

Symantec™ ApplicationHA Installation Guide

Solaris on Oracle VM Server for SPARC

6.0

Symantec™ ApplicationHA Installation Guide

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Introducing Symantec ApplicationHA

This chapter includes the following topics:

- [What is Symantec ApplicationHA](#)
- [Components of the Symantec ApplicationHA setup](#)
- [Symantec ApplicationHA user privileges](#)
- [Symantec ApplicationHA agents](#)
- [About Symantec ApplicationHA licensing](#)
- [Ensuring high availability of applications](#)
- [Ensuring high availability of virtualization infrastructure](#)

What is Symantec ApplicationHA

Symantec ApplicationHA provides monitoring capabilities for applications running inside logical domains in the Oracle VM Server for SPARC virtualization environment. Symantec ApplicationHA adds a layer of application awareness to the core high availability (HA) functionality offered by Veritas™ Cluster Server (VCS) in the control domain.

Symantec ApplicationHA is based on VCS and uses similar concepts such as agents, resources, and service groups. However, it does not include the high availability cluster components such as the Group Membership and Atomic Broadcast (GAB), Low Latency Transport (LLT), Asynchronous Monitoring Framework (AMF), and Veritas Fencing (VxFEN). Symantec ApplicationHA has a lightweight server footprint that allows faster installation and configuration.

Key benefits include the following:

- Out of the box integration with VCS.
- Full visibility and control over applications with the ability to start, stop, and monitor applications running inside guest domains.
- High availability of the application as well as the guest domain inside which the application runs.
- Graded application fault-management responses such as:-
 - Application restart
 - ApplicationHA-initiated, graceful internal reboot (soft reboot) of a guest domain
 - VCS-initiated, external reboot (hard reboot) of guest domain
 - Failover of the guest domain to another VCS node.
- Standardized way to manage applications using a single interface that is integrated with the Veritas Operations Manager (VOM) console.
- Specialized Application Maintenance mode, in which ApplicationHA allows you to intentionally take an application out of its purview for maintenance or troubleshooting.

How ApplicationHA is deployed in the Oracle VM Server for SPARC environment

Oracle VM Server for SPARC is a virtualization and partitioning solution supported on Oracle Solaris CoolThreads technology-based servers. Oracle VM Server for SPARC lets you create multiple virtual systems called logical domains, on a single physical host.

In the Oracle VM Server for SPARC virtualization environment, ApplicationHA provides high availability of applications running on guest domains. Veritas Cluster Server (VCS) provides high availability of the guest domains that run on the physical host.

The following figure illustrates how ApplicationHA and VCS are deployed in a typical Oracle VM Server for SPARC virtualization environment.

When you install the Oracle VM Server for SPARC software, the first logical domain that you create in a physical host is the control domain. For the other logical domains on the same physical host, this document uses the term “guest domains”.

ApplicationHA is installed on the guest domain, and provides high availability to a configured application running on the guest domain. VCS is installed on the control domain, as part of a Storage Foundation Cluster File Server High Availability (SFCFSHA) stack installation. VCS provides high availability to the guest domain where the configured application runs.

To ensure application-aware monitoring of guest domains, you must enable VCS support for ApplicationHA.

When you enable VCS to support ApplicationHA, a private VLAN is created between monitored guest domains and the VCS node (control domain). The private VLAN facilitates heartbeat communication between VCS in the control domain and ApplicationHA in the guest domains.

Veritas Operations Manager (VOM) provides you with a centralized management console (GUI) to administer application monitoring with ApplicationHA.

For more information on how VCS monitors guest domains for high availability, see the *SFHA Virtualization Solutions Guide for Solaris*.

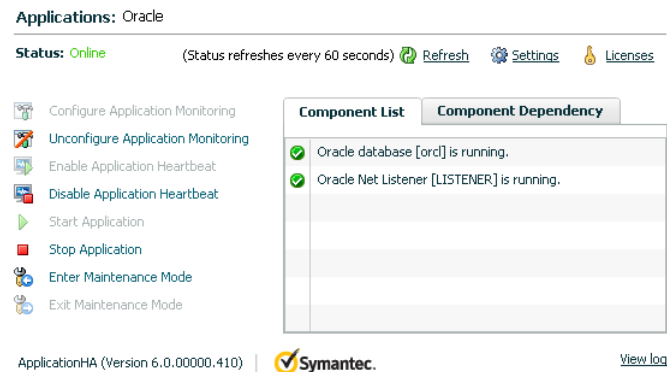
How Symantec ApplicationHA works with VCS

Symantec ApplicationHA installed in guest domains communicates directly with VCS installed in the control domain. Symantec ApplicationHA conveys the application health status to VCS in the form of a heartbeat. If VCS does not receive the heartbeat from a particular guest domain within a specified interval, VCS either restarts that guest domain or fails it over to another physical host.

