

# Veritas Storage Foundation<sup>™</sup> Cluster File System Release Notes

Solaris x64 Platform Edition

5.0



# Veritas Storage Foundation Cluster File System Release Notes

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Storage Foundation Cluster File System 5.0

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Veritas Storage Foundation Cluster File System is a licensed product. See the *Veritas Storage Foundation Cluster File System Installation Guide* for license installation instructions.

## Technical support

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



# Contents

Chapter 1	Storage Foundation Cluster File System Release Notes	
	Introduction .....	7
	New features .....	8
	Concurrent I/O support .....	8
	Delaylog supported .....	8
	Disk layout Version supported .....	8
	Nested mount support .....	8
	Multiple transaction servers .....	8
	System requirements .....	9
	Hardware compatibility list .....	9
	Required patches .....	9
	No longer supported .....	9
	seonly mount option .....	9
	I/O error mount options .....	9
	License package not completely removed from local zones .....	9
	Fixed issues .....	10
	Known issues .....	12
	Running fsck before upgrading to 5.0 .....	12
	fsck may abort when applied to unclean file systems from Veritas File System 4.1 .....	12
	Support for SFCFS configurations larger than 16 nodes .....	13
	Software limitations .....	13
	Quick I/O, ODM, mount -o cio, and the VX_CONCURRENT advisory are mutually exclusive .....	13
	Compatibility with previous versions of Veritas File System .....	13
	Consistent distribution and kernel version for Storage Foundation Cluster File System .....	14
	Storage Foundation Cluster File System agents cannot support Japanese mount points .....	14
	Fencing .....	14
	Required upgrade for Cluster Volume Manager protocol .....	14
	NIC detection during installation .....	15
	Caching advisories .....	15
	Cached Quick I/O .....	15
	Quotas .....	15
	Local scope for named pipes .....	15

- Do not define LD\_LIBRARY\_PATH to contain Storage Foundation Cluster File System mounted directories ..... 15
- Turn off Veritas Cluster Server volume-level resource monitoring before deleting a volume ..... 16
- Swap files not supported ..... 16
- Documentation Errata ..... 16
  - Veritas Storage Foundation Cluster File System Administrator's Guide errata ..... 16
- Available documentation ..... 17
  - Veritas documentation disc ..... 17
  - Release Notes and Installation guides ..... 17
  - Veritas Storage Foundation Cluster File System guides ..... 18
  - Related documentation ..... 18

Appendix A Third-party Legal Notices

# Storage Foundation Cluster File System 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.

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

<http://entsupport.symantec.com/docs/286955>

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## New features

Veritas Storage Foundation Cluster File System provides the following new features:

### Concurrent I/O support

This feature extends current support for concurrent I/O to cluster file systems. Semantics for concurrent read/write access on a file in a cluster file system matches those for a local mount.

### Delaylog supported

The `-o delaylog` mount option is supported with cluster mounts.

### Disk layout Version supported

Disk layout Version 7 is supported on SFCFS.

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

### Nested mount support

This allows mounts of a VxFS file system on any VxFS mount point. There is no requirement to allow mounts of non-VxFS file system on a shared VxFS mount point. A directory on a shared VxFS file system may be used as a mount point for a VxFS file system, enabling nested mounts of shared file systems. The SFCFS and Veritas Cluster Server (VCS) administration interface is enhanced to support nested mounts.

### Multiple transaction servers

With this feature, SFCFS moves from a primary/secondary architecture, where only one node in the cluster processes metadata operations, such as file creates, deletes, grows, to a symmetrical architecture, where all nodes in the cluster can simultaneously process metadata operations. This allows SFCFS to handle significantly higher metadata loads.



# System requirements

## Hardware compatibility list

For information on servers, network controllers, and disk subsystems that support SFCFS, see the hardware compatibility list available at <http://entsupport.symantec.com/docs/287089>.

## Required patches

Patch requirements and versions are determined at the time of product release. See the *Veritas Storage Foundation Release Notes*.

Contact your vendor for the most current patch version and information.

## No longer supported

### seconly mount option

The `seconly mount` option might not be supported in the next release of Veritas Storage Foundation Cluster File System.

