

# **VERITAS Storage Foundation and High Availability Solutions 4.1**

## **Getting Started Guide**

**Solaris**

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# VERITAS Storage Foundation and High Availability Solutions Product Overview

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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.

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**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. Read this entire document before installing any VERITAS products.

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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 12
- ◆ [VERITAS Cluster Server Agents](#) on page 13
- ◆ [VERITAS Volume Replicator](#) on page 15
- ◆ [VERITAS Storage Foundation](#) on page 16 (includes the [VERITAS File System](#) on page 22 and [VERITAS Volume Manager](#) on page 23)
- ◆ [VERITAS Storage Foundation for DB2](#) on page 19
- ◆ [VERITAS Storage Foundation for Oracle](#) on page 20
- ◆ [VERITAS Storage Foundation for Sybase](#) on page 21
- ◆ [Storage Foundation Cluster File System](#) on page 24
- ◆ [Storage Foundation for Oracle RAC](#) on page 25



## How This Guide Is Organized

- ✓ Read “[VERITAS Product Licensing](#)” on page 3. You must obtain a license key before installing any VERITAS product.
- ✓ Read “[Software Disc Contents](#)” on page 4 for instructions on installing your VERITAS product.
- ✓ The VERITAS products contained in this kit are listed under “[VERITAS Storage Foundation and High Availability Solutions Product Overview](#)” on page 1. 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 32 before installing any product for information on software issues that may affect all products in this release.
- ✓ Read “[Additional Product Information](#)” on page 10 for a description of other features in the Storage Foundation and High Availability Solutions product kit.
- ✓ Review “[Getting Help](#)” on page 34 for important VERITAS support and contact information.



## VERITAS Product Licensing

Product keys are available on the License Key certificate. The certificate also includes the number of product licenses purchased. A single key enables product installation on the number and the type of systems for which you purchased the license. A key may enable the operation of more products than specified on the certificate, but you are legally limited to the number of product licenses purchased.

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

`vxlicinst` installs a license key for a VERITAS product

`vxlicrep` displays currently installed licenses

`vxlictest` retrieves features and their descriptions encoded in a license key

Instructions on how to activate the key are included in the product's installation procedure. After you receive the license key, read “[Installation Methods](#)” on page 6.

If you encounter problems while licensing your product, visit the VERITAS licensing support website at <http://www.veritas.com/buy/vLicense/vLicenseHome.jhtml>.



## Software Disc Contents

The VERITAS Storage Foundation and High Availability Solutions 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 [“VERITAS Storage Foundation and High Availability Solutions Product Overview”](#) on page 1. Read the installation guide and release notes for your product before beginning an installation procedure.

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**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.

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VERITAS Disc	Contents
Disc 1	VERITAS Cluster Server VERITAS File System VERITAS Storage Foundation VERITAS Storage Foundation <i>for DB2</i> VERITAS Storage Foundation <i>for Oracle</i> VERITAS Storage Foundation <i>for Sybase</i> VERITAS Volume Manager VERITAS Volume Replicator
Disc 2	VERITAS Storage Foundation Cluster File System VERITAS Storage Foundation <i>for Oracle RAC</i> (Real Application Clusters)
Cluster Server Agents Disc	VERITAS Cluster Server Agents: VCS Enterprise Agent for DB2 VCS Enterprise Agent for Informix VCS Enterprise Agent for Oracle VCS Enterprise Agent for Sybase VCS Enterprise Agent for Hitachi TrueCopy VCS Enterprise Agent for Sun ONE VCS Enterprise Agent for EMC SRDF VCS Enterprise Agent for IBM PPRC

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VERITAS Disc	Contents
Documentation Disc	<p>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 print selected PDF files using Acrobat Reader.</p> <p>If you insert the documentation disc in a Microsoft Windows system CD drive, the autorun feature brings up the page containing information on how to use the search functionality. To use the documentation disc on a Solaris system, mount the CD (see <a href="#">Mounting a Software Disc</a> on page 6). Review the documentation disc README located at the top-level directory.</p>
Language Discs	<p><b>Note</b> Not available in every release.</p> <p>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 “<a href="#">Documentation Disc</a>” above).</p>
Maintenance Pack Disc	<p><b>Note</b> Not available in every release.</p> <p>If you have a maintenance release of the VERITAS Storage Foundation and High Availability Solutions kit, a disc containing software patches or updated packages is included. After installing the product, mount the maintenance software disc. Go to the appropriate product directory and review the release notes for upgrade instructions.</p>

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## Mounting a Software Disc

1. Log in as superuser.
2. Place the VERITAS software disc containing your product into a CD-ROM 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 CD, 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 CD-ROM 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.

