

# **VERITAS Storage Foundation™ 4.1**

## **Release Notes**

**Linux**

**Maintenance Pack 2**

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# VERITAS Storage Foundation 4.1 Maintenance Pack 2 Release Notes

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## Introduction

This document provides release information about the products in the VERITAS Storage Foundation 4.1 Maintenance Pack 2 (MP2) Linux product line:

- ◆ VERITAS Storage Foundation (QuickStart, Standard, Standard HA, Enterprise, and Enterprise HA)
- ◆ VERITAS Storage Foundation *for DB2* (Standard, Enterprise, and HA Editions)
- ◆ VERITAS Volume Manager (VxVM)
- ◆ VERITAS File System (VxFS)
- ◆ VERITAS Cluster Server (VCS)

Each of these products is activated by a single license key. You must obtain a license key before installing the product. For information on obtaining a license key, see the *VERITAS Storage Foundation Installation Guide*.

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**Note** Read the following VERITAS Technical Support TechNote for the latest information on updates, patches, and software issues regarding this release:

<http://support.veritas.com/docs/277033>

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Review this entire document before installing your VERITAS Storage Foundation product.

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**Note** Throughout this document, reference numbers for issues are included in square brackets, for example [xxxxxx], where xxxxxx is a number. If you contact VERITAS Technical Support about an issue, please provide the reference number where available.

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# New and Enhanced Features

## Asynchronous I/O Support

This release includes support for Linux native Asynchronous I/O (AIO). This provides an interface for the submission of one or more I/O requests in one system call, without the need for the application thread to await I/O completion.

AIO is of significant benefit to database management systems, such as DB2 and Sybase.

# System Requirements

## Supported Linux Operating Systems

Storage Foundation operates on the following Linux operating systems and kernel binaries distributed by Red Hat and SUSE:

Operating System	Architecture	Kernel
Red Hat Enterprise Linux 4 Update 1	x86 (32-bit)	2.6.9-11EL 2.6.9-11ELsmp 2.6.9-11ELhugemem
	x86_64 (Intel Xeon, AMD Opteron)	2.6.9-11EL 2.6.9-11ELsmp
	IA64 (Intel)	2.6.9-11EL
Red Hat Enterprise Linux 4 Update 2	x86 (32-bit)	2.6.9-22EL 2.6.9-22ELsmp 2.6.9-22ELhugemem
	x86_64 (Intel Xeon, AMD Opteron)	2.6.9-22EL 2.6.9-22ELsmp
	IA64 (Intel)	2.6.9-22EL



Operating System	Architecture	Kernel
Red Hat Enterprise Linux 4 Update 3	x86 (32-bit)	2.6.9-34EL 2.6.9-34ELsmp 2.6.9-34ELhugemem
	x86_64 (Intel Xeon, AMD Opteron)	2.6.9-34EL 2.6.9-34ELsmp 2.6.9-34ELlargesmp
	IA64 (Intel)	2.6.9-34EL 2.6.9-34ELlargesmp
SUSE Linux Enterprise Server 9 Service Pack 1	IA64 (Intel)	2.6.5-7.139-default 2.6.5-7.145, 147, 151-default
	x86_64 (Intel Xeon, AMD Opteron), x86 (32-bit)	2.6.5-7.139-smp 2.6.5-7.139-default 2.6.5-7.145, 147, 151-smp 2.6.5-7.145, 147, 151-default
SUSE Linux Enterprise Server 9 Service Pack 2	IA64 (Intel)	2.6.5-7.195, 201, 202-default
	x86_64 (Intel Xeon, AMD Opteron), x86 (32-bit)	2.6.5-7.195, 201, 202-smp 2.6.5-7.195, 201, 202-default
SUSE Linux Enterprise Server 9 Service Pack 3	IA64 (Intel)	2.6.5-7.244, 252-default
	x86_64 (Intel Xeon, AMD Opteron), x86 (32-bit)	2.6.5-7.244, 252-smp 2.6.5-7.244, 252-default

**Note** For SUSE SLES9 SP2 installations, kernel version 2.6.5-7.201 or greater is required because versions 2.6.5-7.191 (SP2) and 2.6.5-7.193 have a bug [Incident 425945] that stops dynamic multipathing (DMP) failover from working. This is fixed in the 2.6.5-7-201 kernel version. For the available SUSE Linux maintenance web site contact Novell.

On IA64 systems, upgrading SLES9 to SP2 removes the `sfdisk` binary, which is required by VxVM. See TechNote 278873 for instructions on how to install this binary:

<http://support.veritas.com/docs/278873>

32-bit Storage Foundation Cluster File System (SFCFS) is not supported by 4.1 MP2 on SUSE SLES 9.



## Supported Linux Operating System Updates

VERITAS products will operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

Information about the latest supported Red Hat erratas and updates and SUSE service packs is available in the following TechNote. Read this TechNote *before* installing any VERITAS product.

<http://support.veritas.com/docs/277033>

## Memory Requirements

A minimum of 1 GB of memory is strongly recommended.

## Supported DB2 Versions

DB2 8.2, also referred to as DB2 8.1 with FixPak 7, or later is supported on the Linux operating systems listed above.

## Software and Hardware Requirements

The compatibility list contains the latest information about supported hardware and software and is updated regularly.

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**Note** Before installing or upgrading VxVM, review the current compatibility list to confirm the compatibility of your hardware and software.

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For the most up-to-date Hardware Compatibility List detailing supported Array Support Libraries (ASLs), visit the VERITAS support site at <http://support.veritas.com>, select **Volume Manager > Volume Manager for UNIX**, click on **Compatibility**, and enter the product version and platform details.

If you do not find your hardware or software listed or if you have questions about the information in the compatibility list, contact VERITAS Technical Services.



## VERITAS Volume Manager 4.1 MP2 Licenses

The following table shows the levels of licensing in VERITAS Volume Manager 4.1 MP2 and the features supported at each level:

VxVM License	Description of Supported Features
Full	Concatenation, spanning, rootability, volume resizing, multiple disk groups, co-existence with native volume manager, striping, mirroring, DRL logging for mirrors, striping plus mirroring, mirroring plus striping, RAID-5, RAID-5 logging, Smartsync, hot sparing, hot-relocation, online data migration, online relayout, volume snapshots, volume sets, Intelligent Storage Provisioning, FastResync with Instant Snapshots, Storage Expert, Device Discovery Layer (DDL), Dynamic Multipathing (DMP), and VERITAS Enterprise Administrator (VEA).
Add-on License	The feature that augments the Full VxVM license is VERITAS Volume Replicator (VVR).

