Symantec™ ApplicationHA agent for SQL Server 2008 and 2008 R2 Configuration Guide

Windows on Hyper-V

6.1

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Symantec™ ApplicationHA agent for SQL Server 2008 and 2008 R2 Configuration Guide

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Contents

Introducing ApplicationHA agents

This chapter includes the following topics:

About ApplicationHA agents

Agents are application-specific modules that plug into the ApplicationHA framework that manages the components of the configured applications.

The agents are installed when you install ApplicationHA. These agents start, stop, and monitor the components of the configured applications and report its state changes. If an application or its components fail, these agents restart the applications and its components on the virtual machine.

A virtual machine has one agent per component that monitors all the components of that type. For example, a single GenericService agent manages all services that are configured using the GenericService components. When the agent starts, it obtains the necessary configuration information from these components and then monitors the configured applications. The agents then periodically updates ApplicationHA with the component and application status.

Agents perform the following operations:

- Brings the components online

- Takes the components offline

- Monitors the components and reports the state changes

ApplicationHA agents are classified in the following categories:

- Infrastructure agents (bundled agents)
  Infrastructure agents are packaged (bundled) with the base software and include agents for mount points, generic services and processes. These agents are immediately available for use after you install ApplicationHA.

- Application agents
  Application agents are used to monitor third party applications such as Microsoft SQL Server, Microsoft Exchange and so on. These agents are packaged separately and are available in the form of an agent pack that gets installed when you install ApplicationHA.
  The agent pack is released on a quarterly basis. The agent pack includes support for new applications as well as fixes and enhancements to existing agents. You can install the agent pack on an existing ApplicationHA installation.
  Refer to the Symantec Operations Readiness Tools (SORT) Website for information on the latest agent pack availability:
  https://sort.symantec.com

This document describes the ApplicationHA bundled agents along with their resource type definitions, attribute definitions, and sample configurations.

About intelligent monitoring framework

ApplicationHA provides Intelligent Monitoring Framework (IMF) to determine the status of the configured application and its components. IMF employs an event-based monitoring framework that is implemented using custom as well as native operating system-based notification mechanisms.

IMF provides instantaneous state change notifications. ApplicationHA agents detect this state change and then trigger the necessary actions.

IMF provides the following key benefits:

- Instantaneous notification
  Faster fault detection resulting in faster fail over and thus less application down time.

- Ability to monitor large number of components
  With reduced CPU consumption, IMF effectively monitors a large number of components.

- Reduction in system resource utilization

Reduced CPU utilization by ApplicationHA agent processes when number of components being monitored is high. This provides significant performance benefits in terms of system resource utilization.

About the agent functions and attributes

Every agent has a collection of attributes and performs a definite set of functions.

Attributes are the set of variables whose values configures the corresponding application component to function in a specific way. By modifying attribute values you can change the way in which ApplicationHA agent manages the component.

For example, the IP agent monitors an IP address. The specific address to be monitored is identified by the attribute "Address" whose value is the specific IP address.

Depending on the category to which an agent belongs, an agent performs either or all of the following functions:

Online	Brings the configured component online
Offline	Takes the configured component offline
Monitor	Verifies if the configured component is online

As part of the Monitor function, an agent reports the following states:

ONLINE	Indicates that the configured component is online
OFFLINE	Indicates that the configured component/application has faulted
UNKNOWN	Indicates that the agent encountered errors while monitoring the configured component

About the ApplicationHA agents for SQL Server 2008

The Symantec ApplicationHA agents for Microsoft SQL Server 2008 provide monitoring support for the following application SQL Server versions:

- SQL Server 2008 (including SP3)
- SQL Server 2008 R2 (including SP2)

The agents monitor the SQL Server databases and the associated services on the virtual machine.

The SQL Server 2008 agents include the following:

- SQL Server 2008 Database Engine agent
  Provides monitoring for SQL Server Database Engine service. The agent
  monitors the status of the service and if the service is not running, the agent
  declares the service resource as offline.
  About the ApplicationHA agent for SQL Server 2008 Database Engine

- SQL Server 2008 FILESTREAM agent
  Provides monitoring for SQL Server FILESTREAM component. The agent
  monitors the Windows FILESTREAM configuration settings for the SQL Server
  instance.
  About the ApplicationHA agent for FILESTREAM agent

About the ApplicationHA agent for SQL Server 2008 Database Engine

The Symantec ApplicationHA SQL Server 2008 Database Engine agent monitors
the Database Engine service. The agent brings the service online, monitors the
status, and takes it offline. If the service is not running, the agent declares the state
as offline.

