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

AIX, HP-UX, Linux, Solaris

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

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350 Ellis Street
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Chapter 1

Introducing the Veritas High Availability Agent for WebSphere MQ FTE

This chapter includes the following topics:

- About the Veritas agent for WebSphere MQ FTE
- Supported software
- How the agent makes WebSphere MQ FTE highly available
- About WebSphere MQ FTE
- WebSphere MQ FTE agent functions

About the Veritas agent for WebSphere MQ FTE

The Veritas agent for WebSphere MQ FTE provides high availability for all WebSphere MQ File Transfer agents in a cluster. The agent can bring a specific WebSphere MQ File Transfer agent online and monitor the state of the FTE agent. The agent can also detect failures and stop the FTE agent in case of a failure.

Supported software

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

Veritas Cluster Server	■ AIX—VCS 4.0, 5.0 ■ HP-UX—VCS 4.1, 5.0 ■ Linux—VCS 4.1, 5.0 ■ Solaris—VCS 4.1, 5.0 and all intermediate Maintenance Packs of these releases. VCS One 2.0 on AIX, HP-UX, Linux, and Solaris and all minor versions of these releases.
ACC Library	5.1.5.0 and later
Operating Systems	■ AIX 5.3 on pSeries ■ HP-UX 11i version 2, HP-UX 11i version 3 ■ Red Hat Enterprise Linux 5.0 on Intel ■ SUSE Linux Enterprise Server 10 with SP1 ■ Solaris 10 on SPARC
WebSphere MQ FTE	7.0

How the agent makes WebSphere MQ FTE highly available

The Veritas agent for WebSphereMQFTE agent continuously monitors the FTE agent processes to verify they function properly.

The agent provides the following levels of application monitoring:

- Primary or Basic monitoring
  This mode has Process check and Health check monitoring options. With the default Process check option, the agent verifies that the WebSphere MQ FTE agent processes are present in the process table. Process check cannot detect whether processes are in a hung or stopped states.
- Secondary or Detail monitoring
  In this mode, the agent runs a utility to verify the status of WebSphere MQ FTE agent. The agent detects application failure if the monitoring routine reports an improper function of the WebSphere MQ FTE agent processes. When this application failure occurs, the WebSphere MQ FTE agent service group fails over to another node in the cluster. Thus, the agent ensures high availability for WebSphere MQ FTE agent.

About WebSphere MQ FTE

IBM® WebSphere® MQ File Transfer Edition, called FTE, integrates with an existing WebSphere MQ network and adds managed file transfer solution. From an architectural perspective, FTE is constructed like any other WebSphere MQ application. It connects to queue managers to put messages into or get messages from queues. It is secured through authentication and access control, like any other MQ application. However, unlike most messaging applications, FTE crosses a security domain boundary from the messaging realm into the operating system's file and directory service.

Component architecture

There are different versions of FTE, depending on whether it will connect to the queue manager in bindings or client mode. In addition to the functional components, each version also includes installation media containing remote tools and documentation packages. During configuration, the administrator is asked to supply the details of three queue managers known as the agent queue manager, command queue manager, and coordination queue manager. FTE is a single long-running daemon process called an agent, with tools to let users submit commands to the agent and inquire on its status. Beyond that, everything else is just configuration details.

In a typical installation of FTE there is a sender FTE agent and a receiver FTE agent, each of which has its own command queue. File transfers are managed by users or administrators by placing messages on the sending FTE agent's command queue, either directly or with the supplied tooling. The FTE agent processes respond to command messages, move files through WebSphere MQ, and then publish activity logs onto the SYSTEM.FTE topic. Users, administrators, and applications may then subscribe to the status updates on the SYSTEM.FTE topic.

Each FTE component requires access to a queue manager. In the simplest case, the users and FTE agents can all connect to the same queue manager. At the other extreme, it is possible to distribute the FTE agents and users across the network and let WebSphere MQ take care of routing the commands and data traffic between them. When discussing topologies, it is necessary to distinguish the different nodes based on their role. As noted above, they are referred to as agent queue manager, command queue manager, and coordination queue manager.

Agent queue manager

Each FTE agent is associated with a single V6.0 or later queue manager. The FTE agent and its queue manager may be hosted on the same server or the FTE agent may use a WebSphere MQ client channel to communicate with a remote queue

manager. When the FTE agent is deployed, the administrator will create a set of queues for that agent to use. As the queue names include the FTE agent's name, it is possible for one queue manager to host multiple agents.

