

Veritas Storage Foundation[™] Installation Guide

HP-UX 11i Version 3

5.0

Veritas Storage Foundation Installation Guide

Copyright © 2008 Symantec Corporation. All rights reserved.

Storage Foundation 5.0

Symantec, the Symantec logo, Veritas and Veritas Storage Foundation are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.

The product described in this document is distributed under licenses restricting its use, copying, distribution, and decompilation/reverse engineering. No part of this document may be reproduced in any form by any means without prior written authorization of Symantec Corporation and its licensors, if any.

THIS DOCUMENTATION IS PROVIDED “AS IS” AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID, SYMANTEC CORPORATION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

The Licensed Software and Documentation are deemed to be “commercial computer software” and “commercial computer software documentation” as defined in FAR Sections 12.212 and DFARS Section 227.7202.

Veritas Software Corporation
20330 Stevens Creek Blvd.
Cupertino, CA 95014
www.symantec.com

Third-party legal notices

Third-party software may be recommended, distributed, embedded, or bundled with this Symantec product. Such third-party software is licensed separately by its copyright holder. All third-party copyrights associated with this product are listed in the accompanying release notes.

HP-UX is a registered trademark of Hewlett-Packard Development Company, L.P.

Licensing and registration

Veritas Volume Manager is a licensed product. See the *Veritas Storage Foundation Installation Guide* for license installation instructions.

Technical support

For technical assistance, visit <http://support.veritas.com> and select phone or email support. Use the Knowledge Base search feature to access resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and our customer email notification service.

Contents

Chapter 1	Preinstallation Instructions	
	Veritas Storage Foundation product suites	10
	General installation requirements	11
	Centralized management considerations	11
	Supported HP-UX operating systems	12
	Software and hardware requirements	12
	Database requirements	13
	Disk space	13
	/opt directory	14
	Environment variables	14
	Prerequisites for remote and cluster installation and uninstallation ..	15
	Release Notes	15
	Veritas Volume Manager requirements	15
	Taking a disk inventory	15
	Excluding disks	16
	Array support libraries	17
	Veritas Enterprise Administrator	17
	Cluster environment requirements	18
	Veritas File System requirements	18
	Converting from QuickLog to Multi-Volume Support	19
Chapter 2	Installing the Veritas software	
	Installation requirements	22
	About mapping services and performance statistics for databases	22
	About the operating system	23
	Summary of Veritas Storage Foundation installation tasks	23
	About existing licenses	24
	Upgrading HP-UX	24
	Installation notes for the Veritas 5.0 software	25
	Preparing to install the Veritas software	26
	Installing the Veritas Storage Foundation 5.0 software	28
	Mounting the software disc	28
	Installing using the product installer	29
	Configuring Veritas Storage Foundation on a cluster	31
	Completing the installation procedure	36

- Configuring your system after the installation 38
- Upgrading to the new repository database for DB2 and Oracle 39
- Migrating from /etc/vx/vxdba to /var/vx/vxdba for DB2 and Oracle 40
- Verifying the Veritas Storage Foundation installation 40
 - Checking Volume Manager processes 40
 - Checking VxFS installation 40
 - Checking cluster operation 41
- Converting to a VxVM root disk 43
- Upgrading VxFS disk layout versions 45
 - When to upgrade disk layout versions 46
 - When to use vxfsconvert 46
 - When to use vxupgrade 46
 - Requirements for upgrading to disk layout Version 7 46
- Upgrading VxVM disk group versions 47
- Upgrading to SF 5.0 on HP-UX 11i Version 3 47
 - Upgrading from SF 4.1 on 11.31 to SF 5.0 on 11.31 48
 - Upgrading from SF 5.0 on 11.23 to SF 5.0 on 11.31 49
 - Upgrading from SF 4.1 on 11.23 to SF 5.0 on 11.31 50
 - Upgrading from SF 3.5 on 11.11 to SF 5.0 on 11.31 51
- Upgrading to VxVM 5.0 on HP-UX 11i Version 3 52
 - Upgrading VxVM 5.0 on 11.23 to VxVM 5.0 11.31 using integrated VxVM 5.0 package for 11.31 52
- Upgrading to SFORA 5.0 on HP-UX 11i Version 3 53
 - Upgrading from SFORA 5.0 on 11.23 to SFORA 5.0 on 11.31 53
 - Upgrading from SFORA 4.1 on 11.23 to SFORA 5.0 on 11.31 55
- Upgrading the VxVM cluster protocol version 57
- Installing the VEA client 57
 - Installing the VEA client on HP-UX 57
 - Installing the VEA client on Microsoft Windows 57
- Installing Veritas Volume Manager 58

Chapter 3 Configuring the Veritas software

- Creating and configuring the repository database for DB2 and Oracle 61
- Configuring Veritas Storage Foundation 64
 - Database configuration requirements 65
 - Setting administrative permissions 65
 - vxtunefs command permissions and Cached Quick I/O 65
- Configuring Veritas Enterprise Administrator 66
 - Adding Users to the VEA Service Console Registry for Oracle 66
 - Removing Users from the VEA Service Console Registry for Oracle .. 67
 - Starting the VEA server 68
 - Starting the VEA client 68
- Configuring Veritas Volume Manager 69

	Starting and enabling the configuration daemon	70
	Enabling cluster support in VxVM (Optional)	71
	Configuring Veritas File System	74
Chapter 4	Uninstalling the Veritas software	
	Summary of Veritas Storage Foundation uninstallation tasks	76
	Dropping the repository database for Oracle	76
	Shutting down cluster operations	77
	Removing the root disk from VxVM control	77
	Removing VxFS file systems and Storage Checkpoints	78
	Moving volumes to disk partitions	78
	Moving volumes onto disk partitions	79
	Uninstalling Veritas Storage Foundation packages	83
	Removing license files (Optional)	84
	Uninstalling the Veritas Enterprise Administrator Client	85
	Uninstalling Veritas Volume Manager	85
	Uninstalling Veritas File System	86
Appendix A	Installation script options	
	Installation Script Options	87
Appendix B	Veritas Storage Foundation install packages	
	Veritas Storage Foundation install packages	91
Appendix C	Configuring the Symantec License Inventory Agent	
	About the Symantec License Inventory Manager	98
	When the Symantec License Inventory Agent is installed	99
	When the server and access points are installed	99
	What you can do with the agent after it is installed	99
	How to remove the agent	100
	How to order the Symantec License Inventory Manager license and media kit	
	101	

Preinstallation Instructions

Topics covered in this chapter include:

- [“Veritas Storage Foundation product suites”](#) on page 10
- [“General installation requirements”](#) on page 11
- [“Veritas Volume Manager requirements”](#) on page 15
- [“Veritas File System requirements”](#) on page 18

Follow the preinstallation instructions outlined in this chapter if you are installing one of the following Veritas Storage Foundation products by Symantec:

- Veritas Storage Foundation, formerly known as Veritas Foundation Suite (Standard, Enterprise, Enterprise HA Editions)
- Veritas Storage Foundation for Oracle, formerly known as Veritas Database Edition for Oracle (Standard, Enterprise, Enterprise HA Editions)

Note: If you are installing Veritas Volume Replicator, see the *Veritas Volume Replicator Installation Guide* on the product disc. The *Veritas Volume Replicator Installation Guide* explains how to install the product and directs you to the Veritas Volume Replicator documentation.

After reviewing the information in this chapter, see [“Installing the Veritas software”](#) on page 21 for information on installing the software.

Veritas Storage Foundation product suites

The following table lists the Symantec products and optionally licensed features available with each Veritas Storage Foundation product suite.

Table 1-1 Contents of Veritas Storage Foundation products

Storage Foundation version	Products and features
Storage Foundation Standard	Veritas File System Veritas Volume Manager Optionally licensed features: Veritas Volume Replicator
Storage Foundation Standard HA	Veritas File System Veritas Volume Manager Veritas Cluster Server Optionally licensed features: Veritas Volume Replicator
Storage Foundation Enterprise	Veritas File System Veritas Volume Manager Optionally licensed features: Veritas Volume Replicator
Storage Foundation Enterprise HA	Veritas File System Veritas Volume Manager Veritas Cluster Server Optionally licensed features: Veritas Volume Replicator
Storage Foundation for Oracle Standard	Veritas File System Veritas Volume Manager Veritas Quick I/O option Veritas Extension for Oracle Disk Manager option Optionally licensed features: Veritas Volume Replicator

Table 1-1 Contents of Veritas Storage Foundation products

Storage Foundation version	Products and features
Storage Foundation for Oracle Enterprise	Veritas File System Veritas Volume Manager Veritas Quick I/O option Veritas Extension for Oracle Disk Manager option Veritas Storage Checkpoint option Veritas Storage Mapping option Optionally licensed features: Veritas Volume Replicator
Storage Foundation for Oracle Enterprise HA	Veritas File System Veritas Volume Manager Veritas Cluster Server Veritas Quick I/O option Veritas Extension for Oracle Disk Manager option Veritas Storage Checkpoint option Veritas Storage Mapping option Optionally licensed features: Veritas Volume Replicator

Note: If you are installing Veritas Volume Replicator, see the *Veritas Volume Replicator Installation Guide* on the product disc. The *Veritas Volume Replicator Installation Guide* explains how to install the product and directs you to the Veritas Volume Replicator documentation.

General installation requirements

Before installing Veritas Storage Foundation, read the following sections to make sure you understand and comply with the basic requirements of the software.

Centralized management considerations

Veritas Storage Foundation Management Server by Symantec ties together the Storage Foundation product offerings to ensure that the hosts in your data center use storage as efficiently as possible. You can use it to centrally monitor,

visualize, and manage Storage Foundation hosts and generate reports about the hosts and the storage resources they consume.

The central console seamlessly integrates a wide range of management tasks like monitoring and reporting.

SF Management Server also offers customizable policy-based management that helps you automate:

- notification
- recovery
- other user-definable actions

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:

<http://www.symantec.com/business/sfms>

Supported HP-UX operating systems

Veritas Storage Foundation and Veritas Storage Foundation *for Oracle* can only be installed on a system running the HP-UX 11i version 3.0 release or later on the PA-RISC or Itanium platforms.

To verify the operating system version

Use the `swlist` command as follows:

```
# swlist | grep HPUX11i
HPUX11i-OE      B.11.31      HP-UX Foundation Operating Environment
```

JFS must be installed on your system prior to installing any Veritas software.

To verify that JFS is installed

Use the `swlist` command as follows:

```
# swlist -l product JFS
JFS B.11.31                                     The Base VxFS File System
```

Software and hardware requirements

For information on hardware requirements, see the *Veritas Storage Foundation Release Notes*.

For information on specific HA setup requirements, see Chapter 2, “Preparing to Install VCS 5.0,” in the *Veritas Cluster Server Installation Guide*.

Database requirements

The table identifies supported database and HP-UX combinations if you plan to use Veritas Storage Foundation for Oracle.

Table 1-2 Supported database and HP-UX combinations

Oracle Release	HP-UX 11i version 3.0 or later
9.2	Yes
10.1	Yes

Additional Oracle information

In order to use Veritas Extension for Oracle Disk Manager, you must use Oracle9i release 92 or later. Refer to Oracle bug number 1824061.

To use the Storage Mapping functionality, you must install Oracle 9.2.0.5 or higher.

Refer to the appropriate Oracle installation guide that accompanied your Oracle software for additional preinstallation information.

Using asynchronous I/O on Oracle

If you did not use raw devices for your database, it is likely that your system was not configured to perform asynchronous I/O. Veritas Storage Foundation for Oracle supports asynchronous I/O on Quick I/O files and Oracle Disk Manager files.

For the Oracle database to take advantage of the asynchronous I/O capability offered by Veritas Storage Foundation for Oracle, you must create the following device:

```
/dev/async
```

Refer to your *Oracle Administrator's Reference Guide* for instructions on how to create this device.

There are system and database configuration requirements that must be met before enabling asynchronous I/O. To make sure your environment meets those requirements, see your Oracle documentation.

Disk space

Before installing any of the Veritas Storage Foundation products, confirm that your system has enough free disk space. Use the "Perform a Preinstallation

Check” (P) option of the product installer to determine whether there is sufficient space.

The following table shows the approximate disk space used by the Storage Foundation products for all (both the required and optional) packages:

Disk space requirements

Product Name	Minimum Space Required	Maximum Space Required
Storage Foundation Standard	1276 MB	1280 MB
Storage Foundation Enterprise	1276 MB	1280 MB
Storage Foundation Enterprise HA	1406 MB	1453 MB
Storage Foundation for Oracle Standard or Enterprise	1553 MB	1570 MB 1810 MB (for RAC depots)
Storage Foundation for Oracle Enterprise HA	1688 MB	1748 MB 1810 MB (for RAC depots)

/opt directory

The directory `/opt` must exist, be writable and must not be a symbolic link. If you are upgrading, you cannot have a symbolic link from `/opt` to an unconverted volume. If you do have a symbolic link to an unconverted volume, the symbolic link will not function during the upgrade and items in `/opt` will not be installed.

Environment variables

Most of the commands used in the installation are in the `/sbin` or `/usr/sbin` directory. However, there are additional variables needed to use the Veritas Storage Foundation product after installation. Add the following directories to your `PATH` environment variable:

- If you are using Bourne or Korn shell (`sh` or `ksh`), use the commands:


```
$ PATH=$PATH:/usr/sbin:/opt/VRTSvxfs/sbin:/opt/VRTSob/bin:\
/opt/VRTSvc/bin:/opt/VRTS/bin
$ MANPATH=/usr/share/man:/opt/VRTS/man:$MANPATH
$ export PATH MANPATH
```
- If you are using a C shell (`csh` or `tcsh`), use the commands:

```
% set path = ( $path /usr/sbin /opt/VRTSvxfs/sbin \  
/opt/VRTSvcs/bin /opt/VRTSob/bin /opt/VRTS/bin )  
% setenv MANPATH /usr/share/man:/opt/VRTS/man:$MANPATH
```

Note: If you are not installing an HA product, you can omit
`/opt/VRTSvcs/bin`.

Prerequisites for remote and cluster installation and uninstallation

Establishing communication between nodes is required to install Veritas software from a remote system, or to install and configure a cluster. The node from which the installation utility is run must have permissions to run `rsh` (remote shell) or `ssh` (secure shell) utilities as `root` on all cluster nodes or remote systems. See “Configuring SSH or RSH Before Installing Veritas Products” in the *Getting Started Guide* for more information.

Release Notes

Read the *Release Notes* for all products included with this product. Portable Document Format (.pdf) versions of the *Release Notes* are included on the software disc in the `storage_foundation/release_notes` directory and on the documentation disc that came with your software.

Because product *Release Notes* are not installed by any packages, it is recommended that you copy them from the disc to the `/opt/VRTS/docs` directory on your system so that they are available for future reference.

Veritas Volume Manager requirements

Review the following Volume Manager-related items before installing or upgrading Veritas Storage Foundation or Veritas Volume Manager.

Taking a disk inventory

How to select disks

Decide which disks you want to place under VxVM control. The other disks in your configuration are not affected. Disks may be brought under VxVM control in two ways:

- Encapsulated disks—Data in all existing file systems and partitions on the disk are preserved.
- Initialized disks—Data on the disks is removed.

Verifying disk contents

Verify the disk contents. Answer the following questions and list the data for your convenience.

- 1 Make sure you are aware of the contents of each disk. Determine which disks can be initialized (destroying any existing data on the disks).

- 2 Do you want to place the system root disk under VxVM control?

- 3 Do you want to initialize *all* disks on a controller together? Identify the controllers (for example c0t0d0) - where c0t0d0 represents a disk on controller c0.

- 4 Identify the disks to be initialized or excluded in a table similar to the following.

Disk ID	Initialize, Exclude

Excluding disks

It is possible to configure the `vxdiskadm` utility not to list certain disks or controllers as being available. For example, this may be useful in a SAN environment where disk enclosures are visible to a number of separate systems.

To exclude a device from the view of VxVM, select item 16 (*Prevent multipathing/Suppress devices from VxVM's view*) from the `vxdiskadm` main menu. See “Disabling and Enabling Multipathing for Specific Devices” in the “Administering Dynamic Multipathing (DMP)” chapter of the *Veritas Volume Manager Administrator's Guide* for details.

Array support libraries

VxVM provides support for new disk arrays in the form of Array Support Library (ASL) software packages. You can obtain ASL packages from:

- The VxVM release package
- The disk array provided by the vendor
- The Veritas Technical Support site, <http://support.veritas.com>

Veritas Enterprise Administrator

The Veritas Storage Foundation software must be installed and run on an HP-UX machine. The Veritas Enterprise Administrator (VEA) client can be installed and run on any HP-UX, Windows XP, Windows NT, Windows ME, Windows 2000, or Windows 98 machine that supports the Java Runtime Environment.

Veritas Enterprise Administrator (VEA) is required to access the graphical user interface (GUI) for Veritas Storage Foundation. You can use the GUI to administer disks, volumes, file systems, and database functionality on local or remote machines.

One of the following packages needs to be installed and running on the client:

- VERITAS Enterprise Administrator (VRTSobgui)
This is the client package for HP-UX.
- VERITAS Enterprise Administrator for Windows
(windows/VRTSobgui.msi)
This is the client package for Windows.

For VEA functionality to work reliably, you must have HP-UX patches PHCO_36900 and PHSS_37202 installed prior to installing VEA. In addition to the previous patches, patches PHSS_36311 and PHSS_37040 are required for the Itanium platform. Check the *Veritas Storage Foundation Release Notes* for any additional patch information before you install VEA.

Requirements

The following are system recommendations for the GUI:

HP-UX	Minimum of 512MB of memory
Windows XP, NT, ME, 2000, or 98	300MHz Pentium with at least 256MB of memory

Cluster environment requirements

If your configuration has a cluster, which is a set of hosts that share a set of disks, there are additional requirements.