### I/O error mount options

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

### License package not completely removed from local zones

Some files from the Veritas licensing package (`VRTSvlic`) may not be removed from a local zone that was created after `VRTSvlic` was originally installed. An error message is displayed if all files are not removed. If the error was encountered, after the package removal process ends, run the following command from the global zone to remove any remaining `VRTSvlic` files:

```
# rm -rf zonepath/root/var/sadm/pkg/VRTSvlic
```

If you are upgrading a product, and local zones are configured, instead of selecting the installer upgrade procedure (or running the script from the command line), perform the upgrade in steps: Uninstall the product, uninstall the infrastructure packages (`uninstallinfr` script), then reinstall the product.

## Fixed issues

The Veritas Storage Foundation, Veritas Volume Manager, Veritas File System, Veritas Volume Replicator, and Veritas Storage Foundation for Databases fixed issues are listed in the *Veritas Storage Foundation 5.0 Release Notes*.

See the *Veritas Storage Foundation 5.0 Release Notes*.

The following are new Veritas Storage Foundation Cluster File System fixed issues in this release:

Incident	Description
612406	Push the entire extent for an ilist hole. This will prevent multi-entry holes.
645227	The file system was hanging due to a rare race between the merge and activation of File Change Log (FCL) which lead to a deadlock. The problem has been resolved by ensuring that the merge threads try for the FCL global lock and proceed only if the lock is available.
770917	In some code paths related to large directory support, the cluster member (node) was not taking and holding the ownership of the inode for which the extents are to be re-organized. So, an assertion was being triggered when another member node of the cluster tried to revoke ownership of the inode. The problem has been resolved by correcting the ownership issues in large directory related code paths.
771892	A deadlock was occurring during CFS recovery. Log replay, which is performed as the first step during CFS recovery when a node crashes, was found to block in certain scenarios on an inode that the replay is trying to process. The problem has been resolved by freeing all inodes in the chunk one at a time without marking other inodes as busy.
771970	When a file is truncated, the truncate request is shipped to the cluster member that has the current ownership of the inode. There were certain inconsistencies in pre-splitting a buffer in the presence of clones, when the truncate request was shipped to another node of the cluster leading to an assertion. The problem has been resolved by changing the truncation code paths to handle the pre-splitting of buffers at a later stage during truncation, for both locally mounted and cluster mounted file systems.

Incident	Description
771998	Add CFS support for Solaris 10 local zones as of the 5.0 release. VRTSvxfs and VRTSodm now support Clustered File Systems mounted within Solaris 10 local zones. This includes LOFS and direct mounts.
771999	A node in a cluster was hanging under heavy CFS activity in the cluster. When all the worker threads servicing callbacks from a queue were blocked, the callbacks that were still lying in the same queue faced a deadlock. The problem has been resolved by queuing the callbacks that need to be processed to unblock other callbacks into a different queue, and processing them at a higher priority.
775611	Upon encountering an I/O error, the file system is correctly disabled but an internal inconsistency check fails. The check failure in this instance is quite benign and cannot cause customer data corruption since the file system is safely disabled upon encountering an I/O error of this nature. To further diagnose this condition, a new consistency check has been added.
782024	Under heavy inode cache stress, file system recovery on a cluster file system was hanging after an I/O error. The problem has been resolved by ensuring that the code paths that attempt to reuse an inode do not wait for a dirty/bad/inactive inode to become free if recovery initiated by a disabled file system is currently in progress. If there are no inodes available for re-use, a new inode will be allocated to ensure that the recovery proceeds to completion.
793030	The vxfsutil.h was using 'struct timeval' in one of the function declarations without including time.h resulting in a warning message during compilation. The problem has been resolved by including time.h in vxfsutil.h.

## Known issues

The Veritas Storage Foundation, Veritas Volume Manager, Veritas File System, Veritas Volume Replicator, and Veritas Storage Foundation for Databases known issues are listed in the *Veritas Storage Foundation 5.0 Release Notes*.

See the *Veritas Storage Foundation 5.0 Release Notes*.

The following are new Veritas Storage Foundation Cluster File System known issues in this release:

### Running fsck before upgrading to 5.0

Before upgrading to SFCFS 5.0, make sure that all the file systems are clean by running the `fsck` command.

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

The `fsck` command replays the intent log to complete any outstanding transactions, then marks the file system as clean.

---

**Warning:** You must run `fsck` before upgrading an existing cluster file system to 5.0. If you upgrade to 5.0, and then run the `fsck` command, it will fail due to the incompatibility of older `fsck` binaries with the new kernel.

---

See the *Veritas Storage Foundation Cluster File System Installation Guide*.