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**Note** Do not make `/opt` a VxFS file system.

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There are also two installation modes:

- ◆ Single node local
- ◆ Multiple remote target systems

You can do remote installations using SSH or RSH. See [“Configuring SSH or RSH Before Installing VERITAS Products”](#) on page 26 for shell configuration information.



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## Using the Product Installer

The product installer simplifies the process of installing VERITAS software and is the recommended method of installation. Selecting a product to install from the product installer invokes the product installation script.

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**Note** If you have obtained a VERITAS product from an electronic download site, the single product download files do not contain the `installer` installation script, so you must use the product installation script to install the product. For example, if you download VERITAS Cluster Server, use the `installvcs` script instead of the `installer` script.

---

To begin installing a VERITAS product:

1. Locate the name of the product to install on the product software disc. Insert the product software disc into a CD-ROM drive attached to your system and mount it (see [Mounting a Software Disc](#) on page 6).

2. Move to the `cdrom` directory:

```
# cd /cdrom/cdrom0
```

---

**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:

```
# /opt/VRTS/bin/vxsvcctl stop
```

---

3. From the `cdrom` directory, invoke the installer script:

```
# ./installer (to install using rsh)
```

or:

```
# ./installer -usessh (to install using ssh)
```



4. The product installer lists the following options to select:

```

VERITAS Product                               Version Installed  Licensed
=====
Cluster Server                               no                 no
File System                                  no                 no
Volume Manager                               no                 no
Volume Replicator                           no                 no
Storage Foundation                           no                 no
Storage Foundation for DB2                   no                 no
Storage Foundation for Oracle                no                 no
Storage Foundation for Sybase                no                 no
Storage Foundation Cluster File System       no                 no
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 Selection: [I,C,L,P,U,D,Q,?]

Select Help (?) to display information about the options.

---

**Note** It is advisable to run the preinstallation check for all systems.

---

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