If detail monitoring is configured, the agent checks the health of critical SQL
databases or executes a monitoring script. If detail monitoring is successful, the
agent declares the application as available.

This agent is represented by the SQLServer2008 resource type.

Agent functions

Online	Brings the SQL Server 2008 service online.
Offline	Takes the SQL Server 2008 service offline.
Monitor	Queries the Service Control Manager (SCM) for the status of SQL Server 2008 services. Also, if detail monitoring is configured, the agent performs a database health check depending on the configuration.
Clean	Forcibly stops the SQL Server service.

Resource type definition

```
type SQLServer2008 (
static int IMF{} = { Mode=3, MonitorFreq=5, RegisterRetryLimit=3 }
static i18nstr ArgList[] = { Instance,
"LanmanResName:VirtualName",SQLOnlineTimeout,
SQLOfflineTimeout, DetailMonitorInterval,
SQLDetailMonitorTimeout, Username, Domain, Password, DBList,
SQLFile, FaultOnDMFailure, "LanmanResName:IPResName",
```

```
SQLClusterAccount }
str Instance
str LanmanResName
int SQLOnlineTimeout = 90
int SQLOfflineTimeout = 90
int DetailMonitorInterval
int SQLDetailMonitorTimeout = 30
i18nstr Username
i18nstr Domain
str Password
i18nstr DBList[]
i18nstr SQLFile
boolean FaultOnDMFailure = 1
str SQLClusterAccount
)
```

Agent attributes

Table 1-1 describes the SQL Server 2008 Database Engine required attributes.

Table 1-1   SQL Server 2008 Database Engine required attributes

Attributes	Description
Instance	Name of the SQL Server instance to monitor.
	If the attribute is blank the agent monitors the default instance (MSSQLSERVER).
	Type and dimension: string-scalar
LanmanResName	This attribute is not applicable for Symantec ApplicationHA.
SQLOnlineTimeout	Number of seconds that can elapse before the agent online function aborts.
	Default = 90
	Type and dimension: integer-scalar
SQLOfflineTimeout	Number of seconds that can elapse before the agent offline function aborts.
	Default = 90
	Type and dimension: integer-scalar

Table 1-2 describes the SQL Server 2008 Database Engine optional attributes.

Table 1-2   SQL Server 2008 Database Engine optional attributes

Attributes	Description
DetailMonitorInterval	Defines whether the agent performs detail monitoring of SQL Server.
	The default value 0 means that the agent does not monitor SQL Server in detail.
	A non-zero value indicates the number of online monitor cycles that the agent must wait before performing detail monitoring. Symantec recommends that you set this value to between 1 and 12.
	The numeric value specifies how often the monitoring check must run. 1 means, run a detail check every single monitor interval, 2 means run the detail check every second monitor interval. This interpretation may be extended to other values.
	If this attribute is set to a non-zero value, then the following attributes must be assigned appropriate values:
	■ For script-based monitoring: SQLFile, Username, Password, Domain, and SQLDetailMonitorTimeOut ■ For databases list based monitoring: DBList
	Default: 5
	Type and dimension: integer-scalar
FaultOnDMFailure	Defines whether the agent faults the SQL Server resource if the detail monitoring fails.
	If the value is set to True, the agent faults the configured SQL Server resource if detail monitoring fails. In such a case, the SQL Server resource may go into offline state.
	If the value is set to False, the agent does not fault the SQL Server resource if detail monitoring fails. In such a case, the SQL Server resource may go into the unknown state.
	Note: The value set gets operational only after the SQL Server resource under consideration comes online.
	Default = True
	Type and dimension: boolean
SQLDetailMonitor Timeout	Number of seconds that can elapse before script-based detail monitor routine aborts.
	Default = 30
	Type and dimension: integer-scalar