### fsck may abort when applied to unclean file systems from Veritas File System 4.1

Due to an incompatibility in the VxFS `fsck` utility between the 5.0 and 4.1 releases, `fsck` may abort during intent log replay if run on older file systems. This only affects file systems that were previously running under VxFS 4.1 that are CVM-shared volumes or multi-volume file systems, and that were not cleanly unmounted prior to use in VxFS 5.0.

If you encounter this situation, perform a full `fsck` to bring the file system to a consistent, clean state that is ready to be mounted.

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

## Support for SFCFS configurations larger than 16 nodes

SFCFS 5.0 is capable of supporting cluster file systems with up to 32 nodes. Symantec has tested and qualified SFCFS 5.0 cluster file system configurations of up to 16 nodes at product release time. Support can be contacted for their approval and recommendations on cluster file system deployments larger than 16 nodes, based on the application workload. For the latest information on SFCFS support issues, see the following TechNote:

<http://entsupport.symantec.com/docs/286955>

## Software limitations

The Veritas Storage Foundation, Veritas Volume Manager, Veritas File System, Veritas Volume Replicator, and Veritas Storage Foundation for Databases software limitations are listed in the *Veritas Storage Foundation 5.0 Release Notes*.

See the *Veritas Storage Foundation 5.0 Release Notes*.

The following are new Veritas Storage Foundation Cluster File System software limitations in this release:

### Quick I/O, ODM, mount -o cio, and the VX\_CONCURRENT advisory are mutually exclusive

The VX\_CONCURRENT advisory cannot be set on a file that is actively open by Quick I/O or ODM. A file that has the VX\_CONCURRENT advisory set may not be concurrently opened by Quick I/O or ODM. Quick I/O and ODM access are not allowed for any files on a file system that is mounted with the `-o cio` mount option.

### Compatibility with previous versions of Veritas File System

A disk layout Version 7 file system created with VxFS 5.0 software will not be accessible if the VxFS 5.0 file system software is removed and the system is reverted to VxFS 4.1.

In addition, if a disk layout Version 7 file system exists on a boot disk and VxFS 5.0 is removed, the host will not reboot successfully and will remain at the `bcheckrc` prompt. To reboot the host successfully, first edit the `fstab` file and comment out disk layout Version 7 file system

See the *Veritas Storage Foundation Release Notes*.

## Consistent distribution and kernel version for Storage Foundation Cluster File System

Cluster nodes must run the same distribution and kernel version.

## Storage Foundation Cluster File System agents cannot support Japanese mount points

None of the SFCFS agents (for example, `cfsmntadm` and `cfsmount`) work on a Japanese mount point. These commands fail on a Japanese operating system because the SFCFS agents require VCS and VCS currently does not support non-ASCII input.

## Fencing

If during the SFCFS installation procedure you chose to enable fencing but have yet to configure the coordinator disks, Cluster Volume Manager will not join the cluster. If you choose to disable fencing, or if fencing cannot be supported in the current configuration, the following steps will disable fencing and allow shared disk groups to join:

- 1 Create the file `/etc/vxfenmode` on each node (if it does not already exist).
- 2 Add the string `vxfen_mode=disabled` to the file.

## Required upgrade for Cluster Volume Manager protocol

The Cluster Volume Manager (CVM) protocol must be upgraded before upgrading the disk group from previous versions.

### To upgrade the CVM protocol

- 1 Check the existing cluster protocol version:  

```
# vxdctl protocolversion
```
- 2 To upgrade the cluster protocol version to version 70 for the entire cluster, use the following command on the master node:  

```
# vxdctl upgrade
```

## NIC detection during installation

Operating system limitations may affect the detection of valid network interconnect cards (NICs) during SFCFS/SFCFS HA installation. Specifically, more NICs for heartbeat links may be listed than are actually available. Verify which NICs are valid on your system before proceeding with the install.

To verify which NICs are valid, use the following command:

```
# ifconfig -a
```

## Caching advisories

Caching advisories are set with the `mount` command on individual file systems, but are not propagated to other nodes of a cluster.

To work around this issue, set the required cache advisories with the `vxtunefs` command instead.

## Cached Quick I/O

This Quick I/O for Databases feature that caches data in the file system cache is not supported.

## Quotas

When using quotas, the UID and GID for a user must be the same on each node in the cluster.

## Local scope for named pipes

Named pipes created on a cluster-mounted file system have only a local scope pertaining to the local node.

Devices other than named pipes cannot be created using the `mknod` command.

