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

AIX, HP-UX, Linux, Solaris

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Chapter 1

Introducing the Symantec High Availability Agent for WebSphere MQ

This chapter includes the following topics:

About the Symantec High Availability agent for WebSphere MQ

Symantec 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 Symantec High Availability 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 Agent Pack Release Notes for the latest updates or software issues for this agent.

Supported software

For information on the software versions that the Symantec High Availability agent for WebSphere MQ supports, see the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

Support matrix for IMF and in-depth monitoring

Depending on your version of Symantec Cluster Server (VCS) and the WebSphere MQ agent, the following features and functionality are supported.

Table 1-1

VCS and agent version	IMF capability	SecondLevelMonitor attribute	LevelTwoMonitorFreq attribute
VCS 5.1 SP1 or later with WebSphere MQ agent 5.1.9.0 or later	Yes	No	Yes
VCS 5.1 SP1 with WebSphere MQ agent 5.1.8.0 or earlier	No	Yes	No
VCS 5.1 or earlier with WebSphere MQ agent 5.1.9.0 or later	No	Yes	No
VCS 5.1 or earlier with WebSphere MQ agent 5.1.8.0 or earlier	No	Yes	No

How the agent supports intelligent resource monitoring

With intelligent monitoring framework (IMF), VCS supports intelligent resource monitoring in addition to the poll-based monitoring. Poll-based monitoring polls the resources periodically whereas intelligent monitoring performs asynchronous monitoring.

When an IMF-enabled agent starts up, the agent initializes the asynchronous monitoring framework (AMF) kernel driver. After the resource is in a steady state, the agent registers with the AMF kernel driver, the details of the resource that are

required to monitor the resource. For example, the agent for WebSphere MQ registers the PIDs of the WebSphere MQ Queue Manager processes with the AMF kernel driver. The agent's imf_getnotification function waits for any resource state changes.When the AMF kernel driver module notifies the imf_getnotification function about a resource state change, the agent framework runs the monitor agent function to ascertain the state of that resource. The agent notifies the state change to VCS, which then takes appropriate action.

See the *Symantec Cluster Server Administrator's Guide* for more information.

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.

Online

The online function performs the following tasks:

- Verifies that the WebSphere MQ instance is not already online. If the instance is online, the online operation exits immediately.
- If the partial set of WebSphere MQ processes are running, the agent performs a process level clean up before starting the queue manager.
- Uses an IBM provided start script to start the WebSphere MQ 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 WebSphere MQ 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.
- If the MQInstallationPath attribute is configured, the agent runs WebSphere MQ commands from the specified WebSphere MQ installation path.

Offline

The offline function performs the following tasks:

- Verifies that the WebSphere MQ instance is not already offline. If the instance is offline, the offline operation exits immediately.

- Uses an IBM provided stop script to stop the WebSphere MQ 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 WebSphere MQ queue manager is given enough time to go offline successfully. The operation uses a wait period that the OfflineTimeout attribute specifies, to allow the WebSphere MQ queue manager to complete the offline sequence before allowing further probing of the resource.
  If the processes are found running even after the wait period, then these processes are killed.
- If the MQInstallationPath attribute is configured, the agent runs WebSphere MQ commands from the specified WebSphere MQ installation path.

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 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 WebSphere MQ 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.
  The agent for WebSphere MQ also supports Intelligent Monitoring Framework (IMF) in the first level check. IMF enables intelligent resource monitoring. The agent for WebSphere MQ is IMF-aware and uses the asynchronous monitoring framework (AMF) kernel driver for resource state change notifications. See "How the agent supports intelligent resource monitoring" on page 12.
  You can use the MonitorFreq key of the IMF attribute to specify the frequency at which the agent invokes the monitor function. See "MonitorFreq" on page 83.
- The second level check, if configured, determines 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.

Note: The attribute used to configure the second level check and its frequency depends on the software versions of VCS and WebSphere MQ agent you have installed: For VCS 5.1 SP1 with WebSphereMQ agent version 5.1.9.0, use the LevelTwoMonitorFreq attribute. For VCS 5.1 or earlier with WebSphereMQ agent 5.1.8.0 or earlier, use the SecondLevelMonitor attribute

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- 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 50.
- When the WebSphere MQ resource is offline and the agent detects the queue manager processes as running, but the second level monitor check fails, the agent cleans these processes.
- If the MQInstallationPath attribute is configured, the agent runs WebSphere MQ commands from the specified WebSphere MQ installation path.

Clean

In case of a failure or after an unsuccessful attempt to online or offline WebSphere MQ 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 WebSphere MQ queue manager.
- If a graceful shutdown fails, the clean function looks for all the processes running for the WebSphere MQ 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 WebSphere MQ 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 WebSphere MQ queue manager.
- If the MQInstallationPath attribute is configured, the agent runs WebSphere MQ commands from the specified WebSphere MQ installation path.

Note: For information about the additional functions of the agent for WebSphere MQ when IMF is enabled: See "Agent functions for the IMF functionality" on page 81.

Chapter 2

Installing, upgrading, and removing the agent for WebSphere MQ

This chapter includes the following topics:

Before you install the Symantec High Availability agent for WebSphere MQ

You must install the Symantec High Availability agent for WebSphere MQ on all the systems that will host WebSphere MQ Queue Manager service groups.

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

For VCS, do the following:

- Install and configure Symantec Cluster Server.
  For more information on installing and configuring Symantec Cluster Server, refer to the *Symantec Cluster Server Installation Guide*.
- Remove any previous version of this agent.
- Install the latest version of ACC Library.
  To install or update the ACC Library package, locate the library and related documentation in the Agent Pack tarball:
  See "Installing the ACC library" on page 19.
- On Solaris 11, ensure that the pkg:/compatibility/ucb package is installed on the system.

Note: All non-global zones must be booted and in a running state at the time of package installation or un-installation. If the non-global zones are not booted, you may need to reinstall the package manually after booting the non-global zones.

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 VCS One environment" on page 36.

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.
  See "Installing the ACC library" on page 19.
- For VCS 5.0 and earlier releases, 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 cd1/*platform*/*arch_dist*/vcs/application/i18n_support/5.0

VCS 4.1	cd1/*platform*/*arch_dist*/vcs/application/i18n_support/4.1
VCS 4.0	cd1/*platform*/*arch_dist*/vcs/application/i18n_support/4.0

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

Note: *arch_dist* is not applicable to AIX.

About the ACC library

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

Instructions to install or remove the ACC library on a single system in the cluster are given in the following sections. The instructions assume that the agent's tar file has already been extracted.

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. Download ACC Library.

   You can download either the complete Agent Pack tar file or the individual ACCLib tar file from the Symantec Operations Readiness Tools (SORT) site (https://sort.symantec.com/agents).

3 If you downloaded the complete Agent Pack tar file, navigate to the directory containing the package for the platform running in your environment.

AIX	*cd1*/aix/vcs/application/acc_library/*version*_library/pkgs
HP-UX	*cd1*/hpux/generic/vcs/application/acc_library/*version*_library/pkgs
Linux	*cd1*/linux/generic/vcs/application/acc_library/*version*_library/rpms
Solaris	*cd1*/solaris/*dist_arch*/vcs/application/acc_library/*version*_library/pkgs where *dist_arch* is sol_sparc or sol_x64.

4 If you downloaded the individual ACCLib tar file, navigate to the pkgs directory (for AIX, HP-UX, and Solaris), or rpms directory (for Linux).

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

AIX	`# installp -ac -d VRTSacclib.bff VRTSacclib`
HP-UX	`# swinstall -s 'pwd' VRTSacclib`
Linux	`# rpm -i \` `VRTSacclib-`*`VersionNumber`*`-GA_GENERIC.noarch.rpm`
Solaris	`# pkgadd -d VRTSacclib.pkg` **Note:** To install the ACCLib IPS package on a Solaris 11 system, see Installing the ACC library IPS package on Oracle Solaris 11 systems.

Installing the ACC library IPS package on Oracle Solaris 11 systems

To install the ACC library IPS package on an Oracle Solaris 11 system

1 Copy the VRTSacclib.p5p package from the pkgs directory to the system in the `/tmp/install` directory.

2 Disable the publishers that are not reachable as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

3 Add a file-based repository in the system.

```
# pkg set-publisher -g /tmp/install/VRTSacclib.p5p Symantec
```

4 Install the package.

```
# pkg install --accept VRTSacclib
```

5 Remove the publisher from the system.

```
# pkg unset-publisher Symantec
```

6 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher name>
```

Installing the ACC library package on Solaris brand non-global zones

With Oracle Solaris 11, you must install the ACC library package inside non-global zones. The native non-global zones are called Solaris brand zones.

To install the ACC library package on Solaris brand non-global zones

1 Ensure that the SMF service `svc:/application/pkg/system-repository:default` and `svc:/application/pkg/zones-proxyd:default` are online on the global zone.

```
# svcs svc:/application/pkg/system-repository:default

# svcs svc:/application/pkg/zones-proxyd:default
```

2 Log on to the non-global zone as a superuser.

3 Ensure that the SMF service `svc:/application/pkg/zones-proxy-client:default` is online inside non-global zone:

```
# svcs svc:/application/pkg/zones-proxy-client:default
```

4 Copy the VRTSacclib.p5p package from the pkgs directory to the non-global zone (for example at `/tmp/install` directory).

5 Disable the publishers that are not reachable, as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

6 Add a file-based repository in the non-global zone.

```
# pkg set-publisher -g/tmp/install/VRTSacclib.p5p Symantec
```

7 Install the package.

```
# pkg install --accept VRTSacclib
```

8 Remove the publisher on the non-global zone.

```
# pkg unset-publisher Symantec
```

9 Clear the state of the SMF service, as setting the file-based repository causes the SMF service `svc:/application/pkg/system-repository:default` to go into maintenance state.

```
# svcadm clear svc:/application/pkg/system-repository:default
```

10 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher>
```

Note: Perform steps 2 through 10 on each non-global zone.

Installing the agent in a VCS environment

Depending upon the operating system and VCS version installed on the cluster nodes, you can install the agent using the following methods:

Table 2-1 Agent installation methods in a VCS environment

Method	VCS version	Operating system
Manual installation using native commands See "Installing the agent manually" on page 22.	4.x, 5.x, and 6.x	AIX, HP-UX, Linux, Solaris
Installation using a script-based installer See "Installing the agent using the script-based installer" on page 27.	6.0	Linux
Interactive installation using the vCenter menu For more information, see the Installing quarterly VCS agent updates using the vSphere Client menu technical note.	6.0	Linux

Note: On successful installation of the WebSphere MQ agent version 5.1.14.0 or later, the agent runs the `/opt/VRTSagents/ha/bin/WebSphereMQ/MQ_update.pl` script. This script changes any existing resources of type WebSphereMQ6 to type WebSphereMQ in the VCS configuration, and deletes the WebSphereMQ6 agent type.

Installing the agent manually

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

To install the agent manually in a VCS environment

1. Download the agent from the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

   You can download either the complete Agent Pack tar file or an individual agent tar file.

2. Uncompress the file to a temporary location, say /tmp.

3. If you downloaded the complete Agent Pack tar file, navigate to the directory containing the package for the platform running in your environment.

AIX	`cd1/aix/vcs/application/webspheremq_agent/`*`vcs_version`*`/`*`version`*`_agent/pkgs`
HP-UX	`cd1/hpux/generic/vcs/application/webspheremq_agent/`*`vcs_version`*`/`*`version`*`_agent/pkgs`
Linux	`cd1/linux/generic/vcs/application/webspheremq_agent/`*`vcs_version`*`/`*`version`*`_agent/rpms`
Solaris	`cd1/solaris/`*`dist_arch`*`/vcs/application/webspheremq_agent/`*`vcs_version`*`/`*`version`*`_agent/pkgs` where, *dist_arch* is sol_x64 or sol_sparc

   If you downloaded the individual agent tar file, navigate to the pkgs directory (for AIX, HP-UX, and Solaris), or rpms directory (for Linux).

4 Log in as superuser.

5 Install the package.

AIX
```
# installp -ac -d VRTSmq6.rte.bff VRTSmq6.rte
```

HP-UX
```
# swinstall -s 'pwd' VRTSmq6
```

Linux
```
# rpm -ihv \
VRTSmq6-AgentVersion-GA_GENERIC.noarch.rpm
```

Solaris
```
# pkgadd -d . VRTSmq6
```

Note: The agent package VRTSmq6 includes the Symantec High Availability 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. However, the agent for WebSphere MQ FTE does not support the Symantec High Availability Configuration wizard.

Installing the agent IPS package on Oracle Solaris 11 systems

To install the agent IPS package on an Oracle Solaris 11 system

1 Copy the VRTSmq6.p5p package from the pkgs directory to the system in the `/tmp/install` directory.

2 Disable the publishers that are not reachable as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

where the publisher name is obtained using the `pkg publisher` command.

3 Add a file-based repository in the system.

```
# pkg set-publisher -g /tmp/install/VRTSmq6.p5p Symantec
```

4 Install the package

```
# pkg install --accept VRTSmq6
```

5 Remove the publisher from the system.

```
# pkg unset-publisher Symantec
```

6 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher name>
```

Installing agent packages on Solaris brand non-global zones

With Oracle Solaris 11, you must install the agent package inside non-global zones. The native non-global zones are called Solaris brand zones.

To install the agent package on Solaris brand non-global zones

1 Ensure that the SMF service `svc:/application/pkg/system-repository:default` and `svc:/application/pkg/zones-proxyd:default` are online on the global zone.

```
# svcs svc:/application/pkg/system-repository:default
```

```
# svcs svc:/application/pkg/zones-proxyd:default
```

2 Log on to the non-global zone as a superuser.

3 Ensure that the SMF service `svc:/application/pkg/zones-proxy-client:default` is online inside non-global zone:

```
# svcs svc:/application/pkg/zones-proxy-client:default
```

4 Copy the VRTSmq6.p5p package from the pkgs directory to the non-global zone (for example at `/tmp/install` directory).

5 Disable the publishers that are not reachable, as package install may fail if any of the already added repositories are unreachable.

```
# pkg set-publisher --disable <publisher name>
```

6 Add a file-based repository in the non-global zone.

```
# pkg set-publisher -g/tmp/install/VRTSmq6.p5p Symantec
```

7 Install the package.

```
# pkg install --accept VRTSmq6
```

8 Remove the publisher on the non-global zone.

```
# pkg unset-publisher Symantec
```

9 Clear the state of the SMF service, as setting the file-based repository causes the SMF service `svc:/application/pkg/system-repository:default` to go into maintenance state.

```
# svcadm clear svc:/application/pkg/system-repository:default
```

10 Enable the publishers that were disabled earlier.