```

VERITAS Storage Foundation and High Availability Solutions 4.1
    
```

- 1) VERITAS Cluster Server
- 2) VERITAS File System
- 3) VERITAS Volume Manager
- 4) VERITAS Volume Replicator
- 5) VERITAS Storage Foundation, Storage Foundation for Oracle, Storage Foundation for DB2, and Storage Foundation for Sybase
- 6) VERITAS Storage Foundation Cluster File System
- 7) VERITAS Storage Foundation for Oracle RAC
- B) Back to previous menu

Select a product to install: [1-7,b,q]

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



## Product Installation Scripts

You can also install VERITAS products by running an installation script from the command line:

<code>installfs</code>	VERITAS File System
<code>installvcs</code>	VERITAS Cluster Server
<code>installvm</code>	VERITAS Volume Manager
<code>installvvr</code>	VERITAS Volume Replicator
<code>installsfcfs</code>	VERITAS Storage Foundation Cluster File System
<code>installsfrac</code>	VERITAS Storage Foundation for Oracle RAC
<code>installsf</code>	VERITAS Storage Foundation, VERITAS Storage Foundation for DB2, VERITAS Storage Foundation for Oracle, VERITAS Storage Foundation for Sybase

Read the release notes and installation guide for your product before beginning an installation procedure.

## Uninstalling VERITAS Infrastructure Packages

There are several packages, referred to as *infrastructure* packages, that are used by multiple VERITAS products. These packages are not removed when uninstalling a single VERITAS product. If you remove all VERITAS products from a system and want to ensure that there are no remaining VERITAS packages, you can run the `uninstallinfr` script.

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

This script removes the `VRTSvlic` licensing package and the `VRTScpi` and `VRTSperl` packages required for product installation. The VERITAS Enterprise Administrator packages, `VRTSob` and `VRTSobgui`, are also removed.



## Additional Product Information

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

### Locating and Displaying Documentation

VERITAS does not include hard copy guides in the VERITAS Storage Foundation and High Availability Solutions kit. Documents are in Adobe Portable Document Format (PDF) on the enclosed discs. You can access product documentation in several 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.

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- ◆ After a product documentation package is installed, user and administration guides are available 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>.

## Installing Language Products

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

After installing a VERITAS product, mount the language package CD and run the command-line installation script. The script detects any installed VERITAS products and automatically installs the corresponding language packages.



# VERITAS Cluster Server

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Cluster Server software is located on disc 1. Read the Cluster Server release notes and installation guide before starting the installation:

- ◆ `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 individual component.

---

## About This Product

VERITAS Cluster Server provides an open systems clustering solution that eliminates both planned and unplanned downtime, facilitates server consolidation and failover, and effectively manages a wide range of applications in heterogeneous environments.





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# VERITAS Cluster Server Agents

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Cluster Server agents are located on Cluster Server Agents disc. Agents cannot be installed or configured using the product installer. Read the relevant agent installation and configuration guide before starting the installation:

- ◆ `db2_agent/docs/vcs_db2_install.pdf`
- ◆ `htc_agent/docs/vcs_truecopy_install.pdf`
- ◆ `informix_agent/docs/vcs_informix_install.pdf`
- ◆ `oracle_agent/docs/vcs_oracle_install.pdf`
- ◆ `pprc_agent/docs/vcs_pprc_install.pdf`
- ◆ `srdf_agent/docs/vcs_srdf_install.pdf`
- ◆ `sunone_agent/docs/vcs_sunone_install.pdf`
- ◆ `sybase_agent/docs/vcs_sybase_install.pdf`

---

**Note** Agents are sometimes installed as part of a Storage Foundation product. For example, the Enterprise Agent for Oracle is installed with the Storage Foundation *for Oracle RAC* product.

---



## About This Product

VERITAS Cluster Server enterprise agents provide high availability for specific resources and applications. Each VCS agent manages resources of a particular type; for example, the Oracle agent manages Oracle databases. Typically, agents start, stop, and monitor resources and report any state changes to VCS.

Contact your VERITAS sales representative for details about these agents, additional agents under development, agents available as part of a Storage Foundation product, or agents available from VERITAS Consulting Services.

## Supported Enterprise Agents

Available VCS 4.1 enterprise agents are listed below. Refer to this table for supported application and operating system versions. VCS agents support a specified application version on Solaris 10 if the application vendor supports that version on Solaris 10. Before configuring an enterprise agent with VCS, verify that you have the latest agent version.

Supported VCS Agent	Agent version	VCS version				Application	OS			
		2.0	3.5	4.0	4.1		8	9	10	
Sun ONE	4.0	p	p	s	s	Administration Server				
						Messaging Server	5.0, 5.1, 5.2			
						Messaging Multiplexor	5.0, 5.1, 5.2			
						Directory Server	5.0, 5.1, 5.2			
						Web Server	4.1, 6.0, 6.1			
						Proxy Server	3.6			
						SOCKS Server	3.6			
Oracle	4.1	p	p	s	s	Oracle	8.0.x, 8i, 9i R1, 9i R2, 10g	s	s	s
DB2	4.1	p	p	s	s	DB2 Enterprise Server Edition	7.2, 8.1, 8.2	s	s	s
Sybase	4.0	p	p	s	s	Sybase Adaptive Server	11.x–11.9.2, 12.0, 12.5	s	s	s
Informix	1.3.0	s	s	s	s	Informix Dynamic Server	7.1–9.4	s	s	s
True Copy	4.1	n	n	s	s	Hitachi True Copy		s	s	s
SRDF	4.1	n	n	s	s	EMC Symmetrix Remote Data Facility		s	s	s
PPRC	4.1	n	n	s	s	IBM Peer-to-Peer Remote Copy		s	s	s
s – supported configuration      n – not supported      p – supported by previous version of agent										



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# VERITAS Volume Replicator

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Volume Replicator (VVR) software is located on disc 1. Read the product release notes and installation guide before starting the installation:

- ◆ `volume_replicator/release_notes/vvr_notes.pdf`
- ◆ `volume_replicator/docs/vvr_install.pdf`

## About This Product

VERITAS Volume Replicator 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

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

### Installation Overview

The VERITAS Storage Foundation software is located on disc 1. Read the component product release notes and installation guide before starting the installation:

- ◆ `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

There are five VERITAS Storage Foundation offerings:

- ◆ Storage Foundation QuickStart
- ◆ Storage Foundation Standard
- ◆ Storage Foundation Standard HA
- ◆ Storage Foundation Enterprise
- ◆ Storage Foundation Enterprise HA

The table on the following page lists the VERITAS products and optionally licensed features available with each Storage Foundation version.



<b>Storage Foundation Version</b>	<b>Products and Features</b>
