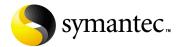# Veritas™ Storage Foundation and High Availability Solutions Getting Started Guide

Solaris

5.0

symantec™

Veritas Storage Foundation and High Availability Solutions
Getting Started Guide

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Licensing and registration

Veritas Storage Foundation and High Availability Solutions are licensed products. See the product installation guides for information on product licensing and license installation instructions.

Technical support

For technical assistance, visit http://support.veritas.com and select phone or email support. Select a product to use the Knowledge Base Search feature to access resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and the customer email notification service. If you encounter an error when using a product, include the error number preceding the message when contacting Technical Services. You can also use the error number to search for information in TechNotes or documents on the website.

Contents

Storage Foundation and High Availability Solutions

Veritas Storage Foundation and High Availability Solutions are a group of products used for enterprise data management and protection, failover and high availability, and backup applications. This guide provides an overview of the products in this release and the contents of the product software discs. It also explains how to obtain a product license and describes the methods for installing Veritas products.

Note: A PDF version of this guide (`getting_started.pdf`) is available at the top level of each Storage Foundation and High Availability Solutions product software disc. Before you install any Veritas product, read this entire document.

Veritas Storage Foundation and High Availability Solutions includes the following products. After reading the licensing and installation methods sections, go to the indicated page for product information.

- Veritas Cluster Server on page 26
- Veritas high availability agents on page 27
- Veritas Volume Replicator on page 29
- Veritas Storage Foundation on page 30 (includes Veritas File System and Veritas Volume Manager)
- Veritas Storage Foundation for DB2 on page 34
- Veritas Storage Foundation for Oracle on page 35
- Veritas Storage Foundation for Sybase on page 36
- Storage Foundation Cluster File System on page 37
- Storage Foundation for Oracle RAC on page 38

> **Note:** To obtain and install Storage Foundation Basic, see "Veritas Storage Foundation Basic" on page 32 for information on product availability.

What's included

To familiarize yourself with a Veritas product and its installation procedure, do the following:

■   Read "How to license Symantec products" on page 9. You must obtain a license key before installing any Veritas product.

■   Read "Installation methods" on page 13 for instructions on installing your Veritas product.

■   The Symantec products contained in this kit are listed under "Storage Foundation and High Availability Solutions" on page 7. Go to the section describing your product to find the location of the product release notes and installation guide. Read the release notes and installation guide before installing a product.

■   Review "Known issues" on page 44 before installing any product for information on software issues that may affect all products in this release.

■   Read "Additional product information" on page 22 for a description of other features in the Storage Foundation and High Availability Solutions product kit.

How to license Symantec products

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. 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 procedures describe how to activate the key. If you encounter problems while licensing a product, visit the Symantec licensing support website at:

http://www.veritas.com/buy/vLicense/vLicenseHome.jhtml

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 features and their descriptions encoded in a license key

Even though other products are included on the enclosed software discs, you can only install the Symantec software products for which you have purchased a license.

Operating system requirements

This release of Veritas products operates on the Solaris 8, Solaris 9, and Solaris 10 operating systems on SPARC platforms.

See the Veritas product release notes for more information.

Software disc contents

The Veritas Storage Foundation and High Availability Solutions media kit includes multiple software discs. The contents of each disc is shown on the disc label.

The location of the installation guide and release notes for each product is given in the corresponding product sections listed under "Storage Foundation and High Availability Solutions" on page 7. Read the installation guide and release notes for your product before beginning an installation procedure.

Note: You can install only the Veritas software products for which you have purchased a license, even though other products are included on the enclosed software discs.

Veritas Disc	Contents
Product disc	Veritas Cluster Server Veritas Cluster Server Central Management Console Veritas File System Veritas Volume Manager Veritas Volume Replicator Veritas Storage Foundation Veritas Storage Foundation for DB2 Veritas Storage Foundation for Oracle Veritas Storage Foundation for Sybase Veritas Storage Foundation Cluster File System Veritas Storage Foundation for Oracle RAC (Real Application Clusters) Symantec Product Authentication Service
Documentation disc	The Veritas documentation disc provides searchable, HTML documentation for each product in this release. Printable PDF documents are also included on the disc. All documentation is organized by product groups. The documents are also on the disc in PDF format under the product directories. You can view and print selected PDF files using Acrobat Reader. If you insert the documentation disc in a Microsoft Windows system drive, the autorun feature displays the page with information on how to search. To use the documentation disc on a Solaris system, mount the disc (see Mounting a software disc on page 13). Review the documentation disc README in the top-level directory.

