

# Veritas Storage Foundation<sup>™</sup> for Oracle RAC Release Notes

HP-UX

5.0



# Veritas Storage Foundation for Oracle RAC Release Notes

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## Storage Foundation for Oracle RAC

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Veritas Storage Foundation for Oracle RAC is a licensed product. See the *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide* for license installation instructions.

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# Veritas Storage Foundation for Oracle RAC Release Notes

This document provides important information regarding Veritas™ Storage Foundation for Oracle RAC (SF Oracle RAC) for HP-UX. Review this entire document before installing this product.

See the following Technical Support TechNote for the latest information on updates, patches, and software issues regarding this release:

<http://support.veritas.com/docs/281875>

Veritas Storage Foundation for Oracle RAC is an integrated set of software products. It enables administrators of Oracle Real Application Clusters (RAC) to operate a database in an environment of cluster systems running Veritas Cluster Server (VCS) and the cluster features of Veritas Volume Manager and Veritas File System, also known as CVM and CFS, respectively.

Acronyms used for Storage Foundation for Oracle RAC components include the following:

<b>CVM</b>	Veritas Volume Manager cluster functionality
<b>CFS</b>	Veritas File System cluster functionality
<b>VCS</b>	Veritas Cluster Server
<b>VEA</b>	Veritas Enterprise Administrator graphical user interface
<b>VxFS</b>	Veritas File System
<b>VxVM</b>	Veritas Volume Manager

SF Oracle RAC components are described in the *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide*. Refer to component-product documentation and release notes for additional information to assist you during installation and configuration of SF Oracle RAC.

## New features

Features introduced with VERITAS Storage Foundation 5.0 for Oracle RAC include:

- Fencing with DMP disks
- Support for Oracle 10g R2

## System requirements

Make sure that you have the correct equipment to install SF Oracle RAC.

Item	Description
SF Oracle RAC systems	Two to eight systems with two or more CPUs at 2GHz or higher.
RAM	Each SF Oracle RAC system requires 2 GB or more of physical memory.
Network links	Two or more private links and one public link. Links must be 100BaseT or Gigabit Ethernet directly linking each node to the other node to form a private network that handles direct inter-system communication.  Symantec recommends switches for the private network links. These links must be of the same type; you cannot mix 100BaseT and Gigabit.
DVD drive	One drive that is accessible to all nodes in the cluster.
Fibre channel or SCSI host bus adapters	SF Oracle RAC requires at least one built-in SCSI adapter per system to access the operating system disks, and at least one additional SCSI or Fibre Channel Host Bus Adapter per system for shared data disks.
Disks	Typical SF Oracle RAC configurations require that shared disks support applications that migrate between systems in the cluster.  The SF Oracle RAC I/O fencing feature requires that all disks used as data disks or as coordinator disks must support SCSI-3 Persistent Reservations (PR).
Disk space	SF Oracle RAC space needed for required depots: <ul style="list-style-type: none"> <li>■ Total: 3.1 GB</li> <li>■ /opt: 1.5 GB</li> <li>■ /usr: 225 MB</li> <li>■ /var: 32 MB</li> <li>■ /var/tmp: 600 MB</li> <li>■ /tmp: 612 MB</li> <li>■ / 230 MB</li> </ul>



The output of this command includes a line that identifies the installed OE.  
For example:

```
HPUX11i-OE-MC          B.11.23.0409          HP-UX Mission
Critical Operating Environment Component
```

## Veritas software

Only versions of VCS, VxVM, and VxFS provided on the software disc are supported. Remove other versions before you install the software from the Veritas Storage Foundation for Oracle RAC software disc.