Table 1-2   SQL Server 2008 Database Engine optional attributes *(continued)*

Attributes	Description
Username	The user account in whose context the script-based detail monitoring is performed. The agent uses this account context to run the SQL script for detail monitoring.
	This attribute must not be null if DetailMonitorInterval attribute is set to a non-zero value and script-based detail monitoring is configured.
	Note: This attribute can take localized values.
	Type and dimension: string-scalar
Domain	Domain of the user account specified in the Username attribute.
	Note: This attribute can take localized values.
	Type and dimension: string-scalar
Password	Password for the user account specified in the Username attribute.
	Type and dimension: string-scalar
SQLFile	The location of the SQL file executed during a monitor cycle. This attribute must not be null if script-based detail monitoring is configured and the DetailMonitorInterval attribute is set to a non-zero value.
	This attribute is related only to script-based Detail Monitoring. This attribute can be null if DBList based detail monitoring is configured.
	Note that if both script-based (SQLFile attribute) and databases list based (DBList attribute) detail monitoring are configured, then the DBList attribute takes precedence. The agent performs databases list based (DBList attribute) detail monitoring.
	Note: This attribute can take localized values.
	Type and dimension: string-scalar
DBList	List of databases for which the agent will perform detail monitoring.
	Note that if both script-based (SQLFile attribute) and databases list based (DBList attribute) detail monitoring are configured, then the DBList attribute takes precedence. The agent performs databases list based (DBList attribute) detail monitoring.
	Note: This attribute can take localized values.
	Type and dimension: string-vector

Table 1-2   SQL Server 2008 Database Engine optional attributes *(continued)*

Attributes	Description
SQLClusterAccount	This attribute is not applicable for Symantec ApplicationHA.

About the ApplicationHA agent for FILESTREAM agent

The Symantec ApplicationHA agent for SQL Server 2008 FILESTREAM enables FILESTREAM for the specified SQL Server instance, monitors its status, and disables it.

FILESTREAM in SQL Server enables SQL Server-based applications to store unstructured data, such as documents and images, on the file system.

This agent is represented by the FILESTREEAM resource type.

Agent functions

Online	Enables FILESTREAM on the system.
Offline	Disables FILESTREAM on the system.
Monitor	Monitors FILESTREAM status on the system. If the agent is unable to query the status of FILESTREAM or if FILESTREAM is disabled on the system, the FILESTREAM resource in the service group faults.
Clean	Forcibly stops the configured FILESTREAM services.

Resource type definition

```
type SQLFilestream (
static i18nstr ArgList[] = { InstanceName }
i18nstr InstanceName
)
```

Agent attributes

Table 1-3 describes the SQL Server 2008 FILESTREAM required attribute.

Table 1-3   SQL Server 2008 FILESTREAM required attribute

Attribute	Description
InstanceName	Name of the SQL Server instance to which the FILESTREAM is bound. If the attribute is blank the agent monitors the default instance (MSSQLSERVER).

How ApplicationHA agents monitor SQL Server 2008 and 2008 R2

The SQL Server 2008 agents monitor the configured resources, determine the status of these resources, bring them online, and take them offline. The agents detect an application failure if the configured SQL Server instance or associated services become unavailable. The agents try to start the application services for a configurable number of attempts. If the application services fail to start, the agents consider this as an application failure and report the "Application critical state" to the Hyper-V host.

Depending on the configuration, the Hyper-V host then restarts the virtual machine. After the virtual machine restarts, the agent starts the configured Web sites and the associated application pools and brings the configured resources online on the system.

The agent provides the following levels of monitoring support:

- Basic monitoring
  In the basic level monitoring, the agent monitors and determines if the configured resources are online and the corresponding SQL Server instance and associated services are running.

- Detail monitoring
  In detail monitoring, the agent runs a user defined SQL script or connects to the database to verify the status of SQL instances. It detects an application failure if the monitoring routine reports an improper function of the SQL instance processes.
  Following exit codes highlight if the database is up and functional:

Exit code	Status
0	Online
Any other	Depending on the FaultOnDMFailure attribute value set, the resource may go into Offline or Unknown state.
	If the value is set to True, the SQL Server resource may go into offline state.
	If the value is set to False, the SQL Server resource may go into the unknown state.

Configuring application monitoring

This chapter includes the following topics:

- Considerations for configuring application monitoring
- Configuring application monitoring

Considerations for configuring application monitoring

Symantec ApplicationHA provides an interface, Symantec ApplicationHA Health View, to configure and administer application monitoring.

A shortcut to access the Health View is created on the system's desktop after you install ApplicationHA. The Health View is Web-based and can be accessed using any of the available browser.

You can also access the Health View directly from a browser window using the following URL:

https://*VMNameorIP*:5634/vcs/admin/application_health.html?priv=ADMIN

Consider the following before you configure application monitoring:

- You can configure application monitoring on a virtual machine using the Symantec ApplicationHA Configuration Wizard. The wizard is launched when you click **Configure Application Monitoring** on the Symantec ApplicationHA Health View.

- You can use the wizard to configure monitoring for only one application per virtual machine.
  To configure application monitoring on the same virtual machine, for any additional applications, you must use the VCS commands.