Veritas Disc	Contents
Language discs	**Note:** Not available in every release.
	Veritas products are partially or wholly localized in Japanese, French, and Simplified Chinese. If you purchase a Veritas non-English language product, a language disc and a language documentation disc are included in the Storage Foundation and High Availability Solutions kit. The language disc contains localized packages that must be installed for Veritas products to operate in the supported locale. The language documentation disc contains translated product guides (see "Documentation disc" above).
Maintenance Pack disc	**Note:** Not available in every release.
	If you have a Veritas Storage Foundation and High Availability Solutions maintenance release, the kit contains a disc with software patches or updated packages. After installing the product, mount the maintenance software disc. Go to the appropriate product directory and review the release notes for upgrade instructions.

Mounting a software disc

Veritas software is provided on a DVD format disc.

To mount the software disc

1 Log in as superuser.

2 Place the Veritas software disc containing your product into a DVD drive connected to your system.

3 If Solaris volume management software is running on your system, the software disc automatically mounts as /cdrom/cdrom0.

4 If Solaris volume management software is not available to mount the DVD, you must mount it manually. After inserting the software disc, enter:

    # **mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom**
    where c0t6d0s2 is the default address for the disc drive.

5 Change to the appropriate directory and product subdirectory to view the product release notes and installation guides.

Installation methods

There are two ways to install Veritas products:

■ Using the product installer

■ Invoking product installation scripts from the command line

See the product installation guides for information on the other installation methods.

Note: Do not make /opt a VxFS file system.

There are also two installation modes:

■ Single node local

■ Multiple remote target systems

You install products remotely using SSH or RSH. For shell configuration information, see "Configuring SSH or RSH before installing products" on page 39.

Using the product installer

The product installer displays a menu that simplifies the selection of installation and upgrade options. It is the recommended installation method. Selecting a product to install or upgrade from the menu invokes that product's installation script.

Note: If you are using the Veritas Enterprise Administrator (VEA) GUI on your system, stop the VEA service before performing a new installation, an uninstall, or an upgrade. To stop the VEA service, on each system type the following command:

/opt/VRTS/bin/vxsvcctrl stop

To use the product installer

1   Locate the name of the product to install on the product software disc. Insert the disc into a drive attached to your system and mount it (see Mounting a software disc on page 13).

2   To change to the cdrom directory, type the following command:
    #   **cd /cdrom/cdrom0**

3   From the cdrom directory, do one of the following. To invoke the installer script using SSH (recommended), type the following command:
    # **./installer**
    To invoke the installer script using RSH, type the following command:
    # **./installer -rsh**

4 The product installer displays a list of products and their installation and licensing status as shown in the example below. A list of tasks to perform follows the product status:

```
Storage Foundation and High Availability Solutions 5.0

Symantec Product                        Version Installed  Licensed
==================================================================
Veritas Cluster Server                          4.1         yes
Veritas Volume Replicator                       no          no
Veritas Storage Foundation                      4.1         yes
Veritas Storage Foundation for Oracle           no          no
Veritas Storage Foundation Cluster File System  no    no
Veritas Storage Foundation for Oracle RAC   no          no

I) Install/Upgrade a Product  C) Configure an Installed Product
L) License a Product          P) Perform a Preinstallation Check
U) Uninstall a Product        D) View a Product Description
Q) Quit                       ?) Help

Enter a Task: [I,C,L,P,U,D,Q,?] i
```

Select a task. Enter (?) to display option descriptions.
It is highly recommended that you run the preinstallation check for all systems before installing a product.

5 If you select I, the list of products and options to install is displayed:

```
Storage Foundation and High Availability Solutions 5.0

1) Veritas Cluster Server
2) Veritas File System
3) Veritas Volume Manager
4) Veritas Volume Replicator
5) Veritas Storage Foundation
6) Veritas Storage Foundation for Oracle
7) Veritas Storage Foundation for DB2
8) Veritas Storage Foundation for Sybase
9) Veritas Storage Foundation Cluster File System
10) Veritas Storage Foundation for Oracle RAC
11) Veritas Cluster Management Console
12) Web Server for Storage Foundation Host Management
13) Symantec Product Authentication Service
b)  Back to previous menu

Select a product to install: [1-13,b,q] q
```

Select "**b**" ("back") to return to a previous section of an installation procedure. This feature is context-sensitive, so it returns to the beginning of a grouped section of questions. If an installation procedure hangs, use **Control–c** to stop and exit the program.

6   Enter the number of the product to install and press Return. Follow the instructions described in your product installation guide.