---

**Note** You need a Full VxVM license to make effective use of add-on license to VxVM.

---

To see the license features that are enabled in VxVM 4.1 MP2, enter the following command:

```
# vxdctl license
```

## Cross-Platform Data Sharing Licensing

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**Note** The Cross-Platform Data Sharing (CDS) feature is also referred to as Portable Data Containers.

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The ability to import a CDS disk group on a platform that is different from the platform on which the disk group was last imported is controlled by a CDS license. CDS licenses are included as part of the VERITAS Storage Foundation license.



## Component Product Release Notes

Release notes for component products in all versions of the VERITAS Storage Foundation are located under the `storage_foundation/release_notes` directory of the VERITAS Storage Foundation disc or the `cluster_server/release_notes` directory of the VERITAS Cluster Server disc. It is important that you read the relevant component product release notes before installing any version of VERITAS Storage Foundation:

*VERITAS Storage Foundation Release Notes (sf\_notes.pdf)*

*VERITAS Storage Foundation Cluster File System Release Notes (sfvfs\_notes.pdf)*

*VERITAS Cluster Server Release Notes (vcs\_notes.pdf)*

Because release notes are not installed by any packages, VERITAS recommends that you copy them to the `/opt/VRTS/docs` directory after the product installation so that they are available for future reference.



# Installing for the First Time

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**Note** VERITAS Storage Foundation 4.1 MP1 is not a prerequisite for installing MP2.

---

If you are installing the VERITAS Storage Foundation 4.1 MP2 software for the first time and not upgrading an existing system, read the *VERITAS Storage Foundation Installation Guide* for pre-installation instructions. Also review the *VERITAS Storage Foundation Release Notes* and all documents in the `release_notes` directory for important release information.

---

**Caution** Existing data could be destroyed on any disks that are touched by upgrading the operating system. While upgrading, do not reconfigure any disks other than the root disk. To ensure the integrity of your data, it is recommended that you back it up before starting the upgrade.

---

## ▼ To install the Storage Foundation software

1. Before installing VERITAS Storage Foundation 4.1 MP2, you must install the VERITAS Storage Foundation 4.1 as described in the *VERITAS Storage Foundation 4.1 Installation Guide*. However, run the product installation script instead of the generic installer script. For example, if you are installing the Storage Foundation software, enter the following command from the top-level directory of the mounted DVD-ROM:

```
# ./installsf -installonly [-usersh]
```

The `-installonly` option is required to perform the installation without configuring the software. The `-usersh` option is required if you are using the remote shell (RSH) rather than the secure shell (SSH) to install the software simultaneously on several systems.

---

**Note** Provided that the remote shell (RSH) or secure shell (SSH) has been configured correctly, this command can be run on a single node of the cluster to install the software on all the cluster nodes.

---

For help on how to respond to the installation prompts, see the *VERITAS Storage Foundation 4.1 Installation Guide*.

2. Insert the VERITAS Storage Foundation 4.1 MP2 software disc and mount the DVD-ROM. For example:

```
# mount -o ro /dev/dvd /media/dvd
```

3. Move to the top-level directory on the DVD-ROM:

```
# cd /media/dvd
```



4. To install the Storage Foundation 4.1 MP2, you must invoke the `installmp` command from one of your cluster nodes using the option that corresponds to your configuration:

- ◆ To install on the local system, enter the following command:

```
# ./installmp
```

- ◆ To install on more than one system using secure shell (SSH) utilities, enter the following command:

```
# ./installmp system_name1 system_name2 ...
```

- ◆ To install on more than one system using remote shell (RSH) utilities, enter the following command:

```
# ./installmp system_name1 system_name2 ... -usersh
```

5. After the initial system checks have completed successfully, press **Enter** to start the requirements checks for the upgrade.
6. After the requirement checks have completed successfully, press **Enter** to begin upgrading the packages.
7. If you are upgrading multiple systems, you can choose to upgrade the systems simultaneously.
8. After the upgrade of the packages is complete, press **Enter**.
9. Run the same installation script that you used in [step 1](#), this time specifying the `-configure` option to configure the software, for example:

```
# ./installsf -configure [-usersh]
```

For help on how to respond to the installation prompts, see the *VERITAS Storage Foundation 4.1 Installation Guide*.

## Upgrading to Storage Foundation 4.1 MP2

### ▼ To upgrade to Storage Foundation 4.1 MP2

1. Log in as superuser.
2. Make a complete backup of all data on the system. In particular, you will need the information in files such as `/boot/grub/menu.lst`, `/etc/grub.conf` or `/etc/lilo.conf` (as appropriate), and `/etc/fstab`.
3. Run the `vxlicrep`, `vxdisk list`, and `vxprint -ht` commands and record the output. Use this information to reconfigure your system after the upgrade.
4. If you are upgrading a standalone system proceed to [step 5](#). If you are upgrading a cluster, perform the following steps.

- a. Use `hastop` command to stop the cluster:

```
# /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 VERITAS Cluster Server (VCS), causing undesired results while upgrading the packages.

---

All nodes in a cluster must currently be running the VERITAS Storage Foundation 4.1 software, and the correct licenses must be present on these system.

- b. If you are upgrading the HA version of the VERITAS Storage Foundation 4.1 software, follow the guidelines given in the *VERITAS Cluster Server 4.1 Installation Guide*, *VERITAS Cluster Server 4.1 Release Notes* and the *VERITAS Cluster Server 4.1 MP2 Release Notes* for information on preserving your VCS configuration across the upgrade procedure.
5. Perform any necessary preinstallation checks and configuration. See the *VERITAS Storage Foundation 4.1 Installation Guide* for more information.



**6.** Check if the system's root disk is under VxVM control:

```
# df -v /
```

The root disk is under VxVM control if `/dev/vx/dsk/rootvol` is listed as being mounted as the root (`/`) file system. If so, unmirror and unencapsulate the root disk as described in the following steps:

- a.** Use the `vxplex` command to remove all the plexes of the volumes `rootvol`, `swapvol`, `usr`, `var`, `opt` and `home` that are on disks other than the root disk.

For example, the following command removes the plexes `mirrootvol-01`, and `mirswapvol-01` that are configured on a disk other than the root disk:

```
# vxplex -o rm dis mirrootvol-01 mirswapvol-01
```

---

**Note** Do not remove the plexes on the root disk that correspond to the original disk partitions.

---

- b.** Enter the following command to convert all the encapsulated volumes in the root disk back to being accessible directly through disk partitions instead of through volume devices:

```
# /etc/vx/bin/vxunroot
```

Following the removal of encapsulation, the system is rebooted from the unencapsulated root disk.

**7.** Check if any VERITAS File Systems or Storage Checkpoints are mounted:

```
# df -T | grep vxfs
```

**8.** Unmount all Storage Checkpoints and VERITAS File Systems:

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

9. Verify that all file systems have been cleanly unmounted:

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

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

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

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

- b. 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.
- c. Repeat [step 9](#) to verify that the unclean file system is now clean.
10. If you have created any VERITAS Volume Replicator (VVR) replicated volume groups (RVGs) on your system, perform the following steps. Otherwise, proceed to [step 11](#) on page 12.
- a. Stop all applications that are involved in replication. For example, if a data volume contains a file system, unmount it.
- b. Use the `vxrvrg stop` command to stop each RVG individually:
- ```
# vxrvrg -g diskgroup stop rvg_name
```



- c. On the Primary node, use the `vxrlink status` command to verify that all RLINKs are up-to-date:

```
# vxrlink -g diskgroup status rlink_name
```

---

**Caution** To avoid data corruption, do not proceed until all RLINKs are up-to-date.

---

- d. If you are going to use cross-version replication between any release of 4.0 and 4.1, perform the following step on the host that is running version 4.1 to make the tunable value persistent. Otherwise, proceed to [step 11](#).

```
# vxvoltage vol_vvr_use_host_byte_order 1
```

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

12. Stop all VxVM volumes by entering the following command for each disk group:

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

To verify that no volumes remain open, use the following command:

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

13. Comment out any mount points in the `/etc/fstab` file for VERITAS File Systems, or for any file systems that are configured on VxVM volumes.

14. Check if the VEA service is running:

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

If the VEA service is running, stop it:

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

15. Insert the disc containing the VERITAS software into the DVD-ROM drive, and mount the DVD-ROM on a suitable mount point, for example:

```
# mount -o ro /dev/dvd /media/dvd
```

16. Move to the top-level directory on the DVD-ROM:

```
# cd /media/dvd
```



17. To upgrade the Storage Foundation, you must invoke the `installmp` command from one of your cluster nodes using the option that corresponds to your configuration:
  - ◆ To install on the local system, enter the following command:  

```
# ./installmp
```
  - ◆ To install on more than one system using secure shell (SSH) utilities, enter the following command:  

```
# ./installmp system_name1 system_name2 ...
```
  - ◆ To install on more than one system using remote shell (RSH) utilities, enter the following command:  

```
# ./installmp system_name1 system_name2 ... -usersh
```
18. After the initial system checks have completed successfully, press **Enter** to start the requirements checks for the upgrade.
19. After the requirement checks have completed successfully, press **Enter** to begin upgrading the packages.
20. If you are upgrading multiple systems, you can choose to upgrade the systems simultaneously.
21. After the upgrade of the packages is complete, press **Enter**.
22. (Optional) If required, upgrade your system, and patch it to a kernel version. For more information on supported operating systems and kernel versions, see [“Supported Linux Operating Systems”](#) on page 2.
23. Shut down and reboot the system.
24. If necessary, reinstate any missing mount points in the `/etc/fstab` file.



25. Restart all the volumes by entering the following command for each disk group:

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

26. Restart each RVG:

```
# vxrvrg -g diskgroup start rvg_name
```

27. Remount all VERITAS File Systems and Storage Checkpoints:

```
# mount /filesystem  
# mount /checkpoint_name
```

28. Check if the VEA service was restarted:

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

If the VEA service is not running, restart it:

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

29. If you set the value of the `vol_vvr_use_host_byte_order` tunable to 1 in [step d](#) of [step 10](#), reboot the system.

There are several optional configuration steps that you may perform:

- ◆ If you want to use features of VERITAS Storage Foundation 4.1 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.
- ◆ To encapsulate and mirror the boot disk, follow the procedures in the “Administering Disks” chapter of the *VERITAS Volume Manager 4.1 Administrator’s Guide*.
- ◆ If you upgraded a cluster, restore any VCS configuration files as described in the *VERITAS Cluster Server 4.1 Installation Guide* and *VERITAS Cluster Server 4.1 Release Notes*.

## Verifying Software Versions

To list the VERITAS packages installed on your system, enter the following command:

```
# rpm -qa | grep VRTS
```

## Removing the MP2 Packages

Roll back of the MP2 packages to the release 4.1 or 4.1 MP1 version of the packages is not supported. To restore release 4.1 on your system, you must completely remove MP2, then reinstall VERITAS Storage Foundation 4.1, and then 4.1 MP1 if required.

**To uninstall the VERITAS software:**

1. Log in as superuser.
2. Verify that `/opt/VRTS/bin` is in your `PATH` so you can execute all product commands.
3. If the systems are running as an HA cluster, use the following command to take all service groups offline, and shut down VCS:

```
# /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.

---

4. Check if the root disk is under VxVM control by running this command:

```
# df -v /
```

The root disk is under VxVM control if `/dev/vx/dsk/rootvol` is listed as being mounted as the root (`/`) file system. If so, unmirror and unencapsulate the root disk as described in the following steps:

- a. Use the `vxplex` command to remove all the plexes of the volumes `rootvol`, `swapvol`, `usr`, `var`, `opt` and `home` that are on disks other than the root disk.

For example, the following command removes the plexes `mirrootvol-01`, and `mirswapvol-01` that are configured on a disk other than the root disk:

```
# vxplex -o rm dis mirrootvol-01 mirswapvol-01
```

---

**Note** Do not remove the plexes on the root disk that correspond to the original disk partitions.

---



- b. Enter the following command to convert all the encapsulated volumes in the root disk back to being accessible directly through disk partitions instead of through volume devices. There must be at least one other disk in the `rootdg` disk group in addition to the root disk for `vxunroot` to succeed.

```
# /etc/vx/bin/vxunroot
```

Following the removal of encapsulation, the system is rebooted from the unencapsulated root disk.

- 5. Use the following command to check if any VxFS file systems or Storage Checkpoints are mounted:

```
# df -T | grep vxfs
```

- 6. Unmount all Storage Checkpoints and file systems:

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

- 7. If you have created any VERITAS Volume Replicator (VVR) replicated volume groups (RVGs) on your system, perform the following steps:

- a. Stop all applications that are involved in replication. For example, if a data volume contains a file system, unmount it.

