

# Symantec™ Storage Foundation and High Availability Solutions 6.1 Getting Started Guide - Linux

# Symantec™ Storage Foundation and High Availability Solutions Getting Started Guide

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Symantec Corporation  
350 Ellis Street  
Mountain View, CA 94043

<http://www.symantec.com>

# Technical Support

Symantec Technical Support maintains support centers globally. Technical Support's primary role is to respond to specific queries about product features and functionality. The Technical Support group also creates content for our online Knowledge Base. The Technical Support group works collaboratively with the other functional areas within Symantec to answer your questions in a timely fashion. For example, the Technical Support group works with Product Engineering and Symantec Security Response to provide alerting services and virus definition updates.

Symantec's support offerings include the following:

- A range of support options that give you the flexibility to select the right amount of service for any size organization
- Telephone and/or Web-based support that provides rapid response and up-to-the-minute information
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- Global support purchased on a regional business hours or 24 hours a day, 7 days a week basis
- Premium service offerings that include Account Management Services

For information about Symantec's support offerings, you can visit our website at the following URL:

[www.symantec.com/business/support/index.jsp](http://www.symantec.com/business/support/index.jsp)

All support services will be delivered in accordance with your support agreement and the then-current enterprise technical support policy.

## Contacting Technical Support

Customers with a current support agreement may access Technical Support information at the following URL:

[www.symantec.com/business/support/contact\\_techsupp\\_static.jsp](http://www.symantec.com/business/support/contact_techsupp_static.jsp)

Before contacting Technical Support, make sure you have satisfied the system requirements that are listed in your product documentation. Also, you should be at the computer on which the problem occurred, in case it is necessary to replicate the problem.

When you contact Technical Support, please have the following information available:

- Product release level
- Hardware information

- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
  - Error messages and log files
  - Troubleshooting that was performed before contacting Symantec
  - Recent software configuration changes and network changes

## Licensing and registration

If your Symantec product requires registration or a license key, access our technical support Web page at the following URL:

[www.symantec.com/business/support/](http://www.symantec.com/business/support/)

## Customer service

Customer service information is available at the following URL:

[www.symantec.com/business/support/](http://www.symantec.com/business/support/)

Customer Service is available to assist with non-technical questions, such as the following types of issues:

- Questions regarding product licensing or serialization
- Product registration updates, such as address or name changes
- General product information (features, language availability, local dealers)
- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs or manuals

## Support agreement resources

If you want to contact Symantec regarding an existing support agreement, please contact the support agreement administration team for your region as follows:

Asia-Pacific and Japan	<a href="mailto:customercare_apac@symantec.com">customercare_apac@symantec.com</a>
Europe, Middle-East, and Africa	<a href="mailto:semea@symantec.com">semea@symantec.com</a>
North America and Latin America	<a href="mailto:supportsolutions@symantec.com">supportolutions@symantec.com</a>

## Documentation

Product guides are available on the media in PDF format. Make sure that you are using the current version of the documentation. The document version appears on page 2 of each guide. The latest product documentation is available on the Symantec website.

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

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions. Include the title and document version (located on the second page), and chapter and section titles of the text on which you are reporting. Send feedback to:

[doc\\_feedback@symantec.com](mailto:doc_feedback@symantec.com)

For information regarding the latest HOWTO articles, documentation updates, or to ask a question regarding product documentation, visit the Storage and Clustering Documentation forum on Symantec Connect.

<https://www-secure.symantec.com/connect/storage-management/forums/storage-and-clustering-documentation>

## About Symantec Connect

Symantec Connect is the peer-to-peer technical community site for Symantec's enterprise customers. Participants can connect and share information with other product users, including creating forum posts, articles, videos, downloads, blogs and suggesting ideas, as well as interact with Symantec product teams and Technical Support. Content is rated by the community, and members receive reward points for their contributions.

<http://www.symantec.com/connect/storage-management>

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# Overview of installing Symantec products

This chapter includes the following topics:

- [About this guide](#)
- [Prerequisites before installing your Symantec products](#)
- [Determining which products you need](#)
- [Obtaining the product binaries](#)
- [Automatically assessing your systems](#)
- [Manually assessing your systems](#)
- [Licensing](#)

## About this guide

This guide provides a high-level overview of installing Symantec products. This guide describes the Symantec script-based installer. There are other installation methods that are not described in this guide. For the other installation methods and detailed configuration information, refer to the installation guide for your product. This guide is useful for new users and returning users that want a quick refresher.

## Prerequisites before installing your Symantec products

See the release notes for your product for the system requirements, including supported operating system versions, disk space usage, and so forth. The following sections can help you assess your systems before installing.

See [“Automatically assessing your systems”](#) on page 11.

See [“Manually assessing your systems”](#) on page 12.

## Determining which products you need

The installation media or tar ball includes multiple products. When you run the installation program, you can choose which product to install. If you are not sure which product to install, refer to the high-level overview about the products.

See [“About the Symantec Storage Foundation and High Availability Solutions products”](#) on page 25.

Additional information is available about Symantec products, and about the features that are installed with each product.

<http://www.symantec.com/business/support/index?page=content&id=HOWTO74584>

## Obtaining the product binaries

If you are not installing from the installation media, you need to obtain the product binaries from Symantec's electronic distribution site.

### Obtaining the product binaries

- 1 Call Customer Care for your region by following the instructions provided at: [http://www.symantec.com/support/assistance\\_care.jsp](http://www.symantec.com/support/assistance_care.jsp)  
Do one of the following:
  - If you have not obtained a license, ask Customer Care to email you a licensing template. Follow the instructions in the email to license your product, and repeat these instructions.
  - If you have already obtained a license, ask Customer Care to email you a FileConnect download template.
- 2 Locate the email that contains the FileConnect download template, and locate the serial number. (The serial number is not a license key; it is a code you need to download Symantec products from the portal).