Installation options

The installer provides three installation options:

- Install required packages
- Install required and optional packages
- Install additional packages to allow easy upgrade to higher product level

Install required packages

This option installs only the packages required to operate the licensed product.

Install required and optional packages

This option also installs optional packages, such as documentation and client features, that are not required to operate the licensed product.

Install additional packages

This option installs all packages of higher product level. For example, if you install Storage Foundation for Oracle, you can install additional packages for Storage Foundation for Oracle RAC. This enables you to upgrade simply by entering an additional product license key. Even though the extra packages are installed, only the selected product and its licensed options are configured. This is the default option.

Command line installation

You can also install Veritas products by running the following installation scripts from the command line:

`installcmc`	Veritas Cluster Server Management Console
`installfs`	Veritas File System
`installsf`	Veritas Storage Foundation
`installsfcfs`	Veritas Storage Foundation Cluster File System
`installsfdb2`	Veritas Storage Foundation for DB2
`installsfora`	Veritas Storage Foundation for Oracle
`installsfrac`	Veritas Storage Foundation for Oracle RAC
`installsfsyb`	Veritas Storage Foundation for Sybase
`installvcs`	Veritas Cluster Server
`installvm`	Veritas Volume Manager
`installvvr`	Veritas Volume Replicator

Before you begin an installation using a command-line script, read the product release notes and installation guide.

Command line options

Table 3-1 lists the options available when using the product installation script. Installation script command usage takes the following form:

installation_script [*system1 system2...*] [*options*]

installation_script can be any product installation script or the product installer. For an initial install or upgrade, options are not typically required.

Table 3-1   Product installer command line options

Command Line Option	Function
system1 system2...	Specifies the systems on which to run the installation options. A system name is required for all options. If not specified, the command prompts for a system name.
–configure	Configures the product after installing using the `-installonly` option.
–enckeyfile *encryption_key_file*	See the `-responsefile` and the `-encrypt` options.
–encrypt *password*	Encrypts *password* using the encryption key provided with the `-enckeyfile` option so that the encrypted password can be stored in response files.
–installpkgs	Displays all product packages in correct installation order. Output can be used to create scripts for command line installs, or for installations over a network. See the `requiredpkgs` option.
–installonly	Installs packages, but does not configure the product.
–keyfile *ssh_key_file*	Specifies a key file for secure shell (SSH) installs. This option passes `-i ssh_key_file` to every SSH invocation.
–license	Registers or updates product licenses on the specified systems.
–logpath *log_path*	Specifies a directory other than `/opt/VRTS/install/logs` as the location where installer log files, summary files, and response files are saved.
–noextrapkgs	Additional packages can be installed so that you can upgrade to another Symantec product simply by installing a new license. The `–noextrapkgs` option bypasses installation of extra product packages to simplify future maintenance updates.

Table 3-1   Product installer command line options

Command Line Option	Function
–nolic	Allows installation of product packages without entering a license key. Licensed features cannot be configured, started, or used when this option is specified.
–nooptionalpkgs	Bypasses installation of optional product packages such as user documentation and manual pages.
–nostart	Bypasses startup of the product following installation and configuration.
–patchpath *patch_path*	Designates the path of a directory that contains all patches to install. The directory is typically an NFS-mounted location and must be accessible all specified installation systems.
–pkgpath *package_path*	Designates the path of a directory that contains all packages to install. The directory is typically an NFS-mounted location and must be accessible all specified installation systems.
–precheck	Performs a preinstallation check to determine if systems meet all installation requirements. Symantec recommends doing a precheck before installing a product.
–requiredpkgs	Displays all required product packages in correct installation order. Optional packages are not listed. Output can be used to create scripts for command line installs, or for installations over a network. See `installpkgs` option.
–responsefile *response_file* [–enckeyfile *encryption_key_file*]	Automates installation and configuration by using system and configuration information stored in a specified file instead of prompting for information. The *response_file* must be a full path name. If not specified, the response file is automatically generated as `installerer`*number*`.response.` *number* is random. You must edit the response file to use it for subsequent installations. Variable field definitions are defined within the file. The `-enckeyfile` option and *encryption_key_file* name are required with the `-responsefile` option when the response file contains encrypted passwords.

Table 3-1   Product installer command line options

Command Line Option	Function
–rootpath *root_path*	Specifies an alternative root directory on which to install packages. On Solaris operating systems, `-rootpath` passes `-R path` to `pkgadd`. On HP-UX operating systems, `-rootpath` passes `-I path` to `swinstall`. The `-rootpath` option is not supported on AIX or Linux operating systems.
–rsh	Specify this option when you want to use RSH and RCP for communication between systems instead of the default SSH and SCP. The `-rsh` option requires that systems be preconfigured so that commands between systems execute without prompting for passwords or confirmations.
–tmppath *tmp_path*	Specifies a directory other than `/var/tmp` as the working directory for the installation scripts. This destination is where initial logging is performed and where packages are copied on remote systems before installation.

