Veritas Storage Foundation™ Installation Guide

AIX

5.0

symantec™

Veritas Storage Foundation
Installation Guide

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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

Preinstallation instructions

Topics covered in this chapter include:

- "Veritas Storage Foundation product suites" on page 10
- "General installation requirements" on page 12

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 (Standard, Enterprise, Enterprise HA Editions)
- Veritas Storage Foundation for DB2 (Standard, Enterprise, Enterprise HA Editions)
- Veritas Storage Foundation 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.

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 Basic	Veritas File System Veritas Volume Manager
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 DB2 Standard	Veritas File System Veritas Volume Manager Veritas Quick I/O 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 DB2 Enterprise	Veritas File System Veritas Volume Manager Veritas Quick I/O option Veritas Storage Checkpoint option Veritas Storage Mapping option **Optionally licensed features:** Veritas Volume Replicator
Storage Foundation for DB2 Enterprise HA	Veritas File System Veritas Volume Manager Veritas Cluster Server Veritas Quick I/O option Veritas Storage Checkpoint option Veritas Storage Mapping option **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
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

Table 1-1   Contents of Veritas Storage Foundation products

Storage Foundation version	Products and features
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/enterprise/sfms

Symantec product licensing

This product includes a License Key certificate. The certificate specifies the product keys and the number of product licenses purchased. A single key lets you install the product on the number and type of systems for which you purchased the license. A key may enable the operation of more products than are specified on the certificate; however, you are legally limited to the number of product licenses purchased.

The product installation procedure describes how to activate the key. If you encounter problems while licensing this product, visit the Symantec licensing support website at:

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

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

vxlicinst   Installs a license key for a Symantec product

vxlicrep   Displays currently installed licenses

vxlictest   Retrieves features and their descriptions encoded in a license key

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

Supported AIX operating systems

This release of Veritas Storage Foundation operates on AIX 5.2 and AIX 5.3 operating systems.

Product installation scripts verify the required update levels. The installation process terminates if the target systems do not meet the maintenance level requirements.

For any Veritas cluster product, all nodes in the cluster must have the same operating system version and update level.

The minimum system requirements for this release are:

■   AIX 5.2 ML6 (legacy) or above

■ AIX 5.3 TL4 with SP 4

Note: SP 4 was not available at the time of this release. Veritas 5.0 products also operate on AIX 5.3 with Service Pack 3, but you must install an AIX interim fix. See the following TechNote for information on availability and installation.

http://support.veritas.com/docs/282024

For the latest information on updates, patches, and software issues regarding this release, refer to the following technote on the Veritas Technical Support website:

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

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 following databases are supported in this release for Veritas Storage Foundation for DB2:

■ DB2 8.1 ESE (8.1 with FixPak 9) (32- or 64-bit)

■ DB2 8.2 ESE (8.1 with FixPak7 or 8) (32-or 64-bit)

■ 8.2.2 ESE (8.1 with FixPak 9) (32- or 64-bit)

The following databases are supported in this release for Veritas Storage Foundation for Oracle:

■ 9.2.0.2 and above (64-bit)

■ 10.1.0.2 (64-bit)

■ 10.2.0.1 and above (64-bit)

Additional DB2 information

In a Massively Parallel Processor (MPP) configuration, only Quick I/O and Cached Quick I/O are supported. All other Veritas Storage Foundation for DB2 tools are not supported in an MPP environment.

Refer to the appropriate DB2 installation guide that accompanied your DB2 software for additional information. IBM maintains DB2 UDB FixPaks for download at the following location:

http://www.ibm.com/cgi-bin/db2www/data/db2/udb/winos2unix/support /download.d2w/report

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Note: With DB2 8.1 ESE, the Database Partitioning feature is only supported in an SMP configuration.

Additional Oracle information

In order to use Veritas Extension for Oracle Disk Manager, you must use Oracle9*i* release 9.2 or later. Refer to Oracle bug number 1824061 for more details.

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.

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 (Without Optional Packages)	Maximum Space Required (Including All Packages)
Storage Foundation Standard	691 MB	722 MB
Storage Foundation Standard HA	980 MB	1114 MB
Storage Foundation Enterprise	691 MB	722 MB
Storage Foundation Enterprise HA	980 MB	1114 MB
Storage Foundation for DB2 Standard or Enterprise	755 MB	860 MB

Disk space requirements

Product Name	Minimum Space Required (Without Optional Packages)	Maximum Space Required (Including All Packages)
Storage Foundation for DB2 Enterprise HA	1138 MB	1350 MB
Storage Foundation for Oracle Standard or Enterprise	920 MB	1335 MB
Storage Foundation for Oracle Enterprise HA	1300 MB	1335 MB

Environment Variables

Most of the commands used in the installation are in the /sbin or /usr/sbin directory. However, there are additional variables needed in order to use a 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/VRTSvcs/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.

Note: The nroff versions of the online manual pages are not readable using the man command if the bos.txt.tfs fileset is not installed; however, the VRTSvxvm and VRTSvxfs packages install ASCII versions in the /opt/VRTS/man/catman* directories that are readable without the bos.txt.tfs fileset.

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.

Installing Veritas Storage Foundation

Topics covered in this chapter include:

- "Installation requirements" on page 20
- "Mounting a software disc" on page 20
- "Installation methods" on page 20
- "Verifying the Veritas Storage Foundation Installation" on page 33
- "Enabling the Intelligent Storage Provisioning (ISP) feature" on page 36
- "Creating and configuring the repository database for DB2 and Oracle" on page 37

Note: Only users with superuser privileges can install and initialize Storage Foundation.

Use the instructions in this chapter to install Veritas Storage Foundation, Veritas Storage Foundation for DB2, or Veritas Storage Foundation for Oracle.

Installation requirements

Veritas software and operating system installation requirements are described in the following sections.

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 (SYMCLI) 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 DB2 Administrator's Guide*.
See the *Veritas Storage Foundation Oracle Administrator's Guide*.

Mounting a software disc

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

To mount the Veritas software disc

1   Log in as superuser.

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

3   Mount the disc by determining the device access name of the DVD drive. The format for the device access name is `cdx` where x is the device number. After inserting the disc, type the following commands:

```
# mkdir -p /cdrom
# mount -V cdrfs -o ro /dev/cdX /cdrom
```

Installation methods

After you have mounted the Veritas software disc, there are several recommended ways of installing Veritas products:

■   "Installing using the Veritas product installer" on page 21

■   "Installing using Network Installation Manager" on page 29

> **Note:** Save a copy of `/var/adm/ras/errtmplt` and `/etc/trcfmt` files before you install the product. If the packages fail to install due to the `template file is corrupted` error message, replace `/var/adm/ras/errtmplt` file and `/etc/trcfmt` file with the ones that you had saved, uninstall all the packages installed, see "Uninstalling Veritas Storage Foundation" on page 71 and reinstall, see "Installation methods."

You can perform an upgrade to Storage Foundation using the Veritas product installer or product installation script if you already have Storage Foundation installed.

> **Note:** Veritas products are installed under the `/opt` directory on the specified host systems. Ensure that the directory `/opt` exists and has write permissions for root before starting an installation procedure.