You can monitor an application running on a guest domain by using Veritas Operations Manager (VOM). An ApplicationHA add-on for VOM integrates the ApplicationHA tab with VOM.

The ApplicationHA tab is the primary interface for performing the application monitoring operations on a guest domain. From this tab, you configure application monitoring and then monitor and control the configured application on the guest domain. After configuring application monitoring, the ApplicationHA tab displays the state of the application and the component dependencies.

The following figure displays the ApplicationHA tab where Oracle is configured for monitoring.



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 inside the guest domains. Symantec ApplicationHA agents monitor the overall health of the

configured applications by running specific commands, tests, or scripts. 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 auto-configured in the guest domain when you configure application monitoring. The Heartbeat agent sends the application heartbeat to VCS in the control domain. Symantec ApplicationHA uses the application heartbeat as the communication medium to convey the status of the application to VCS.

If an application fails, the application agents attempt to restart the application for a configurable number of times. If the agents are unable to start the application, ApplicationHA tries to reboot the guest domain. After the guest domain is restarted, Symantec ApplicationHA attempts to start the application and its dependent components in a predefined order.

Components of the Symantec ApplicationHA setup

A Symantec ApplicationHA setup in the Oracle VM Server for SPARC virtualization environment comprises of the following components:

- [Symantec ApplicationHA guest components for guest domains](#)
- [VCS in the virtualization infrastructure](#)
- [VOM add-on for Symantec ApplicationHA Management](#)

Symantec ApplicationHA guest components for guest domains

The Symantec ApplicationHA guest components are installed separately on the guest domains 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 (xprtld). This service communicates the status of the applications running on the guest domain and displays it in the ApplicationHA tab of the Veritas Operations Manager console.

VCS in the virtualization infrastructure

Veritas Cluster Server by Symantec (VCS) is installed as part of a Storage Foundation Cluster File System High Availability (SFCFSHA) stack installation on the control domain. VCS is installed on control domains in more than one physical host, to form a VCS cluster. As a result, VCS provides high availability in the infrastructure layer of the Oracle VM Server for SPARC virtualization

environment on such physical hosts. VCS mainly ensures high availability of the guest domains on which ApplicationHA monitors configured applications.

For more information on how ApplicationHA and VCS are integrated in the Oracle VM Server for SPARC virtualization environment:

See “[How ApplicationHA is deployed in the Oracle VM Server for SPARC environment](#)” on page 12.

For more information on how to install VCS as part of an SFCFSHA installation, see the *SFCFSHA Installation Guide*.

VOM add-on for Symantec ApplicationHA Management

The Veritas Operations Manager (VOM) Add-on for ApplicationHA Management is installed on the VOM Management Server. You must also add as managed hosts to VOM, the guest domains where you want ApplicationHA to monitor applications. The ApplicationHA tab then appears on the VOM console for the respective guest domain, and lets you administer application monitoring with ApplicationHA in the Oracle VM Server for SPARC environment.

Symantec ApplicationHA user privileges

Symantec ApplicationHA provides a set of privileges that are available when using VOM Console to manage ApplicationHA. These privileges define the application monitoring operations that a user can perform on the guest domains. You can create roles and then assign privileges to the roles or assign privileges to the existing roles that are available in the virtualization environment. Application monitoring operations are enabled or disabled depending on the privileges that are assigned to the VOM user account. For example, the Admin privilege is required for configuring application monitoring on a guest domain.

VOM administrators can use these privileges to configure access control in an application monitoring environment.

Symantec ApplicationHA provides the following privileges:

- **View Application Monitoring State (Guest)**
Can view the application monitoring status on the guest domain. The Guest cannot perform any ApplicationHA operations.
- **Control Application Monitoring (Operator)**
Can perform all the ApplicationHA operations that include start and stop configured applications, enable and disable application monitoring, specify the application monitoring configuration settings, enter and exit application monitoring maintenance mode, and view application monitoring status.

The Operator cannot configure or unconfigure application monitoring on the guest domain.

- **Configure Application Monitoring (Admin)**

Can perform all ApplicationHA operations that include configure and unconfigure application monitoring, start and stop configured applications, enable and disable application monitoring, specify the application monitoring configuration settings, enter and exit application monitoring maintenance mode, and view application monitoring status.

Symantec ApplicationHA agents

Agents are application-specific modules that plug into the ApplicationHA framework that manages applications and resources of predefined resource types on a system. The agents are installed when you install Symantec ApplicationHA guest components. These agents start, stop, and monitor the resources configured for the applications and report state changes. If an application or its components fail, ApplicationHA restarts the application and its resources on the guest domain.