Log files

After every product installation, the installer creates three text files:

■ Installation log file

■ Response file

■ Summary file

The name and location of each file is displayed at the end of a product installation, and are always located in the `/opt/VRTS/install/logs` directory. It is recommended that you keep the files for auditing, debugging, and future use.

Using the installation log file

The installation log file contains all commands executed during the procedure, their output, and errors generated by the commands. This file is for debugging installation problems and can be used for analysis by Veritas Support.

Using the response file

The response file contains the configuration information that you entered during the procedure. You can use the response file for future installation procedures by invoking an installation script with the `responsefile` option. The response file passes arguments to the script to automate the installation of that product. You can edit the file to automate installation and configuration of additional systems.

Using the summary file

The summary file contains the output of the product installation scripts. This file shows the products that were installed, the location of the log and response files related to a particular installation, and messages displayed at the end of installation. You can use the summary file to prepare for running Veritas software following installation.

Additional product information

The following sections contain important information about Veritas Storage Foundation and High Availability Solutions products.

Locating and displaying documentation

Veritas documents are in Adobe Portable Document Format (PDF) on the enclosed discs. You can access product documentation in the following ways:

■ Mount the appropriate product software disc and go to the *product_name*/release_notes for release notes or the *product_name*/docs directory for installation guides.

> **Note:** Release notes and installation guides are not installed with the documentation packages. Veritas recommends that you copy them to the /opt/VRTS/docs directory so that they are available for future reference.

■ After a product documentation package is installed, access the user and administration guides under the /opt/VRTS/docs directory.
Localized documentation packages are installed under the /opt/VRTS/docs/*language_dir* directory. The *language_dir* can be "ja" for Japanese, "fr" for French, or "zh" for simplified Chinese.

■ Mount the "Documentation disc," which contains all product guides and release notes.

Ordering documents

You can purchase hard copy software guides by contacting your salesperson or by ordering directly from the Veritas Web Store at:

http://webstore.veritas.com.

Documentation feedback

Email comments about this guide to:

sf_docs@symantec.com.

Installing language products

If you purchase a non-English language version of Veritas Storage Foundation and High Availability Solutions, the product also includes a language disc and a language documentation disc. You install Veritas language packages using the installation script, `install_lp`, on the language disc.

After you install a Veritas product, mount the language package disc and run the command-line installation script. The script detects any installed Veritas products and automatically installs the corresponding language packages.

Note: The `install_lp` script does not install French and Simplified Chinese packages.

See the *Veritas Storage Foundation Installation Guide* for more information.

About Veritas products

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

Component software

Symantec Product Authentication Service

The Symantec Product Authentication Service is a common Veritas feature that validates identities based on existing network operating system domains (such as NIS and NT) or private domains. The authentication service protects communication channels among Symantec application clients and services through message integrity and confidentiality services.

Before you install the authentication service, read the Storage Foundation and High Availability Solutions appendix in the *Symantec Product Authentication Service Installation Guide* located at:

```
authentication_service/docs/vxat_install.pdf
```

Also read the installation guide an release notes for the product you are installing before selecting this method of setting up the authentication service.

Storage Foundation Management Server

Storage Foundation Management Server (SF Management Server) provides a centralized management console for Veritas Storage Foundation products. You can use SF Management Server to monitor, visualize, and manage storage resources and generate reports about those resources. You are prompted to set up an optional SF Management Server managed host during every Storage Foundation product installation. SF Management Server is not available on the Storage Foundation and High Availability Solutions release and must be obtained separately. For information on ordering SF Management Server, visit:

www.symantec.com/enterprise/sfms

Cluster Management Console

The Veritas Cluster Server Cluster Management Console enables administration and analysis of all clusters in an enterprise from a single console using any supported web browser. Review the following guide for installation information:

```
cluster_server/docs/vcs_install.pdf
```

Web Server for Storage Foundation Host Management

Web Server for Storage Foundation Host Management provides web-based management capabilities for Storage Foundation products. After installing the web server, you can remotely administer Storage Foundation products without requiring a client-side installation.

Veritas Cluster Server

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the Cluster Server release notes and installation guide:

- `cluster_server/release_notes/vcs_notes.pdf`

- `cluster_server/docs/vcs_install.pdf`

Note: Cluster Server is included in all Veritas high availability (HA) products. If you have purchased a Veritas product suite that includes Cluster Server, it is installed and updated as part of that product suite. Do not install or update it as an individual component.

