Symantec™ ApplicationHA Agent for WebSphere MQ Configuration Guide

Linux on KVM

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Symantec

Symantec™ ApplicationHA Agent for WebSphere MQ Configuration Guide

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Chapter 1

Introducing the Symantec ApplicationHA Agent for WebSphere MQ

This chapter includes the following topics:

- About the Symantec agent for WebSphere MQ
- About installing and removing the ApplicationHA agent for WebSphere MQ
- Supported software
- WebSphere MQ agent functions

About the Symantec agent for WebSphere MQ

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

The Symantec agent for WebSphere MQ provides high availability for all WebSphere MQ Queue Managers in a virtual machine. The agent can bring a specific WebSphere MQ Queue Manager online and monitor the state of the Queue Manager. The agent can detect failures and shut down the Queue Manager in case of a failure. The agent can also check Queue Manager Listener status.

About installing and removing the ApplicationHA agent for WebSphere MQ

When you install or uninstall Symantec ApplicationHA, the ApplicationHA agent for WebSphere MQ is automatically installed or removed. For more information, see the *Symantec ApplicationHA Installation and Upgrade Guide*.

When you run the installer or uninstall program that accompanies the quarterly agent pack release of high availability agents from Symantec, the latest version of the ApplicationHA agent for WebSphere MQ is automatically installed or removed. For more information, see the *Symantec ApplicationHA Agent Pack Installation Guide*.

Supported software

The Symantec ApplicationHA agent for WebSphere MQ supports the following software versions:

- Symantec ApplicationHA agent for WebSphere MQ can be installed and run inside virtual machines that have Symantec ApplicationHA 6.0 installed.
- The following versions of the Veritas Operations Manager components are supported:
  - Veritas Operations Manager Management Server 4.1 or later
  - Veritas Operations Manager managed host for Linux: 4.1 or later
  - Veritas Operations Manager Add-on for Symantec ApplicationHA Management

Supported application versions

Table 1-1 lists the WebSphere MQ versions that Symantec ApplicationHA 6.0 currently supports on virtual machine.

Table 1-1 Supported application versions

Application	Version
WebSphere MQ	7.0, 7.1, and 7.5

Supported virtualization environments

Symantec ApplicationHA can be installed and run inside virtual machines in a KVM virtualization environment, running Red Hat Enterprise Linux (RHEL) 6, Update 1 in the physical host.

Supported operating systems on virtual machines

Table 1-2 shows the supported operating systems for Symantec ApplicationHA 6.0.

Table 1-2 Supported guest operating systems

Operating systems	Levels	Kernel version
Red Hat Enterprise Linux 5	U3 or later	2.6.18-128.el5
Red Hat Enterprise Linux 6	Base or later	2.6.32-71.el6

Note: 64-bit operating systems are only supported.

If your system is running a lower level of Red Hat Enterprise Linux, than indicated in Table 1-2, you must upgrade it before attempting to install Symantec ApplicationHA. Consult the Red Hat documentation for more information on upgrading or reinstalling your operating system.

Symantec supports only Red Hat distributed kernel binaries.

Symantec products operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

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 instance.

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 instance.
  If the processes are found running even after the wait period, then these processes are killed.

Monitor

The monitor function monitors the states of the WebSphere MQ Queue Managers running on the virtual machine.

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 second level check, if configured, determines the status of the WebSphere MQ Queue Manager.

The second level check executes the `runmqsc` command and pings the Queue Manager to see if the manager is up and running. This check ensures that the processes are truly available for MQ Queue processing.

- Depending upon the MonitorProgram attribute, the monitor function can perform a customized check using a user-supplied monitoring utility.

  Note: ApplicationHA WebSphere MQ wizard does not configure MonitorProgram Attribute. To configure the MonitorProgram attribute, use CLI.

- 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.

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.

Chapter 2

Configuring application monitoring with Symantec ApplicationHA

This chapter includes the following topics:

- About configuring application monitoring with ApplicationHA
- Before configuring application monitoring for WebSphere MQ
- Accessing the ApplicationHA tab
- Configuring application monitoring for WebSphere MQ

About configuring application monitoring with ApplicationHA

This chapter describes the steps to configure application monitoring with ApplicationHA in a virtualization environment.

Consider the following points before you proceed:

- You configure an application for monitoring on a virtual machine using the Application Monitoring Configuration Wizard.
- The Application Monitoring Configuration Wizard is launched when you click **Configure Application Monitoring** in the ApplicationHA tab of the Veritas Operations Manager (VOM) console.
- In this release, the wizard allows you to configure monitoring for only one application per virtual machine.