```
# pkg set-publisher --enable <publisher>
```

Note: Perform steps 2 through 10 on each non-global zone.

Installing the agent in a Solaris 10 brand zone

To install the WebSphere MQ agent in a brand zone on Solaris 10:

- Ensure that the ACClibrary package, VRTSacclib, is installed in the non-global zone.
  To install VRTSacclib in the non-global zone, run the following command from the global zone:
  ```
  # pkgadd -R /zones/zone1/root -d VRTSacclib.pkg
  ```
- To install the agent package in the non-global zone, run the following command from the global zone:
  ```
  # pkgadd -R zone-root/root -d . VRTSmq6
  ```
  For example: `# pkgadd -R /zones/zone1/root -d . VRTSmq6`

Note: You can ignore the following messages that might appear:

```
## Executing postinstall script.

ln: cannot create
/opt/VRTSagents/ha/bin/WebSphereMQ/imf_getnotification: File exists

ln: cannot create /opt/VRTSagents/ha/bin/WebSphereMQ/imf_register:
File exists

or ## Executing postinstall script.

ln: cannot create
/opt/VRTSagents/ha/bin/WebSphereMQ/imf_getnotification: No such file
or directory

ln: cannot create /opt/VRTSagents/ha/bin/WebSphereMQ/imf_register:
No such file or directory
```

Installing the agent using the script-based installer

This section provides instructions for installing the latest version of this agent by using the script-based installer. The latest version of this agent is available in the VCS Agent Pack release.

The script-based installer uses the installagpack program to install the agent for WebSphere MQ on multiple cluster systems.

To install the agent using the installagpack script:

1. Download the complete Agent Pack tar file from the Symantec Operations Readiness Tools (SORT) site:

   https://sort.symantec.com/agents.

2. Uncompress the file to a temporary location, say /tmp.

3. Navigate to the folder that contains the installagpack program.

   For VCS 6.1 `cd1/linux/dist_arch/vcs/6.1`

   For VCS 6.0.x `cd1/linux/dist_arch/vcs/6.0`

   where, dist_arch is rhel5_x86_64, rhel6_x86_64, slesl0_x86_64, or sles11_x86_64.

   Note: For OEL5 and OEL6 platforms, use rhel5_x86_64 and rhel6_x86_64, respectively.

4. Start the installagpack program:

   ```
   # ./installagpack
   ```

   Run this command with the -rsh option if you use rsh and rcp for communication between the cluster systems.

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

   The -rsh option requires that systems be preconfigured such that the rsh commands between systems execute without prompting for passwords or confirmations.

5. Enter the names of the systems where you want to install the agent.

   The installer replaces the previous version of the rpm with the current version.

This completes the installation procedure. You can view the details of the installation in the installation logs located in the `/var/VRTS/install/logs` directory.

Installing the agent in VCS One environment

You must install the agent for WebSphere MQ on all the client systems of the VCS One cluster that will host the WebSphere MQ service group. You can install the agent for WebSphere MQ using the installagpack program or using the command line interface (CLI).

The installation of the agent packs involves the following phases:

Installing the agent packages	See "Installing the agent packages using the installer" on page 28.
Adding the agent resource type definitions	See "Adding the agent resource type definitions to the Policy Master Server on UNIX" on page 30. See "Adding the agent resource type definitions to the Policy Master Server on Windows" on page 32.

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 using the installer

You can install the agent packages on one or more client systems of a specific platform type.

Note: To install the VCS One client for managing VMware ESX Servers, download the tar ball for Red Hat Enterprise Linux 4 (RHEL 4) x86 (32-bit) or RHEL 5 x86_64

Perform the following steps to install the agent packages using the installer

1. On the Policy Master system, download the complete Agent Pack tarball or the individual agent tarball from the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.
2. Uncompress the file to a temporary location, say /tmp.

3 If you downloaded the complete Agent Pack tarball, navigate to the following directory containing the installer for the VCS One agents, for the platform running in your environment:

AIX	`cd1/aix/vcsone/vcsone_version`
HP-UX	`cd1/hpux/hpuxos_version/vcsone/vcsone_version` Where *os_version* is the HP-UX version.
Linux	`cd1/linux/dist_arch/vcsone/vcsone_version` Where *dist* is the Linux distribution and *arch* is the architecture.
Solaris	`cd1/solaris/dist_arch/vcsone/vcsone_version` Where, *dist_arch* is 'sol_sparc' or 'sol_x64'.

4 Enter the following 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.

5 Enter the name of the client systems where you want to install the agents.

6 Choose whether to install all the agents or any specific agent. Follow the installer prompt to specify your option.

7 Review the output as the installation program installs the agent packages.

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

Installing the agent package using the CLI

You can install the desired agent package using the CLI, on one or more client systems of a specific platform type.

Perform the following steps to install the agent packages using CLI

1 On the Policy Master system, download the complete Agent Pack tarball or the individual agent tarball from the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

2 Uncompress the file to a temporary location, say /tmp.

3 If you downloaded the complete Agent Pack tarball, navigate to the following directory containing the installer for the VCS One agents, for the platform running in your environment:

AIX	# **cd1/aix/vcsone/vcsone_version/pkgs**
HP-UX	# **cd1/hpux/hpux*os_version*/vcsone/vcsone_version/depot**
Linux	# **cd1/linux/*dist_arch*/vcsone/vcsone_version/rpms** Where, *dist* is the Linux distribution and *arch* is the architecture
Solaris	# **cd1/solaris/*dist_arch*/vcsone/vcsone_version/pkgs** Where *dist_arch* is 'sol_sparc' or 'sol_x64'

4 Type the following command on each client system to install the agent. Answer the prompt accordingly:

AIX	# **installp -ac -d . VRTSmq6.rte**
HP-UX	# **swinstall -s `pwd` VRTSmq6**
Linux	# **rpm -ivh VRTSmq6_rpm_filename**
Solaris	For Solaris 10: # **pkgadd -d . VRTSmq6** For Solaris 11: See "Installing the agent IPS package on Oracle Solaris 11 systems" on page 24.

Adding the agent resource type definitions to the Policy Master Server on UNIX

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 VCS One cluster.

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

To add the agent resource types to the policy master database configuration

1. Set up RSH or SSH communications between the client system and the policy master system.

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

2. Make sure that the PM daemon is running.

   ```
   # /opt/VRTSvcsone/bin/haclus -display
   ```

   The output should show ClusterState is RUNNING.

3. Access the temporary location where you downloaded the tar ball and depending on the platform type, navigate to the directory containing the agent installer:

AIX	`cd1/aix/vcsone/`*`vcsone_version`*
HP-UX	`cd1/hpux/hpux`*`os_version`*`/vcsone/`*`vcsone_version`* Where *os_version* is the HP-UX version.
Linux	`cd1/linux/`*`dist_arch`*`/vcsone/`*`vcsone_version`* Where *dist* is the Linux distribution and *arch* is the architecture.
Solaris	`cd1/solaris/`*`dist_arch`*`/vcsone/`*`vcsone_version`* Where *dist_arch* is the sol_sparc or sol_x64.

4. 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
   ```

5. When the installer prompts, enter the virtual IP address of the Policy Master.
6. Review the output as the installer verifies communication with the Policy Master system.
7. Choose whether to add the type definitions for all the agents or for specific agents. Follow the installer prompts to add the type definitions.
8. Review the output as the installer adds the agent types to the PM database configuration and copies the appropriates types.xml files to the PM system.

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

Adding the agent resource type definitions to the Policy Master Server on Windows

After you have installed the agent package, you must add the agent resource type definitions to the Policy Master database configuration. You must perform this task from the Policy Master Server.

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

To add the agent resource types to the Policy Master Server on Windows, perform the following steps from the Policy Master Server command prompt

1. Create a temporary directory on the Policy Master Server, to add the type definitions.

   ```
   C:\> mkdir addtypes_tmp
   ```

2. Change your working directory to the temporary directory created in step 1.

   ```
   C:\> chdir addtypes_tmp
   ```

3. Copy the agent's type xml file in to the temporary directory.
4. Convert this type xml file into type cmd file.

   ```
   C:\addtypes_tmp> haconf -xmltocmd type_xml_filename.xml
   ```

5. Rename the *type_xml_filename*.xml.cmd file to *type_xml_filename*.bat
6. Run the batch file.

   ```
   C:\addtypes_tmp> type_xml_filename.bat >log.txt 2>&1
   ```

7. Review the log.txt file for any errors.
8. Verify whether the type has been successfully added to the Policy Master Server.

   ```
   C:\addtypes_tmp> hatype -list -platform platform_name
   ```

Removing the agent in a VCS environment

Depending upon the operating system and VCS version installed on the cluster nodes, you can uninstall the agent using the following methods:

Table 2-2 Agent uninstallation methods in a VCS environment

Method	VCS version	Operating system
Manual uninstallation using native commands See "Removing the agent manually" on page 33.	4.x, 5.x, and 6.x	AIX, HP-UX, Linux, Solaris
Uninstallation using a script-based installer See "Removing the agent using the script-based installer" on page 34.	6.0	Linux

Removing the agent manually

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

Warning: The agent package VRTSmq6 includes the Symantec High Availability 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=WebSphereMQ
   ```

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

   ```
   # hatype -delete WebSphereMQ
   ```

   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` **Note:** To uninstall the agent IPS package on a Solaris 11 system: `# pkg uninstall VRTSmq6`

Removing the agent using the script-based installer

The script-based installer uses the uninstallagpack program to remove all agent packages. Removing the agent packages involves removing the agent files from each system where it was installed.

To uninstall a specific agent: See "Removing the agent manually" on page 33.

Note: The uninstallagpack program removes the following rpms: VRTSvcsvmw, VRTSmq6, and VRTSsapwebas. The uninstallagpack program does not uninstall VRTSacclib.

To remove the agent packages from the systems

1 Freeze the service groups that host the application, on the system from which you want to remove the agent package.

```
# hagrp -freeze groupname
```

2 Stop the agent on all systems before you remove the agent package.

```
# haagent -stop WebSphereMQ6 -force -sys system_name
```

```
# haagent -stop SAPWebAS71 -force -sys system_name
```

3 Ensure that the agent operations are stopped on all the cluster systems.

```
# haagent -display WebSphereMQ6

# haagent -display SAPWebAS71
```

4 Delete all resources of type WebSphereMQ6 and SAPWebAS71.

5 Access the temporary location where you downloaded the Agent Pack tar file and navigate to the directory containing the package for the platform running in your environment:

For VCS 6.1 `cd1/linux/dist_arch/vcs/6.1`

For VCS 6.0 `cd1/linux/dist_arch/vcs/6.0`

where, dist_arch is rhel5_x86_64, rhel6_x86_64, slesl0_x86_64, or sles11_x86_64

Note: For OEL5 and OEL6 platforms, use rhel5_x86_64 and rhel6_x86_64, respectively.

---

6 Start the uninstallagpack program.

```
# ./uninstallagpack
```

Run this command with the -rsh option if you use rsh and rcp for communication between the cluster systems.

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

The -rsh option requires that systems be preconfigured such that the rsh commands between systems execute without prompting for passwords or confirmations.

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

---

7 Enter the name of the systems from which you want to remove the agent package. The names must be separated by spaces.

This completes the uninstallation procedure. You can view the details in the installation logs located in the `/var/VRTS/install/logs` directory.

Removing the agent in VCS One environment

Removing the agent package involves removing the agent files from each client system where it was installed.

You can remove the packages using the agent pack installer or the command line.

See "Removing the agent packages using the installer" on page 36.

See "Removing the agent package using CLI" on page 37.

After removing the agent packages you can remove the agent type definition from the Policy Master system.

See "Removing the agent type definition from the Policy Master system on UNIX" on page 38.

See "Removing the agent type definition from the Policy Master system on Windows" on page 39.

Removing the agent packages using the installer

You can remove all the agent packages or the desired agent package 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 the agent packages from the client systems

1. Freeze the service groups that hosts the application, on the system from which you want to remove the agent package.

   ```
   # hagrp -freeze <groupname>
   ```

2. Stop the agent on all client systems before you remove the agent package from the system.

   ```
   # haagent -stop -notransition <AgentName> -sys <system_name>
   ```

3. Ensure that the agent operations are stopped on all the cluster systems.

   ```
   # haagent -display <AgentName>
   ```

4 Access the temporary location where you downloaded the Agent Pack and navigate to the directory containing the package for the platform running in your environment:

AIX	**cd1/aix/vcsone/*vcsone_version***
HP-UX	**cd1/hpux/hpux*os_version*/vcsone/*vcsone_version*** Where *os_version* is the HP-UX version.
Linux	**cd1/linux/*dist_arch*/vcsone/*vcsone_version*** Where *dist* is the Linux distribution and *arch* is the architecture.
Solaris	**cd1/solaris/*dist_arch*/vcsone/*vcsone_version*** Where *dist_arch* is the sol_sparc or sol_x64.

5 Start the uninstallagpack program.

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

6 Enter the name of the client systems on which you want to uninstall the agent pack. The names must be separated by spaces.

7 Choose whether to remove all the agent packages or a specific agent package. Follow the installer prompt to remove the agent package.

8 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 agent package using CLI

You can remove a desired agent package using the CLI.

Note: You must remove this agent package from each client system in the cluster.

To remove the agent for WebSphere MQ from a client system

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

AIX	# **installp -u VRTSmq6**
HP-UX	# **swremove VRTSmq6**
Linux	# **rpm -e VRTSmq6**
Solaris	For Solaris 10: # **pkgrm VRTSmq6** For Solaris 11: # **pkg uninstall VRTSmq6**

Removing the agent type definition from the Policy Master system on UNIX

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

To remove the agent type definition from the Policy Master system on UNIX

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 agent type definition from the Policy Master system on Windows

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

To remove the agent type definition from the Policy Master system on Windows

- Run the following command from the Policy Master Server command prompt.

  C:\> hatype -delete *agentname*_i.e._*typename* -platform *platformname*

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`
HP-UX	`# swremove VRTSacclib`
Linux	`# rpm -e VRTSacclib`

Solaris	`# pkgrm VRTSacclib`
	Note: To uninstall the ACClib IPS package on a Solaris 11 system:
	`# pkg uninstall VRTSacclib`

Upgrading the agent in a VCS environment

The VRTSmq6 package for the WebSphere MQ agent version 5.1.14.0 or later contains a script named `MQ_update.pl`.

This script does the following:

- Updates the WebSphereMQ6 agent type to WebSphereMQ.
- Reconfigures all the existing resources of the WebSphereMQ6 agent type with the WebSphereMQ agent type.
- Removes the WebSphereMQ6 agent type.

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

To upgrade the agent

1. If VCS is not running, proceed to step 2.

   If VCS is running, stop the WebSphereMQ6 and WebSphereMQFTE agents on all the nodes.

2. Uninstall the WebSphereMQ6 agent package (VRTSmq6) on all the nodes. Use the platform's native software management program to remove the old agent package (VRTSmq6) for WebSphereMQ Server 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`

3. Install the WebSphereMQ agent on all the nodes. See "Installing the agent in a VCS environment" on page 22.

   The `MQ_update.pl` script runs automatically on successful installation of the agent.

4. When the agent is successfully upgraded to version 5.1.14.0, the following message is displayed:

```
You have successfully replaced agent type [WebSphereMQ6]
with the new agent type [WebSphereMQ]
For details, see the following log: [/var/VRTSvcs/log/
UpdateWebSphereMQType_4251/MQ_update.log]
Installation of <VRTSmq6> was successful.
```

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.

   `# hagrp -freeze -propagate GroupName`

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

   `# hastop -client -sys SystemName -force`

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

   `# ps -ef | grep WebSphereMQ`

4. Uninstall the agent package from all the nodes. Type the following command on each client system to remove the agent. Answer prompts accordingly:

AIX	`# installp -u VRTSmq6`
HP-UX	`# swremove VRTSmq6`
Linux	`# rpm -e VRTSmq6`

Solaris	For Solaris 10:
	`# pkgrm VRTSmq6`
	For Solaris 11:
	`# pkg uninstall VRTSmq6`

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

   See "Installing the agent in VCS One environment" on page 28.

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

   See "Adding the agent resource type definitions to the Policy Master Server on UNIX" on page 30.

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

8 Start the clients.