Symantec ApplicationHA agents are classified as follows:

- **Infrastructure agents**

Agents such as NIC, IP, and Mount are classified as infrastructure agents.

Infrastructure agents are automatically installed as part of the ApplicationHA installation on guest domains.

For more details about the infrastructure agents, refer to the *Veritas Cluster Server 6.0 Bundled Agents Reference Guide (Solaris)*.

- **Application agents**

Application agents are used to monitor third party applications such as Oracle. These agents are packaged separately and are available in the form of an agent pack that gets installed when you install Symantec ApplicationHA guest components.

The ApplicationHA 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 guest components installation.

Refer to the Symantec Operations Readiness Tools (SORT) Web site for information on the latest agent pack availability.

<https://sort.symantec.com/agents>

Refer to the agent-specific configuration guide for more details about the application agents.

About Symantec ApplicationHA licensing

Symantec ApplicationHA is a licensed product. Licensing for Symantec ApplicationHA is applicable for ApplicationHA guest components and is based on the server operating systems in use.

An evaluation license key is embedded in the product. This license key is valid only for a period of 2 months. If you are installing ApplicationHA for the first time, you can use the embedded license key or procure a permanent license key and enter the same while installing the product.

You can add or view the license keys from a guest domain that has ApplicationHA guest components installed. You can add a license key through the command line or the ApplicationHA tab. For more information:



















See [“About managing ApplicationHA licenses”](#) on page 51.

Ensuring high availability of applications

You can ensure high availability of applications running inside guest domains by using ApplicationHA. To provide high availability to the applications, perform the following steps:

- Install Veritas Operations Manager Add-on for ApplicationHA Management on the VOM Management Server.
- Install ApplicationHA on the guest domain
- Add the guest domain as a managed host to Veritas Operations Manager (VOM)
- Configure application monitoring on the guest domain.

The following figure illustrates the workflow for ensuring high availability of applications with ApplicationHA. The figure also indicates the corresponding document that you must refer for detailed instructions at each step.




























1.  **Install VOM Management Server 4.1.**

 Refer VOM Installation Guide
2.  **Install VOM Add-on for ApplicationHA on VOM Management Server.**

 Refer ApplicationHA Installation Guide
3.  **Install ApplicationHA 6.0 on the guest domains.**

 Refer ApplicationHA Installation Guide
4.  **Add guest domains and control domains as managed hosts to VOM.**

 Refer ApplicationHA User's Guide
5.  **Configure application monitoring on the guest domains.**

 Refer Application specific Agent Guide
6.  **Monitor application.**

 Refer ApplicationHA User's Guide

Ensuring high availability of virtualization infrastructure

In addition to high availability of applications using ApplicationHA, you can also ensure high availability of the virtualization infrastructure with VCS. By using VCS, you can externally restart guest domains and fail over the guest domains in case of application failures or guest domain failures. To ensure high availability of the virtualization environment, perform the following steps:

- Install Veritas Operations Manager Add-on for ApplicationHA Management on the VOM Management Server.
- Install SFCFS HA on the control domain.
- Enable ApplicationHA capabilities in underlying VCS in the control domain.
- Install ApplicationHA on the guest domain.
- Add guest domain and control domain as managed hosts to Veritas Operations Manager (VOM).
- Configure application monitoring on the guest domain.

The following figure illustrates the workflow for ensuring high availability of the applications running inside the guest domain and the virtualization infrastructure. The figure also indicates the corresponding documents that you must refer for detailed instructions at each step.

1.  **Install VOM Management Server 4.1.**
  Refer VOM Installation Guide
2.  **Install VOM Add-on for ApplicationHA on VOM Management Server.**
  Refer ApplicationHA Installation Guide
3.  **Install SFCFSHA 6.0 on the control domain.**
  Refer SFCFSHA Installation Guide
4.  **Set up virtualization environment on the control domain.**
  Refer SFHA Solutions Virtualization Guide
5.  **Enable VCS for ApplicationHA 6.0 on the control domain.**
  Refer ApplicationHA User's Guide
6.  **Install ApplicationHA 6.0 on the guest domains.**
  Refer ApplicationHA Installation Guide
7.  **Add guest domains and control domains as managed hosts to VOM.**
  Refer ApplicationHA User's Guide
8.  **Configure application monitoring on the guest domains.**
  Refer Application specific Agent Guide
9.  **Monitor application.**
  Refer ApplicationHA User's Guide

Planning to install Symantec ApplicationHA

This chapter includes the following topics:

- [About installing Symantec ApplicationHA](#)
- [Requirements for installing ApplicationHA on guest domains](#)
- [Requirements for providing high availability of virtualization environment](#)
- [Additional requirements](#)

About installing Symantec ApplicationHA

[Table 2-1](#) describes the installation tasks for ensuring high availability of the applications.

