

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

Linux for IBM System p

5.0 Phase III



# Veritas Storage Foundation Cluster File System Release Notes

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Storage Foundation Cluster File System 5.0 Phase III

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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://www.symantec.com/enterprise/support/assistance\\_care.jsp](http://www.symantec.com/enterprise/support/assistance_care.jsp)

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.



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## Appendix A Third-party Legal Notices

# Storage Foundation Cluster File System Release Notes

This document provides release information about the products in the Veritas Storage Foundation Cluster File System 5.0 Phase III Linux product line for the IBM System p™ platform featuring IBM POWER5™ technology.

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/285834>

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## New features

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

### Block device support in Veritas File System

VxFS 5.0 supports the creation of file systems directly on raw devices without requiring a VxVM volume. However, this feature is limited to local mount file systems only and is not supported for CFS mounts. Both partitioned and non-partitioned block devices may now be used directly with VxFS.

For example:

```
# mkfs -t vxfs /dev/sdc1
# mount -t vxfs /dev/sdc1 /mnt
# fsck -t vxfs /dev/sdc1
```

Similarly, all local mount features of VxFS, such as clones and file system snapshots, do not require the creation of a VxVM volume.

### 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 now supported on SFCFS.

### 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—a new major architectural enhancement to SFCFS

With this feature, SFCFS moves from a primary/secondary architecture, where only one node in the cluster processes metadata operations (file creation, deletion, resizing, and so on) 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

This section describes the system requirement for this release.

### Supported Linux operating systems

The Veritas 5.0 Phase III release operates on the architectures and operating systems shown below. Veritas supports only those kernel binaries distributed by Red Hat and SUSE:

- Red Hat Enterprise Linux 4 (RHEL 4) with Update 3, 4 or 5 (2.6.9-34, 42, 55 kernels) on IBM System p servers (using IBM POWER5 processors). Later updates of RHEL4 are supported provided that Red Hat maintains kernel application binary interface (kABI) compatibility.
- SUSE Linux Enterprise Server 9 (SLES 9) with SP3 (2.6.5-7.244, 252, 276, 283 kernels) on IBM System p servers (using IBM POWER5 processors). Later updates of SLES 9 are supported provided that SUSE maintains kernel application binary interface (kABI) compatibility.

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**Note:** If your system is running an older version of either Red Hat Enterprise Linux or SUSE Linux Enterprise Server, you must upgrade it before attempting to install the Veritas Storage Foundation software. Consult the Red Hat or SUSE documentation for more information on upgrading your system.

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#### 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>.

## Memory requirements

A minimum of 2 GB of memory is required.

## Required patches

Patch requirements and versions are determined at the time of product release.

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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/285834>

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See the *Veritas Storage Foundation Cluster File System Installation Guide*.  
Contact your vendor for the most current patch version and information.

## Future support issues

This section lists functions that may not be supported in future releases.

### seconly mount option

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

### Version 4 disk layout

VxFS disk layout Version 4 is not supported. Maintenance patches for the 4.0 release of SFCFS will continue to support previous disk layouts. Use the `vxupgrade` command to upgrade to disk layout Version 6 or 7.

See the *Veritas Storage Foundation Cluster File System Administrator's Guide*.

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**Note:** Version 7 is the default disk layout version for the 5.0 release.

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### 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.

## Fixed issues

The following table contains information about fixed issues in this release.

Incident	Description
784208	When upgrading a version 4 file system, it was possible for the file system to become disabled if the inode list had been grown.
833457	After upgrading a version 4 file system, it was possible for <code>fsck</code> to fail if a physical disk error or a SCSI error had occurred during the upgrade.
963729	Using a file system checkpoint (clone) that was not being accessed via Oracle Disk Manager (ODM) caused the <code>dbed_clonedb</code> command to hang.
969511	The <code>odmstat</code> command exited with an error after 2 iterations.
998273	When executing <code>fsckpt_restore</code> on an invalid device, the command would exit with an incorrect error message stating that the device was mounted. The error message now reports an invalid device.
1005256	The replay of a log on a large file system took a long time. The replay time has now been significantly reduced.
1025672	The system could panic if a physical disk error occurred while performing direct I/O to a snapshot.
1034452	The Veritas Mapping Service (VxMS) could return incorrect directory entries.
1072612	The <code>fsck</code> command failed to replay a SFCFS file system.
1075632	VxFS was sleeping unnecessarily when trying to obtain a GLM lock. This would manifest itself in SFCFS as slow <code>stat()</code> performance.