```
# hastart -client
```

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

```
# haagent -start WebSphereMQ -sys SystemName
```

10 Unfreeze the service groups.

```
# hagrp -unfreeze -propagate GroupName
```

Chapter 3

Configuring the agent for WebSphere MQ

This chapter includes the following topics:

About configuring the Symantec High Availability agent for WebSphere MQ

After installing the Symantec High Availability agent for WebSphere MQ, you must import the agent type configuration file. After importing this file, review the attributes table that describes the resource type and its attributes, and then create and configure WebSphere MQ Queue Manager resources.

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

See "About sample configurations for the agent for WebSphere MQ" on page 104.

Importing the agent types file in a VCS environment

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

You can import the agent types file using Cluster Manager (Java Console) or via the command line interface.

Importing the agent types file using Cluster Manager (Java Console)

To import the agent types file using Cluster Manager (Java Console)

1. Start the Cluster Manager (Java Console) 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	■ AIX ■ HP-UX ■ Linux ■ Solaris	`/etc/VRTSvcs/conf/sample_WebSphereMQ/WebSphereMQTypes.cf`
VCS 5.x or later	■ AIX ■ HP-UX ■ Linux	`/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes.cf`
VCS 5.0	Solaris SPARC and x64	`/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes50.cf`
VCS 5.1 or later	Solaris SPARC and x64	`/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes51.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.

Importing the agent types file using the CLI

To import the agent types file using the command line interface (CLI):

1. If VCS is running, run the `/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes.cmd` file from the command line.
2. If VCS is not running, perform the following steps:

   1. Copy the agent types file from the `/etc/VRTSagents/ha/conf/<AgentTypes_file>` directory to the `/etc/VRTSvcs/conf/config` directory.

Where, <AgentTypes_file> is chosen according to the following table:

VCS 4.x	■ AIX ■ HP-UX ■ Linux ■ Solaris	/etc/VRTSvcs/conf/sample_WebSphereMQ/WebSphereMQTypes.cf
VCS 5.x or later	■ AIX ■ HP-UX ■ Linux	/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes.cf
VCS 5.0	Solaris SPARC and x64	/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes50.cf
VCS 5.1 or later	Solaris SPARC and x64	/etc/VRTSagents/ha/conf/WebSphereMQ/WebSphereMQTypes51.cf

2. Include the agent types file in the main.cf file.

3. Start HAD.

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

Table 3-1 Required attributes *(continued)*

Required attributes	Description
MQUser	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. 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. Type and dimension: string-scalar Default: mqm Example: mqusr1
MQVer	Version of the WebSphere MQ queue manager. Valid values are 5.3, 6.0, 7.0, 7.1, and 7.5. Type and dimension: string-scalar Default: 6.0 Example: 7.0
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: "" Example: venus.queue.manager
ResLogLevel	The logging detail performed by the agent for the resource. Valid values are: ERROR: Only logs error messages. WARN : Logs above plus warning messages. INFO: Logs above plus informational messages. TRACE: Logs above plus trace messages. TRACE is very verbose and should only be used during initial configuration or for troubleshooting and diagnostic functions. 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

Optional attribute	Description
EnvFile	The complete path of the file name to source to set the environment prior to executing WebSphere MQ programs. Symantec recommends storing the file on the shared disk. This ensures that the same file is available on each failover node. Specifying this attribute is optional. The shell environments supported are ksh, sh, and csh. Type and dimension: string-scalar Default: "" Example: /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 50. 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. **Note:** The SecondLevelMonitor attribute is applicable to VCS versions earlier than VCS 5.1 SP1 with WebSphereMQ agent versions earlier than 5.1.9.0. From VCS version 5.1 SP1 with WebSphere MQ agent version 5.1.9.0 onwards, the SecondLevelMonitor attribute of the WebSphereMQ agent is deprecated. Instead, a resource type level attribute LevelTwoMonitorFreq should be used to specify the frequency of in-depth monitoring. Type and dimension: integer-scalar Default: 0 Example: 1

Table 3-2 Optional attributes *(continued)*

Optional attribute	Description
LevelTwoMonitorFreq	Specifies the frequency at which the agent for this resource type must perform second-level or detailed monitoring. You can also override the value of this attribute at the resource level. The value indicates the number of monitor cycles after which the agent will monitor the WebSphere MQ queue manager in detail. For example, the value 5 indicates that the agent will monitor the WebSphere MQ queue manager in detail after every five online monitor intervals. **Note:** This attribute is applicable to VCS version 5.1 SP1 with WebSphere MQ agent version 5.1.9.0 or later. If the VCS version is earlier than VCS 5.1 SP1 and the WebSphere MQ agent version is earlier than 5.1.9.0, the SecondLevelMonitor attribute should be used. If you upgraded the VCS version to VCS 5.1 SP1 and the WebSphereMQ agent version to 5.1.9.0 (or later), and if you had enabled detail monitoring in the previous version, then do the following: ■ Set the value of the LevelTwoMonitorFreq attribute to the same value as that of the SecondLevelMonitor attribute. Type and dimension: integer-scalar Default: 0
MonitorListener	Decides whether the monitor and clean functions must monitor and clean MQ listener processes (runmqlsr). If this attribute is set to a value greater than zero, the agent monitors MQ listener processes. The integer you specify in this attribute denotes the number of MQ listener processes that the agent must monitor. If you set this attribute to 0 (default value), the agent does not monitor the WebSphere MQ listener process. If a listener cannot be started or stopped as part of the queue manager startup or shutdown, then you must create a separate resource for that WebSphereMQ listener, using the Application agent. Type and dimension: integer-scalar Default: 0 Example: 1

Table 3-2 Optional attributes *(continued)*

Optional attribute	Description
MQInstallationPath	When more than one copy of WebSphere MQ is installed on a system, each queue manager is associated with a particular installation. Specify the location of the WebSphere MQ installation to which this queue manager is associated. For WebSphere MQ versions earlier than 7.1, the default installation path is `/opt/mqm` or `/usr/mqm` for AIX platforms . Specify a custom installation path for WebSphere MQ 7.1 or later. If you change the installation that is associated with a queue manager, ensure that you update this attribute to specify the newly-associated installation path. Example: `/opt/customLocation` Default: " "
DisabledProcesses	Specifies a list of queue manager processes that the agent must bypass or disregard while performing a monitor operation. Typically, when the agent for WebSphere MQ performs the monitor operation, the agent searches for all system processes that must be running for a queue manager to function. These are processes that are expected to start by default when a queue manager is started on the system. However, in certain circumstances, such as for security purposes, a few of these processes might be disabled on the system. You can specify such disabled processes in the DisabledProcesses attribute. When the agent performs a monitor operation, the agent bypasses or disregards the specified processes. For example, the Object Authority Manager (OAM) process (amqzfuma) is expected to start by default when queue manager starts on a system. Therefore, the WebSphere MQ agent assumes that the amqzfuma process is running. However, it is possible for this process to be disabled. In such a case, you can specify the amqzfuma process in the DisabledProcesses attribute, so that the agent does not consider (bypasses) this process. The disabled process name must be specified as the binary name, as seen in the MQ installation path. Type and dimension: string-vector Example: amqzfuma Default: ""

Note: For information about the additional attributes of the agent for WebSphereMQ when IMF is enabled: See “Attributes that enable IMF” on page 82.

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 second-level monitor check indicates that the WebSphere MQ Queue Manager instance is online.
- The second-level monitor 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 an online node.

Chapter 4

Configuring the service group for WebSphere MQ using the Symantec High Availability Configuration wizard

This chapter includes the following topics:

- Sample configurations

Installing the agent for WebSphere MQ in VCS 6.0

You can install the agent for WebSphere MQ in the following ways:

- Using the product installer.
  Use this method to install the agent for SAP WebAS in a physical or virtual environment.
  For more details, refer to the product installation and upgrade guide.
- Using the command line interface (CLI).
  Use this method to install the agent for SAP WebAS in a physical or virtual environment.
  For more details, refer to the product installation and upgrade guide.
- Using the VMware vSphere client integrated menu.
  Use this method to install the agent for SAP WebAS in a virtual environment.
  For more details, refer to the *Symantec High Availability Solutions Guide for VMware*.

Typical cluster configuration in a virtual environment

A typical cluster configuration for WebSphere MQ Queue Manager, in a VMware virtual environment involves two or more virtual machines. The virtual machine on which the application is active, accesses a non-shared VMware VMDK or RDM disk that resides on a VMware datastore.

The virtual machines involved in the cluster configuration may belong to a single ESX host or could reside on separate ESX hosts. If the virtual machines reside on separate ESX hosts, the datastore on which the VMware VMDK or RDM disks (on which the application data is stored) reside must be accessible to each of these ESX hosts.

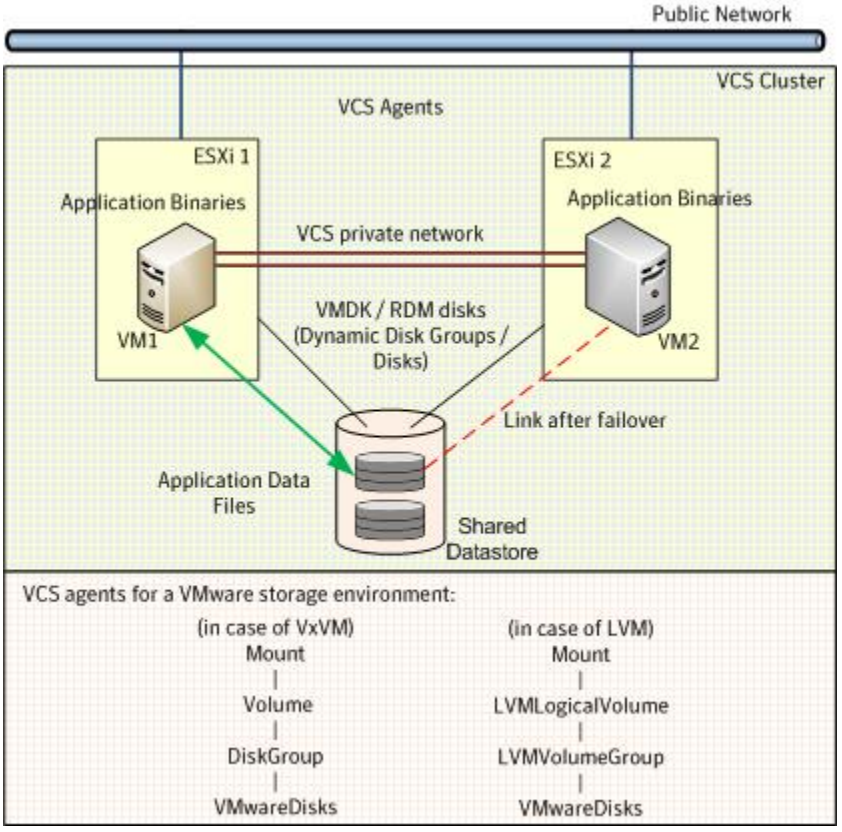
The application binaries are installed on the virtual machines and the data files are installed on the VMware disk drive. The agents monitor the application components and services, and the storage and network components that the application uses.

In a site recovery environment, Symantec High Availability solution additionally provides script files for the following tasks. These files are invoked when the SRM recovery plan is executed.

- Set up communication between the vCenter Server and the SRM Server at the recovery site and the virtual machines at the protected site.
- Assign a SiteID to both the sites.

- Specify attribute values for the application components at the respective site.
- Retrieve the application status in the SRM recovery report, after the virtual machine is started at the recovery site.

Figure 4-1 Typical WebSphere MQ Queue Manager cluster configuration in a VMware virtual environment



During a failover, the storage agents move the VMware disks to the new system. The network agents bring the network components online, and the application specific agents then start application services on the new system.

About configuring application monitoring using the Symantec High Availability solution for VMware

Consider the following before you proceed:

- You can configure application monitoring on a virtual machine using the Symantec High Availability Configuration wizard for VMware. The wizard is launched when you click **Configure application for high availability** on the Symantec High Availability tab in VMware vSphere Client.
- Apart from the Symantec High Availability Configuration wizard, you can also configure application monitoring using the VCS commands. For more information, refer to the *Symantec Cluster Server Administrator's Guide*.
- Symantec recommends that you first configure application monitoring using the wizard before using VCS commands to add additional components or modify the existing configuration.
  Apart from configuring application availability, the wizard also sets up the other components required for successful application monitoring.
- You must not suspend a system if an application is currently online on that machine. If you suspend a system, VCS moves the disks along with the application to another system. Later, when you try to restore the suspended system, VMware does not allow the operation because the disks that were attached before the system was suspended are no longer with the system. To suspend a virtual machine, ensure that the application being monitored is not online on that system.

Note: For details about deploying, configuring, and administering the Symantec High Availability solution, refer to the *Symantec High Availability Solutions Guide for VMware*.

Getting ready to configure VCS service groups using the wizard

Ensure that you complete the following tasks before configuring application monitoring on a virtual machine:

- Install the VMware vSphere Client.
- Install and enable VMware Tools on the virtual machine, where you want to monitor applications with VCS. Install a version that is compatible with the VMware ESX server.
- Install Symantec High Availability console on a Windows system in your data center and register the Symantec High Availability plug-in with the vCenter server.
- Assign Configure Application Monitoring (Admin) privileges to the logged-on user on the virtual machine where you want to configure application monitoring.

- Install Symantec Cluster Server.
- Install the application and the associated components that you want to monitor on the virtual machine.
- If you have configured a firewall, ensure that your firewall settings allow access to ports used by the Symantec High Availability installer, wizards, and services. Refer to the *Symantec High Availability Solutions Guide for VMware* for a list of ports and services used.

Before configuring application monitoring

Note the following prerequisites before configuring application monitoring on a virtual machine:

- The Symantec High Availability Configuration wizard discovers the disks which are attached and the storage which is currently mounted. Ensure that the shared storage used by the application is mounted before you invoke the wizard.
- For all the WebSphere MQ Queue Managers that you want to configure, the DataPath, LogPath, and InstallationPath directories must be accessible from the node from where you invoke the Symantec High Availability Configuration wizard.
- The latest `VRTSmq6` and `VRTSacclib` packages must be installed on the node on which you want to monitor WebSphere MQ Queue Managers.
- You must not restore a snapshot on a virtual machine where an application is currently online, if the snapshot was taken when the application was offline on that virtual machine. Doing this may cause an unwanted failover. This also applies in the reverse scenario; you should not restore a snapshot where the application was online on a virtual machine, where the application is currently offline. This may lead to a misconfiguration where the application is online on multiple systems simultaneously.
- While creating a VCS cluster in a virtual environment, you must configure the cluster communication link over a public network in addition to private adapters. The link using the public adapter should be assigned as a low-priority link. This helps in case the private network adapters fail, leading to a condition where the systems are unable to connect to each other, consider that the other system has faulted, and then try to gain access to the disks, thereby leading to an application fault.
- You must not select teamed network adapters for cluster communication. If your configuration contains teamed network adapters, the wizard groups them as "NIC Group #N" where "N" is a number assigned to the teamed network adapters. A teamed network adapter is a logical NIC, formed by grouping several physical

NICs together. All NICs in a team have an identical MAC address, due to which you may experience the following issues:

- SSO configuration failure.
- The wizard may fail to discover the specified network adapters.
- The wizard may fail to discover/validate the specified system name.

- Verify that the boot sequence of the virtual machine is such that the boot disk (OS hard disk) is placed before the removable disks. If the sequence places the removable disks before the boot disk, the virtual machine may not reboot after an application failover. The reboot may halt with an "OS not found" error. This issue occurs because during the application failover the removable disks are detached from the current virtual machine and are attached on the failover target system.
- Verify that the disks used by the application that you want to monitor are attached to non-shared controllers so that they can be deported from the system and imported to another system.
- If multiple types of SCSI controllers are attached to the virtual machines, then storage dependencies of the application cannot be determined and configured.
- The term ‘shared storage’ refers to the removable disks attached to the virtual machine. It does not refer to disks attached to the shared controllers of the virtual machine.
- If you want to configure the storage dependencies of the application through the wizard, the LVM volumes or VxVM volumes used by the application should not be mounted on more than one mount point path.
- The host name of the system must be resolvable through the DNS server or, locally, using `/etc/hosts` file entries.

Launching the Symantec High Availability Configuration wizard

