

Symantec™ ApplicationHA Installation and Configuration Guide

Linux

5.1

Symantec™ ApplicationHA Installation and Configuration Guide

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Product version: 5.1

Document version: 5.1.1

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Introducing Symantec ApplicationHA

This chapter includes the following topics:

- [What is Symantec ApplicationHA?](#)
- [What kind of applications can I monitor?](#)
- [Components of Symantec ApplicationHA](#)
- [Symantec ApplicationHA user privileges](#)
- [About installing the Symantec ApplicationHA agents](#)
- [About Symantec ApplicationHA licensing](#)

What is Symantec ApplicationHA?

Symantec ApplicationHA provides monitoring capabilities for applications running inside virtual machines hosted on ESX or ESXi hosts managed by a VMware vCenter Server. Symantec ApplicationHA adds a layer of application awareness to the core High Availability functionality offered by VMware virtualization technology.

Symantec ApplicationHA is based on Veritas™ Cluster Server (VCS) and internally uses similar concepts such as agents, resources, and service groups. However, it does not include the high availability cluster components such as the Global Atomic Broadcast (GAB) and Low Latency Transport (LLT). Symantec ApplicationHA has a lightweight server footprint that allows faster installation and configuration.

Key benefits include:

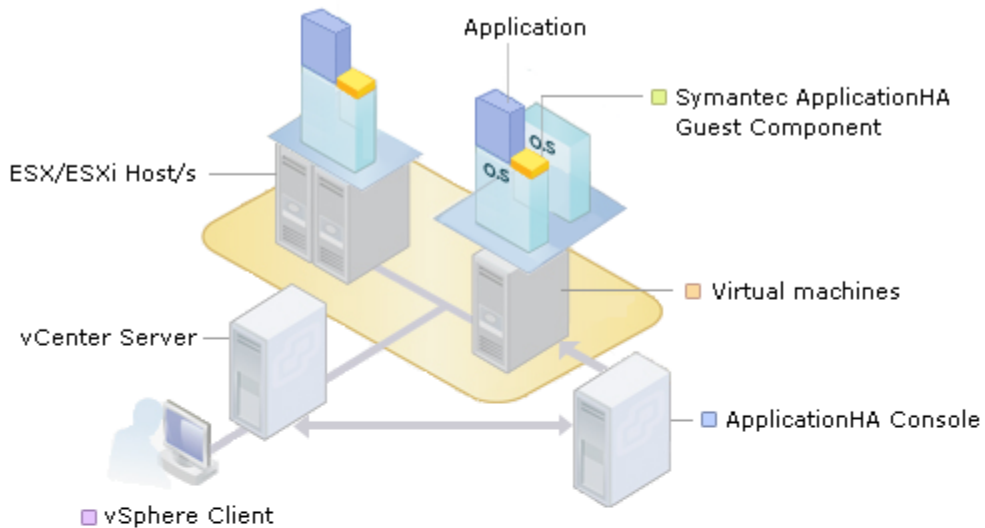
- Out of box integration with VMwareHA and VMware vCenter Server.

- Full visibility and control over applications with the ability to start, stop, and monitor applications running inside virtual machines
- Standardized way to manage applications using a single interface that is integrated with VMware vSphere Client
- Specialized Application Maintenance mode, in which ApplicationHA allows you to intentionally take an application out of its purview for maintenance or troubleshooting

How Symantec ApplicationHA works with VMware HA and vCenter Server

Symantec ApplicationHA communicates directly with VMware HA. Symantec ApplicationHA conveys the application health status in the form of an application heartbeat. This allows VMware HA to automatically reset or restart a virtual machine if the application heartbeat is not received within a specified interval.

The following figure displays the sample deployment of Symantec ApplicationHA



- **Symantec ApplicationHA Guest Component**
 - Include Heartbeat components integrated with VMware HA
 - Include other components for monitoring application status

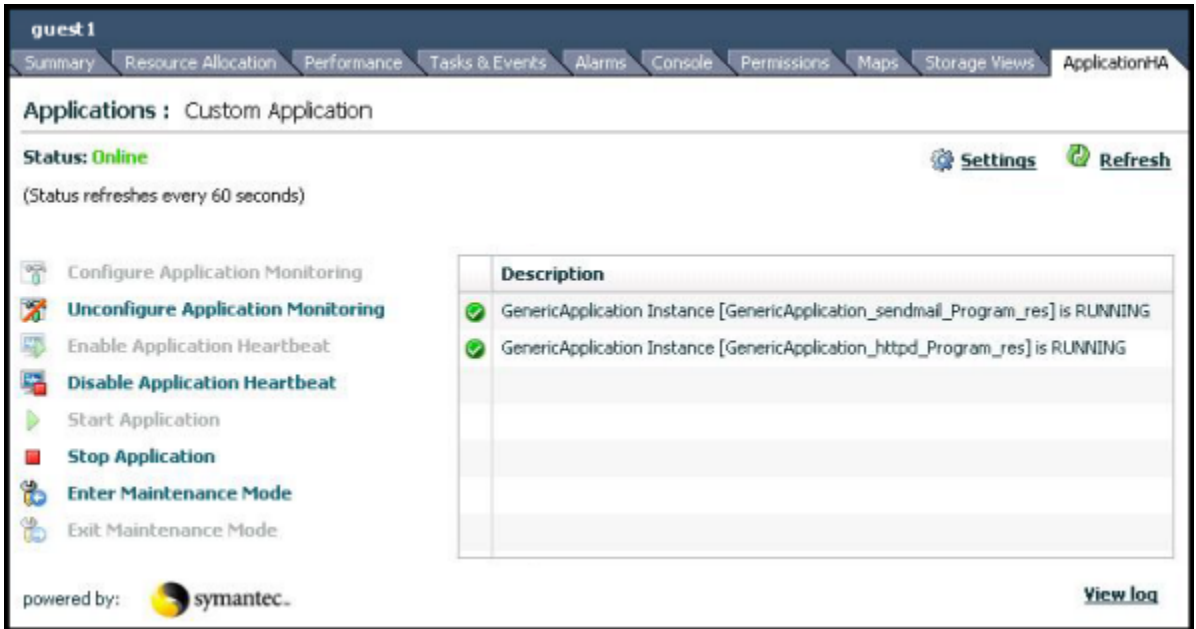
- **Virtual machines**
 - Running Windows OS or Linux OS

- **ApplicationHA Console**
 - Integrates with vSphere Client
 - Has vCentre privileges to provide discretionary access control (DAC)
 - Offers single sign-on to virtual machines under ApplicationHA control
 - Can be installed on a virtual machine or a physical machine

- **vSphere Client**
 - Integrates with Symantec ApplicationHA View

Symantec ApplicationHA provides a vCenter plug-in for configuring application monitoring and administering the configured applications. A new tab named ApplicationHA appears in the vSphere Client after you install the ApplicationHA Console. The ApplicationHA tab is the primary interface for performing the application monitoring operations on a virtual machine.

The following figure displays the ApplicationHA tab.



From this view you configure application monitoring and then monitor and control the configured application on the virtual machine. After configuring application monitoring, the Symantec ApplicationHA view displays the state of the application.

How Symantec ApplicationHA detects application failures

Symantec ApplicationHA architecture uses the agent framework to monitor the state of the applications and their dependent components running on the virtual machines. To monitor the overall health and detect failure of an application, Symantec ApplicationHA issues certain commands, tests, or scripts. The Symantec ApplicationHA agents ensure that the configured applications are running on the virtual machine. For more details, see the agent functions section of the application-specific agent guides or the generic agent guide distributed with ApplicationHA.