- b. Use the `vxrvlg stop` command to stop each RVG individually:

```
# vxrvlg -g diskgroup stop rvg_name
```

- c. On the Primary node, use the `vxrlink status` command to verify that all RLINKs are up-to-date:

```
# vxrlink -g diskgroup status rlink_name
```

---

**Caution** To avoid data corruption, do not proceed until all RLINKs are up-to-date.

---

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

- 9. Stop all VxVM volumes by entering the following command for each disk group:

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

To verify that no volumes remain open, use the following command:

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

**10.** Check if the VEA service is running:

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

If the VEA service is running, stop it:

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

**11.** To shut down and remove the installed VERITAS packages, use the appropriate command in the `/opt/VRTS/install` directory. For example, to uninstall the Storage Foundation or VERITAS Storage Foundation *for DB2* packages, use the following commands:

```
# cd /opt/VRTS/install  
# ./uninstallsf [-usersh]
```

You can use this command to remove the packages from one or more systems. The `-usersh` option is required if you are using the remote shell (RSH) rather than the secure shell (SSH) to uninstall the software simultaneously on several systems.

---

**Note** Provided that the remote shell (RSH) or secure shell (SSH) has been configured correctly, this command can be run on a single node of the cluster to install the software on all the cluster nodes.

---

After uninstalling the VERITAS software, reinstall the release 4.1 software as described in the *VERITAS Storage Foundation Installation Guide*, *VERITAS Storage Foundation Cluster File System Installation Guide*, or *VERITAS Cluster Server (VCS) Installation Guide*. If required, you can then install Maintenance Pack 1 as described in the *VERITAS Storage Foundation 4.1 MP1 Release Notes*.



## Fixed Issues

### VERITAS Volume Manager Fixed Issues

The following issues have been fixed in this release of VxVM

| Incident | Description                                                                                                                                                                                |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 368959   | Device discovery could fail to identify Compaq SMART Array devices correctly.                                                                                                              |
| 378131   | A clustered system with shared volumes could panic under certain circumstances.                                                                                                            |
| 380287   | The VxVM configuration daemon ( <code>vxconfigd</code> ) could hang under certain circumstances in a cluster connected to an A/A array.                                                    |
| 381908   | When SCSI-3 PGR fencing was used in a VCS environment, the <code>vxfsadm</code> command could report LUNs with multiple invalid keys after deporting a disk group.                         |
| 384130   | When an I/O path failed, the DMP error daemon processed the error at the LUN level, which could lead to long failover and I/O restart times.                                               |
| 391955   | A corrupted I/O queue could occur on a DCO to a striped-mirror volume in a shared disk group.                                                                                              |
| 394647   | Access to raw devices are not supported for the component volumes volume sets. A fix is available as a special patch for release 4.1. This patch is not included in this maintenance pack. |
| 411141   | A false serial split brain error was raised on the master node of a cluster if a slave node and one of the attached arrays were brought down together.                                     |
| 411143   | Takeover of the master node in a cluster did not succeed if PGR registration on one path had failed for some reason.                                                                       |
| 416359   | A false serial split brain error was raised on a standalone system if one of two arrays containing a disk group was brought down.                                                          |
| 414370   | Deporting shared disk groups in a cluster took a long time if the disk group contained a large number of disks.                                                                            |



| Incident | Description                                                                                                                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 417747   | The default value of the <code>dmp_failed_io_threshold</code> tunable was set to 1600 hours on Linux rather than the correct value of 16 hours.                                                                    |
| 419372   | Importing a shared disk group on a slave node in a cluster could take a long time.                                                                                                                                 |
| 425952   | The VERITAS Volume Manager modules would not load if a customer-specific kernel patch obtained from Red Hat had been installed.                                                                                    |
| 519122   | The array support library (ASL) for EMC Symmetrix devices with PowerPath did not support the SPC-2 flag.                                                                                                           |
| 519123   | The host panicked if an attempt was made to add an online invalid EMC PowerPath pseudo-device.                                                                                                                     |
| 533364   | Disk I/O was failing when block I/O was broken up by the <code>vxio</code> driver.                                                                                                                                 |
| 533372   | Initializing a shared disk group by running the <code>vxdbg -s init</code> command on a cluster node was causing the other nodes to reboot.                                                                        |
| 538306   | The function call from <code>vendor_info()</code> in <code>ddlemc.c</code> to <code>/etc/powermt</code> has been removed.                                                                                          |
| 564019   | VxVM was unnecessarily patching system files for hotplug devices.                                                                                                                                                  |
| 566085   | Data corruption could occur in a cluster with shared access to LUNs.                                                                                                                                               |
| 567958   | Dependencies on <code>voldthreads</code> have been removed from <code>libvxddl.so</code> .                                                                                                                         |
| 578662   | The VxVM configuration daemon, <code>vxconfigd</code> , could dump core if the <code>vxddctl enable</code> command was run to recognize newly added LUNs.                                                          |
| 578678   | A command line option has been added to the <code>vxddladm</code> command to enable or disable persistent naming of disk devices. See <a href="#">“Enabling or Disabling Persistent Device Naming”</a> on page 24. |
| 578731   | A stack overflow issue in cluster configurations has been corrected.                                                                                                                                               |
| 581406   | The DMP round-robin I/O policy did not take effect.                                                                                                                                                                |



## VERITAS File System Fixed Issues

The following issues have been fixed in this release of VxFS:

| Incident | Description                                                                                                                                                                                                                                                                                             |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 470642   | Under certain conditions, the <code>fsckptadm list</code> command could fail if clones were being removed.                                                                                                                                                                                              |
| 479802   | Under certain conditions, a forced umount of an VxFS file system could cause a system panic in <code>vx_doquota()</code> .                                                                                                                                                                              |
| 480349   | The <code>sendfile(2)</code> system call is now supported by VxFS 4.1. In earlier VxFS 4.1 releases, <code>sendfile(2)</code> would return <code>EINVAL</code> when the source file was on a VxFS file system.                                                                                          |
| 516207   | Under certain conditions, a Direct I/O <code>read(2)</code> or <code>write(2)</code> could fail if available system memory was low. While the failure condition was returned to the caller, the return was unnecessary. Direct I/O now handles low system memory situations without returning an error. |
| 516237   | For a disabled VxFS file system, the <code>EBUSY</code> error code was returned for file accesses over NFS, which was incorrect. The correct code, <code>EIO</code> , is now returned.                                                                                                                  |
| 516342   | Improved integration between VxFS, Linux's <code>dcache</code> , and NFS, giving a small performance gain when a large number of files are accessed over NFS.                                                                                                                                           |
| 540265   | Fixed panic which occurred on a limited number of IA-64 systems when VxFS module is loaded during installation.                                                                                                                                                                                         |
| 542164   | Under RHEL4 Update 2, POSIX file locks against VxFS files were not removed when the owning process exited, leading to a kernel panic in the function <code>locks_remove_flock()</code> .                                                                                                                |
| 569128   | Improved VxFS write throughput when underlying VxVM volume has RAID-5 layout.                                                                                                                                                                                                                           |
| 575027   | Auto-tuning of VxFS buffer and inode caches has been improved for large memory systems, for both local mount and CFS configurations.                                                                                                                                                                    |