Command queue manager

The command-line and Eclipse plug-in tooling lets users and instrumentation issue commands to the various FTE agents in the network. In a small network with two FTE agents connected to a single queue manager, the tooling can be configured to connect directly to that same queue manager. But in a distributed network with many FTE agent queue managers, it is not practical or necessary to have the tooling connect directly to each FTE agent queue manager to issue commands.

Instead, the tooling is configured to connect to a single queue manager that has connectivity to all of the FTE agents, relying on WebSphere MQ to route the command messages accordingly. Whichever queue manager the tooling connects to is referred to as the command queue manager. There is nothing special about this queue manager other than that it can resolve a route to each agent queue manager. There is no FTE code required to run here and the only queues required are the temporary dynamic queues created by the tooling at run time. Any V6.0 or later queue manager will work. There is also no requirement that all users connect to the same command queue manager and in fact the expected deployment would group sets of users by role onto different command queue managers.

Coordination queue manager

The coordination queue manager is the one thing all of the components in the FTE network have in common. Any significant event occurring at the FTE agent results in a message published by the agent on the SYSTEM.FTE topic hosted on the coordination queue manager. Any user or application that needs to know what is happening in the FTE network must subscribe to these publications. Both the command-line and Eclipse plug-in tooling require a connection to the coordination queue manager to consume publications. FTE agents have no such requirement, because the publications can be sent from the agent queue manager across the WebSphere MQ network to the coordination queue manager. There is no actual FTE code required to run on the coordination queue manager. All of the work is accomplished using native WebSphere MQ functionality. FTE requires that this queue manager must be a WebSphere MQ V7.0 or later queue manager for the publish/subscribe features.

Deployment topologies

The simplest example of an FTE network is a single queue manager that serves as agent queue manager, coordination queue manager, and command queue manager all bundled into one. While this will work, it would not be very useful if it just moved a file from one directory on a server to another directory on the same server. To get the FTE network out of the lab and useable in the real world, the first thing to do is to distribute the FTE agent processes onto the servers where files will be consumed or delivered. The queue manager in this case serves simultaneously in all three roles of Coordination, Command, and Agent queue manager.

A high volume FTE network is alternative approach to deploy FTE as mentioned in the above paragraph. In this topology, command and status messages still flow through a single queue manager serving as both coordination and command queue manager, but data flows directly between the two agent queue managers over WebSphere MQ channels such as a Sender/Receiver pair.

For more information about WebSphere MQ FTE see the IBM WebSphere MQ FTE information centre.

WebSphere MQ FTE agent functions

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

Online

The online function performs the following tasks:

- Verifies that WebSphere MQ FTE is not already online.
- Uses an IBM provided start script to start the WebSphere MQ FTE agent using the name of the FTE agent and coordination 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 FTE agent is up and running successfully. The online operation uses the wait period that the OnlineTimeout attribute specifies, to enable the FTE agent to initialize fully before allowing the monitor function to probe the resource

Offline

The offline function performs the following tasks:

- Verifies that the WebSphere MQ FTE agent is not already offline.
- Uses an IBM provided stop script to stop the WebSphere MQ FTE agent using the name of the Agent Name and Coordination 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 FTE agent is given enough time to go offline successfully. The offline operation uses a wait period that the OfflineTimeout attribute specifies, to allow the WebSphere MQ FTE agent to complete the offline sequence before allowing further probing of the resource.

Monitor

The monitor function monitors the states of the WebSphere MQ FTE agent running on all nodes within the cluster.

- The first level check searches for all system processes that must be running for a WebSphere MQ FTE agent. If the first level check does not find these processes running on the node, the check exits immediately, and reports the FTE agent as offline.
- If the SecondLevelMonitor attribute is set to greater than 0, the monitor function performs a second level check to determine the status of the WebSphere MQ FTE agent. The second level check performs a dummy transfer to see if the FTE agent is up and running. This check ensures that the processes are truly available for MQ FTE agent processing.
- Depending upon the MonitorProgram attribute, the monitor function can perform a customized check using a user-supplied monitoring utility. For details about executing a custom monitor program:
  See "Executing a customized monitoring program" on page 34.

Clean

In case of a failure or after an unsuccessful attempt to online or offline WebSphere MQ FTE agent, the clean function removes any FTE agent processes remaining in the system.

The function performs the following tasks:

- Attempts to gracefully shut down the WebSphere MQ FTE agent.

- If a graceful shutdown fails, the clean function looks for all the processes running for the WebSphere MQ FTE agent , and cleans the processes by killing them.