The ApplicationHA Heartbeat agent is configured when you configure application monitoring. The Heartbeat agent sends the application heartbeat to VMware High Availability. Symantec ApplicationHA uses the application heartbeat as the communication medium to convey the status of the application to VMware HA.

If an application fails, the agents attempt to restart the application for a configurable number of times. If the agents are unable to start the application, Symantec ApplicationHA stops sending the application heartbeat to VMware HA.

Depending on the configuration, VMware HA takes the necessary corrective action. VMware HA can restart the virtual machines.

After the virtual machine is restarted, Symantec ApplicationHA agents attempt to start the application components in a predefined order.

For more details about configuring the number of application restart attempts, See “[Administering application monitoring settings](#)” on page 48.

What kind of applications can I monitor?

Symantec ApplicationHA has out of box support for applications such as Oracle Database, SAP, and WebLogic Server on Linux. For more information on these, see the application-specific agent installation and configuration guides.

However, Symantec ApplicationHA also supports applications that meet the following guidelines:

- **Defined start, stop, and monitor procedures**

The application to be monitored must have defined procedures for starting, stopping, and monitoring.

You can write your own scripts for the start/stop/monitor operations. For more information on writing custom scripts, see the VCS Agent Developer’s Guide.

Start procedure The application must have a command to start it and all the dependent components and resources it may require.

Symantec ApplicationHA brings up the required resources in a specific order, then brings up the application using the defined start procedure.

Stop procedure The application must have a command to stop it and all the dependent components and resources.

Symantec ApplicationHA stops the required resources in a specific order, then stops the application using the defined stop procedure.

Monitor procedure

The application must have a monitor procedure that determines if the specified application instance is healthy. The application must allow individual monitoring of unique instances. For example, in a database environment, the monitoring application can connect to the database server and perform SQL commands to verify read and write access to the database.

The closer a test comes to matching what a user does, the better the test is in discovering problems. You should balance the level of monitoring between ensuring that the application is up and minimizing monitor overhead.

- Ability to restart the application in a known state

When the application is stopped, it must close out all tasks, store data properly, and then exit. When Symantec ApplicationHA attempts to restart the application, it should be able to start from the last known state. In case of a server crash, the application must be able to recover gracefully.

Commercial databases such as SQL Server and Oracle are good examples of well-written, crash-tolerant applications. On any client request, the client is responsible for holding the request until it receives acknowledgement from the server. When the server receives a request, it is placed in a special redo log file. The database confirms that the data is saved before it sends an acknowledgement to the client.

After a server crashes, the database recovers to the last-known committed state by mounting the data tables and applying the redo logs. This returns the database to the time of the crash. The client resubmits any outstanding client requests that are unacknowledged by the server, and all others are contained in the redo logs.

Components of Symantec ApplicationHA

Symantec ApplicationHA consists of the following components in a VMware virtualization environment:

- [Symantec ApplicationHA Console](#)
- [Symantec ApplicationHA guest components for virtual machines](#)

Note: The component Symantec ApplicationHA Console is supported only on Windows. For information on installation and configuration of these components, see the *Symantec ApplicationHA Installation and Configuration Guide* for Windows.

Symantec ApplicationHA Console

The ApplicationHA Console is installed on a virtual or a physical machine.

The ApplicationHA Console performs the following functions:

- As part of the Console installation, the install program registers the ApplicationHA plugin for VMware vCenter Server. The plugin enables ApplicationHA integration with VMware vSphere Client. The plugin adds the ApplicationHA tab to the VMware vSphere Client.
This plugin is required to view the ApplicationHA tab in the vSphere Client. You can use the ApplicationHA tab to configure application monitoring, control application start and stop, and monitor the application status on a virtual machine.
- The ApplicationHA Console provides a single sign-on mechanism so that an authenticated vCenter user does not have to provide the virtual machine user credentials to configure and control application monitoring. The user also does not have to log on each time to connect to the virtual machine from the vSphere Client.
For security reasons, the Console requires the virtual machine administrator account for establishing a trust relationship. It uses the administrator credentials to set up a permanent account that is used for performing various application monitoring operations on the virtual machine.
- The Console uses Symantec ApplicationHA Authentication service to provide secure communication between the virtual machine and the vSphere Client. It uses digital certificates for authentication and uses SSL to encrypt communications. ApplicationHA uses platform-based authentication; it does not store user passwords.
- The Console adds the ApplicationHA privileges to the vSphere Client environment. You can use the privileges to configure access control for vCenter Server users and groups.

Symantec ApplicationHA guest components for virtual machines

The Symantec ApplicationHA guest components are installed separately on the virtual machines where you wish to monitor applications. The guest components include the configuration wizard and the ApplicationHA agents that are used for configuring and monitoring applications. The guest components also include the Veritas Storage Foundation Messaging Service (xpirtld). This service communicates the application monitoring status on the virtual machine and displays it in the ApplicationHA tab.

Symantec ApplicationHA user privileges

[Table 1-1](#) lists the user privilege levels for Symantec ApplicationHA operations.

Table 1-1 Symantec ApplicationHA user privileges for operations

Operations	Guest	Operator	Admin
Configure Application Monitoring			Y
Unconfigure Application Monitoring			Y
Enable Application Heartbeat		Y	Y
Disable Application Heartbeat		Y	Y
Start Application		Y	Y
Stop Application		Y	Y
Enter Maintenance Mode		Y	Y
Exit Maintenance Mode		Y	Y
View Application Status in the ApplicationHA tab	Y	Y	Y

Note: If you do not assign any privilege to a user, then the user will not be able to view any details in the ApplicationHA tab.

To view the Application health status in the ApplicationHA tab of the vSphere client, you must assign at least Guest privileges to the user.

[Table 1-2](#) lists the user privilege levels for Symantec ApplicationHA settings.

Table 1-2 Symantec ApplicationHA user privileges for settings

Settings	Guest	Operator	Admin
App.RestartAttempts		Y	Y
App.ShutdownGraceTime		Y	Y
App.StartStopTimeout		Y	Y

These privileges are available after you install the ApplicationHA Console. You must assign these privileges to the vCenter Server users, groups, or roles that are available in the vSphere environment. Application monitoring operations are enabled or restricted depending on the privileges that are assigned to the vCenter

user account with which you log on. For example, the Admin privilege is required for configuring application monitoring on a virtual machine. vCenter Server administrators can use these privileges to configure access control for vCenter Server users.

About installing the Symantec ApplicationHA agents

In addition to the agents that are bundled with the product, Symantec ApplicationHA provides agents for monitoring key enterprise applications. These agents start, stop, and monitor the corresponding resources configured for the applications and report state changes. These agents are available in the form of an agent pack. In addition to the agents provided with Symantec ApplicationHA base package, the Agent Pack media will contain newly added agents to support other applications.

About Symantec ApplicationHA licensing

A software license is a legal instrument governing the usage or redistribution of copyright protected software. The administrator and company representatives must ensure that a server or cluster is entitled to the license level for the products installed. Symantec reserves the right to ensure entitlement and compliance through auditing.

If you encounter problems while licensing this product, visit the Symantec licensing support website.

The ApplicationHA install program prompts you to select one of the following licensing methods:

- Install a license key for the product and features that you want to install. When you purchase a Symantec product, you receive a License Key certificate. The certificate specifies the product keys and the number of product licenses purchased.
- Continue to install without a license key.
The install program prompts for the product modes and options that you want to install, and then sets the required product level. Within two months of choosing this option, you must install a valid license key corresponding to the license level entitled. If you do not comply with the above, continuing to use the product is a violation of your end user license agreement, and results in warning messages.

Planning to install Symantec ApplicationHA

This chapter includes the following topics:

- [Before installing Symantec ApplicationHA](#)
- [Symantec ApplicationHA installation methods for guest components](#)

Before installing Symantec ApplicationHA

You can install Symantec ApplicationHA on Linux systems. The system where you want to install ApplicationHA must meet the hardware and the software requirements.