## Known issues

### cfsumount resource remains in an incorrect state

On a RHEL 4 system, the `cfsumount` command correctly fails if the file system has a checkpoint that has been mounted directly by using the `mount` command rather than `cfsmount`. However, even after the checkpoint has been unmounted and `cfsumount` has been retried on the file system, the `hasstatus` command continues to show that the state of the `cfsmount` resource is `ONLINE|UNABLE TO OFFLINE`. To clear the `cfsmount` state, use the `umount` command to unmount the file system. [1072047]

### Mounted VxFS file systems may prevent rebooting

If you have VxFS file systems mounted and I/O is being done on those file systems and you try to reboot the machine, it might not reboot. To work around this issue, unmount all VxFS file systems that are mounted before rebooting the machine. [153253]

### Nested non-shared mount

If you want to unmount all the file systems where the parent file system is disabled for any reason, you will need to force unmount on the parent first then by a regular unmount of the child. [592554]

## 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
```

See the *Veritas Storage Foundation Installation Guide*.

## VxFS limits multiple mounts capability

Even though Linux supports mounting the same device multiple times on different points in the name space, VxFS limits this capability. Veritas does not allow multiple mounts if one of the mount points is a directory on a VxFS cluster-mounted file system. This displays an already mounted message from the `mount` command.

## vxesd reference to originating directory causes possible file system unmounting problems

The Event Source Daemon (`vxesd`) holds a reference to the directory from where it was started, that prevents the file system associated with the directory from being unmounted. To unmount the file system, perform the following steps:

- 1 Stop the `vxesd` daemon:  

```
# vxddladm stop eventsource
```
2. Change the current working directory:  

```
# cd /
```
3. Restart the `vxesd` daemon:  

```
# vxddladm start eventsource
```

## Issues with node crashes and joins after the FCL is activated

If a node crashes or joins the cluster within 60 seconds of the FCL (File Change Log) being turned on, the FCL does not correctly record data.

[608169]

## Software disc cannot be ejected during installation

During installation, if any of the products were configured and started, the software disc cannot be ejected. This may prevent installation from continuing in following circumstances:

- If the language pack disc needs be loaded so that the associated packages can be installed.
- A product was installed that did not require a system reboot to complete the installation.

This problem is not an issue if a product was installed or upgraded that required a system reboot to complete the installation.

### To avoid this problem at install time

- 1 Specify the `-installonly` option to the `installer` script in addition to any other options.
- 2 Eject the software disc.
- 3 Run the `installer` script with the `-configure` option specified.

### If a software disc cannot be ejected

- 1 Stop the event source daemon:  

```
# /usr/sbin/vxddladm stop eventsource
```
- 2 Kill the `vxcached`, `vxrelocd` and `vxnotify` processes by using the `kill -9` command with their process IDs as reported by the `ps` command.
- 3 Eject the software disc.
- 4 Restart the VxVM daemon processes:  

```
# /usr/sbin/vxddladm start eventsource  
# /etc/vx/bin/vxcached  
# /etc/vx/bin/vxrelocd
```

[622442]

## 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/285834>

## Oracle-Linux

### ODM is incompatible with auditing on SLES9

Oracle Disk Manager (ODM) is incompatible with the auditing subsystem on SUSE Linux Enterprise Server 9 systems.

### Problems uninstalling or upgrading Veritas Storage Foundation for Oracle when Veritas Storage Foundation Cluster File System is installed on the same system

If Veritas Storage Foundation for Oracle and Veritas Storage Foundation Cluster File System are installed on the same machine, do not use the installer to uninstall if you are planning to uninstall only one product.

If you want to uninstall the product, you must uninstall the Veritas Storage Foundation for Oracle packages manually.

#### To uninstall the Veritas Storage Foundation for Oracle packages

- 1 Review the uninstallation requirements in the *Veritas Storage Foundation Installation Guide*.
- 2 Stop the repository database and unmount the repository volume.

In a stand-alone configuration:

Stop the database repository:

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

Unmount the database repository:

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

In an HA configuration: Stop VCS processes on either the local system or all systems.

To stop VCS processes on the local system:

```
# hastop -local
```

To stop VCS processes on all systems:

```
# hastop -all
```

- 3 Remove the Veritas Storage Foundation for Oracle packages using the `rpm -e` command.