## Do not define LD\_LIBRARY\_PATH to contain Storage Foundation Cluster File System mounted directories

If SFCFS-mounted directories are present in the `LD_LIBRARY_PATH` environment variable, the system may hang in circumstances such as a forced unmount.

## Turn off Veritas Cluster Server volume-level resource monitoring before deleting a volume

If you are using VCS volume-level resource monitoring and you want to delete a volume, you must turn off monitoring for that volume before deleting it. If monitoring for the volume is not turned off, the VCS monitor disables access to the disk group in which the volume resided by changing the activation mode to off. Failure to turn off monitoring will require intervention to change the disk group activation mode back to its original setting.

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

## Swap files not supported

Swap files are not supported on cluster-mounted file systems.

## Documentation Errata

The following section describe Veritas Storage Foundation Cluster File System documentation errata for the 5.0 release.

### Veritas Storage Foundation Cluster File System Administrator's Guide errata

For Veritas Storage Foundation Cluster File System Administrator's Guide 5.0 in the section "Setting up the disk group for coordinator disks" on page 45, step 5 and 6 is incorrect.

It should read as follows:

- 5 On any node, create the disk group by specifying the device name of one of the disks:

```
# vxdg init vxfencoorddg c1t1d0
```

- 6 Add the other two disks to the disk group and set the option `coordinator=on` to set the coordinator attribute:

```
# vxdg -g vxfencoorddg adddisk c2t1d0  
# vxdg -g vxfencoorddg adddisk c3t1d0  
# vxdg -g vxfencoorddg set coordinator=on
```



## Available documentation

After the installation procedure is complete, documents are available online under the `/opt/VRTS/docs` directory. Documents are provided as Adobe Portable Document Format (PDF) files and in a searchable HTML-based format. To view or print PDF documents, you must have the Adobe Acrobat Reader installed.

Installing documentation and online manual pages is optional.

## Veritas documentation disc

The Veritas documentation disc provides searchable, HTML documentation for each product in this release. Printable PDF documents are also included on the disc.

All documentation is organized by product groups.

## Release Notes and Installation guides

Release notes and installation guides are not installed by any packages. Veritas recommends that you copy them from the software disc to the `/opt/VRTS/docs` directory on your system after product installation so that they are available for future reference.

Release notes for component products of SFCFS are located under `storage_foundation_cluster_file_system/release_notes`.

Installation guides for component products of SFCFS are located under `storage_foundation_cluster_file_system/docs`.

Read the following installation guide and component product release notes before starting the installation:

- *Veritas Storage Foundation Cluster File System Installation Guide* (`sfvfs_install.pdf`)
- *Veritas Storage Foundation Release Notes* (`sf_notes.pdf`)
- *Veritas Cluster Server Release Notes* (`vcs_notes.pdf`)

## Veritas Storage Foundation Cluster File System guides

The following guides comprise the Veritas Storage Foundation Cluster File System documentation set:

Guide Title	Filename
<i>Veritas Storage Foundation Cluster File System Release Notes (this document)</i>	<code>sfdfs_notes.pdf</code>
<i>Veritas Storage Foundation Cluster File System Installation Guide</i>	<code>sfdfs_install.pdf</code>
<i>Veritas Storage Foundation Cluster File System Administrator's Guide</i>	<code>sfdfs_admin.pdf</code>

## Related documentation

The following manuals, along with the online help, provide important information about the software components for SFCFS/SFCFS HA.

## Veritas Storage Foundation guides

Guide Title	Filename
<i>Veritas Storage Foundation and High Availability Solutions Getting Started Guide</i>	<code>getting_started.pdf</code>
<i>Veritas Storage Foundation Release Notes</i>	<code>sf_notes.pdf</code>
<i>Veritas Storage Foundation Installation Guide</i>	<code>sf_install.pdf</code>
<i>Veritas Storage Foundation for Oracle Administrator's Guide</i>	<code>sf_ora_admin.pdf</code>
<i>Veritas Storage Foundation for Sybase Administrator's Guide</i>	<code>sf_syb_admin.pdf</code>
<i>Veritas Array Integration Layer Configuration Guide</i>	<code>vail_config.pdf</code>
<i>Veritas Volume Manager Administrator's Guide</i>	<code>vxvm_admin.pdf</code>
<i>Veritas Storage Foundation Intelligent Storage Provisioning Administrator's Guide</i>	<code>sf_isp_admin.pdf</code>
<i>Veritas Storage Foundation Intelligent Storage Provisioning Solutions Guide</i>	<code>sf_isp_solutions.pdf</code>