To configure another application using the wizard, you must first unconfigure the existing application monitoring.

- After you have configured monitoring for an application using the wizard, you can configure monitoring for other applications residing in the same virtual machine, using Veritas Cluster Server (VCS) commands.
  For more information read the following technote:
  http://www.symantec.com/docs/TECH159846
- After configuring WebSphere MQ for monitoring, if you create another WebSphere MQ instance, this new instance is not monitored as part of the existing configuration.
  In such a case, you must first unconfigure the existing configuration and then reconfigure the application using the wizard. You can then select all the instances for monitoring.
- If your WebSphere MQ agent version is 5.1.14.0, you must install the 2Q2013 agent pack release or later to configure an application for monitoring using the wizard.

Before configuring application monitoring for WebSphere MQ

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

- Install the Veritas Operations Manager (VOM) Management Server and install the VOM add-on for ApplicationHA on the VOM Management Server. For more information on working with VOM, see the *Symantec ApplicationHA User's Guide*. For information on Accessing the ApplicationHA tab: See "Accessing the ApplicationHA tab" on page 17.
- Install ApplicationHA guest components on the virtual machine that you need to monitor.
- Assign ApplicationHA - Configure Application Monitoring (Admin) privileges to the logged-on user on the virtual machine where you want to configure application monitoring.
- Install the application and the associated components that you wish to monitor on the virtual machine.
- If you have configured a firewall, ensure that your firewall settings allow access to ports used by ApplicationHA installer, wizards, and services.
  Refer to the *Symantec ApplicationHA Installation Guide* for a list of ports and services used.

Accessing the ApplicationHA tab

To administer an application on a virtual machine that is running in the KVM environment, you must access the ApplicationHA tab of the Veritas Operations Manager (VOM) console.

In the ApplicationHA tab, you can perform administrative actions such as:

- Start an application
- Stop an application
- Configure application monitoring
- Unconfigure application monitoring
- Enable application heartbeat
- Disable application heartbeat
- Enter maintenance mode
- Exit maintenance mode

To access the ApplicationHA tab

1. On the Veritas Operations Manager console, click **Manage** > **Servers** > **Hosts**.
2. In the left pane, in the **License** list box, select the **ApplicationHA** check box.
3. In the right pane, click the virtual machine where you want to perform administrative actions.
4. Click the **ApplicationHA** tab.

Configuring application monitoring for WebSphere MQ

Perform the following steps to configure monitoring for WebSphere MQ on a virtual machine.

To configure application monitoring for WebSphere MQ

1. In the ApplicationHA tab of theVeritas Operations Manager console, click **ConfigureApplication Monitoring**.

   This launches the Application Monitoring Configuration Wizard.
2. Review the information on the Welcome screen and then click **Next**.

   The wizard lists all the supported applications for the system.

3 Select WebSphere MQ, and then click **Next**.

The WebSphere MQ Instance Selection screen appears.

4 Select the WebSphere MQ instances that you want to monitor.

5 If you want to monitor the related queue listener, check the **Monitor Queue Listener** option.

If you do not want to monitor the related queue listener, proceed to step 7.

6 To monitor the queue listeners along with WebSphere MQ queue manager instances, select the **Along with Queue Manager**

To monitor the queue listeners separately, select the **Independent of Queue Manager** option and enter the listener address.

7 Click **Configure**.

The wizard performs the application monitoring configuration tasks. The ApplicationHA Configuration screen displays the status of each task.

8 After all the tasks are complete, click **Next**.

Note: If the configuration tasks fail, click **View Logs** to check the details of the failure.

You then have to run the wizard again to configure the application monitoring.

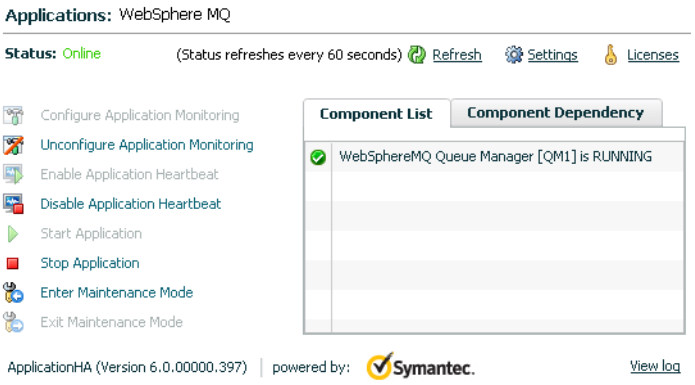
---

9 Click **Finish** to complete the wizard.

This completes the application monitoring configuration.