- 3 Go to Symantec's electronic distribution website at:  
[http://www.symantec.com/products-solutions/licensing/activating-software/detail.jsp?detail\\_id=fileconnect](http://www.symantec.com/products-solutions/licensing/activating-software/detail.jsp?detail_id=fileconnect).
- 4 Select a language.
- 5 Enter the serial number contained in the FileConnect download email, and click **Enter**, and then agree to the license agreement.
- 6 Select the product you want to download.
- 7 Under step 1, select a download method. Do one of the following:
  - If you are only downloading one item, click **HTTP Download** to make the download go faster.
  - If you are downloading more than one item, click **Managed Download**.
- 8 Select the product you want to download, and click **Begin Downloading**.
- 9 Open the tar file and save it to your local system.
- 10 Unzip the tar file. For example, enter the following:

```
# gunzip VRTS_SF_HA_Solutions_<version>_<platform>.tar.gz
```
- 11 Untar the file. For example, enter the following:

```
# tar -xvf VRTS_SF_HA_Solutions_<version>_<platform>.tar
```

## Automatically assessing your systems

You can use Symantec's data collection tool available on the Symantec Operations Readiness Tools (SORT) website to create a custom report that assesses your systems for installation readiness, and provides all the information you need to install your Symantec product.

---

**Note:** If you automatically assess your systems, you can skip the instructions for creating a preinstallation checklist and checking the hardware compatibility list. The automatic assessment already generates that information.

---

### To automatically assess your systems

- 1 Go to the My SORT page on the SORT website at:  
<https://sort.symantec.com/home>
- 2 Find the **Custom Reports using Data Collectors** widget.

- 3 Click the **Data Collector** tab.
- 4 Click the appropriate link in the **Platform** column to download the data collection tool for your environment.
- 5 Follow the instructions in the readme file to install the data collection tool.
- 6 In your environment, run the data collection tool on each of the systems on which you plan to install your Symantec product. The data collection tool analyzes your systems and stores the results in an XML file.
- 7 On the widget's **Upload Report** tab, upload the XML file to generate a report.

If you plan to do a lot of Symantec product installations, consider bookmarking the My SORT page on the SORT website at:

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

## Manually assessing your systems

Manually assessing your systems involves several tasks.

See “[Filling out the online preinstallation checklist](#)” on page 12.

See “[Checking the hardware compatibility list](#)” on page 13.

You can also assess your systems automatically. If you automatically assess your systems, you can skip this section.

See “[Automatically assessing your systems](#)” on page 11.

## Filling out the online preinstallation checklist

Before you install your Symantec product, go online and generate a preinstallation checklist. The preinstallation checklist helps you make sure that your configuration meets the operating system requirements and that you are installing the correct Symantec patch level.

### To generate a preinstallation checklist

- 1 Go to the **Assessments > Install and Upgrade** tab on the Symantec Operations Readiness Tools (SORT) website at:  
<https://sort.symantec.com/checklist/install>
- 2 From the drop-down lists, select the information for the Symantec product you want to install.
- 3 Click **Generate Checklist**.

You see a checklist with system requirements, patch information, operating system parameters, and product information. You can print the checklist, save it as a PDF, and email it.

## Checking the hardware compatibility list

The hardware compatibility list contains up-to-date information about supported arrays, host bus adapters, switches, and other hardware products. Check the hardware compatibility list to make sure that the hardware in your configuration is supported. Before you install your Symantec product, follow any instructions that are needed to prepare your hardware.

### To check the hardware compatibility list

- 1 Go to the **Documentation > Documents** page on the Symantec Operations Readiness Tools (SORT) website at:  
<https://sort.symantec.com/documents>
- 2 From the **Document categories** list, click the check box for **Compatibility lists**.
- 3 Select the compatibility list for your product version and platform.

The compatibility list shows as a PDF file in the bottom-left corner of your browser window. Open the PDF and check the hardware information.

## Licensing

You have the option to install Symantec products using a keyless license. Installation using a keyless license does not eliminate the need to obtain a license. 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 Business Support website, and access the appropriate link.

[http://www.symantec.com/support/contact\\_techsupp\\_static.jsp](http://www.symantec.com/support/contact_techsupp_static.jsp)

You can also access the licensing portal, an online tool for product activation, registration of licenses, and maintenance or support at the following URL:

[http://www.symantec.com/products-solutions/licensing/activating-software/detail.jsp?detail\\_id=licensing\\_portal](http://www.symantec.com/products-solutions/licensing/activating-software/detail.jsp?detail_id=licensing_portal)

The Symantec product installer 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 using a keyless license.  
The installer prompts for the product modes and options that you want to install, and then sets the required product level.  
Within 60 days of choosing this option, you must install a permanent license key corresponding to the license level entitled. If you do not comply with the terms, continuing to use the Symantec product is a violation of your End User License Agreement, and results in warning messages  
For more information about keyless licensing, see the following Symantec Connect article:  
<http://go.symantec.com/sfhakeyless>

# Installation and configuration

This chapter includes the following topics:

- [About the script-based installer](#)
- [Prechecking your systems](#)
- [Installing your Symantec product](#)
- [Configuring your Symantec product](#)

## About the script-based installer

You can use the script-based installer to install Symantec products (version 6.1 and later) from a driver system that runs any supported platform to a target system that runs different supported platforms.

To install your Symantec product, use one of the following methods:

- The general product installer (`installer`). The general product installer script provides a menu that simplifies the selection of installation and configuration options. Use the general product installer if you want to install multiple products from a disc.
- Product-specific installation scripts (`installsfha`). The product-specific installation scripts provide command-line interface options. Installing and configuring with the `installsfha` script is identical to running the general product installer and specifying SFHA from the list of products to install. Use the product-specific installation scripts to install or configure individual products you download electronically. You can find these scripts at the root of the product media. These scripts are also installed with the product.

Table 2-1 lists all the SFHA Solutions product installation scripts. The list of product-specific installation scripts that you find on your system depends on the product that you install on your system.

