VERITAS™

VERITAS Storage Foundation and High Availability Solutions 4.1

Getting Started Guide

HP-UX

N17024G

June 2005

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

VERITAS Legal Notice

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650–527–8000 Fax 650–527–2908
www.veritas.com

Third-Party Legal Notices

Data Encryption Standard (DES) Copyright

Contents

VERITAS Storage Foundation and High Availability Solutions Product Overview

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. Read this entire document before installing any VERITAS products.

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 13
- VERITAS Cluster Server Enterprise Agents on page 14
- VERITAS Volume Replicator on page 16
- VERITAS Storage Foundation on page 17 (includes the VERITAS File System on page 21 and VERITAS Volume Manager on page 22)
- VERITAS Storage Foundation for Oracle on page 20
- Storage Foundation Cluster File System on page 23
- Storage Foundation for Oracle RAC on page 24

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 30 before installing any product for information on software issues that may affect all products in this release.

✔ Read "Additional Product Information" on page 12 for a description of other features in the Storage Foundation and High Availability Solutions product kit.

✔ Review "Getting Help" on page 30 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 8.

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.

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 (DVD)	VERITAS Cluster Server
	VERITAS Cluster Server Agents:
	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 EMC SRDF
	VERITAS File System
	VERITAS Storage Foundation
	VERITAS Storage Foundation *for Oracle*
	VERITAS Storage Foundation Cluster File System
	VERITAS Storage Foundation *for Oracle RAC* (Real Application Clusters)
	VERITAS Volume Manager
	VERITAS Volume Replicator

VERITAS Disc	Contents
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 print selected PDF files using Acrobat Reader.
	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 an HP-UX system, mount the CD (see Mounting a Software Disc on page 6). Review the documentation disc README located at the top-level directory.
Maintenance Pack Disc	**Note** Not available in every release.
	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.

Mounting a Software Disc

VERITAS software is provided on a DVD format disc. To mount the software disc:

1. Insert the VERITAS software disc into a DVD drive connected to your system and login as superuser:

   ```
   $ su root
   ```

2. Determine the block device file for the DVD drive:

   ```
   # ioscan -fnC disk
   ```

   Make a note of the device file as it applies to your system.

3. Create a directory in which to mount the software disc and mount the disc using the appropriate drive name. For example:

   ```
   # mkdir -p /dvdrom
   # /usr/sbin/mount -F cdfs /dev/dsk/c3t2d0 /dvdrom
   ```

4. Verify that the disc is mounted:

   ```
   # mount
   ```

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

The information on the VERITAS Documentation disc is provided in Portable File System (PFS) format. Follow these mounting instructions to make the software disc readable on your system:

1. Insert the VERITAS software disc into a CD drive connected to your system and login as superuser:

   ```
   $ su root
   ```

2. Determine the block device file for the CD drive:

   ```
   # ioscan -fnC disk
   ```

   Make a note of the device file as it applies to your system.

3. Run the following commands to start PFS:

   ```
   # nohup pfs_mountd &
   # nohup pfsd &
   ```

4. Create a directory in which to mount the software disc and mount the disc using the appropriate drive name. For example:

   ```
   # mkdir -p /cdrom
   # /usr/sbin/pfs_mount -t rrip /dev/dsk/c3t2d0 /cdrom
   ```

5. Verify that the disc is mounted:

   ```
   # mount
   ```

6. To unmount the disc, type:

   ```
   # pfs_umount /cdrom
   ```

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 can do remote installations using SSH or remsh. See "Configuring SSH or remsh Before Installing VERITAS Products" on page 25 for shell configuration information.

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.

> **Note** If you have downloaded a product from the VERITAS website, you must use the installation script specific to the product, not the installer script. For example, to install VERITAS Cluster Server, use the installvcs script (see Product Installation Scripts on page 11).

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 drive attached to your system and mount it (see Mounting a Software Disc on page 6).

2. Move to the directory where the software disc is mounted.

> **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/vxsvcctrl stop**

3. Invoke the installer script:

   # **./installer** (to install using remsh)

   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
Volume Manager                        no                no
Volume Replicator                     no                no
Storage Foundation                    no                no
Storage Foundation for Oracle         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 Volume Manager
3) VERITAS Volume Replicator
4) VERITAS Storage Foundation, Storage Foundation for Oracle
5) VERITAS Storage Foundation Cluster File System
6) VERITAS Storage Foundation for Oracle RAC
B) Back to previous menu

Select a product to install: [1-6,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:

`installvcs`	VERITAS Cluster Server
`installvvr`	VERITAS Volume Replicator
`installsfcfs`	VERITAS Storage Foundation Cluster File System
`installsfrac`	VERITAS Storage Foundation for Oracle RAC
`installsf`	VERITAS Storage Foundation,
	VERITAS Storage Foundation for Oracle,

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.

◆ After a product documentation package is installed, user and administration guides are available under the /opt/VRTS/docs directory.

◆ 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.

VERITAS Cluster Server

Installation Overview

Review "Mounting a Software Disc" on page 6 and "Installation Methods" on page 8 before installing this product.

The VERITAS Cluster Server software is located on the product disc. 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 no 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.

VERITAS Cluster Server Enterprise Agents

Installation Overview

Review "Mounting a Software Disc" on page 6 and "Installation Methods" on page 8 before installing this product.