Chapter 2

Installing, upgrading, and removing the agent for WebSphere MQ FTE

This chapter includes the following topics:

- Before you install the Veritas agent for WebSphere MQ FTE
- Installing the ACC library
- Installing the agent in a VCS environment
- Installing the agent in a VCS One environment
- Removing the agent in a VCS environment
- Removing the agent in a VCS One environment
- Removing the ACC library

Before you install the Veritas agent for WebSphere MQ FTE

For VCS, do the following:

- Install and configure Veritas Cluster Server.
  For more information on installing and configuring Veritas Cluster Server, refer to the *Veritas Cluster Server Installation Guide*.
- Install the latest version of ACC Library.
  To install or update the ACC Library package, locate the library and related documentation on the agentpack disc.

See "Installing the ACC library" on page 18.

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*.

Prerequisites for enabling i18n support

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

- 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*/application/i18n_support/vcs/5.0
VCS 4.1	cd1/*platform*/*arch_dist*/application/i18n_support/vcs/4.1
VCS 4.0	cd1/*platform*/*arch_dist*/application/i18n_support/vcs/4.0

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

Note: *arch_dist* is not applicable to AIX.

About ACC Library

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

Installing the ACC library

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

To install the ACC library

1 Log in as superuser.

2 Navigate to the pkgs directory (the pkgs directory on the CD).

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

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

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

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

Installing the agent in a VCS environment

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

Note: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. So, the following procedure to install the agent for WebSphere MQ FTE installs the agent for WebSphere MQ also. If you are installing the agent for WebSphere MQ FTE and you already have an existing older version of the agent for WebSphere MQ, you must first remove the agent for WebSphere MQ from your system.

For information on removing and upgrading the agent for WebSphere MQ, refer to the *Veritas High Availability Agent for WebSphere MQ Installation and Configuration Guide*.

To install the agent in a VCS environment

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

   AIX `*cd_mount*/aix/application/webspheremq_agent/vcs_*version*/*version*_agent/pkgs`

   HP-UX `*cd_mount*/hpux/generic/application/webspheremq_agent/vcs_*version*/*version*_agent/pkgs`

   Linux `*cd_mount*/linux/generic/application/webspheremq_agent/vcs_*version*/*version*_agent/rpms`

   Solaris `*cd_mount*/solaris/*arch*/application/webspheremq_agent/vcs_*version*/*version*_agent/pkgs`

   Where *arch* is the Solaris processor architecture.

3. 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
   ```

Installing the agent in a VCS One environment

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

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

- Installing the agent packages
  See "Installing the agent packages" on page 21.
- Adding the agent resource type definitions
  See "Adding the agent resource type definitions" on page 22.

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

Installing the agent packages

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

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

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

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

AIX	# *cd_mount*/aix/high_availability_agents
HP-UX	# *cd_mount*/hpux*os_version*/high_availability_agents Where os_version is the HP-UX version.
Linux	# *cd_mount*/linux/dist_arch/high_availability_agents Where *dist* is the Linux distribution and *arch* is the architecture.
Solaris	# *cd_mount*/solaris/arch/high_availability_agents where *arch* is the Solaris processor architecture.

3 Enter the command to start the agent pack installation.

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

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

4 Enter the name of a client system or client systems where you want to install the agents.

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

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

Adding the agent resource type definitions

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

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

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

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

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

2 Make sure that the PM daemon is running.

```
# haclus -display
```

The output should show ClusterState is RUNNING.

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

4 Mount the VCS One Agent Pack software disc.

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

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

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

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

7 When the installer prompts, enter the virtual IP address of the Policy Master.

8 Review the output as the installer verifies communication with the Policy Master system.

9 Review the output as the installer adds the agent types to the PM database configuration and copies the appropriate types.xml files to the PM system.

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

Removing the agent in a VCS environment

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

Warning: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. So, the following procedure to remove the agent for WebSphere MQ FTE removes the agent for WebSphere MQ 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 FTE agent resources from the cluster. Use the following command to verify that all resources have been removed:

```
# hares -list Type=WebSphereMQFTE
```

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