**Table 2-1** Product installation scripts

Symantec product name	Script name in the media	Script name after an installation
For all SFHA Solutions products	installer	N/A
Symantec ApplicationHA	installapplicationha	installapplicationha<version>
Symantec Cluster Server (VCS)	installvcs	installvcs<version>
Symantec Storage Foundation (SF)	installsf	installsf<version>
Symantec Storage Foundation and High Availability (SFHA)	installsfha	installsfha<version>
Symantec Storage Foundation Cluster File System High Availability (SFCFSHA)	installsfcfsha	installsfcfsha<version>
Symantec Storage Foundation for Oracle RAC (SF Oracle RAC)	installsfrac	installsfrac<version>
Symantec Dynamic Multi-pathing (DMP)	installdmp	installdmp<version>

When you install from the installation media, the script name does not include a product version.

When you configure the product after an installation, the installation scripts include the product version in the script name.

For example, for the 6.1 version:

```
# /opt/VRTS/install/installsfha61 -configure
```



---

**Note:** The general product installer (`installer`) script does not include the product version.

---

At most points during the installation you can type the following characters for different actions:

- Use `b` (back) to return to a previous section of the installation procedure. The back feature of the installation scripts is context-sensitive, so it returns to the beginning of a grouped section of questions.
- Use `Control+c` to stop and exit the program if an installation procedure hangs. After a short delay, the script exits.
- Use `q` to quit the installer.
- Use `?` to display help information.
- Use the Enter button to accept a default response.

## Prechecking your systems

The installer's precheck option checks for recommended swap space, optimal memory size, and supported operating system versions.

### To use the precheck option

- 1 Mount the media, or navigate to the installation directory.
- 2 You can access the available installer options by entering the following command:

```
# ./installer -help
```

- 3 Use the following command to install on the system where you have root access. You can specify one or more system names to install on a remote system, if secure or Remote Shell access is configured. Enter the following:

```
# ./installer -precheck sys1 sys2
```

- 4 Review the output and make the changes that the installer recommends.

## Installing your Symantec product

To install your Symantec product, prepare the information needed for the installation, and then install your product.

### Preparing information for the installation

- ◆ Before you install your Symantec product, have the following information ready:
  - The system name with the fully-qualified domain name
  - The product license key if there are no plans to use keyless licensing
  - The cluster name and cluster ID (high availability products only)
  - The public NIC device name (high availability products only)
  - The private heartbeat NIC device name (high availability products only)

Using the information you have prepared, follow the next procedure to install your product.

### Installing your product

- 1 Mount the media or navigate to the installation directory.
- 2 From this directory, type the following command to start the installation on the local system. Use this command to install on remote systems if Secure Shell or Remote Shell communication modes are configured:

```
# ./installer
```

- 3 Follow the rest of the prompts to install your product.

## Configuring your Symantec product

The configuration steps differ by product. [Table 2-2](#) provides a high-level view of the configuration steps.

**Table 2-2** Symantec product configuration steps

Product	Configuration Step	Description
Storage Foundation (SF)	None	After the installation is complete, the installer starts the daemons, and the configuration is complete.
Storage Foundation High Availability (SFHA)	Configuring SFHA <ul style="list-style-type: none"> <li>■ Configure NICs.</li> </ul>	Refer to the <i>Symantec Storage Foundation and High Availability Installation Guide</i> .

**Table 2-2** Symantec product configuration steps (*continued*)

Product	Configuration Step	Description
Storage Foundation Cluster File System High Availability (SFCFSHA)	Configuring SFCFSHA <ul style="list-style-type: none"> <li>■ Configure NICs.</li> </ul>	Refer to the <i>Symantec Storage Foundation Cluster File System High Availability Installation Guide</i> .
Dynamic Multi-Pathing (DMP)	None	After the installation is complete, the installer starts the daemons, and the configuration is complete.
Storage Foundation for Oracle RAC (SFRAC)	Configuring SFRAC <ul style="list-style-type: none"> <li>■ Configure NICs.</li> </ul>	Refer to the <i>Symantec Storage Foundation for Oracle RAC Installation and Configuration Guide</i> .
Storage Foundation for Sybase ASE CE (SF Sybase CE)	Configuring SF Sybase CE <ul style="list-style-type: none"> <li>■ Configure NICs.</li> </ul>	Refer to the <i>Symantec Storage Foundation for Sybase ASE CE Installation and Configuration Guide</i> .
Symantec ApplicationHA	None	Symantec ApplicationHA is configured by using a wizard.
Symantec Cluster Server (VCS)	Configuring VCS <ul style="list-style-type: none"> <li>■ Configure NICs.</li> </ul>	Refer to the <i>Symantec Cluster Server Installation Guide</i> .

For additional configuration options, consult the feature-specific user documentation.

- *Symantec Storage Foundation™ and High Availability Solutions 6.1 Virtualization Guide*
- *Symantec Storage Foundation™ and High Availability Solutions 6.1 Solutions Guide*
- *Symantec Storage Foundation™ and High Availability Solutions 6.1 Replication Administrator's Guide*
- *Symantec Storage Foundation™ and High Availability Solutions 6.1 Disaster Recovery Implementation Guide*

- *Symantec Cluster Server 6.1 Installation Guide*

See [“Symantec Storage Foundation and High Availability Solutions product documentation”](#) on page 32.

# Patching and updating

This chapter includes the following topics:

- [Checking installed product versions and downloading maintenance releases and hot fixes](#)
- [Obtaining installer hot fixes](#)

## Checking installed product versions and downloading maintenance releases and hot fixes

Symantec provides a means to check the Symantec RPMs you have installed, and download any needed maintenance releases and hot fixes.

Use the `installer` command with the `-version` option to determine what is installed on your system, and download any needed maintenance releases or hot fixes. After you have installed the current version of the product, you can use the `showversion` script in the `/opt/VRTS/install` directory to find product information.