Installing using the Veritas product installer

The Veritas 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.

You can use the product installer to install Veritas Storage Foundation, Veritas Storage Foundation for DB2, or Veritas Storage Foundation for Oracle.

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.

To install a Storage Foundation product

1   Make sure the disc is mounted.
    See "Mounting a software disc" on page 20.

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

    # **/mnt/cdrom/*disc_name*/installer**

3   Enter **I** to install a product and press Return to begin.

4   When the list of available products is displayed, select the product you want to install and enter the corresponding number and press Return.
    The product installation begins automatically.

5 You are prompted to enter the systems 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
```

6 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
host2
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.

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

---

7 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 filesets to conserve
diskspace. Additional filesets are typically installed to
simplify future upgrades.

  1)   Required Veritas Storage Foundation filesets - 928 MB
       required
  2)   All Veritas Storage Foundation filesets - 1063 MB
       required

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

Note: 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.

---

8 Enter **1** or **2** to select the filesets to be installed and press Return.

9 Reboot all systems.

10 If you are installing on a cluster, proceed to"Configuring Storage Foundation on a cluster" on page 23 to configure Storage Foundation Enterprise HA. Otherwise, proceed to "Completing the installation procedure" on page 27.

Configuring Storage Foundation on a cluster

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

As the installation and configuration procedure continues, a message displays notifying you that configuring Storage Foundation at this point in the installation procedure is optional.

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 en0 en1 en2
```

7   Enter private heartbeat NIC information for each host.

```
Enter the NIC for the first private heartbeat link on host1:
[b,?] en1
Would you like to configure a second private heartbeat link?
[y,n,q,b,?] (y) y
Enter the NIC for the second private heartbeat link on host1:
[b,?] en2
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) n
Are you using the same NICs for private heartbeat links on
all systems? [y,n,q,b,?] (y) 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, en0 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 DB2 or 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 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)
```

23 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)
```

24 You are prompted to enable Storage Foundation Management Server
Management.

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

25 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.

To complete installing and configuring Storage Foundation

1   If you are completing the intallation procedure in a cluster configurations, 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 product_name 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 vxdctl defaultdg *diskgroup* command on a system. See the vxdctl(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 Standard HA was started successfully.

Press [Return] to continue:
```

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

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

    /opt/VRTS/install/logs/installer-TxO083

Reboot all systems on which VxFS was installed or upgraded.
    shutdown -y -i6 -g0
```

10 If you installed Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, create a new repository database.
See "Upgrading to the new repository database for DB2 and Oracle" on page 64.

Installing using Network Installation Manager

Veritas product packages are compressed using GNU compression utilities before writing them to distribution media. The product installer or installation scripts automatically uncompress the packages before installing and configuring a product. Only a few of the packages can be installed using network installation manager (NIM). If you want to use NIM to install the Veritas packages, copy the packages to your NIM server and uncompress them.

Note: Storage Foundation HA cannot be installed using this method.

Follow the "Preinstallation instructions" on page 9 before starting the installation. If the requirements are not met, the packages may only be partially installed. In case of partial installation, you must uninstall each package manually.

Note: You must run the Veritas product installer with the -configure option to complete the product configuration. It is recommended that you do the entire installation and configuration using the product installer.

Uncompressing Storage Foundation packages

Veritas provides the gunzip utility under the gnu directory on the product software disc to uncompress the Storage Foundation packages.

To uncompress the packages

1 Log in as superuser.

2   Place the Veritas software disc into a CD-ROM drive connected to your NIM server.

3   Mount the disc by determining the device access name of the CD-ROM drive. After inserting the disc into the CD-ROM drive, enter:

```
# mkdir -p /mnt/dvdrom
# mount -V cdrfs -o ro /dev/cdN /mnt/dvdrom
```

where *N* is the device number.

4   Change to the directory containing the product packages.
For Veritas Storage Foundation:

```
# cd /cdrom/storage_foundation/pkgs
```

For Veritas Storage Foundation for DB2

```
# cd /cdrom/storage_foundation_for_db2/pkgs
```

For Veritas Storage Foundation for Oracle:

```
# cd /cdrom/storage_foundation_for_oracle/pkgs
```

5   Copy the compressed package files from the software disc to your NIM server and unzip them.

```
# gunzip VRTS*.gz
```

Installing on the NIM server

1   From the disc, get a list of packages and the correct installation order.

Product	To view required filesets	To view all filesets
Veritas Storage Foundation	`# ./installsf -requiredpkgs`	`# ./installsf -installpkgs`
Veritas Storage Foundation for DB2	`# ./installsfdb2 -requiredpkgs`	`# ./installsfdb2 -installpkgs`
Veritas Storage Foundation for Oracle	`# ./installsfora -requiredpkgs`	`# ./installsfora -installpkgs`

2   Install all of the packages on your NIM clients in the correct order.

3   Following the NIM install, if you want to install all the remaining Storage Foundation Packages, then follow the "Installing using the Veritas product installer" on page 21 on your NIM clients.

Note: You may see the following when you try to run the CPI installer.

```
SF version 5.0.0.0 is already installed on aix610fs12.
        Do you want to continue? [y,n,q,?] (n) y
```

```
Press 'y' to continue.
```

If you do not want to install the remaining Storage Foundation Packages, then configure the Veritas Volume Manager by running `vxinstall` on your NIM clients.

4 Reboot the system after the packages are successfully installed.

Configuring Storage foundation after installing packages

After installing the packages, you must configure the product. To do this, run the Veritas product installer or the appropriate installation script using the –configure option. After configuring the product, you must configure Veritas Volume Manager.

See

Stopping and starting the VEA service

To check the state of the VEA service, enter:

`# /opt/VRTS/bin/vxsvcctrl status`

To stop the VEA service, enter:

`# /opt/VRTS/bin/vxsvcctrl stop`

To start the VEA service, enter:

`# /opt/VRTS/bin/vxsvcctrl start`

Note: The VEA service is automatically started on a reboot.

Installing the VEA client on a Microsoft Windows system

The VEA client package for Microsoft Windows® systems (`win32\VRTSobgui.msi`) is used to access servers running VxVM and the VEA service on AIX. This package can be installed on Windows NT®, Windows XP, Windows 2000, Windows 2003, Windows ME, Windows 98 and Windows 95 machines.

To install and run the VEA client, your system must conform to the following specification:

■ Windows Installer 2.0 or later must be present. For information about upgrading Windows Installer, visit http://www.microsoft.com. For Windows NT 4.0, it is also recommended that you use Windows NT 4.0 Service Pack 6.

■ Java Runtime Environment 1.1 or later must be present.

■ 100MHz Pentium with 32MB memory or higher specification.

- 22MB available disk space.

Note: Microsoft Installer is required to install the `VRTSobgui.msi` package. You can get this product from the Microsoft website if it is not already installed on your system.

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.

Install the VEA client on a Windows machine as follows:

1   Log in as administrator.

2   Insert the CD-ROM containing VEA.

3   Using Windows Explorer or a DOS Command window, change directory to `pkgs\win32` and execute the `VRTSobgui.msi` program with Windows Installer.

4   Follow the instructions presented by the `VRTSobgui.msi` program.

5   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.

Starting the VEA client

Note: Only users with appropriate privileges can run the VEA client.

You can use the VEA client to administer the local systems or several remote systems. Both Veritas Volume Manager (as the `vxconfigd` daemon) and the backend VEA server must be installed and running on any machine that is to be administered.

After installing and starting Veritas Volume Manager and VEA server on the machine to be administered, start the VEA client in one of the following ways.

AIX

To use the VEA client to administer the *local* AIX machine, enter the following command:

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

To use the VEA client to administer a *remote* AIX machine, enter the following command:

    # **/opt/VRTSob/bin/vea** *remote_machine_name*

Windows

To use the VEA client to administer a *remote* AIX machine, select **Start > Programs > Veritas Enterprise Administrator > Veritas Enterprise Administrator**.

Verifying the Veritas Storage Foundation Installation

To check which packages have been installed

◆ Use the lslpp command as follows:

    # **lslpp -L | grep VRTS**
    The packages should be in the COMMITTED state.

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 File System installation

After the Storage Foundation software has been successfully installed, you can confirm successful Veritas File System installation.

To confirm the File System installation

◆ Use the lsvfs command as follows:

    # **lsvfs vxfs**
    Entries for these processes appear in output similar to the following:

    vxfs 32 /sbin/helpers/vxfs /sbin/helpers/vxfs

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 `-n`N 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.*

Disabling hot-relocation

The hot-relocation feature is enabled by default and it is recommended that you leave it on. However, you can disable it by preventing the `vxrelocd` daemon from starting up during system startup. This should be done after the VxVM packages have been installed.

To disable hot-relocation, comment out the `vxrelocd` line in the startup file `/etc/init.d/vxvm-recover` by inserting a leading # character as shown here:

```
# vxrelocd root &
```

Hot sparing may be enabled by commenting out the following line in the same file:

```
# vxsparecheck root &
```

Note: One of these two lines must be commented out.

Any changes that you make to the `vxvm-recover` file do not take effect until you reboot the system.

Enabling the Intelligent Storage Provisioning (ISP) feature

If you load the allocator provider package (`VRTSalloc`), enter the following commands to restart the VEA service and enable the Intelligent Storage Provisioning (ISP) feature:

```
# /opt/VRTS/bin/vxsvcctrl stop
# /opt/VRTS/bin/vxsvcctrl start
```

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	■ 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	■ 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 an unique virtual IP address for public NIC interface.
	■ Obtain the device names for the public NIC interface (for example: hme0 / en0 /) 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: # **haconf –dump –makero**

Table 2-2 indicates the options available for the `sfua_db_config` script.

Table 2-2   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.
`-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 ....en0

Enter the NIC for system host1 for HA Repository configuration:
[en0]

Discovering public NIC on host2 ....en0

Enter the NIC for system host2 for HA Repository  configuration:
[en0]

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 -> en0,host2 -> en0
    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'.
```

Installing Veritas Storage Foundation Basic

Topics covered in this chapter include:

■ "About Veritas Storage Foundation Basic"

■ "Installing Veritas Storage Foundation Basic"

■ "Upgrading Veritas Storage Foundation Basic"

■ "Uninstalling Veritas Storage Foundation Basic"

This chapter describes how to install, upgrade, and uninstall the Veritas Storage Foundation Basic software.

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

http://www.symantec.com/sfbasic

About Veritas Storage Foundation Basic

The Storage Foundation Basic software contains the same features as Storage Foundation Standard software, but you will receive messages on the system console if you exceed the following soft limitations of the license:

■ Maximum of 4 VxVM volumes

■ Maximum of 4 VxFS file systems

■ Maximum server capacity of 2 CPU sockets

For a product overview on Storage Foundation Basic, see the *Veritas Storage Foundation and High Availability Solutions Getting Started Guide*.

Storage Foundation Basic technical support

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

http://support.veritas.com

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

```
# /opt/VRTS/bin/vxlicrep
....
License Key       = XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXX
Product Name      = Veritas Storage Foundation Basic
```

The Storage Foundation Basic license key is installed automatically by the Veritas product installer.

Storage Foundation Basic system requirements

Dependencies

Veritas Storage Foundation Basic can only be installed on a system running AIX 5.2 ML5 or above or AIX 5.3 TL4 with Service Pack 4. Installing this product on any other AIX release will fail. If necessary, upgrade AIX before you install the Veritas products.

Note: Service Pack 4 was not available at the time of this release. Veritas 5.0 products also operate on AIX 5.3 with Service Pack 3, but you must install an AIX efix. See the following TechNote for information on availability and installation.

http://support.veritas.com/docs/282024

Disk space

The product installation script automatically checks that sufficient disk space is available. However, before installing the Veritas Storage Foundation Basic software, you may wish to confirm that there is sufficient disk space in the file systems on the target systems.

The following table shows the approximate disk space used by all the Storage Foundation Basic software packages:

/ (excluding /opt, /usr and /var)	/opt	/usr	/var	Total disk space required
75MB	642MB	125MB	3MB	845MB

The following table describes each package:

Package	Contents
Volume Manager packages	
VRTSalloc	Veritas Volume Manager: Veritas Intelligent Storage Provisioning
VRTSddlpr	Veritas Device Discovery Layer Services Provider
VRTSvdid	Veritas Device Identification API

Package	Contents
VRTSvmdoc	Veritas Volume Manager Documentation (optional)
VRTSvmman	Veritas Volume Manager -Manual Pages (optional)
VRTSvmpro	Veritas Volume Manager Management Services Provider
VRTSvxvm	Veritas Volume Manager, Binaries
File System packages	
VRTSfsdoc	Veritas File System Documentation (optional)
VRTSfsman	Veritas File System - Manual Pages (optional)
VRTSfsmnd	Veritas File System Software Developer Kit Manual Pages (optional)
VRTSfspro	Veritas File System Management Services Provider
VRTSfssdk	Veritas File System Software Developer Kit
VRTSvxfs	Veritas File System, Binaries
Veritas Enterprise Administrator packages	
VRTSaa	Veritas Enterprise Administrator Action Agent
VRTSccg	Veritas Enterprise Administrator Central Control Grid
VRTSob	Veritas Enterprise Administrator Service
VRTSobc33	Veritas Enterprise Administrator Core Service
VRTSobgui	Veritas Enterprise Administrator
Veritas FlashSnap Agent for Symmetrix packages	
VRTSfas	Veritas FlashSnap Agent for Symmetrix
VRTSfasdc	Veritas FlashSnap Agent for Symmetrix Documentation
Miscellaneous packages	
SYMClma	Symantec License Inventory Agent
VRTSat	Symantec Product Authentication Service
VRTSdcli	Veritas Distributed Command Line Agent

Package	Contents
VRTSdsa	Veritas Datacenter Storage Agent
VRTSgapms	Veritas Generic Array Plugin
VRTSicsco	Symantec Common Infrastructure
VRTSmapro	Veritas Storage Foundation GUI for Mapping
VRTSmh	Veritas Centralized Management for Storage Foundation Managed Host
VRTSpbx	Symantec Private Branch Exchange
VRTSperl	Perl 5.8.0 for Veritas
VRTSsmf	Symantec Service Management Framework
VRTSspt	Veritas Software Support Tools
VRTSvail	Veritas Array Integration Layer
VRTSvlic	Veritas License Utilities
VRTSvsvc	Veritas Volume Server and Client Provider
VRTSvxmsa	Veritas Mapping Service, Application Libraries
windows/vrtsobgui.msi	Veritas Enterprise Administrator for Windows

Installing Veritas Storage Foundation Basic

This section describes how to install Veritas Storage Foundation Basic.