```
# hatype -delete WebSphereMQFTE
```

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 FTE from each node in the cluster.

Execute the following command to uninstall the agent:

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

Removing the agent in a VCS One environment

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

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

See "Removing the VCS One agent package for WebSphere MQ FTE" on page 26.

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

Removing all the VCS One agent packages

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

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

To remove all the VCS One agent packages from client systems

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

AIX	# **cd aix/high_availability_agents**
HP-UX	# **cd hpux*os_version*/high_availability_agents** Where *os_version* is the HP-UX version.
Linux	# **cd linux/*dist_arch*/high_availability_agent** Where *dist* is the Linux distribution and *arch* is the architecture.
Solaris	# **cd solaris/*arch*/high_availability_agents** Where *arch* is the architecture.

3. Start the uninstallagpack program.

   ```
   # ./uninstallagpack
   ```

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

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

Removing the VCS One agent package for WebSphere MQ FTE

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

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

To remove the VCS One agent for WebSphere MQ FTE 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	`# pkgrm VRTSmq6`

Removing the agent type definition from the Policy Master system

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

To remove the agent type definition from the Policy Master system

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

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

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

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

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

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

Removing the ACC library

Perform the following steps to remove the ACC library.

To remove the ACC library

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

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

Chapter 3

Configuring the agent for WebSphere MQ FTE

This chapter includes the following topics:

- About configuring the Veritas agent for WebSphere MQ FTE
- About Configuring WebSphere MQ FTE for high availability
- Importing the agent types files in a VCS environment
- WebSphere MQ FTE agent attributes
- Executing a customized monitoring program
- Uniquely identifying the WebSphere MQ FTE agent
- Monitoring the WebSphere MQ FTE agent

About configuring the Veritas agent for WebSphere MQ FTE

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

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

See "About sample configurations for the agent for WebSphere MQ FTE" on page 45.

About Configuring WebSphere MQ FTE for high availability

You can configure the WebSphere MQ FTE agent to be highly available by installing it on all the nodes in the cluster and moving its data directory (/var/IBM/WMQFTE) on the shared storage.

The WebSphere MQ FTE agent depends on three WebSphere MQ queue managers for its functioning. In some cases, a single queue manager can be used for all the three purpose while in others the three different queue manager can be used and all of them can be on different hosts. So it is recommended to configure the dependency between the service group containing the WebSphere MQ FTE agent resource and the service group containing the WebSphere MQ resource for corresponding queue manager.

The Dependency type between the WebSphere MQ FTE agent service group and service group containing WebSphere MQ queue manager will be “Online Global Soft”. All the queue manager should be running for WebSphere MQ FTE agent to work properly. If the FTE agent is running and any of the queue manager goes down then it does not affect the FTE agent until any transaction is requested by the application which involve that particular queue manage. In that case the FTE agent will notify that it is not able to connect to that particular queue manager. When the particular queue manager again comes up running and application request for the same transaction, the FTE agent will connect to the queue manager and perform the appropriate action to fulfill the request. Since for each transaction a new connection will be established by the FTE agent to the respective queue manager, there is no need to restart the FTE agent in case of any failure. The queue managers can be running on any machine but the hostname should be known to the FTE agent since it will connect to the hostname though the listener on which the queue manager listen to.

Importing the agent types files in a VCS environment

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

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

1. Start the Veritas Cluster Manager and connect to the cluster on which the agent is installed.
2. Click **File > Import Types**.

3 In the Import Types dialog box, select the following file:

VCS 4.x /etc/VRTSvcs/conf/sample_WebSphereMQFTE/WebSphereMQFTETypes.cf

VCS 5.0 /etc/VRTSagents/ha/conf/WebSphereMQFTE/WebSphereMQFTETypes.cf

4 Click **Import**.

5 Save the VCS configuration.

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

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

WebSphere MQ FTE agent attributes

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

Table 3-1 shows the required attributes for configuring a WebSphere MQ FTE agent.

Table 3-1 Required attributes

Required attributes	Description
FTEAgentName	Name of the WebSphere MQ FTE agent. Type and dimension: string-scalar Default: "" Example: AGENT1