You can launch the Symantec High Availability Configuration wizard from:

- VMware vSphere Client: See To launch the wizard from the VMware vSphere Client.
- A browser window: See To launch the wizard from a browser window.

You must launch the Symantec High Availability Configuration wizard from the system where the disk residing on the shared datastore is attached.

To launch the wizard from the VMware vSphere Client

1. Launch the VMware vSphere Client and connect to the VMware vCenter Server that hosts the virtual machine.
2. From the vSphere Client's Inventory view in the left pane, select the virtual machine where you want to configure application monitoring.
3. Skip this step if you have already configured single sign-on during guest installation.

   Select the Symantec High Availability tab and in the Symantec High Availability View page, specify the credentials of a user account that has administrative privileges on the virtual machine and click **Configure**.

   The Symantec High Availability console sets up a permanent authentication for the user account on that virtual machine.
4. Depending on your setup, use one of the following options to launch the wizard:
   - If you have not configured a cluster, click the **Configure application for high availability** link.
   - If you have already configured a cluster, click **Actions > Configure application for high availability** or the **Configure application for high availability** link.
   - If you have already configured a cluster and configured an application for monitoring, click **Actions > Configure application for high availability**.

To launch the wizard from a browser window

1. Open a browser window and enter the following URL:

   `https://<VMNameorIP>:5634/vcs/admin/application_health.html`

   <VMNameorIP> is the virtual machine name or IP address of the system on which you want to configure application monitoring.
2. In the Authentication dialog box, enter the username and password of the user who has administrative privileges.
3. Depending on your setup, use one of the following options to launch the wizard:
   - If you have not configured a cluster, click the **Configure application for high availability** link.
   - If you have already configured a cluster, click **Actions > Configure application for high availability** or the **Configure application for high availability** link.
   - If you have already configured a cluster and configured an application for monitoring, click **Actions > Configure application for high availability**.

Configuring the WebSphere MQ queue manager for high availability

Perform the following steps to configure the WebSphere MQ queue manager for high availability on a virtual machine.

To configure the WebSphere MQ queue manager for high availability

1. Launch the Symantec High Availability Configuration wizard. See "Launching the Symantec High Availability Configuration wizard" on page 56.
2. Review the information on the Welcome panel and click **Next**.
3. On the Application Selection panel, select **WebSphere MQ** from the Supported Applications list and click **Next**.

   You can use the Search box to search for the WebSphere MQ application.
4. On the Application Inputs panel, from the Queue Manager list, select the WebSphere MQ queue manager instances that you want to monitor.
5. Skip this step if you do not want to specify environment file for the queue manager.

   In the **Environment File** field, enter the path where the environment file is located. The environment file must be accessible on the node from which you invoke the wizard.
6. Skip this step if you do not want to monitor the related queue manager listener.

   If you want to monitor the related queue manager listener, check the **Monitor Queue Manager Listener** check box and select one of the following options to proceed:

   - Select the **Along with Queue Manager** radio button to monitor the queue manager listeners along with WebSphere MQ queue manager instances. The `MonitorListener` attribute of the WebSphere MQ resource is enabled.
   - Select the **Independent of Queue Manager** radio button to monitor the queue manager listeners separately from queue manager instances. In the **Listener Port** field, enter the listener port number. A separate resource for the listener is created using the Application agent.

   Note: The Symantec High Availability Configuration wizard supports only one listener associated with each queue manager.
7. Click **Next**.

8 Skip this step if you do not want to select mount points for the queue manager instances that you want to monitor.

On the Storage Selection panel, select the mount points that you want to associate with each queue manager instance. Resource-level dependencies are created between queue managers and their corresponding mount resources. If the same mount point is associated with two or more queue managers, the queue managers are configured as part of the same service group.

Note: The Symantec High Availability Configuration wizard does not automatically associate mount points with queue manager instances.

---

9 Click **Next**.

10 On the Configuration Inputs panel, use the Edit icon to specify the user name and password of the systems for VCS cluster operations.

Cluster systems lists the systems included in the cluster configuration. **Application failover targets** lists the systems to which the application can fail over. Move the required systems to the Application failover targets list. Use the up and down arrow keys to define the priority order of the failover systems. The local system is selected by default for both, the cluster operations and as a failover target.

11 Click **Next**.

12 Skip this step if you do not want to add more systems to your cluster.

To add a system to the VCS cluster, click **Add System**. In the Add System dialog box, specify the following details of the system that you want to add to the VCS cluster and click **OK**.

System Name or IP address	Specify the name or IP address of the system that you want to add to the VCS cluster.
User name	Specify the user account for the system. Typically, this is the root user. The root user should have the necessary privileges.
Password	Specify the password for the user account mentioned.
Use the specified user account on all systems	Select to use the specified user account on all the cluster systems that have the same user name and password.

13 If you are configuring a cluster and if you want to modify the security settings for the cluster, click **Advanced Settings**. In the Advanced settings dialog box, specify the following details and click **OK**.

Use Single Sign-on	Select to configure single sign-on using VCS Authentication Service for cluster communication. This option is enabled by default.
Use VCS user privileges	Select to configure a user with administrative privileges to the cluster. Specify the username and password and click **OK**.

Note: The **Advanced Settings** link is not visible if the cluster is already created.

14 Skip this step if the cluster is already configured. By default, the links are configured over Ethernet.

On the Network Details panel, select the type of network protocol to configure the VCS cluster network links and then specify the adapters for network communication.

The wizard configures the VCS cluster communication links using these adapters. You must select a minimum of two adapters per system.

Select **Use MAC address for cluster communication (LLT over Ethernet)** or **Use IP address for cluster communication (LLT over UDP)**, depending on the IP protocol that you want to use and then specify the required details to configure the VCS cluster communication network links. You must specify these details for each cluster system.

- To configure LLT over Ethernet, select the adapter for each network communication link. You must select a different network adapter for each communication link.
- To configure LLT over UDP, select the type of IP protocol and then specify the required details for each communication link.
  Depending on the IP protocol, specify the following:

Network Adapter	Select a network adapter for the communication links. You must select a different network adapter for each communication link.
IP Address	Displays the IP address.

Port	Specify a unique port number for each link. For IPv4 and IPv6, the port range is from 49152 to 65535. A specified port for a link is used for all the cluster systems on that link.
Subnet mask (IPv4)	Displays the subnet mask details.
Prefix (IPv6)	Displays the prefix details.

By default, one of the links is configured as a low-priority link on a public network interface. The second link is configured as a high-priority link. To change a high-priority link to a low-priority link, click **Modify**. In the Modify low-priority link dialog box, select the link and click **OK**.

Note: Symantec recommends that you configure one of the links on a public network interface. You can assign the link on the public network interface as a low-priority link for minimal VCS cluster communication over the link.

15 Skip this step if the application does not use virtual IP address.

In the Virtual Network Details panel, specify the IP protocol and virtual IP address for the application.

Depending on the IP protocol, specify the following:

Virtual IP address	Specify a unique virtual IP address.
Subnet Mask (IPv4)	Specify the subnet mask details.
Prefix (IPv6)	Select the prefix from the drop-down list.
Network Adapter	Select the network adapter that will host the virtual IP.

If you want to add another virtual IP address for your application, click **Add virtual IP address**.

If you select multiple instances for the same virtual IP address, those instances are configured in the same service group.

16 Click **Next**.

17 Skip this step if you did not select mount points.

On the Target ESX Details panel, specify all the ESX hosts to which the virtual machines can fail over. Each ESX host must be able to access the required shared datastores that contain visible disks. Enter the administrative user account details for each ESX host and click **Next**.

To specify the ESX hosts, click **Add ESX Host** and in the Add ESX Host dialog box, specify the following details:

ESX hostname or IP address	Specify the target ESX hostname or IP address. The virtual machines can fail over on this ESX host during vMotion. All the additional ESX hosts should have access to the datastore on which the disks used by the application reside.
User name	Specify a user account for the ESX host. The user account must have administrator privileges on the specified ESX host.
Password	Specify the password for the user account provided in the User name text box.

The wizard validates the user account and the storage details on the specified ESX hosts.

18 On the Summary panel, review the VCS cluster configuration summary and then click **Next** to proceed with the configuration.

If the network contains multiple clusters, the wizard verifies the cluster ID with the IDs assigned to all the accessible clusters in the network. The wizard does not validate the assigned ID with the clusters that are not accessible during the validation. Symantec recommends you to validate the uniqueness of the assigned ID in the existing network. If the assigned ID is not unique or if you want to modify the cluster name or cluster ID, click **Edit**. In the Edit Cluster Details dialog box, modify the details as necessary and click **OK**.

19 On the Implementation panel, the wizard creates the VCS cluster, configures the application for monitoring, and creates cluster communication links.

The wizard displays the status of each task. After all the tasks are complete, click **Next**.

If the configuration task fails, click **View Logs** to check the details of the failure. Rectify the cause of the failure and run the wizard again to configure application monitoring.

20 On the Finish panel, click **Finish** to complete the wizard workflow.

This completes the application monitoring configuration.

If the application status shows as not running, click **Start** to start the configured components on the system.

Understanding service group configurations

One or more WebSphere MQ Queue Manager instances can be discovered on a virtual machine. These WebSphere MQ Queue Manager instances may or may not share the same mount points, disks, disk groups, volume, or virtual IP address. The WebSphere MQ Queue Manager listeners that do not share any of these forms a separate service group.

Resource dependency

Following are the resource dependencies:

- When the listeners are monitored using the Independent of Queue Manager option, the listener resources associated with a WebSphere MQ Queue Manager instance depends on the WebSphere MQ resource.
- Listener resources also depend on the configured IP resources.
- When you associate a mount point with a queue manager using the Symantec High Availability Configuration wizard, a dependency is created between the corresponding WebSphere MQ resource and the mount resource.
- Mount point resources depend on either LVM (logical volume) or VxVM volume.
  - VxVM volume depends on DiskGroup resources.
  - LVM depends on LVM volume group.
- DiskGroup and LVM volume group resources depend on the shared disks which are configured as VMwareDisks resources.

Service group dependency

The Symantec High Availability Configuration wizard does not create service group dependency for WebSphere MQ.

Infrastructure service groups

As part of configuring the application, the Symantec High Availability Configuration wizard:

- Configures application specific service groups and resources.
- Configures the VCS infrastructure service group (VCSInfraSG).

VCSInfraSG includes a resource called VCSNotifySinkRes. The type of this resource is Process. VCSNotifySinkRes configures and administers the notify_sink process on the guest. The notify_sink process sends the details about service groups and its attributes to the Symantec High Availability Console. This information is used for reporting purpose and is displayed on the Dashboard.

Note: VCSInfraSG is an internal service group. You must not add or delete resources from this service group.

The following are the VCSInfraSG notes:

- Before you configure the application for monitoring, ensure that SSO is configured between the Symantec High Availability Console and the guest. If SSO is not configured, VCSInfraSG fails to come online.
- If VCSInfraSG or VCSNotifySinkRes faults, ensure that SSO is configured between the Symantec High Availability Console and the guest. Clear the faults and bring the resource online again.
- VCSInfraSG or VCSNotifySinkRes must not be taken offline because it affects the information displayed on the Dashboard.

Understanding configuration scenarios

You can configure WebSphere MQ Queue Manager instances in different ways using the Symantec High Availability Configuration wizard.

Table 4-1 WebSphere MQ Queue Manager configurations

Configuration Type	Reference
Configuring a single instance/multiple instances in VCS	See Configuring a single instance/multiple instances in VCS
Configuring multiple WebSphere MQ Queue Manager instances in VCS using multiple runs of the wizard	See Configuring multiple WebSphere MQ Queue Manager instances in VCS using multiple runs of the wizard
Configuring multiple applications	See Configuring multiple applications

Configuring a single instance/multiple instances in VCS

Use the Symantec High Availability Configuration wizard to configure one or more WebSphere MQ Queue Manager instances in a single run.

In the Application Inputs panel, select the WebSphere MQ Queue Manager instances from the Queue Manager list. For each instance, you can specify the following optional parameters:

- Environment file
- Listener related to the specific Queue Manager

Configuring multiple WebSphere MQ Queue Manager instances in VCS using multiple runs of the wizard

If you are configuring the first WebSphere MQ Queue Manager instance on a machine where more than one Queue Manager instance is present, configure it by following the steps in the Configuring a single instance/multiple instances in VCS section.

The Symantec High Availability Configuration wizard will not allow you to configure the next WebSphere MQ Queue Manager instance if any of the mandatory dependent resources such as mount point, disk group, and disk are already configured in VCS.

- If existing resources are part of the WebSphere MQ service group, unconfigure the existing service group and then reconfigure the new instance along with the old instances/listeners which were part of the pre-existing service group.
- If existing resources are part of an application service group other than WebSphere MQ, the wizard does not support configuring multiple applications. You can configure these applications through CLI or Veritas Operations Manager.

Configuring multiple applications

If you run the Symantec High Availability Configuration wizard multiple times, you can configure multiple applications of different types.

If you are configuring the first application on a machine where more than one application is running, you can configure it by following the steps in the Configuring a single instance/multiple instances in VCS section.

The Symantec High Availability Configuration wizard will not allow you to configure the next application if any of the mandatory dependent resources such as mount point, disk group, and disk are already configured in VCS.

Symantec High Availability Configuration wizard limitations

Following are the Symantec High Availability Configuration wizard limitations:

- If the WebSphere MQ Queue Manager instance is already configured, that instance is not shown in the list of queue managers and it will not be available for configuration. In such a scenario, no error message will be displayed.
  For example, if there are two WebSphere MQ Queue Manager instances running on the system with the same mount point and assuming that the first instance is configured, if you run the wizard to configure the next instance, the following error message is displayed:

  ```
  The wizard has failed to discover WebSphere MQ Queue Manager
   on the system
  ```

  However, if the WebSphere MQ queue managers do not share any resources (storage and network), you can configure the WebSphere MQ Queue Manager.
- The wizard supports discovery of only LVM or VxVM type of storage.
- The wizard will not discover the disks used by the application if the controllers attached to the virtual machine are of different type.
  To correctly discover and identify the association of mount points to the virtual disks, all the controllers attached to the virtual machine must be of same type.
- The wizard will not discover disks which are attached to the virtual machine in shared mode.
- Although the WebSphereMQ agent allows the MonitorListener attribute to be set to any positive integer, the wizard allows the MonitorListener attribute to be set to 0 or 1. To specify multiple listeners for monitoring, use HA commands or Veritas Operations Manager.

- The wizard does not support the configuration of the DisabledProcesses attribute. To configure this attribute, use HA commands or Veritas Operations Manager.

Troubleshooting

This section lists common troubleshooting scenarios that you may encounter while or after configuring application monitoring.

The installer might display a warning message

When you use the script-based installer to install the WebSphereMQ agent version 5.1.14.0 or later, you might see the following warning message:

```
VCS WARNING V-16-1-13301 Attempt to access non-existent agent
```

This message appears because the installer attempts to stop agents of type WebSphereMQ and WebSphereMQ6, and finds that one of these agents does not exist.

Workaround:

It is safe to ignore this message.

Symantec High Availability Configuration wizard displays blank panels

The Symantec High Availability Configuration wizard may fail to display the wizard panels. The window may appear blank.

Workaround:

Verify that the Symantec ApplicationHA Service is running on the Symantec High Availability Console host and then launch the wizard again.

The Symantec High Availability Configuration wizard displays the "hadiscover is not recognized as an internal or external command" error

While configuring application monitoring the Symantec High Availability Configuration wizard may display the "hadiscover is not recognized as an internal or external command" error, after you click Next on the Application Selection panel.

This issue occurs if you launch the wizard from a system where you have reinstalled the Symantec High Availability guest components.

Workaround:

Close the wizard, restart the Veritas Storage Foundation Messaging Service, and then re-run the wizard.

Running the ‘hastop –all’ command detaches virtual disks

The `hastop -all` command takes offline all the components and component groups of a configured application, and then stops the VCS cluster. In the process, the command detaches the virtual disks from the VCS cluster nodes.

Workaround:

If you want to stop the VCS cluster (and not the applications running on cluster nodes), instead of the `hastop -all` command, use the following command:

```
hastop -all -force
```

This command stops the cluster without affecting the virtual disks attached to the VCS cluster nodes.

Log files

The log files are stored in the virtual machine on which you configured application monitoring.

The healthview_A.log file contains the steps performed by the back-end to configure the application. To check the file, you must access:

```
/var/VRTSvcs/log/healthview_A.log
```

The WebSphereMQ_A.log file contains the actions performed by the agent. To check the file, you must access:

```
/var/VRTSvcs/log/WebSphereMQ_A.log
```

The engine_A.log file contains the actions performed by the VCS cluster. To check the file, you must access:

```
/var/VRTSvcs/log/engine_A.log
```

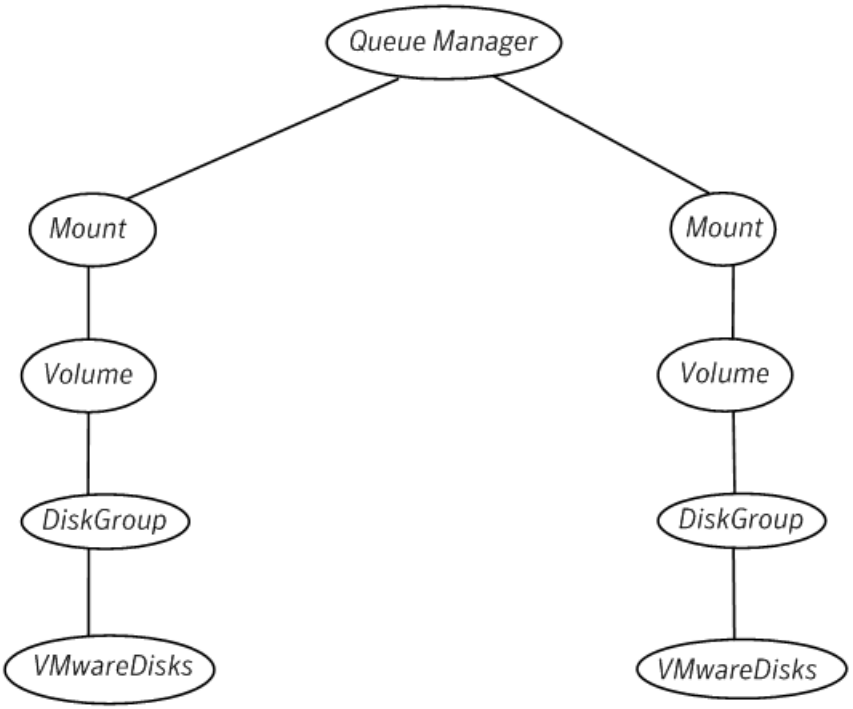
Sample configurations

The sample configurations includes description for typical service groups that are configured using the Symantec High Availability Configuration wizard.

Sample VCS configuration file for single WebSphere MQ Queue Manager instance (VxVM)

Figure 4-2 shows a typical service group configured to monitor the state of a WebSphere MQ Queue Manager instance. In this example, the WebSphere MQ Queue Manager instance uses VxVM volume as storage.

Figure 4-2 Dependency graph for single WebSphere MQ Queue Manager instance (VxVM)



Review the sample configuration with a resource of type WebSphere MQ Queue Manager that is configured as follows in main.cf file.

```
include "OracleASMTypes.cf"
include "types.cf"
include "Db2udbTypes.cf"
include "OracleTypes.cf"
include "SybaseTypes.cf"
include "WebSphereMQTypes.cf"
```

```
cluster Cluster_32625 (
 SecureClus = 1
 )

system rhel5u8mq1 (
 )

group MQ_1 (
 SystemList = { rhel5u8mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 )

 DiskGroup dg_QM1Log (
  DiskGroup = QM1Log
  )

 DiskGroup dg_QM1Qmgrs (
  DiskGroup = QM1Qmgrs
  )

 Mount mnt_QM71_2 (
  MountPoint = "/usr/queuManager/qmgrs/QM71"
  BlockDevice = "/dev/vx/dsk/QM1Qmgrs/QM1Qmgrs_Vol"
  FSType = vxfs
  MountOpt = "rw,delaylog,largefiles,ioerror=mwdisable"
  FsckOpt = "-y"
  )

 Mount mnt_QM71_3 (
  MountPoint = "/usr/queuManager/logs/QM71"
  BlockDevice = "/dev/vx/dsk/QM1Log/QM1Log_Vol"
  FSType = vxfs
  MountOpt = "rw,delaylog,largefiles,ioerror=mwdisable"
  FsckOpt = "-y"
  )

 VMwareDisks VMwareDisk_1 (
  ESXDetails = {
    "vcslx658.domain.com" = "root=HVNtKVkPHnINjNK" }
  DiskPaths = {
    "6000C293-f663-218a-7ac7-16175cde2daa:[rhel5MQ1]
```

```
 QM1qmgrs.vmdk" = "0:1" }
 VMRegisterWait = 5
 )

VMwareDisks VMwareDisk_2 (
 ESXDetails = {
   "vcslx658.domain.com" = "root=HVNtKVkPHnINjNK" }
 DiskPaths = {
   "6000C290-f3f0-77ff-49b1-74ef05b87f8b:[rhel5MQ1]
 QM1log.vmdk" = "0:2" }
 VMRegisterWait = 5
 )

Volume vol_QM1Log_Vol_QM1Log (
 DiskGroup = QM1Log
 Volume = QM1Log_Vol
 )

Volume vol_QM1Qmgrs_Vol_QM1Qmgrs (
 DiskGroup = QM1Qmgrs
 Volume = QM1Qmgrs_Vol
 )

WebSphereMQ QM71 (
 QueueManager = QM71
 MQVer = "7.1"
 MonitorListener = 1
 MQInstallationPath = "/opt/MQ"
 )

QM71 requires mnt_QM71_2
QM71 requires mnt_QM71_3
dg_QM1Log requires VMwareDisk_2
dg_QM1Qmgrs requires VMwareDisk_1
mnt_QM71_2 requires vol_QM1Qmgrs_Vol_QM1Qmgrs
mnt_QM71_3 requires vol_QM1Log_Vol_QM1Log
vol_QM1Log_Vol_QM1Log requires dg_QM1Log
vol_QM1Qmgrs_Vol_QM1Qmgrs requires dg_QM1Qmgrs


// resource dependency tree
//
// group MQ_1
```

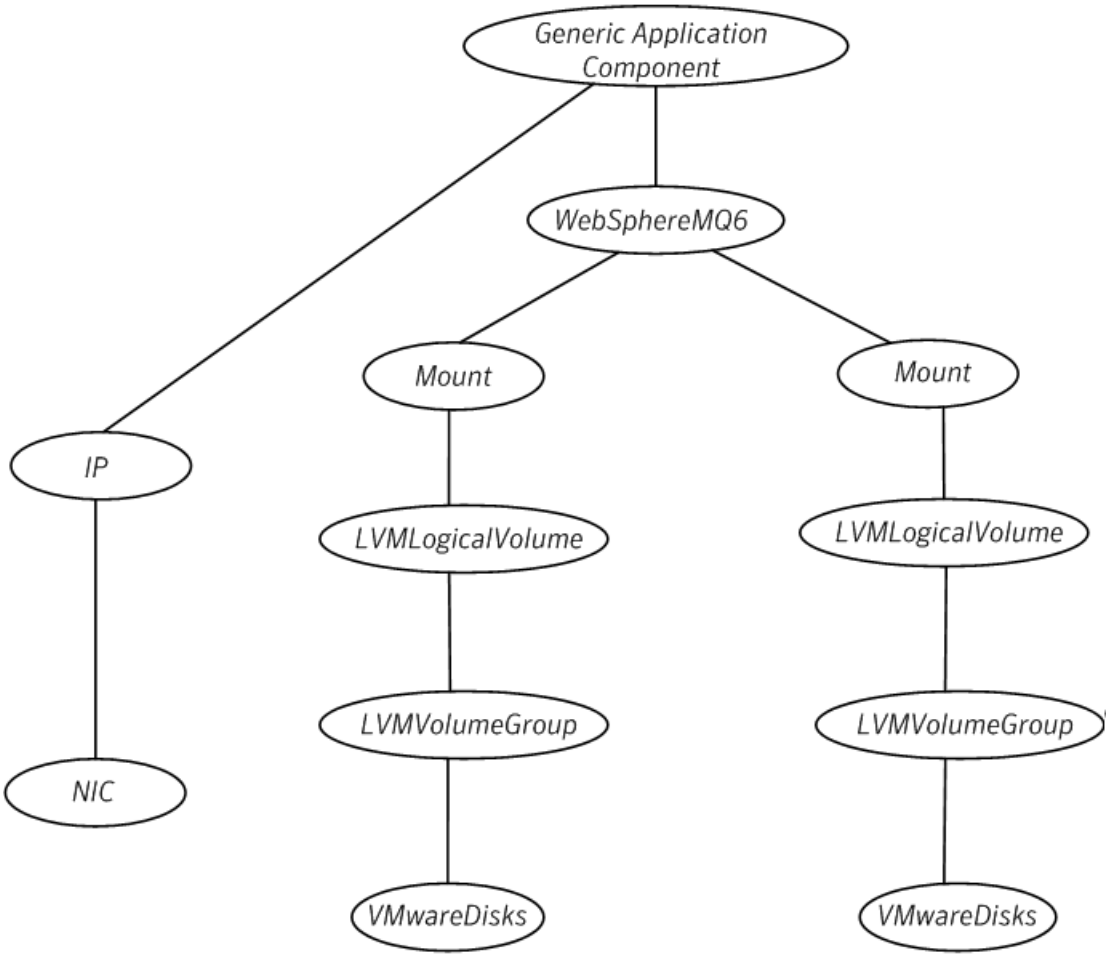
```
// {
// WebSphereMQ QM71
//     {
//     Mount mnt_QM71_2
//         {
//         Volume vol_QM1Qmgrs_Vol_QM1Qmgrs
//             {
//             DiskGroup dg_QM1Qmgrs
//                 {
//                 VMwareDisks VMwareDisk_1
//                 }
//             }
//         }
//     Mount mnt_QM71_3
//         {
//         Volume vol_QM1Log_Vol_QM1Log
//             {
//             DiskGroup dg_QM1Log
//                 {
//                 VMwareDisks VMwareDisk_2
//                 }
//             }
//         }
//     }
// }


group VCSInfraSG (
 SystemList = { rhel5u8mq1 = 0 }
 UserAssoc = { Type = "vcs internal",
   Name = "VCS Infrastructure service group" }
 Parallel = 1
 AutoStartList = { rhel5u8mq1 }
 OnlineRetryLimit = 5
 )

 Process VCSNotifySinkRes (
  PathName = "/opt/VRTSvcs/portal/admin/notify_sink"
  )



 // resource dependency tree
```

```
//
// group VCSInfraSG
// {
// Process VCSNotifySinkRes
// }
```

Sample VCS configuration file for single WebSphere MQ Queue Manager instance (LVM)

Figure 4-3 shows a typical service group configured to monitor the state of a WebSphere MQ Queue Manager instance. In this example, the WebSphere MQ Queue Manager instance uses LVM volume as storage.

Figure 4-3 Dependency graph for single WebSphere MQ Queue Manager instance (LVM)



Review the sample configuration with a resource of type WebSphere MQ Queue Manager that is configured as follows in main.cf file.