Note: The Storage Foundation Basic license key is automatically installed by the Veritas product installer.

SF Basic systems can be administered with the Storage Foundation Management Server.

To install Veritas Storage Foundation Basic

1   If you are installing from the Veritas Storage Foundation Basic disc, insert
    the disc into your system's DVD-ROM drive, and mount the DVD-ROM
    manually as in the following example:

    ```
    # mkdir -p /mnt/dvdrom
    # mount -V cdrfs -o ro /dev/dvdN /mnt/dvdrom
    ```

    where *N* in /dev/dvd*N* is a number for the DVD device configured on the
    target system. Usually the value for *N* is 0. Check the DVD device nodes on
    your system in the /dev directory.

2   Move to the top-level directory on the mounted disc, or in the extracted
    download, for example:

    ```
    # cd /mnt/dvdrom
    ```

3   From this directory, type the following command if you are installing on the
    local system only, or if you are using the secure shell (SSH) utilities to install
    on remote systems:

    ```
    # ./installer
    ```

    If you are using the remote shell (RSH) utilities to install on remote
    systems, additionally specify the -rsh option:

    ```
    # ./installer -rsh
    ```

    The sample installation assumes that SSH is being used.

4   At the product status page, enter **I** for the product installer and press
    Return. The product installation begins.

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

5   Enter the system names on which the software is to be installed. The script
    performs an initial check on each system, installs the licensing packages,
    and displays the packages that will be installed. You are prompted to press
    Return to page through the list of packages.

    ```
    It is optional to configure SF Basic now. If you choose to
    configure SF Basic later, you can either do so manually or
    run the installsf -configure command.

    Are you ready to configure SF Basic? [y,n,q,?] (y)
    ```

6   Press **Return** to continue installing the packages and to configure the
    software.

    ```
    Installation completed successfully on all systems

    The enclosure-based naming scheme is a feature of Volume
    Manager. It allows one to reference disks using a symbolic
    name that is more meaningful than the operating system's
    normal device access name. This symbolic name is typically
    derived from the array name.
    ```

```
Do you want to set up the enclosure-based naming scheme?
[y,n,q,?] (n)
```

7 Enter **y** or enclosure-based naming scheme, or **n** to use.

```
Volume Manager default disk group configuration:

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.

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

8 Press **Return** to set up the default disk group for each system. You are prompted to specify one disk group name for all eligible systems.

```
Will you specify one disk group name for all eligible
systems? [y,n,q,?] (y)
```

9 Press **Return** to specify a disk group name for all eligible systems.

```
Specify a default disk group name for system host1. [?] sfbdg
```

10 Enter the name of the default disk group for each system.

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

11 Press **Return** to confirm the name of the default disk group.

12 If you are prompted to configure Veritas FlashSnap™ Agent for Symmetrix (VxFAS), follow the instructions to configure or unconfigure VxFAS, or skip this step.

```
Verify the install systems Fully Qualified Hostnames.

Querying fully qualified domain name of host "host1" ... ok

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

13 Press **Return** to confirm the fully qualified host name of each system.

14 The next phase of the configuration procedure consists of setting up a centrally managed host:

```
Enable Centralized Management? [y,n,q]
```

If you select to enable centralized management, you are asked a series of questions relating to the configuration of the Storage Foundation Management Server.

15 Finally, you are asked whether you want to start the Storage Foundation processes on the target systems.

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

Press **Return** to start the Storage Foundation Basic processes.

16 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/installsf-xSY2LZ
```

Note: Do not remove the log files until the Veritas products are working properly on your system. Technical Support will need these log files for debugging purposes. See "Storage Foundation Basic technical support" on page 46.

Upgrading Veritas Storage Foundation Basic

This section describes how to upgrade Veritas Storage Foundation Basic to a full version of Veritas Storage Foundation.

Note: If you upgrade Storage Foundation Basic to any other product, contact Veritas Sales for product information.

Planning the upgrade

Complete the following tasks in advance of upgrading:

■ Ensure that you have created a valid backup.

■ Review the *Veritas Storage Foundation Release Notes* for any late-breaking information on upgrading your system.

■ Be sure that the administrator doing the upgrade has root access and a working knowledge of AIX operating system administration.

■ Schedule sufficient outage time for the upgrade.

To determine which version of Storage Foundation is installed on your system, run the vxlicrep command.

Upgrade paths

The upgrade paths for Veritas Storage Foundation Basic are:

From	Upgrade to	Tasks
Storage Foundation Basic	Storage Foundation Standard	■ Install the license key by running `vxlicinst` command. ■ Run `vxdctl license init` to reread the Storage Foundation Standard license key.
Storage Foundation Basic	Storage Foundation Enterprise	■ Install the licence key by running `vxlicinst` command. ■ Run `vxdctl license init` to reread the Storage Foundation Enterprise license key.
Storage Foundation Basic	Storage Foundation Enterprise with licensed features: Veritas Volume Replicator	■ Run the Storage Foundation product `installer` to install the Storage Foundation Enterprise and Veritas Volume Replicator key. See "Installing Veritas Storage Foundation" on page 19. ■ Run `vxdctl license init` to reread the Veritas Volume Replicator license key.
Storage Foundation Basic	Any Storage Foundation product	■ Uninstall Storage Foundation Basic. See "Uninstalling Veritas Storage Foundation Basic" on page 54. ■ Install any Storage Foundation product, see the *Veritas Storage Foundation and High Availability Getting Started Guide*.

Uninstalling Veritas Storage Foundation Basic

This section describes how to uninstall Veritas Storage Foundation Basic.

To uninstall Veritas Storage Foundation Basic

1   Move all of your data off any VxVM volumes or VxFS file systems that you have created. Unmount all VxFS file systems, and stop any applications that may be accessing VxVM volumes.

2   Change directory to `/opt/VRTS/install`, and run the `uninstallsf` program.

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

Enter the system names separated by spaces on which
to uninstall SF: host1 host2
```

3   Enter the system names on which the software is installed. You are prompted to press **Return** to continue.

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

4   Press **Return** to continue. You are prompted to uninstall the Storage Foundation Basic packages.

```
uninstallsf is now ready to uninstall SF.
All SF processes that are currently running must be stopped.

Are you sure you want to uninstall SF packages? [y,n,q] (y)
```

5   Enter **y** to uninstall the Storage Foundation Basic packages. You are prompted to press **Return** to continue.

```
Storage Foundation Basic package uninstall completed
successfully.

Press [Return] to continue:
```

Press **Return** to continue after the Storage Foundation Basic package uninstall completed successfully.

```
Uninstall completed successfully on all systems
Uninstallation log files, summary file, and response file
are saved at:

    /opt/VRTS/install/logs/uninstallsf-7TdmtZ

NOTICE: As part of the uninstallation process on AIX,
the current configuration of VxVM was saved in the directory
/VXVM-CFG-BAK. This configuration may be used in a future
installation of VxVM.  If you do not plan to reuse it, you
may manually remove this subdirectory.
```

It is suggested that you archive the saved files for review in the event that they are needed at a future date.