Guide Title	Filename
<i>Veritas Storage Foundation Cross-Platform Data Sharing Administrator's Guide</i>	sf_cds_admin.pdf
<i>Veritas Enterprise Administrator User's Guide</i>	veax6_users.pdf
<i>Veritas Volume Manager Troubleshooting Guide</i>	vxvm_tshoot.pdf
<i>Veritas FlashSnap Point-In-Time Copy Solutions Administrator's Guide</i>	flashsnap_admin.pdf
<i>Veritas File System Administrator's Guide</i>	vxfs_admin.pdf
<i>Veritas File System Programmer's Reference Guide</i>	vxfs_ref.pdf

**Note:** In this release, some of the above documents have new PDF file names.

## Veritas Cluster Server documentation

The following Veritas Cluster Server documentation is available with Veritas Storage Foundation Cluster File System HA:

Guide Title	Filename
<i>Veritas Cluster Server Release Notes</i>	vcs_notes.pdf
<i>Veritas Cluster Server Installation Guide</i>	vcs_install.pdf
<i>Veritas Cluster Server User's Guide</i>	vcs_users.pdf
<i>Veritas Cluster Server Agent Developer's Guide</i>	vcs_agent_dev.pdf
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	vcs_bundled_agents.pdf
<i>Veritas Cluster Server SunFire 12K/15K Application Note</i>	vcs_appnote_f15k.pdf
<i>Veritas Cluster Server SunFire 6800 Application Note</i>	vcs_appnote_6800.pdf
<i>VCS Enterprise Agent for Oracle Installation and Configuration Guide</i>	vcs_oracle_install.pdf
<i>VCS Enterprise Agent for Sybase Installation and Configuration Guide</i>	vcs_sybase_install.pdf

**Available documentation**

<b>Guide Title</b>	<b>Filename</b>
<i>VCS Enterprise Agent for SunONE Installation and Configuration Guide</i>	vcs_sunone_install.pdf
<i>VCS Enterprise Agent for EMC SRDF Installation and Configuration Guide</i>	vcs_srdf_install.pdf
<i>VCS Enterprise Agent for IBM PPRC Installation and Configuration Guide</i>	vcs_pprc_install.pdf

**Veritas Volume Replicator documentation**

The following Veritas Volume Replicator documentation is available with the Veritas Volume Replicator option:

<b>Guide Title</b>	<b>Filename</b>
<i>Veritas Volume Replicator Release Notes</i>	vvr_notes.pdf
<i>Veritas Volume Replicator Installation Guide</i>	vvr_install.pdf
<i>Veritas Volume Replicator Administrator's Guide</i>	vvr_admin.pdf
<i>Veritas Volume Replicator Planning and Tuning Guide</i>	vvr_planning.pdf
<i>Veritas Volume Replicator Web Console Administrator's Guide</i>	vvr_web_admin.pdf
<i>Veritas Volume Replicator Advisor User's Guide</i>	vvr_advisor_users.pdf
<i>Veritas Cluster Server Agents for Veritas Volume Replicator Configuration Guide</i>	vvr_agents_config.pdf

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If you have any suggestions, additions, comments, or questions, please let me know.

Douglas C. Schmidt

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Apache Common Logging

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Apache Portable Runtime

Apache Snmp4j - The Object Oriented SNMP API for Java

Apache Spring Framework

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### Expat XML Parsing Library

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MD5.h

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#### JavaTip87: Automate the Hourglass Cursor

Kyle Davis

Portions of this code taken from an article available as of 2/02/02 on the JavaWorld Internet site, entitled Javatip87: Automate the HourGlass Cursor" by Kyle Davis.

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Perl

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Archive-Tar-1.24

Compress-Zlib-1.41

Crypt-CBC-2.17

File-Spec-0.90

IO-String-1.06

IO-Tty-1.02

libnet-1.19

List-Compare-0.31

Log dispatch perl module

Logfile rotate perl module

Module-Build-0.2611

MIME-Base64-3.07

HTML-Tagset-3.10

HTML-Parser-3.50

Net-DNS-0.49

Net-DNS-SEC-0.12

Net-Netmask-1.9011

Net-Telnet-3.03

Params validate perl module

Proc-Background-1.08

Test-Plan-0.02

Test-Simple-0.60

Time-Date-1.16

Time zone info

URI-1.35

XML-Parser-2.34

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## Sockets++ library

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