

# Veritas Storage Foundation™ and High Availability Solutions 6.0.1 Getting Started Guide - Linux

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

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# 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
- Upgrade assurance that delivers software upgrades
- 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 Web site 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 [customercare\\_apac@symantec.com](mailto:customercare_apac@symantec.com)

Europe, Middle-East, and Africa [semea@symantec.com](mailto:semea@symantec.com)

North America and Latin America [supportolutions@symantec.com](mailto:supportsolutions@symantec.com)

## 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 Web site.

<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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# About Storage Foundation and High Availability Solutions 6.0.1

This chapter includes the following topics:

- [About Veritas Storage Foundation and High Availability products](#)
- [Related products](#)

## About Veritas Storage Foundation and High Availability products

The following sections describe the products and component software available in this Veritas Storage Foundation and High Availability Solutions release.

### About Veritas Storage Foundation

Veritas Storage Foundation by Symantec includes Veritas File System (VxFS) and Veritas Volume Manager (VxVM.)

Veritas File System is a high performance journaling file system that provides easy management and quick-recovery for applications. Veritas File System delivers scalable performance, continuous availability, increased I/O throughput, and structural integrity.

Veritas Volume Manager removes the physical limitations of disk storage. You can configure, share, manage, and optimize storage I/O performance online without interrupting data availability. Veritas Volume Manager also provides easy-to-use, online storage management tools to reduce downtime.

VxFS and VxVM are included in all Veritas Storage Foundation products. If you have purchased a Veritas Storage Foundation product, VxFS and VxVM are installed and updated as part of that product. Do not install or update them as individual components.

Veritas Storage Foundation includes the dynamic multi-pathing functionality.

The Veritas Replicator option, which replicates data to remote locations over an IP network, can also be licensed with this product.

Before you install the product, read the *Veritas Storage Foundation Release Notes*.

To install the product, follow the instructions in the *Veritas Storage Foundation Installation Guide*.

See “[Product documentation](#)” on page 21.

## About Veritas Cluster Server

Veritas Cluster Server (VCS) by Symantec is a clustering solution that provides the following benefits:

- Minimizes downtime.
- Facilitates the consolidation and the failover of servers.
- Effectively manages a wide range of applications in heterogeneous environments.

Before you install the product, read the *Veritas Cluster Server Release Notes*.

To install the product, follow the instructions in the *Veritas Cluster Server Installation Guide*.

See “[Product documentation](#)” on page 21.

### Installation overview

Veritas Cluster Server is available as a standalone product. It is also included in all Veritas Storage Foundation product suites that include high availability functionality. If you have purchased a product suite that includes high availability functionality, VCS is installed and updated as part of that product suite; do not install or update VCS as an individual component.

## About Veritas Cluster Server agents

Veritas agents provide high availability for specific resources and applications. Each agent manages resources of a particular type. For example, the Oracle agent manages Oracle databases. Typically, agents start, stop, and monitor resources and report state changes.

Before you install VCS agents, review the configuration guide for the agent.

See “[Product documentation](#)” on page 21.

In addition to the agents that are provided in this release, other agents are available through an independent Symantec offering called the Veritas Cluster Server 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.

Contact your Symantec sales representative for the following details:

- Agents that are included in the agent pack
- Agents under development
- Agents available through Symantec Consulting Services

You can download the latest agents from the Symantec Operations Readiness Tools website:

[sort.symantec.com/agents](http://sort.symantec.com/agents)

## Installation overview

Agents are typically installed as part of Storage Foundation products that include high availability.

For example, the high availability agent for Oracle is installed with the Storage Foundation for Oracle RAC product.

## About Veritas Storage Foundation High Availability

Storage Foundation High Availability includes Veritas Storage Foundation and Veritas Cluster Server. Veritas Cluster Server adds high availability functionality to Storage Foundation products.

Before you install the product, read the *Veritas Storage Foundation and High Availability Release Notes*.

To install the product, follow the instructions in the *Veritas Storage Foundation and High Availability Installation Guide*.

For HA installations, also read the *Veritas Cluster Server Release Notes*.

See “[Product documentation](#)” on page 21.