Upgrading Veritas Storage Foundation and AIX

Topics covered in this chapter include:

Note: Only users with superuser privileges can upgrade and initialize Storage Foundation and AIX.

Upgrading Veritas Storage Foundation

This sections describes how to upgrade Veritas Storage Foundation, Veritas Storage Foundation for DB2, and Veritas Storage Foundation for Oracle.

Planning the upgrade

Complete the following tasks in advance of upgrading:

■   Ensure that you have created a valid backup.

■   Review the *Veritas Storage Foundation Release Notes* for any late-breaking information on upgrading your system.

■   Review TechNote 282024 for additional information:
      http:support.veritas.com/docs/282024.htm

■   Be sure that the administrator doing the upgrade has root access and a working knowledge of AIX operating system administration.

■   Upgrade the OS to the required level.

■   Schedule sufficient outage time for the upgrade of Veritas Storage Foundation, Veritas Storage Foundation for DB2, or Veritas Storage Foundation for Oracle. Depending on your configuration, this may take several hours.

■   Make sure the file systems are clean before upgrading, see "Make sure the file systems are clean" on page 57.

To determine which Storage Foundation product is installed on your system, run the following commands:

```
# lslpp -L VRTSvxfs
# lslpp -L VRTSvxvm
```

If the versions of VRTSvxfs and VRTSvxvm are 3.4.6.0 and 3.2.3.0, respectively, you have a 1.0 MP3 product installed.

If the versions of VRTSvxfs and VRTSvxvm are both 4.0.3.0, you have a 4.0 MP3 product installed.

Upgrade paths

The upgrade paths for Veritas Storage Foundation, Veritas Storage Foundation for DB2, and Veritas Storage Foundation for Oracle are:

From	Upgrade to	Tasks
Storage Foundation 1.0 MP3 on AIX 5.1 or AIX 5.2 Storage Foundation 1.0 for DB2 MP3 on AIX 5.1 Storage Foundation 1.0 for Oracle MP3 on AIX 5.1	Storage Foundation 5.0 on AIX 5.2 Storage Foundation 5.0 for DB2 on AIX 5.2 Storage Foundation 5.0 for Oracle on AIX 5.2	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62.

From	Upgrade to	Tasks
Storage Foundation 1.0 MP3 on AIX 5.1 or AIX 5.2 or AIX 5.3 Storage Foundation 1.0 for DB2 MP3 on AIX 5.1 Storage Foundation 1.0 for Oracle MP3 on AIX 5.1	Storage Foundation 5.0 on AIX 5.3 Storage Foundation 5.0 for DB2 on AIX 5.3 Storage Foundation 5.0 for Oracle on AIX 5.3	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62. ■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13.
Storage Foundation 4.0 Storage Foundation 4.0 for DB2 Storage Foundation 4.0 for Oracle	Storage Foundation 5.0 Storage Foundation 5.0 for DB2 Storage Foundation 5.0 for Oracle	■ Not Supported. You must upgrade SF 4.0 to 4.0 MP3 to upgrade to 5.0.
Storage Foundation 4.0 MP1 Storage Foundation 4.0 for DB2 MP1 Storage Foundation 4.0 for Oracle MP1	Storage Foundation 5.0 Storage Foundation 5.0 for DB2 Storage Foundation 5.0 for Oracle	■ Not Supported. You must upgrade SF 4.0 MP 1 to 4.0 MP3 to upgrade to 5.0.

From	Upgrade to	Tasks
Storage Foundation 4.0 MP2 Storage Foundation 4.0 for DB2 MP2 Storage Foundation 4.0 for Oracle MP2	Storage Foundation 5.0 Storage Foundation 5.0 for DB2 Storage Foundation 5.0 for Oracle	■ Not Supported. You must upgrade SF 4.0 MP 1 to 4.0 MP3 to upgrade to 5.0.
Storage Foundation 4.0 MP3 on AIX 5.1 or AIX 5.2 Storage Foundation 4.0 for DB2 MP3 on AIX 5.2 Storage Foundation 4.0 for Oracle MP3 on AIX 5.2	Storage Foundation 5.0 on AIX 5.3 Storage Foundation 5.0 for DB2 Storage Foundation 5.0 for Oracle	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62.
Storage Foundation 4.0 MP3 on AIX 5.1 Storage Foundation 4.0 for DB2 MP3 on AIX 5.1 Storage Foundation 4.0 for Oracle MP3 on AIX 5.1	Storage Foundation 5.0 on AIX 5.2 Storage Foundation 5.0 for DB2 on AIX 5.2 Storage Foundation 5.0 for Oracle on AIX 5.2	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62.

From	Upgrade to	Tasks
Storage Foundation 4.0 MP3 on AIX 5.2 Storage Foundation 4.0 for DB2 MP3 on AIX 5.2 Storage Foundation 4.0 for Oracle MP3 on AIX 5.2	Storage Foundation 5.0 on AIX 5.2 Storage Foundation 5.0 for DB2 on AIX 5.2 Storage Foundation 5.0 for Oracle on AIX 5.2	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62.
Storage Foundation 4.0 MP3 on AIX 5.3 Storage Foundation 4.0 for DB2 MP3 on AIX 5.3 Storage Foundation 4.0 for Oracle MP3 on AIX 5.3	Storage Foundation 5.0 on AIX 5.3 Storage Foundation 5.0 for DB2 on AIX 5.3 Storage Foundation 5.0 for Oracle on AIX 5.3	■ Upgrade the OS, see "Supported AIX operating systems" on page 13. ■ Install the appropriate APARs. See "Supported AIX operating systems" on page 13. ■ Upgrade to Storage Foundation 5.0. Proceed to either "Upgrading Storage Foundation using the product installer" on page 58 or "Upgrading Storage Foundation using the installsf script" on page 60 or "Upgrading using SMIT" on page 62.

Make sure the file systems are clean

Prior to upgrading to release 5.0, verify that all file systems have been cleanly unmounted by running the `fsdb` command from the existing release of File System.

1   Verify that all file systems have been cleanly unmounted:

```
# echo "8192B.p S" | /opt/VRTSvxfs/sbin/fsdb filesystem | \
grep clean
flags 0 mod 0 clean clean_value
```

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

2   If a file system is not clean, enter the following commands for that file system:

```
# fsck -V vxfs filesystem
# mount -V 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.
```

3   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.