To set up a cluster environment

- 1 If you plan to place the root disk group under VxVM control, decide into which disk group you want to configure it for each node in the cluster. The root disk group, usually aliased as `bootdg`, contains the volumes that are used to boot the system. VxVM sets `bootdg` to the appropriate disk group if it takes control of the root disk. Otherwise `bootdg` is set to `nodg`. To check the name of the disk group, enter the command:

```
# vxkg bootdg
```
- 2 Decide on the layout of shared disk groups. There may be one or more shared disk groups. Determine how many you wish to use.
- 3 If you plan to use Dirty Region Logging (DRL) with VxVM in a cluster, leave a small amount of space on the disk for these logs. The log size is proportional to the volume size and the number of nodes. Refer to the *Veritas Volume Manager Administrator's Guide* and the *Veritas Storage Foundation Cross-Platform Data Sharing Administrator's Guide* for more information on DRL.
- 4 Install the license that supports the clustering feature on every node in the cluster.
See [“Enabling cluster support in VxVM \(Optional\)”](#) on page 71.

Veritas File System requirements

Before installing Veritas File System:

- Review the *Veritas Storage Foundation Release Notes*, `sf_notes.pdf`, located under the `storage_foundation/release_notes` directory on the Veritas software disc. Because product release notes are not installed by any packages, Veritas recommends that you copy them from the software disc to the `/opt/VRTS/docs` directory so that they are available for future reference.
- Ensure that the `/opt` directory exists and has write permissions for `root`.
- If the `VRTSfsnbl` package is installed on the system, you must remove it before installing VxFS 5.0.

To verify the `VRTSfsnbl` package is installed, enter:

```
# swlist -l product | egrep -i 'VRTSfsnbl'
```

If the `VRTSfsnbl` package is installed, you must remove it:

```
# swremove VRTSfsnbl
```

- The Veritas File System does not support OmniStorage. Do not install VxFS without first retrieving any files archived using OmniStorage.
- Prior to installing VxFS 5.0 on HP-UX 11iv3, you must install patch PHKL_36872. Patch PHKL_36872 provides cumulative VM modules to fix performance issues in HP-UX 11iv3. It is also recommended that you install patches PHCO_37127 and PHKL_37296, which are fixes to mount and unmount issues, patch PHKL_36054, which is a fix for read(2), write(2) failures in HP-UX 11iv3, and patch PHCO 37645, which is for the fs wrapper to incorporate the latest changes in VxFS 5.0 subtype. Out of these patches, patch PHKL_36054 is pre-requisite for patch PHKL_36872. You must also install patch PHKL_37184, which fixes issues regarding excessive kernel arena garbage collection.
- Install all the latest required HP-UX patches.

Converting from QuickLog to Multi-Volume Support

The 4.1 release of the Veritas File System is the last major release to support QuickLog. The Version 6 disk layout does not support QuickLog. The functionality provided by the Veritas Multi-Volume Support (MVS) feature replaces most of the functionality provided by QuickLog.

The following procedure describes how to convert from QuickLog to MVS. Unlike QuickLog, which allowed logging of up to 31 VxFS file systems to one device, MVS allows intent logging of only one file system per device. Therefore, the following procedure must be performed for each file system that is logged to a QuickLog device if Version 6 disk layout is used.

Note: The QuickLog device did not need to be related to the file system. For MVS, the log volume and the file system volume must be in the same disk group.

To convert Quicklog to MVS

- 1 Select a QuickLog-enabled file system to convert to MVS and unmount it.

```
# umount myfs
```
- 2 Detach one of the QuickLog volumes from the QuickLog device that the file system had been using. This volume will be used as the new intent log volume for the file system.

```
# qlodetach -g diskgroup log_vol
```
- 3 Create the volume set.

```
# vxvset make myvset myfs_volume
```
- 4 Mount the volume set.

```
# mount -F vxfs /dev/vx/dsk/rootdg/myvset /mnt1
```

- 5 Upgrade the volume set's file system to Version 6 disk layout.
See the *Veritas Storage Foundation Installation Guide*.
See the `vxfsconvert(1M)` and `vxupgrade(1M)` manual pages.

```
# vxupgrade -n 6 /mnt1
```

- 6 Add the log volume from [step 2](#) to the volume set.

```
# vxvset addvol myvset log_vol
```

- 7 Add the log volume to the file system. The size of the volume must be specified.

```
# fsvoladm add /mnt1 log_vol 50m
```

- 8 Move the log to the new volume.

```
# fsadm -o logdev=log_vol,logsize=16m /mnt1
```

Installing the Veritas software

Topics covered in this chapter include:

- [“Installation requirements”](#) on page 22
- [“Summary of Veritas Storage Foundation installation tasks”](#) on page 23
- [“About existing licenses”](#) on page 24
- [“Upgrading HP-UX”](#) on page 24
- [“Preparing to install the Veritas software”](#) on page 26
- [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28
- [“Upgrading to the new repository database for DB2 and Oracle”](#) on page 39
- [“Migrating from /etc/vx/vxdba to /var/vx/vxdba for DB2 and Oracle”](#) on page 40
- [“Verifying the Veritas Storage Foundation installation”](#) on page 40
- [“Converting to a VxVM root disk”](#) on page 43
- [“Upgrading VxFS disk layout versions”](#) on page 45
- [“Upgrading VxVM disk group versions”](#) on page 47
- [“Upgrading to SF 5.0 on HP-UX 11i Version 3”](#) on page 47
- [“Upgrading to VxVM 5.0 on HP-UX 11i Version 3”](#) on page 52
- [“Upgrading to SFORA 5.0 on HP-UX 11i Version 3”](#) on page 53
- [“Upgrading the VxVM cluster protocol version”](#) on page 57
- [“Installing the VEA client”](#) on page 57
- [“Installing Veritas Volume Manager”](#) on page 58

Note: Only users with superuser (root) privileges can install Veritas products.

Because Veritas Volume Manager 4.1 and Veritas File System 3.5 are bundled in the HP-UX 11i version 3.0 release, a fresh installation is not possible. You must perform an upgrade to move to the 5.0 versions of the Veritas products.

Caution: After you install the 5.0 software, the Veritas Volume Manager 4.1 software that was bundled with the HP-UX operating system is no longer available. To reinstall Veritas Volume Manager 4.1, you must use your HP-UX software discs. Because you can only have one version of Veritas Volume Manager on your system, if you choose to reinstall Veritas Volume Manager 4.1 (with the appropriate `swinstall` options to downgrade the version), the 5.0 software will no longer be available.

Installing the 5.0 Veritas software will overwrite Veritas File System 4.1. After installing the 5.0 version of Veritas File System, to revert back to the 4.1 version you must uninstall the 5.0 version and then re-install the 4.1 version. The 4.1 and 5.0 versions of Veritas File System cannot coexist.

Installation requirements

If you are not running the HP-UX 11i version 3.0 release, upgrade HP-UX on your system before you install the new Veritas software.

See [“Upgrading HP-UX”](#) on page 24.

Only users with superuser privileges can install, upgrade, or initialize Veritas Storage Foundation and HP-UX.

About mapping services and performance statistics for databases

- You must install Veritas Array Integration Layer (VAIL), Generic Array for Mapping Services by Symantec (VRTSgapms), and Veritas Mapping Services (VxMS) if you want to use deep mapping services and performance statistics for supported storage arrays.
- Install the EMC Solutions Enabler (SYMCLD) before you install VAIL. If you install Solutions Enabler after you install VAIL, rescan the EMC Symmetrix arrays so that they can be discovered.

See the *Veritas Storage Foundation Oracle Administrator's Guide*.

About the operating system

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

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

Note: See “[Supported HP-UX operating systems](#)” on page 12 for information on patches required for Veritas, HP-UX, or Oracle software.

Summary of Veritas Storage Foundation installation tasks

Installation of Veritas Storage Foundation products consists of the following tasks:

- Reviewing *Release Notes* for the most current product information.
- Reviewing preinstallation requirements and making any necessary modifications.
See “[Preinstallation Instructions](#)” on page 9.
- Adding HP-UX operating system patches, if needed.
- Obtaining a license key.
- Installing the Veritas Storage Foundation or Veritas Storage Foundation for Oracle software packages. Follow the instructions in this chapter.
- Configuring the Veritas software.
See “[Configuring the Veritas software](#)” on page 61.

Note: Installing Veritas Storage Foundation using the product installer will automatically configure the software. If you install using an alternative method, you will have to run the product installer to configure the software.

About existing licenses

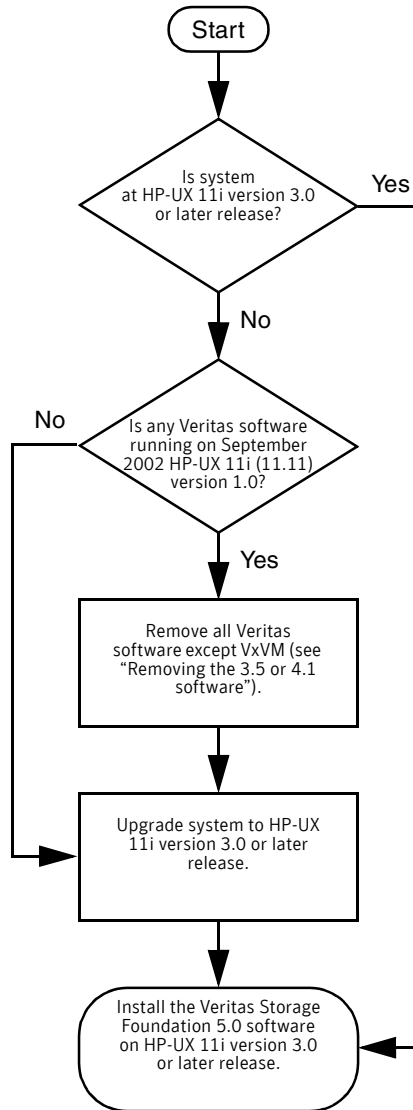
You must obtain new licenses to use all of the features in the Veritas Storage Foundation 5.0 software. Any Veritas licenses for previous releases that are currently installed will allow you to use only a limited subset of these features.

See [“Preinstallation Instructions”](#) on page 9.

Upgrading HP-UX

If you need to upgrade the HP-UX operating system, do so before installing the Veritas Storage Foundation or Veritas Storage Foundation for Oracle software. [Figure 2-1](#) shows the recommended sequence of steps for all Veritas Storage Foundation products.

Figure 2-1 Flowchart of steps for upgrading HP-UX



Installation notes for the Veritas 5.0 software

- When you install Veritas Volume Manager 5.0, the installation will overwrite the 4.1 version of the software that came bundled with the OS.

- When you install Veritas File System 5.0, the installation will install the 5.0 version of the software in a different location. The Base-VXFS 4.1 software which came bundled with the OS remains and it is restored when VxFS 5.0 is removed.
- Other packages, such as the database packages, will install normally.

Preparing to install the Veritas software

Ensure that you have made backups of all data that you want to preserve. In particular, you will need the information in files such as `/etc/fstab`. You should also run the `vxlicrep`, `vxdisk list`, and `vxprint -ht` commands, and record the output from these. You may need this information to reconfigure your system after the upgrade.

If you are upgrading an HA cluster, follow the guidelines given in the *Veritas Cluster Server (VCS) Installation Guide* for information on preserving your VCS configuration across the upgrade procedure. In particular, you should take care to make backups of configuration files, such as `main.cf` and `types.cf`, in the `/etc/VRTSvcs/conf/config` directory. Additional configuration files, such as `Oracletypes.cf`, may also be present in this directory if you have installed any VCS agents. You should also back up these files.

To prepare for the Veritas software upgrade

- 1 Log in as superuser.
- 2 Perform any necessary preinstallation checks and configuration. See [“Preinstallation Instructions”](#) on page 9 for more information.
- 3 If you are upgrading Veritas Storage Foundation for Oracle, resynchronize all existing snapshots before upgrading.

```
# /opt/VRTS/bin/dbed_vmsnap -S $ORACLE_SID -f SNAPPLAN \  
-o resync
```
- 4 Use the `vxlicrep` command to make a record of the currently installed Veritas licenses. Print the output or save it on a different system.
- 5 If you are upgrading a high availability (HA) product, take all service groups offline.
List all service groups:

```
# /opt/VRTSvcs/bin/hagrp -list
```

For each service group listed, take it offline:

```
# /opt/VRTSvcs/bin/hagrp -offline service_group \  
-sys system_name
```
- 6 Use the following command to check if any VxFS file systems or Storage Checkpoints are mounted:

```
# df -F vxfs
```

- 7 Unmount all Storage Checkpoints and VxFS file systems:

```
# umount /checkpoint_name  
# umount /filesystem
```

- 8 Verify that all file systems have been cleanly unmounted:

```
# echo "8192B.p S" | fsdb -F vxfs filesystem | grep clean  
flags 0 mod 0 clean clean_value
```

A *clean_value* value of 0x5a indicates the file system is clean, 0x3c indicates the file system is dirty, and 0x69 indicates the file system is dusty. A dusty file system has pending extended operations.

- 9 (Optional) If a file system is not clean, enter the following commands for that file system:

```
# fsck -F vxfs filesystem  
# mount -F vxfs filesystem mountpoint  
# umount mountpoint
```

This should complete any extended operations that were outstanding on the file system and unmount the file system cleanly.

There may be a pending large fileset clone removal extended operation if the `umount` command fails with the following error:

```
file system device busy
```

You know for certain that an extended operation is pending if the following message is generated on the console:

```
Storage Checkpoint asynchronous operation on file_system  
file system still in progress.
```

- 10 (Optional) If an extended operation is pending, you must leave the file system mounted for a longer time to allow the operation to complete. Removing a very large fileset clone can take several hours.
- 11 (Optional) Repeat [step 8](#) to verify that the unclean file system is now clean.
- 12 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.
- 13 Stop all the volumes by entering the following command for each disk group:
- ```
vxvol -g diskgroup stopall
```
- To verify that no volumes remain open, use the following command:
- ```
# vxprint -Aht -e v_open
```
- 14 Make a record of the mount points for VxFS file systems and VxVM volumes that are defined in the `/etc/fstab` file. You will need to recreate these entries in the `/etc/fstab` file on the freshly installed system.
- 15 Reboot the system.

Installing the Veritas Storage Foundation 5.0 software

These steps apply to both Veritas Storage Foundation and Veritas Storage Foundation for Oracle. After you complete the installation procedure, you need to initialize (where required) and set up the Veritas software in order to use it. See [“Configuring the Veritas software”](#) on page 61.

Caution: Installing the 5.0 Veritas software will overwrite the Veritas Volume Manager 4.1 software on your system. To go back to Veritas Volume Manager 4.1, you must reinstall using your HP-UX operating system discs.

Installing the 5.0 Veritas software will not overwrite OnlineJFS which came bundled with the OS. They coexist and when VxFS 5.0 is removed, OnlineJFS is used as a default file system.

Note: If you have obtained a Veritas product from an electronic download site, the single product download files do not contain the product installer, so you must use the product installation script to install the product.

See [“Installation script options”](#) on page 87.

After invoking the appropriate script, follow the instructions in [“Installing using the product installer”](#) on page 29 starting with step 2.

Mounting the software disc

You must have superuser (`root`) privileges to load the Veritas software.

To mount the software disc

- 1 Place 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
```

To install, use the procedure described in [“Installing using the product installer”](#) on page 29.

Installing using the product installer

The product installer is the recommended method to license and install the product. The installer also enables you to configure the product, verify preinstallation requirements, and view the product’s description.

At most points during an installation, you can type **b** (“**back**”) to return to a previous section of the installation procedure. The **back** feature of the installation scripts is context-sensitive, so it returns to the beginning of a grouped section of questions. If an installation procedure hangs, use Control-c to stop and exit the program. There is a short delay before the script exits.

The following sample procedure is based on the installation of a Veritas Storage Foundation Enterprise HA cluster with two nodes: “host1” and “host2.” If you are installing on standalone systems only, some steps are unnecessary, and these are indicated. Default responses are enclosed by parentheses. Press **Return** to accept defaults.

Note: If you have obtained a Veritas product from an electronic download site, the single product download files do not contain the product installer, so you must use the product installation script to install the product.

See [“Installation script options”](#) on page 87.

If you are upgrading your Veritas software, remove the previously installed packages. Then, follow the instructions in this section to install the 5.0 software. See [“Summary of Veritas Storage Foundation uninstallation tasks”](#) on page 76.

To install a Storage Foundation product

- 1 To invoke the common installer, run the `installer` command on the disc as shown in this example:

```
# cd /dvdrom
# ./installer
```

For information on installing on multiple hosts, see [“Completing the installation procedure”](#) on page 36.

- 2 At the Product Status page, enter **I** for the product installer and press **Return**. The product installer is displayed.

3 At the Veritas product installer page, select one of the following products:

- Veritas Storage Foundation
This option will install the Standard, Standard HA, Enterprise, or Enterprise HA product.
- Veritas Storage Foundation for Oracle
This option will install the Standard, Enterprise, or Enterprise HA product.

The product installation begins automatically.

The version of Veritas Volume Manager that was bundled with HP-UX will be replaced with Veritas Volume Manager 5.0. If you ever want to go back to the bundled version of Veritas Volume Manager, then you will have to remove Veritas Volume Manager 5.0 and re-install the bundled version using the HP-UX OS media.
Do you wish to continue with the installation? [y,n,q] (y)

If you are installing Veritas Storage Foundation for Oracle, do not select the “Storage Foundation for Oracle RAC packages” option unless you have the correct license or setup.

If you installed VRTSdbed on your system while installing SF 5.0 on HP-UX 11i Version 2, Symantec recommends that you select Veritas Storage Foundation for Oracle (SFORA).

4 You are prompted to enter the system names (in the following example, “host1” and “host2”) on which the software is to be installed. Enter the system name or names and then press Return.

Enter the system names separated by spaces on which to install
product_name: **host1 host2**

5 Enter the product license information.

Enter a *product_name* license key for host1: [?]
XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-X
XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-X successfully registered on host1
Do you want to enter another license key for host1? [y,n,q,?]
(n)

Enter a *product_name* license key for host2: [?]
XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-X
XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-X successfully registered on host1
Do you want to enter another license key for host2? [y,n,q,?]
(n)

Enter **n** if you have no further license keys to add for a system. You are then prompted to enter the keys for the next system.

Each system requires a Storage Foundation product license before installation. License keys for additional product features should also be added at this time.

6 You can choose to either install only required packages or all packages. Each option displays the disk space required for installation. Select which option

you want to install and press Return. For example, you should see output similar to the following:

```
SF can be installed without optional depots to conserve
diskspace. Additional filesets are typically installed to
simplify future upgrades.
```

- 1) Required Veritas Storage Foundation depots - 1406 MB
required
- 2) All Veritas Storage Foundation depots - 1453 MB
required

```
Select the depots to be installed on all systems? [1-
2,c,?] (2)
```

If you are installing Veritas Storage Foundation for Oracle, do not select the “Storage Foundation for Oracle RAC packages” option unless you have the correct license or setup.

- 7 Enter **1** or **2** to select the depots to be installed and press Return.
- 8 Reboot the system.
- 9 If you are installing on a cluster, proceed to “[Configuring Veritas Storage Foundation on a cluster](#)” on page 31 to configure Storage Foundation Enterprise HA. Otherwise, read “[Configuring the Veritas software](#)” on page 61 for important details about initializing (where required), setting up, and using the Veritas software.

Configuring Veritas Storage Foundation on a cluster

The following sample procedure is based on the configuration of a Veritas Storage Foundation Enterprise HA cluster with two nodes: “host1” and “host2.” Default responses are enclosed by parentheses. Press **Return** to accept defaults.

Note: The procedure in this section is only relevant if you are installing an HA version of the Storage Foundation software.

To configure Storage Foundation on a cluster

- 1 To invoke the common installer, run the `installer` command on the disc as shown in this example:

```
# cd /dvdrom
# ./installer
```
- 2 At the product status page, enter **C** for the Configure an Installed Product and press Return. The product installer is displayed.

- 3 You are prompted to enter the system names (in the following example, “host1” and “host2”) on which the software is to be installed. Enter the system name or names and then press Return.