About this product

Veritas Cluster Server by Symantec (VCS) is an open systems clustering solution that eliminates downtime, facilitates server consolidation and failover, and effectively manages a wide range of applications in heterogeneous environments.

Veritas high availability agents

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

The high availability agents are in the `cluster_server_agents` directory. You cannot install or configure agents using the product installer. Before you start the installation, read the relevant agent installation and configuration guide:

- `cluster_server_agents/db2_agent/docs/vcs_db2_install.pdf`
- `cluster_server_agents/oracle_agent/docs/vcs_oracle_install.pdf`
- `cluster_server_agents/sybase_agent/docs/vcs_sybase_install.pdf`

Note: Agents are typically installed as part of a Storage Foundation product. For example, the high availability agent for Oracle is installed with the Storage Foundation for Oracle RAC product.

About this product

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

In addition to the database agents 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 new agents that are now under development. Contact your Symantec sales representative for information about application and replication agents included in the agent pack, agents under development, and agents available through Symantec consulting services.

Supported high availability agents

Table 3-2 lists the supported high availability agents.

Table 3-2   Supported high availability agents

Agent	Agent version	VCS version			Application		OS		
		4.0	4.1	5.0			8	9	10
DB2	5.0	p	p	s	DB2 Enterprise Server Edition	8.1, 8.2, 9.1	s	s	s
Oracle	5.0	p	p	s	Oracle	9*i*, 10g R1, 10g R2	s	s	s
Sybase	5.0	p	p	s	Sybase Adaptive Server	12.5.x, 15	s	s	s

s — supported configuration   p — supported by previous version of the agent

Refer to this table for supported application and operating system versions. Before configuring an high availability agent with VCS, verify that you have the latest agent version.

Veritas Volume Replicator

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the product release notes and installation guide:

- `volume_replicator/release_notes/vvr_notes.pdf`

- `volume_replicator/docs/vvr_install.pdf`

About this product

Veritas Volume Replicator by Symantec is an optional, separately-licensable feature of Veritas Volume Manager. Volume Replicator is a fully integrated component of Veritas Volume Manager that replicates data to remote locations over any standard IP network to provide continuous data availability.

The Volume Replicator option is available with Veritas Storage Foundation Standard and Enterprise offerings.

Veritas Storage Foundation

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the component product release notes and installation guides:

■ `storage_foundation/release_notes/sf_notes.pdf`

■ `storage_foundation/docs/sf_install.pdf`

■ `storage_foundation/release_notes/vcs_notes.pdf` (for HA installations)

■ `storage_foundation/docs/vcs_install.pdf` (for HA installations)

About this product

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

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 so that 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.

You add high availability functionality to Storage Foundation HA by installing Veritas Cluster Server software.

Note: 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 has the following four offerings:

■ Storage Foundation Standard

■ Storage Foundation Standard HA

■ Storage Foundation Enterprise

■ Storage Foundation Enterprise HA

Table 3-3 lists the Veritas products and optionally licensed features available with each Storage Foundation version.

Table 3-3   Storage Foundation offerings

Storage Foundation version	Products and features
Storage Foundation Standard	Veritas File System Veritas Volume Manager **Optionally licensed features:** Veritas Volume Replicator Option
Storage Foundation Standard HA	Veritas File System Veritas Volume Manager Veritas Cluster Server **Optionally licensed features:** Veritas Volume Replicator Option
Storage Foundation Enterprise	Veritas File System Veritas Volume Manager **Optionally licensed features:** Veritas Volume Replicator Option
Storage Foundation Enterprise HA	Veritas File System Veritas Volume Manager Veritas Cluster Server **Optionally licensed features:** Veritas Volume Replicator Option

Veritas Storage Foundation Basic

Veritas Storage Foundation Basic by Symantec (SF Basic) is a special offering that is available on a separate Storage Foundation Basic disc or downloadable from the Symantec website. SF Basic is not part of the Storage Foundation and High Availability Solutions product suite. For complete information on ordering this product, licensing, and technical support, visit:

www.symantec.com/enterprise/sfbasic

You can use SF Basic with Veritas Storage Foundation Management Server to set up a centrally managed host to monitor, visualize, and manage storage resources across multiple installations. SF Management Server is a separately available product. For information on ordering SF Management Server, visit the following Symantec website:

www.symantec.com/enterprise/sfms

About this product

Storage Foundation Basic supports all Storage Foundation Standard features, however, there are deployment, licensing, and technical support limitations.