The `version` option or the `showversion` script checks the specified systems and discovers the following:

- Storage Foundation and High Availability product versions that are installed on the system
- All the required RPMs and the optional Symantec RPMs installed on the system
- Any required or optional RPMs (if applicable) that are not present
- Installed hot fixes
- Available base releases (major or minor)
- Available maintenance releases
- Available hot fix releases

### To check your systems and download maintenance releases and hot fixes

- 1 Mount the media, or navigate to the installation directory.
- 2 Start the installer with the `-version` option.

```
# ./installer -version sys1 sys2
```

For each system, the installer lists all of the installed base releases, maintenance releases, and hot fixes, followed by the lists of available downloads.

- 3 If you have Internet access, follow the prompts to download the available maintenance releases and hot fixes to the local system.
- 4 If you do not have Internet access, you can download any needed maintenance releases and hot fixes from the Symantec Operations Readiness Tools (SORT) Patch Finder page at:

<https://sort.symantec.com/patch/finder>

You can obtain installer hot fixes automatically or manually.

See “[Obtaining installer hot fixes](#)” on page 22.

Downloading maintenance releases and hot fixes requires the installer to make outbound networking calls. You can also disable external network connection attempts.

See “[Disabling external network connection attempts](#)” on page 23.

## Obtaining installer hot fixes

Symantec occasionally finds issues with the Storage Foundation and High Availability Solutions installer, and posts public installer hot fixes on the Symantec Operations Readiness Tools (SORT) website's Patch Finder page at:

<https://sort.symantec.com/patch/finder>

You can access installer hot fixes automatically or manually.

### To download installer hot fixes automatically

- ◆ Starting with Storage Foundation and High Availability Solutions version 6.1, installer hot fixes are downloaded automatically. No action is needed on your part.

If you are running Storage Foundation and High Availability Solutions version 6.1 or later, and your system has Internet access, the installer automatically imports any needed installer hot fix, and begins using it.

Automatically downloading installer hot fixes requires the installer to make outbound networking calls. You can also disable external network connection attempts.

See “[Disabling external network connection attempts](#)” on page 23.

If your system does not have Internet access, you can download installer hot fixes manually.

#### To download installer hot fixes manually

- 1 Go to the Symantec Operations Readiness Tools (SORT) website's Patch Finder page, and save the most current Symantec patch on your local system.
- 2 Navigate to the directory where you want to unzip the file you downloaded in step 1.
- 3 Unzip the patch tar file. For example, run the following command:

```
# gunzip cpi-6.1P2-patches.tar.gz
```

- 4 Untar the file. For example, enter the following:

```
# tar -xvf cpi-6.1P2-patches.tar
patches/
patches/CPI61P2.p1
README
```

- 5 Navigate to the installation media or to the installation directory.
- 6 To start using the patch, run the `installer` command with the `-require` option. For example, enter the following:

```
# ./installer -require /target_directory/patches/CPI61P2.p1
```

## Disabling external network connection attempts

When you execute the `installer` command, the installer attempts to make an outbound networking call to get information about release updates and installer hot fixes. If you know your systems are behind a firewall, or do not want the installer to make outbound networking calls, you can disable external network connection attempts by the installer.

**To disable external network connection attempts**

- ◆ Disable inter-process communication (IPC).

To do this, run the installer with the `-noipc` option.

For example, to disable IPC for system1 (sys1) and system2 (sys2) enter the following:

```
# ./installer -noipc sys1 sys2
```



# Symantec Storage Foundation and High Availability Solutions product overview

This appendix includes the following topics:

- [About the Symantec Storage Foundation and High Availability Solutions products](#)

## About the Symantec Storage Foundation and High Availability Solutions products

Symantec Storage Foundation and High Availability (SFHA) Solutions is a set of products that provide storage administration and management in a heterogeneous storage environment.

This section can help you determine which product you need.

[Table A-1](#) shows the benefits of each product and its components.

**Table A-1** SFHA Solutions product comparisons

Product	Components	Benefits
<p>Symantec Cluster Server (VCS) connects multiple, independent systems into a management framework for increased availability. Each system, or node, runs its own operating system and cooperates at the software level to form a cluster. VCS links commodity hardware with intelligent software to provide application failover and control. When a node or a monitored application fails, other nodes can take predefined actions to take over and bring up services elsewhere in the cluster.</p>	<p>VCS</p>	<ul style="list-style-type: none"> <li>■ Minimizes downtime</li> <li>■ Facilitates the consolidation and the failover of servers</li> <li>■ Effectively manages a wide range of applications in heterogeneous environments</li> <li>■ Provides data integrity protection through I/O fencing</li> </ul>
<p>Dynamic Multi-Pathing (DMP) provides multi-pathing functionality for the devices configured on the system. The product creates DMP metadevices (also known as DMP nodes) to represent all the device paths to the same physical LUN.</p>	<p>DMP</p>	<ul style="list-style-type: none"> <li>■ Extends DMP metadevices to support OS native logical volume managers (LVM)</li> <li>■ Provides improved storage I/O performance with load balancing</li> <li>■ Provides storage path failure protection and fast failover</li> <li>■ Centralizes storage path management regardless of operating system or storage hardware</li> </ul>
<p>Symantec Replicator Option enables cost-effective replication of data over IP networks, giving organizations an extremely flexible, storage hardware independent alternative to traditional array-based replication architectures.</p>	<p>VVR VFR</p>	<p>VVR</p> <ul style="list-style-type: none"> <li>■ Provides block-based continuous replication</li> <li>■ Provides effective bandwidth management</li> <li>■ Supports cross-platform replication, and replication in a Portable Data Container (PDC) environment</li> </ul> <p>VFR</p> <ul style="list-style-type: none"> <li>■ Provides file-based periodic replication</li> <li>■ Supports reversible data transfer</li> <li>■ Deduplication</li> <li>■ Supports protection of the target file system from accidental writes</li> </ul>