Storage Foundation QuickStart	VERITAS File System (Base feature set) VERITAS Volume Manager (Base feature set)
Storage Foundation Standard	VERITAS File System VERITAS Volume Manager <b>Optionally licensed features:</b> VERITAS Volume Replicator Option
Storage Foundation Standard HA	VERITAS File System VERITAS Volume Manager VERITAS Cluster Server <b>Optionally licensed features:</b> VERITAS Volume Replicator Option
Storage Foundation Enterprise	VERITAS File System VERITAS Volume Manager VERITAS FlashSnap Option <b>Optionally licensed features:</b> VERITAS Volume Replicator Option
Storage Foundation Enterprise HA	VERITAS File System VERITAS Volume Manager VERITAS Cluster Server VERITAS FlashSnap Option <b>Optionally licensed features:</b> VERITAS Volume Replicator Option

The table on the following page provides a more detailed list of features and their availability with Storage Foundation offerings.



Feature	File System	Volume Manager	Storage Foundation			Storage Foundation for Oracle /DB2/Sybase		Storage Foundation for Oracle RAC	Storage Foundation Cluster File System
			QS	Std	Ent	Std	Ent	Ent	Ent
Boot Drive Management		✓	✓	✓	✓	✓	✓	✓	✓
External Drive Management		✓		✓	✓	✓	✓	✓	✓
Dynamic Multipathing (DMP)		✓		✓	✓	✓	✓	✓	✓
Storage Provisioning Templates		✓	✓	✓	✓	✓	✓	✓	✓
Configuration Backup and Restore		✓	✓	✓	✓	✓	✓	✓	✓
Online Administration	✓	✓		✓	✓	✓	✓	✓	✓
1 to 32 Terabyte File Systems	✓			✓	✓	✓	✓	✓	✓
File Change Log	✓		✓	✓	✓	✓	✓	✓	✓
Named Data Streams	✓		✓	✓	✓	✓	✓	✓	✓
Online LUN Resize				✓	✓	✓	✓	✓	✓
64-bit File Systems				✓	✓	✓	✓	✓	✓
Hardware Assisted E-Copy				✓	✓	✓	✓	✓	✓
Quality of Storage Service (QoSS)					✓		✓	✓	✓
Quick I/O, Cached Quick I/O						✓	✓		
ODM (Oracle Disk Manager)						✓ <sub>o</sub>	✓ <sub>o</sub>		✓
VxDBA GUI						✓ <sub>p</sub>	✓ <sub>p</sub>		
Storage Mapping							✓ <sub>p</sub>		
Storage Rollback							✓ <sub>p</sub>		✓
Block-Level Incremental Backup							✓ <sub>o</sub>		
Database FlashSnap							✓ <sub>o</sub>		
Storage CheckPoints (FlashSnap)	s				✓		✓	✓	✓
Disk Group Split & Join (FlashSnap)		s			✓		✓	✓	✓
Instant Volume Snapshots (FlashSnap)		s			✓		✓	✓	✓
Fast Mirror Resync (FlashSnap)		s			✓		✓	✓	✓
FlashSnap Agent for Symmetrix		s			✓		✓	✓	✓
Volume Replicator		s		s	s	s	s		
Ent — Enterprise Std — Standard QS — QuickStart o — Oracle only p — Oracle and DB2 only s — Separately purchasable option									



# VERITAS Storage Foundation for DB2

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Storage Foundation *for DB2* software is located on disc 1. Read the product release notes and the installation guide before starting the installation:

- ◆ `storage_foundation/release_notes/sf_notes.pdf`
- ◆ `storage_foundation/docs/sf_install.pdf`

## About This Product

VERITAS Storage Foundation *for DB2* 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.



# VERITAS Storage Foundation for Oracle

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Storage Foundation *for Oracle* software is located on disc 1. Read the product release notes and the installation guide before starting the installation:

- ◆ `storage_foundation/release_notes/sf_notes.pdf`
- ◆ `storage_foundation/docs/sf_install.pdf`

## About This Product

VERITAS Storage Foundation *for Oracle* 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.





# VERITAS Storage Foundation for Sybase

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Storage Foundation *for Sybase* software is located on disc 1. Read the product release notes and the installation guide before starting the installation:

- ◆ `storage_foundation/release_notes/sf_notes.pdf`
- ◆ `storage_foundation/docs/sf_install.pdf`

## About This Product

VERITAS Storage Foundation *for Sybase* 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.



# VERITAS File System

## Installation Overview

The VERITAS File System is installed as part of VERITAS Storage Foundation. Read the VERITAS Storage Foundation release notes and the VERITAS Storage Foundation Installation Guide before starting the installation:

- ◆ `storage_foundation/release_notes/sf_notes.pdf`
- ◆ `storage_foundation/docs/sf_install.pdf`

---

**Note** File System is included in all VERITAS Storage Foundation products. If you have purchased a VERITAS Storage Foundation product, File System is installed and updated as part of that product. Do not install or update it as an individual component.

---

## About This Product

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

## Installation Overview

The VERITAS Volume Manager is installed as part of VERITAS Storage Foundation. Read the VERITAS Storage Foundation release notes and the VERITAS Storage Foundation Installation Guide before starting the installation:

- ◆ `storage_foundation/release_notes/sf_notes.pdf`
- ◆ `storage_foundation/docs/sf_install.pdf`

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**Note** Volume Manager is included in all VERITAS Storage Foundation products. If you have purchased a VERITAS Storage Foundation product, Volume Manager is installed and updated as part of that product. Do not install or update it as an individual component.

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## About This Product

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 planned and unplanned downtime.



# Storage Foundation Cluster File System

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Storage Foundation Cluster File System software is located on disc 2. VERITAS Storage Foundation Cluster File System HA functionality is added by installing VERITAS Cluster Server software. Read the component product release notes and the installation guide before starting the installation:

- ◆ `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 extends VERITAS File System and VERITAS Volume Manager to support shared data in a SAN (Storage Area Network) 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, is additionally licensable with this product.



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# Storage Foundation for Oracle RAC

## Installation Overview

Review “[Mounting a Software Disc](#)” on page 6 and “[Installation Methods](#)” on page 6 before installing this product.

The VERITAS Storage Foundation *for Oracle RAC* software is located on disc 2. Read the component product release notes and the installation guide before starting the installation:

- ◆ `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* 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, is additionally licensable with this product.



## Configuring SSH or RSH Before Installing VERITAS Products

You can install VERITAS products to remote systems using either SSH or RSH. RSH is the default method of installation for Solaris.

### Enabling SSH

The SSH (secure shell) program allows logging into and executing commands on a remote system. SSH can be used in place of `rlogin` and `rsh`, and provides encrypted communications and an authentication process between two untrusted hosts over an insecure network. SSH 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.

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**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.

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

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1. Log in as root on the source system from which you want to install the VERITAS product.
2. Generate a DSA key pair on the source system:  