Limited deployment

SF Basic deployment is limited to the following configurations:

- Maximum four VxVM volumes per physical server (excluding system volumes required for booting root disks)

- Maximum four VxFS file systems per physical server (excluding root file systems)

- Maximum server capacity of two CPU sockets

Licensing

SF Basic includes a limited-use license. Customers must comply with the terms stated in the End-User License Agreement.

Technical support

Technical support is self-service only, available from the Veritas Support website. You can purchase additional support corresponding to the terms of the Storage Foundation Basic license. To access the self-service knowledge base, go to:

http://support.veritas.com

When contacting Support with questions relating to Storage Foundation Basic, be prepared to provide your product license key. You can determine your currently installed license by running the Veritas license report utility as shown in the following example:

```
# vxlicrep
....
License Key    = WXYZ-9999-WXY7-WXYZ-WXYZ-WX3
Product Name   = Veritas Storage Foundation Basic
```

Installation overview

The Veritas Storage Foundation software is on the Veritas Storage Foundation Basic disc. You cannot install SF Basic if another Veritas Storage Foundation product is installed unless that product is first removed from the system.

Read the *Storage Foundation Installation Guide* guide on the Storage Foundation Basic disc before starting the installation:

```
storage_foundation/docs/sf_install.pdf
```

Upgrade paths

Storage Foundation Basic provides the following upgrade paths:

- Upgrade from SF Basic to Storage Foundation Standard or Storage Foundation Enterprise simply by installing the appropriate license key.

- Upgrade from SF Basic to Storage Foundation Enterprise plus Veritas Volume Replicator by installing the appropriate license keys and products.

- Upgrade from SF Basic to any other Storage Foundation product by uninstalling SF Basic and installing the newly licensed product (see "Installation methods" on page 13).

To determine the release level of any Storage Foundation product installed on your system, run the vxlicrep command.

See the *Storage Foundation Installation Guide* for more information on upgrades.

Veritas Storage Foundation for DB2

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the component product release notes and installation guides:

- `storage_foundation/release_notes/sf_notes.pdf`

- `storage_foundation/docs/sf_install.pdf`

- `storage_foundation/release_notes/vcs_notes.pdf` (for HA installations)

- `storage_foundation/docs/vcs_install.pdf` (for HA installations)

About this product

Veritas Storage Foundation for DB2® by Symantec is an integrated set of system software enhancements and configuration guidelines that combine to help DB2 database administrators configure a database system with high performance, availability, manageability, and the reliability provided by Veritas software products.

You add high availability functionality to Storage Foundation for DB2 HA by installing Veritas Cluster Server software.

Veritas Storage Foundation for Oracle

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the component product release notes and installation guides:

■　`storage_foundation/release_notes/sf_notes.pdf`

■　`storage_foundation/docs/sf_install.pdf`

■　`storage_foundation/release_notes/vcs_notes.pdf` (for HA installations)

■　`storage_foundation/docs/vcs_install.pdf` (for HA installations)

About this product

Veritas Storage Foundation for Oracle® by Symantec is an integrated set of system software enhancements and configuration guidelines that combine to help Oracle database administrators configure a database system with high performance, availability, manageability, and the reliability provided by Veritas software products.

You add high availability functionality to Storage Foundation for Oracle HA by installing Veritas Cluster Server software.

Veritas Storage Foundation for Sybase

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the product release notes and installation guides:

■   `storage_foundation/release_notes/sf_notes.pdf`

■   `storage_foundation/docs/sf_install.pdf`

■   `storage_foundation/release_notes/vcs_notes.pdf` (for HA installations)

■   `storage_foundation/docs/vcs_install.pdf` (for HA installations)

About this product

Veritas Storage Foundation for Sybase® by Symantec is an integrated set of system software enhancements and configuration guidelines that combine to help Sybase database administrators configure a database system with high performance, availability, manageability, and the reliability provided by Veritas software products.

You add high availability functionality to Storage Foundation for Sybase HA by installing Veritas Cluster Server software.

Storage Foundation Cluster File System

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the component product release notes and installation guides:

■ storage_foundation_cluster_file_system/release_notes/sfcfs_notes.pdf

■ storage_foundation_cluster_file_system/release_notes/sf_notes.pdf

■ storage_foundation_cluster_file_system/release_notes/vcs_notes.pdf

■ storage_foundation_cluster_file_system/docs/sfcfs_install.pdf

About this product

Veritas Storage Foundation Cluster File System by Symantec extends Veritas File System and Veritas Volume Manager to support shared data in a Storage Area Network (SAN) environment. Using Storage Foundation Cluster File System, multiple servers can concurrently access shared storage and files transparently to applications.