DataDir	Absolute path to the data directory of WebSphere MQ FTE provided at the time of installing WebSphere MQ FTE. Type and dimension: string-scalar Default: /var/IBM/WMQFTE Example: /var/IBM/WMQFTE

Table 3-1 Required attributes *(continued)*

Required attributes	Description
HomeDir	Absolute Path to the home installation directory of the WebSphere MQ FTE provided at the time of installation of WebSphere MQ FTE. Type and dimension: string-scalar Default: /opt/IBM/WMQFTE Example: /opt/IBM/WMQFTE
CoordinationQM	Coordination queue manager name for the WebSphere MQ FTE agent. Type and dimension: string-scalar Default: "" Example: QM1
AgentQM	Agent queue manager name for the WebSphere MQ FTE agent. Type and dimension: string-scalar Default: "" Example: QM2
FTEUser	User name that the Veritas agent for WebSphere MQ FTE uses to execute the programs for managing a WebSphere MQ FTE agent. The user name must also be synchronized across the systems in the cluster. In other words, the user name must resolve to the same UID and have the same default shell on each system in the cluster. The Veritas agent functions use the getpwnam(3c) function call to obtain UNIX user attributes. As a result, the user can be defined locally or can be defined in a common repository (that is, NIS, NIS+, or LDAP). In the latter case, the agent will fail if the access to this repository fails. The supported shell environments are: ksh, sh, and csh. Type and dimension: string-scalar Default: mqm Example: mqusr1

Table 3-1 Required attributes *(continued)*

Required attributes	Description
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 FTE.

Table 3-2 Optional attributes

Optional attribute	Description
EnvFile	Full path to the file that the WebSphere MQ FTE sources to set the environment variables. Symantec recommends storing this file on a shared disk. The supported shell environments are: ksh, sh, and csh. Type and dimension: string-scalar Default: "" Example: /opt/IBM/WMQFTE/envfile
SecondLevelMonitor	Used to enable second-level monitoring. Second-level monitoring is a deeper, more thorough state check of the WebSphere MQ FTE agent. The numeric value specifies how often the monitoring routines must run. 0 means never run the second-level monitoring routines, 1 means run routines every monitor interval, 2 means run routines every second monitor interval, and so on. **Note:** Exercise caution while setting SecondLevelMonitor to large numbers. For example, if the MonitorInterval is set to 60 seconds and the SecondLevelMonitor is set to 100, then the runmqsc command is executed every 100 minutes, which may not be as often as intended. For maximum flexibility, no upper limit is defined for SecondLevelMonitor. Type and dimension: integer-scalar Default: 0 Example: 5

Table 3-2 Optional attributes *(continued)*

Optional attribute	Description
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. Type and dimension: string-scalar Default: "" Example: /var/ibm/wmqfte/myMonitor.sh

Executing a customized monitoring program

The monitor function can execute a customized monitoring utility to perform an additional WebSphere MQ FTE agent 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 FTE agent agent instance is online.
- The SecondLevelMonitor attribute is either set to 0 or 1, and the second level check indicates that the WebSphere MQ FTE agent agent instance is online.
- The SecondLevelMonitor attribute is set to greater than 1, but the second level check is deferred for this monitoring cycle.

The monitor function interprets the utility exit code as follows:

110 or 0	WebSphere MQ FTE agent instance is online
100 or 1	WebSphere MQ FTE agent instance is offline
99	WebSphere MQ FTE agent instance is unknown
Any other value	WebSphere MQ FTE agent instance is unknown

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

Uniquely identifying the WebSphere MQ FTE agent

For multiple WebSphere MQ FTE agents running concurrently on a single node, the Veritas agent for FTE must be able to uniquely identify each FTE agent on

that system. Each FTE agent has a unique agent name under same coordination queue manager. The Veritas agent for FTE will use the CoordinationQM and FTEAgentName attribute value to identify the FTE agent uniquely. Differentiating the WebSphere MQ FTE agent is important to identify each FTE agent uniquely. In the absence of unique names for each FTE agent, the Veritas agent for FTE may kill the processes for more than one FTE agent during a clean operation, while attempting to kill the processes of a non-responsive or failed instance.

Monitoring the WebSphere MQ FTE agent

- In first level monitoring, the Veritas agent for WebSphere MQ FTE checks for the existence of the Java process that represents the WebSphere MQ FTE agent instance. The Veritas agent for WebSphere MQ FTE checks for the process existence by scanning the system process table and searching for strings in the process command line that uniquely identify the Java process associated with the WebSphere MQ FTE agent . These search strings include the values specified in resource attributes DataDir, HomeDir, CoordinationQM, and FTEAgentName.
- The Veritas agent for WebSphere MQ FTE also performs a Pid file-based monitoring in the first level monitoring. When each FTE agent gets started, it creates a Pid file by the name agent.lck under *FTEAgentName*. The Veritas agent for WebSphere MQ FTE checks for the existence of this Pid file in the FTE agent directory. If it is present, the Veritas agent for WebSphere MQ FTE extracts the process id from that file and then perform the process level check in that process command line.
  If the file does not exist in the FTE agent directory, the Veritas agent for WebSphere MQ FTE will continue with the process check from the system process table.