This is document version 5.1. Before you continue, make sure that you are using the current version of this guide. It is online at:

https://vos.symantec.com/documents/doc_details/sfha/5.1/Linux/ProductGuides/

Virtual machine requirements

[Table 2-1](#) lists the hardware requirements for Symantec ApplicationHA

Table 2-1

Hardware requirements for Symantec ApplicationHA

Item	Description
Symantec ApplicationHA nodes	Virtual machines running on ESX or ESXi 4.1 installed with supported Linux operating systems. See “ Supported Linux operating systems ” on page 22.

Table 2-1 Hardware requirements for Symantec ApplicationHA (*continued*)

Item	Description
Disk space	See “Required disk space” on page 22. Note: During installation, Symantec ApplicationHA may require temporary disk space greater than the required disk space.
RAM	Each virtual machine requires at least 256 megabytes.

Required disk space

The approximate disk space usage for Symantec ApplicationHA RPMs is as follows:

Table 2-2 Required disk space

RPMs	Disc space required
/	3 MB
/opt	241 MB
/etc	3 MB
/var	25 MB

Virtual machine prerequisites

The following prerequisites apply to the virtual machines where you wish to configure Symantec ApplicationHA for application monitoring:

- Ensure that VMware Tools is installed. Install the version that is the same as or later than that available with VMware ESX 4.1.
- Ensure that your firewall settings allow access to ports used by Symantec ApplicationHA install program, wizards, and services.
See [“Ports and firewall settings”](#) on page 23.

Note: Install ApplicationHA Console before installing guest components.

Supported Linux operating systems

The Symantec ApplicationHA 5.1 release supports the following operating systems:

- Red Hat Enterprise Linux 5 (RHEL 5) with Update 4 (2.6.18-128.el5 kernel) or later, Architecture: x86_64

Supported applications

Table 2-3 lists the applications that Symantec ApplicationHA currently supports on virtual machines.

Table 2-3 Symantec ApplicationHA supported applications

Application	Version
SAP	SAP NetWeaver 7.0 (NW04)
Oracle Database	10g, 11gR1, and 11gR2
WebLogic	9 and 10

Note: Alternatively, you can use the Custom Application wizard to configure and monitor applications that are not listed in the above support matrix.

Ports and firewall settings

Symantec ApplicationHA uses certain ports and services during installation and configuration. If you have configured a firewall, ensure that the firewall settings allow access to these ports and services on the virtual machines.

Table 2-4 displays the services and ports used by Symantec ApplicationHA.

Table 2-4 Services and ports used by Symantec ApplicationHA

Component Name	Port/Protocol	Settings	Description
Veritas Storage Foundation Messaging Service (xprtld.exe)	https/5634	Allow inbound and outbound	Used for communications between the ApplicationHA Console host machine and the virtual machines.
vCenter Server communication port	443 (Default port)	Allow inbound and outbound	Used by the install program to register the ApplicationHA plugin and add ApplicationHA privileges to the vCenter Server.

Table 2-4 Services and ports used by Symantec ApplicationHA (*continued*)

Component Name	Port/Protocol	Settings	Description
Symantec ApplicationHA authentication service	14152, 14545	Allow inbound and outbound	Used by ApplicationHA Console for the single sign-on feature.

Required Linux RPMs for Symantec ApplicationHA

Make sure that you have installed the following operating system-specific RPMs on the systems where you want to install ApplicationHA. ApplicationHA will support any updates made to the following RPMs, provided the RPMs maintain the ABI compatibility.

[Table 2-5](#) lists the RPMs that ApplicationHA requires for a specific Linux operating system.

Table 2-5 Required Linux RPMs

Operating system	Required RPMs
RHEL 5	compat-libgcc-296-2.96-138.i386.rpm compat-libstdc++-33-3.2.3-61.i386.rpm compat-libstdc++-296-2.96-138.i386.rpm glibc-2.5-24.i686.rpm libgcc-4.1.2-42.el5.i386.rpm libstdc++-3.4.6-10.i386.rpm compat-libstdc++-33-3.2.3-61.x86_64.rpm glibc-2.5-24.x86_64.rpm glibc-common-2.5-24.x86_64.rpm libgcc-4.1.2-42.el5.x86_64.rpm libstdc++-3.4.6-10.x86_64.rpm java-1.4.2-gcj-compat-1.4.2.0-40jpp.115.noarch.rpm

Additional requirements

The following additional software requirements apply:

- Microsoft Internet Explorer version 6.0 or later is required on the machine where the vSphere client is running.

No other browsers are currently supported.

- Installation media and licenses for all products and third-party applications.
- Adobe Flash Player
 Install Adobe Flash Player (version 9.0 or later) on the systems from where you run the VMware vSphere Client to manage the virtual machines.
- Symantec ApplicationHA license
 An evaluation key is embedded in the product and is valid for two months. You can use all the product features during that period. To continue unrestricted usage, you must procure a valid license key.
- When installing Symantec ApplicationHA ensure that there are no parallel installations or live updates in progress.

Symantec ApplicationHA installation methods for guest components

Table 2-6 lists the different methods that you can choose to install ApplicationHA guest components on virtual machines running the Linux operating system:

Note: For information on installing the ApplicationHA Console, refer the *Symantec ApplicationHA Installation and Configuration Guide* (for Windows)

Table 2-6 ApplicationHA installation methods

Method	Description
Interactive installation using the installapplicationha program	The install program asks you a few questions and installs ApplicationHA, based on the information you provide. One of the options is directly installing ApplicationHA using the install program, which internally uses the installapplicationha program.
Automated installation using the ApplicationHA response files	At the end of each successful installation, the install program creates response files. You can use these response files to perform multiple installations to set up multiple virtual machines.
Manual installation using the Linux commands and utilities	You can install ApplicationHA using the operating system rpm -i command.

About the Symantec ApplicationHA install program

You can access the `installapplicationha` program from the command line.

The Symantec ApplicationHA installation program is interactive and manages the following tasks:

- Licensing Symantec ApplicationHA
- Installing Symantec ApplicationHA RPMs on single or multiple systems

See [“About preparing to install Symantec ApplicationHA guest components”](#) on page 29.

The `uninstallapplicationha` program, a companion to the `installapplicationha` program, uninstalls ApplicationHA RPMs.

Features of the install program

In addition to the program installation, it also provides command options to perform the following tasks:

- Check the systems for ApplicationHA installation requirements.
See [“Performing an automated preinstallation check”](#) on page 31.
- Perform automated installations using the values that are stored in a file.

Interacting with the `installapplicationha` program

As you run the program, you are prompted to answer yes or no questions. A set of responses that resemble `[y, n, q, ?] (y)` typically follow these questions. The response within parentheses is the default, which you can select by pressing the **Enter** key. Type the `?` character to get help to answer the prompt. Enter `q` to quit the installation.

Installation of ApplicationHA RPMs takes place only after you have confirmed the information. However, you must remove the partially installed ApplicationHA files before you run the `installapplicationha` program again.

During the installation, the install program prompts you to type information. The install program expects your responses to be within a certain range or in a specific format. The install program provides examples. If you are prompted to enter an item from a list, enter your selection exactly as it is shown in the list.

About response files

The install program generates a "response file" after performing an install program task such as installation or uninstallation. These response files contain the details that you provided to the install program questions in the form of values for the

response file variables. The response file also contains descriptions and explanations of the variables and their values.

The install program displays the location of the response file at the end of each successful install program task. The install program saves the response file in the default location for the install-related log files: /opt/VRTS/install/logs. If you provided a different log path using the `-logpath` option, the install program saves the response file in the path that you specified.