Table 2-1 Installation tasks for ensuring high availability of applications

Task	Description
Install VOM Management Server 4.1 and install the ApplicationHA add-on	Download the installer for VOM Management Server 4.1. The installer is available here: http://sort.symantec.com On the VOM Management Server 4.1, install the VOM add-on for ApplicationHA. The add-on is available here: http://www.symantec.com/sfm_addons

Table 2-1 Installation tasks for ensuring high availability of applications
(continued)

Task	Description
Install Symantec ApplicationHA guest components for guest domains	Install the Symantec ApplicationHA guest components on the guest domains where you want to monitor applications. Symantec ApplicationHA guest components include ApplicationHA agents and configuration wizards.
Add required guest domains to VOM as managed hosts	Add the guest domains where you want to monitor applications, to the list of managed hosts in VOM. As a result, when you click a configured guest domain in the VOM console, the ApplicationHA tab appears.
Configure application monitoring on the guest domains	In the ApplicationHA tab, click Configure application monitoring to launch the Application Monitoring Configuration Wizard.
Administer application monitoring on the guest domains	Click the appropriate links in the ApplicationHA tab, to perform administrative actions on configured applications.

Table 2-2 describes the installation tasks for ensuring high availability of applications and the virtualization infrastructure on which the applications run.

Table 2-2 Installation tasks for ensuring high availability of applications and virtualization infrastructure

Task	Description
Install VOM Management Server 4.1 and install the ApplicationHA add-on on the server	Download the installer for VOM Management Server 4.1. The installer is available here: http://sort.symantec.com On the VOM Management Server 4.1, install the VOM add-on for ApplicationHA. The add-on is available here: http://www.symantec.com/sfm_addons
Install SFCFSHA 6.0 on the control domain	SFCFSHA 6.0 enables you to ensure high availability of the virtualization infrastructure in terms of restart and failover of failed guest domains.

Table 2-2 Installation tasks for ensuring high availability of applications and virtualization infrastructure (*continued*)

Task	Description
Enable ApplicationHA capabilities for underlying VCS 6.0	Run the enable_applicationha script from /opt/VRTSvcs/bin/utlils path on each control domain. The enable_applicationha script configures the infrastructure settings. It also enables communication between VCS in the control domain and ApplicationHA in the guest domains.
Install Symantec ApplicationHA guest components for guest domains	Install the Symantec ApplicationHA guest components on the guest domains where you want to monitor applications. Symantec ApplicationHA guest components include ApplicationHA agents and configuration wizards.
Add required guest domains and control domain to VOM as managed hosts	Add the guest domains where you want to monitor applications, to the list of managed hosts in VOM. You may optionally add the control domains to VOM. This allows you to co-relate a guest domain with the control domain hosting it.
Configure application monitoring on the guest domains	In the ApplicationHA tab, click Configure application monitoring to launch the Application Monitoring Configuration Wizard.
Administer application monitoring on the guest domains	Click the appropriate links in the ApplicationHA tab, to perform administrative actions on configured applications.

Requirements for installing ApplicationHA on guest domains

You can install Symantec ApplicationHA Guest Components on guest domains running Solaris. The guest domain where you want to install ApplicationHA Guest Components must meet the following requirements.

For the latest information on system requirements, refer to the latest version of the product documentation on the Symantec Operations Readiness Tools (SORT) Web site: <https://sort.symantec.com>

Supported virtualization environments

Symantec ApplicationHA can be installed and run inside guest domains in an Oracle VM Server for SPARC virtualization environment. The following versions are supported:

Table 2-3 Supported versions

Server version	Firmware version
Oracle VM Server for SPARC 2.0	Version 7.3.0 or later
Oracle VM Server for SPARC 2.1	Version 7.4.0 or later

Refer to Oracle VM Server for SPARC Release Notes, for more information on the required firmware versions.

Supported operating systems on guest domains

This section lists the supported operating systems for Symantec ApplicationHA 6.0.

[Table 2-4](#) shows the supported operating systems for this release.

Table 2-4 Supported guest operating systems

Operating systems	Levels	Chipsets
Solaris 10	Update 8, 9, and 10	SPARC

Required Solaris packages for Symantec ApplicationHA

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

[Table 2-5](#) lists the packages that ApplicationHA requires for a given Solaris operating system.

Table 2-5 Required packages

Operating system	Required packages
Solaris SPARC 10	The following Solaris DHCP packages are required: <ul style="list-style-type: none"> ■ SUNWdhcsu ■ SUNWdhcsr

Supported applications

[Table 2-6](#) lists the applications that Symantec ApplicationHA 6.0 currently supports on guest domains.