## About Veritas Storage Foundation Cluster File System High Availability

Veritas Storage Foundation Cluster File System High Availability by Symantec extends Veritas Storage Foundation to support shared data in a storage area network (SAN) environment. Using Storage Foundation Cluster File System High

Availability, multiple servers can concurrently access shared storage and files transparently to applications.

Veritas Storage Foundation Cluster File System High Availability also provides increased automation and intelligent management of availability and performance.

Storage Foundation Cluster File System High Availability includes Veritas Cluster Server, which adds high availability functionality to the product.

Veritas Replicator Option can also be licensed with this product.

Before you install the product, read the *Veritas Storage Foundation Cluster File System High Availability Release Notes*.

To install the product, follow the instructions in the *Veritas Storage Foundation Cluster File System High Availability Installation Guide*.

For information on high availability environments, read the Veritas Cluster Server documentation.

See [“Product documentation”](#) on page 21.

## About Veritas Storage Foundation for Oracle® RAC

Veritas Storage Foundation for Oracle® RAC by Symantec is an integrated suite of Veritas storage management and high-availability software. The software is engineered to improve performance, availability, and manageability of Real Application Cluster (RAC) environments. Certified by Oracle Corporation, Veritas Storage Foundation for Oracle RAC delivers a flexible solution that makes it easy to deploy and manage RAC.

The Veritas Replicator feature, which replicates data, can also be licensed with this product.

Before you start the installation, read the *Veritas Storage Foundation for Oracle RAC Release Notes*.

To install the product, follow the instructions in the *Veritas Storage Foundation for Oracle RAC Installation Guide*.

See [“Product documentation”](#) on page 21.

## About Veritas Storage Foundation for Sybase CE

Veritas Storage Foundation for Sybase Adaptive Server Enterprise Cluster Edition (SF Sybase CE) by Symantec leverages proprietary storage management and high availability technologies to enable robust, manageable, and scalable deployment of Sybase ASE CE.

SF Sybase CE integrates existing Symantec storage management and clustering technologies into a flexible solution which you can use to create a standard towards application and database management in datacenters . The product simplifies database management while fully integrating with Sybase clustering solution.

Before you install this product, read the *Veritas Storage Foundation for Sybase CE Release Notes*.

To install this product, follow the instructions in the *Veritas storage Foundation for Sybase CE Installation Guide*.

See “[Product documentation](#)” on page 21.

## About Veritas Replicator Option

Veritas Replicator Option is an optional, separately-licensable feature.

Veritas File Replicator enables replication at the file level over IP networks. File Replicator leverages data duplication, provided by Veritas File System, to reduce the impact of replication on network resources.

Veritas Volume Replicator replicates data to remote locations over any standard IP network to provide continuous data availability.

This option is available with Storage Foundation for Oracle RAC, Storage Foundation Cluster File System, and Storage Foundation Standard and Enterprise products.

Before installing this option, read the Release Notes for the product.

To install the option, follow the instructions in the Installation Guide for the product.

See “[Product documentation](#)” on page 21.

## About Symantec VirtualStore

Symantec VirtualStore serves as a highly scalable, highly available NAS solution that is optimized for deploying and hosting virtual machines. VirtualStore is built on top of Veritas Storage Foundation Cluster File System, which provides high availability and linear scalability across the cluster.

Before installing this product, read the *Symantec VirtualStore Release Notes*.

To install the product, follow the instructions in the *Symantec VirtualStore Installation and Configuration Guide*.

See “[Product documentation](#)” on page 21.

## About Veritas Dynamic Multi-Pathing

Veritas Dynamic Multi-Pathing (DMP) provides multi-pathing functionality for the operating system native 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.

In earlier releases, DMP was only available as a feature of Veritas Volume Manager (VxVM). DMP supported VxVM volumes on DMP metadevices, and Veritas File System (VxFS) file systems on those volumes.

Symantec now extends DMP metadevices to support OS native logical volume managers (LVM). You can create LVM volumes and volume groups on DMP metadevices.

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**Note:** Veritas Dynamic Multi-Pathing is a standalone product. Support for dynamic multi-pathing is also included in Veritas Storage Foundation products.

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Before you install this product, review the *Veritas Dynamic Multi-Pathing Release Notes*.