```
# ssh-keygen -t dsa
```

System output similar to the following appears:  

```
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 present 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 /.ssh
```

6. Make sure the Secure file transfer program (SFTP) is enabled on all target 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:

```
# svcadmin restart ssh
```

To restart on Solaris 9 type:

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

8. Use SFTP to copy the public DSA key, `/.ssh/id_dsa.pub` to each of the target systems:

```
# 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 (10.182.12.3)' 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)? yes
```

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

```
Warning: Permanently added 'target_sys,10.182.12.3' (DSA) to the
list of known hosts.
root@target_sys password:
```

10. Enter the root password.



11. Enter the following at the `sftp` prompt:

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

The following output is displayed:

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

12. Quit the SFTP session. Type:

```
sftp> quit
```

13. Begin the `ssh` session on the target system:

```
# 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. Log out of the `ssh` session:

```
# exit
```

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**Note** When installing from a 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.

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17. Run the following commands on the host 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.

18. To verify that you can connect to the target system, enter:

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

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





## Enabling 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. Ensure that the `rsh` and `rsh-server` packages are installed:

```
# rpm -qa | grep rsh
rsh-server-0.17-17
rsh-0.17-17
```

2. Append the line “`rsh`” to the `/etc/securetty` file if it does not already exist.

```
# echo "rsh" >> /etc/securetty
```

3. Enable the `rsh` server using the `chkconfig` command:

```
# chkconfig rsh on
```

4. Modify the `.rhosts` file. A separate `.rhosts` file resides 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`, an entry for `system2.companyname.com` must be added to the `.rhosts` file on `system1`.

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

## Disabling RSH

To disable RSH:

1. Remove the “`rsh`” entry in the `/etc/securetty` file.

2. Disable the `rsh` server using the `chkconfig` command:

```
# chkconfig rsh off
```

3. (Optional) Delete the `.rhosts` file from each user’s `$HOME` directory.