- In second level monitoring, the Veritas agent for WebSphere MQ FTE performs a dummy transfer of a file. The Veritas agent for WebSphere MQ FTE transfers a small dummy file by executing the `fteCreateTransfer` command in the /tmp directory. Thereafter, the Veritas agent for WebSphere MQ FTE repeatedly checks for the existence of destination file by delaying the monitor function. If the file is transferred successfully, it implies that the FTE agent is working fine.

Chapter 4

Configuring the service groups for WebSphere MQ FTE

This chapter includes the following topics:

- About configuring service groups for WebSphere MQ FTE
- Before configuring the service groups for WebSphere MQ FTE agent
- Configuring service groups for WebSphere MQ Queue Managers

About configuring service groups for WebSphere MQ FTE

Configuring the WebSphereMQFTE agent service group involves creating the service group, its resources, and defining attribute values for the configured resources. You must have administrator privileges to create and configure a service group. You can configure the service groups using the Cluster Manager (Java console).

Before configuring the service groups for WebSphere MQ FTE agent

Before you configure the WebSphereMQFTE service group, you must do the following:

- Verify that VCS is installed and configured on all nodes in the cluster where you will configure the service group.
  Refer to the *Veritas Cluster Server Installation Guide* for more information.
- Verify that WebSphere MQ FTE is installed on all the systems in the cluster on the same path that will host a WebSphereMQFTE service group.
- Verify that the WebSphere MQ FTE agents are created using the tools available with the WebSphere MQ FTE installation, such as fteCreateAgent. Make sure that coordination, command and all queue managers are running, respective channels and listeners are properly configured and running.
- Verify that the WebSphere MQ FTE agent to be clustered is working fine.
- Verify that the Veritas agent for WebSphere MQ FTE is installed on all nodes in the cluster.
- Verify that the type definition for the Veritas agent WebSphere MQ FTE is imported into the VCS engine.

Configuring service groups for WebSphere MQ Queue Managers

A cluster must have spare capacity to handle WebSphere MQ FTE agent failover scenarios. A cluster can provide application failover by encapsulating the resources required for an application into a service group. A service group is a virtualized application that can move among cluster nodes. A service group can contain a set of dependent resources, such as disk groups, disk volumes, file systems, IP addresses, NIC cards, and dependent application processes.

A cluster can start, stop, monitor, and switch service groups within the cluster, depending upon server or resource faults. An administrator can proactively move a service group between cluster nodes to perform preventative maintenance or apply patches. The service group includes logic about the dependencies between application components.

Perform the following steps to add a service group for WebSphere MQ FTE agent:

To add a service group for WebSphere MQ FTE agent

1. Create a separate service groups for each WebSphere MQ FTE agent. In each service group create the respective WebSphere MQ FTE resource.
2. Provide the specific attribute values for all the resources. Refer to the attribute table.
3. Create a separate file system for WebSphere MQ FTE on shared disk.

4 Add the file system to respective agent service group using Mount, DiskGroup and Volume resources.

Refer to figure A-1.

5 Copy the contents of data directory of the WebSphere MQ FTE to this shared file system. Ensure that you copy the sub-directories also.

6 Delete the contents of data directory and then create a link between data directory and the directory on the shared disk where you copied the contents of the data directory.

7 Create the resource dependency between the resources by linking them. Refer to figure A-1.

8 Create the service group for WebSphere MQ Queue Manager on which the WebSphereMQFTE agent will depend for its functioning. For more information refer to the *Veritas™ High Availability Agent for WebSphere MQ Installation and Configuration Guide*.

9 Add the service group dependency between the service group created in step1 and service group created in step 8 by performing following steps

- Go to the Service Group View.
- Link the service group containing WebSphere MQ FTE and WebSphere queue manager as mentioned in the preceding section.
- Choose Relationship as “Online Global” and Dependency Type as “Soft.”

Chapter 5

Troubleshooting the agent for WebSphere MQ FTE

This chapter includes the following topics:

- Using the correct software and operating system versions
- Meeting prerequisites
- Configuring WebSphere MQ FTE agent resources
- Starting the WebSphere MQ FTE agent instance outside a cluster
- Reviewing error log files

Using the correct software and operating system versions

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

See "Supported software" on page 9.

Meeting prerequisites

Before installing the agent for WebSphere MQ FTE, double check that you meet the prerequisites.

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

See "Before you install the Veritas agent for WebSphere MQ FTE" on page 17.

Configuring WebSphere MQ FTE agent resources

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

Starting the WebSphere MQ FTE agent 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 FTE agent instance independent of the cluster framework. Refer to the cluster documentation for information about disabling a resource.

You can then restart the WebSphere MQ FTE agent 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 FTE instance outside the cluster framework, is illustrated as follows.

To restart the WebSphereMQ FTE agent instance outside a cluster

1 Log in to the WebSphere MQ FTE agent as an MQUser.