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

- The wizard runs in a logged-on user context. You must thus ensure that the logged-on user has administrative privileges on the virtual machine where you want to configure application monitoring.

- If you have configured a firewall, ensure that your firewall settings allow access to ports used by Symantec ApplicationHA installer, wizard, and services.
  For information about the ports used, refer to the *Symantec ApplicationHA Deployment Guide*.

- If the application data is stored on nested mount points, then it is required to set the dependency between these mount points. This enables ApplicationHA to monitor all the nested mount points.
  To define the dependency between the nested mount points, you must set the value for MountDependsOn attribute of the MountMonitor agent. The value of this attribute must be specified as a key-value pair.
  Where,
  Key= mount path
  Value= volume name

- After configuring SQL Server 2008 for monitoring, if you create another database or service, then these new components are not monitored as part of the existing configuration.
  In this case, you can either use the VCS commands to add the components to the configuration or unconfigure the existing configuration and then run the wizard again to configure all the components.

  Note: When you configure or unconfigure application monitoring, it does not affect the state of the application. The application runs unaffected on the virtual machine.

- Verify that you have installed SQL Server and the associated components (FILESTREAM, SQL Server Agent, Analysis Service) that you want to monitor on the virtual machine.

- Verify that the SQL Server instances that you want to configure for monitoring are running.

- Symantec ApplicationHA does not support application monitoring for SQL Server 2008 and SQL Server 2008 R2 on the same virtual machine simultaneously.

Configuring application monitoring

Perform the following steps to configure monitoring for SQL Server 2008 and 2008 R2 on a virtual machine using the Symantec ApplicationHA Configuration Wizard.

Note: You can configure monitoring for multiple services and processes in a single wizard workflow. However, you cannot configure multiple applications simultaneously. To configure another application, run the wizard again.

To configure application monitoring for SQL Server 2008 and 2008 R2

1   Launch the Symantec ApplicationHA Health View, using the shortcut created or in a browser, using the following URL:

    https://*VMNameorIP*:5634/vcs/admin/ application_health.html?priv=ADMIN

2   Click **Configure Application Monitoring** to launch the Symantec ApplicationHA Configuration Wizard.

3   Review the information on the Welcome panel and then click **Next**.

4   On the Application Selection panel, click **Microsoft SQL Server 2008** in the Supported Applications list.

5   On the SQL Instance Selection panel, choose the SQL Server instances and the associated components that you want to monitor and then click **Next**.

Instances	Select the SQL Server instances to monitor.
SQL Agent Service	Select SQLAgentService to configure monitoring for SQL Server 2008 Agent service for the selected instance.
	You must select this for each selected SQL Server instance separately.
Analysis Service	Select Analysis Service to configure monitoring for SQL Server 2008 Analysis service for the selected instance.
	You must select this for each selected SQL Server instance separately.
FILESTREAM	The FILESTREAM check box cannot be selected.
	If FILESTREAM is enabled on the computer, this option is selected by default.

6   To enable detail monitoring for the selected instances and associated services, select **Configure detail monitoring** and provide the following required details:

- Enter a non-zero value in the **Monitor after every... cycles** box. This value indicates the number of online monitor cycles that the agent must wait before performing detail monitoring.

  The numeric value specifies how often the monitoring check must run. 1 means, run a detail check every single monitor interval, 2 means run the detail check every second monitor interval. This interpretation may be extended to other values.

  Symantec recommends that you set this value between 1 and 12. The default value is 5.

- Select one of the following mode for detail monitoring:

  - Database monitoring
    Select this mode to enable detail monitoring by connecting to the database and choose the desired databases from the Databases list.

  - Script-based monitoring
    Select this mode to enable detail monitoring by using a user defined SQL script.

    Enter the following details, if you choose script-based monitoring as the mode for detail monitoring.

Script Path	Enter the script location on the virtual machine
User Name	Enter the valid user name
	Note: The user account must have rights to run the script and execute the SQL commands specified in the script.
Password	Enter the password for the user account

- Select **Restart the SQLinstance if detail monitoring fails** if you want the agent to detect an application failure in case detail monitoring has failed.

7 On the ApplicationHA Configuration panel, the wizard performs the application monitoring configuration tasks, creates the required resources, and enables the application heartbeat that communicates with Hyper-V host.

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

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

8 On the Finish panel, click **Finish** to complete the wizard.

This completes the application monitoring configuration.

Use the ApplicationHA Health View to monitor the application status and control application monitoring.

For more details refer to the *Symantec ApplicationHA Deployment Guide*.

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