The format of the response file name is:

```
/opt/VRTS/install/logs/installscript-YYYYMMDDHHSSxxx
```

/installscript-YYYYMMDDHHSSxxx.response, where:

- *installscript* may be, for example: installapplicationha program or uninstallapplicationha program
- *YYYYMMDDHHSS* is the current date when the installscript is run and *xxx* are three random letters that the script generates for an installation instance

For example:

```
/opt/VRTS/install/logs/installer-200910101010ldS/installer-200910101010ldS.response
```

You can customize the response file as required to perform unattended installations using the `-responsefile` option of the install program. This method of automated installations is useful in the following cases:

- To perform multiple installations.
See “[Installing Symantec ApplicationHA using response files](#)” on page 37.
- To uninstall ApplicationHA from multiple systems.
See “[Uninstalling Symantec ApplicationHA using response files](#)” on page 57.

Syntax of the response file

The syntax of the Perl statements that are included in the response file variables varies. It can depend on whether the variables require scalar or list values.

For example, in the case of a string value:

```
$CFG{Scalar_variable}="value";
```

or, in the case of an integer value:

```
$CFG{Scalar_variable}=123;
```

or, in the case of a list:

```
$CFG{List_variable}=["value", "value", "value"];
```


Preparing to install Symantec ApplicationHA

This chapter includes the following topics:

- [About preparing to install Symantec ApplicationHA guest components](#)
- [Performing preinstallation tasks](#)

About preparing to install Symantec ApplicationHA guest components

Before you perform the preinstallation tasks, ensure that you meet the following installation requirements, set up the basic hardware, and plan your ApplicationHA setup.

- See [“Virtual machine requirements”](#) on page 21.
- See [“Required disk space”](#) on page 22.
- See [“Virtual machine prerequisites”](#) on page 22.
- See [“Supported Linux operating systems”](#) on page 22.
- See [“Supported applications”](#) on page 23.
- See [“Ports and firewall settings”](#) on page 23.
- See [“Additional requirements”](#) on page 24.

Performing preinstallation tasks

See [Table 3-1](#) on page 30. lists the tasks you must perform before proceeding to install ApplicationHA.

Table 3-1 Preinstallation tasks

Task	Reference
Obtain license keys.	See “ Obtaining Symantec ApplicationHA license keys ” on page 30.
Set the PATH variable.	See “ Setting the PATH variable ” on page 31.
Mount the product disc	See “ Mounting the product disc ” on page 31.
Verify the systems before installation	See “ Performing an automated preinstallation check ” on page 31.

Obtaining Symantec ApplicationHA license keys

You must obtain and install a license key for ApplicationHA.

See “[About Symantec ApplicationHA licensing](#)” on page 19.

This product includes a License Key certificate. The certificate specifies the product keys and the number of product licenses purchased. A single key lets you install the product on the number and type of systems for which you purchased the license. A key may enable the operation of more products than are specified on the certificate. However, you are legally limited to the number of product licenses purchased. The product installation procedure describes how to activate the key.

To register and receive a software license key, go to the Symantec Licensing Portal at the following location:

<https://licensing.symantec.com>

Make sure you have your Software Product License document. You need information in this document to retrieve and manage license keys for your Symantec product. After you receive the license key, you can install the product.

Click the Help link at this site to access the License Portal User Guide and FAQ.

The VRTSvlic package enables product licensing. After the VRTSvlic is installed, the following commands and their manual pages are available on the system:

- vxlicinst Installs a license key for a Symantec product
- vxlicrep Displays currently installed licenses
- vxlictest Retrieves the features and their descriptions that are encoded in a license key

Setting the PATH variable

Installation commands as well as other commands reside in the `/opt/VRTS/bin` directory. Add this directory to your PATH environment variable.

To set the PATH variable

- ◆ Do one of the following

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

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

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

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

Mounting the product disc

You must have super user (root) privileges to load the ApplicationHA software.

To mount the product disc

- 1 Log in as super user on the system from where you want to install ApplicationHA.

The system must run the supported operating system version. You can either install ApplicationHA on the node where you run the install program, or you can install ApplicationHA on a remote node.

- 2 Insert the product disc with the ApplicationHA software into a drive that is connected to the system.

The disc is automatically mounted.

- 3 If the disc does not automatically mount, then enter:

```
# mount -o ro /dev/cdrom /mnt/cdrom
```

- 4 Navigate to the location of the RPMs.

```
# cd /mnt/cdrom/rhel5_x86_64/cluster_server
```

Performing an automated preinstallation check

Before you begin the installation of ApplicationHA software, you can check the readiness of the systems where you plan to install Symantec ApplicationHA. The command to start the preinstallation check is:

```
installapplicationha -precheck system1 system2 ...
```

To check the systems

- 1 Navigate to the folder that contains the installapplicationha program.
See [“Mounting the product disc”](#) on page 31.
- 2 Start the preinstallation check:

```
# ./installapplicationha -precheck galaxy nebula
```

The program proceeds in a noninteractive mode to examine the systems for licenses, RPMs, disk space, and system-to-system communications.

- 3 Review the output as the program displays the results of the check and saves the results of the check in a log file.

Installing Symantec ApplicationHA using the install program

This chapter includes the following topics:

- [Installing Symantec ApplicationHA using the install program](#)

Installing Symantec ApplicationHA using the install program

Perform the following steps to install ApplicationHA:

Note: The system from where you install ApplicationHA must run the same Linux distribution as the target virtual machines.

To install ApplicationHA

- 1 Confirm that you are logged in as the super user and you mounted the product disc.
See “[Mounting the product disc](#)” on page 31.
- 2 Navigate to the folder that contains the installapplicationha install program.

```
# cd cdrom_root  
/rhe15_x86_64/cluster_server
```

3 Start the installapplicationha.

```
# ./installapplicationha
```

The install program starts with a copyright message and specifies the directory where the logs are created.

4 Enter **y** to agree to the End User License Agreement (EULA).

```
Do you agree with the terms of the End User License Agreement  
as specified in the EULA.pdf file present on media? [y,n,q,?] y
```

5 Enter the name of the system where you want to install ApplicationHA.

```
Enter the 64 bit operating_system system names separated by spaces:  
galaxy nebula
```

The install program does the following for the system:

- Checks that the local system that runs the install program can communicate with remote systems.
If the install program finds ssh binaries, it confirms that ssh can operate without requests for passwords or passphrases.
If the default communication method ssh fails, the install program attempts to use rsh.
- Makes sure the system uses one of the supported operating systems.
- Make sure that either SSH or RSH communication is enabled between the systems. Else, the install program prompts you for the root password and allows you to enable communication using either SSH or RSH.
- Makes sure that the systems have the required operating system patches.
If the install program reports that any of the patches are not available, install the patches on the system before proceeding with the ApplicationHA installation.
See “[Required Linux RPMs for Symantec ApplicationHA](#)” on page 24.
- Checks for product licenses.
- Checks for the required file system space and makes sure that any processes that are running do not conflict with the installation.
If requirements for installation are not met, the install program stops and indicates the actions that you must perform to proceed with the process.
- Checks whether any of the RPMs already exists on a system.
If the current version of any RPMs exists, the install program removes the RPMs from the installation list for the system.

6 Review the list of RPMs that the install program would install on each virtual machine.

The install program installs the ApplicationHA RPMs on the systems that you specified in step 5. For example, galaxy and nebula.

7 Select the license type.

- 1) Enter a valid license key
- 2) Enter a valid license key later

How would you like to license the systems? [1-2,q] (2)

Based on what license type you want to use, enter one of the following:

- 1 You must have a valid license key. Enter the ApplicationHA license key at the prompt:

Enter a ApplicationHA license key: [b,q,?]
~~XXXX-XXXX-XXXX-XXXX-XXXX~~

The install program registers the license and completes the installation process.