## VERITAS Volume Replicator Fixed Issues

The following issues have been fixed in this release of VVR:

| Incident | Description                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 278838   | When replicating in TCP mode, the default Nagle algorithm results in very slow replication because it attempts to coalesce small messages from the Secondary, which delays their transmission.                                                                                                                                                                                                              |
| 279096   | After a disk failure on the Secondary, the <code>secondary_log_err</code> flag on the Primary was not cleared even after the disk on the Secondary was fixed.                                                                                                                                                                                                                                               |
| 296372   | Under certain conditions, I/O could hang when issued during a checkpoint attach.                                                                                                                                                                                                                                                                                                                            |
| 304305   | When replicating using TCP, the algorithm for choosing the number of connections has been enhanced.                                                                                                                                                                                                                                                                                                         |
| 308169   | There is potential for a panic when an SRL I/O error occurs during a pending transaction that is waiting for I/Os to finish.                                                                                                                                                                                                                                                                                |
| 310204   | You cannot resize the SRL while automatic synchronization or DCM replay is in progress. Also, the SRL resize operation does not preserve checkpoint information.                                                                                                                                                                                                                                            |
| 312769   | For disk group version 90, if the SRL is disassociated and associated again before the Secondary assumes the role of Primary, the <code>srl_config</code> table is corrupted or not initialized.                                                                                                                                                                                                            |
| 316409   | Under certain conditions, VVR could hang when connecting to the remote host during a transaction.                                                                                                                                                                                                                                                                                                           |
| 346446   | In a clustered Primary and Secondary with NAT support enabled, if you switch the virtual IP from one node to the other, either on the Primary or the Secondary, the heartbeat messages are either sent from the incorrect node or are received by the incorrect node, respectively. This results in the heartbeat messages not being acknowledged, causing the RLINK to disconnect and replication to stop. |
| 370768   | In certain cases, with a high volume of concurrent writes, replication can stop because VVR on the Primary sends too many messages that are not in the order expected on the Secondary.                                                                                                                                                                                                                     |
| 383627   | The <code>vxrlink stats</code> command incorrectly reports certain errors as timeout errors but actually they should be reported as memory errors.                                                                                                                                                                                                                                                          |
| 540056   | After upgrading a disk group, an error was set on a RVG, and the SRL header could not be successfully initialized.                                                                                                                                                                                                                                                                                          |



| Incident | Description                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------|
| 546851   | Application throughput was highly degraded in detached RLINK configurations with no replication.                   |
| 568312   | A mechanism has been added to modify the <code>vol_rp_increment</code> and <code>vol_rp_decrement</code> tunables. |
| 568399   | Recovery of SRL versions prior to version 4.0 and 4.1 could cause a system panic.                                  |

## Documentation Issues

### VERITAS File System Documentation Issues

The *VERITAS File System 4.1 Administrator's Guide* incorrectly states that to increase the system memory size value, make the following change in `/etc/modprobe.conf` file. This is documented incorrectly in the Internal Inode Table Size section, refer to the table below for the correct operating system and file:

| Operating System               | File                                  |
|--------------------------------|---------------------------------------|
| Red Hat Enterprise Linux 4     | <code>/etc/modprobe.conf</code>       |
| SUSE Linux Enterprise Server 9 | <code>/etc/modprobe.conf.local</code> |

### VERITAS Volume Manager Documentation Issues

There are two errors on the `vxsnap(1M)` manual page.

- ◆ The syntax that is shown for the `dis` operation is incorrect. The correct syntax is:  

```
# vxsnap [-f] [-g diskgroup] dis {volume|volset}
```
- ◆ It is incorrectly stated that the `restore` operation is not supported for space-optimized instant snapshots. In fact, non-destructive restoration is supported for space-optimized instant snapshots, but destructive restoration is not.

## Software Issues

Software issues listed in the *VERITAS Storage Foundation 4.1 Release Notes* still apply.

For a list of the VERITAS Storage Foundation 4.1 software issues, see the *VERITAS Storage Foundation 4.1 Release Notes*, which is included with the VERITAS Storage Foundation 4.1. Also, the *VERITAS Storage Foundation 4.1 Release Notes* is available online at:

[http://ftp.support.veritas.com/pub/support/products/Foundation\\_Suite/277925.pdf](http://ftp.support.veritas.com/pub/support/products/Foundation_Suite/277925.pdf)

Additional software issues for this 4.1 MP2 release are listed below.

### VERITAS File System Software Issues

The following are the software issues in this release of VxFS:

| Incident | Description                                                                                                                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i153943  | The VERITAS manual pages are installed in the /opt/VRTS/man directory. The df_vxfs(1M) manual page is in the /opt/VRTS/bin directory. Both of these directories must be added to the MANPATH environment variable. |

### VERITAS Volume Replicator Software Issues

For a list of the known issues in VVR 4.1, see the *VERITAS Volume Replicator 4.1 Release Notes*, which is included with VVR 4.1. Also, the *VERITAS Volume Replicator 4.1 Release Notes* is available online at:

[http://ftp.support.veritas.com/pub/support/products/Volume\\_Replicator/277944.pdf](http://ftp.support.veritas.com/pub/support/products/Volume_Replicator/277944.pdf)

In addition, the following software issue applies to this release:

| Incident | Description                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------------------|
| 429318   | You cannot associate VxVM ISP volumes of the type stripe-mirror to an RVG.                                       |
| 497131   | Under certain conditions, VVR may hang while executing the vradm resizeurl command. Workaround: Reboot the host. |



## Software Limitations

The following sections describe VERITAS Storage Foundation software limitations that exist in this release.