```
# rpm -e VRTSorgui-common VRTSdbed-common VRTSdbcom-common \ VRTSdbdoc
```

If Veritas Storage Foundation for Oracle and Veritas Storage Foundation Cluster File System are installed on the same machine and you are upgrading both products, use the installer to upgrade Veritas Storage Foundation Cluster File

System first. Then, use the installer to upgrade Veritas Storage Foundation for Oracle.

If the second upgrade fails, remove the Veritas Storage Foundation for Oracle packages as described above, then run the installer to upgrade Veritas Storage Foundation for Oracle. [840486]

## DB2-Linux

### Problems uninstalling or upgrading Veritas Storage Foundation for DB2 when Veritas Storage Foundation Cluster File System is installed on the same system

If Veritas Storage Foundation for DB2 and Veritas Storage Foundation Cluster File System are installed on the same machine, do not use the installer to uninstall if you are planning to uninstall only one product.

If you want to uninstall the product, you must uninstall the Veritas Storage Foundation for DB2 packages manually.

#### To uninstall the Veritas Storage Foundation for DB2 packages

- 1 Review the uninstallation requirements in the *Veritas Storage Foundation Installation Guide*.
- 2 Stop the repository database and unmount the repository volume.

In a stand-alone configuration:

Stop the database repository:

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

Unmount the database repository:

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

In an HA configuration: Stop VCS processes on either the local system or all systems.

To stop VCS processes on the local system:

```
# hastop -local
```

To stop VCS processes on all systems:

```
# hastop -all
```

- 3 Remove the Veritas Storage Foundation for DB2 packages using the `rpm -e` command.