8 Enter y at the prompt to send the installation information to Symantec.

```
Would you like to send the information about this installation  
to Symantec to help improve installation in the future? [y,n,q,?] (y)  
y
```

The install program provides an option to collect data about the installation process each time you complete an installation of the product. The install program transfers the contents of the install log files to an internal Symantec site. The information is used only to gather metrics about how you use the install program. No personal customer data is collected, and no information will be shared by any other parties. Information gathered may include the product and the version installed or upgraded, how many systems were installed, and the time spent in any section of the install process.

9 After the installation, note the location of the installation log files, the summary file, and the response file for future reference.

The files provide the useful information that can assist you with future installations.

summary file	Lists the RPMs that are installed on each system.
log file	Details the entire installation.
response file	Contains the installation information that can be used to perform unattended or automated installations on other systems. See “Installing Symantec ApplicationHA using response files” on page 37.

Installing Symantec ApplicationHA using response files

This chapter includes the following topics:

- [Installing Symantec ApplicationHA using response files](#)
- [Response file variables to install Symantec ApplicationHA](#)
- [Sample response file for installing Symantec ApplicationHA](#)

Installing Symantec ApplicationHA using response files

When you install ApplicationHA on a virtual machine using the install program, it generates a response file. You can use the response file to install ApplicationHA on other virtual machines. You can also generate the response file using the `-makeresponsefile` option on the install program.

To install ApplicationHA using response files

- 1 Make sure the systems where you want to install ApplicationHA meet the installation requirements.
See [“Before installing Symantec ApplicationHA ”](#) on page 21.
- 2 Make sure the preinstallation tasks are completed.
See [“Performing preinstallation tasks”](#) on page 29.

- 3 Copy the response file to the system where you want to install ApplicationHA. See “[Sample response file for installing Symantec ApplicationHA](#)” on page 40.
- 4 Edit the values of the response file variables as necessary. See “[Response file variables to install Symantec ApplicationHA](#)” on page 38.
- 5 Mount the product disc and navigate to the folder that contains the installation program.
- 6 Start the installation from the system to which you copied the response file. For example:

```
# ./installapplicationha -responsefile /tmp/response_file
```

Where */tmp/response_file* is the response file’s full path name.

Response file variables to install Symantec ApplicationHA

[Table 5-1](#) lists the response file variables that you can define to install ApplicationHA.

Table 5-1 Response file variables specific to installing Symantec ApplicationHA

Variable	List or Scalar	Description
CFG{opt}{install}	Scalar	Installs Symantec ApplicationHA RPMs. (Required)
CFG{accepteula}	Scalar	Specifies whether you agree with EULA.pdf on the media. (Required)
CFG{opt}{stopfail_allow}	Scalar	Decides whether or not to proceed if the install program fails while stopping the processes or while unloading the drivers. (Optional)
CFG{systems}	List	List of systems on which the product is to be installed. Required

Table 5-1 Response file variables specific to installing Symantec ApplicationHA
(continued)

Variable	List or Scalar	Description
CFG{prod}	Scalar	Defines the product to be installed. The value is APPLICATIONHA51. (Required)
CFG{opt}{installallpkgs}	Scalar	Instructs the Symantec ApplicationHA install program to install all packages, based on the value of this variable. As there are no optional variables, the value of this variable must always be set to 1. (Required)
CFG{opt}{rsh}	Scalar	Defines that <i>rsh</i> must be used instead of <i>ssh</i> as the communication method between systems. (Optional)
CFG{opt}{keyfile}	Scalar	Defines the location of an <i>ssh</i> keyfile that is used to communicate with all remote systems. (Optional)
CFG{opt}{patchpath}	Scalar	Defines a location, typically an NFS mount, from which all remote systems can install product patches. The location must be accessible from all target systems. (Optional)
CFG{opt}{pkgpath}	Scalar	Defines a location, typically an NFS mount, from which all remote systems can install product RPMs. The location must be accessible from all target systems. (Optional)

Table 5-1 Response file variables specific to installing Symantec ApplicationHA
(continued)

Variable	List or Scalar	Description
CFG{opt}{tmppath}	Scalar	Defines the location where a working directory is created to store temporary files and the depots that are needed during the install. The default location is /var/tmp. (Optional)
CFG{opt}{logpath}	Scalar	Mentions the location where the log files are to be copied. The default location is /opt/VRTS/install/logs. Note: The install program copies the response files and summary files also to the specified <i>logpath</i> location. (Optional)
CFG{keys} {system}	Scalar	List of keys to be registered on the system. (Optional)

Sample response file for installing Symantec ApplicationHA

Review the response file variables and their definitions.

See [“Response file variables to install Symantec ApplicationHA”](#) on page 38.

```
#
# Configuration Values:
#
our %CFG;

$CFG{accepteula}=1;
$CFG{opt}{install}=1;
$CFG{opt}{installall_pkgs}=1;
```



```
$CFG{prod}="APPLICATIONHA51";  
$CFG{systems}=[ qw(galaxy nebula) ];
```


Performing post-installation tasks

This chapter includes the following topics:

- [Accessing the Symantec ApplicationHA documentation](#)
- [Removing permissions for communication](#)

Accessing the Symantec ApplicationHA documentation

The software disc contains the documentation for ApplicationHA in Portable Document Format (PDF) in the `cluster_server/docs` directory. After you install ApplicationHA, Symantec recommends that you copy the PDF version of the documents to the `/opt/VRTS/docs` directory on each virtual machine to make it available for reference.

To make the ApplicationHA documentation accessible from virtual machines

- ◆ Copy the PDF from the software disc (`cluster_server/docs/`) to the directory `/opt/VRTS/docs`.

Removing permissions for communication

Make sure you completed the installation of ApplicationHA. If you used `rsh`, remove the temporary `rsh` access permissions that you set for the virtual machines and restore the connections to the public network.

If the virtual machines use `ssh` for secure communications, and you temporarily removed the connections to the public network, restore the connections.

Administering ApplicationHA from the vSphere client

This chapter includes the following topics:

- [Administering application monitoring from vSphere Client](#)
- [Administering application monitoring settings](#)
- [Considerations while administering virtual machines](#)

Administering application monitoring from vSphere Client

ApplicationHA provides an interface, the ApplicationHA tab, to configure and control application monitoring. The ApplicationHA tab is integrated with the VMware vSphere Client.

Use the ApplicationHA view to perform the following tasks:

- configure and unconfigure application monitoring
- start and stop configured applications
- enable and disable application heartbeat
- suspend and resume application monitoring

To view the ApplicationHA tab, launch the VMware vSphere Client, select a virtual machine from the Inventory pane, and in the Management pane on the right, click the **ApplicationHA** tab.

After you configure an application on a virtual machine, the ApplicationHA tab displays the health of the configured application.

Viewing the status of configured applications

The Description box in the ApplicationHA view displays the status of the configured application and the associated services.

The **Application** field displays the name of the application that is configured.

The **Status** field displays the state of the configured application.

- **online** indicates that the application and its services are running on the virtual machine
- **offline** indicates that the application and its associated services are not running on the virtual machine
- **partial** indicates that either the services are being started on the virtual machine or ApplicationHA was unable to start one or more of the configured application services

Click **Refresh** to see the most current status of the applications and services. The status of the configured application and its associated services is refreshed every 60 seconds by default.

Starting and stopping applications

To the left side of the Description box in the ApplicationHA view there are links that allow you to control the status of the configured application and the associated services.