## Oracle software

SF Oracle RAC supports the following Oracle software:

- Oracle9i Release 2
- Oracle 10g Release 1
- Oracle 10g Release 2

To verify the latest information on support for Oracle database versions, see the Technical Support TechNote:

<http://support.veritas.com/docs/281875>

# Required patches

## HP-UX operating system patches

Install the following HP-UX depots and patches on each node before installing SF Oracle RAC:

DiskQuota-Enh	EnableVxFS	FSCmdsEnh
FSLibEnh	PHCO_32385	PHCO_32387
PHCO_32388	PHCO_32389	PHCO_32390
PHCO_32391	PHCO_32392	PHCO_32393
PHCO_32488	PHCO_32523	PHCO_32524
PHCO_32551	PHCO_32552	PHCO_32596
PHCO_32608	PHCO_32609	PHCO_32610
PHCO_32611	PHCO_33238	PHCO_34036
PHKL_32272	PHKL_32425	PHKL_32430



PHKL\_32431

PHKL\_33312

PHKL\_34010

**To identify the patches currently installed on your system**

- ◆ Use the `swlist` command. For example, to check for patch PHKL\_31500, type:

```
# swlist -l patch PHKL_31500
```

## Oracle software patches

- Oracle 10g Release 1: requires Oracle patches 4435949, 4637591, 5082958
- Oracle 10g Release 2: requires Oracle patch 4637591

## Software limitations

The following limitations apply to this release.

### Cluster File System (CFS)

The following are limitations of Cluster File System:

- CFS supports only disk layout version 6 and 7
- No support for HSM/DMAPI.
- VxFS does not distribute its own versions of file utilities such as `cpio` or `mv`.

### Space-optimized volume snapshots

To avoid performance impact on an SF Oracle RAC cluster, Symantec does not recommend using the space-optimized instant volume snapshot type when using VxVM volume snapshot functionality.

### SRVM volume location

The Oracle RAC wizard does not support the SRVM volume and volumes for Oracle datafiles existing in the same shared disk group. However, you can allow for this condition when you manually configure Oracle service groups.

## Oracle Disk Manager (ODM)

Oracle Disk Manager uses the Quick I/O driver for asynchronous I/O. Do not turn off the Quick I/O mount option, which is the default.

## Storage Checkpoints and Database FlashSnap

The following are limitations of Storage Checkpoints and Database FlashSnap:

- You cannot create a clone database using a mounted Storage Checkpoint.
- If you create an Oracle instance using the `spfile` option, you must run the `dbed_update` command before you can successfully perform any Storage Checkpoint or Database FlashSnap functions.
- Storage Checkpoints require file system layout version 6 or 7. Use the `vxupgrade(1M)` command to check the current layout version and to change the layout version if necessary. When upgrading a CFS file system, issue the command from the primary node.  
**Note:** After you upgrade a system to layout version 6 or 7, the file system is no longer compatible with older VxFS file systems.
- When cloning a database using Database FlashSnap, the Oracle database must have at least one mandatory archive destination. For more information about Oracle parameters for archiving redo logs, see your Oracle documentation.
- For an Oracle RAC database, the `dbed_vmsnap`, `dbed_vmclonedb`, and `dbed_vmchecksnap` commands must be run on the CVM master node. Also, only online snapshots are supported, which means the database instance should be up and running on the master node where validation is performed.
- After running `dbed_vmsnap -o reverse_resync_commit`, your primary database is started using a `pfile`. If your original primary database used an `spfile`, you need to shut down the database and restart it using the `spfile`. Then, run `dbed_update` to update the repository.
- The Database FlashSnap feature does not support RAID-5 volumes.
- The Storage Checkpoint and Database FlashSnap features of SF Oracle RAC do not support the GUI of the Veritas Storage Foundation for Oracle product.
- SF Oracle RAC does not support the Veritas FlashSnap agent for Symmetrix (EMC TimeFinder) mapping functionality (package: `VRTSfas`).

## Installation notes

The following information includes guidelines, tips, and other considerations for installing the product.

### Storage Foundation for Oracle RAC packages

Storage Foundation for Oracle RAC is a licensed product. The *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide* describes how to obtain a license that applies for Veritas Storage Foundation for Oracle RAC, Veritas Volume Manager, Veritas File System, and Veritas Cluster Server.