```
include "OracleASMTypes.cf"
include "types.cf"
include "Db2udbTypes.cf"
include "OracleTypes.cf"
include "SybaseTypes.cf"
include "WebSphereMQTypes.cf"
```

```
cluster Cluster_3175 (
 SecureClus = 1
 )

system sles11sp2mq1 (
 )

group MQ_1 (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 )

 Application QM1_Listener_res (
  User = mqm
  StartProgram = "/opt/mqm/bin/runmqlsr -t tcp -i 10.209.70.205
  -p 1490 -m QM1 &"
  StopProgram = "/opt/mqm/bin/endmqlsr -m QM1"
  MonitorProcesses = {
    "/opt/mqm/bin/runmqlsr -t tcp -I 10.209.70.205 -p 1490 -m QM1" }
  )

 IP IP_10-209-70-205 (
  Device @sles11sp2mq1 = eth0
  Address = "10.209.70.205"
  NetMask = "255.255.252.0"
  )

 LVMLogicalVolume lvol_QM1QmgrVol_QM1Qmgrs (
  LogicalVolume = QM1QmgrVol
  VolumeGroup = QM1Qmgrs
  )

 LVMLogicalVolume lvol_QM1TmpVol_QM1Tmp (
  LogicalVolume = QM1TmpVol
  VolumeGroup = QM1Tmp
  )

 LVMVolumeGroup volg_QM1Qmgrs (
  VolumeGroup = QM1Qmgrs
  )
```

```
LVMVolumeGroup volg_QM1Tmp (
 VolumeGroup = QM1Tmp
 )

Mount mnt_QM1_2 (
 MountPoint = "/var/mqm/qmgrs/QM1"
 BlockDevice = "/dev/mapper/QM1Qmgrs-QM1QmgrVol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Mount mnt_QM1_3 (
 MountPoint = "/var/mqm/log/QM1"
 BlockDevice = "/dev/mapper/QM1Tmp-QM1TmpVol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Proxy NICProxy_10-209-70-205 (
 TargetResName @sles11sp2mq1 = NIC_sles11sp2mq1_eth0
 )

VMwareDisks VMwareDisk_1 (
 ESXDetails = {
   "vcslx658.domain.com" = "root=drjPgrGldJejFjg" }
 DiskPaths = {
   "6000C29f-3b70-a4e1-9933-0b882e6fd051:[SAPMQ]
 slesQM2Tmp.vmdk" = "0:1" }
 VMRegisterWait = 5
 )

VMwareDisks VMwareDisk_2 (
 ESXDetails = {
   "vcslx658.domain.com" = "root=drjPgrGldJejFjg" }
 DiskPaths = {
   "6000C29c-cfd8-3914-fe12-a5b7461fbd9e:[SAPMQ]
 slesQM2Qmgrs.vmdk" = "0:2" }
 VMRegisterWait = 5
 )

WebSphereMQ QM1 (
```

```
 QueueManager = QM1
 MQVer = "7.0"
 )

IP_10-209-70-205 requires NICProxy_10-209-70-205
QM1 requires mnt_QM1_2
QM1 requires mnt_QM1_3
QM1_Listener_res requires IP_10-209-70-205
QM1_Listener_res requires QM1
lvol_QM1QmgrVol_QM1Qmgrs requires volg_QM1Qmgrs
lvol_QM1TmpVol_QM1Tmp requires volg_QM1Tmp
mnt_QM1_2 requires lvol_QM1QmgrVol_QM1Qmgrs
mnt_QM1_3 requires lvol_QM1TmpVol_QM1Tmp
volg_QM1Qmgrs requires VMwareDisk_2
volg_QM1Tmp requires VMwareDisk_1


// resource dependency tree
//
// group MQ_1
// {
// Application QM1_Listener_res
//     {
//     IP IP_10-209-70-205
//         {
//         Proxy NICProxy_10-209-70-205
//         }
//     WebSphereMQ QM1
//         {
//         Mount mnt_QM1_2
//             {
//             LVMLogicalVolume lvol_QM1QmgrVol_QM1Qmgrs
//                 {
//                 LVMVolumeGroup volg_QM1Qmgrs
//                     {
//                     VMwareDisks VMwareDisk_2
//                     }
//                 }
//             }
//         Mount mnt_QM1_3
//             {
//             LVMLogicalVolume lvol_QM1TmpVol_QM1Tmp
//                 {
```

```
 //                  LVMVolumeGroup volg_QM1Tmp
 //                      {
 //                      VMwareDisks VMwareDisk_1
 //                      }
 //                  }
 //              }
 //          }
 //     }
 // }


group VCSInfraSG (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = "vcs internal",
   Name = "VCS Infrastructure service group" }
 Parallel = 1
 AutoStartList = { sles11sp2mq1 }
 OnlineRetryLimit = 5
 )

 Process VCSNotifySinkRes (
  PathName = "/opt/VRTSvcs/portal/admin/notify_sink"
  )



 // resource dependency tree
 //
 // group VCSInfraSG
 // {
 // Process VCSNotifySinkRes
 // }


group sles11sp2mq1_NIC_SG (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = "vcs internal", Name = "NIC service group" }
 )

 NIC NIC_sles11sp2mq1_eth0 (
  Device @sles11sp2mq1 = eth0
  Mii = 0
  )
```

```
Phantom Phantom_NIC_SGsles11sp2mq1 (
 )



// resource dependency tree
//
// group sles11sp2mq1_NIC_SG
// {
// NIC NIC_sles11sp2mq1_eth0
// Phantom Phantom_NIC_SGsles11sp2mq1
// }
```

Chapter 5

Enabling the agent for WebSphere MQ to support IMF

This chapter includes the following topics:

About Intelligent Monitoring Framework

With intelligent monitoring framework (IMF), VCS supports intelligent resource monitoring in addition to the poll-based monitoring. Poll-based monitoring polls the resources periodically whereas intelligent monitoring performs asynchronous monitoring. You can enable or disable the intelligent resource monitoring functionality of the WebSphere MQ agent.

VCS process and mount-based agents use the Asynchronous Monitoring Framework (AMF) kernel driver that provides asynchronous event notifications to the agents that are enabled for Intelligent Monitoring Framework (IMF).

You can enable the WebSphere MQ agent for IMF, provided the following software versions are installed:

- Symantec Cluster Server (VCS) 5.1 SP1 or later
- Symantec High Availability agent for WebSphere MQ version 5.1.9.0 or later

See the *Symantec Cluster Server Administrator's Guide* for more information about IMF notification module functions and administering the AMF kernel driver.

Benefits of IMF

IMF offers the following benefits:

- Performance
  Enhances performance by reducing the monitoring of each resource at a default of 60 seconds for online resources, and 300 seconds for offline resources. IMF enables the agent to monitor a large number of resources with a minimal effect on performance.
- Faster detection
  Asynchronous notifications would detect a change in the resource state as soon as it happens. Immediate notification enables the agent to take action at the time of the event.

Agent functions for the IMF functionality

If the WebSphere MQ agent is enabled for IMF support, the agent supports the following functions, in addition to the functions mentioned in WebSphere MQ agent functions.

imf_init

This function initializes the WebSphere MQ agent to interface with the AMF kernel driver, which is the IMF notification module for the agent for WebSphere MQ. This function runs when the agent starts up.

imf_getnotification

This function gets notifications about resource state changes. This function runs after the agent initializes with the AMF kernel module. This function continuously waits for notification and takes action on the resource upon notification.

imf_register

This function registers or unregisters resource entities with the AMF kernel module. This function runs for each resource after the resource goes into a steady state—online or offline.

Attributes that enable IMF

If the agent for WebSphere MQ is enabled for IMF support, the agent uses the following type-level attributes in addition to the attributes described in WebSphere MQ agent attributes.

IMF

This resource type-level attribute determines whether the WebSphere MQ agent must perform intelligent resource monitoring. You can also override the value of this attribute at the resource level.

This attribute includes the following keys:

Mode

Define this attribute to enable or disable intelligent resource monitoring. Valid values are as follows:

- 0—Does not perform intelligent resource monitoring
- 1—Performs intelligent resource monitoring for offline resources and performs poll-based monitoring for online resources
- 2—Performs intelligent resource monitoring for online resources and performs poll-based monitoring for offline resources
- 3—Performs intelligent resource monitoring for both online and for offline resources.

Note: The agent for WebSphere MQ supports intelligent resource monitoring for online resources only. Hence, Mode should be set to either 0 or 2.

Type and dimension: integer-association

Default: 0 for VCS 5.1 SP1, 3 for VCS 6.0 and later.

MonitorFreq

This key value specifies the frequency at which the agent invokes the monitor agent function. The value of this key is an integer.

Default: 1

You can set this key to a non-zero value for cases where the agent requires to perform both poll-based and intelligent resource monitoring.

If the value is 0, the agent does not perform poll-based process check monitoring.

After the resource registers with the AMF kernel driver, the agent calls the monitor agent function as follows:

- After every (MonitorFreq x MonitorInterval) number of seconds for online resources
- After every (MonitorFreq x OfflineMonitorInterval) number of seconds for offline resources

RegisterRetryLimit

If you enable intelligent resource monitoring, the agent invokes the imf_register agent function to register the resource with the AMF kernel driver.

The value of the RegisterRetryLimit key determines the number of times the agent must retry registration for a resource. If the agent cannot register the resource within the limit that is specified, then intelligent monitoring is disabled until the resource state changes or the value of the Mode key changes.

Default: 3.

IMFRegList

An ordered list of attributes whose values are registered with the IMF notification module.

Type and dimension: string-vector

Default: No default value

Note: The attribute values can be overriden at the resource level.

Before you enable the agent to support IMF

Before you enable the WebSphere MQ agent to support IMF, ensure that the AMF kernel module is loaded and AMF is configured. For details, see the ‘Administering

the AMF kernel driver' section of the *Symantec Cluster Server Administrator's Guide*. For details about the commands you can use to configure AMF, use the `amfconfig -h` command.

Enabling the agent to support IMF

In order to enable the WebSphere MQ agent to support IMF, you must make the following configuration changes to the attributes of the agent:

- AgentFile: Set the AgentFile attribute to **Script51Agent**
- IMF Mode: Set the IMF Mode attribute to **2**
- IMFRegList: Update the IMFRegList attribute

The following sections provide more information on the commands you can use to make these configuration changes, depending on whether VCS is in a running state or not.

Note: If you have upgraded VCS from an earlier version to version 5.1 SP1 or later, and you already have WebSphere MQ agent 5.1.9.0 installed, ensure that you run the following commands to create appropriate symbolic links:

```
# cd /opt/VRTSagents/ha/bin/WebSphereMQ

# ln -s /opt/VRTSamf/imf/imf_getnotification imf_getnotification

# ln -s /opt/VRTSagents/ha/bin/WebSphereMQ/monitor imf_register
```

If VCS is in a running state

To enable the WebSphere MQ resource for IMF when VCS is in a running state:

1. Make the VCS configuration writable.

   ```
   # haconf -makerw
   ```

2. Run the following command to update the AgentFile attribute.

   ```
   # hatype -modify WebSphereMQ AgentFile\
   /opt/VRTSvcs/bin/Script51Agent
   ```

3 For VCS version 6.0 or later, run the following commands to add the IMF attributes:

```
# haattr -add -static  WebSphereMQ IMF -integer -assoc Mode 0 \
MonitorFreq 1 RegisterRetryLimit 3

# haattr -add -static WebSphereMQ IMFRegList -string -vector
```

Note: Execute these commands only once after you first enable IMF support for the agent.

4 Run the following command to update the IMF attribute.

```
# hatype -modify WebSphereMQ IMF Mode num MonitorFreq num
RegisterRetryLimit num
```

For example, to enable intelligent monitoring of online resources, with the MonitorFreq key set to 5, and the RegisterRetryLimit key is set to 3, run the following command:

```
# hatype -modify WebSphereMQ IMF Mode 2 MonitorFreq 5 \
RegisterRetryLimit 3
```

Note: The valid values for the Mode key of the IMF attribute are 0 (disabled) and 2 (online monitoring).

5 Run the following command to update the IMFRegList attribute:

```
# hatype -modify WebSphereMQ IMFRegList QueueManager MQUser\
 MQVer MonitorListener
```

6 Save the VCS configuration.

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

7 If the WebSphere MQ agent is running, restart the agent.

For information on the commands you can use to restart the agent, see Restarting the agent.

Restarting the agent

To restart the agent:

1 Run the following command to stop the agent forcefully:

```
# haagent -stop WebSphereMQ -force -sys <system>
```

Note: Stopping the agent forcefully eliminates the need to take the resource offline.

2 Run the following command to start the agent:

```
# haagent -start WebSphereMQ -sys <system>.
```

If VCS is not in a running state

To change the WebSphereMQ type definition file when VCS is not in a running state:

1 Update the AgentFile attribute.

```
static str AgentFile = "/opt/VRTSvcs/bin/Script51Agent"
```

2 Update the IMF attribute.

The valid values for the Mode key of the IMF attribute are 0 (disabled) and 2 (online monitoring).

```
static int IMF{} = { Mode=num, MonitorFreq=num,
RegisterRetryLimit=num }
```

For example, to update the IMF attribute such that the Mode key is set to 2, the MonitorFreq key is set to 5, and the RegisterRetryLimit key is set to 3:

```
static int IMF{} = { Mode=2, MonitorFreq=5, RegisterRetryLimit=3
}
```

3 Update the IMFRegList attribute.