- Click **Start Application** to start a configured application. ApplicationHA attempts to start the configured application and its services in the required order. The configured resources are also brought online in the appropriate hierarchy.
- Click **Stop Application** to stop a configured application that is running on the virtual machine. ApplicationHA begins to stop the configured application and its services gracefully. The configured resources are also taken offline in the appropriate hierarchy.

Enabling and disabling application heartbeat

The VMware virtual machine monitoring feature uses the heartbeat information that VMware Tools captures as a proxy for guest operating system availability. This allows VMware HA to automatically reset or restart individual virtual

machines that have lost their ability to heartbeat. You can select VM and Application Monitoring if you also want to enable application monitoring.

ApplicationHA view allows you to control the application heartbeat on the virtual machines. To the left side of the Description box there are two links that allow you to control the status of the configured application heartbeat.

- Click **Enable Application Heartbeat** to enable the heartbeat communication between the configured applications running on the virtual machine and VMware HA. The application heartbeat is enabled by default when an application is configured for monitoring.
- Click **Disable Application Heartbeat** to disable the heartbeat communication between the configured applications running on the virtual machine and VMware HA. Disabling the application heartbeat does not instruct VMware HA to restart the virtual machine. This option disables the application monitoring feature in the VMware virtual machine monitoring settings.

Unconfiguring application monitoring

ApplicationHA view allows you to delete an application monitoring configuration for a virtual machine. This may be required in case you wish to re-create the configuration or configure another application using the wizard.

- Click **Unconfigure Application Monitoring** to remove the application monitoring configuration for a virtual machine. ApplicationHA removes all the configured resources for the application and its services from the configuration.

Note that this does not uninstall ApplicationHA from the virtual machine. This only removes the configuration.

In case you have configured monitoring for multiple applications, the unconfigure option removes all the application monitoring configuration resources from the virtual machine.

Suspending and resuming application monitoring

After configuring application monitoring you may want to perform routine maintenance tasks on those applications. These tasks may or may not involve stopping the application but may temporarily affect the state of the applications and its dependent components. If there is any change to the application status, ApplicationHA may try to restore the application state. This may potentially affect the maintenance tasks that you intend to perform on those applications.

If stopping the application is not an option, you can suspend application monitoring and create a window for performing such maintenance tasks. When

application monitoring is suspended, ApplicationHA freezes the application configuration and also stops sending the application heartbeat to VMware HA.

The ApplicationHA view provides the following options:

- Click **Enter Maintenance Mode** to suspend the application monitoring for the applications that are configured on the virtual machine. During the time the monitoring is suspended, ApplicationHA does not monitor the state of the application and its dependent components. The ApplicationHA view does not display the current status of the application. If there is any failure in the application or its components, ApplicationHA takes no action.
- Click **Exit Maintenance Mode** to resume the application monitoring for the applications configured on the virtual machine. You may have to click the **Refresh** link in the ApplicationHA view to see the current status of the application.

When application monitoring is restarted from a suspended state, ApplicationHA does not enable the application heartbeat. Click **Enable Application Heartbeat** to enable it.

If you have made changes that include database addition or change in the underlying storage mount point that was being monitored, then those changes may not reflect in the application monitoring configuration. In such cases, you may have to unconfigure and reconfigure the application monitoring.

Administering application monitoring settings

The ApplicationHA view provides a set of options that you can use to control the way Symantec ApplicationHA handles application monitoring, and application and dependent component faults on the virtual machine. These configuration settings are applicable on a per virtual machine basis. The settings apply to all the applications that Symantec ApplicationHA monitors on the virtual machine.

The following settings are available:

- **App.StartStopTimeout**
When you click the **Start Application** or **Stop Application** links in the ApplicationHA view, Symantec ApplicationHA initiates an orderly start or stop of the application and its dependent components. This option defines the number of seconds Symantec ApplicationHA must wait for the application to start or stop. If the application does not respond in the stipulated time, an error is displayed in the ApplicationHA view.
A delay in the application response does not indicate that the application or its dependent component has faulted. Parameters such as workload, system performance, and network bandwidth may affect the application response.

Symantec ApplicationHA continues to wait for the application response even after the timeout interval is over. If the application fails to start or stop, ApplicationHA takes the necessary action depending on the other configuration settings.

AppStartStopTimeout value can vary between 0 and 600. The default is 300 seconds.

- **App.RestartAttempts**

This option defines the number of times Symantec ApplicationHA should try to restart a failed application or its dependent component. If an application fails to start in the specified number of attempts, Symantec ApplicationHA stops the application heartbeat and communicates the fault to VMware HA. This option is applicable at the application service group level. Internally, it sets the *OnLineRetryLimit* attribute of the service group. In case there are multiple application service groups on the virtual machine, this setting applies to all the service groups. AppRestartAttempts value can vary between 1 to 6. The default is 1.

- **App.ShutdownGraceTime**

This option defines the number of seconds Symantec ApplicationHA should wait before communicating the application fault to VMware HA. This option is useful if you have configured application monitoring for multiple applications on the virtual machine.

If a configured application or its dependent component fails, Symantec ApplicationHA tries to restart the application for the configured number of times. If the application fails to start, Symantec ApplicationHA stops the application heartbeat and communicates the fault to VMware HA.

VMware HA may restart the virtual machine depending on the configuration. If there are multiple applications being monitored on the machine, a restart does not give Symantec ApplicationHA an opportunity to stop those applications gracefully. An abrupt shutdown may affect the healthy applications running on the machine.

If you set this option, then during fault remediation, Symantec ApplicationHA initiates a graceful shutdown of all the healthy applications being monitored on the machine and waits for the duration specified in this option. A virtual machine reboot takes place after all the applications are shut down gracefully or at the end of the grace time, whichever is earlier.

This setting is applicable to the heartbeat service group that is created when you configure application monitoring using the Application Monitoring Configuration Wizard. Internally, it sets the *DelayBeforeAppFault* attribute of the Heartbeat agent resource (VMWAppMonHB) in the configuration.

AppShutDownGraceTime value can vary between 0 and 600. The default is 300 seconds.

To modify the application monitoring configuration settings

- 1 Launch the vSphere Client and from the inventory pane on the left, select the virtual machine where you have configured application monitoring.
- 2 Select the **ApplicationHA** tab and then click the **Settings** link to display the Settings dialog box.
- 3 Specify the values for the available options displayed in the Settings box and then click **OK**.

The specified values are updated in the configuration and they take effect immediately.

Considerations while administering virtual machines

In a VMware environment you may perform various virtual machines administration tasks that include suspending or stopping virtual machines, taking snapshots, reverting to snapshots, migrating virtual machines to alternate hosts, and creating virtual machine templates. VMware provides a host of features to perform these administrative tasks on the virtual machines. Symantec ApplicationHA also supports these features.

Following are some of the features that Symantec ApplicationHA supports:

- VMware vMotion
- VMware Distributed Resource Scheduler (VMware DRS)
- VMware Storage vMotion
- VMware Snapshots
- VMware High Availability (VMware HA)

You can perform administrative tasks on virtual machines where you have configured application monitoring. Symantec ApplicationHA supports these administrative operations while it is actively monitoring applications on the virtual machines. These operations do not affect the Symantec ApplicationHA functionality.

Symantec recommends that while working with virtual machine snapshots or migrating virtual machines to alternate hosts, you either disable the application heartbeat (Disable Application Heartbeat button on the ApplicationHA tab) or suspend application monitoring (Enter Maintenance Mode button on the ApplicationHA tab) on the virtual machine.

You can create templates of virtual machines that have Symantec ApplicationHA installed. You make a template after installing Symantec ApplicationHA and

configuring a secure trust relationship between the virtual machine and the Console.