4   Repeat step 1 to verify that the unclean file system is now clean.

Upgrading Storage Foundation using the product installer

If your system is already running a previous version of Storage Foundation (formerly known as Foundation Suite), this section describes how to upgrade it to Veritas Storage Foundation 5.0. This may require the operating system to be at a certain level.

See "Supported AIX operating systems" on page 13.

Warning: If you are upgrading Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, log in as `oracle` or `db2` and then shutdown the database before proceeding.

---

1 Log in as `root`.

2 If you are upgrading Veritas Storage Foundation for DB2 or Veritas Storage Foundation for Oracle, resynchronize all existing snapshots before upgrading.
    For Veritas Storage Foundation for DB2:

    ```
    # /opt/VRTS/bin/db2ed_vmsnap -D DB2DATABASE -f SNAPPLAN \
    -o resync
    ```
    For Veritas Storage Foundation for Oracle:

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

3 Stop activity to all file systems and raw volumes, for example by unmounting any file systems that have been created on volumes.

    ```
    # umount mnt_point
    ```

4 Stop all the volumes by entering the following command for each disk group:

    ```
    # vxvol -g diskgroup stopall
    ```

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 Stop the VEA backend service by entering the following command:

    ```
    # /opt/VRTS/bin/vxsvcctrl stop
    ```

7 Upgrade AIX on your system to the required levels if applicable.
    See "Supported AIX operating systems" on page 13.

8   If you are upgrading from Veritas Storage Foundation 1.0 for DB2 MP3 or
     Veritas Storage Foundation 1.0 for Oracle MP3, uninstall the 1.0 MP3
     software.
     To list all installed filesets:

         # lslpp -al|grep VRTS

     To uninstall the filesets, run the `installp -u` command for all filesets:

         # **installp -u *fileset_name***
         # **installp -u *fileset_name***
         . . .

     Then, reboot the system.

9   Upgrade the required packages from the Veritas disc as described in
     "Installing using the Veritas product installer" on page 21.

10   After installing the packages, reboot your system. Then, run the installation
     again with to configure the software.
     See "Installing using the Veritas product installer" on page 21.
     At the product status page, enter **C** for the Configure an Installed Product
     and press **Return**. The product installer is displayed.

11   For Veritas Storage Foundation for DB2 and Veritas Storage Foundation for
     Oracle, create the repository database.
     See "Creating and configuring the repository database for DB2 and Oracle"
     on page 37.

Storage Foundation 5.0 recognizes the existing disks and volumes without any
intervention from you.

Note: To take advantage of new features, upgrade the VxVM disk group version
to the latest (140). See the `vxdg` manual pages for more details.

If you want to use features of Storage Foundation 5.0 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.

See "Symantec product licensing" on page 13.

Upgrading Storage Foundation using the installsf script

Note: The Veritas installer and the `installsf` program recognize the existing packages, and upgrade these in addition to installing any new packages that are required, For example, the `VRTSddlpr` and `VRTSalloc` packages were not provided with earlier releases.

Note: If you are installing on multiple hosts at the same time, note that the installation program does not support a mixture of new installations and upgrades. Install only on hosts where the Storage Foundation software is not already installed, and upgrade only on hosts where a previous release of the Storage Foundation software is already installed.

1 Insert the Veritas software disc into a CD-ROM drive attached to your system, and mount the disc.
See "Mounting a software disc" on page 20.

2 Change directory to the `pkgs` directory as shown in this example:
    # cd /mnt/cdrom/*disc_name*/storage_foundation

3 Verify OS environment.
See "Supported AIX operating systems" on page 13.

4 To begin upgrading Storage Foundation, enter the following command:
    # **./installsf**

Note: You can use the options listed in "Installation Script Options" on page 77 to modify the action of this command.

5 At the following prompt, enter the names of the systems on which you want to install the software:
    ```
    Enter the system names separated by spaces on which to
    install SF:
    ```

6 The program next checks whether you have a license installed. Enter another license for host1. You can also install additional licenses if required.
    ```
    Do you want to enter another license key for host1? [y,n,q]
    (n)
    ```

7 Press Return to continue.

8 Enter y to upgrade SF.
    ```
    Are you sure you want to upgrade SF? [y,n,q] (y)
    ```

9   The installer program will now confirm the upgrade procedure has
successfully completed.

```
Storage Foundation installation successfully on all systems
Upgrade log files and summary file are saved at:

    /opt/VRTS/install/logs/installsf-gCPKs6

CPI WARNING V-9-0-0 You have completed upgrading VxVM on
some or all the systems. Reboot your systems at this time.
During the reboot your default disk group will be set to
rootdg for you if VxVM version 3.x was previously installed.
After a system has come up, you may configure the default
disk group using the command, vxdctl defaultdg. Review the
manual page for vxdctl(1M) for further details. 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.

At least one package will require a reboot prior to
configuration. Please reboot and run installsf
-configure on the following systems after reboot has
completed:

    host1
Execute '/usr/sbin/shutdown -r' to properly restart your
systems.
You have mail in /usr/spool/mail/root
```

You can now proceed to use the command line utilities or VEA to add disks to
disk groups, create volumes, and so on.

See the *Veritas Volume Manager Administrator's Guide.*

See the *Veritas Volume Manager Intelligent Storage Provisioning Administrator's
Guide.*

See the *Veritas Volume Manager User's Guide - VEA.*

Note: To take advantage of new features, upgrade the Volume Manager disk
group version to the latest (140).
See the vxdg(1M) manual page for more details.

Upgrading using SMIT

Veritas provides the `gunzip` utility under the `gnu` directory on the product software disc so that you can uncompress the Storage Foundation packages.

Note: Upgrading using SMIT is not available for Storage Foundation HA.

To uncompress the packages:

1   Log in as superuser.

2   Create an installation directory on your system large enough for all the Storage Foundation packages.
See "General installation requirements" on page 12.

    # **mkdir /tmp/install**

3   Place the Veritas software disc into a DVD drive connected to your system. See "Mounting a software disc" on page 20.

4   Mount the disk by determining the device access name of the DVD drive. The format for the device access name is cd*N* where *N* is the device number. After inserting the disk into the DVD drive, enter:

    # **mkdir -p /mnt/dvdrom**
    # **mount -V cdrfs -o ro /dev/cdN /mnt/dvdrom**

5   Change to the directory containing the Storage Foundation packages:

    # **cd /cdrom/storage_foundation/pkgs**

6   Copy the compressed package files and the table of contents (`.toc`) file from the software disc to the temporary directory.

    # **cp -r * /tmp/install**
    # **cp .toc /tmp/install/**

Note: The `.toc` specifies the order in which the Storage Foundation components must be installed, and is used by the `installp` command. In general `VRTSveki`, `VRTSvxvm`, and `VRTSvxfs` must be installed first in the specified order.

---

7   Change to the temporary directory and unzip the compressed package files:

    # **cd /tmp/install**
    # **gunzip VRTS*.gz**

8   Invoke SMIT from the command line to upgrade the system. First, upgrade the already installed components of Storage Foundation (formerly known as Foundation Suite):

    # **cd /tmp/install**
    # **smit update_all**

9   Once the existing components have been upgraded, add the new
    components added to the 5.0 release with this command:

    ```
    # smit install
    ```

10 After successful upgrade, you must reboot the system. Reboot using the
    command:

    ```
    # shutdown -r
    ```

Note: To take advantage of new features, upgrade the VxVM disk group version
(90) to the latest (140).
See the vxdg manual pages for more details.