Storage Foundation Cluster File System HA adds the failover functionality of Veritas Cluster Server, which can protect everything from a single critical database instance to very large multiple-application clusters in networked environments. Veritas Storage Foundation Cluster File System also provides increased automation and intelligent management of availability and performance.

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

Storage Foundation for Oracle RAC

Before you install this product, review "Mounting a software disc" on page 13 and "Installation methods" on page 13.

Installation overview

Before you start the installation, read the component product release notes and installation guide:

- ■ `storage_foundation_for_oracle_rac/release_notes/sfrac_notes.pdf`

- ■ `storage_foundation_for_oracle_rac/release_notes/sf_notes.pdf`

- ■ `storage_foundation_for_oracle_rac/release_notes/vcs_notes.pdf`

- ■ `storage_foundation_for_oracle_rac/docs/sfrac_install.pdf`

About this product

Veritas Storage Foundation for Oracle® RAC by Symantec is an integrated suite of Veritas storage management and high-availability software, 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 simple to deploy and manage RAC.

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

Configuring SSH or RSH before installing products

You can install Veritas products to remote systems using either secure shell (SSH) or remote shell (RSH). SSH is the default and recommended method of installation.

Enabling SSH

The SSH program lets you log into and execute commands on a remote system. SSH enables encrypted communications and an authentication process between two untrusted hosts over an insecure network. SSH is the preferred method of remote communication because it provides a greater level of security than the RSH suite of protocols. Veritas recommends configuring a secure shell environment before installing any Veritas product. The following is an example SSH setup procedure.

Note: Read the SSH documentation and online manual pages before enabling SSH. Visit the OpenSSH website for more information. Contact your OS support provider for issues regarding SSH configuration.

For Solaris 8, SSH must be obtained from a third-party vendor.

To enable SSH

1   Log in as root on the source system from which you want to install the Veritas product.

2   To generate a DSA key pair on the source system, type the following:
    # **ssh-keygen -t dsa**
    System output similar to the following is displayed:
    ```
    Generating public/private dsa key pair.
    Enter file in which to save the key (//.ssh/id_dsa):
    ```

3   Press Enter to accept the default location of /.ssh/id_dsa. System output similar to the following is displayed:
    ```
    Enter passphrase (empty for no passphrase):
    ```

4   Do not enter a passphrase. Press Enter:
    ```
    Enter same passphrase again:
    ```
    Press Enter again.

5   Make sure the `/.ssh` directory is on all the target installation systems. If
    that directory is missing, create it on the target system and set the write
    permission to root only:

    ```
    # mkdir /.ssh
    # chmod go-w /
    # chmod 700 /.ssh
    # chmod go-rwx /.ssh
    ```

6   Make sure the secure file transfer program (SFTP) is enabled on all the
    target installation systems. To enable SFTP, the `/etc/ssh/sshd_config`
    file must contain the following two lines:

    ```
    PermitRootLogin  yes
    Subsystem        sftp      /usr/lib/ssh/sftp-server
    ```

7   If the lines are not there, add them and restart SSH. To restart SSH on
    Solaris 10, type the following command:

    ```
    # svcadm restart ssh
    ```

    To restart on Solaris 9, type the following commands:

    ```
    # /etc/init.d/sshd stop
    # /etc/init.d/sshd start
    ```

8   To copy the public DSA key, `/.ssh/id_dsa.pub` to each target system,
    type the following commands:

    ```
    # sftp target_sys
    ```

    If this is the first time this step is run on a system, output similar to the
    following displays:

    ```
    Connecting to target_sys...
    The authenticity of host 'target_sys (10.182.00.00)'
    can't be established. DSA key fingerprint is
    fb:6f:9e:61:91:9e:44:6b:87:86:ef:68:a6:fd:87:7d.
    Are you sure you want to continue connecting (yes/no)?
    ```

9   Enter `yes`. Output similar to the following is displayed:

    ```
    Warning: Permanently added 'target_sys,10.182.00.00'
    (DSA) to the list of known hosts.
    root@target_sys password:
    ```

10 Enter the root password.

11 At the `sftp` prompt, type the following command:

    ```
    sftp> put /.ssh/id_dsa.pub
    ```

    The following output is displayed:

    ```
    Uploading /.ssh/id_dsa.pub to /id_dsa.pub
    ```

12 To quit the SFTP session, type the following command:

    ```
    sftp> quit
    ```

13 To begin the `ssh` session on the target system, type the following command:

`# `**`ssh target_sys`**

14 Enter the root password at the prompt:

`password:`

15 After logging in, enter the following command to append the authorization key to the `id_dsa.pub` file:

`# `**`cat /id_dsa.pub >> /.ssh/authorized_keys`**

16 To delete the `id_dsa.pub` public key file after it is copied to the target (host) system and added to the authorized keys file, type the following command:

`# `**`rm /id_dsa.pub`**

17 To log out of the `ssh` session, type the following command:

`# `**`exit`**

18 When installing from a source system that is also an installation target, add the local system `id_dsa.pub` key to the local `/.ssh/authorized_key` file. The installation can fail if the installation source system is not authenticated.