```
# su - MQUser
```

2 Start the WebSphere MQ FTE agent.

```
# fteStartAgent -p (coordination_QM) agent_name
```

3 Do a simple File Transfer using WebSphere MQ FTE.

```
# fteCreateTransfer -sa AG1 -sm MQ -da AGENT1 -dm QM2 -df
/tmp/mq.copy  -pr 0 -p QM1 -cs MD5
/var/IBM/WMQFTE/config/MQ1/agents/AG1/agent.properties
```

If the WebSphere MQ FTE Agent works properly outside the cluster framework, you can then attempt to implement the FTE agent within the cluster framework.

Reviewing error log files

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

Reviewing cluster log files

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

- The VCS engine log file is /var/VRTSvcs/log/engine_A.log.
- The VCS One engine log file is /var/VRTSvcsone/log/engine_A.log.
- The VCS One client log file is /var/VRTSvcsone/log/vcsoneclientd_A.log.
- The VCS WebSphere MQ FTE resource log file is /var/VRTSvcs/log/WebSphereMQFTE_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 FTE agent 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.

Note: For ACC library versions 5.1.1.0 and later, the TRACE level logs for any ACCLib based agent are generated locally at the location /var/VRTSvcs/log/WebSphereMQFTE_A.log.

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

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

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

6 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

Sample Configurations

This appendix includes the following topics:

- About sample configurations for the agent for WebSphere MQ FTE
- Sample agent type definition for WebSphere MQ FTE
- Sample configuration in a VCS environment
- Sample service group configurations

About sample configurations for the agent for WebSphere MQ FTE

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 FTE. For more information about these resource types, see the *Veritas Cluster Server Bundled Agents Reference Guide*.

Sample agent type definition for WebSphere MQ FTE

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 WebSphereMQFTETypes.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 WebSphereMQFTE
```

```
(
    static str ArgList[] =  { ResLogLevel, State, IState, FTEAgentName,
                              CoordinationQM, AgentQM, HomeDir,DataDir,
                              FTEUser, EnvFile, MonitorProgram,
                              SecondLevelMonitor }
    str ResLogLevel     = INFO
    str FTEAgentName
    str CoordinationQM
    str AgentQM
    str HomeDir            =  "/opt/IBM/WMQFTE"
    str DataDir              =  "/var/IBM/WMQFTE"
    str FTEUser
    str EnvFile
    str MonitorProgram
    int SecondLevelMonitor = 0

)
```

For VCS 5.x

```
type WebSphere MQFTE
(
    static str AgentFile  = "/opt/VRTSvcs/bin/Script50Agent"
    static str AgentDirectory =
    "/opt/VRTSagents/ha/bin/WebSphereMQFTE"
    static str ArgList[] =  { ResLogLevel, State, IState, FTEAgentName,
                              CoordinationQM, AgentQM, HomeDir,DataDir,
                              FTEUser, EnvFile, MonitorProgram,
                              SecondLevelMonitor }
    str ResLogLevel = INFO
    str FTEAgentName
    str CoordinationQM
    str AgentQM
    str HomeDir  =  "/opt/IBM/WMQFTE"
    str DataDir    =  "/var/IBM/WMQFTE"
    str FTEUser
    str EnvFile
    str MonitorProgram
    int SecondLevelMonitor = 0

)
```