Table 2-6 Symantec ApplicationHA supported applications

Application	Version
Oracle Database	10gR2, 11gR1, and 11gR2
Apache HTTP Server	1.3, 2.0, and 2.2. Also supports the IBM HTTP Server 7.x.

Note: Alternatively, you can use the Generic Agent to configure other applications that are not listed in the above support matrix. For more information refer to *Symantec ApplicationHA Generic Agent Configuration Guide*.

Permissions requirements

The following permissions are required for installing the ApplicationHA guest components on the guest domains:

- You must have root privileges on the guest domain where you install the guest components.
In case of remote installation, you must also have root privileges on all the guest domains where you install the ApplicationHA guest components.

Ports and firewall settings for application high availability

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 guest domains.

[Table 2-7](#) displays the services and ports used by ApplicationHA.

Table 2-7 Services and ports used by Symantec ApplicationHA

Component Name	Port	Settings	Description
Veritas Storage Foundation Messaging Service (xpftld)	5634	Allow inbound and outbound	Used for communications between the VOM Console and the guest domains.

Table 2-7 Services and ports used by Symantec ApplicationHA (*continued*)

Component Name	Port	Settings	Description
Veritas Operations Manager (VOM)	14161	Allow inbound and outbound	Used by the Tomcat server on VOM Console to receive Web service requests and for local administration.

Requirements for providing high availability of virtualization environment

The following are the requirements for providing high availability of the virtualization environment:

- Install SFCFSHA 6.0 on the control domain
Refer to *Veritas Storage Foundation Cluster File System Installation Guide - Solaris*
- Review the settings of the virtualization environment for which you want to provide high availability
Refer to *Veritas Storage Foundation and High Availability Solutions Virtualization Guide - Solaris*
- Enable ApplicationHA capabilities for underlying VCS 6.0
Refer to *Symantec ApplicationHA User's Guide - Solaris on Oracle VM Server for SPARC*

Ports and firewall settings for virtualization infrastructure high availability

ApplicationHA uses certain ports and services when providing high availability of the virtualization environment. If you have configured a firewall, ensure that the firewall settings allow access to these ports and services on the guest domains.

[Table 2-8](#) displays the services and ports used by ApplicationHA for providing high availability of the virtualization environment.

Table 2-8 Services and ports used by Symantec ApplicationHA

Component Name	Port	Settings	Description
Veritas Storage Foundation Messaging Service (xprtld)	5634	Allow inbound and outbound	Used for communications between the VOM Console host machine and the guest domains.
Veritas Operations Manager (VOM)	14161	Allow inbound and outbound	Used by the Tomcat server on VOM Console to receive Web service requests and for local administration.
Internal communication component	14142	Allow inbound and outbound	Used for communication between, VCS in the control domain and ApplicationHA in the guest domain

Additional requirements

The following additional software requirements apply:

- Internet Explorer or Firefox Web browser is required on the systems where you access the Veritas Operations Manager console to manage the guest domains.
 Microsoft Internet Explorer 6.x, 7.x, 8.x, and 9.x are supported.
 Mozilla Firefox 3.x, 4.x, 5.x, and 6.x are supported.
- Adobe Flash Player
 Install Adobe Flash Player (version 9.0 or later) on the systems from where you access the Veritas Operations Manager console to manage the guest domains.
- 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 in progress.

Installing Symantec ApplicationHA Guest Components

This chapter includes the following topics:

- [About preparing to install Symantec ApplicationHA guest components](#)
- [Performing preinstallation tasks](#)
- [ApplicationHA installation methods for guest components](#)
- [Installing Symantec ApplicationHA using the install program](#)
- [Installing Symantec ApplicationHA using response files](#)

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 [“Supported virtualization environments”](#) on page 26.
- See [“Supported operating systems on guest domains”](#) on page 26.
- See [“Required Solaris packages for Symantec ApplicationHA”](#) on page 26.
- See [“Supported applications”](#) on page 27.
- See [“Permissions requirements”](#) on page 27.

- See “Ports and firewall settings for application high availability” on page 27.
- See “Additional requirements” on page 29.

Performing preinstallation tasks

Table 3-1 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 32.
Set the PATH variable	See “Setting the PATH variable” on page 33.
Mount the product disc	See “Mounting the product disc” on page 33.
Verify the system before installation	See “Performing an automated preinstallation check” on page 34.

Obtaining Symantec ApplicationHA license keys

You must obtain and install a license key for ApplicationHA.

See “About Symantec ApplicationHA licensing ” on page 18.

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 (bash or sh) or Korn Shell (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 install program for the Solaris SPARC operating system:

```
# cd cdrom_root/unix-sparc-ldom/sol_sparc/applicationha
```

Performing an automated preinstallation check

Before you begin the installation of ApplicationHA software, you can check the readiness of the system where you plan to install Symantec ApplicationHA.