**Table A-1** SFHA Solutions product comparisons (*continued*)

Product	Components	Benefits
<p>Storage Foundation (SF) is a storage management offering that consists of Veritas Volume Manager (VxVM), Veritas File System (VxFS), and DMP.</p> <p>Veritas Volume Manager is a storage management subsystem that enables you to manage physical disks and logical unit numbers (LUNs) as logical devices called volumes.</p> <p>Veritas File System is an extent-based, intent logging file system.</p>	DMP, VxVM, VxFS	<ul style="list-style-type: none"> <li>■ Increased storage utilization across heterogeneous environments</li> <li>■ Deduplication and compression</li> <li>■ Automated storage tiering</li> <li>■ Centralized storage management</li> <li>■ Easy OS and storage migration with minimum downtime</li> <li>■ All benefits of DMP</li> </ul>
<p>Storage Foundation High Availability (SFHA) includes all the functionality of SF plus the high availability of VCS.</p>	DMP, VxVM, VxFS, VCS	<ul style="list-style-type: none"> <li>■ All benefits of DMP</li> <li>■ All benefits of SF</li> <li>■ All benefits of VCS</li> </ul>
<p>Storage Foundation Cluster File System High Availability (SFCFSHA) extends Symantec Storage Foundation to support shared data in a storage area network (SAN) environment. Multiple servers can concurrently access shared storage and files transparently to applications.</p> <p>Cluster Volume Manager (CVM) extends VxVM to support shared disk groups. Cluster File System (CFS) extends VxFS to support parallel clusters.</p>	DMP, VxVM, VxFS, VCS, CVM, SFCFSHA	<ul style="list-style-type: none"> <li>■ All benefits of DMP</li> <li>■ All benefits of SF</li> <li>■ All benefits of VCS</li> <li>■ Increased automation and intelligent management of availability and performance across shared storage</li> </ul>
<p>Storage Foundation for Oracle RAC (SFRAC) is an integrated suite of Symantec storage management and high-availability software. The software is engineered to improve performance, availability, and manageability of Real Application Cluster (RAC) environments.</p>	DMP, VxVM, VxFS, VCS, CVM, SFCFSHA, plus support for Oracle RAC	<ul style="list-style-type: none"> <li>■ All benefits of DMP</li> <li>■ All benefits of SF</li> <li>■ All benefits of VCS</li> <li>■ All benefits of SFCFSHA</li> <li>■ Support for Oracle RAC that simplifies database management while fully integrating with the Oracle clustering solution</li> </ul>
<p>Storage Foundation for Sybase ASE CE is an integrated suite of Symantec storage management and high-availability software. The software is engineered to improve performance, availability, and manageability of Sybase ASE CE on UNIX platforms.</p>	DMP, VxVM, VxFS, VCS, CVM, SFCFSHA, plus support for Sybase ASE CE	<ul style="list-style-type: none"> <li>■ All benefits of DMP</li> <li>■ All benefits of SF</li> <li>■ All benefits of VCS</li> <li>■ All benefits of SFCFSHA</li> <li>■ Support for SF Sybase ASE CE that simplifies database management while fully integrating with the Sybase clustering solution</li> </ul>

**Table A-1** SFHA Solutions product comparisons (*continued*)

Product	Components	Benefits
<p>Symantec ApplicationHA provides monitoring capabilities for applications running inside virtual machines in the virtualization environment. Symantec ApplicationHA adds a layer of application awareness to the core high availability functionality that is offered by Symantec Cluster Server (VCS) in the physical host. Symantec ApplicationHA is based on VCS, and uses similar concepts such as agents, resources, and service groups. However, Symantec ApplicationHA has a lightweight server footprint that enables faster installation and configuration in virtualization environments.</p>	<p>Symantec ApplicationHA, VCS</p>	<ul style="list-style-type: none"> <li>■ Out of the box integration with VCS</li> <li>■ Full visibility and control over applications with the ability to start, stop, and monitor applications running inside virtual machines</li> <li>■ High availability of the application as well as the virtual machine inside which the application runs</li> <li>■ Graded application fault-management responses</li> <li>■ Standardized way to manage applications using a single interface that is integrated with the Veritas Operations Manager console</li> <li>■ Specialized Application Maintenance mode, in which Symantec ApplicationHA enables you to intentionally take an application out of its purview for maintenance or troubleshooting</li> </ul>
<p>Veritas Operations Manager provides a centralized management console for Symantec Storage Foundation and High Availability products. You can use Veritas Operations Manager to monitor, visualize, and manage storage resources and generate reports.</p>	<p>All</p>	<ul style="list-style-type: none"> <li>■ Centralized, standardized way to manage the various features in the Storage Foundation products</li> <li>■ Visual interface for managing individual hosts and their storage</li> <li>■ Visibility into all instances of Storage Foundation that are running in the datacenter, across multiple operating system platforms</li> </ul>

**Table A-1** SFHA Solutions product comparisons (*continued*)

Product	Components	Benefits
<p>Symantec Cluster Server (VCS) agents provide high availability for specific resources and applications. Each agent manages resources of a particular type. Typically, agents start, stop, and monitor resources and report state changes.</p> <p>In addition to the agents that are provided in this release, other agents are available through an independent Symantec offering called the Symantec High Availability Agent Pack. The agent pack includes the currently shipping agents and is re-released quarterly to add the new agents that are now under development.</p> <p>You can download the latest agents from the Symantec Operations Readiness (SORT) website at:  <a href="https://sort.symantec.com/agents">https://sort.symantec.com/agents</a></p>	VCS, Symantec ApplicationHA	<ul style="list-style-type: none"> <li>■ All benefits of VCS</li> <li>■ All benefits of Symantec ApplicationHA</li> </ul>

# How the discs are organized

This appendix includes the following topics:

- [Contents of the media kit](#)
- [Directory structure](#)

## Contents of the media kit

Symantec Storage Foundation and High Availability Solutions includes several products.

The physical media kit includes multiple software discs. The contents of each disc are shown on the disc label.

Read this guide and the release notes for your product before you begin an installation procedure.