### VERITAS Volume Manager Software Limitations

#### Root Disk Encapsulation Fails After Installing an ASL

Root disk encapsulation can fail if a new array support library (ASL) has been installed but not enabled. Before starting the encapsulation, enable the newly installed ASL by rebooting the system or by running the following command:

```
# vxctl enable
```

#### Enabling or Disabling Persistent Device Naming

The `vxddladm` command has been enhanced to support the configuration of persistent device naming, as shown here:

```
# vxddladm set namingscheme={ebn|osn} [persistence={yes|no}]
```

Setting the `namingscheme` attribute bases the device naming convention on enclosure name (`ebn`), or on the device name that is used by the operating system (`osn`). The change is immediate, and does not require `vxconfigd` to be restarted.

The optional `persistence` argument allows you to select whether the names of disk devices that are displayed by VxVM remain unchanged after disk hardware has been reconfigured and the system rebooted. By default, enclosure-based naming is persistent (`yes`), but operating system-based naming is not persistent (`no`). [578678]

### VERITAS File System Software Limitations

#### Volume Management Support

The VERITAS File System (VxFS) is only supported on VERITAS Volume Manager (VxVM) volumes.

## **Sendfile Support**

The current version of VxFS does not support the `sendfile()` system call. In order to use Apache with VxFS, please use the Apache configuration Option “EnableSendFile Off”.

## **Stack Overflow**

There is a known issue in Red Hat Enterprise 4 Update 1 32-bit system that is unlikely to occur but may result in a stack overflow. The issue was reported to Red Hat and is documented in Novell’s Bugzilla bug number 162257. Contact Novell for their Bugzilla web site.

This is only an issue for Red Hat Enterprise 4 Update 1 32-bit systems, it is fixed in Red Hat Enterprise 4 Update 2.

## **Security-Enhanced Linux**

VxFS includes Security-Enhanced Linux (SE Linux) support for evaluation purposes only. VxFS conforms to the requirements of the SE Linux API. However, security policy files are not available for the VERITAS product stack.

## **Large Number of ACLs Over NFS Can Cause Kernel Panic on SLES9 SP1**

The use of a large number of access control lists (ACLs) over NFS version 3 can result in a kernel panic on SUSE SLES9 SP1. This is not an issue if the maximum number of ACLs is restricted to 300.

This issue is not specific to VxFS. This is a core operating system issue, and is described in detail in Novell’s Bugzilla bug number 85745. Contact Novell for their Bugzilla web site.

# **VERITAS Volume Replicator Software Limitations**

## **Length of RLINK Names**

VVR does not support RLINK names that exceed 31 characters. If the host name and domain name together exceed 31 characters, the `vxmake rlink` command fails. [151336]

## **Unsupported Internet Protocol Versions**

VVR does not support IPv6. All nodes in a VVR environment must use IPv4. [135504]



## **RAID-5 Volume**

VVR does not support Volume Manager RAID-5 volumes as part of RVGs. Hardware RAID-5 is supported.

## **Disk Group Split and Join**

VVR does not support Disk Group Split and Join. This means that you cannot use Disk Group Split and Join on data volumes in an RVG. However, you can take snapshots of data volumes and use DGSJ on the snapshots.

## **Importing a Disk Group with VVR Objects**

If a private disk group containing VVR objects is imported on two nodes, as well as the problems documented for VxVM objects, the SRL is corrupted and a full resynchronization of the Secondary is required.

## **Volumes in Boot Disk Group**

It is not recommended to have replicated volumes in the boot disk group (`bootdg`).

# **No Longer Supported**

## **32-bit Operating Systems**

This release of VERITAS Storage Foundation 4.1 is the last major version to support 32-bit operating systems on Linux.

# **Getting Help**

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

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



For license information, software updates and sales contacts, visit <https://my.veritas.com/productcenter/ContactVeritas.jsp>. For information on purchasing product documentation, visit <http://webstore.veritas.com>.







# VERITAS Storage Foundation Basic

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**A**

This appendix describes how to install, upgrade, and uninstall 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>

Topics covered in this appendix include:

- ◆ “VERITAS Storage Foundation Basic Introduction”
- ◆ “Installing VERITAS Storage Foundation Basic”
- ◆ “Upgrading VERITAS Storage Foundation Basic”
- ◆ “Uninstalling VERITAS Storage Foundation Basic”



## VERITAS Storage Foundation Basic Introduction

The Storage Foundation Basic contains the same features as Storage Foundation Standard, but has the following limitations:

- ◆ Maximum of 4 user data Volumes
- ◆ Maximum of 4 user data File Systems
- ◆ Maximum server capacity of 2 CPU sockets

For a product overview on Storage Foundation Basic, see the *VERITAS Storage Foundation Basic 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:

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

## Storage Foundation Basic System Requirements

### Dependencies

VERITAS Storage Foundation Basic can only be installed on a system running Red Hat Enterprise Linux 4 Update 3 (64-bit). Installing this product on any other Linux release will fail. If necessary, upgrade Linux before you install the VERITAS products.

### Disk Space

Before installing the VERITAS Storage Foundation Basic software, confirm that there is sufficient disk space in the file systems on the target systems. You can use the **Precheck** option, in the product installer, to make sure that sufficient disk space is available.

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

| Product Name             | / root   | /opt      | /usr     | /var       |
|--------------------------|----------|-----------|----------|------------|
| Storage Foundation Basic | 55930 KB | 280850 KB | 78010 KB | 1005094 KB |