```
Enter the system names separated by spaces on which to install
product_name: host1 host2
```

- 4 At the following prompt, enter **y** or press Return to configure the Storage Foundation product.

```
Are you ready to configure product_name? [y,n,q] (y) y
You have a VCS license and you are installing product_name
HA.
```

- 5 When prompted to configure VCS, enter **y** to configure VCS on these systems.

```
Do you want to configure VCS on these systems at this time?
[y,n,q] (y) y
```

- 6 Enter the unique cluster name and Cluster ID number

```
Enter the unique cluster name: [?] vcs_cluster2
Enter the unique Cluster ID number between 0-65535: [b,?] 76
```

The installer discovers the NICs available on the first system and reports them:

```
Discovering NICs on host1 ...discovered lan0 lan1 lan2
```

- 7 Enter private heartbeat NIC information for each host.

```
Enter the NIC for the first private heartbeat link on host1:
[b,?] lan1
Would you like to configure a second private heartbeat link?
[y,n,q,b,?] (y)
Enter the NIC for the second private heartbeat link on host1:
[b,?] lan2
Would you like to configure a third private heartbeat link?
[y,n,q,b,?] (n) n
Do you want to configure an additional low priority
heartbeat link? [y,n,q,b,?] (n)
Are you using the same NICs for private heartbeat links on
all systems? [y,n,q,b,?] (y)
```

Note: When answering **y**, be sure that the same NICs are available on each system; the installer does not verify this.

Notice that in this example, lan0 is not selected for use as a private heartbeat NIC because it already in use as the public network interface. The default responses are chosen.

- 8 A summary of the information you entered is given. When prompted, confirm that the information is correct.

```
Is this information correct? [y,n,q] (y)
```


If the information is correct, press Return. If the information is *not* correct, enter **n**. The installer prompts you to enter the information again.

- 9 When prompted to configure the product to use Veritas Security Services, enter **y** or **n** to configure.

Note: Before configuring a cluster to operate using Veritas Security Services, another system must already have Veritas Security Services installed and be operating as a Root Broker. Refer to the Veritas Cluster Server Installation Guide for more information on configuring a VxSS Root Broker.

```
Would you like to configure product_name to use Veritas
Security
Services? [y,n,q] (n) n
```

- 10 A message displays notifying you of the information required to add users. When prompted, set the user name and /or password for the Administrator.

```
Do you want to set the username and/or password for the Admin
user (default username = 'admin', password='password')?
[y,n,q] (n)
```

- 11 Enter **n** if you want to decline. If you enter **y**, you are prompted to change the password. You are prompted to add another user to the cluster.

```
Do you want to add another user to the cluster? [y,n,q] (y)
```

- 12 Enter **n** if you want to decline, enter **y** if you want to add another user. You are prompted to verify the user.

```
Is this information correct? [y,n,q] (y)
```

Enter **y** or **n** to verify if this information is correct.

- 13 You are prompted to configure the cluster management console. Enter **y** or **n** to configure the cluster management console.

```
Do you want to configure the Cluster Management Console
[y,n,q] (n) y
```

- 14 Enter the NIC for the Cluster Manager (Web Console), then confirm whether the NIC is to be the public NIC used by all systems.

```
Enter the NIC for Cluster Manager (Web Console) to use on
host1: [b,?] (hme0)
Is hme0 to be the public NIC used by all systems [y,n,q,b,?]
(y)
```

- 15 Enter the Virtual IP address for Cluster Manager.

- 16 You are prompted to verify the information.

```
Is this information correct? [y,n,q] (y)
```

Enter **y** or **n** to verify if this information is correct.

- 17 You are prompted to configure the cluster connector. Enter **y** or **n** to configure the cluster connector.
Do you want to configure the cluster connector [y,n,q] (n)
- 18 When prompted to configure SMTP notification, enter **y** or **n** to configure.
Do you want to configure SMTP notification? [y,n,q] (y)
- 19 When prompted to configure SNMP notification, enter **y** or **n** to configure.
Do you want to configure SNMP notification? [y,n,q] (y)
- 20 When prompted to set up the default disk group for each system, enter **y** to set up the disk group for each system.
Do you want to set up a default disk group for each system?
[y,n,q,?] (y)
- 21 If you are installing Veritas Storage Foundation for Oracle, change permissions to allow a database administrator or a group of administrators access to the database tools on each system.
Do you want to add single user access on host1? [y,n,q,?] y
Enter login account name for DBA user: *account_name*
Do you want to add group access on host1? [y,n,q,?] y
Enter groupo name for DBA users: dba
Do you want to add single user access on host2? [y,n,q,?] y
Enter login account name for DBA user: *account_name*
Do you want to add group access on host2? [y,n,q,?] y
Enter groupo name for DBA users: dba
- 22 When prompted to change any of the VVR ports on host1, enter **y** or **n** if you want to change any of the VVR ports on host1
Do you want to change any of the VVR ports on host1? [y,n,q]
(n)
- 23 When prompted to configure VVR statistics on host1, enter **y** or **n** to configure the VVR statistics.
Do you want to change the frequency of VVR statistics collection on host1? [y,n,q] (n)

Do you want to change the maximum number of days for retaining VVR statistics on host1? [y,n,q] (n)
- 24 When prompted to modify the VVR tunables on host1, enter **y** or **n** to modify VVR tunables host1.
Do you want to view or modify VVR tunables on host1?
[y,n,q,?] (n)
- 25 When prompted to change any of the VVR ports on host2, enter **y** or **n** if you want to change any of the VVR ports on host2
Do you want to change any of the VVR ports on host2? [y,n,q]
(n)
- 26 When prompted to configure VVR statistics on host2, enter **y** or **n** to configure VVR statistics on host2.

Do you want to change the frequency of VVR statistics collection on host2 ? [y,n,q] (n)

Do you want to change the maximum number of days for retaining VVR statistics on host2 ? [y,n,q] (n)

- 27** When prompted to modify the VVR tunables on host2, enter **y** or **n** to modify the VVR tunables on host2.

Do you want to view or modify VVR tunables on host2 ? [y,n,q,?] (n)

- 28** You are prompted to enter the fully qualified hostname of system host1. Enter **y** for the host1.domain_name.

Is the fully qualified hostname of system "host1" = "host1.domain_name"? [y,n,q] (y)

- 29** You are prompted to enter the fully qualified hostname of system host1. Enter **y** for the host2.domain_name.

Is the fully qualified hostname of system "host2" = "host2.domain_name"? [y,n,q] (y)

- 30** You are prompted to enable Storage Foundation Management Server Management.

Enable Storage Foundation Management Server Management? [y,n,q] (y)

- 31** Enter **y** to enable Storage Foundation Management Server Management. You are prompted to start Storage Foundation.

Do you want to start Veritas Storage Foundation processes now? [y,n,q] (y)

.
.
.

Startup completed successfully on all systems

You declined to set up the name of the default disk group for host1.

You declined to set up the name of the default disk group for host2.

Installation log files, summary file, and response file are saved at:

/opt/VRTS/install/logs/installsf-7ai12i

When installsf installs software, some software may be applied rather than committed. It is the responsibility of the system administrator to commit the software, which can be performed later with the -c option of the installp command.

Completing the installation procedure

At this point in the installation and configuration procedure, the utility begins to install the various packages on one node and copy them to any other specified nodes. The following sample output is for a Storage Foundation Enterprise HA installation.

To complete the installation procedure

- 1 If you are completing the installation procedure in a cluster configuration, skip this step. If you are completing the installation procedure on a stand-alone configuration, invoke the common installer, run the `installer` command on the disc as shown in this example:

```
# cd /dvdrom
# ./installer
```

At the product status page, enter **C** for the Configure an Installed Product and press Return. The product installer is displayed.

- 2 As the utility continues the procedure, you are prompted to choose whether to install on all systems simultaneously. Enter **y** or press Return to accept simultaneous installation.

```
Would you like to install Storage Foundation Standard HA on all
systems simultaneously? [y,n,q,?] (y) y
```

- 3 A message displays notifying you of successful installation. Press Return to continue.
- 4 A message displays describing the VxVM enclosure-based naming scheme and showing which nodes are eligible. When prompted to configure this feature, enter **n** if you want to decline. If required, you can use the `vxdiskadm` command or the Veritas Enterprise Administrator to configure this feature after installation. See the `vxdiskadm(1M)` manual page and the “Administering Disks” chapter of the *Veritas Volume Manager Administrator’s Guide* for more information.
- 5 If you are installing an HA version of the product, a message displays indicating the VCS configuration files are being created and copied. Press Return to continue.
- 6 A message displays indicating which systems can be started and on the systems that VxVM selects as targets.
- 7 Press Return to continue. If you are installing an HA version of the product, a message displays notifying you that Cluster Server is starting. This message also contains information about configuring a default disk group.

- 8** You are now given the option of specifying the default name of a disk group that is to be assumed by Veritas Volume Manager commands if a disk group is not otherwise specified.

```
Many Volume Manager commands affect the contents or
configuration of a disk group. Such commands require that the
user specify a disk group. This is accomplished by using the -g
option of a command or setting the VXVM_DEFAULTDG environment
variable. An alternative to these two methods is to configure
the default disk group of a system.
```

```
Evaluating which systems can now have their default disk group
configured...
```

```
System host1 is eligible -- can configure the default diskgroup.
System host2 is eligible -- can configure the default diskgroup.
```

```
Do you want to set up the default disk group for each system?
[y,n,q,?] (y) n
```

Enter **n** if you do not want to specify the name of the default disk group at this time. You can set the name of the default disk group after installation by running the `vxctl defaultdg diskgroup` command on a system. See the `vxctl(1M)` manual page and the “Creating and Administering Disk Groups” chapter of the *Veritas Volume Manager Administrator’s Guide* for more information.

Note: If you specify the name of a default disk group, this step does not create the disk group. After installation, you can use menu item 1 in the `vxdiskadm` command or the Veritas Enterprise Administrator to create the disk group.

- 9** Finally, a message displays indicating the utility is preparing to start the daemons on the target systems.

```
Preparing to start daemons on target system(s)...
Starting vxrelocd on host1 ..... Success
Starting vxcached on host1 ..... Success
Starting vxconfigbackupd on host1 ..... Success
```

```
Starting vxrelocd on host2..... Success
Starting vxcached on host2 ..... Success
Starting vxconfigbackupd on host2 ..... Success
```

```
Storage Foundation Enterprise HA was started successfully.
```

```
Press [Return] to continue:
```

Press Return. A message displays notifying you of a successful installation and the locations of the `/opt/VRTS/install` files.

```
Installation log files, summary file, and response file are
saved at:
```

```
/opt/VRTS/install/logs/installer-Tx0083
```

At least one package will require a reboot prior to configuration. Please reboot and run `installer -configure` on the systems that have the packages installed.

Run the following command to properly restart your systems:

```
/usr/sbin/shutdown -r now
```

- 10 If you installed Veritas Storage Foundation for Oracle, create a new repository database or upgrade to the new repository database. See [“Upgrading to the new repository database for DB2 and Oracle”](#) on page 39.

Configuring your system after the installation

To configure your system after the software upgrade

- 1 Reinststate the mount points in the `/etc/fstab` file that you recorded in [step 14](#) on page 27.
- 2 Reboot the upgraded systems.
- 3 Restart all the volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup startall
```

There are several optional configuration steps that you may want to perform:

- If you want to use features of Veritas Storage Foundation 5.0 or Veritas Storage Foundation 5.0 *for Oracle* for which you do not currently have an appropriate license installed, obtain the license and run the `vxlicinst` command to add it to your system.
 - Stop the cluster, restore the VCS configuration files to the `/etc/VRTSvcs/conf/config` directory, and restart the cluster.
 - To create root volumes that are under VxVM control after installation, use the `vxcp_lvmroot` command as described in [“Converting to a VxVM root disk”](#) on page 43, and in the “Administering Disks” chapter of the *Veritas Volume Manager Administrator’s Guide*.
 - To upgrade VxFS Disk Layout versions and VxVM Disk Group versions, follow the instructions given in [“Upgrading VxFS disk layout versions”](#) on page 45 and [“Upgrading VxVM disk group versions”](#) on page 47.
- 4 After you complete the installation procedure, read [“Configuring the Veritas software”](#) on page 61 for important details about initializing (where

required), setting up, and using the Veritas software shipped with Veritas Storage Foundation.

Upgrading to the new repository database for DB2 and Oracle

If you are installing or upgrading Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, you need to either create a new repository database or migrate your old repository database to the new one. To use the `db2ed_update` or `dbed_update` command, you must be the instance owner or database administrator.

To upgrade your repository database

- 1 Create and configure the new repository database with the `sfua_db_config` command.

```
# /opt/VRTSdbcom/bin/sfua_db_config
```

- 2 Migrate your old repository information into the new repository database. If you are upgrading Veritas Storage Foundation for DB2 in a single-host environment, run the `db2ed_update` command.

```
# /opt/VRTS/bin/db2ed_update -D DB2DATABASE
```

If you are upgrading Veritas Storage Foundation for DB2 in a high availability (HA) environment, run the `db2ed_update` command with the `-G` option.

```
# /opt/VRTS/bin/db2ed_update -D DB2DATABASE -G service_group
```

If you are upgrading Veritas Storage Foundation for Oracle in a single-host environment, run the `dbed_update` command.

```
# /opt/VRTS/bin/dbed_update -S $ORACLE_SID -H $ORACLE_HOME
```

If you are upgrading Veritas Storage Foundation for Oracle in a high availability (HA) environment, run the `dbed_update` command with the `-G` option.

```
# /opt/VRTS/bin/dbed_update -S $ORACLE_SID -H $ORACLE_HOME \
-G service_group
```

After the upgrade, the old repository database will be marked with a hidden file name, such as `/etc/vx/vxdba/.instance_name`, to prevent further updates. If you need to perform an additional upgrade, the file must be removed.

Migrating from `/etc/vx/vxdba` to `/var/vx/vxdba` for DB2 and Oracle

If you are upgrading Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, you can migrate to `/var/vx/vxdba` to save space under the root partition. Migrating to `/var/vx/vxdba` is optional. However, if you do not perform this migration, you cannot remove any file or directory from `/etc/vx/vxdba` to ensure proper operation. This procedure can be done at any time.

To migrate from `/etc/vx/vxdba` to `/var/vx/vxdba`

- 1 Copy the `/etc/vx/vxdba` directory and contents to `/var/vx/vxdba`

```
# cp -rp /etc/vx/vxdba /var/vx/vxdba
```
- 2 Remove `/etc/vx/vxdba`.

```
# rm -rf /etc/vx/vxdba
```
- 3 Link the two directories.

```
# ln -s /var/vx/vxdba /etc/vx/vxdba
```

Verifying the Veritas Storage Foundation installation

You can use the `swlist` command to check which packages have been installed:

```
# swlist -l product | grep VRTS
```

Use the following sections to verify the product installation.

Checking Volume Manager processes

To confirm that key Volume Manager processes are running

- ◆ Type the following command:

```
# ps -e | grep vx
```

Entries for the `vxconfigd`, `vxnotify`, `vxrelocd`, `vxsmf`, `vxpal`, `vxcached` and `vxconfigbackupd` processes should appear in the output from this command. If you disable hot-relocation, the `vxrelocd` and `vxnotify` processes are not displayed.

Checking VxFS installation

The Veritas File System package consists of a kernel component and administrative commands.

Command installation verification

The Veritas File System commands are installed in two directories:

<code>/sbin/fs/vxfs5.0</code>	Contains the <code>Veritas mount</code> command required to mount file systems.
<code>/opt/VRTS/bin</code>	Contains symbolic links to all Veritas-specific commands installed in the directories listed above.

Determine whether these subdirectories are present:

```
# ls /sbin/fs/vxfs5.0
# ls /opt/VRTS/bin
```

Make sure you have adjusted your environment variables accordingly. See [“Environment variables”](#) on page 14 for details.

Checking cluster operation

You need to check cluster operation only if you installed and configured an HA version of the Storage Foundation software.