19 Run the following commands on the source installation system. These commands bring the private key into the shell environment and makes the key globally available for the user `root`:

`# `**`exec /usr/bin/ssh-agent $SHELL`**
`# `**`ssh-add`**
`Identity added: /.ssh/identity`

This is a shell-specific step and is valid only while the shell is active. You must execute the procedure again if you close the shell during the session.

20 To verify that you can connect to the target system, type the following command:

`# `**`ssh -l root target_sys uname -a`**

The commands should execute on the remote system without the system requesting a passphrase or password.

Enabling and Disabling RSH

The following section describes how to enable remote shell on Solaris system. See the operating system documentation for more information on configuring remote shell.

1   To determine the current status of rsh and rlogin, type the following command:

    # **inetadm | grep -i login**

    If the service is enabled, the following line is displayed:

    enabled online svc:/network/login:rlogin

    If the service is not enabled, the following line is displayed:

    disabled disabled svc:/network/login:rlogin

2   To enable a disabled rsh/rlogin service, type the following command:

    # **inetadm -e rlogin**

3   To disable an enabled rsh/rlogin service, type the following command:

    # **inetadm -d rlogin**

4   Modify the .rhosts file. A separate .rhosts file is in the $HOME directory of each user and must be modified for each user who will remotely access the system using RSH. Each line of the .rhosts file contains a fully qualified domain name or IP address for each remote system having access to the local system. For example, if the root user must remotely access system1 from system2, you must add an entry for system2.*companyname*.com in the .rhosts file on system1.

    # **echo "system2.*companyname*.com" >> $HOME/.rhosts**

5   After completing an installation procedure, delete the .rhosts file from each user's $HOME directory to ensure security:

    # **rm -f $HOME/.rhosts**

Disc directory structure

Table 3-4 lists the directory and contents of the Veritas Storage Foundation and High Availability Solutions 5.0 disc.

Table 3-4   Storage Foundation and High Availability Solutions disc directories

Directory name	Contents
authentication_service	Symantec Authentication Services packages and documentation
cluster_management_console	Veritas Cluster Server Centralized Management Console packages and scripts
cluster_server	Veritas Cluster Server packages, scripts, and documentation
cluster_server_agents	Veritas Cluster Server high availability agents for DB2, Oracle, and Sybase packages, scripts, and documentation
file_system	Veritas File System packages and scripts
getting_started.pdf	This document
gnu	GNU compression utilities
installer	Product installation script
perl	Perl language binaries and library functions
storage_foundation	Veritas Storage Foundation, Veritas File System, and Veritas Volume Manager packages, scripts, and documentation
storage_foundation_cluster_file_system	Veritas Storage Foundation Cluster File System packages, scripts, and documentation
storage_foundation_for_db2	Veritas Storage Foundation for DB2 packages, scripts, and documentation
storage_foundation_for_oracle	Veritas Storage Foundation for Oracle packages, scripts, and documentation
storage_foundation_for_oracle_rac	Veritas Storage Foundation for Oracle RAC packages, scripts, and documentation
storage_foundation_for_sybase	Veritas Storage Foundation for Sybase, packages, scripts, and documentation
volume_manager	Veritas Volume Manager packages and scripts
volume_replicator	Veritas Volume Replicator packages, scripts, and documentation
windows	Veritas Enterprise Administrator GUI and the Volume Replicator advisor Windows clients, VCS Windows installers, VCS Cluster Server Centralized Management installers, Symantec Product Authentication Services installer

Known issues

Before you install any product, read the following Veritas Technical Support TechNote for the latest information on updates, patches, and software issues regarding this release:

http://support.veritas.com/docs/281987

To find information on supported hardware, see the hardware compatibility list (HCL) in the following TechNote:

http://support.veritas.com/docs/283282

Permissions on the /etc directory change during product installation

Because of a Solaris bug in the pkgadd command, the permissions on the /etc directory may change during the installation of Symantec product packages. Check after an installation procedure to see if this occurred. Use the chmod command to reset the permissions.