### Software installed for Storage Foundation for Oracle RAC

The software components installed by the Veritas Storage Foundation 5.0 for Oracle RAC installation utility, `installsfrac`, include:

- Veritas Storage Foundation for Oracle RAC
- Veritas Cluster Server (VCS)
- Veritas Volume Manager (VxVM)
- Veritas Group Lock Manager
- Veritas File System (VxFS)
- Veritas extension for Oracle Disk Manager (ODM)
- Veritas Cluster Server agent for Oracle

## Operation notes

The following information includes guidelines, tips, and other considerations for operating the product. See the *Storage Foundation for Oracle RAC Installation and Configuration Guide* for complete procedures.

### Enabling fencing

When the product installer completes installation of SF Oracle RAC, I/O fencing is disabled on all cluster nodes. Symantec does not support using SF Oracle RAC with I/O fencing disabled. See the *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide* for details on configuring I/O fencing in a cluster environment.

## Known issues

The following issues were reported for this release:

### Configuring an Oracle 10g database under VCS control

#### Disabling CRS for Veritas agent for Oracle

The Veritas agent for Oracle can control an Oracle 10g database, providing in-depth monitoring capability. Before using the agent, disable CRS control of the database. Refer to the following TechNote on the Technical Support website for details: <http://support.veritas.com/docs/275388>.

#### Oracle 10.1.0.3 databases created by DBCA may fail on reboot

When a cluster runs an Oracle 10g (10.1.0.3) database created by the Oracle Database Creation Assistant (DBCA), shutting down or rebooting one node may kill the database instances on other nodes. This problem occurs when CRS control of the database is disabled. The 10.1.0.4 release is addressing this issue.

**Workaround:** Refer to the following TechNote on the Technical Support website for the latest information on this problem:

<http://support.veritas.com/docs/275388>.

### Handling of RAW files with ODM enabled for Oracle 10g

Oracle can use RAW files for data files, control files and redo logs. Previously, the SQL REUSE clause was ignored if the associated file was a RAW file. From Oracle 10g onwards, the REUSE clause of SQL is mandatory when Oracle Disk Manager (ODM) is enabled.

**Workaround:** To create database files on raw volumes, you must set the REUSE option in the SQL commands. For examples of error messages and SQL workarounds, see the following Technical Support TechNote:

<http://support.veritas.com/docs/283362>

### Wizard requirements for Oracle database and binaries

The wizard requires the Oracle database and Oracle binaries exist in separate file systems.

## Bringing CVMVolDg resource online after stopping VCS with -force

If you stop VCS with the `-force` option, CVMVolDg resources in service groups other than the `CVM` service group do not start when you restart VCS. You must manually bring the CVMVolDg resource online:

```
# hares -online cvmvoldg_resource -sys node_name
```

In service groups other than the `CVM` service group, volume resources for the CVMVolDg resource remain running after you issue the `hastop -force` command. This situation occurs even though you must bring the CVMVolDg resource online.

## Deporting and importing of shared disk groups

If you manually deport a shared disk group, the CVMVolDg agent does not automatically reimport it as a shared group. You must manually reimport it as a shared group.

## Importing shared disk groups after a reboot

CVM may not successfully import shared disk groups after a cluster node completes a reboot. The CVM disks appear in the `ERROR` state instead of the `ONLINE` or `ONLINE SHARED` state.

Run the `vxdisk scandisks` command to clear the `ERROR` state. You can then restart CVM and import the shared disk groups.

## The vxfcntlshdw command requires "+ +" in /.rhosts file

The `vxfcntlshdw` command requires `remsh` permissions to all cluster nodes, including the one on which you run the command. The `/.rhosts` file must contain a "+ +" character in the first line.

## Removal of SF Oracle RAC configuration files

If any of the following configuration files are present prior to running the `installer` utility, move or rename the files:

- `/etc/llttab`
- `/etc/llthosts`
- `/etc/gabtab`
- `/etc/vcsmmtab`
- `/etc/vxfendg`
- `/etc/VRTSvcs/conf/config/main.cf`

## Stopping cluster nodes configured with I/O fencing

The I/O fencing feature protects against data corruption resulting from a failed cluster interconnect or “split brain.” See “VCS Communications, Membership, and I/O Fencing” in the *VCS User’s Guide* for details on the problems a failed interconnect can create and the protection I/O fencing provides.