The VERITAS Cluster Server enterprise agents are located on the product disc. Enterprise gents cannot be installed or configured using the product installer. You must purchase a license before installing and using enterprise agents. Read the relevant agent installation and configuration guide before starting the installation:

- ◆ `cluster_server_agents/htc_agent/docs/vcs_truecopy_install.pdf`

- ◆ `cluster_server_agents/informix_agent/docs`
  `/vcs_informix_install.pdf`

- ◆ `cluster_server_agents/oracle_agent/docs/vcs_oracle_install.pdf`

- ◆ `cluster_server_agents/srdf_agent/docs/vcs_srdf_install.pdf`

- ◆ `cluster_server_agents/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.

VCS enterprise agents are separately licensed. You must purchase a license before installing and using agents. 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 HP-UX 11iv2 if the application vendor supports that version on HP-UX 11iv2. Before configuring an enterprise agent with VCS, verify that you have the latest agent version.

Supported VCS Agent	Agent version	VCS version			Application		OS		
		1.31	3.5	4.1			11iv2 Sept/04	11.0	11i
Oracle	4.1	p	p	s	Oracle	9*i* R1, 9*i* R2 10g	s	n	n
Sybase	4.1	p	p	s	Sybase Adaptive Server	11.x–11.9.2 12.0, 12.5	s	n	n
Informix	4.1	p	p	s	Informix Dynamic Server	7.1–9.40	s	n	n
True Copy	4.1	n	n	s	Hitachi True Copy		s	n	n
SRDF	4.1	n	n	s	EMC Symmetrix Remote Data Facility		s	n	n
s – supported configuration n – not supported p – supported by previous version of agent									

VERITAS Volume Replicator

Installation Overview

Review "Mounting a Software Disc" on page 6 and "Installation Methods" on page 8 before installing this product.

The VERITAS Volume Replicator (VVR) software is located on the product disc. 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 8 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 four VERITAS Storage Foundation offerings:

◆ 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.

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 VERITAS FlashSnap Option
	Optionally licensed features:
	VERITAS Volume Replicator Option
Storage Foundation Enterprise HA	VERITAS File System VERITAS Volume Manager VERITAS Cluster Server VERITAS FlashSnap Option
	Optionally licensed features:
	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		Storage Foundation for Oracle RAC	Storage Foundation Cluster File System
			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)					✓o	✓o	✓	
VxDBA GUI					✓p	✓p		
Storage Mapping						✓p		
Storage Rollback						✓p	✓	
Block-Level Incremental Backup						✓o		
Database FlashSnap						✓o		
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	o — Oracle only
Std — Standard	p — Oracle and DB2 only
QS — QuickStart	s — Separately purchasable option

VERITAS Storage Foundation for Oracle

Installation Overview

Review "Mounting a Software Disc" on page 6 and "Installation Methods" on page 8 before installing this product.

The VERITAS Storage Foundation *for Oracle* software is located on the product disc. 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`

◆ `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* 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 File System

Installation Overview

The VERITAS File System is installed only 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 no 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`

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 no install or update it as an individual component.

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 8 before installing this product.

The VERITAS Storage Foundation Cluster File System software is located on disc 1. 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.

Storage Foundation for Oracle RAC

Installation Overview

Review "Mounting a Software Disc" on page 6 and "Installation Methods" on page 8 before installing this product.

The VERITAS Storage Foundation *for Oracle RAC* software is located on the product disc. 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 remsh Before Installing VERITAS Products

You can install VERITAS products to remote systems using either SSH or remsh. The default method of installation for HP-UX is remsh.

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 remsh, 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 remote shell 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.

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:

```
# /usr/sbin/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
```

> **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.

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 remsh

Remote shell functionality is enabled automatically after installing HP-UX system.

Typically, the only requirement to enable remote installs is to 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 `remsh`. 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
```

After completing an installation procedure, you may want to delete the `.rhosts` file from each user's `$HOME` directory.

See the operating system documentation and the `remsh(1M)` manual page for more information on configuring remote shell.

Disc Directory Structure

Product Disc (DVD)	
`cluster_server`	VERITAS Cluster Server packages, scripts, documentation
`cluster_server_agents`	VCS Enterprise Agents for Hitachi TrueCopy, Oracle, Informix, Sybase, and EMC SRDF
`depot`	VERITAS product packages
`file_system`	VERITAS File System packages, 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 Storage Foundation *for Oracle*, VERITAS File System, and VERITAS Volume Manager packages, scripts, documentation
`storage_foundation_cluster_ file_system`	VERITAS Storage Foundation Cluster File System packages, scripts, documentation
`storage_foundation_for_oracle_rac`	VERITAS Storage Foundation *for Oracle RAC* packages, scripts, documentation
`support`	VERITAS diagnostic tools
`volume_manager`	VERITAS Volume Manager packages, scripts
`volume_replicator`	VERITAS Volume Replicator packages, scripts, documentation
`windows`	VERITAS Enterprise Administrator GUI and the Volume Replicator advisor Windows client

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/275787

▼ **VxFS Disk Layout 6 Cannot Be Used for the / (root) or /stand Directories**

The HP-UX bootloader does not recognize VxFS Disk Layout 6. Do not upgrade the / or /stand directories to this layout or the system will become unbootable.

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.