Symantec Storage Foundation and High Availability is a licensed product. Refer to the End User License Agreement (EULA) in the product directories for the terms and the conditions that govern the use of the product.

## Directory structure

[Table B-1](#) lists the directory and contents of the Symantec Storage Foundation and High Availability Solutions product suite.

These are contained in directories for each supported operating system or architecture.

**Table B-1** Storage Foundation and High Availability Solutions directories

Directory name or file name	Contents
docs	User documentation for all products on the release
copyright	The Copyright (©) file
installer	Product installation script
perl	Perl language binaries and library functions
scripts	Symantec scripts
webinstaller	GUI web-based installer
windows	Volume Replicator Advisor Windows client
xprt1	xprt1d binaries used by the web-based installer
<product>	Scripts related to each product.

# Where to find more information

This appendix includes the following topics:

- [Symantec Storage Foundation and High Availability Solutions product documentation](#)
- [Documentation set](#)
- [Service and support](#)
- [About Symantec Operations Readiness Tools](#)

## Symantec Storage Foundation and High Availability Solutions product documentation

Symantec Storage Foundation and High Availability Solutions product documentation is available in the Adobe Portable Document Format (PDF) on the product discs or with the downloaded software.

See the release notes for information on documentation changes in this release.

The documentation is available in the `/docs` directory.

Make sure that you are using the current version of documentation. The document version appears on page 2 of each guide. The publication date appears on the title page of each document. Symantec updates the product documents periodically for any errors or corrections. The latest product documentation is available on the Symantec website.

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



## Documentation set

Each product in the Storage Foundation and High Availability Solutions product line includes release notes, an installation guide, and additional documents such as administration and agent guides. In most cases, you may also need to refer to the documentation for the product's components.

The SFHA Solutions documents describe functionality and solutions that apply across the product line. These documents are relevant whichever SFHA Solutions product you use.

### Symantec Storage Foundation for Oracle RAC documentation

[Table C-1](#) lists the documentation for Symantec Storage Foundation for Oracle RAC.

**Table C-1** Symantec Storage Foundation for Oracle RAC documentation

Document title	File name	Description
<i>Symantec Storage Foundation for Oracle RAC Release Notes</i>	sfrac_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Storage Foundation for Oracle RAC Installation and Configuration Guide</i>	sfrac_install_61_lin.pdf	Provides information required to install and configure the product.
<i>Symantec Storage Foundation for Oracle RAC Administrator's Guide</i>	sfrac_admin_61_lin.pdf	Provides information required for administering and troubleshooting the product.

The SFHA Solutions documents describe functionality and solutions relevant to the SF Oracle RAC product.

See [Table C-7](#) on page 37.

### Symantec Storage Foundation Cluster File System High Availability documentation

[Table C-2](#) lists the documentation for Symantec Storage Foundation Cluster File System High Availability.

The SFHA Solutions documents describe functionality and solutions relevant to the SFCFSHA product.

See [Table C-7](#) on page 37.

**Table C-2** Symantec Storage Foundation Cluster File System High Availability documentation

Document title	File name	Description
<i>Symantec Storage Foundation Cluster File System High Availability Release Notes</i>	sfdfs_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Storage Foundation Cluster File System High Availability Installation Guide</i>	sfdfs_install_61_lin.pdf	Provides information required to install the product.
<i>Symantec Storage Foundation Cluster File System High Availability Administrator's Guide</i>	sfdfs_admin_61_lin.pdf	Provides information required for administering the product.

## Storage Foundation and High Availability

[Table C-3](#) lists the documentation for Symantec Storage Foundation and High Availability.

For cluster administration, refer to the Symantec Cluster Server Administrator's Guide

See [the section called "Symantec Cluster Server documentation"](#) on page 35.

For storage administration, refer to the Symantec Storage Foundation Administrator's Guide.

See [the section called "Symantec Storage Foundation documentation"](#) on page 36.

The SFHA Solutions documents describe functionality and solutions relevant to the SFHA product.

See [Table C-7](#) on page 37.

**Table C-3** Symantec Storage Foundation and High Availability documentation

Document title	File name	Description
<i>Symantec Storage Foundation and High Availability Release Notes</i>	sfha_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Storage Foundation and High Availability Installation Guide</i>	sfha_install_61_lin.pdf	Provides information required to install the product.

## Symantec Cluster Server documentation

Table C-4 lists the documents for Symantec Cluster Server.

**Table C-4** Symantec Cluster Server documentation

Title	File name	Description
<i>Symantec Cluster Server Release Notes</i>	vcs_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Cluster Server Installation Guide</i>	vcs_install_61_lin.pdf	Provides information required to install the product.
<i>Symantec Cluster Server Administrator's Guide</i>	vcs_admin_61_lin.pdf	Provides information required for administering the product.
<i>Symantec High Availability Solution Guide for VMware</i>	sha_solutions_61_vmware_lin.pdf	Provides information on how to install, configure, and administer Symantec Cluster Server in a VMware virtual environment, by using the VMware vSphere Client GUI.
<i>Symantec Cluster Server Bundled Agents Reference Guide</i>	vcs_bundled_agents_61_lin.pdf	Provides information about bundled agents, their resources and attributes, and more related information.
<i>Symantec Cluster Server Generic Application Agent Configuration Guide</i>	vcs_gen_agent_61_lin.pdf	Provides notes for installing and configuring the generic Application agent.
<i>Symantec Cluster Server Agent Developer's Guide</i> (This document is available online only.)	vcs_agent_dev_61_unix.pdf	Provides information about the various Symantec agents and procedures for developing custom agents.
<i>Symantec Cluster Server Agent for DB2 Installation and Configuration Guide</i>	vcs_db2_agent_61_lin.pdf	Provides notes for installing and configuring the DB2 agent.
<i>Symantec Cluster Server Agent for Oracle Installation and Configuration Guide</i>	vcs_oracle_agent_61_lin.pdf	Provides notes for installing and configuring the Oracle agent.
<i>Symantec Cluster Server Agent for Sybase Installation and Configuration Guide</i>	vcs_sybase_agent_61_lin.pdf	Provides notes for installing and configuring the Sybase agent.