10 To view the status of the configured application on a virtual machine, on the Veritas Operations Manager console, navigate to the appropriate virtual machine, and then click the **ApplicationHA** tab.

The ApplicationHA view appears.

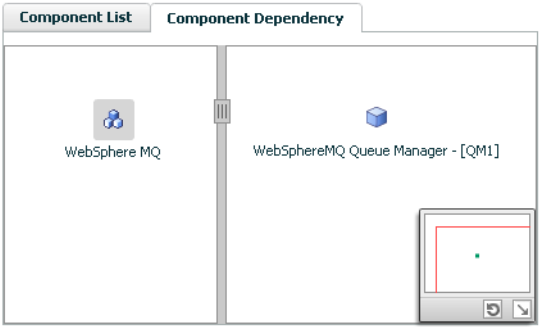


By default, the Component List tab appears. The tab lists each component of the configured application and the status description of each component.

For more information on viewing and administering applications through the Veritas Operations Manager, see the *Symantec ApplicationHA User's Guide*.

11 To view component dependency for the monitored application, click the **Component Dependency** tab.

The component dependency graph appears.



The graph illustrates the dependencies between a selected component group (an application or a group of inter-related components) and its components for the configured application. The left pane displays component groups and/or configured applications. The right pane displays components of the selected component group or application.

For more information on viewing component dependency for any configured application, see the *Symantec ApplicationHA User's Guide*.

Chapter 3

Troubleshooting the agent for WebSphere MQ

This chapter includes the following topics:

- Starting the WebSphere MQ Queue Manager instance outside ApplicationHA control
- Monitoring WebSphere MQ Queue Manager processes
- Stopping WebSphere MQ Queue Manager processes forcefully
- Reconfiguring ApplicationHA when WebSphere MQ queue manager/listener fails to start
- Reviewing error log files

Starting the WebSphere MQ Queue Manager instance outside ApplicationHA control

If you face problems while working with an instance, you must disable the instance within the ApplicationHA framework. A disabled instance is not under the control of theApplicationHA framework, and so you can test the WebSphere MQ Queue Manager instance independent of the ApplicationHA framework. Refer to the Veritas Cluster Server Administrator's Guide for information about disabling a resource.

You can then restart the WebSphere MQ Queue Manager instance outside the ApplicationHA framework.

Note: Use the same parameters that the instance attributes define within the ApplicationHA framework while restarting the instance outside the ApplicationHA framework.

A sample procedure to start a WebSphere MQ instance outside the ApplicationHA 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 ApplicationHA framework, you can then attempt to implement the Queue Manager within the ApplicationHA framework.

Monitoring WebSphere MQ Queue Manager processes

The agent for WebSphere MQ monitors the following processes:

MQ 7.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( |\$)",
"amqzmuc0 .*-m *X_QUEUE_MANAGER_X( |\$)",
"amqzmur0 .*-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 7.x

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

Reconfiguring ApplicationHA when WebSphere MQ queue manager/listener fails to start

When you configure ApplicationHA to monitor WebSphere MQ queue manager instances, you may need to reconfigure the same, in the following cases:

- If you configure ApplicationHA to monitor the listener along with the WebSphere MQ queue manager, and the WebSphere MQ queue manager fails to start.
- If you configure ApplicationHA to monitor the listener independent of the WebSphere MQ queue manager, and the listener (as a generic application) goes into the “Unable to start the WebSphere MQ queue manager” state.

You may observe this behavior if during WebSphere MQ configuration, the listener is not configured with the queue manager.

Perform the following steps to reconfigure application monitoring:

1. In the ApplicationHA tab, click **Unconfigure Application Monitoring**. A confirmation box appears.
2. Click **OK**. The configuration for application monitoring is deleted.
3. Click **Configure** and proceed configuring application monitoring for WebSphere MQ. See "Configuring application monitoring for WebSphere MQ" on page 17.

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 instance. The engine log files are located at the following location:

- The ApplicationHA engine log file is /var/VRTSvcs/log/engine_A.log.
- WebSphere MQ agent log file is /var/VRTSvcs/log/WebSphereMQ_A.log
- ApplicationHA log file is /var/VRTSvcs/log/AppControlOperations_A.log

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in a log file for each WebSphere MQ Queue Manager instance. 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 instance.

