Symantec™ ApplicationHA agent for Oracle Configuration Guide

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Chapter 1

Introducing ApplicationHA agents

This chapter includes the following topics:

- About ApplicationHA agents
- About intelligent monitoring framework
- About the agent functions and attributes
- About the ApplicationHA agents for Oracle
- How ApplicationHA agents monitor Oracle

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 application 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 agent then periodically updates ApplicationHA with the component and application status.

Agents perform the following operations:

- Bring the components online

- Take the components offline
- Monitor the components and report 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 Oracle

The Symantec ApplicationHA agents for Oracle monitor the Oracle database and listener services, bring them online, and take them offline.

The solution contains the following agents:

- The Oracle agent, which monitors the Oracle databases.
- The GenericService agent, which monitors the listener services.

Both agents work together to provide high availability for Oracle.

About Oracle agent

The Oracle agent monitors the databases. The agent brings the Oracle databases online, monitors their status, and takes them offline.

The Oracle agent is configured as a resource of type Oracle.

Oracle agent functions

Online	Starts the Oracle service
Offline	Stops the Oracle service, it also stops all the services that are dependent on the Oracle service.
Monitor	Verifies the status of Oracle services. The agent provides two levels of application monitoring as follows: ■ Basic monitoring The agent queries the Service Control Manager (SCM) to verify that Oracle services are continuously active. ■ Detail monitoring The agent runs a SQL script to verify the status of the database. It updates a temporary table in the Oracle database to verify the availability of the database.
Clean	Forcibly stops the Oracle database.
Info	Provides the static information and dynamic information about the state of the database.
Action	Performs the predefined actions on a resource.

About the Info function

The Info function provides static and dynamic information about the state of the database.

The function retrieves the following static information:

Version	InstanceNo
HostName	StartupTime
Parallel	Thread
InstanceRole	InstanceName

The entry point retrieves the following dynamic information:

InstanceStatus Logins

DatabaseStatus ShutdownPending

You can add additional attributes by adding SQL statements to the file

```
%VCS_HOME%\bin\Oracle\scripts\info\db_info.sql
```

Where, %VCS_HOME% typically expands to:

```
C:\Program Files\Veritas\Cluster Server
```

For example:

```
select 'static:HostName:'||host_name from v$instance;
```

```
select 'dynamic:ShutdownPending:'||shutdown_pending from v$instance;
```

The format of the selected record must be as follows:

```
attribute_type:userkey_name:userkey_value
```

The variable attribute_type can take the value static and/or dynamic.

About the Action function

The Action function enables you to perform predefined actions on a resource.

To perform an action on a resource, type the following command:

```
C:\> hares -action resource_name token [-actionargs arg1 ...] [-sys
system] [-clus cluster]
```

Table 1-1 includes the actions that the agent supports.

Table 1-1 Actions supported by Oracle agent

Token for Action	Description
DBRestrict	Changes the database session to enable the RESTRICTED mode.
DBUndoRestrict	Changes the database session to disable the RESTRICTED mode.
DBSuspend	Suspends a database.
DBResume	Resumes a suspended database.
DBQuiesce	Places the database into a quiesced state. **Note:** You must set the resource_manager_plan parameter and restart the database before quiescing a database.
DBUnQuiesce	Restores the database from a quiesced state to a normal operation state.

Oracle agent resource type definition

The following section describes the resource type definition of Oracle agent:

```
type Oracle
static int IMF{} = { Mode=3, MonitorFreq=5, RegisterRetryLimit=3 }
( static keylist SupportedActions = { DBRestrict, DBUndoRestrict,
DBResume, DBSuspend, DBQuiesce }
static i18nstr ArgList[] = { ServiceName, DelayAfterOnline,
DelayAfterOffline, DetailMonitor, IndepthMonitorCount, SID, Domain,
UserName, EncryptedPasswd, SQLFile, SQLTimeOut }
str ServiceName
int DelayAfterOnline = 20
int DelayAfterOffline = 20
boolean DetailMonitor = 0
int IndepthMonitorCount = 5
str SID
str Domain
str UserName
str EncryptedPasswd
str SQLFile
int SQLTimeOut = 20
)
```

Oracle agent attributes

Table 1-2 lists the required attributes of the Oracle agent.

Table 1-2 Oracle agent required attributes

Required Attribute	Definition
ServiceName	The name of the Oracle service that is set during the installation of Oracle. The service name is specified in the format OracleService*SID*, where SID represents the database. Type and dimension: string-scalar
Domain	The name of the domain or host to which the user belongs in whose context Oracle was installed. Type and dimension: string-scalar
SID	A system identifier that uniquely identifies the Oracle database to be monitored in detail. Type and dimension: string-scalar

Table 1-2 Oracle agent required attributes *(continued)*

Required Attribute	Definition
UserName	The name of the Windows domain user or local user who has Database Administrator privileges for Oracle. Type and dimension: string-scalar **Note:** The UserName attribute is used by the agent if detail monitoring is configured for the Oracle database.
EncryptedPasswd	The encrypted password for the user that is identified by UserName. The password must be encrypted with the VCSEncrypt utility. Type and dimension: string-scalar

Table 1-3 lists the optional attributes of the Oracle agent.