## Symantec Dynamic Multi-Pathing documentation

[Table C-5](#) lists the documentation for Symantec Dynamic Multi-Pathing.

**Table C-5** Symantec Dynamic Multi-Pathing documentation

Document title	File name	Description
<i>Symantec Dynamic Multi-Pathing Release Notes</i>	dmp_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Dynamic Multi-Pathing Installation Guide</i>	dmp_install_61_lin.pdf	Provides information required to install the product.
<i>Symantec Dynamic Multi-Pathing Administrator's Guide</i>	dmp_admin_61_lin.pdf	Provides information required for administering the product.

## Symantec Storage Foundation documentation

[Table C-6](#) lists the documentation for Symantec Storage Foundation.

**Table C-6** Symantec Storage Foundation documentation

Document title	File name	Description
<i>Symantec Storage Foundation Release Notes</i>	sf_notes_61_lin.pdf	Provides release information such as system requirements, changes, fixed incidents, known issues, and limitations of the product.
<i>Symantec Storage Foundation Installation Guide</i>	sf_install_61_lin.pdf	Provides information required to install the product.
<i>Symantec Storage Foundation Administrator's Guide</i>	sf_admin_61_lin.pdf	Provides information required for administering the product.
<i>Symantec Storage Foundation: Storage and Availability Management for DB2 Databases</i>	sfhas_db2_admin_61_unix.pdf	Provides information about the deployment and key use cases of the SFDB tools with Storage Foundation High Availability (SFHA) Solutions products in DB2 database environments. It is a supplemental guide to be used in conjunction with SFHA Solutions product guides.

**Table C-6** Symantec Storage Foundation documentation (*continued*)

Document title	File name	Description
<i>Symantec Storage Foundation: Storage and Availability Management for Oracle Databases</i>	sfhas_oracle_admin_61_unix.pdf	Provides information about the deployment and key use cases of the SFDB tools with Storage Foundation High Availability (SFHA) Solutions products in Oracle database environments. It is a supplemental guide to be used in conjunction with SFHA Solutions product guides.
<i>Veritas File System Programmer's Reference Guide</i> (This document is available online only.)	vxfs_ref_61_lin.pdf	Provides developers with the information necessary to use the application programming interfaces (APIs) to modify and tune various features and components of the Veritas File System.

## Symantec Storage Foundation and High Availability Solutions products documentation

[Table C-7](#) lists the documentation for Symantec Storage Foundation and High Availability Solutions products.

**Table C-7** Symantec Storage Foundation and High Availability Solutions products documentation

Document title	File name	Description
<i>Symantec Storage Foundation and High Availability Solutions—What's new in this release</i> (This document is available online.)	sfhas_whats_new_61_unix.pdf	Provides information about the new features and enhancements in the release.
<i>Symantec Storage Foundation and High Availability Solutions Getting Started Guide</i>	getting_started.pdf	Provides a high-level overview of installing Symantec products using the Veritas script-based installer. The guide is useful for new users and returning users that want a quick refresher.
<i>Symantec Storage Foundation and High Availability Solutions Solutions Guide</i>	sfhas_solutions_61_lin.pdf	Provides information about how SFHA Solutions product components and features can be used individually and in concert to improve performance, resilience and ease of management for storage and applications.

**Table C-7** Symantec Storage Foundation and High Availability Solutions products documentation (*continued*)

Document title	File name	Description
<i>Symantec Storage Foundation and High Availability Solutions Virtualization Guide</i> (This document is available online.)	sfhas_virtualization_61_lin.pdf	Provides information about Symantec Storage Foundation and High Availability support for virtualization technologies. Review this entire document before you install virtualization software on systems running SFHA products.
<i>Symantec Storage Foundation and High Availability Solutions SmartIO for Solid State Drives Solutions Guide</i>	sfhas_smartio_solutions_61_lin.pdf	Provides information on using and administering SmartIO with SFHA solutions. Also includes troubleshooting and command reference sheet for SmartIO.
<i>Symantec Storage Foundation and High Availability Solutions Disaster Recovery Implementation Guide</i> (This document is available online.)	sfhas_dr_impl_61_lin.pdf	Provides information on configuring campus clusters, global clusters, and replicated data clusters (RDC) for disaster recovery failover using Storage Foundation and High Availability Solutions products.
<i>Symantec Storage Foundation and High Availability Solutions Replication Administrator's Guide</i>	sfhas_replication_admin_61_lin.pdf	Provides information on using Symantec Replicator Option for setting up an effective disaster recovery plan by maintaining a consistent copy of application data at one or more remote locations. Symantec Replicator Option provides the flexibility of block-based continuous replication with Symantec Volume Replicator Option (VVR) and file-based periodic replication with Symantec File Replicator Option (VFR).
<i>Symantec Storage Foundation and High Availability Solutions Troubleshooting Guide</i>	sfhas_tshoot_61_lin.pdf	Provides information on common issues that might be encountered when using Symantec Storage Foundation and High Availability Solutions and possible solutions for those issues.

## Symantec ApplicationHA documentation

Table C-8 lists the documentation for Symantec ApplicationHA.