To localize ResLogLevel attribute for a resource

1. ApplicationHA commands reside in the /opt/VRTS/bin directory. Add this directory to your PATH environment variable. To set the path variable, perform one of the following steps:

   ```
   # export PATH=$PATH:/opt/VRTS/bin
   ```

2. Make the ApplicationHA configuration writable:

   ```
   # haconf -makerw
   ```

3. Identify the instance for which you want to enable detailed logging.
4. Localize the ResLogLevel attribute for the identified resource:

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

5. Set the ResLogLevel attribute to TRACE for the identified resource:

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

6. Note the time before you begin to operate the identified resource.
7. Test the identified resource. The function reproduces the problem that you are attempting to diagnose.
8. Note the time when the problem is reproduced.
9. Set the ResLogLevel attribute back to INFO for the identified resource:

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

10. 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.

Appendix A

Resource type definitions

This appendix includes the following topics:

- About the resource type and attribute definitions
- WebSphere MQ agent attributes

About the resource type and attribute definitions

The resource type represents the configuration definition of the agent and specifies how the agent is defined in the configuration file. The attribute definitions describe the attributes associated with the agent. The required attributes describe the attributes that must be configured for the agent to function.

Resource type definition for WebSphere MQ

The ApplicationHA agent for WebSphere MQ is represented by the WebSphereMQ resource type in ApplicationHA.

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

WebSphere MQ agent attributes

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

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

Table A-1 Required attributes

Required attributes	Description
CommandServer	Decides whether the monitor function must monitor the command server process. This attribute is applicable for 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
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 virtual machine. The login shell for this user must be Bourne, Korn, or C-shell. Type and dimension: string-scalar Default: mqm Example: mqusr1

Table A-1 Required attributes *(continued)*

Required attributes	Description
MQVer	Version of the WebSphere MQ Queue Manager. Valid values are 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 ApplicationHA manages. You must uniquely define this attribute for each Queue Manager within the virtual machine. 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 A-2 shows the optional attributes for configuring a WebSphere MQ Queue Manager.

Table A-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: 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. The agent internally executes the runmqsc command to check the status of the Queue Manager. Second-level monitoring consumes additional CPU memory. Type and dimension: integer-scalar Default: 0 Example: 1

Table A-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 A-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: ""

Appendix B

Detail monitoring

This appendix includes the following topics:

- Setting the PATH variable
- Setting up detail monitoring for ApplicationHA agent for WebSphere MQ

Setting the PATH variable

ApplicationHA commands reside in the `/opt/VRTS/bin` directory. Add this directory to your PATH environment variable.

To set the PATH variable

- Perform one of the following steps:

  For the Bourne Shell (sh or ksh), type:

  ```
  $ PATH=/opt/VRTS/bin:$PATH; export PATH
  ```

  For the C Shell (csh or tcsh), type:

  ```
  $ setenv PATH :/opt/VRTS/bin:$PATH
  ```

Setting up detail monitoring for ApplicationHA agent for WebSphere MQ

This section describes the procedure to enable and disable detail monitoring for WebSphere MQ.

To enable detail monitoring for WebSphere MQ

1 Make the ApplicationHA configuration writable:

```
# haconf -makerw
```

2 Freeze the service group to avoid automated actions by ApplicationHA in case of an incomplete configuration:

```
# hagrp -freeze WMQ_SG
```

3 Enable detail monitoring for WebSphere MQ instances by using the following ApplicationHA commands:

```
# hagrp -modify WMQ_<QueueManagerName>_res

SecondLevelMonitor <frequency>
```

Note: For more information on SecondLevelMonitor attribute, See "WebSphere MQ agent attributes" on page 28.

4 Save the configuration and unfreeze the service group.

```
# hagrp -unfreeze WMQ_SG

# haconf -dump -makero
```

To disable detail monitoring for WebSphere MQ

1 Make the ApplicationHA configuration writable:

```
haconf -makerw
```

2 Freeze the service group to avoid automated actions by ApplicationHA in case of an incomplete configuration:

```
# hagrp -freeze WMQ_SG
```

3 Disable detail monitoring for WebSphere MQ instance by using the following ApplicationHA commands:

```
# hares -modify WMQ_<QueueManagerName>_res

SecondLevelMonitor 0
```

4 Save the configuration and unfreeze the service group.

```
# hagrp -unfreeze WMQ_SG

# haconf -dump -makero
```