```
# rpm -e VRTSd2gui-common VRTSdb2ed-common VRTSdbcom-common \ VRTSdbdoc
```



If Veritas Storage Foundation for DB2 and Veritas Storage Foundation Cluster File System are installed on the same machine and you are upgrading both products, use the installer to upgrade Veritas Storage Foundation Cluster File System first. Then, use the installer to upgrade Veritas Storage Foundation for DB2.

If the second upgrade fails, remove the Veritas Storage Foundation for DB2 packages as described above, then run the installer to upgrade Veritas Storage Foundation for DB2. [840486]

## Software limitations

### 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.

### sendfile support

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

### Security-enhanced Linux

Security-enhanced (SE) Linux support 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.

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

Cluster nodes must run the same Linux 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 Veritas Cluster Server (VCS) and VCS currently does not support non-ASCII input.

## 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.

## Stopping cluster manager from the command line

In an HA environment where Veritas Cluster Server (VCS) is used to manage other resources, `cfsccluster stop all` fails to stop all the VCS components.

## 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 `vxvob(1M)` online manual page for information on disk group activation modes.

## Cluster Volume Manager comes up in partial state on configuration

When configuring a cluster using the command `cfscscluster config -s`, occasionally CVM comes online in a PARTIAL state because the command is issued before VCS has probed the `vxfsckd`. To bring CVM online, first stop VCS on all the nodes in cluster using `hastop -all`, then restart VCS on each node.

## Swap files not supported

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

## Obtaining information about mounted file system states

For accurate information about the state of mounted file systems on Linux, refer to the contents of `/proc/mounts`. The `mount` command may or may not reference this source of information depending on whether the regular file `/etc/mtab` has been replaced with a symbolic link to `/proc/mounts`. This change is made at the discretion of the system administrator and the benefits are discussed in the `mount` online manual page.

A benefit of using `/proc/mounts` is that changes to SFCFS mount options are accurately displayed for all nodes.

## 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* (`sfcfs_install.pdf`)
- *Veritas Storage Foundation Cluster File System Administrator's Guide* (`sfcfs_admin.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

### Veritas Storage Foundation guides

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

Guide Title	Filename
<i>Veritas Storage Foundation and High Availability 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 Intelligent Storage Provisioning Administrator's Guide</i>	<code>sf_isp_admin.pdf</code>
<i>Veritas Storage Foundation Cross-Platform Data Sharing Administrator's Guide</i>	<code>sf_cds_admin.pdf</code>
<i>Veritas Enterprise Administrator User's Guide</i>	<code>veax6x_users.pdf</code>
<i>Veritas Volume Manager Administrator's Guide</i>	<code>vxvm_admin.pdf</code>
<i>Veritas Volume Manager Troubleshooting Guide</i>	<code>vxvm_tshoot.pdf</code>
<i>Veritas FlashSnap Point-In-Time Copy Solutions Administrator's Guide</i>	<code>flashsnap_admin.pdf</code>
<i>Veritas File System Administrator's Guide</i>	<code>vxfs_admin.pdf</code>
<i>Veritas File System Programmer's Reference Guide</i>	<code>vxfs_ref.pdf</code>

## 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>	<i>vcs_notes.pdf</i>
<i>Veritas Cluster Server Installation Guide</i>	<i>vcs_install.pdf</i>
<i>Veritas Cluster Server User's Guide</i>	<i>vcs_users.pdf</i>
<i>Veritas Cluster Server Agent Developer's Guide</i>	<i>vcs_agent_dev.pdf</i>
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	<i>vcs_bundled_agents.pdf</i>
<i>Veritas Cluster Server High Availability for VMware ESX Virtual Machines Application Note</i>	<i>vcs_esx_server.pdf</i>
<i>VCS Enterprise Agent for Oracle Installation and Configuration Guide</i>	<i>vcs_oracle_install.pdf</i>
<i>VCS Enterprise Agent for DB2 Installation and Configuration Guide</i>	<i>vcs_db2_install.pdf</i>
<i>VCS Enterprise Agent for EMC SRDF Installation and Configuration Guide</i>	<i>vcs_srdf_install.pdf</i>
<i>VCS Enterprise Agent for Hitachi TrueCopy Installation and Configuration Guide</i>	<i>vcs_truecopy_install.pdf</i>

## Veritas Volume Replicator documentation

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

Guide Title	Filename
<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



# Documentation errata

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

On page 45, the procedure in “Setting up the disk group for coordinator disks” is incorrect. The following procedure should be used instead:

### Setting up the disk group for coordinator disks

The disk group for the coordinator disks must contain an odd number of disk devices with a minimum of three devices. It is recommended that you use only three coordinator disks, and that you use small LUNs to conserve disk space. The default size of the private region is 32 megabytes, but a smaller size can be specified.

If you have already added and initialized disks that you intend to use as coordinator disks, you can begin the following procedure at step 5.

#### To set up the disk group for coordinator disks

- 1 Add the three disks or create the three LUNs that are to be used as coordinator disks. All cluster nodes must be able to access these devices. (This procedure assumes that the disks have the device names `sdz`, `sdaa`, and `sdab`.)
- 2 Use the `vxdisk scandisks` command to scan the disks and their attributes. This command updates the VxVM device list and reconfigures DMP with the new devices.

```
# vxdisk scandisks
```

- 3 Use the `vxdisksetup` command to initialize each disk as a VxVM disk. In the following example, the CDS format is specified for the disk `sdz`, and the size of the private region is set to 512 kilobytes:

```
# vxdisksetup -i sdz format=cdsdisk privlen=512k
```

- 4 Test the disks for SCSI-3 persistent reservation support. If the size of a LUN is 1 megabyte or greater, you can use the `vxfcntlsthdw` command.
- 5 On the master node of the cluster, create the disk group for the disks, such as `vxfencdg`, specifying the device names of all three coordinator disks:

```
# vxvg -o coordinator=on init vxfencdg sdz sdaa sdab
```



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## MD5.h

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#### JavaTip87: Automate the Hourglass Cursor

Kyle Davis

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