**Table C-8** Symantec ApplicationHA documentation

Document title	File name	Description
<i>Symantec ApplicationHA Release Notes</i>	applicationha_notes_61_vmware_lin.pdf	Describes the new features and software and system requirements. This document also contains a list of limitations and issues known at the time of the release.
<i>Symantec ApplicationHA Installation and Upgrade Guide</i>	applicationha_install_61_vmware_lin.pdf	Describes the steps for installing and configuring and managing Symantec ApplicationHA. Some of the most common troubleshooting steps are also documented in this guide.
<i>Symantec ApplicationHA User's Guide</i>	applicationha_users_61_vmware_lin.pdf	Provides information about configuring ApplicationHA in a local VMware cluster environment and the VMware site recovery environment. Some of the most common troubleshooting steps are also documented in the guide.
<i>Symantec ApplicationHA Agent for Oracle Configuration Guide</i>	applicationha_oracle_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for Oracle.
<i>Symantec ApplicationHA Agent for SAP NetWeaver Configuration Guide</i>	applicationha_sap_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for SAP NetWeaver.
<i>Symantec ApplicationHA Agent for WebLogic Server Configuration Guide</i>	applicationha_weblogicserver_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for WebLogic Server.
<i>Symantec ApplicationHA Generic Agent Configuration Guide</i>	applicationha_gen_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for a generic application.
<i>Symantec ApplicationHA Agent for WebSphere MQ Configuration Guide</i>	applicationha_webspheremq_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for WebSphere MQ.
<i>Symantec ApplicationHA Agent for WebSphere Application Server Configuration Guide</i>	applicationha_websphereas_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for WebSphere Application Server.
<i>Symantec ApplicationHA Agent for DB2 Configuration Guide</i>	applicationha_db2_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for DB2.
<i>Symantec ApplicationHA Agent for Apache HTTP Server Configuration Guide</i>	applicationha_apache_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for Apache HTTP Server.

**Table C-8** Symantec ApplicationHA documentation (*continued*)

Document title	File name	Description
<i>Symantec™ ApplicationHA Agent for JBoss Application Server Configuration Guide</i>	applicationha_jboss_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for JBoss Application Server.
<i>Symantec™ ApplicationHA Agent for MySQL Configuration Guide</i>	applicationha_mysql_agent_61_vmware_lin.pdf	Describes how to configure application monitoring for MySQL.
<i>Symantec ApplicationHA Release Notes</i>	applicationha_notes_61_kvm_lin.pdf	Describes the new features and software and system requirements. This document also contains a list of limitations and issues known at the time of the release.
<i>Symantec ApplicationHA Installation Guide</i>	applicationha_install_61_kvm_lin.pdf	Describes the steps for installing and configuring Symantec ApplicationHA. Some of the most common troubleshooting steps are also documented in this guide.
<i>Symantec ApplicationHA User's Guide</i>	applicationha_users_61_kvm_lin.pdf	Provides information about configuring and managing Symantec ApplicationHA in Kernel-based Virtual Machine (KVM) virtualization environments. Some of the most common troubleshooting steps are also documented in the guide.
<i>Symantec ApplicationHA Agent for Oracle Configuration Guide</i>	applicationha_oracle_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for Oracle.
<i>Symantec ApplicationHA Generic Agent Configuration Guide</i>	applicationha_gen_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for a generic application.
<i>Symantec ApplicationHA Agent for WebSphere MQ Configuration Guide</i>	applicationha_webspheremq_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for WebSphere MQ.
<i>Symantec ApplicationHA Agent for WebSphere Application Server Configuration Guide</i>	applicationha_websphereas_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for WebSphere Application Server.
<i>Symantec ApplicationHA Agent for DB2 Configuration Guide</i>	applicationha_db2_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for DB2.
<i>Symantec ApplicationHA Agent for Apache HTTP Server Configuration Guide</i>	applicationha_apache_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for Apache HTTP Server.



**Table C-8** Symantec ApplicationHA documentation (*continued*)

Document title	File name	Description
Symantec™ ApplicationHA Agent for MySQL Configuration Guide  (This document is available online)	applicationha_mysql_agent_61_kvm_lin.pdf	Describes how to configure application monitoring for MySQL.

Veritas Operations Manager (VOM) is a management tool that you can use to manage Symantec Storage Foundation and High Availability Solutions products. If you use VOM, refer to the VOM product documentation at:

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

## Service and support

To access the self-service knowledge base, go to the following URL:

<http://entsupport.symantec.com>

## About Symantec Operations Readiness Tools

Symantec Operations Readiness Tools (SORT) is a website that automates and simplifies some of the most time-consuming administrative tasks. SORT helps you manage your datacenter more efficiently and get the most out of your Symantec products.

SORT can help you do the following:

- Prepare for your next installation or upgrade
  - List product installation and upgrade requirements, including operating system versions, memory, disk space, and architecture.
  - Analyze systems to determine if they are ready to install or upgrade Symantec products and generate an Installation and Upgrade custom report.
  - List patches by product or platform, and in the order they need to be installed. Display and download the most recent patches or historical patches.
  - Display Array Support Library (ASL) details by vendor, platform, or Storage Foundation and High Availability (SFHA) version. ASLs make it easier to manage arrays that are connected to SFHA-based servers.
  - List VCS and ApplicationHA agents, documentation, and downloads based on the agent type, application, and platform.

Identify risks and get server-specific recommendations

- Analyze your servers for potential environmental risks. Generate a Risk Assessment custom report with specific recommendations about system availability, storage use, performance, and best practices.
- Display descriptions and solutions for thousands of Symantec error codes.

Improve efficiency

- Get automatic email notifications about changes to patches, array-specific modules (ASLs/APMs/DDIs/DDLs), documentation, product releases, Hardware Compatibility Lists (HCLs), and VCS/ApplicationHA agents.
- Quickly gather installed Symantec product and license key information from across your production environment. Generate a License/Deployment custom report that includes product names, versions, and platforms, server tiers, Symantec Performance Value Units (SPVUs), and End of Service Life dates.
- List and download Symantec product documentation including product guides, manual pages, compatibility lists, and support articles.
- Access links to important resources on a single page, including Symantec product support, SymConnect forums, customer care, Symantec training and education, Symantec FileConnect, the licensing portal, and my.symantec.com. The page also includes links to key vendor support sites.
- Use a subset of SORT features from your iOS device. Download the application at:  
<https://sort.symantec.com/mobile>

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**Note:** Certain features of SORT are not available for all products. Access to SORT is available at no extra cost.

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To access SORT, go to:

<https://sort.symantec.com>