To install the product, follow the instructions in the *Veritas Dynamic Multi-Pathing Installation Guide*.

See “[Product documentation](#)” on page 21.

## Related products

This section describes related products for Storage Foundation and High Availability Solutions.

### About Veritas Storage Foundation Basic

Veritas Storage Foundation Basic by Symantec (SF Basic) is a special product that is available for download from the Symantec Web site. SF Basic is not part of the Storage Foundation and High Availability Solutions product suite. Storage Foundation Basic supports all Storage Foundation Standard features, however, there are deployment and technical support limitations.

For complete information on ordering this product, licensing, and technical support, visit the following URL:

<http://www.symantec.com/business/storage-foundation-basic>

See “[Product documentation](#)” on page 21.

## About Veritas Operations Manager

Veritas Operations Manager provides a centralized management console for Veritas Storage Foundation and High Availability products. You can use Veritas Operations Manager to monitor, visualize, and manage storage resources and generate reports.

Symantec recommends using Veritas Operations Manager (VOM) to manage Storage Foundation and Cluster Server environments.

You can download Veritas Operations Manager at no charge at <http://go.symantec.com/vom>.

Refer to the Veritas Operations Manager documentation for installation, upgrade, and configuration instructions.

The Veritas Enterprise Administrator (VEA) console is no longer packaged with Storage Foundation products. If you want to continue using VEA, a software version is available for download from [http://go.symantec.com/vcsm\\_download](http://go.symantec.com/vcsm_download). Veritas Storage Foundation Management Server is deprecated.

If you want to manage a single cluster using Cluster Manager (Java Console), a version is available for download from [http://go.symantec.com/vcsm\\_download](http://go.symantec.com/vcsm_download). You cannot manage the new features of this release using the Java Console. Veritas Cluster Server Management Console is deprecated.

**Related products**



# How the discs are organized

This chapter includes the following topics:

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

## Contents of the media kit

Veritas 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 the Getting Started Guide and Release Notes for your product before you begin an installation procedure.

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

## Directory structure

[Table 2-1](#) lists the directory and contents of the Veritas Storage Foundation and High Availability Solutions product suite.

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

**Table 2-1** 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                     | Veritas scripts                                    |
| webinstaller                | GUI Web-based installer                            |
| windows                     | Volume Replicator advisor Windows client           |
| xprtl                       | xprtld binaries used by the Web-based installer    |
| <product>                   | Packages and scripts related to each product.      |

# Installation overview

This chapter includes the following topics:

- [Performing preinstallation checks and configuration](#)
- [About the Veritas installer](#)
- [About the Web-based installer](#)

## Performing preinstallation checks and configuration

Only users with superuser (or root) privileges can install and initialize Storage Foundation and High Availability Solutions products.

Review the preinstallation requirements and system requirements. Install the operating system before installing the software.

Mount the software disc, or download and uncompress the software.

To produce a report of the preinstallation requirements, go to the installer directory and run the installer with the `precheck` option.

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

If patches to the operating system are required, the patches should be applied prior to installing the Veritas products. Patches may be required to resolve kernel, product performance, or other issues.

The system should be in a quiescent state before adding patches.

See the product *Release Notes* for last minute information on recommended patches.

You must obtain new licenses to use all of the features in this release of Veritas Storage Foundation and High Availability Solutions. Licenses for previous releases may allow you to use only a limited subset of these features.

## About the Veritas installer

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

- The general product installer. The general product installer enables you to install and configure SFHA Solutions products, verify preinstallation requirements, and view product description. You perform the installation from a disc, and you are prompted to choose a product to install.
- Product-specific installation scripts. If you obtained a standalone Veritas product from an electronic download site, the single product download files do not contain the general product installer. Use the product installation script to install the product. Note that the name of the script differs depending on whether you run the script from the install media or from a system on which the product software is installed. See the Installation Guide for additional information.

## About the Web-based installer

The Web-based installer is a convenient GUI method to install the Veritas products and to verify preinstallation requirements.

The Web-based installer can perform most of the tasks that the script-based installer performs.

Use the `webinstaller` script to start and stop the Veritas XPortal Server `xprtlwid` process. The `webinstaller` script can also be used to check the status of the XPortal Server.