The following table shows the suggested approximate space requirements for each package:

| Package                        | Contents                                                         | Size    |
|--------------------------------|------------------------------------------------------------------|---------|
| <b>Volume Manager Packages</b> |                                                                  |         |
| VRTSvxvm                       | VERITAS Volume Manager, Binaries                                 | 232 MB  |
| VRTSvmpro                      | VERITAS Volume Manager Management Services Provider              | 20.5 MB |
| VRTSalloc                      | VERITAS Volume Manager: VERITAS Intelligent Storage Provisioning | 64.5 MB |
| VRTSvm doc                     | VERITAS Volume Manager Documentation (optional)                  | 16 MB   |
| VRTSvmman                      | VERITAS Volume Manager -Manual Pages (optional)                  | 3.5 MB  |



| Package                                          | Contents                                                                                                                                                                                                                               | Size    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>File System Packages</b>                      |                                                                                                                                                                                                                                        |         |
| VRTSvxfs                                         | VERITAS File System                                                                                                                                                                                                                    | 38 MB   |
| VRTSfspro                                        | VERITAS File System Management Services Provider                                                                                                                                                                                       | 199 MB  |
| VRTSfssdk                                        | VERITAS File System Software Developer Kit                                                                                                                                                                                             | 2.5 MB  |
| VRTSfsdoc                                        | VERITAS File System Documentation (optional)                                                                                                                                                                                           | 3.5 MB  |
| VRTSfsman                                        | VERITAS File System - Manual Pages (optional)                                                                                                                                                                                          | 2.5 MB  |
| VRTSfsmnd                                        | VERITAS File System Software Developer Kit Manual Pages (optional)                                                                                                                                                                     | 4.5 MB  |
| <b>VERITAS Enterprise Administrator Packages</b> |                                                                                                                                                                                                                                        |         |
| VRTSob                                           | VERITAS Enterprise Administrator Service                                                                                                                                                                                               | 27.5 MB |
| VRTSmuob                                         | VERITAS Enterprise Administrator Service Localized Package                                                                                                                                                                             | .02 MB  |
| VRTSobgui                                        | VERITAS Enterprise Administrator (optional)                                                                                                                                                                                            | 80 MB   |
| <b>Infrastructure Packages</b>                   |                                                                                                                                                                                                                                        |         |
| VRTSddlpr                                        | VERITAS Device Discovery Layer Services Provider                                                                                                                                                                                       | 20.5 MB |
| VRTSap                                           | VERITAS Action Provider (optional)<br><b>Note</b> VRTSap is the rules engine add-on for the VERITAS Enterprise Administrator GUI. Installing VRTSap enables SNMP trap and email                                                        | 36 MB   |
| VRTStep                                          | VERITAS Task Execution Provider (optional)<br><b>Note</b> VRTStep provides the command execution add-on for the VERITAS Enterprise Administrator GUI. Installing VRTStep and VRTSap enables command execution in response to an alert. | 7.2 MB  |
| <b>Miscellaneous Packages</b>                    |                                                                                                                                                                                                                                        |         |

| Package                                  | Contents                                            | Size       |
|------------------------------------------|-----------------------------------------------------|------------|
| VRTSvlic                                 | VERITAS License Utilities                           | 3 MB       |
| VRTSperl                                 | Perl 5.8.0 for VERITAS                              | 34.5 MB    |
| VRTScpi                                  | VERITAS Cross Product Installation Framework        | 1 MB       |
| VRTSat                                   | VERITAS Authentication Service                      | 302.5 MB   |
| VRTSjre                                  | VERITAS Java Runtime Environment Redistribution     | 70 MB      |
| VRTSjre15                                | VERITAS Java Runtime Environment Redistribution     | 70 MB      |
| VRTSmulic                                | Multi Language VERITAS License Utilities (optional) | 2.5 MB     |
| VRTSweb                                  | VERITAS Java Web Server                             | 10 MB      |
| <b>Total space for all packages</b>      |                                                     | 1095.02 MB |
| <b>Total space for required packages</b> |                                                     | 1251.22 MB |



## Installing VERITAS Storage Foundation Basic

This sections describes how to install VERITAS Storage Foundation Basic.

---

**Note** No license is required for installation.

---

### ▼ To install VERITAS Storage Foundation Basic

1. Log in as superuser (root).
2. Insert the appropriate VERITAS Storage Foundation Basic disc into your system's DVD-ROM drive.
3. If Linux volume management software is running on your system, the software disc is automatically mounted as `/media/dvd`.

4. Run the `installsf` program.

◆ If the disc is mounted automatically, enter:

```
# cd /media/dvd/distribution/storage_foundation_basic
# ./installsf
```

◆ If the disc is mounted manually, enter:

```
# cd /mount_point/distribution/storage_foundation_basic
# ./installsf
```

```
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. You are prompted to press Enter to continue.

```
Initial system check completed successfully.
```

```
Press [Enter] to continue:
```

6. Press **Enter** to continue after the initial system check is completed successfully. You are prompted to press Enter to continue.

```
VERITAS Infrastructure rpms installed successfully.
```

```
Press [Enter] to continue:
```

7. Press **Enter** to continue after the VERITAS infrastructure packages are installed successfully. You are prompted to press Enter to continue.

```
SF Basic licensing completed successfully.
```

```
Press [Enter] to continue:
```

8. Press **Enter** to continue after the Storage Foundation licensing completed successfully. You are prompted to install optional Storage Foundation packages.

```
installsf can install the following optional SF rpms:
```

```
VRTSobgui    VERITAS Enterprise Administrator€
VRTSvmdoc    VERITAS Volume Manager Documentation€
VRTSvmmman   VERITAS Volume Manager Manual Pages€
VRTSlvconv   VERITAS Linux LVM to VxVM Converter€
VRTSap       VERITAS Action Provider€
VRTStep      VERITAS Task Provider€
VRTSfsdoc    VERITAS File System Documentation€
VRTSfsmnd    VERITAS File System Software Developer Kit Manual€
              Pages
```

- 1) Install all of the optional rpms
- 2) Install none of the optional rpms
- 3) View package descriptions and select optional rpms

```
Select the optional rpms to be installed on all systems?
[1-3,q,?] (1)
```

9. Enter **1** to install all of the optional packages. You are prompted to press Enter to continue.

```
installsf will install the following SF Basic rpms:€
VRTSperl     VERITAS Perl 5.8.0 Redistribution€
VRTSob       VERITAS Enterprise Administrator Service€
.€
.€
.€
Press [Enter] to continue:€
```

10. Press **Enter** to continue with the install of the optional packages. You are prompted to press Enter to continue.

```
Installation requirement checks completed successfully.
```

```
Press [Enter] to continue:
```



- 11.** Press **Enter** to continue after the installation requirement checks are completed successfully. You are prompted if you are ready to configure Storage Foundation Basic.

```
It is possible to install SF rpms without performing €
configuration.€
```

```
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? [y,n,q] (y)€
```

- 12.** Enter **y** to configure Storage Foundation Basic. You are prompted if you want to install Storage Foundation Basic on all systems simultaneously.

```
SF can be installed on systems consecutively or simultaneously.
Installing on systems consecutively takes more time but allows
for better error handling.
```

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

- 13.** Enter **y** to install Storage Foundation Basic on all systems simultaneously. You are prompted to press **Enter** to continue.