```
static str IMFRegList[] = { QueueManager, MQUser, MQVer,
MonitorListener }
```

Disabling intelligent resource monitoring

To disable intelligent resource monitoring

1. Make the VCS configuration writable.

   ```
   # haconf -makerw
   ```

2. To disable intelligent resource monitoring for all the resources of a certain type, run the following command:

   ```
   # hatype -modify WebSphereMQ IMF -update Mode 0
   ```

3. To disable intelligent resource monitoring for a specific resource, run the following command:

   ```
   # hares -override resource_name IMF

   # hares -modify resource_name IMF -update Mode 0
   ```

4. Save the VCS configuration.

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

Sample IMF configurations

An example of a type definition file for a WebSphere MQ agent that is IMF-enabled is as follows.

In this example, the IMF-related attributes are set to the following values:

AgentFile	opt/VRTSvcs/bin/Script51Agent
IMF{}	{ Mode=2, MonitorFreq=5, RegisterRetryLimit=3 }
IMFRegList[]	{ QueueManager, MQUser, MQVer, MonitorListener }
LevelTwoMonitorFreq	25

```
type WebSphereMQ (
   static boolean AEPTimeout = 1
   static str AgentFile = "/opt/VRTSvcs/bin/Script51Agent"
   static int LevelTwoMonitorFreq = 5
   static str AgentDirectory = "/opt/VRTSagents/ha/bin/WebSphereMQ"
   static str ArgList[] = { ResLogLevel, State, IState, QueueManager,
                            CommandServer, MQUser, MQVer, EnvFile,
                            SecondLevelMonitor, MonitorProgram,
                            MonitorListener, MQInstallationPath,
```

```
                              DisabledProcesses}
   static int IMF{} = { Mode=2, MonitorFreq=5, RegisterRetryLimit=3 }
   static str IMFRegList[] = { QueueManager, MQUser, MQVer,
                               MonitorListener }
   str ResLogLevel = INFO
   str QueueManager
   boolean CommandServer = 0
   str MQUser = mqm
   str MQVer = "6.0"
   str EnvFile
   int SecondLevelMonitor
   str MonitorProgram
   int MonitorListener = 0
   str MQInstallationPath
   keylist DisabledProcesses
)
```

A sample resource configuration from the `/etc/VRTSvcs/conf/config/main.cf` file is as follows:

```
WebSphereMQ Queue1 (
                QueueManager = Queue1
                CommandServer = 1
                MQVer = "7.0"
                MonitorListener = 1
                )
```

Chapter 6

Configuring the service groups for WebSphere MQ using the CLI

This chapter includes the following topics:

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 *Symantec Cluster Server Installation Guide* for more information.
- Verify that the Symantec High Availability agent for WebSphere MQ is installed on all nodes in the cluster.

Configuring service groups for WebSphere MQ queue managers

You can cluster WebSphere MQ queue managers in a clustered environment, and you can use the Symantec High Availability 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 117.

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 provides the flexibility that some applications may require.

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

3 Add the queue manager resource to the service group that contains the storage resources used by this queue manager.

4 If the listener for the queue manager uses a virtual IP, add the networking resources such as IP and NIC to the same service group as that of corresponding queue manager.

See "Sample configuration in a VCS virtual environment with VMware" on page 108.

Configuring a WebSphere MQ listener

A WebSphere MQ queue manager uses a Listener to listen for requests on a specific IP address. You can 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.

See "WebSphere MQ agent attributes" on page 45.

You can enable the MonitorListener attribute, if the listener is configured to start automatically when the queue manager starts.

You can enable the MonitorListener attribute, to start Listener when WebSphere MQ resource is online.

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/runmqlsr -t tcp
                    -i 1.2.3.4 -m venus.veritas &"
   StopProgram   = "/opt/mqm/bin/endmqlsr -m venus.veritas"
   MonitorProcesses  = {"/opt/mqm/bin/runmqlsr -t tcp
                        -i 1.2.3.4 -m venus.veritas" }
)
```

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

Creating service groups for WebSphere MQ under Solaris non-global zones

To configure zones on each cluster node:

1. Set up the non-global zone configuration.

   `hazonesetup` *`servicegroup_name zoneres_name zone_name password systems`*

   For example:

   `hazonesetup -g` *`servicegroup_name`* `-r` *`zoneres_name`* `-z` *`zone_name`* `-p` *`password`* `-s` *`systems`*

2. Verify the non-global zone configuration.

   `hazoneverify` *`servicegroup_name`*

3. Whenever you make a change that affects the zone configuration, run the `hazonesetup` command to reconfigure the zones in VCS.

4. Make sure that the zone configuration files are consistent on all nodes at all times. The file is located at /etc/zones/zone_name.xml.

5 Make sure that the application is identical on all nodes. If you update the application configuration on one node, apply the same updates to all nodes.

6 Configure the service groups for WebSphere MQ.

Chapter 7

Troubleshooting the agent for WebSphere MQ

This chapter includes the following topics:

Using the correct software and operating system versions

Ensure that you use correct software and operating system versions.

For information on the software versions that the agent for WebSphere MQ supports, see the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

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 Symantec High Availability agent for WebSphere MQ" on page 17.

Note: For information about the prerequisites for IMF and for other IMF-related troubleshooting information: See "Troubleshooting the configuration for IMF" on page 100.

Configuring WebSphere MQ Queue Manager resources

Before using WebSphere MQ Queue Manager resources, ensure that you configure the resources 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

```
"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( |\$)",
```

MQ 7.0

```
"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( |\$)",
"runmqlsr .*-m *X_QUEUE_MANAGER_X( |\$)",
```

MQ 8.0 and later

```
"amqrrmfa .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqchi .*-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( |\$)",
"runmqlsr .*-m *X_QUEUE_MANAGER_X( |\$)",
```

Stopping WebSphere MQ queue manager processes forcefully

As per IBM recommendations, when an attempt to gracefully stop the queue manager fails, the agent for WebSphere MQ kills the processes in the following order:

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( |\$)",
"amqpcsea .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqharmx .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqlsr .*-m *X_QUEUE_MANAGER_X( |\$)",
```

MQ 6.0

```
"amqzmuc0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzxma0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzfuma .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzlaa0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzlsa0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmgr0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmur0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqrmppa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqrrmfa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzdmaa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqpcsea *X_QUEUE_MANAGER_X( |\$)",
"amqhasmx X_QUEUE_MANAGER_X( |\$)",
"amqzllp0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqchi .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqharmx .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqfqpub .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqfcxba .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqcrsta .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqsc *X_QUEUE_MANAGER_X( |\$)",
"runmqlsr .*-m *X_QUEUE_MANAGER_X( |\$)",
```

MQ 7.0 and later

```
"amqzmuc0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzxma0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzfuma .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzlaa0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzlsa0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmuf0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmur0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmgr0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqfqpub .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqfcxba .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqrmppa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqcrsta .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqcrs6b .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqrrmfa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzdmaa .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqpcsea *X_QUEUE_MANAGER_X( |\$)",
"runmqtrm .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqdlq .*X_QUEUE_MANAGER_X( |\$)",
"runmqchi .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqlsr .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqxssvn .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqztrcn .*-m *X_QUEUE_MANAGER_X( |\$)",
"runmqsc *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 VCS engine log file is at `/var/VRTSvcs/log/engine_A.log`.

The VCS One engine log file is at `/var/VRTSvcsone/log/engine_A.log`.

The VCS One client log file is at `/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.

Troubleshooting the configuration for IMF

If you face problems with the IMF configuration or functionality, consider the following:

- Ensure that the following attributes are configured with appropriate values.
  - AgentFile
  - IMF
  - IMFRegList
    If IMFRegList is not configured correctly, the WebSphere MQ resources that have been registered for IMF get unregistered every time the monitor function is run.
- If you have configured the required attributes to enable the WebSphere MQ agent for IMF, but the agent is still not IMF-enabled, restart the agent. The imf_init function runs only when the agent starts up, so when you restart the agent, imf_init runs and initializes the WebSphere MQ agent to interface with the AMF kernel driver.
- You can run the following command to check the value of the MonitorMethod attribute and to verify that a resource is registered for IMF.

  ```
  # hares -value resource MonitorMethod system
  ```

  The MonitorMethod attribute specifies the monitoring method that the agent uses to monitor the resource:
  - Traditional—Poll-based resource monitoring
  - IMF—Intelligent resource monitoring
- You can use the `amfstat` to see a list of registered PIDs for a WebSphereMQ resource.

Following is a sample output for the Queue Manager 'testQM'.
The `ps -ef` command output shows the Queue Manager process.

```
# ps –ef | grep -i testQM
mqm 10085 10075   1 13:38:30 ?  0:00 amqzlaa0 -mTestQM
                                      -fip0
mqm 10080 10075   1 13:38:28 ?  0:00 amqzmur0 -m TestQM
mqm 10083 10075   1 13:38:28 ?  0:00 /opt/mqm/bin/
                                      amqzdmaa -m TestQM
mqm 10076 10075   1 13:38:27 ?  0:00 /opt/mqm/bin/
                                      amqzfuma -m TestQM
mqm 10088 10081   1 13:38:30 ?  0:00 amqfqpub -mTestQM
mqm 10086 10084   0 13:38:30 ?  0:00 /opt/mqm/bin/
                                      runmqchi -m TestQM
                                      -q SYSTEM.CHANNEL.
                                      INITQ -r
mqm 10089 10088   1 13:38:30 ?  0:00 amqfcxba -m TestQM
mqm 10077 10075   1 13:38:27 ?  0:00 amqzmuc0 -m TestQM
mqm 10082 10075   0 13:38:28 ?  0:00 /opt/mqm/bin/
                                      amqrrmfa -m TestQM
                                      -t2332800 -s2592000
                                      -p2592000 -g5184000
                                      -c3600
mqm 10084 10075   1 13:38:29 ?  0:00 /opt/mqm/bin/
                                      amqzmgr0 -m TestQM
mqm 10075     1   1 13:38:27 ?  0:00 amqzxma0 -m TestQM
mqm 10081 10075   1 13:38:28 ?  0:00 amqzmuf0 -m TestQM
mqm 10087 10084   1 13:38:30 ?  0:00 /opt/mqm/bin/
                                      amqpcsea TestQM
```

The `amfstat` command shows the Queue Manager PIDs monitored by the WebSphereMQ agent.

```
# amfstat
AMF Status Report

Registered Reapers (3):
=======================
 RID    PID     MONITOR TRIGG   REAPER
163    16417   7       0       WebSphereMQ

Process ONLINE Monitors (7):
============================
```

```
RID     R_RID    PID      GROUP
165     163      10082    TestQM
166     163      10086    TestQM
167     163      10083    TestQM
168     163      10076    TestQM
169     163      10075    TestQM
170     163      10077    TestQM
171     163      10080    TestQM
```

- Run the following command to set the ResLogLevel attribute to TRACE. When you set ResLogLevel to TRACE, the agent logs messages in the WebSphereMQ_A.log file.

  ```
  # hares -modify ResourceName ResLogLevel TRACE
  ```

- Run the following command to view the content of the AMF in-memory trace buffer.

  ```
  # amfconfig -p dbglog
  ```

- If you have upgraded to VCS version 5.1 SP1, from an earlier VCS version, and if you already have WebSphere MQ agent version 5.1.9.0 or later installed, ensure that the appropriate symbolic links have been created. You can run the following commands to create appropriate symbolic links:

  - `# cd /opt/VRTSagents/ha/bin/WebSphereMQ`
  - `# ln -s /opt/VRTSamf/imf/imf_getnotification imf_getnotification`
  - `# ln -s /opt/VRTSagents/ha/bin/WebSphereMQ/monitor imf_register`

Known issues

This release of the agent for WebSphere MQ has the following known issues:

Problem

An error message might appear when you run the `hares -offline` command to take a resource offline.

Description

When a resource is taken offline, it is unregistered from the AMF module. However, the imf_register function attempts to unregister the resource again.

This results in the following error message from the engine log.

```
VCS ERROR V-16-2-13710 Resource(Queue1) - imf_register entry point
failed with exit code(1)
```

The following message is logged in the agent log:

```
V-16-55000-10209 Commandline [/opt/VRTSamf/bin/amfregister -u
-rWebSphereMQ -g Queue1 ] provided a non-zero exit code --This does
not necessarily indicate a problem ... (Perl's OS error variable
prior to the command-pipe close was [], and after the close was []
) VCSagentFW:messageEngineLog:[AMF amfregisterNOTICEIgnoring the
group unregister request; group named \"Queue1\" not found]
```

Workaround

It is safe to ignore this error message.

Appendix A

Sample Configurations

This appendix includes the following topics:

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 *Symantec 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 WebSphereMQTypes.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, MonitorListener }
    str ResLogLevel = INFO
    str QueueManager
    boolean CommandServer = 1
    str MQUser = mqm
    str MQVer = "6.0"
    str EnvFile
    int SecondLevelMonitor
    str MonitorProgram
    boolean MonitorListerner = 0
)
```

For VCS 5.x and VCS 6.0

```
type WebSphereMQ (
 static boolean AEPTimeout = 1
 static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
 static str AgentDirectory = "/opt/VRTSagents/ha/bin/WebSphereMQ"
 static str ArgList[] = { ResLogLevel, State, IState, QueueManager,
 CommandServer, MQUser, MQVer, EnvFile, SecondLevelMonitor,
 MonitorProgram, MonitorListener, MQInstallationPath, DisabledProcesses}
 str ResLogLevel = INFO
 str QueueManager
 boolean CommandServer = 0
 str MQUser = mqm
 str MQVer = "6.0"
 str EnvFile
 int SecondLevelMonitor
 str MonitorProgram
 int MonitorListener = 0
 str MQInstallationPath
 keylist DisabledProcesses
)
```

VCS One

After installing the agent, go to the /etc/VRTSagents/ha/conf/WebSphereMQ/ directory to view the WebSphereMQTypes.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
                )
```

```
WebSphereMQ WASMQ (
        QueueManager = MQ1
        CommandServer = 1
        MQVer = "7.0"
        SecondLevelMonitor = 5
        MonitorProgram = "/ibm/mq/myMonitor.sh"
        MonitorListener = 1
        MQInstallationPath = "/opt/customLocation"
        )

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
//      {
//      WebSphereMQ WASMQ
//          {
//          Mount Mount_OPT
//              {
//              Volume Volum_OPT
//                  {
//                  DiskGroup DG_OPT
//                  }
//              }
//          Mount Mount_VAR
//              {
//              Volume Volume_VAR
//                  {
//                  DiskGroup DG_VAR
//                  }
//              }
```

