

VERITAS Storage Foundation Cluster File System 4.1

Release Notes

Linux

Maintenance Pack 1

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VERITAS Storage Foundation Cluster File System 4.1 Maintenance Pack 1 Release Notes

Introduction

VERITAS Storage Foundation Cluster File System (SFCFS) and Storage Foundation Cluster File System High Availability (SFCFS HA) compose the clustering functionality of VERITAS File System (VxFS) and are separately licensed features of Storage Foundation. Failover capabilities, such as monitoring system and application services and restarting them on a different system when hardware or software fails, are not required for the operation of SFCFS, but can be added to the cluster after installing and configuring SFCFS HA.

Note For information about new features, end of support, and software issues, see the *VERITAS Storage Foundation Cluster File System 4.1 Release Notes*.

References in this document about new features, compatibility, and software issues apply to both VERITAS Storage Foundation Cluster File System 4.1 and VERITAS Storage Foundation Cluster File System 4.1 MP1.

Review this entire document before installing the product. For a list of new features and end product support, see the *VERITAS Storage Foundation Release Notes*.



System Requirements

Supported Linux Operating Systems

Storage Foundation Cluster File System 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
SUSE Linux Enterprise Server 9 Service Pack 1	IA64 (Intel)	2.6.5-7.139-default 2.6.5-7.145-default
	x86_64 (Intel Xeon, AMD Opteron)	2.6.5-7.139-smp 2.6.5-7.139-default 2.6.5-7.145-smp 2.6.5-7.145-default
SUSE Linux Enterprise Server 9 Service Pack 2	IA64 (Intel)	2.6.5-7.201-default
	x86_64 (Intel Xeon, AMD Opteron)	2.6.5-7.201-smp 2.6.5-7.201-default
SUSE Linux Enterprise Server 9 Service Pack 3	IA64 (Intel)	2.6.5-7.241-default
	x86_64 (Intel Xeon, AMD Opteron)	2.6.5-7.241-smp 2.6.5-7.241-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 SLES 9 to SP2 removes the `sfdisk` binary, which is required by VERITAS Volume Manager. 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 MP1 on 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>

Recommended Configuration

These are the recommended minimum hardware configuration requirements for both 32-bit and 64-bit clusters for both Red Hat and SUSE distributions:

- ◆ 2 processors
- ◆ 2 GB of memory

In addition for 32-bit cluster, regardless of a node's physical memory, the virtual address space is limited to less than 1 GB when running Linux 2.6.x SMP kernels. This limitation has been known to cause memory fragmentation and, in some cases, memory starvation. To accommodate this limitation, VERITAS strongly recommends the "hugemem" kernel supplied by Red Hat, which increases virtual address space to 4 GB and eases the demands on memory, such caching file date and metadata.



Hardware Compatibility

For information on servers, network controllers, and disk subsystems that support SFCFS, see the hardware compatibility list available at <http://support.veritas.com>.

Disk Layout Support

The VERITAS Storage Foundation Cluster File System 4.1 MP1 supports disk layout Version 6 only.

Component Product Release Notes

In addition to reading these *Release Notes*, review all component product release notes before installing the Storage Foundation Cluster File System. The following release notes for the Storage Foundation Cluster File System and the Storage Foundation components are included as PDF files on the VERITAS software disc:

VERITAS Storage Foundation Cluster File System Release Notes (sf_cfs_notes.pdf)

VERITAS Storage Foundation Release Notes (sf_notes.pdf)

VERITAS Cluster Server Release Notes (vcs_notes.pdf)

Because release notes are not installed by any packages and are not on the documentation disc, it is recommended that you copy them from the software disc to the `/opt/VRTS/docs` directory so they are available on your system for reference.



Installing for the First Time

If you are installing the VERITAS Storage Foundation Cluster File System 4.1 MP1 software for the first time and not upgrading an existing system, read the *VERITAS Storage Foundation Cluster File System Installation Guide* for pre-installation instructions. Also review the *VERITAS Storage Foundation Cluster File System 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 Cluster File System software

1. Before installing VERITAS Storage Foundation Cluster File System 4.1 MP1, you must install the VERITAS Storage Foundation Cluster File System 4.1 as described in the *VERITAS Storage Foundation Cluster File System 4.1 Installation Guide*. However, run the product installation script. For example, if you are installing the Storage Foundation Cluster File System software, enter the following command from the `storage_foundation_cluster_file_system` directory of the mounted CD-ROM:

```
# ./installsfcfs -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 Cluster File System 4.1 Installation Guide*.

2. Insert the VERITAS Storage Foundation Cluster File System 4.1 MP1 software disc and mount the CD-ROM. For example:

```
# mount -o ro /dev/cdrom /mnt/cdrom
```

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

```
# cd /mnt/cdrom
```



4. To install the Storage Foundation Cluster File System 4.1 MP1, 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 only, enter the following command:

```
# ./installmp
```

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

```
# ./installmp node_name1 node_name2 ...
```

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

```
# ./installmp node_name1 node_name2 ... -usersh
```

5. After the initial system checks are complete, press **Return** to start the requirements checks.
6. After the requirements checks are complete, press **Return** to start upgrading the packages. If you are upgrading multiple nodes, you have the option of upgrading them simultaneously. You will be prompted after the upgrade is complete.
7. When installation is complete, note the locations of the summary, log, and response files indicated by the installer.
8. Run the same installation script that you used in [step 1](#), this time specifying the `-configure` option to configure the software. For example:

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

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



Upgrading to Storage Foundation Cluster File System

An upgrade requires stopping cluster failover functionality during the entire procedure, however CFS and CVM services remain available. The upgrade is performed in several stages:

- ✓ Freeze service group operations and stop VCS on the cluster.
- ✓ Select a group of one or more cluster nodes to upgrade and leave a group of one or more nodes running.
- ✓ Take the first group offline and install the maintenance patch.
- ✓ Bring the first group (with the newly installed maintenance patch) online to restart cluster failover services.
- ✓ Upgrade the remaining nodes in the second group and bring them online. The cluster is fully restored.

▼ To upgrade to Storage Foundation Cluster File System

1. Log in as superuser.
2. Verify that `/opt/VRTS/bin` is in your PATH so you can execute all product commands.
3. From any node in the cluster, make the VCS configuration writable:

```
# haconf -makerw
```
4. Enter the following command to freeze HA service group operations on each node:

```
# hasys -freeze -persistent node_name
```
5. Make the VCS configuration read-only:

```
# haconf -dump -makero
```
6. Select a group of nodes to upgrade first.



7. Verify that there are no VxFS Storage Checkpoints or file systems mounted on the nodes being upgraded:

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

- a. Unmount any Storage Checkpoints and file systems:

```
# umount /checkpoint_name  
# umount /file_system
```

8. Insert the VERITAS software disc on any node and mount the CD-ROM. For example:

```
# mount -o ro /dev/cdrom/mnt/cdrom
```

9. Move to the top-level directory on the CD-ROM:

```
# cd /mnt/cdrom
```

10. To upgrade the Storage Foundation Cluster File System, 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 only, enter the following command:

```
# ./installmp
```

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

```
# ./installmp node_name1 node_name2 ...
```

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

```
# ./installmp node_name1 node_name2 ... -usersh
```

11. After the initial system checks are complete, press **Return** to start the requirements checks.

12. After the requirements checks are complete, press **Return** to start upgrading the packages. If you are upgrading multiple nodes, you have the option of upgrading them simultaneously. You will be prompted after the upgrade is complete.

13. When installation is complete, note the locations of the summary, log, and response files indicated by the installer.

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. (Optional) If you are going to upgrade your system, perform the following:

- a. 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.

16. Reboot the upgraded nodes. Assuming the reboot was successful, application failover is now available for the first group of nodes.

17. Make the VCS configuration writable again from any node in the upgraded group:

```
# haconf -makerw
```

18. Unfreeze HA service group operations on each node in the upgraded group:

```
# hasys -unfreeze -persistent node_name
```

19. Make the configuration read-only:

```
# haconf -dump -makero
```

20. Bring the CVM service group online on each node in the upgraded group:

```
# hagrps -online cvm -sys node_name
```

21. Repeat [step 7](#) through [step 20](#) for the second group of nodes.

Verifying Software Versions

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

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



Removing the MP1 Packages

Roll back of the MP1 packages to the release 4.1 version of the packages is not supported. To restore release 4.1 on your system, you must completely remove MP1, then reinstall VERITAS Storage Foundation Cluster File System 4.1.

To uninstall the VERITAS Storage Foundation Cluster File System 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 a 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 `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.

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 Cluster File System, use the following commands:

```
# cd /opt/VRTS/install
# ./uninstallsfcfs [-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*.

Fixed Issues

The following issues have been fixed in this release:

Incident	Description
153001	Under certain conditions, CFS <code>mmap()</code> cache coherency issue could occur for private mappings (<code>MAP_PRIVATE</code>) on the last page of a file.
507859	Under certain conditions, POSIX file locking operations could hang a CFS node. This was most often seen with a high frequency of locking operations, but could occur under a light load. This required a manual reboot to clear the condition.

Refer to the *VERITAS Storage Foundation Release Notes* for VxFS and VxVM fixed issues.



Software Issues in SFCFS/SFCFS HA

Software issues listed in the Storage Foundation Cluster File System 4.1 still apply. There are no new software issues for this MP1 release.

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

http://ftp.support.veritas.com/pub/support/products/Foundation_Suite/277927.pdf

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

Security-enhanced (SE) Linux supported is provided for evaluation purposes only. Security policy files are not currently available for the VERITAS product stack.

To disable SE Linux at boot time on both SLES9 and RHEL4, set the kernel boot parameter `selinux` to 0 (`selinux=0`) and reboot the machine.

Assuming the system has been configured for booting from the machine *machine_name*, edit the file `/boot/machine_name/menu.lst` to include `selinux=0` on the kernel line. Then reboot the machine to ensure the setting takes effect.

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 SFCFS. 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.

No Longer Supported

32-bit Operating Systems

This release of VERITAS Storage Foundation Cluster File System 4.1 MP1 is the last major version to support 32-bit operating systems on Linux.

Version 4 and Version 5 File System Layouts

This is the last release of SFCFS to support Version 4 and Version 5 disk layouts. VERITAS recommends upgrading to disk layout Version 6. Maintenance patches for the 4.1 release of SFCFS will continue to support previous disk layouts. Use the `vxupgrade` or `vxconvert` command to upgrade to disk layout Version 6. See the *VERITAS File System Administrator's Guide* for details.



File System Snapshots

Support for file system snapshots may be discontinued in the next release of SFCFS. It will be replaced by Storage Checkpoints. VERITAS recommends using the Storage Checkpoints feature to create “point-in-time” copies.

I/O Error Mount Options

In this and future releases, only the `ioerror=disable` mount option, which is the default, is supported for cluster-mounted file systems. Other `ioerror` mount options are not supported.

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.

Additionally, the VERITAS documentation disc provides searchable, HTML documentation for each product in this release. Printable PDF documents are also included on the disc. All documentation is organized by product groups. For information on purchasing product documentation, visit <http://webstore.veritas.com>.

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Version 2, June 1991

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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The End

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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Strlcat.c

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Tomcat

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Xerces Java

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