To verify that the cluster is operating

- ◆ Type the following command on any node:

```
# hastatus -summary

-- SYSTEM STATE
-- System          State          Frozen

A host1            RUNNING        0
A host2            RUNNING        0

-- GROUP STATE
-- Group           System        Probed  AutoDisabled  State

B ClusterService  host1         Y      N              ONLINE
B ClusterService  host2         Y      N              OFFLINE
```

Identify the system state of each node in the output of this command. If the value is `RUNNING` for all the nodes, VCS is successfully installed and running.

Refer to the `hastatus(1M)` manual page and the *Veritas Cluster Server User's Guide* for more information on system states and state transitions.

About Low Latency Transport

The file `llthosts(4)` is a database containing one entry per node that links the Low Latency Transport (LLT) system ID (in the first column) with the LLT host name. This file is identical on each cluster node.

Based on the sample installation, the file `/etc/llthosts` contains the entries:

```
0 host1
1 host2
```

The file `llttab(1M)` contains information derived from the installation and used by the utility `lltconfig(1M)`. After installation, this file lists the network links that correspond to the specific node.

The first line identifies the node. The second line identifies the cluster, based on the cluster ID entered during installation. The next two lines, beginning with the `link` command, identify the two network cards used by the LLT protocol.

See the `llttab(4)` manual page for details on how to modify the LLT configuration. The manual page describes ordering the directives in the `llttab` file.

Verifying LLT

Use the `lltstat` command to verify that LLT links are active for each system in the cluster.

To verify that links are active for LLT

- ◆ Use the `lltstat -n` as follows:

```
# lltstat -n
```

With LLT configured correctly, the output of `lltstat -n` shows all of the nodes in the cluster and two links for each node. If the output shows otherwise, type `lltstat -nvv | more` on any node to view additional information about LLT.

To obtain LLT port information

- ◆ Use the `lltstat -p` command as follows:

```
# lltstat -p
```

About Group Membership and Atomic Broadcast

After installation, the file `/etc/gabtab` contains a `gabconfig(1M)` command that configures the Group Membership and Atomic Broadcast (GAB) driver.

The file `/etc/gabtab` contains a line that resembles:

```
/sbin/gabconfig -c -nN
```

where the `-c` option configures the driver and `-nN` specifies the cluster will not be formed until at least N nodes are ready. The variable N represents the number of cluster nodes.

Verifying GAB

To verify that GAB is operating

- ◆ Type the following command on each system:

```
# /sbin/gabconfig -a
```

If GAB is operating, the following GAB port membership information is returned:

```
GAB Port Memberships
=====
Port a gen a36e0003 membership 01
Port h gen fd570002 membership 01
```

Port a indicates that GAB is communicating, gen a36e0003 is a randomly generated number, and membership 01 indicates that nodes 0 and 1 are connected.

Port h indicates that VCS is started, gen fd570002 is a randomly generated number, and membership 01 indicates that nodes 0 and 1 are both running VCS.

If GAB is not operating, no GAB port membership information is returned:

```
GAB Port Memberships
=====
```

If only one network is connected, the following GAB port membership information is returned:

```
GAB Port Memberships
=====
Port a gen a36e0003 membership 01
Port a gen a36e0003 jeopardy 1
Port h gen fd570002 membership 01
Port h gen fd570002 jeopardy 1
```

For more information on GAB, including descriptions of ports, refer to the *Veritas Cluster Server User's Guide*.

Converting to a VxVM root disk

From the September 2004 HP-UX 11i version 2.0 release, it is possible to select VxVM as a choice for your root disk when performing a new installation using Ignite-UX. Alternatively, you can use the following procedure to achieve VxVM rootability by cloning your LVM root disk using the `vxcp_lvmroot` command.

To convert to a VxVM root disk

- 1 Select the disk to be used as your new VxVM root disk. It is recommended that this disk is internal to the main computer cabinet. If this is currently an LVM disk, then it must be removed from LVM control as follows:
 - Use the `vgreduce` command to remove the disk from any LVM volume groups to which it belongs.
 - Use the `lvremove` command to remove any LVM volumes that are using the disk.
 - Use the `pvremove` command to erase the LVM disk headers

Note: If the disk to be removed is the last disk in the volume group, use the `vgremove` command to remove the volume group, and then use `pvremove` to erase the LVM disk headers.

If the disk is not currently in use by any volume or volume group, but has been initialized by `pvcreate`, you must still use the `pvremove` command to remove LVM disk headers.

If you want to mirror the root disk across multiple disks, make sure that all the disks are free from LVM control.

- 2 While booted on the newly upgraded LVM root disk, invoke the `vxcp_lvmroot` command to clone the LVM root disk to the disk(s) you have designated to be the new VxVM root disks. In the following example, `c1t0d0` is used for the target VxVM root disk:

```
# /etc/vx/bin/vxcp_lvmroot -v c1t0d0
```

To additionally create a mirror of the root disk on `c2t0d0`:

```
# /etc/vx/bin/vxcp_lvmroot -v -m c2t0d0 c1t0d0
```

Use of the `-v` (verbose) option is highly recommended. The cloning of the root disk is a lengthy operation, and this option gives a time-stamped progress indication as each volume is copied, and other major events.
- 3 Use the `setboot (1M)` command to save the hardware path of the new VxVM root disk in the system NVRAM. The disk hardware paths can be found using this command:

```
# ioscan -kfnC disk
```
- 4 Reboot from the new VxVM root disk. If you created a mirrored root disk, then there is nothing more to do. The LVM root disk safely co-exists with your VxVM root disk, and provides a backup boot target.
- 5 If desired, you can convert the original LVM root disk into a mirror of your VxVM root disk by using the following commands:

```
# /etc/vx/bin/vxdestroy_lvmroot -v c2t0d0
```

```
# /etc/vx/bin/vxrootmir -v c2t0d0
```

Once this operation is complete, the system is running on a completely mirrored VxVM root disk.

Note: If later required, you can use the `vxres_lvmroot` command to restore the LVM root disk.

Upgrading VxFS disk layout versions

Veritas File System 5.0 allows Version 4, 5, 6 and 7 for locally mounted file systems and disk layout Versions 6 and 7 for cluster mounted file systems. If you have cluster mounted file systems with disk layout Versions lower than 6, then after upgrading to VxFS 5.0. Perform the following additional steps to prepare the file system for being mounted on all nodes of the cluster:

Note: Disk layout Versions 1, 2, and 3 are not supported by VxFS 5.0. All file systems created on VxFS 5.0 use disk layout Version 7 by default.

See the *Veritas File System Administrator's Guide*.

- 1 Select one of the nodes of the cluster and mount the file system locally on this node. Use the `mount`, but without the `-o cluster` option. For example:

```
# mount -F vxfs /dev/vx/dsk/sharedg/vol1 /mnt1
```

- 2 To find the current disk layout version on a file system:

```
# fstyp -v <char_device_path> | grep version | \
awk '{print $2}'
```

- 3 On the node selected in [step 1](#), incrementally upgrade the disk layout of this file system to layout Version 6 or 7. For example, if you had a cluster mounted file system of disk layout Version 4 running with previous version of VxFS, after upgrading to VxFS 5.0, you would need to upgrade the disk layout to Version 6 or 7. The incrementally upgrade is as follows:

```
# vxupgrade -n 5 /mnt1
# vxupgrade -n 6 /mnt1
# vxupgrade -n 7 /mnt1
```

- 4 On the node selected in [step 1](#), after the disk layout has been successfully upgraded, unmount the file system:

```
# umount /mnt1
```

- 5 This file system can be mounted on all nodes of the cluster.

When to upgrade disk layout versions

You must upgrade your older disk layout versions, to make use of the extended features available in the VxFS 5.0 release. Use the `vxfsconvert` or `vxupgrade` utilities to upgrade older disk layout versions to disk layout Version 7 as described in the following sections.

See the *Veritas Storage Foundation Release Notes*.

Caution: Never upgrade the `/` and `/stand` file systems to disk layout Version 6 or 7. The HP-UX bootloader does not support disk layout Version 6 and 7.

When to use vxfsconvert

You can use the `vxfsconvert` command to convert an unmounted HFS file system to a Veritas file system with disk layout Version 7.

```
# vxfsconvert /device_name
```

See the `vxfsconvert(1M)` and `fsadm_vxfs(1M)` manual pages.

When to use vxupgrade

You can use the `vxupgrade` command to upgrade older VxFS disk layouts to disk layout Version 7 while the file system remains mounted.

```
# vxupgrade -n 7 /mount_point
```

See the `vxupgrade(1M)` and `fsadm_vxfs(1M)` manual pages.

The contents of intent logs created on a previous disk layout version cannot be used after the disk layout version is upgraded.

See the *Veritas Storage Foundation Release Notes*.

Requirements for upgrading to disk layout Version 7

Converting a Version 4, 5, or 6 disk layout to Version 7 disk layout requires adequate free space. The space and time required to complete the upgrade increases with the number of files, extended attributes, and hard links in the file system. Typical maximum space is at least two additional inodes with one block for every inode. Allow at least ten minutes to upgrade for every million inodes in the file system.

Upgrading VxVM disk group versions

All Veritas Volume Manager disk groups have an associated version number. Each VxVM release supports a specific set of disk group versions and can import and perform tasks on disk groups with those versions. Some new features and tasks work only on disk groups with the current disk group version, so you need to upgrade existing disk groups before you can perform the tasks. The following table summarizes the disk group versions that correspond to each VxVM release on HP-UX from 3.0 to the present.

Table 2-3 VxVM disk group versions

VxVM Release	Disk Group Version	Supported Disk Group Versions
3.0	60	20-40, 60
3.1	70	20-70
3.1.1	80	20-80
3.5	90	90
4.1	120	90, 110, 120
5.0	140	90, 110, 120, 140

Use the following command to find the version of a disk group:

```
# vxdg list diskgroup
```

To upgrade a disk group to version 140, use the following command:

```
# vxdg upgrade diskgroup
```

Upgrading to SF 5.0 on HP-UX 11i Version 3

If you are running an earlier release of Storage Foundation, you can upgrade your product using the procedures described in this section. This section discusses the following upgrade paths from earlier releases of SF on HP-UX 11.11, HP-UX 11.23 and HP-UX 11.31 to SF 5.0 on HP-UX 11.31:

- Upgrading from SF 4.1 on 11.31 to SF 5.0 on 11.31
- Upgrading from SF 5.0 on 11.23 to SF 5.0 on 11.31
- Upgrading from SF 4.1 on 11.23 to SF 5.0 on 11.31
- Upgrading from SF 3.5 on 11.11 to SF 5.0 on 11.31

Note: If performing a Storage Foundation upgrade on a cluster, refer to the Veritas Cluster Server upgrade instructions available in the *Veritas Cluster Server Installation Guide* along with the following Storage Foundation upgrade instructions.

Note: During installation of SF 5.0 on 11.31, you may receive the following error message:

ERROR: Veritas Volume Manager is being upgraded on system *hostname*, where it was originally installed with HP-UX as Base-VXVM. As part of the upgrade process, it is expected that the Base-VXVM package would become empty and `swremove(1M)` would succeed in removing it. However, the removal failed. Please examine Base-VXVM using `swlist(1M)`.

In this case please remove Base-VXVM using the following command after the SF install procedure completes:

```
# swremove -x autoreboot=true Base-VXVM
```

Upgrading from SF 4.1 on 11.31 to SF 5.0 on 11.31

Prior to upgrading to SF 5.0 on 11.31, take note of the following disk group considerations:

- Disk group version 120 is the default disk group version for VxVM 4.1, whereas disk group version 140 is the default disk group version for VxVM 5.0.
- All disk group versions supported by VxVM 4.1 (90 and 120) are also supported by VxVM 5.0. Consequently, all the disk groups created using VxVM 4.1 can be imported after upgrading to VxVM 5.0. Some new features and tasks work only on disk groups with the current disk group versions. To use new features, the disk group versions need to be upgraded.
- VxVM 5.0 on HP-UX 11.31 supports shared disk groups only on disk group version 140.

To upgrade from SF 4.1 on 11.31 to SF 5.0 on 11.31

- 1 Stop activity to all SF volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

- 2 If patches to SF 5.0 11.31 are required, the patches should be applied prior to upgrading the product.
- 3 Install SF 5.0 11.31.
See [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28.
- 4 Configure SF 5.0 11.31 using the `installsf -configure` option.
See [“Configuring your system after the installation”](#) on page 38
Upon successful completion of the upgrade, SF 4.1 will be replaced by SF 5.0. Disk groups created in SF 4.1 should be accessible after the upgrade to SF 5.0. To upgrade a disk group to version 140 see [“Upgrading VxVM disk group versions”](#) on page 47.

Upgrading from SF 5.0 on 11.23 to SF 5.0 on 11.31

Prior to upgrading to SF 5.0 on 11.31, take note of the following disk group consideration:

- All disk group versions supported by VxVM 5.0 (90, 120, and 140) on HP-UX 11.23 are also supported by VxVM 5.0 on HP-UX 11.31.

Note: During the OS upgrade, the following errors will be reported. However these errors can be ignored and the OS upgrade will complete successfully.

ERROR: A later revision (one with a higher revision number) of fileset "VRTSvxvm.VXVM-KRN,r=4.1.032" has already been installed.

ERROR: A later revision (one with a higher revision number) of fileset "VRTSvxvm.VXVM-RUN,r=4.1.032" has already been installed.

Note: If the AT broker was not configured prior to the upgrade, it will remain unconfigured after the upgrade. The installation logs will contain a message stating that vxatd will not be started because it was not configured. This is expected and can be ignored.

To upgrade from SF 5.0 on 11.23 to SF 5.0 on 11.31

- 1 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.
- 2 Convert Rootable VxVM volumes to LVM Rootable.
- 3 If you have any external Array Policy Modules (APMs) installed, uninstall the APMs.

The following warning message displays during the OS upgrade and also when you issue an administrative command for HP-UX kernel modules after the upgrade, until SF 5.0 on HP-UX 11i Version 3 is installed:

```
WARNING: The file '/usr/conf/mod/dmpXXX.1' does not  
contain valid kernel code. It will be ignored.
```

This message can be ignored and does not affect the functionality of SF.

- 4 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP.
After the OS upgrade is complete, Base-VXVM 5.0 for HP-UX 11.23 will be the default VxVM software available in the system. Therefore, after upgrade procedure, any disk groups including 5.0 (11.23) disk groups with 140 disk group versions will not be accessible. Disk groups and volume manager objects can be accessed only after Base-VXVM 5.0 for HP-UX 11.31 installation is complete.
- 5 If patches to SF 5.0 11.31 are required, the patches should be applied prior to upgrading the product.
- 6 Install SF 5.0 11.31.
See [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28.
- 7 Configure SF 5.0 11.31 using the `installsf -configure` option.
See [“Configuring your system after the installation”](#) on page 38
Upon successful completion of the upgrade, disk groups created in VxVM 5.0 11.23 should be accessible after the upgrade. If the rootable VxVM volumes were converted to LVM, convert them back to VxVM rootable.

Upgrading from SF 4.1 on 11.23 to SF 5.0 on 11.31

Prior to upgrading to SF 5.0 on 11.31, take note of the following disk group considerations:

- Disk group version 120 is the default disk group version for VxVM 4.1, whereas disk group version 140 is the default disk group version for VxVM 5.0.
- All disk group versions supported by VxVM 4.1 (90 and 120) are also supported by VxVM 5.0. Consequently, all the disk groups created using VxVM 4.1 can be imported after upgrading to VxVM 5.0. Some new features and tasks work only on disk groups with the current disk group versions. To use new features, the disk group versions need to be upgraded.
- VxVM 5.0 on HP-UX 11.31 supports shared disk groups only on disk group version 140. VxVM 4.1 on HP-UX 11.31 does not support shared disk groups.

Note: If the AT broker was not configured prior to the upgrade, it will remain unconfigured after the upgrade. The installation logs will contain a message stating that vxatd will not be started because it was not configured. This is expected and can be ignored.

To upgrade from SF 4.1 on 11.23 to SF 5.0 on 11.31

1 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

2 If you have any external Array Policy Modules (APMs) installed, uninstall the APMs.

The following warning message displays during the OS upgrade and also when you issue an administrative command for HP-UX kernel modules after the upgrade, until SF 5.0 on HP-UX 11i Version 3 is installed:

```
WARNING: The file '/usr/conf/mod/dmpXXX.1' does not  
contain valid kernel code. It will be ignored.
```

This message can be ignored and does not affect the functionality of SF.

3 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP.

After the OS upgrade is complete, Base-VXVM 4.1 will be the default VxVM software available in the system. Shared disk groups with disk group versions less than or equal to 120 will not be accessible, as shared disk group is not supported in VxVM 4.1 on 11.31.

4 If patches to SF 5.0 11.31 are required, the patches should be applied prior to upgrading the product.

5 Install SF 5.0 11.31.

See “[Installing the Veritas Storage Foundation 5.0 software](#)” on page 28.

6 Configure SF 5.0 11.31 using the `installsf -configure` option.

See “[Configuring your system after the installation](#)” on page 38

Upon successful completion of the upgrade, SF 4.1 will be replaced by SF 5.0. Disk groups created in SF 4.1 11.23 should be accessible after the upgrade to SF 5.0. To upgrade a disk group to version 140 see “[Upgrading VxVM disk group versions](#)” on page 47.

Upgrading from SF 3.5 on 11.11 to SF 5.0 on 11.31

Prior to upgrading to SF 5.0 on 11.31, take note of the following disk group consideration:

- VxVM 3.5 and VxVM 5.0 both support disk group version 90. All upgrades from HP-UX 11.11 to HP-UX 11.31 require an intermediate upgrade to HP-UX 11.23.