When the `webinstaller` script starts the `xprtlwid` process, the script displays a URL. Use this URL to access the Web-based installer from a Web browser such as Internet Explorer or FireFox.

The Web installer creates log files whenever the Web installer is operating. While the installation processes are operating, the log files are located in a session-based directory under the `/var/tmp` directory. After the install process completes, the log files are located in the `/opt/VRTS/install/logs` directory. It is recommended that you keep the files for auditing, debugging, and future use.

The location of the Veritas XPortal Server configuration file is `/var/opt/webinstaller/xprtlwid.conf`.

# Where to find more information

This chapter includes the following topics:

- [Product documentation](#)
- [Documentation set](#)
- [Service and support](#)
- [About Symantec Operations Readiness Tools](#)

## Product documentation

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. The latest product documentation is available on the Symantec website.

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

## Documentation set

[Table 4-1](#) lists the documentation for Veritas Storage Foundation and High Availability Solutions products. Note that all documents are not bundled with the media. You can find all documentation online.

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

If you use Veritas Operations Manager (VOM) to manage Veritas Storage Foundation and High Availability Solutions products, refer to the VOM product documentation.

**Table 4-1** Veritas Storage Foundation and High Availability Solutions products documentation

| Document title   | File name                       |
|--|---------------------------------|
| <b>Veritas Storage Foundation documentation</b>  |                                 |
| <i>Veritas Storage Foundation Release Notes</i>  | sf_notes_601_lin.pdf            |
| <i>Veritas Storage Foundation Installation Guide</i>   | sf_install_601_lin.pdf          |
| <i>Veritas Storage Foundation Administrator's Guide</i>                                      | sf_admin_601_lin.pdf            |
| <i>Veritas Storage Foundation: Storage and Availability Management for Oracle Databases</i>  | sfhas_oracle_admin_601_unix.pdf |
| <i>Veritas File System Programmer's Reference Guide</i> (This document is available online.) | vxfs_ref_601_lin.pdf            |
| <b>Veritas Cluster Server documentation</b>  |                                 |
| <i>Veritas Cluster Server Release Notes</i>  | vcs_notes_601_lin.pdf           |
| <i>Veritas Cluster Server Installation Guide</i>   | vcs_install_601_lin.pdf         |
| <i>Veritas Cluster Server Administrator's Guide</i>  | vcs_admin_601_lin.pdf           |
| <i>Veritas Cluster Server Bundled Agents Reference Guide</i>                                 | vcs_bundled_agents_601_lin.pdf  |
| <i>Veritas Cluster Server Agent Developer's Guide</i> (This document is available online.)   | vcs_agent_dev_601_unix.pdf      |
| <i>Veritas Cluster Server Agent for DB2 Installation and Configuration Guide</i>             | vcs_db2_agent_601_lin.pdf       |
| <i>Veritas Cluster Server Agent for Oracle Installation and Configuration Guide</i>          | vcs_oracle_agent_601_lin.pdf    |
| <i>Veritas Cluster Server Agent for Sybase Installation and Configuration Guide</i>          | vcs_sybase_agent_601_lin.pdf    |
| <b>Veritas Storage Foundation and High Availability documentation</b>                        |                                 |
| <i>Veritas Storage Foundation and High Availability Release Notes</i>                        | sfha_notes_601_lin.pdf          |
| <i>Veritas Storage Foundation and High Availability Installation and Configuration Guide</i> | sfha_install_601_lin.pdf        |