Configuring Storage Foundation

This section describes how to configure the Storage Foundation.

To configure Storage Foundation

1   To configure Storage Foundation, enter the following command:

    ```
    # ./installsf -configure
    .
    .
    .
    Enter the system names separated by spaces on which to
    install SF:
    ```

2   Enter the names of the systems on which you want to install the software.

    ```
    Are you sure you want to reuse configuration of SF 4.0.3.0
    [y,n,q] (y)
    ```

3   Enter **y** or **n** to reuse configuration of SF 4.0.3.0.

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

4   Enter the fully qualified hostname of system host1.

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

5   Enter **y** to enable Storage Foundation Management Server Management.

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

6   Enter **y** to start Veritas Storage Foundation processes now.

    ```
    Startup completed successfully on all systems
    .
    .
    .
    Upgrade log files and summary file are saved at:
       /opt/VRTS/install/logs/installsf-4JJnLl
    ```

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/.upgrade_to_5.0, 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
    ```

Upgrading the VEA client on a Microsoft Windows system

To upgrade the VEA client on a Windows system, first uninstall the existing VEA client package as follows:

1   Log in as 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.

After removing the existing package, install the new VEA client package by following the instructions given in "Installing the VEA client on a Microsoft Windows system" on page 31.

Upgrading the Array Support Library

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

Upgrading Veritas Volume Replicator

If you have a system running Veritas Volume Replicator 3.X.X., refer to Chapter 3. "Upgrading Veritas Volume Replicator" from *Veritas Volume Replicaton Installation Guide* for more details on upgrading to VVR 5.0.

Verifying the Veritas Storage Foundation upgrade

Use the following sections to verify the product upgrade.

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 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 `-n`N 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*.

Uninstalling Veritas Storage Foundation

Topics covered in this chapter include:

Preparing to uninstall a Storage Foundation product

Caution: Failure to follow the preparations that are outlined in this chapter can result in loss of data.

To remove Veritas Storage Foundation, complete the following preparations before the uninstallation:

■ Back up all VxFS file systems in full and move the files in all VxFS file systems to native file systems backed with LVM logical volumes. Raw application data stored in VxVM logical volumes must be moved to LVM logical volumes.

■ Remove all but one copy of file systems and databases.

■ Remove all but one plex from volumes that contain multiple plexes (mirrors). To display a list of all volumes, use the command:

```
#vxprint -Ath
```

To remove a plex, use the command:

```
# vxplex -g diskgroup -o rm dis plex
```

■ If a remaining plex contains multiple subdisks, consolidate the subdisks into a single subdisk using the commands:

```
# vxassist -g diskgroup mirror volume layout=contig
# vxplex -g diskgroup -o rm dis plex
```

Note: Sufficient space on another disk is required for this operation to complete.

■ Modify /etc/filesystems to remove or change entries for VxFS file systems that were moved to native file systems.

■ Move all data from volumes created from multiple regions of storage, including striped or spanned volumes, onto a single disk or appropriate LVM logical volume. This can be done using one of the following three methods:

■ Back up the system to tape or other media and recover the system from this.

■ Move volumes incrementally (*evacuate*) onto logical volumes. Evacuation moves subdisks from the source disks to target disks. The evacuated disks provide the initial free disk space for volumes to be moved to LVM volumes. Use the steps in "Moving volumes to physical disks" on page 73 to do this.

Dropping the repository database for DB2 and Oracle

When uninstalling Veritas Storage Foundation for DB2 or 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 a DB2 or 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
```

Moving volumes to physical disks

You can use the following steps to move data off of VxVM volumes:

1 Evacuate as many disks as possible by using one of the following methods:

- the "Remove a disk" option in vxdiskadm
- the Veritas Enterprise Administrator
- the vxevac script from the command line.

2 Remove the evacuated disks from Veritas Volume Manager control using the following commands:

```
# vxdg -g diskgroup rmdisk disk_media_name
# /usr/lib/vxvm/bin/vxdiskunsetup -C disk_access_name
# vxdisk rm disk_access_name
```

For example:

```
# vxdg -g mydg rmdisk mydg01
# /usr/lib/vxvm/bin/vxdiskunsetup -C hdisk1
# vxdisk rm hdisk01
```

3 Decide which volume to move first. If the volume to be moved is mounted, unmount it. 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 data on the volume has been synchronized.

4 On the free disk space, create an LVM logical volume that is the same size as the VxVM volume. If there is not enough free space for the logical volume, add a new disk to the system for the first volume to be removed. For subsequent volumes, you can use the free space generated by the removal of the first volume.

5   Copy the data on the volume onto the newly created LVM logical volume
    using the following command:

    #   **dd if=/dev/vx/dsk/*diskgroup*/*volume* of=/dev/*vgvol***

    where *diskgroup* is the name of a VxVM disk group, *volume_name* is the old
    volume in that disk group, and *vgvol* is a newly created LVM volume.

    If the volume contains a VxFS file system, the user data managed by VxFS
    in the volume must be backed up or copied to a native AIX file system in an
    LVM logical volume.

6   The entries in `/etc/filesystems` for volumes holding VxFS file systems,
    that were copied to native file systems in step 5, must be modified according
    to the change in step 5.

7   Mount the disk if the corresponding volume was previously mounted.

8   Remove the volume from Veritas Volume Manager using the following
    command:

    #   **vxedit -g *diskgroup* -rf rm *volume***

9   Remove any disks that have become free (have no subdisks defined on them)
    by removing volumes from Veritas Volume Manager control. To check if
    there are still some subdisks remaining on a particular disk, use the
    following command:

    #   **vxprint -g *diskgroup* -F "%sdnum" *disk_media_name***

10 If the return code is not 0, there are still some subdisks on this disk that
    must be subsequently removed. If the return code is 0, remove the disk from
    Veritas Volume Manager control using the following commands:

    #   **vxdg -g *diskgroup* rmdisk *disk _media_name***
    #   **vxdisk rm *disk_access_name***

11 Copy the data in the next volume to be removed to the newly created free
    space.

12 Reboot the system after all volumes have been converted successfully. Verify
    that no open volumes remain after the system reboot using the following
    command:

    #   **vxprint -Aht -e v_open**

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

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 Storage Foundation packages

To uninstall a Storage Foundation product

1 Move all of your data off of any VxFS and VxVM volumes.

2 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 local system: **# hastop -local** To stop VCS processes on all systems: **# hastop -all**

3   Uninstall Storage Foundation and remove all Storage Foundation packages.
    For Veritas Storage Foundation:

    # **/opt/VRTS/install/uninstallsf**

    For Veritas Storage Foundation for DB2:

    # **/opt/VRTS/install/uninstallsfdb2**

    For Veritas Storage Foundation for Oracle:

    # **/opt/VRTS/install/uninstallsf**

To remove the packages using SMIT:

1   Enter this command to invoke SMIT:

    # **smit**

2   In SMIT, select **Software Installation and Maintenance> Software
    Maintenance and Utilities> Remove Installed Software**.

3   Under the **SOFTWARE name** menu, press F4 or Esc-4 to list all software
    installed on the system.

4   Enter "/" for Find, type "VRTS" to find all Veritas packages, and select the
    packages that you want to remove.

5   Reboot the system after removing all Storage Foundation packages.

Note: Depending on the choices that were made when Storage Foundation was
originally installed, you may find that not all of the listed Storage Foundation
packages are installed on the system. You may also choose to remove the
VRTSvlic licensing package unless this is required by other Veritas software.

Removing the VEA client from a Microsoft Windows system

To remove the VEA client from a Windows system, uninstall the package as
follows:

1   Log in as 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.

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 DB2	installsfdb2
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.

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-1   Available command line options

Command Line Option	Function
system1 system2...	Specifies the systems on which to run the installation options. A system name is required for all options. If not specified, the command prompts for a system name.

Table A-1   Available command line options

Command Line Option	Function
–configure	Configures the product after installing using the `-installonly` option.
–enckeyfile *encryption_key_file*	See the `-responsefile` and the `-encrypt` options.
–encrypt *password*	Encrypts *password* using the encryption key provided with the `-enckeyfile` option so that the encrypted password can be stored in response files.
–installpkgs	Displays all product packages in correct installation order. Output can be used to create scripts for command line installs, or for installations over a network. See the `requiredpkgs` option.
–installonly	Installs packages, but does not configure the product.
–keyfile *ssh_key_file*	Specifies a key file for secure shell (SSH) installs. This option passes `-i ssh_key_file` to every SSH invocation.
–license	Registers or updates product licenses on the specified systems.
–logpath *log_path*	Specifies a directory other than `/opt/VRTS/install/logs` as the location where installer log files, summary files, and response files are saved.
–noextrapkgs	Additional packages can be installed so that you can upgrade to another Symantec product simply by installing a new license. The `–noextrapkgs` option bypasses installation of extra product packages to simplify future maintenance updates.
–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-1   Available command line options

Command Line Option	Function
–patchpath *patch_path*	Designates the path of a directory that contains all patches to install. The directory is typically an NFS-mounted location and must be accessible all specified installation systems.
–pkgpath *package_path*	Designates the path of a directory that contains all packages to install. The directory is typically an NFS-mounted location and must be accessible all specified installation systems.
–precheck	Performs a preinstallation check to determine if systems meet all installation requirements. Symantec recommends doing a precheck before installing a product.
–requiredpkgs	Displays all required product packages in correct installation order. Optional packages are not listed. Output can be used to create scripts for command line installs, or for installations over a network. See `installpkgs` option.
–responsefile *response_file* [–enckeyfile *encryption_key_file*]	Automates installation and configuration by using system and configuration information stored in a specified file instead of prompting for information. The *response_file* must be a full path name. If not specified, the response file is automatically generated as `installerer`*number*`.response`. *number* is random. You must edit the response file to use it for subsequent installations. Variable field definitions are defined within the file.
	The `-enckeyfile` option and *encryption_key_file* name are required with the `-responsefile` option when the response file contains encrypted passwords.
–rootpath *root_path*	Specifies an alternative root directory on which to install packages.
	On Solaris operating systems, `-rootpath` passes `-R path` to `pkgadd`.
	On HP-UX operating systems, `-rootpath` passes `-I path` to `swinstall`.
	The `-rootpath` option is not supported on AIX or Linux operating systems.

Table A-1   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 `-rsh` option requires that systems be preconfigured so that commands between systems execute without prompting for passwords or confirmations.
–tmppath *tmp_path*	Specifies a directory other than `/var/tmp` as the working directory for the installation scripts. This destination is where initial logging is performed and where packages are copied on remote systems before installation.

Veritas Storage Foundation install packages

This appendix contains the following topics:

■ "Veritas Storage Foundation install packages" on page 81

Veritas Storage Foundation install packages

Table B-1 shows the package name and contents for each English package for:

■ Veritas Storage Foundation

■ Veritas Storage Foundation for DB2

■ Veritas Storage Foundation for Oracle

Table B-1 Storage Foundation packages

Package	Contents	Required/Optional
Volume Manager packages		
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

Table B-1   Storage Foundation packages

Package	Contents	Required/Optional
VRTSalloc	Veritas Volume Manager Veritas Intelligent Storage Provisioning	Required
VRTSvmpro	Veritas Volume Manager Management Services Provider	Required
VRTSvsvc	Veritas Volume Server and Client Provider	Required
VRTSvdid	Veritas Device Identification API	Required
VRTSddlpr	Veritas Device Discovery Layer services Provider	Required
File System packages		
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
Database packages		
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)

Table B-1   Storage Foundation packages

Package	Contents	Required/Optional
VRTSorgui	Veritas Storage Foundation for Oracle Graphical User Interface	Required (for Storage Foundation for Oracle)
VRTSsybed	Veritas Storage Foundation for Sybase **Note:** 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
Veritas Enterprise Administrator packages		
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
Infrastructure packages		
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
High Availability (Veritas Cluster Server) packages		
VRTSvcs	Veritas Cluster Server	Required

Table B-1 Storage Foundation packages

Package	Contents	Required/Optional
VRTScsocw	Veritas Cluster Serer Oracle and RAC Configuration 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
VRTSvcsmg	Veritas Cluster Server English Message Catalogs	Required
VRTSvcsw	Veritas Cluster Manager (Web Console)	Required
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
VRTSvcsdc	Veritas Cluster Server Documentation	Optional
VRTSvcsdr	Veritas Cluster Server Documentation	Optional

Table B-1   Storage Foundation packages

Package	Contents	Required/Optional
VRTSvcsmn	Manual Pages for Veritas Cluster Server	Optional
Other Packages		
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
VRTSgcsha	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
VRTSpbx	Symantec Private Branch Exchange	Required
VRTSspt	Veritas Software Support Tools	Required
VRTSdsa	Veritas Datacenter Storage Agent	Required
VRTSvdid	Veritas Device Identification API	Required
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

Table B-1   Storage Foundation packages

Package	Contents	Required/Optional
VRTSpbx	Symantec Private Branch Exchange	Required
VRTSsmf	Symantec Service Management Framework	Required
VRTSat	Symantec Product Authentication Service	Required
VRTSspt	Veritas Software Support Tools	Required
windows/ vrtsobgui.msi	Veritas Enterprise Administrator for Windows	Optional
Veritas Volume Replicator		
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/SYMClma`

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 C-1 lists the commands required to remove these packages on the supported platforms.

Table C-1   Package removal commands required to remove the agent

Platform	Package removal command
AIX	`installp -u VRTSlma` `installp -u VRTSsmf`
HP-UX	`swremove SYMClma` `swremove VRTSsmf`
Linux	`rpm evv SYMClma` `rpm evv VRTSsmf`
Solaris	`pkgrm VRTSlma` `pkgrm VRTSsmf`

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*