To upgrade from SF 3.5 on 11.11 to SF 5.0 on 11.31

- 1 Stop activity to all SF volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.
- 2 Upgrade from HP-UX 11.11 to HP-UX 11.23 using practices recommended by HP. This installs Base-VXVM 4.1 by default.
- 3 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP. This installs Base-VXVM 4.1 by default.
- 4 If patches to SF 5.0 11.31 are required, the patches should be applied prior to upgrading the product.
- 5 Install SF 5.0 11.31.
See “[Installing the Veritas Storage Foundation 5.0 software](#)” on page 28.
- 6 Configure SF 5.0 11.31 using the `installsf -configure` option.
See “[Configuring your system after the installation](#)” on page 38
Upon successful completion of the upgrade, SF 3.5 will be replaced by SF 5.0. Disk groups created in SF 3.5 should be accessible after the upgrade to SF 5.0. To upgrade a disk group to version 140 see “[Upgrading VxVM disk group versions](#)” on page 47.

Upgrading to VxVM 5.0 on HP-UX 11i Version 3

If you are running an earlier release of Veritas Volume Manager, you can upgrade your product using the procedures described in this section. This section discusses the following upgrade paths from earlier releases of VxVM on HP-UX 11.11 and HP-UX 11.23 to VxVM 5.0 on HP-UX 11.31:

- Upgrading VxVM 5.0 on 11.23 to VxVM 5.0 11.31 using integrated VxVM 5.0 package for 11.31

Upgrading VxVM 5.0 on 11.23 to VxVM 5.0 11.31 using integrated VxVM 5.0 package for 11.31

You can upgrade from VxVM 5.0 on 11.23 to VxVM 5.0 on 11.31 using the integrated VxVM 5.0 package for 11.31 from the ignite depot.

To upgrade to VxVM 5.0 on 11.31 using the integrated VxVM 5.0 package for 11.31 from the ignite depot

- 1 Copy 11.31 LR depot to a depot server.
- 2 Swcopy VxVM 5.0 HP 11.31 to the ignite depot.
- 3 Swremove VxVM 4.1, which is the default VxVM in 11.31 from the ignite depot.

To upgrade VxVM 5.0 on HP-UX 11.31

- 1 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.
- 2 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP.

After the OS upgrade is complete, VxVM 5.0 will be installed. Upon successful completion of the upgrade, disk groups created in VxVM 5.0 11.23 should be accessible.

Upgrading to SFORA 5.0 on HP-UX 11i Version 3

Prior to upgrading to SFORA 5.0 on 11.31, you must resynchronize all existing database snapshots and shutdown the database using database administrator credentials.

Use the following command to resynchronise all database snapshots:

```
# /opt/VRTS/bin/dbed_vmsnap -s $ORACLE_SID -f SNAPPLAN -o resync
```

Upgrading from SFORA 5.0 on 11.23 to SFORA 5.0 on 11.31

Prior to upgrading to SFORA 5.0 on 11.31, take note of the following disk group consideration:

- All disk group versions supported by VxVM 5.0 (90, 120, and 140) on HP-UX 11.23 are also supported by VxVM 5.0 on HP-UX 11.31.

Note: During the OS upgrade, the following errors will be reported. However these errors can be ignored and the OS upgrade will complete successfully.

ERROR: A later revision (one with a higher revision number) of fileset "VRTSvxvm.VXVM-KRN,r=4.1.032" has already been installed.

ERROR: A later revision (one with a higher revision number) of fileset "VRTSvxvm.VXVM-RUN,r=4.1.032" has already been installed.

Note: If the AT broker was not configured prior to the upgrade, it will remain unconfigured after the upgrade. The installation logs will contain a message stating that vxatd will not be started because it was not configured. This is expected and can be ignored.

To upgrade from SFORA 5.0 on 11.23 to SFORA 5.0 on 11.31

- 1 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.
- 2 Convert Rootable VxVM volumes to LVM Rootable.
- 3 If you have any external Array Policy Modules (APMs) installed, uninstall the APMs.

The following warning message displays during the OS upgrade and also when you issue an administrative command for HP-UX kernel modules after the upgrade, until SF 5.0 on HP-UX 11i Version 3 is installed:

```
WARNING: The file '/usr/conf/mod/dmpXXX.1' does not  
contain valid kernel code. It will be ignored.
```

This message can be ignored and does not affect the functionality of SF.

- 4 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP.
After the OS upgrade is complete, Base-VXVM 4.1 for HP-UX 11.31 will be the default VxVM software available in the system. Therefore, after upgrade procedure, any disk groups including 5.0 (11.23) disk groups with 140 disk group versions will not be accessible. Disk groups and volume manager objects can be accessed only after Base-VXVM 5.0 for HP-UX 11.31 installation is complete.
- 5 If patches to SFORA 5.0 11.31 are required, the patches should be applied prior to upgrading the product.
- 6 Install SFORA 5.0 11.31.
See [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28.
- 7 Configure SFORA 5.0 11.31 using the `installsfora -configure` option.
See [“Configuring your system after the installation”](#) on page 38.
Upon successful completion of the upgrade, disk groups created in VxVM 5.0 11.23 should be accessible after the upgrade. If the rootable VxVM volumes were converted to LVM, convert them back to VxVM rootable.
- 8 If upgrading SFORA/HA, unfreeze all service groups using the following command:

```
# /opt/VRTS/bin/hagrps -unfreeze service_group_name -persistent
```

where *service_group_name* is the name of the service group you want to unfreeze.

- 9 If upgrading SFORA/HA, unconfigure the DBED repository cluster configuration using the following command:

```
# /opt/VRTS/bin/sfua_db_config -o unconfig_cluster
```

If upgrading SFORA only (standalone), skip this step.
- 10 Start the DBED repository database using the following command:

```
# /opt/VRTS/bin/sfua_db_config
```

See [“Creating and configuring the repository database for DB2 and Oracle”](#) on page 61.
- 11 Upgrade to the new repository database.
DB2 is not supported on HP-UX 11.31, therefore related DB2 upgrade steps should be excluded.
See [“Upgrading to the new repository database for DB2 and Oracle”](#) on page 39“.

Upgrading from SFORA 4.1 on 11.23 to SFORA 5.0 on 11.31

Prior to upgrading to SFORA 5.0 on 11.31, take note of the following disk group considerations:

- Disk group version 120 is the default disk group version for VxVM 4.1, whereas disk group version 140 is the default disk group version for VxVM 5.0.
- All disk group versions supported by VxVM 4.1 (90 and 120) are also supported by VxVM 5.0. Consequently, all the disk groups created using VxVM 4.1 can be imported after upgrading to VxVM 5.0. Some new features and tasks work only on disk groups with the current disk group versions. To use new features, the disk group versions need to be upgraded.
- VxVM 5.0 on HP-UX 11.31 supports shared disk groups only on disk group version 140. VxVM 4.1 on HP-UX 11.31 does not support shared disk groups.

Note: If the AT broker was not configured prior to the upgrade, it will remain unconfigured after the upgrade. The installation logs will contain a message stating that vxatd will not be started because it was not configured. This is expected and can be ignored.

To upgrade from SFORA 4.1 on 11.23 to SFORA 5.0 on 11.31

- 1 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

- 2 If you have any external Array Policy Modules (APMs) installed, uninstall the APMs.

The following warning message displays during the OS upgrade and also when you issue an administrative command for HP-UX kernel modules after the upgrade, until SF 5.0 on HP-UX 11i Version 3 is installed:

```
WARNING: The file '/usr/conf/mod/dmpXXX.1' does not  
contain valid kernel code. It will be ignored.
```

This message can be ignored and does not affect the functionality of SF.

- 3 Upgrade from HP-UX 11.23 to HP-UX 11.31 using practices recommended by HP.

After the OS upgrade is complete, Base-VXVM 4.1 for 11.31 will be the default VxVM software available in the system. Shared disk groups with disk group versions less than or equal to 120 will not be accessible, as shared disk group is not supported in VxVM 4.1 on 11.31.

- 4 If patches to SFORA 5.0 11.31 are required, the patches should be applied prior to upgrading the product.

- 5 Install SFORA 5.0 11.31.

See [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28.

- 6 Configure SFORA 5.0 11.31 using the `installsfora -configure` option. See [“Configuring your system after the installation”](#) on page 38.

Upon successful completion of the upgrade, VxVM 4.1 will be replaced by VxVM 5.0. Disk groups created in VxVM 4.1 11.23 should be accessible after the upgrade to VxVM 5.0. To upgrade a disk group to version 140 see [“Upgrading VxVM disk group versions”](#) on page 47.

- 7 Start the DBED repository database using the following command:

```
# /opt/VRTS/bin/sfua_db_config
```

See [“Creating and configuring the repository database for DB2 and Oracle”](#) on page 61.

- 8 Upgrade to the new repository database.

DB2 is not supported on HP-UX 11.31, therefore related DB2 upgrade steps should be excluded.

See [“Upgrading to the new repository database for DB2 and Oracle”](#) on page 39“.

Upgrading the VxVM cluster protocol version

If you are upgrading a cluster and you want to take advantage of the new features in this release, you must upgrade the version of the VxVM cluster protocol. To upgrade the protocol to version 70, enter the following command on the master node of the cluster:

```
# vxctl upgrade
```

Installing the VEA client

If you plan to run the VEA client, you must install the `VRTSobgui` package on the machine you are planning to use.

Installing the VEA client on HP-UX

To install the VEA client on an HP-UX machine using `swinstall`

- 1 Log in as `root`.
- 2 First, check to determine whether the VEA client package is already installed.

```
# swlist | grep VRTSobgui
```

This command will return `VRTSobgui` if `VRTSobgui` is already installed. It will return nothing if the package has not been installed.
- 3 To install the VEA client package for HP-UX, insert the appropriate media disc into your system's DVD-ROM drive and mount it as described in [“Mounting the software disc”](#) on page 28.
- 4 Run the `swinstall` command.

```
# swinstall -s /dvdrom/storage_foundation/pkg
```
- 5 Select the software bundles `VRTSobgui`, `VRTSat`, `VRTSspb`, `VRTSicisco` for installation.

The VEA client package for HP-UX is installed.

Installing the VEA client on Microsoft Windows

The VEA client runs on Windows NT, Windows XP, Windows 2003, Windows 2000, Windows ME, Windows 98 and Windows 95 machines.

Before you install VEA on a Windows machine, you must uninstall any existing Veritas Volume Manager Storage Administrator (VMSA) packages and remove the old `setup.exe` from that machine. Only one VEA package can be installed on a Windows machine at any given time.

Note: If you plan to install the GUI client on Windows NT 4.0, Windows Installer must be upgraded to version 2.0. For more information about upgrading Windows Installer, visit <http://www.microsoft.com>. If you are using Windows NT 4.0, it is also recommended that you use Windows NT 4.0 Service Pack 6.

To install the VEA client on a Windows machine

- 1 Insert the appropriate media disc into your system's DVD drive.
- 2 Using Windows Explorer or a DOS Command window, go to the `/windows` directory and execute the `vrtsobgui.msi` program with Windows Installer.
- 3 Follow the instructions presented by the `vrtsobgui.msi` program.
- 4 After installation is complete, ensure environment changes made during installation take effect by performing one of the following procedures:
 - For Windows NT, Windows 2000, Windows 2003 or Windows XP, log out and then log back in.
 - For Windows ME, Windows 98 or Windows 95, restart the computer.

Installing Veritas Volume Manager

This section describes how to install the Veritas Volume Manager software and license key. If you are installing Veritas Storage Foundation or Veritas Storage Foundation *for Oracle*, see “[Installing the Veritas Storage Foundation 5.0 software](#)” on page 28.

To install Veritas Volume Manager

- 1 Log in as superuser.
- 2 Run the `installer` command to install Veritas Volume Manager. For example:

```
# cd /dvdrom
# ./installer
```

From the product installer, choose the **I** option for Install, and select **Veritas Volume Manager**.

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 Volume Manager, use the `installvm` script instead of the `installer` script.

- 3 Enter one or more system names on which Veritas Volume Manager is to be installed. For example:

```
Enter the system names separated by spaces on which to
install VxVM: system01
```

- 4 After the system check completes successfully, press **Return** to continue.

- 5 Enter a VxVM license key. For example:

```
Enter a VxVM license key for system01:[?]
XXXX-XXXX-XXXX-XXXX-XXXX-X
```

- 6 If required, you can enter another license key by typing **y** at the following prompt:

```
Do you want to enter another license key for system02?
[y,n,q,?] (n)
```

- 7 After VxVM licensing completes successfully, press **Return** to continue.

- 8 You will now be asked which depots should be installed.

```
1) Required Veritas Volume Manager packages - 698MB required
2) All Veritas Volume Manager packages - 838 MB required
3) Storage Foundation Enterprise HA packages - 1192 MB required.
```

- 9 Select the packages to be installed.

- 10 After the list of packages is displayed, you will be told that you must reboot prior to reconfiguration.

- 11 After the Veritas Volume Manager installation completes successfully, you will see a message identifying the location of log files. You should save these files for future reference.

- 12 Reboot the system.

```
# /sbin/usr/shutdown -r -y now
```


Configuring the Veritas software

This chapter covers important details about initializing (where required), setting up, and configuring the Veritas software.

Topics covered in this chapter include:

- [“Creating and configuring the repository database for DB2 and Oracle”](#) on page 61
- [“Configuring Veritas Storage Foundation”](#) on page 64
- [“Configuring Veritas Enterprise Administrator”](#) on page 66
- [“Configuring Veritas Volume Manager”](#) on page 69
- [“Enabling cluster support in VxVM \(Optional\)”](#) on page 71
- [“Configuring Veritas File System”](#) on page 74

Creating and configuring the repository database for DB2 and Oracle

After installing Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, you must create and configure the repository database using the `sfua_db_config` script.

The script detects whether your system is running in a stand-alone or HA configuration and then automatically configures the repository database.

Before running the script, review the following requirements:

- | | |
|--------------------------------|---|
| In a stand-alone configuration | <ul style="list-style-type: none"> ■ You must have a mount point mounted on a VxVM volume with a VxFS file system. The mount point is used to store the repository database. |
| In an HA configuration | <ul style="list-style-type: none"> ■ Create a separate, non-shared disk group on shared storage. Create a VxVM volume and a VxFS file system and mount the volume. ■ It is recommended that you have a separate disk group for the repository volume so that any failovers are independent of other service groups. ■ The mount point is used to store the repository database. ■ Obtain a unique virtual IP address for public NIC interface. ■ Obtain the device names for the public NIC interface (for example: hme0 / lan0 /) for all systems in the cluster. ■ Obtain a subnet mask for the public NIC interface. ■ Make sure VCS is not in read-write (-rw) mode. To make sure VCS is in read-only mode, use the following command:
 <pre># haconf -dump -makero</pre> |

[Table 3-4](#) indicates the options available for the `sfua_db_config` script.

Table 3-4 sfua_db_config options

Option	Description
-ssh	Use this option in a high availability (HA) configuration. The option indicates that ssh and scp are to be used for communication between systems. Either ssh or rsh should be preconfigured so that you can execute the commands without being prompted for passwords or confirmations.
-o dropdb	Drops the repository database.

Table 3-4 sfua_db_config options

Option	Description
-o unconfig_cluster	Use this option in a high availability (HA) configuration. Unconfigures the repository database from the VCS cluster.
-o dbstatus	Verifies the status of the database and database server.
-o stopserver	Stops the database server.
-o startserver	Starts the database server.
-o serverstatus	Reports the database server status.
-o stopdb	Detaches the repository database from the database server.
-o startdb	Attaches the repository database to the database server.

To create and configure the repository database

- 1 Run the `sfua_db_config` script as follows:

```
# /opt/VRTSdbcom/bin/sfua_db_config
```

The following is an example of configuring Veritas Storage Foundation for Oracle:

```
Welcome to the SFORA configuration script.
This script creates repository for standalone and HA
configuration.
Please create a Veritas File System on a Veritas Volume
and mount it, before starting configuration using this script.
This mount point will be used to store repository.

The following is required to configure SFORA repository for HA
solution:
* A mount point of already mounted Veritas Volume on a shared
storage, with Veritas File system.
* A public NIC used by each system in the cluster.
* A Virtual IP address and netmask.

Are you ready to configure SFORA repository (y/n/q) [y]?

filesystem mount point for SFORA repository: /sfua_rep

Discovering public NIC on host1 ....lan0

Enter the NIC for system host1 for HA Repository configuration:
[lan0]
```

```

Discovering public NIC on host2 ....lan0

Enter the NIC for system host2 for HA Repository configuration:
[lan0]

Enter the Virtual IP address for repository failover:
xx.xxx.xxx.xxx

Enter the netmask for public NIC interface: [xxx.xxx.xxx.x]

Following information will be used for SFORA HA configuration:

Public IP address:                xx.xxx.xxx.xxx
Subnet mask:                      xxx.xxx.xxx.x
Public interface:                 host1 -> lan0,host2 -> lan0
Mount point:                      /sfua_rep
Volume Name for mount point:      dbed_rep
Diskgroup for mount point:        sfua_rep

Is this correct (y/n/q) [y]?

Adding repository information in VCS (HA) configuration...

Added repository information successfully in VCS (HA)
configuration.

Repository configuration completed successfully for HA
environment.
```

2 Verify that the repository was configured.

If you are installing in a high availability configuration:

```

# /opt/VRTS/bin/hagrp -state
#Group      Attribute      System      Value
Sfua_Base   State          guan        |ONLINE|
Sfua_Base   State          plover      |OFFLINE|
```

Note: Sfua_Base group should be online on one node in the cluster.

If you are installing in a stand-alone configuration:

```

# /opt/VRTSdbcom/bin/sfua_db_config -o dbstatus
Database 'dbed_db' is alive and well on server
'VERITAS_DBMS3_host'.
```

Configuring Veritas Storage Foundation

Once you install and initialize all of the Veritas software, you can take advantage of the various storage management features to ease the task of system and database administration.

Database configuration requirements

Most relational database management system (RDBMS) software requires operating system parameters to be set prior to operation. The Oracle database requires modifications to kernel settings before the databases will run correctly. The most critical settings are normally located in the Shared Memory and Semaphore settings on HP-UX. For precise settings, consult your current database installation and configuration documentation.

Setting administrative permissions

To allow database administrators to administer a database using Veritas Storage Foundation, you are required to change some permission settings. During the installation process, you have the opportunity to configure the product. Answering “y” allows you to provide database administrators access to various functionality. If you did not make the permission changes during installation, you can do so at a later time.