**Table 4-1** Veritas Storage Foundation and High Availability Solutions products documentation (*continued*)

| <b>Document title</b>  | <b>File name</b>                    |
|--|-------------------------------------|
| <b>Veritas Storage Foundation Cluster File System High Availability documentation</b>                    |                                     |
| <i>Veritas Storage Foundation Cluster File System High Availability Release Notes</i>                    | sfdfs_notes_601_lin.pdf             |
| <i>Veritas Storage Foundation Cluster File System High Availability Installation Guide</i>               | sfdfs_install_601_lin.pdf           |
| <i>Veritas Storage Foundation Cluster File System High Availability Administrator's Guide</i>            | sfdfs_admin_601_lin.pdf             |
| <b>Veritas Storage Foundation and High Availability Solutions documentation</b>                          |                                     |
| <i>Veritas Storage Foundation and High Availability Solutions Getting Started Guide</i>                  | getting_started.pdf                 |
| <i>Veritas Storage Foundation and High Availability Solutions Solutions Guide</i>                        | sfhas_solutions_601_lin.pdf         |
| <i>Veritas Storage Foundation and High Availability Solutions Virtualization Guide</i>                   | sfha_virtualization_601_lin.pdf     |
| <i>Veritas Storage Foundation and High Availability Solutions Disaster Recovery Implementation Guide</i> | sfhas_dr_impl_601_lin.pdf           |
| <i>Veritas Storage Foundation and High Availability Solutions Replication Administrator's Guide</i>      | sfhas_replication_admin_601_lin.pdf |
| <i>Veritas Storage Foundation and High Availability Solutions Troubleshooting Guide</i>                  | sfhas_tshoot__601_lin.pdf           |
| <b>Veritas Storage Foundation for Oracle RAC documentation</b>   |                                     |
| <i>Veritas Storage Foundation for Oracle RAC Release Notes</i>   | sfrac_notes_601_lin.pdf             |
| <i>Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide</i>                    | sfrac_install_601_lin.pdf           |
| <i>Veritas Storage Foundation for Oracle RAC Administrator's Guide</i>                                   | sfrac_admin_601_lin.pdf             |
| <b>Veritas Storage Foundation for Sybase ASE CE documentation</b>  |                                     |
| <i>Veritas Storage Foundation for Sybase ASE CE Release Notes</i>  | sfsybasece_notes_601_lin.pdf        |
| <i>Veritas Storage Foundation for Sybase ASE CE Installation and Configuration Guide</i>                 | sfsybasece_install_601_lin.pdf      |
| <i>Veritas Storage Foundation for Sybase ASE CE Administrator's Guide</i>                                | sfsybasece_admin_601_lin.pdf        |
| <b>Veritas Dynamic Multi-Pathing documentation</b>   |                                     |

**Table 4-1** Veritas Storage Foundation and High Availability Solutions products documentation (*continued*)

| Document title  | File name                        |
|---|----------------------------------|
| <i>Veritas Dynamic Multi-Pathing Release Notes</i>                | dmp_notes_601_lin.pdf            |
| <i>Veritas Dynamic Multi-Pathing Installation Guide</i>           | dmp_install_601_lin.pdf          |
| <i>Veritas Dynamic Multi-Pathing Administrator's Guide</i>        | dmp_admin_601_lin.pdf            |
| <b>Symantec VirtualStore documentation</b>                        |                                  |
| <i>Symantec VirtualStore Release Notes</i>                        | virtualstore_notes_601_lin.pdf   |
| <i>Symantec VirtualStore Installation and Configuration Guide</i> | virtualstore_install_601_lin.pdf |
| <i>Symantec VirtualStore Administrator's Guide</i>                | virtualstore_admin_601_lin.pdf   |

## 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 Web site 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:

- |  |   |
|--|---|
| <p>Prepare for your next installation or upgrade</p> | <ul style="list-style-type: none"> <li>■ List product installation and upgrade requirements, including operating system versions, memory, disk space, and architecture.</li> <li>■ Analyze systems to determine if they are ready to install or upgrade Symantec products.</li> <li>■ Download the latest patches, documentation, and high availability agents from a central repository.</li> <li>■ Access up-to-date compatibility lists for hardware, software, databases, and operating systems.</li> </ul> |
|--|---|



- |                    |  |
|--------------------|--|
| Manage risks       | <ul style="list-style-type: none"><li>■ Get automatic email notifications about changes to patches, array-specific modules (ASLs/APMs/DDIs/DDLs), and high availability agents from a central repository.</li><li>■ Identify and mitigate system and environmental risks.</li><li>■ Display descriptions and solutions for hundreds of Symantec error codes.</li></ul> |
| Improve efficiency | <ul style="list-style-type: none"><li>■ Find and download patches based on product version and platform.</li><li>■ List installed Symantec products and license keys.</li><li>■ Tune and optimize your environment.</li></ul>  |

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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>