To check the system

- 1 Navigate to the folder that contains the `installapplicationha` program.
See “Mounting the product disc” on page 33.

- 2 Start the preinstallation check:

```
# ./installer -precheck system1
```

The program proceeds in a non-interactive mode to examine the system for licenses, packages, 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.

ApplicationHA installation methods for guest components

[Table 3-2](#) lists the different methods that you can choose to install ApplicationHA guest components on guest domains running the Solaris operating system:

Table 3-2 ApplicationHA installation methods

Method	Description
Interactive installation using the <code>installapplicationha</code> 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 <code>installapplicationha</code> program.

Table 3-2 ApplicationHA installation methods (*continued*)

Method	Description
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 guest domains.
Manual installation using the Solaris commands and utilities	You can install ApplicationHA using the operating system <code>pkgadd</code> command.

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 Solaris distribution as the target guest domains.

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 33.

- 2 Navigate to the folder that contains the installation program for the Solaris SPARC operating system:

```
# cd cdrom_root/unix-sparc-ldom/sol_sparc/applicationha
```

- 3 Run the installer to start installation on the guest.

```
# ./installapplicationha
```

- 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 systems where you want to install ApplicationHA.
The install program does the following:

- Checks that the local system that runs the install program can communicate with the remote system.
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.
See “[Supported operating systems on guest domains](#)” on page 26.
 - Makes 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 system has 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 Solaris packages for Symantec ApplicationHA](#)” on page 26.
 - 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 packages already exist on a system.
If the current version of any packages exists, the install program removes the packages from the installation list for the system.
- 6** Review the list of packages that the install program would install on the guest domain.
The install program installs the ApplicationHA packages on the system that you specified in step 5. For example, galaxy.
- 7** If the system on which you install ApplicationHA does not have a permanent license key installed, the install program prompts you for the license type.
Based on the license type that you want to use, perform one of the following:
- To specify a new license key, enter **y** and when the installer prompts, specify the new license key.
 - To use the evaluation license key, enter **n**.
- The install program registers the license, and proceeds with the installation.

- 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 with any other parties. Information gathered may include the product and the version installed or upgraded, the number of systems 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.

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

summary file	Lists the packages 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

When you install ApplicationHA on a guest domain using the install program, it generates a response file. You can use the response file to install ApplicationHA on other guest domains. 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 system where you want to install ApplicationHA meet the installation requirements.
See “[Requirements for installing ApplicationHA on guest domains](#)” on page 25.
- 2 Make sure the preinstallation tasks are completed.
See “[Performing preinstallation tasks](#)” on page 32.
- 3 Create a response file on the system where you want to run the installer.
See “[Response file variables to install Symantec ApplicationHA](#)” on page 38.
See “[Sample response file for installing Symantec ApplicationHA](#)” on page 40.
- 4 Mount the product disc and navigate to the folder that contains the installation program.
- 5 Start the installation from the system to which you copied the response file.
For example:

```
# cd /opt/VRTS/install/  
  
# ./installapplicationha -responsefile response_file
```

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

Response file variables to install Symantec ApplicationHA

[Table 3-3](#) lists the response file variables that you can define to install ApplicationHA.

Table 3-3 Response file variables specific to installing Symantec ApplicationHA

Variable	List or Scalar	Description
CFG{accepteula}	Scalar	Specifies whether you agree with EULA.pdf on the media. (Required)
CFG{opt}{install}	Scalar	Installs Symantec ApplicationHA packages. (Required)
CFG{systems}	List	Name of the systems on which the product is to be installed. (Required)

Table 3-3 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 APPLICATIONHA60. (Required)
CFG{keys} {system}	Scalar	List of keys to be registered on the system. (Optional) Note: If you do not provide a valid license key or if the systems where you install the product do not have a valid license key installed, then the installer will install the evaluation license key on these systems.
CFG{uploadlogs}	Scalar	Specifies whether the installer log files must be uploaded to the telemetrics server for troubleshooting. (Optional)
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 the <i>ssh</i> keyfile that is used to communicate with the remote system. (Optional)
CFG{opt}{pkgpath}	Scalar	Defines a location, typically an NFS mount, from which the remote system can install product packages. The location must be accessible from the target system. (Optional)

Table 3-3 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)