The default settings at installation time for the `/opt/VRTSdbed` directory allow only the `root` login to access the directory.

To allow the user “oracle” access to the `/opt/VRTSdbed` directory

Use the `chown` and `chmod` commands, as follows:

```
# chown oracle /opt/VRTSdbed
# chmod 500 /opt/VRTSdbed
```

To allow users in the group “dba” access to the `/opt/VRTSdbed` directory

Use the `chgrp` and `chmod` commands, as follows:

```
# chgrp dba /opt/VRTSdbed
# chmod 550 /opt/VRTSdbed
```

vxtunefs command permissions and Cached Quick I/O

By default, you must have superuser (`root`) privileges to use the `/opt/VRTS/bin/vxtunefs` command. The `vxtunefs` command is a tool that lets you change caching policies to enable Cached Quick I/O and change other file system options. Database administrators can be granted permission to change default file system behavior in order to enable and disable Cached Quick I/O. The system administrator must change the `vxtunefs` executable permissions as follows:

```
# chown root:dba /opt/VRTS/bin/vxtunefs
# chmod 4550 /opt/VRTS/bin/vxtunefs
```

Note: Setting the permissions for `/opt/VRTS/bin/vxtunefs` to 4550 allows all users in the `dba` group to use the `vxtunefs` command to modify caching behavior for Quick I/O files.

For more information, see the *Veritas File System Administrator's Guide*.

Configuring Veritas Enterprise Administrator

You may need to update Veritas Enterprise Administrator (VEA) so that users other than `root` can access features.

Adding Users to the VEA Service Console Registry for Oracle

You may want to add users to the VEA server console registry to allow access to the interface to users other than `root`. You also have the option to give database administrators `root` privileges.

To add users other than `root` to the Veritas Enterprise Administrator Service console registry

- 1 Make sure that the optional GUI package was installed.

```
# swlist -l product | grep VRTSorgui
VRTSorgui 5.0 Veritas Storage Foundation Graphical User
Interface for Oracle
```

- 2 Stop the VEA server.

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

- 3 To give `root` privileges to the database administrator, use the `vxdbedusr` command as follows.

```
# /opt/VRTS/bin/vxdbedusr -a user [-A] [-f] -n user_name
where:
```

`-a user` adds a user to the registry

`-A` grants the user `root` access

`-f` allows the user to be a user other than the `/opt/VRTSdbed` owner.

`-n` indicates the name of the user.

For example, to add a database administrator with the name “oracle” as a user with `root` privileges, enter the following:

```
# /opt/VRTS/bin/vxdbedusr -a user -A -f -n oracle
```

- 4 To add a user without `root` privileges, use the `vxdbedusr` command as follows.

```
# /opt/VRTS/bin/vxdbedusr -a user -n user_name
```

where `-a` adds a user to the registry.

For example, to add “oracle” as a user, enter the following:

- ```
/opt/VRTS/bin/vxdbedusr -a user -n oracle
```
- To add a group to the console registry, use the `vxdbedusr` command as follows:
 

```
/opt/VRTS/bin/vxdbedusr -a group [-A] [-f] -n group_name
```

 where:
    - `-a user` adds a user group to the registry
    - `-A` grants the user group root access
    - `-f` allows the group access to the GUI.
 For example, to add “dba” as a group, enter the following:
 

```
/opt/VRTS/bin/vxdbedusr -a group -A -f -n dba
```
  - Restart the VEA Server.
 

```
/opt/VRTS/bin/vxsvcctl start
```

## Removing Users from the VEA Service Console Registry for Oracle

You may need to restrict access to the VEA server console registry. You can remove users or user groups from the registry if they have been previously added.

---

**Note:** You cannot remove `root` from the VEA console registry.

---

### To remove users other than root from the Veritas Enterprise Administrator Service console registry

- Make sure that the optional GUI package was installed.
 

```
swlist -l product | grep VRTSorgui
```

```
VRTSorgui 5.0 Veritas Storage Foundation Graphical User Interface for Oracle
```
- Stop the VEA server.
 

```
/opt/VRTS/bin/vxsvcctl stop
```
- Use the `vxdbedusr` command to remove a group or user.
 

```
/opt/VRTS/bin/vxdbedusr -r <user or group> \
-n <user_name or group_name>
```

 where `-r` removes a user or user group from the registry.  
 For example, to remove the user “oracle,” enter the following:
 

```
/opt/VRTS/bin/vxdbedusr -r user -n oracle
```
- Restart the VEA Server.
 

```
/opt/VRTS/bin/vxsvcctl start
```

## Starting the VEA server

After installing the VEA packages, the VEA server needs to be stopped and restarted. To check the state of the VEA server, enter:

```
/opt/VRTS/bin/vxsvcctl status
```

To stop the VEA server, enter:

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

You can also stop the VEA server manually by killing the `vxsvc` process.

---

**Note:** The VEA server is automatically started on a reboot.

---

To start the VEA server, enter:

```
/opt/VRTS/bin/vxsvcctl start
```

## Starting the VEA client

Only users with appropriate privileges can run VEA. VEA can administer the local machine or a remote machine. However, VxVM and the VEA server must be installed on the machine to be administered. The VxVM `vxconfigd` daemon and the VEA server must be running on the machine to be administered.

After installing VxVM and VEA and starting the server, start the VEA client in one of the following ways.

### HP-UX operating system

To administer the HP-UX machine, use the following command:

```
/opt/VRTSob/bin/vea
```

### Windows operating System

To administer a remote HP-UX machine from a Windows machine, select **Start > Programs > Veritas > Veritas Enterprise Administrator**.

### Modifying connection access (optional)

To allow users other than `root` to access VEA, set up a group called `vrtsadm` in `/etc/group`, and add the users to this group. For example, adding the following entry:

```
vrtsadm::600:root,ed
```

will allow the two users, `root` and `ed`, to access VEA.

To specify a group other than `vrtsadm`, you should add the group to `/etc/group`, modify the Security key and restart the VEA server daemon, as in the following example.

### To modify connection access

- 1 Add a new group:  

```
groupadd -g gid veagr
```
- 2 Edit `/etc/group` to add users to the group.
- 3 Modify the Security key in the registry:  

```
/opt/VRTSob/bin/vxregctl /etc/vx/isis/Registry setvalue \
Software/Veritas/VxSvc/Current/Version/Security AccessGroups \
REG_SZ veagr
```
- 4 Restart the VEA server.  

```
/opt/VRTS/bin/vxsvcctrl restart
```

## Configuring Veritas Volume Manager

If you deferred configuring VxVM during installation, you can configure it by running the `installvm` script with the `-configure` option.

### To configure VxVM using the `installvm` script

- 1 Enter the following commands.  

```
cd /dvdrom/volume_manager
./installvm -configure
```
- 2 The script runs an initial system check, and will tell you that you cannot configure already configured features such as enclosure-based naming and default disk groups.
- 3 Decide whether you want to set up the enclosure-based naming scheme:  
Do you want to set up the enclosure-based naming scheme? [y, n, q]
- 4 You are then asked if you want to set up a default disk group for each system:
- 5 Do you want to set up a default disk group for each system? [y, n, q]
- 6 If you have a VVR license installed, the next phase concerns configuration of VVR:  
Do you want to change any of the VVR ports ... [y, n, q]
- 7 You are now asked questions regarding the frequency of VVR statistics collection.
- 8 The next phase of the configuration procedure consists of setting up a centrally managed host:  
Enable Centralized Management? [y,n,q]
- 9 Finally, if you selected centralized management, you will be asked a series of questions relating to hostnames.

**10** And finally, you should see the message:

```
11 Startup completed successfully on all systems
```

After the installation and configuration of VxVM is complete, you can use the `vxdiskadm` command and the VEA GUI to create disk groups, and to populate these with disks.

See the *Veritas Volume Manager Administrator's Guide* and the VEA online help for details.

## Starting and enabling the configuration daemon

The VxVM configuration daemon (`vxconfigd`) maintains VxVM disk and disk group configurations. The `vxconfigd` communicates configuration changes to the kernel and modifies configuration information stored on disk.

Startup scripts usually invoke `vxconfigd` at system boot time. The `vxconfigd` daemon must be running for VxVM to operate properly.

The following procedures describe how to check that `vxconfigd` is started, whether it is enabled or disabled, how to start it manually, or how to enable it as required.

To determine whether `vxconfigd` is enabled, use the following command:

```
vxctl mode
```

The following message indicates that the `vxconfigd` daemon is running and enabled:

```
mode: enabled
```

This message indicates that `vxconfigd` is not running:

```
mode: not-running
```

To start the `vxconfigd` daemon, enter the following command:

```
vxconfigd
```

This message indicates that `vxconfigd` is running, but not enabled:

```
mode: disabled
```

To enable the volume daemon, enter the following command:

```
vxctl enable
```

Once started, `vxconfigd` automatically becomes a background process.

By default, `vxconfigd` writes error messages to the console. However, you can configure it to write errors to a log file. For more information, see the `vxconfigd(1M)` and `vxctl(1M)` manual pages.

## Enabling cluster support in VxVM (Optional)

This release includes an *optional* cluster feature that enables VxVM to be used in a cluster environment. The cluster functionality in VxVM allows multiple hosts to simultaneously access and manage a set of disks under VxVM control. A *cluster* is a set of hosts sharing a set of disks; each host is referred to as a *node* in the cluster.

---

**Note:** The VxVM cluster feature requires a license, which can be obtained from your Customer Support channel.

---

### To enable the cluster functionality in VxVM

- 1 Obtain a license for the VxVM cluster feature.
- 2 Install the software packages onto each system (node) to be included in the cluster as described in [“Installing the Veritas Storage Foundation 5.0 software”](#) on page 28 and [“Installing the VEA client”](#) on page 57.
- 3 Initialize VxVM using the procedures described in [“Configuring Veritas Volume Manager”](#) on page 69.
- 4 Start VEA as described in [“Starting the VEA server”](#) on page 68 and [“Starting the VEA client”](#) on page 68.
- 5 Configure shared disks as described in the *Veritas Volume Manager Administrator’s Guide*.

## Configuring shared disks

If you are installing VxVM for the first time or adding disks to an existing cluster, you need to configure new shared disks. If you are upgrading VxVM, verify that your shared disks still exist.

The shared disks should be configured from one node only. Since the VxVM software cannot tell whether a disk is shared or not, you must specify which are the shared disks.

Make sure that the shared disks are not being accessed from another node while you are performing the configuration. If you start the cluster on the node where you perform the configuration only, you can prevent disk accesses from other nodes because the quorum control reserves the disks for the single node.

## Configuring new disks

If you are installing and setting up VxVM for the first time, you must configure the shared disks.

### To configure shared disks

- 1 Start the cluster on at least one node.
- 2 On one node, run the `vxdiskadm` program and choose option 1 to initialize new disks. When asked to add these disks to a disk group, choose `none` to leave the disks for future use.
- 3 On other nodes in the cluster, run `vxdtl enable` to see the newly initialized disks.
- 4 From the master node, create disk groups on the shared disks. To determine if a node is a master or slave, run `vxdtl -c mode`.  
If a node is a master, the `vxdtl -c mode` command will show following output:  

```
vxdtl -c mode
mode: enabled: cluster active - MASTER
master: vmpas15
```

  
If a node is a slave, the `vxdtl -c mode` command will show following output:  

```
vxdtl -c mode
mode: enabled: cluster active - SLAVE
master: vmpas15
```

  
Use the `vxdg` program or VEA to create disk groups. In the `vxdg` program, use the `-s` option to create shared disk groups.
- 5 From the master node only, use `vxassist` or VEA to create volumes in the disk groups.  
The volumes must be of type `gen`. Do not create RAID-5 volumes. Before creating any log subdisks, read the section on DRL in the *Veritas Volume Manager Administrator's Guide*.
- 6 If the cluster is only running with one node, bring up the other cluster nodes. Enter the `vxdg list` command on each node to display the shared disk groups.

### Verifying existing shared disks

If you are upgrading from a previous release of VxVM, verify that your shared disk groups still exist.

#### To verify that your shared disk groups exist

- 1 Start the cluster on all nodes.



- 2 Enter the following command on all nodes:  

```
vxdg -s list
```

This displays the existing shared disk groups.

## Converting existing VxVM disk groups to shared disk groups

Use this procedure if you are upgrading from VxVM 3.x to VxVM 5.0 (or Storage Foundation 3.x to a Storage Foundation product at the 5.0 level) and you want to convert existing disk groups to shared disk groups.

### To convert existing disk groups to shared disk groups

- 1 Start the cluster on at least one node.
- 2 Configure the disk groups using the following procedure.  
To list all disk groups, use the following command:  

```
vxdg list
```

To deport disk groups to be shared, use the following command:  

```
vxdg deport disk_group_name
```

To import disk groups to be shared, use the following command on the master node:  

```
vxdg -s import disk_group_name
```

This procedure marks the disks in the shared disk groups as shared and stamps them with the ID of the cluster, enabling other nodes to recognize the shared disks.  
If dirty region logs exist, ensure they are active. If not, replace them with larger ones.  
To display the shared flag for all the shared disk groups, use the following command:  

```
vxdg -s list
```

The disk groups are now shared.
- 3 If the cluster is only running with one node, bring up the other cluster nodes. Enter the `vxdg -s list` command on each node to display the shared disk groups. This command displays the same list of shared disk groups displayed earlier.
- 4 For information on upgrading in a Cluster Volume Manager (CVM) environment, see the *Veritas Storage Foundation Cluster File System Installation and Administration Guide*.

## Upgrading in a clustered environment with FastResync set

If there are volumes in the shared disk groups with FastResync set (`fastresync=on`), before beginning the upgrade procedure, reattach each snapshot to its data volume, using this procedure:

### To upgrade in a clustered environment when FastResync is set

- 1 You should run this procedure from the master node; to find out if you are on the master node, enter the command:  

```
vxddctl -c mode
```
- 2 On the master node, list which disk groups are shared by entering:  

```
vxdg -s list
```
- 3 Using the diskgroup names displayed by the previous command, list the disk groups that have volumes on which FastResync is set:  

```
vxprint -g diskgroup -F "%name" -e "v_fastresync"
```
- 4 Reattach each snapshot:  

```
vxassist -g diskgroup -o nofmr snapback snapshot_volume
```
- 5 If you are upgrading from VxVM 3.5 Maintenance Patch 3 or from VxVM 3.2 Maintenance Patch 5, set FastResync to off for each volume:  

```
vxvol -g diskgroup set fastresync=off volume
```

## Configuring Veritas File System

After installing Veritas File System, you can create a file system on a disk slice or Veritas Volume Manager volume with the `mkfs` command. Before you can use this file system, you must mount it with the `mount` command. You can unmount the file system later with the `umount` command. A file system can be automatically mounted at system boot time if you add an entry for it in the `/etc/fstab` file.

The Veritas-specific commands are described in the Veritas File System guides and online manual pages.

See the *Veritas File System Administrator's Guide*.

# Uninstalling the Veritas software

Topics covered in this chapter include:

- [“Summary of Veritas Storage Foundation uninstallation tasks”](#) on page 76
- [“Dropping the repository database for Oracle”](#) on page 76
- [“Shutting down cluster operations”](#) on page 77
- [“Removing the root disk from VxVM control”](#) on page 77
- [“Removing VxFS file systems and Storage Checkpoints”](#) on page 78
- [“Moving volumes to disk partitions”](#) on page 78
- [“Uninstalling Veritas Storage Foundation packages”](#) on page 83
- [“Removing license files \(Optional\)”](#) on page 84
- [“Uninstalling the Veritas Enterprise Administrator Client”](#) on page 85
- [“Uninstalling Veritas Volume Manager”](#) on page 85
- [“Uninstalling Veritas File System”](#) on page 86

Once you uninstall Veritas Volume Manager, you will be left without volume management software on your machine.

---

**Note:** The information in [“Uninstalling Veritas Storage Foundation packages”](#) on page 83 pertains to Veritas Storage Foundation and Veritas Storage Foundation for Oracle.

---

## Summary of Veritas Storage Foundation uninstallation tasks

Uninstallation of Veritas Storage Foundation products consists of the following tasks:

- Dropping the repository database if you are uninstalling Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle.
- Shutting down cluster operations.
- Removing the root disk from VxVM control.
- Removing VxFS file systems and Storage Checkpoints.
- Moving volumes to disk partitions.
- Removing the Veritas Storage Foundation.
- Removing the license files (optional).

---

**Caution:** Failure to follow the instructions in the following sections may result in unexpected behavior.

---

See “[Uninstalling the Veritas Enterprise Administrator Client](#)” on page 85 for instructions on how to uninstall the VEA client from a Windows system.

## Dropping the repository database for Oracle

When uninstalling Veritas Storage Foundation for Oracle, drop the repository database. If you want to recreate the repository database, you can drop the existing repository database using these steps.

### To drop the repository database in a stand-alone configuration

- 1 Make sure the repository database volume is mounted using the `df` command.

If the repository database volume is not mounted, run the `sfua_rep_mount` command to mount the volume:

```
/opt/VRTSdbcom/config/sfua_rep_mount start
```

- 2 Use the `sfua_db_config` command with the `-o dropdb` option to remove the database.

```
/opt/VRTS/bin/sfua_db_config -o dropdb
```

### To drop the repository database in an Oracle cluster or Oracle RAC configuration

- 1 Drop the repository database from the VCS configuration and deport the repository disk group.  

```
/opt/VRTS/bin/sfua_db_config -o unconfig_cluster
```
- 2 Import the repository database disk group.  

```
/opt/VRTS/bin/vxdg import repository_diskgroup_name
```
- 3 Run the `sfua_rep_mount` command to mount the repository database volume.  

```
/opt/VRTSdbcom/config/sfua_rep_mount start
```
- 4 Use the `sfua_db_config` command with the `-o dropdb` option to remove the database.  

```
/opt/VRTS/bin/sfua_db_config -o dropdb
```

## Shutting down cluster operations

If the systems are running as an HA cluster, you have to take all service groups offline and shutdown VCS.