I/O fencing uses SCSI-3 Persistent Reserve keys to implement data protection. The software places keys on I/O fencing coordinator and data disks. The administrator must be aware of several operational changes needed when working with clusters protected by I/O fencing. Specific shutdown procedures ensure keys are removed from coordinator disks and data disks to prevent possible difficulties with subsequent cluster startup.

Using the `reboot` command rather than the `shutdown` command bypasses shutdown scripts and can leave keys on the coordinator disks and data disks. Depending on the order of reboot and subsequent startup events, the cluster might warn of a possible split brain condition and fail to start up.

**Workaround:** Use the `shutdown -r` command instead of the `reboot` command to perform a graceful reboot for systems.

## Accessing version 7 file system when removing VxFS

A disk layout version 7 file system created with VxFS 5.0 software is not accessible if you remove the VxFS 5.0 software and revert the system to VxFS 3.5 or 4.1. In addition, if a disk layout version 7 file system exists on a boot disk and you remove the VxFS 5.0 software, the host does not reboot successfully and remains at the `bcheckrc` prompt. To reboot the host successfully, first edit the `fstab` file and comment out entries for disk layout Version 7 file system.

## Changing the Veritas agent for Oracle error handling

The Veritas agent for Oracle provides enhanced handling of Oracle errors encountered during detailed monitoring. The agent uses the reference file, `oraerror.dat`, which provides a list of Oracle errors and actions to address the errors. Refer to the *Veritas High Availability Agent for Oracle Installation and Configuration Guide* for a description of the actions.

Currently, the file specifies the NOFAILOVER action for the following Oracle errors:

```
ORA-00061, ORA-02726, ORA-6108, ORA-06114
```

The NOFAILOVER action means the agent sets the resource state to OFFLINE and freezes the service group.

You can stop the agent, edit `oraerror.dat`, and change the NOFAILOVER action to another action that is appropriate for your environment. The changes go into effect when you restart the agent.

## Japanese VEA does not display correctly on English Windows

To avoid garbled characters, do not change the font setting in the **Preference** dialog box when using the VEA client in non-English locale (including MUI).

**Workaround:** Under the Windows multilingual user interface (MUI), change the user interface language using the “User Locale” setting. Do not change the language using the “UI Language” setting under “Regional Settings” in the Control Panel.

## Stopping VCS does not unregister port f from GAB membership

In an SF Oracle RAC cluster with all the CFS resources under VCS control, when you stop VCS, all the CFS resources must go down cleanly and CFS must unregister port f from GAB membership.

Oracle 10g Cluster Ready Services (CRS) does not clean up all its processes when it is stopped. Now, when you stop VCS, all the CFS resources go down. However, due to the left over Oracle processes, CFS does not unregister port f from GAB membership.

**Workaround:** Perform the following steps to bring down port f.

- 1 Kill all the Oracle processes.
 

```
# kill -9 `ps -u oracle|awk '{print $1}'`
```
- 2 Unregister port f from GAB membership.
 

```
# fsclustadm cfsdeinit
```

## CVM disks get stuck in an error state

CVM disks might get into an error state in some scenarios. For instance, the disk might get into an error state after a reboot of the cluster nodes. It might also happen when a disk group is deported and then imported.

**Workaround:** Perform the following steps to bring the CVM disks online.

- 1 Run the following command on any of the cluster nodes to stop VCS.
 

```
# /opt/VRTSvcs/bin/hastop -all
```
- 2 Run the following commands on each cluster node to clear the error state of the disks.
 

```
# vxdisk -a online
# vxdisk scandisks
```
- 3 Create a file that has all the VxVM disk names with the complete path. For example, /dev/rdisk/c4t1d2.
- 4 Check for SCSI keys on the VxVM devices.
 

```
# vxfenadm -g all -f disk_filename
```

where *disk\_filename* is a file that contains all of the fully qualified path to each disk.