VCS One

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

Sample configuration in a VCS environment

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

```
group WMQFTE_Sol_GRP (
      SystemList = { system_A = 0, System_B = 1 }
 )
DiskGroup DG_WMQFTE (
       DiskGroup = WMQFTE_DG
)
Mount Mount_WMQFTE (
      MountPoint = "/opt/IBM/WMQFTE"
      BlockDevice = "/dev/vx/dsk/WMQFTE/MQFTE_VOL"
      FSType = vxfs
      FsckOpt = "-y"
)
Volume Volume_WMQFTE (
       Volume =MQFTE_VOL
       DiskGroup = WMQFTE_DG
)
 WebSphereMQFTE WMQFTE_Agent01_Res (
                Critical = 1
                FTEAgentName = AGENT1
                CoordinationQM = QM1
                AgentQM = QM1
                FTEUser = mqm
       HomeDir = "/opt/IBM/WMQFTE"
       DataDir = "/var/IBM/WMQFTE"
                )
Mount_WMQFTE requires Volume_WMQFTE
Volum_WMQFTE requires DG_WMQFTE
WMQFTE_Agent01_Res requires Mount_WMQFTE
requires group WMQ_QueueManager_GRP online global soft

// resource dependency tree
//  group WMQFTE_Sol_GRP
```

```
//  {
//       WebSphereMQFTE  WMQFTE_Agent01_Res
//        {
//              Mount Mount_WMQFTE
//   {
//          Volume Volume_WMQFTE
//          {
//       DiskGroup DG_WMQFTE
//           }
//    }
//        }
//  }
group WMQ_QueueManager_GRP (
SystemList = { system_A = 0, System_B = 1 }
 )
Application res_listener (
Critical = 0
User = mqm
StartProgram = "/opt/mqm/bin/runmqlsr -r -m QM1 -t TCP -p 1415 &"
StopProgram = "/opt/mqm/bin/endmqlsr  -m QM1"
MonitorProcesses = { "/opt/mqm/bin/runmqlsr -r -m QM1 -t TCP -p 1415" }
)

         WebSphereMQ6 mq_res (
                Critical = 0
                QueueManager = QM1
                MQVer = "7.0"
          )
DiskGroup DG_WMQ (
DiskGroup = WMQ_DG
)
Mount Mount_WMQ (
MountPoint = "/opt/IBM/WMQ"
BlockDevice = "/dev/vx/dsk/WMQ/MQ_VOL"
FSType = vxfs
FsckOpt = "-y"
)
Volume Volume_WMQ (
Volume =MQ_VOL
DiskGroup = WMQ_DG
)

        Mount_WMQ requires Volume_WMQ
```

```
 Volum_WMQ requires DG_WMQ
mq_Res requires Mount_WMQ
 mq_res requires res_listener
```

Sample service group configurations

Figure A-1 and Figure A-2 represent a sample service group that shows WebSphere MQ FTE agent resources.

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

Figure A-1 Sample Service group configuration

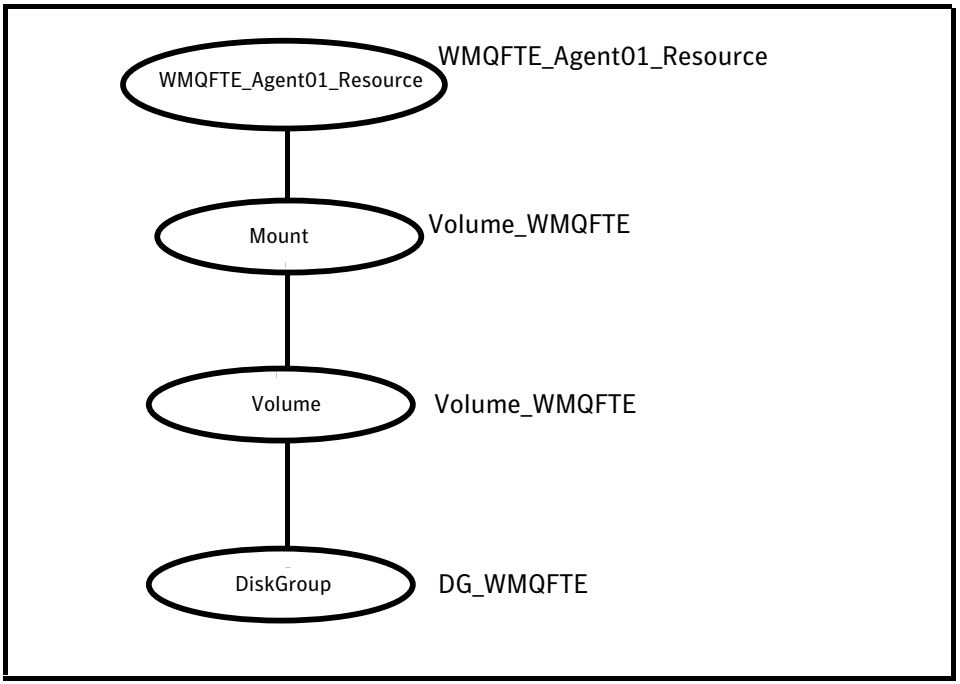


Figure A-2 Sample service group configuration in properties view



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