### To take all service groups offline and shutdown VCS

- ◆ Use the `hastop` command as follows:  

```
/opt/VRTSvcs/bin/hastop -all
```

---

**Note:** Do not use the `-force` option when executing `hastop`. This will leave all service groups online and shut down VCS, causing undesired results during uninstallation of the packages.

---

## Removing the root disk from VxVM control

If the system's root disk is under VxVM control, use the following command to copy its contents to a new LVM root disk:

```
/etc/vx/bin/vxres_lvmroot -v -b [-p c#t#d#2,c#t#d#3,...] c#t#d#
```

where `c#t#d#` is the access name of the new LVM root disk. If the root disk volumes are distributed over several disks, use the `-p` option to specify a comma-separated list of additional disks that are to be used to set up the LVM root volume group. The operation to clone a new LVM root volume group can take some time, so the `-v` (verbose) option is specified to show how far this has progressed.

## Removing VxFS file systems and Storage Checkpoints

It is advisable to unmount any user VxFS file systems before uninstalling VxFS to help smooth uninstallation of VxVM package if VxFS file system is mounted on VxVM volumes. System partitions need not be unmounted as part of this operation. After you remove the `VRTSvxfs` package, VxFS file systems versions greater than those supported by OnlineJFS bundled with HPUX OS are not mountable or accessible until another `VRTSvxfs` package supporting them is installed.

### To unmount a file system

- 1 Check if any VxFS file systems are mounted.  

```
cat /etc/mnttab | grep vxfs
```
- 2 Unmount any file systems that are not system partitions.  

```
umount {special | mount_point}
```

Specify the file system to be unmounted as a *mount\_point* or *special* (the device on which the file system resides).

See the `umount_vxfs(1M)` manual page.

---

**Note:** If using VxFS file system, system partitions need not be unmounted.

---

### To unmount a Storage Checkpoint

- 1 Check if any Storage Checkpoints are mounted.  

```
cat /etc/mnttab | grep vxfs
```
- 2 Unmount any Storage Checkpoints.  

```
umount /checkpoint_name
```

## Moving volumes to disk partitions

All volumes must be moved to disk partitions. This can be done using one of these procedures:

- Back up the system fully onto tape and then recover from it.
- Back up each file system individually and then recover them all after creating new file systems on disk partitions.
- Use VxVM to move volumes incrementally onto disk partitions as described in the following section.

## Moving volumes onto disk partitions

### To move volumes to disk partitions

- 1 Evacuate disks using `vxdiskadm`, the GUI, or the `vxevac` script.  
Evacuation moves subdisks from the specified disks to target disks. The evacuated disks provide the initial free disk space for volumes to be moved to disk partitions.
- 2 Remove the evacuated disks from Veritas Volume Manager control by entering:  

```
vxdg rmdisk diskname
vxdisk rm devname
```
- 3 Decide which volume to move first, and if the volume is mounted, unmount it.
- 4 If the volume is being used as a raw partition for database applications, make sure that the application is not updating the volume and that you have applied the `sync` command to the data on the volume.
- 5 Create a partition on free disk space of the same size as the volume using the `format` command.  
If there is not enough free space for the partition, add a new disk to the system for the first volume removed. Subsequent volumes can use the free space generated by the removal of this first volume.
- 6 Copy the data on the volume onto the newly created disk partition using a command such as `dd`.  

```
dd if=/dev/vx/dsk/diskgroup/lhome of=/dev/dsk/c2t2d2
```

where `c2t2d2` is the disk outside of Volume Manager and `s7` is the newly created partition.
- 7 Replace the entry for that volume (if present) in `/etc/fstab` with an entry for the newly created partition.
- 8 Mount the disk partition if the corresponding volume was previously mounted.
- 9 Remove the volume from Veritas Volume Manager using the command.  

```
vxedit -rf rm volume_name
```
- 10 Remove any free disks (those having no subdisks defined on them) by removing the volumes from Veritas Volume Manager control.  
To check if there are still some subdisks remaining on a particular disk, use the `vxprint` command.  

```
vxprint -F '%snum' diskname
```

If the output is not 0, there are still some subdisks on this disk that you need to remove. If the output is 0, remove the disk from Veritas Volume Manager control.

```
vxdg rmdisk diskname
vxdisk rm devname
```

Use the free space created for adding the data from the next volume you want to remove.

- 11 After you successfully convert all volumes into disk partitions, reboot the system.
- 12 After the reboot, make sure none of the volumes are open by using the `vxprint` command.

```
vxprint -Aht -e v_open
```

If any volumes remain open, repeat the steps listed above.

### Example

This example shows how to move the data on a volume to a disk partition. In the example, there are three disks: `disk1` and `disk2` are subdisks on volume `vol101` and `disk3` is a free disk. The data on `vol101` is copied to `disk3` using `vxevac`.

Diskgroup `voldg` content before the data on `vol101` is copied to `disk3`.

```
vxprint -g voldg -ht
```

| DG NAME  | NCONFIG                              | NLOG        | MINORS   | GROUP-ID |           |          |
|----------|--------------------------------------|-------------|----------|----------|-----------|----------|
| DM NAME  | DEVICE                               | TYPE        | PRIVLEN  | PUBLEN   | STATE     |          |
| RV NAME  | RLINK_CNT                            | KSTATE      | STATE    | PRIMARY  | DATAVOL   | SRL      |
| RL NAME  | RVG                                  | KSTATE      | STATE    | REM_HOST | REM_DG    | REM_RLNK |
| V NAME   | RVG                                  | KSTATE      | STATE    | LENGTH   | READPOL   | PREFPLEX |
| UTYPE    |                                      |             |          |          |           |          |
| PL NAME  | VOLUME                               | KSTATE      | STATE    | LENGTH   | LAYOUT    | NCOL/WID |
| MODE     |                                      |             |          |          |           |          |
| SD NAME  | PLEX                                 | DISK        | DISKOFFS | LENGTH   | [COL/]OFF | DEVICE   |
| MODE     |                                      |             |          |          |           |          |
| SV NAME  | PLEX                                 | VOLNAME     | NVOLLAYR | LENGTH   | [COL/]OFF | AM/NM    |
| MODE     |                                      |             |          |          |           |          |
| DC NAME  | PARENTVOL                            | LOGVOL      |          |          |           |          |
| SP NAME  | SNAPVOL                              | DCO         |          |          |           |          |
| dg voldg | default                              | default     | 115000   |          |           |          |
|          | 1017856044.1141.hostname.veritas.com |             |          |          |           |          |
| dm disk1 | c1t12d0                              | auto:hpdisk | 2591     | 17900352 | -         |          |
| dm disk2 | c1t14d0                              | auto:hpdisk | 2591     | 17899056 | -         |          |
| dm disk3 | c1t3d0                               | auto:hpdisk | 2591     | 17899056 | -         |          |
| v vol1   | -                                    | ENABLED     | ACTIVE   | 4196448  | ROUND     | -        |
| fsgen    |                                      |             |          |          |           |          |
| pl pl1   | vol1                                 | ENABLED     | ACTIVE   | 4196448  | CONCAT    | -        |
| RW       |                                      |             |          |          |           |          |
| sd sd1   | pl1                                  | disk1       | 0        | 2098224  | 0         | c1t12d0  |



```
ENA
sd sd2 p11 disk2 0 2098224 2098224 c1t14d0
ENA
```

Evacuate disk1 to disk3.

```
/etc/vx/bin/vxevac -g voldg disk1 disk3
vxprint -g voldg -ht
```

```
DG NAME NCONFIG NLOG MINORS GROUP-ID
DM NAME DEVICE TYPE PRIVLEN PUBLEN STATE
RV NAME RLINK_CNT KSTATE STATE PRIMARY DATAVOLDS SRL
RL NAME RVG KSTATE STATE REM_HOST REM_DG REM_RLNK
V NAME RVG KSTATE STATE LENGTH READPOL PREFPLEX
UTYPE
PL NAME VOLUME KSTATE STATE LENGTH LAYOUT NCOL/WID
MODE
SD NAME PLEX DISK DISKOFFS LENGTH [COL/]OFF DEVICE
MODE
SV NAME PLEX VOLNAME NVOLLLAYR LENGTH [COL/]OFF AM/NM
MODE
DC NAME PARENTVOL LOGVOL
SP NAME SNAPVOL DCO

dg voldg default default 115000
1017856044.1141.hostname.veritas.com
```

```
dm disk1 c1t12d0 auto:hpdisk 2591 17900352 -
dm disk2 c1t14d0 auto:hpdisk 2591 17899056 -
dm disk3 c1t3d0 auto:hpdisk 2591 17899056 -

v vol1 - ENABLED ACTIVE 4196448 ROUND -
fsgen
pl p11 vol1 ENABLED ACTIVE 4196448 CONCAT -
RW
sd disk3-01 p11 disk3 0 2098224 0 c1t3d0
ENA
sd sd2 p11 disk2 0 2098224 2098224 c1t14d0
ENA
```

Evacuate disk2 to disk3.

```
/etc/vx/bin/vxevac -g voldg disk2 disk3
vxprint -g voldg -ht
```

```
DG NAME NCONFIG NLOG MINORS GROUP-ID
DM NAME DEVICE TYPE PRIVLEN PUBLEN STATE
RV NAME RLINK_CNT KSTATE STATE PRIMARY DATAVOLDS SRL
RL NAME RVG KSTATE STATE REM_HOST REM_DG REM_RLNK
V NAME RVG KSTATE STATE LENGTH READPOL PREFPLEX
UTYPE
PL NAME VOLUME KSTATE STATE LENGTH LAYOUT NCOL/WID
MODE
SD NAME PLEX DISK DISKOFFS LENGTH [COL/]OFF DEVICE
MODE
SV NAME PLEX VOLNAME NVOLLLAYR LENGTH [COL/]OFF AM/NM
```

```

MODE
DC NAME PARENTVOL LOGVOL
SP NAME SNAPVOL DCO

dg voldg default default 115000
1017856044.1141.hostname.veritas.com

dm disk1 c1t12d0 auto:hpdisk 2591 17900352 -
dm disk2 c1t14d0 auto:hpdisk 2591 17899056 -
dm disk3 c1t3d0 auto:hpdisk 2591 17899056 -

v vol1 - ENABLED ACTIVE 4196448 ROUND -
fsgen
pl pl1 vol1 ENABLED ACTIVE 4196448 CONCAT -
RW
sd disk3-01 pl1 disk3 0 2098224 0 c1t3d0
ENA
sd disk3-02 pl1 disk3 2098224 2098224 2098224 c1t3d0
ENA

```

Remove the evacuated disks from Veritas Volume Manager control.

```

vxdisk -g voldg list
DEVICE TYPE DISK GROUP STATUS
c1t3d0 auto:hpdisk disk3 voldg
online
c1t12d0 auto:hpdisk disk1 voldg
online
c1t14d0 auto:hpdisk disk2 voldg
online

vxdg rmdisk disk1
vxdg rmdisk disk2
vxdisk rm c1t12d0
vxdisk rm c1t14d0

```

Verify that the evacuated disks have been removed from Veritas Volume Manager control.

```

vxdisk -g voldg list
DEVICE TYPE DISK GROUP STATUS
c1t3d0 auto:hpdisk disk3 voldg online

```

Check to see whether the volume you want to move first is mounted.

```

mount | grep vol1
/vol1 on /dev/vx/dsk/voldg/vol1
read/write/setuid/log/nolargefiles/dev=12dc138 on Wed Apr 3
10:13:11 2002

```

Create a partition on free disk space of the same size as the volume. In this example, a 2G partition is created on disk1 (c1t12d0).

Copy the data on vol101 to the newly created disk.

```

dd if=/dev/vx/dsk/voldg/vol101 of=/dev/dsk/c1t12d0

```

In the `/etc/fstab` file, remove the following entry.

```
/dev/vx/dsk/voldg/vol1 /dev/vx/rdisk/voldg/vol1 /vol1 vxfs 4
yes rw
```

Replace it with an entry for the newly created disk.

```
/dev/dsk/c1t12d0 /dev/rdsk/c1t12d0 /vol01 vxfs 4 yes rw
```

Mount the disk partition.

```
mount -F vxfs /dev/dsk/c1t12d0 /vol01
```

Remove `vol01` from Veritas Volume Manager.

```
vxedit -rf rm /dev/vx/dsk/voldg/vol01
```

To complete the procedure, follow Steps 10 through 12 in the previous section, “[Moving volumes to disk partitions](#)” on page 78.

## Shutting down Veritas Volume Manager

To shut down Veritas Volume Manager

◆ Enter the `vxctl` and `vxiod` commands as follows:

```
vxctl stop
vxiod -f set 0
```

# Uninstalling Veritas Storage Foundation packages

To shut down and remove the installed Veritas Storage Foundation packages

- 1 If you are uninstalling Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, stop the repository database and unmount the repository volume.

In a stand-alone configuration:

Stop the database repository:

```
/opt/VRTSdbcom/bin/sfua_db_config -o stopdb
```

Unmount the database repository:

```
/opt/VRTSdbcom/config/sfua_rep_mount stop
```

In an HA configuration:

Stop VCS processes on either the local system or all systems.

To stop VCS processes on the the local system:

```
hastop -local
```

To stop VCS processes on all systems:

```
hastop -all
```

- 2 Move to the `/opt/VRTS/install` directory and run the `uninstall` script.

```
cd /opt/VRTS/install
```

For Veritas Storage Foundation

```
./uninstallsf
```

For Veritas Storage Foundation for DB2

```
./uninstallsfdb2
```

For Veritas Storage Foundation for Oracle

```
./uninstallsfora
```

You can use these commands to remove the packages from one or more systems.

---

**Note:** To remove packages from remote systems, configure `ssh` or `rsh` as described in “[Prerequisites for remote and cluster installation and uninstallation](#)” on page 15.

Not all these packages may be installed on your system depending on the choices that you made when you installed VxVM.

If you have obtained a Veritas product from an electronic download site, the single product download files do not contain the `uninstallsf` installation script, so you must use the product uninstallation script to uninstall the product. For example, if you download Veritas Volume Manager, use the `uninstallvm` script instead of the `uninstallsf` script.

---

## Removing license files (Optional)

To remove the Veritas license files

- 1 To see what license key files you have installed on a system, enter:

```
/sbin/vxlicrep
```

The output lists the license keys and information about their respective products.

- 2 Go to the directory containing the license key files and list them:

```
cd /etc/vx/licenses/lic
```

```
ls -a
```

- 3 Using the output from step 1, identify and delete unwanted key files listed in step 2. Unwanted keys may be deleted by removing the license key file.

# Uninstalling the Veritas Enterprise Administrator Client

You should also remove the client software from any machines you used to access the Veritas software.

## To remove the VEA client from an HP-UX system other than the server

- 1 Stop the VEA Service.  

```
/opt/VRTS/bin/vxsvcctl stop
```
- 2 Use the `swremove` command to remove the `VRTSobgui` software package.  

```
swremove VRTSobgui VRTSat VRTSspb VRTSicsco
```

## To remove the VEA client from a Windows system

- 1 Log in as the database administrator.
- 2 Select **Start > Settings > Control Panel**.
- 3 Double-click **Add/Remove Programs** to display a list of installed products.
- 4 Select **Veritas Enterprise Administrator** from the list, and click the **Remove** button.
- 5 Click **Yes** when a dialog box appears asking you to confirm the removal.

# Uninstalling Veritas Volume Manager

This section describes how to uninstall Veritas Volume Manager and the product license. To uninstall Veritas Storage Foundation or Veritas Storage Foundation for Oracle, see “[Uninstalling Veritas Storage Foundation packages](#)” on page 83.

## To uninstall Veritas Volume Manager

- 1 Log in as superuser.
- 2 Run the `installer` command to uninstall Veritas Volume Manager. For example:  

```
cd /dvdrom
./installer
```
- 3 From the product installer, choose the **U** option for Uninstall, and select **Veritas Volume Manager**.
- 4 Enter one or more system names from which Veritas Volume Manager is to be uninstalled. For example:  
Enter the system names separated by spaces on which to

```
uninstall VxVM: system01
```

- 5 After the system check completes successfully, press Return to continue.
- 6 Enter **y** to uninstall the VxVM depots. For example:  
Are you sure you want to uninstall VxVM? [y,n,q] (y)
- 7 After VxVM is successfully stopped, the system will tell you the location of log files. You should save these files for future reference.
- 8 After uninstallation completes, reboot the system.  

```
/sbin/usr/shutdown -r -y now
```

## Uninstalling Veritas File System

This section describes how to uninstall Veritas File System and the product license. To uninstall Veritas Storage Foundation or Veritas Storage Foundation for Oracle, see “[Uninstalling Veritas Storage Foundation packages](#)” on page 83.

### To uninstall Veritas File System

- 1 Log in as superuser.
- 2 Run the `installer` command to uninstall the Veritas File System. For example:  

```
cd /dvdrom
./installer
```
- 3 From the product installer, choose the **U** option for Uninstall and select the **Veritas File System**.
- 4 Enter one or more system names to uninstall Veritas File System. For example:  
Enter the system names separated by spaces on which to  
uninstall VxFS: **system01**
- 5 After the system check completes successfully, press **Return** to continue.
- 6 Enter **y** to uninstall the VxFS packages. For example:  
Are you sure you want to uninstall VxFS packages? [y,n,q] (y)
- 7 After uninstallation completes, reboot the system.  

```
/sbin/usr/shutdown -r -y now
```

# Installation script options

If you choose to install using the product installation script or if you obtained a Veritas product from an electronic download site, which does not include the product installer, you have several script options.

Use the table to determine which installation script to use:

| If you are installing                 | Use          |
|---------------------------------------|--------------|
| Veritas Storage Foundation            | installsf    |
| Veritas Storage Foundation for Oracle | installsfora |

To use the installation script, enter the script name at the prompt. For example, to install Veritas Storage Foundation, type `./installsf` at the prompt. Then, go to step 2 in [“Installing using the product installer”](#) on page 29.

The following options apply to all Veritas Storage Foundation products.