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{keys}{galaxy}="LICENSEKEY";
$CFG{opt}{configure}=1;
$CFG{opt}{install}=1;
$CFG{opt}{installallpkgs}=1;
$CFG{prod}="APPLICATIONHA60";
$CFG{systems}=[ qw(galaxy) ];
$CFG{uploadlogs}=1;
```


Installing the VOM add-on for ApplicationHA

This chapter includes the following topics:

- [Prerequisites for using the Veritas Operations Manager Add-on for ApplicationHA](#)
- [Installing the VOM add-on for ApplicationHA](#)

Prerequisites for using the Veritas Operations Manager Add-on for ApplicationHA

The following table describes the versions of the components that are required for installing and running the Veritas Operations Manager Add-on for ApplicationHA Management:

Table 4-1 Versions for the required components

Component	Version
Veritas Operations Manager Management Server	4.1 or later
Veritas Operations Manager managed host	Solaris: 4.1 or later
Symantec ApplicationHA on the guest domain	6.0 or later

Installing the VOM add-on for ApplicationHA

To be able to view the ApplicationHA tab on the Veritas Operations Manager (VOM) console, you must install the VOM add-on for ApplicationHA Management on the VOM Management Server. You can download the add-on from the Symantec support site:

http://www.symantec.com/sfm_addons

You must first upload the add-on to the VOM repository, and then install the add-on.

To upload the VOM add-on

- 1 On the VOM console, click **Settings > Deployment Management**.
- 2 Select **ApplicationHA Management**.
- 3 Click **Actions > Upload**.
- 4 On the Upload to Repository page, click **Browse**.
- 5 Navigate to the location where you downloaded the VOM add-on for ApplicationHA Management, and click **OK**.

To install the VOM add-on

- 1 On the VOM console, select **Settings > Deployment Management**.
- 2 Select the add-on for ApplicationHA, and click **Install**.
- 3 Select the option to install the add-on only on the Management Server, and click **Install**.

Note: After the add-on is installed, restart the Web Server on the VOM Management Server.

- 4 Click **OK**.

For information on how to use the VOM add-on for ApplicationHA, refer to the *Symantec ApplicationHA User's Guide*.

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). After you install ApplicationHA, Symantec recommends that you copy the PDF version of the documents to each guest domain to make it available for reference.

To make the ApplicationHA documentation accessible from guest domains

- 1 Navigate to the folder that contains the PDF version of the documents for the Solaris SPARC operating system:

```
# cd cdrom_root/unix-sparc-ldom/sol_sparc/docs/
```

- 2 To copy the PDF to the /opt/VRTS/docs directory, run the following command:

```
# cp *.pdf /opt/VRTS/docs
```

You can also download the latest version of the product documentation from the Symantec Operations Readiness Tools (SORT) Web site.

<https://sort.symantec.com>

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 guest domains and restore the connections to the public network.

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

Uninstalling Symantec ApplicationHA Guest Components

This chapter includes the following topics:

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

Preparing to uninstall Symantec ApplicationHA

Before you uninstall ApplicationHA from any guest domain:

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

You must meet the following conditions to remotely uninstall ApplicationHA from the guest domains, using the `uninstallapplicationha` program:

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

If you cannot meet the prerequisites, you will not be able to remotely uninstall ApplicationHA. You must run the `uninstallapplicationha` program on the guest domain from which you want to uninstall ApplicationHA.

The `uninstallapplicationha` program removes all ApplicationHA packages.

The following section describes how to uninstall ApplicationHA using the `uninstallapplicationha` program. The example procedure uninstalls ApplicationHA from the selected or provided guest domain.

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 the `uninstallapplicationha` program.

```
# 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 guest domain.

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

The program performs the following:

- Verifies the communication between systems
- Checks the installation on the system to determine the packages to be uninstalled.
- 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 uninstall program stops processes and removes the packages.
- 6 Note the location of summary and log files that the uninstall program creates after removing all the packages.

Running `uninstallapplicationha` program from the ApplicationHA media

You may need to use the `uninstallapplicationha` program on the ApplicationHA 6.0 media in one of the following cases:

- You need to uninstall ApplicationHA after an incomplete installation.
- The `uninstallapplicationha` program 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/unix-sparc-ldom/sol_sparc/applicationha/
```

For information on how to use the `uninstallapplicationha` program:

See [“Uninstalling Symantec ApplicationHA using the uninstall program”](#) on page 46.

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 guest domain.

To perform automated ApplicationHA uninstallation

- 1 Make sure that you are prepared to uninstall ApplicationHA.
See [“Preparing to uninstall Symantec ApplicationHA”](#) on page 45.
- 2 Copy the response file to the system where you want to uninstall ApplicationHA.
See [“Sample response file for uninstalling Symantec ApplicationHA”](#) on page 49.
- 3 Edit the values of the response file variables as necessary.
See [“Response file variables to uninstall Symantec ApplicationHA”](#) on page 48.
- 4 Start the uninstallation from the system to which you copied the response file. For example:

```
# cd /opt/VRTS/install/  
  
# ./uninstallapplicationha -responsefile response_file
```

Where *response_file* is the response file's full path name.

Response file variables to uninstall Symantec ApplicationHA

Table 6-1 lists the response file variables that you can define to uninstall ApplicationHA.

Table 6-1 Response file variables specific to uninstalling ApplicationHA

Variable	List or Scalar	Description
CFG{opt}{uninstall}	Scalar	Uninstalls ApplicationHA packages. (Required)
CFG{systems}	List	Name of the system on which the product is to be uninstalled. (Required)
CFG{prod}	Scalar	Defines the product to be uninstalled. The value is APPLICATIONHA60. (Required)
CFG{uploadlogs}	Scalar	Specifies whether the installer log files must be uploaded to the telemetrics server for troubleshooting. (Optional)
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 the ssh keyfile that is used to communicate with the remote system. (Optional)
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 uninstall. The default location is <i>/var/tmp</i> . (Optional)

Table 6-1 Response file variables specific to uninstalling ApplicationHA
(continued)

Variable	List or Scalar	Description
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)

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 48.

```
#  
# Configuration Values:  
#  
our %CFG;  
  
$CFG{opt}{uninstall}=1;  
$CFG{prod}="APPLICATIONHA60";  
$CFG{systems}=[ qw(galaxy) ];
```


Managing Symantec ApplicationHA licenses

This chapter includes the following topics:

- [About managing ApplicationHA licenses](#)
- [Managing ApplicationHA licenses through ApplicationHA tab](#)

About managing ApplicationHA licenses

When the embedded, two-month, evaluation license key expires, you may want to add a permanent license key.

You can add or view the license key from any guest domain that has ApplicationHA guest components installed. You can use one of the following methods to manage the licenses:

- From the command line, run the following commands:

To view an existing license:

```
/opt/VRTS/bin/vxlicrep
```

To install a new license:

```
/opt/VRTS/bin/vxlicinst
```

- When you run the CPI installer to install or upgrade ApplicationHA, you can specify a new license key.
- Connect to the Veritas Operations Manager console and select the guest domain for which you want to update the licenses. Select the **ApplicationHA** tab and click **Licenses**. Use this path to manage licenses for the local guest domain. See [“Managing ApplicationHA licenses through ApplicationHA tab”](#) on page 52.

Managing ApplicationHA licenses through ApplicationHA tab

Perform the following steps to manage ApplicationHA licenses through the ApplicationHA tab.

To manage the ApplicationHA licenses

- 1 Connect to the Veritas Operations Manager.
- 2 In the Veritas Operations Manager console, click **Manage > Servers > Hosts**.
- 3 In the left pane, in the **License** list box, select the **ApplicationHA** check box.
- 4 In the right pane, click the guest domain where you want to perform administrative actions.
- 5 Click the **ApplicationHA** tab and then click **Licenses**.
- 6 On the License Management panel, enter the new license key in the **Enter license key** text box and then click **Add**.
- 7 Click **Close**.

ApplicationHA installation packages

This appendix includes the following topics:

- [Symantec ApplicationHA installation packages](#)

Symantec ApplicationHA installation packages

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

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

package	Contents
VRTSvcstag	Contains the binaries for Veritas Cluster Server bundled agents by Symantec.
VRTSvcsvmw	Contains the ApplicationHA guest domain wizards for application monitoring configurations by Symantec.
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).
VRTSvbs	VRTSvbs contains the binaries for Virtual Business Services by Symantec.

Troubleshooting Symantec ApplicationHA installation

This appendix includes the following topics:

- [Symantec ApplicationHA logging](#)
- [Veritas Operations Manager Management Server logging](#)

Symantec ApplicationHA logging

This section describes how to troubleshoot common problems that may occur while installing 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 guest components logging

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

When installing ApplicationHA guest components by using the `installapplicationha` program or by using the response file option, the logs are located in the following location:

```
/opt/VRTS/install/logs
```

Note: When installing ApplicationHA guest components using the response file option, the log files are stored in the location specified inside the response file.

Agent logging on guest domain

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.
- **Message Text:** the actual message generated by the agent.

The agent logs are located in the following location:

```
/var/VRTSvcs/log/<agent name>_A.txt
```

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.
```

Veritas Operations Manager Management Server logging

The Veritas Operations Manager (VOM) Management Server logs contain error and debug information. These logs are useful for resolving issues related to tasks, communication issues between Management Server and the Managed Hosts and configuration issues.

The logs are located at the following location:

```
/var/opt/VRTSsfmcs/logs
```


To set the VOM log levels

- 1 Connect to the Veritas Operations Manager.
- 2 In the Veritas Operations Manager console, click **Settings > Management Server > General**.
- 3 In the Web Server Settings pane, select the appropriate level from the **Log level** dropdown list.

You can select one of the following levels:

- Severe
- Warning
- Info
- Debug
- Fine

Note: For the log level to be effective, after step 3, you must restart the Web server.

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