## Disc Directory Structure

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### Disc 1

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cluster_server	VERITAS Cluster Server packages, scripts, documentation
file_system	VERITAS File System packages, scripts, documentation
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 Storage Foundation <i>for DB2</i> , VERITAS Storage Foundation <i>for Oracle</i> , VERITAS Storage Foundation <i>for Sybase</i> , VERITAS File System, and VERITAS Volume Manager packages, scripts, documentation
support	VERITAS diagnostic tools
volume_manager	VERITAS Volume Manager packages, scripts, documentation
volume_replicator	VERITAS Volume Replicator packages, scripts, documentation
windows	VERITAS Enterprise Administrator GUI and the Volume Replicator advisor Windows client

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### Disc 2

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getting_started.pdf	This document
gnu	GNU compression utilities
installer	Product installation script
perl	PERL language binaries and library functions
storage_foundation_cluster_file_system	VERITAS Storage Foundation <i>for Oracle RAC</i> packages, scripts, documentation
storage_foundation_for_oracle_rac	VERITAS Storage Foundation <i>for Oracle RAC</i> packages, scripts, documentation
support	VERITAS diagnostic tools
windows	VERITAS Enterprise Administrator GUI Windows client

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**Cluster Server Agents Disc**

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db2_agent	VCS Enterprise Agent for DB2 packages and documentation
getting_started.pdf	This document
gnu	GNU compression utilities
htc_agent	VCS Enterprise Agent for Hitachi TrueCopy packages and documentation
informix_agent	VCS Enterprise Agent for Informix packages and documentation
oracle_agent	VCS Enterprise Agent for Oracle packages and documentation
pprc_agent	VCS Enterprise Agent for IBM PPRC packages and documentation
srdf_agent	VCS Enterprise Agent for EMC SRDF packages and documentation
sunone_agent	VCS Enterprise Agent for Sun ONE packages and documentation
support	VERITAS diagnostic tools
sybase_agent	VCS Enterprise Agent for Sybase packages and documentation

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## Known Issues

### ▼ Latest VERITAS Product Information

Before installing 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/272714>

### ▼ License Package Not Completely Removed From Local Zones

Some files from the VERITAS licensing package (VRTSvlic) may not be removed from a local zone that was created after VRTSvlic was originally installed. An error message is displayed if all files are not removed. If the error was encountered, after the package removal process ends, run the following command from the global zone to remove any remaining VRTSvlic files:

```
# rm -rf zonepath/root/var/sadm/pkg/VRTSvlic
```

If you are upgrading a product, and local zones are configured, instead of selecting the installer upgrade procedure (or running the script from the command line), perform the upgrade in steps: Uninstall the product, uninstall the infrastructure packages (uninstallinfr script), then reinstall the product.



## ▼ Solaris 10 Feature Support

The table below lists the VERITAS products and shows their level of support for Solaris 10 features in this release. Product abbreviations are:

VxFS VERITAS File System  
 VxVM VERITAS Volume Manager  
 VVR VERITAS Volume Replicator  
 VCS VERITAS Cluster Server  
 SFCFS Storage Foundation Cluster File System  
 SFRAC Storage Foundation for Oracle RAC

Solaris 10 Feature	V x F S	V x V M	V V R	V C S	S F C F S	S F R A C	Storage Foundation Standard	Storage Foundation for Oracle and DB2	Storage Foundation for Sybase
Trusted Containers (Local Zones)	A	D	D	A	D	X	A	B	X
NFS V4.0	A	D	D	X	A	X	A	C	C
JumpStart	A	A	A	A	D	D	A	A	A
Live Upgrade	X	A	X	X	X	X	X	X	X
Role Based Access Privileges	A	D	D	D	A	D	A	C	C
Dtrace	D								
Failure Monitor Architecture	D								
IP Stack Streamlining	D								
ZFS (Not in Solaris 10)	X								
<p>A — Used by the VERITAS product for documented functionality.            B — Used by VERITAS database product with significant restrictions: ODM and CIO are supported, other features cannot operate with local zones.            C — No extended feature support for databases, but fully supported by VERITAS File System.            D — Not used by VERITAS product, but feature can be safely used with Solaris 10 and other applications.            X — Cannot be used by the VERITAS product.</p>									



## Getting Help

For technical assistance, visit <http://support.veritas.com> and select phone or email support. This site also provides access to resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and the VERITAS customer email notification service. Use the Knowledge Base Search feature to access additional product information, including current and past releases of product documentation.

Diagnostic tools are also available to assist in troubleshooting problems associated with the product. These tools are available on disc or can be downloaded from the VERITAS FTP site. See the `README.VRTSspt` file in the `/support` directory for details.

For information on purchasing product documentation, visit <http://webstore.veritas.com>.