```
Storage Foundation Basic installation completed successfully.
```

```
Press [Enter] to continue:
```

- 14.** Press **Enter** to continue after the Storage Foundation Basic installation completed successfully. You are prompted if you want to set up the enclosure-based naming scheme.

```
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)
```



- 15.** Enter **y** or **n** for setting up the enclosure-based naming scheme. You are prompted to press Enter to continue.

Storage Foundation Basic configured successfully.

Press [Enter] to continue:

- 16.** Press **Enter** to continue after Storage Foundation Basic configured successfully. You are prompted to set up the default disk group for each system.

Note: The vxconfigd daemon will be started, which can take a while depending upon the hardware configuration.

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 the default disk group for each system?  
[y,n,q,?] (y)

- 17.** Enter **y** to set up the default disk group for each system. You are prompted if you will specify one disk group name for all eligible systems.

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

- 18.** Enter **y** to specify one disk group name for all eligible systems. You are prompted to specify a default disk group for all systems or enter **l** to display a listing of existing disk groups.

Specify a default disk group for all systems or type 'l' to display a listing of existing disk group(s). [?] **sfbasic\_dg**

- 19.** Enter a default disk group. You are prompted to enter if this is correct.

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



- 20.** Enter **y**, if this is correct. You are prompted to press Enter to continue.

Storage Foundation Basic was started successfully.

Press [Enter] to continue:

- 21.** Press **Enter** to continue after the Storage Foundation Basic was started successfully. The following message displays when the installation of the Storage Foundation Basic has completed successfully:

Installation of Storage Foundation Basic 4.1 has completed successfully.

The installation summary is saved at:

`/opt/VRTS/install/logs/installsf201164832.summary`

The installsf log is saved at:

`/opt/VRTS/install/logs/installsf201164832.log`

The installation response file is saved at:

`/opt/VRTS/install/logs/installsf201164832.response`

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

See the VERITAS File System Administrators Guide for information on using VxFS.

---

**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 30.

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# Upgrading VERITAS Storage Foundation Basic

This sections describes how to upgrade VERITAS Storage Foundation Basic.

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**Note** If you upgrade Storage Foundation Basic to any other product, contact VERITAS Sales for product information. See [“Getting Help”](#) on page 26.

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## 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 Linux 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 QuickStart | Storage Foundation Basic | <ol style="list-style-type: none"> <li>1. Uninstall Storage Foundation QuickStart, see <a href="#">“Removing the MP2 Packages”</a>.</li> <li>2. Install Storage Foundation Basic, see <a href="#">“Installing VERITAS Storage Foundation Basic”</a> on page 34.</li> </ol> |



| From                     | Upgrade to                                                                         | Tasks                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Storage Foundation Basic | Storage Foundation Standard                                                        | <ol style="list-style-type: none"> <li>1. Install the license key by running <code>vxlicinst</code> command.</li> <li>2. Run <code>vxddctl license init</code> to reread the Storage Foundation Standard license key.</li> </ol>                                                                                                                                       |
| Storage Foundation Basic | Storage Foundation Enterprise                                                      | <ol style="list-style-type: none"> <li>1. Install the licence key by running <code>vxlicinst</code> command.</li> <li>2. Run <code>vxddctl license init</code> to reread the Storage Foundation Enterprise license key.</li> </ol>                                                                                                                                     |
| Storage Foundation Basic | Storage Foundation Enterprise with licensed features:<br>VERITAS Volume Replicator | <ol style="list-style-type: none"> <li>1. Run the Storage Foundation product installer to install the Storage Foundation Enterprise and VERITAS Volume Replicator key, see <a href="#">“Installing VERITAS Storage Foundation Basic”</a> on page 34.</li> <li>2. Run <code>vxddctl license init</code> to reread the VERITAS Volume Replicator license key.</li> </ol> |
| Storage Foundation Basic | Any Storage Foundation product                                                     | <ol style="list-style-type: none"> <li>1. Uninstall Storage Foundation Basic, see <a href="#">“Uninstalling VERITAS Storage Foundation Basic”</a> on page 41.</li> <li>2. Install any Storage Foundation product, see the <i>VERITAS Storage Foundation Basic Getting Started Guide</i>.</li> </ol>                                                                    |



# Uninstalling VERITAS Storage Foundation Basic

This section describes how to uninstall VERITAS Storage Foundation Basic.

## ▼ To uninstall VERITAS Storage Foundation Basic

1. Log in as superuser (root).
2. Insert the appropriate VERITAS Storage Foundation Basic disc into your system's DVD-ROM drive.
3. If Linux volume management software is running on your system, the software disc is automatically mounted as `/media/dvd`.
4. Run the `uninstallsf` program.

- ◆ If the disc is mounted automatically, enter:

```
# cd /media/dvd/distribution/storage_foundation_basic
# ./uninstallsf
```

- ◆ If the disc is mounted manually, enter:

```
# cd /mount_point/distribution/storage_foundation_basic
# ./uninstallsf
```

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

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

```
Press [Enter] to continue:
```

6. Press **Enter** to continue. You are prompted to uninstall the Storage Foundation Basic packages.

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

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

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

```
Storage Foundation Basic package uninstall completed
successfully.
```

```
Press [Enter] to continue:
```



8. Press **Enter** to continue after the Storage Foundation Basic package uninstall completed successfully. The following message displays when the uninstall of the Storage Foundation Standard Basic has completed successfully:

```
Uninstallation of Storage Foundation Basic has completed
successfully.
```

```
The uninstallation summary is saved at:
```

```
    /opt/VRT S/install/logs/uninstallsf201165811.summary
The uninstallsf log is saved at:
```

```
    /opt/VRT S/install/logs/uninstallsf201165811.log
```

9. Make copies of the uninstallation files for review in the event that the files are needed at a later date.
10. Proceed to [“Uninstalling VERITAS Infrastructure Packages”](#) on page 42.

## Uninstalling VERITAS Infrastructure Packages

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

```
# cd /opt/VRTS/install
# ./uninstallinfr host1
```

The `uninstallinfr` script removes the remaining packages that are required for product installation. The VERITAS Enterprise Administrator packages, `VRTSob` and `VRTSobgui`, are also removed.

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## Digital Encryption Standard (DES) - MIT

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## Perl Compatible Regular Expressions

Philip Hazel

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PCRE is a library of functions to support regular expressions whose syntax and semantics are as close as possible to those of the Perl 5 language.

Written by: Philip Hazel <ph10@cam.ac.uk>

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