You must not make a template of a virtual machine where application monitoring is configured. Symantec ApplicationHA may fail to discover the application monitoring configuration on the virtual machine created from such templates. You have to unconfigure the application monitoring first and then configure it again on the virtual machine.

Symantec recommends that you create virtual machine templates after installing Symantec ApplicationHA and setting up the trusted communication between the virtual machine and the Console.

Refer to the VMware documentation for prerequisites and recommendations for performing these virtual machine administration tasks.

Uninstalling Symantec ApplicationHA using the install program

This chapter includes the following topics:

- [Preparing to uninstall Symantec ApplicationHA](#)
- [Uninstalling Symantec ApplicationHA using the uninstall program](#)
- [Running `uninstallapplicationha` from the ApplicationHA media](#)

Preparing to uninstall Symantec ApplicationHA

Before you uninstall ApplicationHA from any virtual machine:

- Shut down the applications that depend on ApplicationHA. For example, applications such as vCentre discovery wizards or any high availability agents for ApplicationHA.

You must meet the following conditions to use the `uninstallapplicationha` to uninstall ApplicationHA from a virtual machine:

- Make sure that the communication exists between systems. By default, the uninstall program uses `ssh`.
- Make sure you can execute `ssh` or `rsh` commands as super user on systems.

If you cannot meet the prerequisites, then you must run the `uninstallapplicationha` on each system.

The `uninstallapplicationha` removes all ApplicationHA RPMs.

The following example demonstrates how to uninstall ApplicationHA using the `uninstallapplicationha`. The `uninstallapplicationha` uninstalls ApplicationHA from the two nodes: galaxy nebula. The example procedure uninstalls ApplicationHA from all selected or provided virtual machines.

Uninstalling Symantec ApplicationHA using the uninstall program

The program stops the ApplicationHA processes that are currently running during the uninstallation process.

To uninstall ApplicationHA

- 1 Log in as super user in the system where you want to uninstall ApplicationHA.
- 2 Start `uninstallapplicationha`.

```
# cd /opt/VRTS/install  
# ./uninstallapplicationha
```

The program specifies the directory where the logs are created. The program displays a copyright notice and a description of the virtual machine.

- 3 Enter the names of the systems from which you want to uninstall ApplicationHA.

The program performs system verification checks and asks to stop all running ApplicationHA processes.

- 4 Enter `y` to stop all the ApplicationHA processes.

The program proceeds with uninstalling the software.

- 5 Review the output as the `uninstallapplicationha` continues to do the following:

- Verifies the communication between systems
- Checks the installations on each system to determine the RPMs to be uninstalled.

- 6 Review the output as the uninstall program stops processes and removes the RPMs.

- 7 Note the location of summary and log files that the uninstall program creates after removing all the RPMs.

Running `uninstallapplicationha` from the ApplicationHA media

You may need to use the `uninstallapplicationha` on the ApplicationHA 5.1 media in one of the following cases:

- You need to uninstall ApplicationHA after an incomplete installation.
- The `uninstallapplicationha` is not available in `/opt/VRTS/install`.

If you have mounted the ApplicationHA media at `/mnt/cdrom` then, you can find the `uninstallapplicationha` program in the following location:

```
/mnt/cdrom/rhel5_x86_64/cluster_server
```


Uninstalling Symantec ApplicationHA using response files

This chapter includes the following topics:

- [Uninstalling Symantec ApplicationHA using response files](#)
- [Response file variables to uninstall Symantec ApplicationHA](#)
- [Sample response file for uninstalling Symantec ApplicationHA](#)

Uninstalling Symantec ApplicationHA using response files

Typically, you can use the response file that the install program generates after you perform ApplicationHA uninstallation on one virtual machine.

To perform automated ApplicationHA uninstallation

- 1 Make sure that you are prepared to uninstall ApplicationHA.
See [“Preparing to uninstall Symantec ApplicationHA”](#) on page 53.
- 2 Copy the response file to the system where you want to uninstall ApplicationHA.
See [“Sample response file for uninstalling Symantec ApplicationHA”](#) on page 59.

- 3 Edit the values of the response file variables as necessary.
See “Response file variables to uninstall Symantec ApplicationHA” on page 58.
- 4 Start the uninstallation from the system to which you copied the response file. For example:

```
# /opt/VRTS/install/uninstallapplicationha -responsefile /tmp/response_file
```

Where `/tmp/response_file` is the response file’s full path name.

Response file variables to uninstall Symantec ApplicationHA

Table 9-1 lists the response file variables that you can define to uninstall ApplicationHA.

Table 9-1 Response file variables specific to uninstalling ApplicationHA

Variable	List or Scalar	Description
CFG{opt}{uninstall}	Scalar	Uninstalls ApplicationHA RPMs. (Required)
CFG{opt}{stopfail_allow}	Scalar	Decides whether or not to proceed if the install program fails while stopping the processes or while unloading the drivers. (Optional)
CFG{systems}	List	List of systems on which the product is to be uninstalled. (Required)
CFG{prod}	Scalar	Defines the product to be uninstalled. The value is APPLICATIONHA51. (Required)
CFG{opt}{keyfile}	Scalar	Defines the location of an ssh keyfile that is used to communicate with all remote systems. (Optional)

Table 9-1 Response file variables specific to uninstalling ApplicationHA
(continued)

Variable	List or Scalar	Description
CFG{opt}{rsh}	Scalar	Defines that <i>rsh</i> must be used instead of <i>ssh</i> as the communication method between systems. (Optional)
CFG{opt}{logpath}	Scalar	Mentions the location where the log files are to be copied. The default location is <i>/opt/VRTS/install/logs</i> . Note: The install program copies the response files and summary files also to the specified <i>logpath</i> location. (Optional)

Sample response file for uninstalling Symantec ApplicationHA

Review the response file variables and their definitions.

See “[Response file variables to uninstall Symantec ApplicationHA](#)” on page 58.

```
#
# Configuration Values:
#
our %CFG;

$CFG{opt}{uninstall}=1;
$CFG{prod}="APPLICATIONHA51";
$CFG{systems}=[ qw(galaxy nebula) ];
```


Symantec ApplicationHA agents

This appendix includes the following topics:

- [About the Symantec ApplicationHA agents](#)
- [About the Heartbeat agent](#)

About the Symantec ApplicationHA agents

Agents are processes that manage applications and resources of predefined resource types on a system. The agents are installed when you install Symantec ApplicationHA. A system has one agent per resource type that monitors all resources of that type. For example, an Oracle agent manages all Oracle applications that are configured using the Application resources. When an Oracle agent starts, it obtains the necessary configuration information from the resources and then monitors the configured applications. The agents then periodically update Symantec ApplicationHA with the resource and application status.

Agents perform the following operations:

- Bring resources online
- Take resources offline
- Monitor resources and report state changes

Symantec ApplicationHA agents are classified as Bundled agents and Application agents.

Bundled agents are packaged with the base software and include agents for Storage (Mount, LVM etc), Networking (NIC, IP etc), networking, and infrastructure (FileOnOff, ElifNone). These agents are immediately available for use after you install Symantec ApplicationHA.

Application agents are used to monitor third party applications such as WebLogic, Oracle, and SAP. These agents are available as part of ApplicationHA base package and are also available in the form of an agent pack that can be installed after you have installed Symantec ApplicationHA.

For more details about an application agent, refer to the application-specific configuration guide.

About the Heartbeat agent

Symantec ApplicationHA uses application heartbeat as a channel to communicate with VMware HA. Symantec ApplicationHA uses a Heartbeat agent to detect application health and communicate it to VMwareHA. The Heartbeat agent reads the status of application service groups to determine the status of an application. The agent works underneath the Symantec ApplicationHA solution, and does not appear in the ApplicationHA tab of the vSphere client. It is internally represented by the VMAppMonHB resource type.