## Installation Script Options

The following options are available when using the product installation script. For an initial install or upgrade, options are not usually required.

**Table A-5** Available command line options

| Command Line Option             | Function                                                                                                                                                            |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>system1 system2...</code> | 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. |

**Table A-5** Available command line options

| Command Line Option                    | Function                                                                                                                                                                                                                                     |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -configure                             | Configures the product after installing using the -installonly option.                                                                                                                                                                       |
| -enckeyfile <i>encryption_key_file</i> | See the -responsefile and the -encrypt options.                                                                                                                                                                                              |
| -encrypt <i>password</i>               | Encrypts <i>password</i> 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 <i>ssh_key_file</i>           | Specifies a key file for secure shell (SSH) installs. This option passes -i <i>ssh_key_file</i> to every SSH invocation.                                                                                                                     |
| -license                               | Registers or updates product licenses on the specified systems.                                                                                                                                                                              |
| -logpath <i>log_path</i>               | 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. |
| -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.                                                                                                                                                                    |



Table A-5 Available command line options

| Command Line Option                                                                                      | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-patchpath <i>patch_path</i></code>                                                                | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>-pkgpath <i>package_path</i></code>                                                                | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>-precheck</code>                                                                                   | Performs a preinstallation check to determine if systems meet all installation requirements. Symantec recommends doing a precheck before installing a product.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>-requiredpkgs</code>                                                                               | 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 <code>installpkgs</code> option.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>-responsefile <i>response_file</i></code><br><code>[-enckeyfile <i>encryption_key_file</i>]</code> | <p>Automates installation and configuration by using system and configuration information stored in a specified file instead of prompting for information. The <i>response_file</i> must be a full path name. If not specified, the response file is automatically generated as <code>installerernumber.response.number</code> is random. You must edit the response file to use it for subsequent installations. Variable field definitions are defined within the file.</p> <p>The <code>-enckeyfile</code> option and <i>encryption_key_file</i> name are required with the <code>-responsefile</code> option when the response file contains encrypted passwords.</p> |
| <code>-rootpath <i>root_path</i></code>                                                                  | <p>Specifies an alternative root directory on which to install packages.</p> <p>On Solaris operating systems, <code>-rootpath</code> passes <code>-R path</code> to <code>pkgadd</code>.</p> <p>On HP-UX operating systems, <code>-rootpath</code> passes <code>-I path</code> to <code>swinstall</code>.</p> <p>The <code>-rootpath</code> option is not supported on AIX or Linux operating systems.</p>                                                                                                                                                                                                                                                                |

**Table A-5** Available command line options

| Command Line Option      | Function                                                                                                                                                                                                                                                                                  |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -rsh                     | Specify this option when you want to use RSH and RCP for communication between systems instead of the default SSH and SCP. The <code>-rsh</code> option requires that systems be preconfigured so that commands between systems execute without prompting for passwords or confirmations. |
| -tmppath <i>tmp_path</i> | Specifies a directory other than <code>/var/tmp</code> 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.                                                 |

# Veritas Storage Foundation install packages

This appendix contains the following topics:

- [“Veritas Storage Foundation install packages”](#) on page 91

## Veritas Storage Foundation install packages

[Table A-1](#) shows the package name and contents for each English package for:

- Veritas Storage Foundation

■ Veritas Storage Foundation for Oracle

**Table A-1** Storage Foundation packages

| Package                        | Contents                                                         | Required/Optional |
|--------------------------------|------------------------------------------------------------------|-------------------|
| <b>Volume Manager packages</b> |                                                                  |                   |
| VRTSvxvm                       | Veritas Volume Manager Binaries                                  | Required          |
| VRTSvmweb                      | Veritas Volume Manager Management Services Web Client Extensions | Required          |
| VRTSvmman                      | Veritas volume Manager Manual Pages                              | Optional          |
| VRTSvmdoc                      | Veritas Volume Manager Documentation                             | Optional          |
| VRTSdcli                       | Veritas Distributed Command Line Interface                       | Required          |
| VRTSalloc                      | Veritas Volume Manager Veritas Intelligent Storage Provisioning  | Required          |
| VRTSvmpro                      | Veritas Volume Manager Management Services Provider              | Required          |
| VRTSsvsc                       | Veritas Volume Server and Client Provider                        | Required          |
| VRTSvdid                       | Veritas Device Identification API                                | Required          |
| VRTSddlpr                      | Veritas Device Discovery Layer services Provider                 | Required          |
| <b>File System packages</b>    |                                                                  |                   |
| VRTSvxfs                       | Veritas File System                                              | Required          |
| VRTSfspro                      | Veritas File System Management Services Provider                 | Required          |
| VRTSfssdk                      | Veritas File System Software Developer Kit                       | Required          |
| VRTSfsweb                      | Veritas File System Provider Web Client Extension                | Required          |
| VRTSfspro                      | Veritas File System Management Services Provider                 | Required          |
| VRTSfsdoc                      | Veritas File System Documentation                                | Optional          |
| VRTSfsman                      | Veritas File System Manual Pages                                 | Optional          |
| VRTSfsmnd                      | Veritas File System Software Developer Kit Manual Pages          | Optional          |

**Table A-1** Storage Foundation packages

| Package                                          | Contents                                                                                                                        | Required/Optional                            |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Database packages</b>                         |                                                                                                                                 |                                              |
| VRTSdbcom                                        | Veritas Storage Foundation Common Utilities for Databases                                                                       | Required (for all database products)         |
| VRTSdb2ed                                        | Veritas Storage Foundation for DB2                                                                                              | Required (for Storage Foundation for DB2)    |
| VRTSd2gui                                        | Veritas Storage Foundation for DB2 Graphical User Interface                                                                     | Required (for Storage Foundation for DB2)    |
| VRTSdbed                                         | Veritas Storage Foundation for Oracle                                                                                           | Required (for Storage Foundation for Oracle) |
| VRTSorgui                                        | Veritas Storage Foundation for Oracle Graphical User Interface                                                                  | Required (for Storage Foundation for Oracle) |
| VRTSsybed                                        | Veritas Storage Foundation for Sybase<br><b>Note:</b> Veritas Storage Foundation for Sybase (VRTSsybed) has not been localized. | Required (for Storage Foundation for Sybase) |
| VRTSodm                                          | ODM Driver for VxFS                                                                                                             | Required (for Storage Foundation for Oracle) |
| VRTSvxmsa                                        | Veritas Mapping Service, Application Libraries                                                                                  | Required (for DB2 and Oracle products)       |
| VRTSdbdoc                                        | Veritas Storage Foundation Documentation for Databases                                                                          | Optional                                     |
| <b>Veritas Enterprise Administrator packages</b> |                                                                                                                                 |                                              |
| VRTSob                                           | Veritas Enterprise Administrator                                                                                                | Required                                     |
| VRTSobc33                                        | Veritas Enterprise Administrator Core                                                                                           | Required                                     |
| VRTSccg                                          | Veritas Enterprise Administrator Central Control Grid                                                                           | Required                                     |
| VRTSaa                                           | Veritas Enterprise Administrator Action Agent                                                                                   | Required                                     |
| VRTSobweb                                        | Veritas Enterprise Administrator Web Console                                                                                    | Required                                     |
| VRTSobgui                                        | Veritas Enterprise Administrator                                                                                                | Optional                                     |
| <b>Infrastructure packages</b>                   |                                                                                                                                 |                                              |

**Table A-1** Storage Foundation packages

| <b>Package</b>                                             | <b>Contents</b>                                             | <b>Required/Optional</b> |
|------------------------------------------------------------|-------------------------------------------------------------|--------------------------|
| VRTSicsco                                                  | Symantec Infrastructure Core Services                       | Required                 |
| VRTSddlpr                                                  | Veritas Device Discovery Layer Services Provider            | Required                 |
| VRTSvail                                                   | Veritas Array Integration Layer                             | Required                 |
| VRTSat                                                     | Symantec Product Authentication Service                     | Required                 |
| VRTSgapms                                                  | Veritas Generic Array Plugin                                | Required                 |
| <b>High Availability (Veritas Cluster Server) packages</b> |                                                             |                          |
| VRTSvcs                                                    | Veritas Cluster Server                                      | Required                 |
| VRTScsocw                                                  | Veritas Cluster Serer Oracle and RAC Configuraiton Wizards  | Required                 |
| VRTSvcsor                                                  | Veritas High Availability Agent for Oracle                  | Required                 |
| VRTSvcsdb                                                  | Veritas High Availability Agent for DB2                     | Required                 |
| VRTScscm                                                   | Veritas Cluster Server Cluster Manager                      | Required                 |
| VRTScscw                                                   | Veritas Cluster Server Configuration Wizards                | Required                 |
| VRTScssim                                                  | Veritas Cluster Server Simulator                            | Required                 |
| VRTScutil                                                  | Veritas Cluster Utilities                                   | Required                 |
| VRTSgab                                                    | Veritas Group Membership and Atomic Broadcast               | Required                 |
| VRTSvcsvr                                                  | Veritas Cluster Server Agents for Veritas Volume Replicator | Required                 |
| VRTSjre                                                    | Veritas Java Runtime Environment Redistribution             | Required                 |
| VRTSjre15                                                  | Veritas Java Runtime Environment Redistribution             | Required                 |
| VRTSllt                                                    | Veritas Low Latency Transport                               | Required                 |
| VRTSvcsag                                                  | Veritas Cluster Server Bundled Agents                       | Required                 |
| VRTSvcsmsg                                                 | Veritas Cluster Server English Message Catalogs             | Required                 |
| VRTSvcsw                                                   | Veritas Cluster Manager (Web Console)                       | Required                 |

**Table A-1** Storage Foundation packages

| Package               | Contents                                                           | Required/Optional |
|-----------------------|--------------------------------------------------------------------|-------------------|
| VRTSvxfen             | Veritas I/O Fencing                                                | Required          |
| VRTSacclib            | Veritas Cluster Server ACC Library 5.0                             | Required          |
| VRTScmcs              | Veritas Cluster Management Console for single cluster environments | Required          |
| VRTScmccc             | Veritas Cluster Management Console Cluster Connector               | Required          |
| VRTSvcscdc            | Veritas Cluster Server Documentation                               | Optional          |
| VRTSvcscdr            | Veritas Cluster Server Documentation                               | Optional          |
| VRTSvcsmn             | Manual Pages for Veritas Cluster Server                            | Optional          |
| <b>Other Packages</b> |                                                                    |                   |
| VRTSvlic              | Veritas Licensing                                                  | Required          |
| SYMClma               | Symantec License Inventory Agent                                   | Required          |
| VRTScweb              | Symantec Web Server                                                | Required          |
| VRTSweb               | Symantec Web Server                                                | Required          |
| VRTSdcp               | Veritas Disk Correlator Provider                                   | Required          |
| VRTSdsa               | Veritas Datacenter Storage Agent                                   | Required          |
| VRTSdsm               | Veritas datacenter Storage Manager                                 | Required          |
| VRTSgcscha            | Veritas GCS High Availability Agents                               | Required          |
| VRTSgcspr             | Veritas SAN Global Configuration Server Object Bus Provider        | Required          |
| VRTSdbms3             | Symantec Shared DBMS                                               | Required          |
| VRTSperl              | Perl 5.8.8 Redistribution                                          | Required          |
| VRTSjre               | Veritas JRE Redistribution                                         | Required          |
| VRTSjre15             | Symantec JRE Redistribution                                        | Required          |
| VRTSspb               | Symantec Private Branch Exchange                                   | Required          |
| VRTSspt               | Veritas Software Support Tools                                     | Required          |
| VRTSdsa               | Veritas Datacenter Storage Agent                                   | Required          |
| VRTSvdid              | Veritas Device Identification API                                  | Required          |

**Table A-1** Storage Foundation packages

| <b>Package</b>                   | <b>Contents</b>                                                                              | <b>Required/Optional</b> |
|----------------------------------|----------------------------------------------------------------------------------------------|--------------------------|
| VRTSdbms3                        | Veritas Shared DBMS                                                                          | Required                 |
| VRTScs                           | Veritas Storage Foundation Management Server                                                 | Required                 |
| VRTScsdoc                        | Veritas Storage Foundation Management Server                                                 | Required                 |
| VRTSmh                           | Veritas Centralized Management for Storage Foundation                                        | Required                 |
| VRTScpi                          | Veritas Cross Product Installation Framework                                                 | Required                 |
| VRTSspb                          | Symantec Private Branch Exchange                                                             | Required                 |
| VRTSsmf                          | Symantec Service Management Framework                                                        | Required                 |
| VRTSat                           | Symantec Product Authentication Service                                                      | Required                 |
| VRTSspt                          | Veritas Software Support Tools                                                               | Required                 |
| windows/vrtsobg ui.msi           | Veritas Enterprise Administrator for Windows                                                 | Optional                 |
| <b>Veritas Volume Replicator</b> |                                                                                              |                          |
| VRTSvrpro                        | Veritas Volume Replicator Client Extension and Provider for Veritas Enterprise Administrator | Required                 |
| VRTSvcsvr                        | Veritas Cluster Server Agents for VVR                                                        | Required                 |
| VRTSvrw                          | Veritas Volume Replicator Web Console                                                        | Required                 |
| VRTSvrdoc                        | Veritas Volume Replicator Documentation                                                      | Optional                 |



# Configuring the Symantec License Inventory Agent

This appendix includes the following topics:

- “[About the Symantec License Inventory Manager](#)” on page 98
- “[When the Symantec License Inventory Agent is installed](#)” on page 99
- “[When the server and access points are installed](#)” on page 99
- “[What you can do with the agent after it is installed](#)” on page 99
- “[How to remove the agent](#)” on page 100
- “[How to order the Symantec License Inventory Manager license and media kit](#)” on page 101

The Symantec License Inventory Manager installation disc is available separately. For information on how to order the full product, see “[How to order the Symantec License Inventory Manager license and media kit](#)” on page 101. The installation media provides online documentation with details on all topics discussed in this appendix.

Read the following Technical Support TechNote for the latest information on updates, patches, and software issues regarding this product:

<http://support.veritas.com/docs/282183>

You can also download the *Symantec License Inventory Agent 4.1 Release Notes*, from this website.

## About the Symantec License Inventory Manager

The Symantec License Inventory Manager (license inventory manager) is an enterprise asset management tracking tool that inventories Symantec Information Availability products in your network and consolidates critical information on the deployment of these products to facilitate license management and compliance tracking. Using the information provided by the license inventory manager, you can:

- Determine all the Symantec software products and licenses being used in your enterprise
- Achieve easier license self-compliance management
- Know your Enterprise License Agreement deployment status
- Reduce administrative overhead for managing license compliance
- Renew support and maintenance based on the licenses you have deployed
- Gain more control over your Symantec software usage
- Manage department chargebacks based on actual software usage
- Use more flexible licensing and pricing models
- Exploit detailed deployment data to perform return on investment analyses for purchased software

The license inventory manager is a three-tiered system that consists of a server tier, access point tier, and an agent tier. The server tier is the Symantec License Inventory Server, which consolidates and stores information that it gathers from the agents and access points.

The optional access point tier includes Symantec License Inventory Access Points and serves as a consolidation layer between the agents and server.

The agent tier includes Symantec License Inventory Agents, which are deployed on individual hosts in a network. Each agent gathers product information on the supported Symantec products that are installed on the agent's host, then sends the information to an access point or the server.

## When the Symantec License Inventory Agent is installed

The Symantec product installer installs or upgrades the agent on the host with the Symantec product. The agent is installed in the following directory:

`/opt/SYMC1ma`

The agent is installed with a default configuration that minimizes its impact on a running system. The minimum configuration prevents remote communication with the agent to keep its data and interfaces secure.

## When the server and access points are installed

The server and access points are not installed automatically. If you want to use the Symantec License Inventory Manager, you must manually install the server and, optionally, the access points. After you install the server and access points, the agents can gather information and you can create inventory reports.

You can install the server and access points from the Symantec License Inventory Manager installation disc.

## What you can do with the agent after it is installed

If you are already participating in a Symantec sales program that requires the use of the agent, or if you want to order and deploy the Symantec License Inventory Manager, you can use the agent to track Symantec products on the systems on which it was installed. To use the agent, however, you must manually configure it to enable remote communication between the agent and its server or access point.

Complete instructions for reconfiguring the agent are provided in the *Symantec License Inventory Manager 4.1 Release Notes*. You can download this document from the following website:

<http://support.veritas.com/docs/282183>

## How to remove the agent

If you do not want to use the Symantec License Inventory Manager, you can remove the agent using the operating system package removal commands to remove the agent packages, which include SYMClma and VRTSsmf.

The server and access point also use the VRTSsmf package. If the server or access point is installed on this host with the agent, you can remove the SYMClma package, but not the VRTSsmf package. If neither the server nor the access point is installed on this host, you can remove both the SYMClma and VRTSsmf packages.

If you remove both packages, remove the SYMClma package first.

[Table B-1](#) lists the commands required to remove these packages on the supported platforms.

**Table B-1** Package removal commands required to remove the agent

| Platform | Package removal command                                              |
|----------|----------------------------------------------------------------------|
| AIX      | <code>installp -u VRTSlma</code><br><code>installp -u VRTSsmf</code> |
| HP-UX    | <code>swremove SYMClma</code><br><code>swremove VRTSsmf</code>       |
| Linux    | <code>rpm evv SYMClma</code><br><code>rpm evv VRTSsmf</code>         |
| Solaris  | <code>pkgrm VRTSlma</code><br><code>pkgrm VRTSsmf</code>             |

Later, you can reinstall the agent with the Symantec License Inventory Manager installation disc. This disc is available in the Symantec License Inventory Manager kit.

## How to order the Symantec License Inventory Manager license and media kit

To order a Symantec License Inventory Manager license and media kit, contact your Symantec sales representative.

The installation media provides online documentation for the Symantec License Inventory Manager. You can contact your sales representative to order printed copies of the documentation. The documents you can order include:

- *Symantec License Inventory Manager Installation and Configuration Guide*
- *Symantec License Inventory Manager Administrator's Guide*
- *Symantec License Inventory Manager User's Guide*