- 5 Register with the disks in the *disk\_filename*.  
`# vxfenadm -m -k <key> -f disk_filename`
- 6 Remove the SCSI keys on the VxVM devices:  
`# vxfenadm -p -k <key> -v victim_node_key -f disk_filename`  
where *victim\_node\_key* is the SCSI key listed while running the command in [step 4](#).  
Repeat the step till all the SCSI keys are cleared.
- 7 Remove the key registered in [step 5](#).  
`# vxfenadm -x -k <key> -f disk_filename`
- 8 Run the following command on each of the cluster nodes to start VCS.  
`# /opt/VRTSvcs/bin/hastart`



# Documentation

Product guides are available on the documentation disc in PDF and HTML formats. We recommend copying pertinent information, such as installation guides and release notes, from the disc to your system directory `/opt/VRTS/docs` for reference.

## Storage Foundation for Oracle RAC Documentation Set

Document Title	File Name
Veritas Storage Foundation for Oracle RAC	
<i>Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide</i>	<code>sfrac_install.pdf</code>
<i>Veritas Storage Foundation for Oracle RAC Release Notes</i>	<code>sfrac_notes.pdf</code>
Veritas Cluster Server	
<i>Veritas Cluster Server Installation Guide</i>	<code>vcs_install.pdf</code>
<i>Veritas Cluster Server Release Notes</i>	<code>vcs_notes.pdf</code>
<i>Veritas Cluster Server User's Guide</i>	<code>vcs_users.pdf</code>
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	<code>vcs_bundled_agents.pdf</code>
<i>Veritas Cluster Server Agent Developer's Guide</i>	<code>vcs_agent_dev.pdf</code>
<i>Veritas Cluster Server Enterprise Agent for Oracle Installation and Configuration Guide</i>	<code>vcs_oracle_install.pdf</code>
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<i>Veritas Storage Foundation Intelligent Storage Provisioning Solutions Guide</i>	<code>sf_isp_solutions.pdf</code>
<i>Veritas Volume Manager Cross-platform Data Sharing Administrator's Guide</i>	<code>sf_cds_admin.pdf</code>
<i>Veritas FlashSnap Point-in-Time Copy Solutions Administrator's Guide</i>	<code>flashsnap_admin.pdf</code>
Veritas Volume Manager	
<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>
Veritas File System	
<i>Veritas File System Administrator's Guide</i>	<code>vxfs_admin.pdf</code>

## Fixed issues

The following issues were corrected for this release. Fixed issues and software enhancement requests are referenced by incident number.

Incident number	Description
596047	vcsmmconfig -c hangs if the max slave parameter value differs from running cluster
595651	vcsmmdebug -s results in segmentation fault
587999	lmx unload may panic the machine after heavy lmx buffer transfers
579175	Oracle instance hangs during peak load
568762	IPC throws "NCON" messages in Oracle alert logs
538897	vcsmm panics when process registers as slave with two primaries
535866	Port 'o' does not join after the reboot since module fails to load
534950	Fencing shuts down the larger cluster after a splitbrain
525049	vcsmm may panic the machine due to bug in its kernel logging
520819	vcsmm can miss a wakeup and this may result in oracle hang
509099	vcsmm unconfiguration fails with "Device busy" error
506182	Add support for CRS online/offline through VCS

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### TAO

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

Douglas C. Schmidt

Apache Commons-Collections

Apache Commons-dbc

Apache Common Logging

Apache Jakarta Commons

Apache Lucene

Apache Portable Runtime

Apache Snmp4j - The Object Oriented SNMP API for Java

Apache Spring Framework

Apache Struts

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### Expat XML Parsing Library

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## MD5c.c

## 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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Compress-Zlib-1.41

Crypt-CBC-2.17

File-Spec-0.90

IO-String-1.06

IO-Tty-1.02

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Log dispatch perl module

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MIME-Base64-3.07

HTML-Tagset-3.10

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Net-DNS-0.49

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Proc-Background-1.08

Test-Plan-0.02

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Time zone info

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