Table 1-3 Oracle agent optional attributes

Optional Attributes	Definition
DelayAfterOffline	Number of seconds the agent waits to start the monitoring routine after Oracle is taken offline. Default = 20 seconds Type and dimension: integer-scalar
DelayAfterOnline	Number of seconds the agent waits to start the monitoring routine after Oracle is brought online. Default = 20 seconds Type and dimension: integer-scalar
DetailMonitor	A flag that defines whether the agent monitors Oracle in detail by trying to verify access to the database by running a SQL script. The value 1 indicates that the agent monitors Oracle in detail. The value 0 indicates that the agent does not monitor Oracle in detail. Default = 0 If the DetailMonitor flag is set to 1, the following attributes must be defined: ■ SID ■ SQLFile Type and dimension: boolean-scalar

Table 1-3 Oracle agent optional attributes *(continued)*

Optional Attributes	Definition
IndepthMonitorCount	An integer that defines the monitor interval between two consecutive detail monitoring cycles. If this attribute is set to 5, the agent monitors the application in detail after every five monitor intervals. Default = 5 **Note:** Ensure that the value of this attribute is set to be greater than or equal to 1. Type and dimension: integer-scalar
SQLTimeOut	The number of seconds the agent waits for the SQL script to return a value during detail monitoring. If this limit exceeds, the resource is declared faulted. Default = 20 seconds Type and dimension: integer-scalar

SQLFile	The name of SQL script to be used for detail monitoring, along with its complete path. The agent verifies the existence of this file.
	A sample file, check.sql, is located at %VCS_HOME%\bin\Oracle\
	Where, %VCS_HOME% typically expands to
	`C:\Program Files\Veritas\cluster server`
	The sample file contents are:
	`select * from v$database;`
	Do not include any spool commands within the SQL script.
	If an Oracle error occurs during execution, the error is logged in the agent log. If debug logging is also enabled for the resource, the output of the SQL script is also logged in the agent log.
	Type and dimension:string-scalar

About the GenericService agent

The GenericService agent monitors the listener services. The agent controls the listener for the database. The listener is a server process that listens to incoming client connection requests and manages traffic to the database.

The GenericService agent brings the listener services online, takes them offline, and monitors their status.

The GenericService agent is configured as resource of type GenericService.

For more information about the GenericService agent, see the *Symantec™ ApplicationHA Bundled Agents Guide*.

How ApplicationHA agents monitor Oracle

In the basic monitoring mode, the Oracle agent for Oracle database detects a failure if the database is not running and the GenericService agent detects a failure if a listener service is not running. In the detail monitoring mode, the agents detect failure if a preconfigured SQL script cannot execute or access the database or if the listener service is not running.

The detail monitoring interval can be defined using the IndepthMonitorCount attribute.

If a database or listener service fails, a configurable number of attempts are made to restart it on the virtual machine. If it does not start, the virtual machine itself can be restarted by VMware HA, depending on the configuration settings.

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.

Chapter 2

Configuring application monitoring

This chapter includes the following topics:

- Supported Oracle versions
- Considerations for configuring application monitoring
- Configuring application monitoring

Supported Oracle versions

ApplicationHA supports the following Oracle versions:

Note: Only 64-bit Oracle installation is supported.

- Oracle 10g Release 2 (10.2.0.5.0)
- Oracle 11g Release 2 (11.2.0.1.0, 11.2.0.2.0)
- Oracle 12c

For the latest information on the supported versions, refer to the software compatibility list at the following location:

http://www.symantec.com/docs/TECH209010

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 a 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:

- Configure "Virtual Machine" role, on the virtual machines where you plan to configure application monitoring.
- Ensure that the "Integration Services" role is enabled on all the virtual machines where you plan to configure application monitoring.
- In case of virtual machines running Windows Server 2008 R2, upgrade the Integration Service.
- 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.
  www.symantec.com/docs/TECH159846
- 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.
- 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

- 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.

- After configuring Oracle for monitoring, if you create another Oracle database or listener service, these new components are not monitored as part of the existing configuration. In such a case, you must first unconfigure the existing monitoring configuration and then reconfigure the application using the wizard. You can then select all the databases for monitoring.

Configuring application monitoring

Perform the following steps to configure monitoring for Oracle 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 Oracle

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

   Note: *VMNameorIP* refers to the Host name or IP address of the virtual machine.

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 **Oracle** in the Supported Applications list.

   Ensure that the Oracle databases and the associated listener services are running.

5 On the Oracle Database Selection panel, choose the Oracle database that you want to monitor.

Note: On selecting Database SID, all the listed databases are selected. Enter the details for each database individually.

Enter the following details and then click **Configure**:

Domain or Host Name	The name of the domain or host to which the user belongs in whose context Oracle was installed.
User Name	The name of the domain user or local user who has Database Administrator privileges for Oracle.
Password	Enter the password for the user account.

Note: These user details are used by the agent if detail monitoring is configured for the Oracle database.

To enable script-based detail monitoring for the selected database using the Configuration Wizard, select **Enable detail monitoring** and provide the following required details:

Script Path	Enter the SQL script location on the virtual machine.
Monitor after every ... cycles	Enter a non-zero value. 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. For example, to run a detail check every single monitor interval, enter the numeric value 1. To run the detail check every second monitor interval, enter the numeric value 2. This interpretation may be extended to other values. Symantec recommends that you set this value between 1 and 12. The default value is 5.

6 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.

7 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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