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

Sample configuration in a VCS virtual environment with VMware

An excerpt from the main.cf file in a scenario where WebSphere MQ queue manager is configured using active-active configuration follows:

```
include "OracleASMTypes.cf"
include "types.cf"
include "Db2udbTypes.cf"
include "OracleTypes.cf"
include "SybaseTypes.cf"
include "WebSphereMQTypes.cf"

cluster Cluster_62228 (
 SecureClus = 1
 )

system sles11sp2mq1 (
 )

group MQ_1 (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 AutoStartList = { sles11sp2mq1 }
 )

 LVMLogicalVolume lvol_log1Vol_Qname1_log (
  LogicalVolume = log1Vol
  VolumeGroup = Qname1_log
  )

 LVMLogicalVolume lvol_qmgr1Vol_Qname1_qmgr (
  LogicalVolume = qmgr1Vol
  VolumeGroup = Qname1_qmgr
  )

 LVMVolumeGroup volg_Qname1_log (
```

```
 VolumeGroup = Qname1_log
 )

LVMVolumeGroup volg_Qname1_qmgr (
 VolumeGroup = Qname1_qmgr
 )

Mount mnt_sym_vcs_qm1_2 (
 MountPoint = "/var/mqm/qmgrs/sym!vcs!qm1"
 BlockDevice = "/dev/mapper/Qname1_qmgr-qmgr1Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Mount mnt_sym_vcs_qm1_3 (
 MountPoint = "/var/mqm/log/sym!vcs!qm1"
 BlockDevice = "/dev/mapper/Qname1_log-log1Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

VMwareDisks VMwareDisk_1 (
 ESXDetails = { vcslx658 = "root=BPHnEPeJBhCHdHE" }
 DiskPaths = {
   "6000C29c-491e-0d0f-835d-a25f9bbf685f:[SAPMQ] sles11sp2mq1
    /sles11sp2mq1_1.vmdk" = "0:3" }
 VMRegisterWait = 5
 )

WebSphereMQ sym_vcs_qm1 (
 QueueManager = "sym!vcs!qm1"
 MQVer = "7.0"
 MonitorListener = 1
 )

lvol_log1Vol_Qname1_log requires volg_Qname1_log
lvol_qmgr1Vol_Qname1_qmgr requires volg_Qname1_qmgr
mnt_sym_vcs_qm1_2 requires lvol_qmgr1Vol_Qname1_qmgr
mnt_sym_vcs_qm1_3 requires lvol_log1Vol_Qname1_log
sym_vcs_qm1 requires mnt_sym_vcs_qm1_2
sym_vcs_qm1 requires mnt_sym_vcs_qm1_3
```

```
 volg_Qname1_qmgr requires VMwareDisk_1


 // resource dependency tree
 //
 // group MQ_1
 // {
 // WebSphereMQ sym_vcs_qm1
 //     {
 //     Mount mnt_sym_vcs_qm1_2
 //         {
 //         LVMLogicalVolume lvol_qmgr1Vol_Qname1_qmgr
 //             {
 //             LVMVolumeGroup volg_Qname1_qmgr
 //                 {
 //                 VMwareDisks VMwareDisk_1
 //                 }
 //             }
 //         }
 //     Mount mnt_sym_vcs_qm1_3
 //         {
 //         LVMLogicalVolume lvol_log1Vol_Qname1_log
 //             {
 //             LVMVolumeGroup volg_Qname1_log
 //             }
 //         }
 //     }
 // }


group MQ_2 (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 AutoStartList = { sles11sp2mq1 }
 )

 LVMLogicalVolume lvol_log2Vol_Qname2_log (
  LogicalVolume = log2Vol
  VolumeGroup = Qname2_log
  )

 LVMLogicalVolume lvol_qmgr2Vol_Qname2_qmgr (
```

```
 LogicalVolume = qmgr2Vol
 VolumeGroup = Qname2_qmgr
 )

LVMVolumeGroup volg_Qname2_log (
 VolumeGroup = Qname2_log
 )

LVMVolumeGroup volg_Qname2_qmgr (
 VolumeGroup = Qname2_qmgr
 )

Mount mnt_sym_vcs_qm2_2 (
 MountPoint = "/var/mqm/qmgrs/sym!vcs!qm2"
 BlockDevice = "/dev/mapper/Qname2_qmgr-qmgr2Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Mount mnt_sym_vcs_qm2_3 (
 MountPoint = "/var/mqm/log/sym!vcs!qm2"
 BlockDevice = "/dev/mapper/Qname2_log-log2Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

VMwareDisks VMwareDisk_2 (
 ESXDetails = { vcslx658 = "root=BPHnEPeJBhCHdHE" }
 DiskPaths = {
   "6000C29d-1034-f3dc-abbc-d9b166e4cf38:[SAPMQ] sles11sp2mq1
    /sles11sp2mq1_2.vmdk" = "0:5" }
 VMRegisterWait = 5
 )

WebSphereMQ sym_vcs_qm2 (
 QueueManager = "sym!vcs!qm2"
 MQVer = "7.0"
 )

lvol_log2Vol_Qname2_log requires volg_Qname2_log
lvol_qmgr2Vol_Qname2_qmgr requires volg_Qname2_qmgr
```

```
 mnt_sym_vcs_qm2_2 requires lvol_qmgr2Vol_Qname2_qmgr
 mnt_sym_vcs_qm2_3 requires lvol_log2Vol_Qname2_log
 sym_vcs_qm2 requires mnt_sym_vcs_qm2_2
 sym_vcs_qm2 requires mnt_sym_vcs_qm2_3
 volg_Qname2_qmgr requires VMwareDisk_2


 // resource dependency tree
 //
 // group MQ_2
 // {
 // WebSphereMQ sym_vcs_qm2
 //     {
 //     Mount mnt_sym_vcs_qm2_2
 //         {
 //         LVMLogicalVolume lvol_qmgr2Vol_Qname2_qmgr
 //             {
 //             LVMVolumeGroup volg_Qname2_qmgr
 //                 {
 //                 VMwareDisks VMwareDisk_2
 //                 }
 //             }
 //         }
 //     Mount mnt_sym_vcs_qm2_3
 //         {
 //         LVMLogicalVolume lvol_log2Vol_Qname2_log
 //             {
 //             LVMVolumeGroup volg_Qname2_log
 //             }
 //         }
 //     }
 // }


group MQ_3 (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 AutoStartList = { sles11sp2mq1 }
 )

 LVMLogicalVolume lvol_log3Vol_Qname3_log (
  LogicalVolume = log3Vol
```

```
 VolumeGroup = Qname3_log
 )

LVMLogicalVolume lvol_qmgr3Vol_Qname3_qmgr (
 LogicalVolume = qmgr3Vol
 VolumeGroup = Qname3_qmgr
 )

LVMVolumeGroup volg_Qname3_log (
 VolumeGroup = Qname3_log
 )

LVMVolumeGroup volg_Qname3_qmgr (
 VolumeGroup = Qname3_qmgr
 )

Mount mnt_sym_vcs_qm3_2 (
 MountPoint = "/var/mqm/qmgrs/sym!vcs!qm3"
 BlockDevice = "/dev/mapper/Qname3_qmgr-qmgr3Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Mount mnt_sym_vcs_qm3_3 (
 MountPoint = "/var/mqm/log/sym!vcs!qm3"
 BlockDevice = "/dev/mapper/Qname3_log-log3Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

VMwareDisks VMwareDisk_3 (
 ESXDetails = { vcslx658 = "root=BPHnEPeJBhCHdHE" }
 DiskPaths = {
   "6000C297-14a0-42b4-ffca-9a00727b7952:[SAPMQ] sles11sp2mq1
    /sles11sp2mq1_3.vmdk" = "0:6" }
 VMRegisterWait = 5
 )

WebSphereMQ sym_vcs_qm3 (
 QueueManager = "sym!vcs!qm3"
 MQVer = "7.0"
```

```
 )

lvol_log3Vol_Qname3_log requires volg_Qname3_log
lvol_qmgr3Vol_Qname3_qmgr requires volg_Qname3_qmgr
mnt_sym_vcs_qm3_2 requires lvol_qmgr3Vol_Qname3_qmgr
mnt_sym_vcs_qm3_3 requires lvol_log3Vol_Qname3_log
sym_vcs_qm3 requires mnt_sym_vcs_qm3_2
sym_vcs_qm3 requires mnt_sym_vcs_qm3_3
volg_Qname3_qmgr requires VMwareDisk_3


// resource dependency tree
//
// group MQ_3
// {
// WebSphereMQ sym_vcs_qm3
//     {
//     Mount mnt_sym_vcs_qm3_2
//         {
//         LVMLogicalVolume lvol_qmgr3Vol_Qname3_qmgr
//             {
//             LVMVolumeGroup volg_Qname3_qmgr
//                 {
//                 VMwareDisks VMwareDisk_3
//                 }
//             }
//         }
//     Mount mnt_sym_vcs_qm3_3
//         {
//         LVMLogicalVolume lvol_log3Vol_Qname3_log
//             {
//             LVMVolumeGroup volg_Qname3_log
//             }
//         }
//     }
// }


group MQ_4 (
 SystemList = { sles11sp2mq1 = 0 }
 UserAssoc = { Type = WebSphereMQ,
   Name = "WebSphere MQ: Queue manager" }
 AutoStartList = { sles11sp2mq1 }
```

```
)

LVMLogicalVolume lvol_log4Vol_Qname4_log (
 LogicalVolume = log4Vol
 VolumeGroup = Qname4_log
 )

LVMLogicalVolume lvol_qmgr4Vol_Qname4_qmgr (
 LogicalVolume = qmgr4Vol
 VolumeGroup = Qname4_qmgr
 )

LVMVolumeGroup volg_Qname4_log (
 VolumeGroup = Qname4_log
 )

LVMVolumeGroup volg_Qname4_qmgr (
 VolumeGroup = Qname4_qmgr
 )

Mount mnt_sym_vcs_qm4_2 (
 MountPoint = "/var/mqm/qmgrs/sym!vcs!qm4"
 BlockDevice = "/dev/mapper/Qname4_qmgr-qmgr4Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

Mount mnt_sym_vcs_qm4_3 (
 MountPoint = "/var/mqm/log/sym!vcs!qm4"
 BlockDevice = "/dev/mapper/Qname4_log-log4Vol"
 FSType = ext3
 MountOpt = rw
 FsckOpt = "-y"
 )

VMwareDisks VMwareDisk_4 (
 ESXDetails = { vcslx658 = "root=BPHnEPeJBhCHdHE" }
 DiskPaths = {
   "6000C29e-cf9a-022e-83e3-eaba577357c1:[SAPMQ] sles11sp2mq1
    /sles11sp2mq1_4.vmdk" = "0:8" }
 VMRegisterWait = 5
 )
```

```
WebSphereMQ sym_vcs_qm4 (
 QueueManager = "sym!vcs!qm4"
 MQVer = "7.0"
 )

lvol_log4Vol_Qname4_log requires volg_Qname4_log
lvol_qmgr4Vol_Qname4_qmgr requires volg_Qname4_qmgr
mnt_sym_vcs_qm4_2 requires lvol_qmgr4Vol_Qname4_qmgr
mnt_sym_vcs_qm4_3 requires lvol_log4Vol_Qname4_log
sym_vcs_qm4 requires mnt_sym_vcs_qm4_2
sym_vcs_qm4 requires mnt_sym_vcs_qm4_3
volg_Qname4_qmgr requires VMwareDisk_4


// resource dependency tree
//
// group MQ_4
// {
// WebSphereMQ sym_vcs_qm4
//     {
//     Mount mnt_sym_vcs_qm4_2
//         {
//         LVMLogicalVolume lvol_qmgr4Vol_Qname4_qmgr
//             {
//             LVMVolumeGroup volg_Qname4_qmgr
//                 {
//                 VMwareDisks VMwareDisk_4
//                 }
//             }
//         }
//     Mount mnt_sym_vcs_qm4_3
//         {
//         LVMLogicalVolume lvol_log4Vol_Qname4_log
//             {
//             LVMVolumeGroup volg_Qname4_log
//             }
//         }
//     }
// }


group VCSInfraSG (
```

```
SystemList = { sles11sp2mq1 = 0 }
UserAssoc = { Type = "vcs internal",
  Name = "VCS Infrastructure service group" }
Parallel = 1
AutoStartList = { sles11sp2mq1 }
OnlineRetryLimit = 5
)

Process VCSNotifySinkRes (
 PathName = "/opt/VRTSvcs/portal/admin/notify_sink"
 )



// resource dependency tree
//
// group VCSInfraSG
// {
// Process VCSNotifySinkRes
// }
```

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/WebSphereMQ/ 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

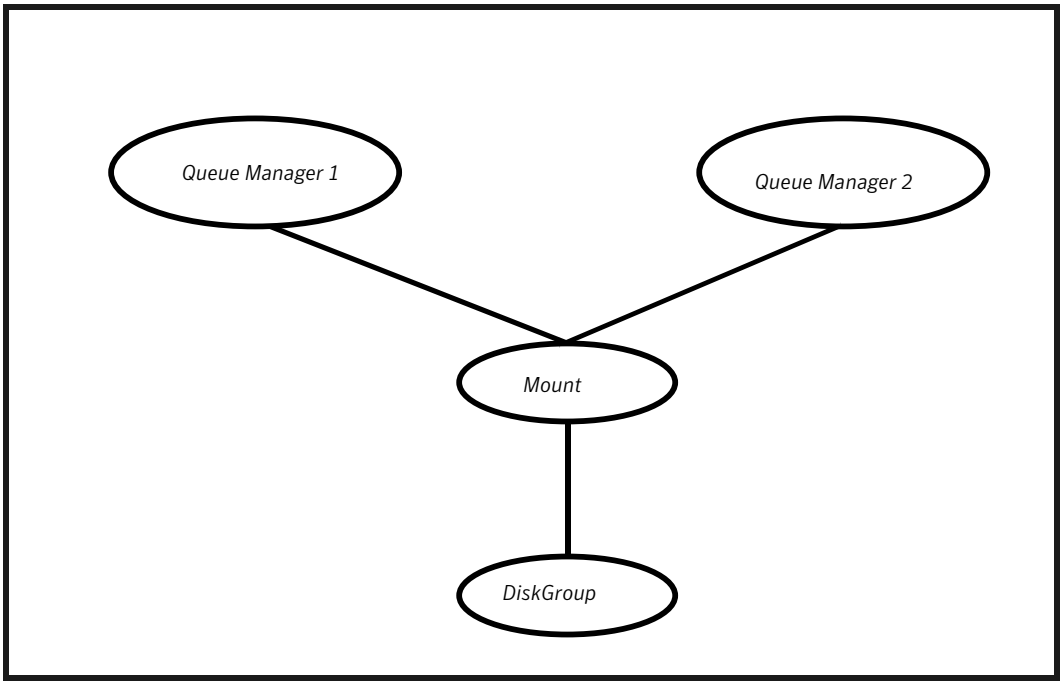
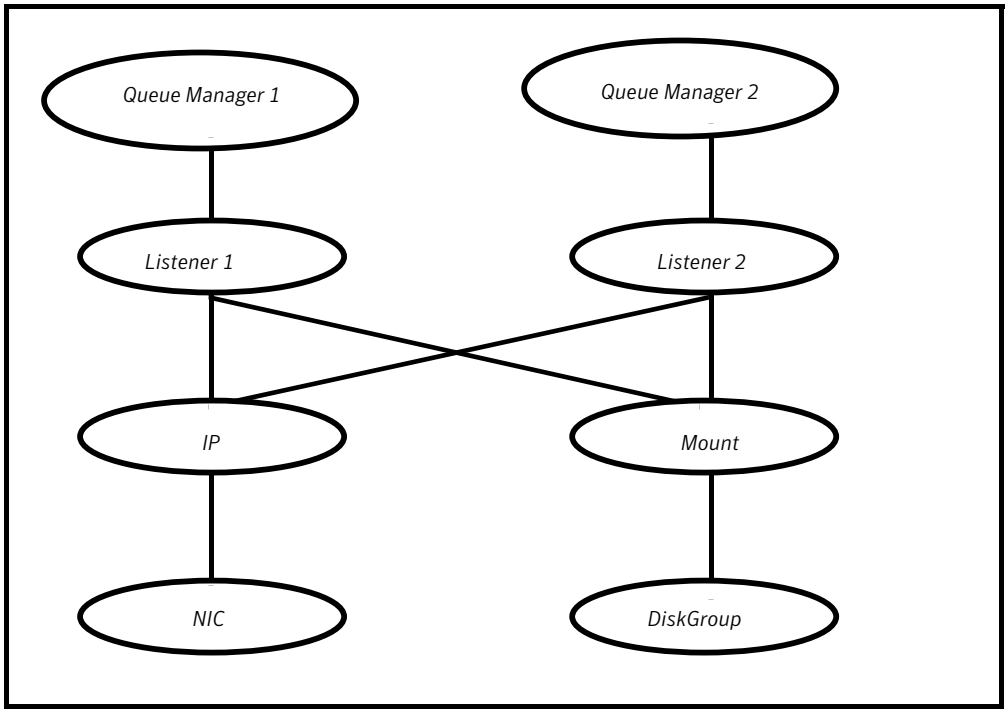


Figure A-2 shows a sample service group that includes two WebSphere MQ queue manager resources with associated listeners.

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



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