Warning: Editing the VMAppMonHB resource is prohibited, except to modify the heartbeat interval.

Hearbeat agent function

Monitor	Verifies that the specified service groups mentioned in the ServiceGroupName attribute are online. If all service groups are online, then healthy Heartbeat (Green status) is communicated. If any of the service groups are in faulted states, then unhealthy heartbeat (Red status) is communicated. If any of the service groups are other than online or faulted state, it disables the heartbeat (Grey status).
---------	---

Hearbeat agent state definitions

ONLINE	Indicates that the specified service groups are online.
FAULTED	Indicates that the specified service groups are not online.
UNKNOWN	Indicates that the agent encountered errors while monitoring the VMAppMonHB resource.

Hearbeat agent resource type definition

```
type VMWAppMonHB (
  static i18nsmtr ArgList[] = { ServiceGroupName }
  static int MonitorInterval = 10
  static int NumThreads = 1
  static str Operations = None
  str ServiceGroupName[]
)
```

Hearbeat agent attribute

Table A-1 Heartbeat agent attributes

Required attribute	Description
ServiceGroupName	<p>The name of the service groups that are being monitored.</p> <p>This attribute contains the list of the service groups created when you run the Application Monitoring Configuration Wizard.</p> <p>If you configure additional application service groups using the command line, this attribute contains the names of all those service groups.</p>
DelayBeforeAppFault	<p>The number of seconds the agent must wait for the healthy application service groups on the machine to go offline, before communicating application fault to VMware HA.</p> <p>This attribute can take a value between 0 and 600 seconds.</p> <p>Default is 300 seconds.</p>

Modifying the application heartbeat interval

The application heartbeat interval is the duration after which the Heartbeat agent notifies the status of a configured application. You can modify the application heartbeat interval by using the `hares` command.

To modify the application heartbeat interval for an application that is online, run the following command on the related virtual machine:

```
hatype -modify VMWAppMonHB MonitorInterval value
```

Here, *value* is the duration in seconds.

To modify the application heartbeat agent interval for an application that is offline, run the application on the related virtual machine:

```
hatype -modify VMWAppMonHB OfflineMonitorInterval value
```

Here, *value* is the duration in seconds.

Symantec ApplicationHA installation packages

This appendix includes the following topics:

- [Symantec ApplicationHA installation packages](#)

Symantec ApplicationHA installation packages

[Table B-1](#) show the package name and contents for each Veritas Cluster Server package.

Table B-1 Symantec ApplicationHA packages

Package	Contents
VRTSvlic	Contains the binaries for Symantec License Utilities.
VRTSperl	Contains Veritas Perl 5.10.0 redistribution by Symantec.
VRTSspt	Contains the binaries for Veritas Software Support Tools by Symantec.
VRTSsfmh	Contains the binaries for Veritas Storage Foundation Managed Host by Symantec.
VRTSvcS	VRTSvcS contains the following components: <ul style="list-style-type: none">■ Contains the binaries for Veritas Cluster Server.■ Contains the binaries for Veritas Cluster Server manual pages.■ Contains the binaries for Veritas Cluster Server English message catalogs.■ Contains the binaries for Veritas Cluster Server utilities. These utilities include security services.

Table B-1 Symantec ApplicationHA packages (*continued*)

Package	Contents
VRTSvcstag	Contains the binaries for Veritas Cluster Server bundled agents by Symantec.
VRTSvcsvmw	Contains the binaries for Veritas Cluster Server bundled agents for VMWare App HA and wizards for configuring the applications.
VRTSsapnw04	Contains the binaries for Veritas High Availability Agent for SAP NetWeaver.
VRTSacclib	Contains the binaries for Veritas Cluster Server ACC libraries by Symantec.
VRTSvcsea	VRTSvcsea contains the binaries for Veritas DBED agents (Oracle, DB2, and Sybase).
VRTSwls9	VRTSwls9 contains the binaries for Veritas high availability agent for WebLogic Server by Symantec.

Troubleshooting Symantec ApplicationHA installation

This appendix includes the following topics:

- [Restarting the install program after a failed connection](#)
- [Symantec ApplicationHA logging](#)
- [Symantec ApplicationHA tab does not display the application monitoring status](#)

Restarting the install program after a failed connection

If an installation is killed because of a failed connection, you can restart the install program to resume the installation. The install program detects the existing installation and prompts you whether you want to resume the installation. If you resume the installation, the installation proceeds from the point where the installation failed.

Symantec ApplicationHA logging

This section describes how to troubleshoot common problems that may occur while installing and configuring Symantec ApplicationHA. The chapter lists the error messages and describes the associated problem. Recommended resolution is included, where applicable.

Troubleshooting issues require looking at the log files created by the various components.

ApplicationHA installer logging

Symantec ApplicationHA installer logs contain details about the installation tasks and the overall progress status. These logs are useful for resolving common installation related issues.

The install program creates the log directory as soon as you launch the install program. Once the installation is complete, the install program displays the location where the log files are stored.

ApplicationHA view logging

The ApplicationHA view generates log files that are appended by letters. The log files are segregated based on operations and configuration settings.

■ Operations and wizard logging

Operations logs include the Application Monitoring Configuration Wizard logs and logs related to the various operations performed from the ApplicationHA view.

Operations logs are located at

```
/var/VRTSvcs/log/AppControlOperations_A.log
```

The Application Monitoring Configuration Wizard also maintains in memory logs that are available only during the time the wizard is running. These logs are maintained on a per session basis. The in-memory logs are purged after the wizard is closed. These logs are not stored in any file or directory.

■ Configuration settings logging

Application monitoring configuration settings related changes are logged separately and are available at

```
/var/VRTSvcs/log/AppControlSettings_A.log.
```

These settings are accessible from the Settings link on the ApplicationHA view.

■ ApplicationHA view logging

The ApplicationHA view also maintains in-memory logs of the operations performed from the view. These logs are available only until the time the logs window is open. To view the current logs, click the **View Logs** link available on the right hand side in the ApplicationHA view. A window appears within the view. This window displays the details of the operations performed.

Agent Logging

Symantec ApplicationHA agents generate log files that are appended by letters. Letter A indicates the first log file, B the second, C the third, and so on.

The agent log components are defined as follows:

- **Timestamp:** the date and time the message was generated.
- **Mnemonic:** the string ID that represents the product (for example, VCS).
- **Severity:** levels include CRITICAL, ERROR, WARNING, NOTICE, and INFO (most to least severe, respectively).
- **UMI:** a unique message ID.
- **The format of the agent log is as follows:**
 Timestamp (Year/MM/DD) | Mnemonic | Severity | UMI | Agent Type | Resource Name | Entry Point | Message Text
 A typical agent log resembles:
 2010/08/22 18:46:44 VCS ERROR V-16-10051-6010
 GenericService:Service_ClipSrv_res:online:Failed to start the service 'ClipSrv'.
 Error = 1058.

Symantec ApplicationHA tab does not display the application monitoring status

The Symantec ApplicationHA tab in the vSphere Client console may either display a HTTP 404 Not Found error or may not show the application health status at all.

Verify the following conditions and then refresh the ApplicationHA tab in the vSphere Client console:

- Verify that the ApplicationHA Console host is running and is accessible over the network.
- Verify the VMware Web Service is running on the vCenter Server.
- Verify that the Veritas Storage Foundation Messaging Service is running on the vCenter Server.
 If it is stopped, type the following on the command prompt:
`/etc/init.d/xprtld start`
- Verify that ports 14152, 14545, and 5634 are not blocked by a firewall.
- Log out of the vSphere Client and then login again. Then, verify that the Symantec ApplicationHA plugin is installed and enabled.

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