

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

Linux

5.0



# Veritas Storage Foundation for Oracle RAC Release Notes

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Storage Foundation 5.0 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 Red Hat Enterprise Linux 4.0 and SUSE Linux Enterprise Server 9 (on x86\_64 architectures). 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/281993>

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

We offer the following new features in this release of Storage Foundation for Oracle RAC. See the *Installation and Configuration Guide* for details.

- Fencing with DMP disks
- Support for Oracle 10g Release 2

## 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	SFRAC space requirement: <ul style="list-style-type: none"> <li>■ total: 2.6 G</li> <li>■ /opt: 1.4 G</li> <li>■ /usr: 200 KB</li> <li>■ /tmp: 512 MB</li> <li>■ /var: 32 MB</li> <li>■ /var/tmp: 700 MB</li> </ul>
Swap space	Two times the main memory.

## Supported hardware

Review the current compatibility list to confirm compatibility of your hardware:  
<http://support.veritas.com/docs/283161>

## Supported software

### Linux operating systems

Within a cluster, all nodes must use the same operating system version and patch level. Software support for this release includes the following Linux operating systems and kernel binaries distributed by Red Hat and SUSE

Operating System	Architecture	Kernel
Red Hat Enterprise Linux 4 Update 3	x86_64 Intel Xeon, AMD, Opteron	2.6.9-34EL 2.6.9-34.ELsmp 2.6.9-34ELlargesmp
SUSE Linux Enterprise Server 9 Service Pack 3	x86_64 Intel Xeon, AMD, Opteron	2.6.5-7.244-smp 2.6.5-7.244-default

If your system is running an older version of Red Hat Enterprise Linux or SUSE Linux Enterprise Server, you must upgrade Linux before installing the SF Oracle RAC software. Consult your Linux documentation for information on upgrading your system.

For RHEL4, disable SELinux (Security Enhanced Linux) and Firewall during OS installation.

For SLES9, do not use the auditing subsystem. ODM is not compatible with the auditing subsystem on SLES 9.

### 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 Oracle software in the following combinations:

Oracle Version	RHEL 4.0 Update 3 x86_64	SLES9 SP3 x86_64
Oracle 9i Release 2 9.2.0.7	Yes	No
Oracle 10g Release 1 10.1.0.5	No	Yes
Oracle 10g Release 2 10.2.0.2	Yes	Yes

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

<http://support.veritas.com/docs/281993>

## Required patches

### Linux operating system patches

Install the updates listed below before installing SF Oracle RAC.

- Red Hat Enterprise Linux 4 (RHEL 4): Update 3
- SUSE Linux Enterprise Server 9 (SLES 9): SP3

### Oracle software patches

Oracle9i Release 2 (9.2.0.7) on Red Hat Enterprise Linux 4.0 requires a number of patches. These patches, and other manual steps that need to be executed before installing Oracle, are available at the Oracle metalink site.

## No longer supported

Support is no longer provided for:

- Oracle 9i Release 1
- x86 (32-bit) architecture
- IA 64 architecture



# Software limitations

The following limitations apply to this release.

## Non-global zones

Storage Foundation for Oracle RAC is not supported on non-global zones.

## 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`.

## Volume Manager in a shared disk environment (CVM)

Volume Manager cluster functionality does not support software RAID 5.

## 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 Storage Checkpoint and Database FlashSnap features of SF Oracle RAC do not support the GUI of the Veritas Storage Foundation for Oracle product.
- The Database FlashSnap feature does not support RAID-5 volumes.

# Installation notes

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

## Setting the environment variable LD\_ASSUME\_KERNEL

Setting the environment variable LD\_ASSUME\_KERNEL=2.4.19 may be required for some Oracle tasks. Set the variable manually. Do not set this variable in the profile of root user. Doing so may result in SF Oracle RAC processes terminating abnormally.

## 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.

### Infrastructure packages installed

The installer checks for the presence of the infrastructure packages, `VRTSvlic` (Veritas Licensing) and `VRTScpi` (Veritas Product Installer). If they are not present, or if they are present but not the correct version, they will be installed.

### Software installed for Storage Foundation for Oracle RAC

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

### Kernel warning messages when Veritas modules load

For SLES9 SP3, a warning message resembling the following may be displayed in the console or the system log when Veritas modules are loaded into the kernel.

```
Warning: module not supported by Novell, setting U
taint flag. module license 'Proprietary. Send bug
reports to support@veritas.com' taints kernel.
```

These warning messages are displayed because the Veritas modules are proprietary. They can safely be ignored.

### Installation fails while starting the CFS agents

The installation of Storage Foundation for Oracle RAC may fail if the system names provided during installation do not match the actual host names of the cluster systems. The failure occurs while attempting to start the CFS agents.

#### To resolve system name mismatch

- 1 Uninstall the Storage Foundation for Oracle RAC product.
- 2 Reinstall using the correct host names of the cluster systems.

## Network interfaces change their names after restart

On SUSE systems, network interfaces change their names after restarting even with `HOTPLUG_PCI_QUEUE_NIC_EVENTS=yes` and `MANDATORY_DEVICES="..."` set.

**Work around:** Use `PERSISTENT_NAME= ethX` where X is the interface number for all interfaces. For more details see the *Storage Foundation for Oracle RAC Installation and Configuration Guide*.

## Wizard does not detect preconfigured PrivNIC resources

The VCS Oracle 10g RAC wizard does not properly detect PrivNIC resources if they are already set up. If PrivNIC is already configured, you must remove the `ora_priv` resource from `main.cf`.

## CRS resources go into UNKNOWN state after reboot

After reboot, CRS resources (`gsd`, `ons`, instances, listeners) may display UNKNOWN state.

To resolve this issue, do one of the following:

- Stop and start CRS with: `/etc/init.d/init.crs`
- stop the UNKNOWN resources one by one and start them with: `$(CRS_HOME)/bin/crs_start`

This problem is identified as bug in Oracle. For further information on this bug, contact Oracle support.

## Disabling CRS for Veritas agent for Oracle

The Veritas high availability agent for Oracle can control an Oracle 10g database, providing in-depth monitoring capability. Before using the Veritas 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>.

## 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>

## Database recovery may fail with `dbed_vmclonedb -o recoverdb`

Recovering a database with `dbed_vmclonedb -o recoverdb` produces the following error message:

```
SFORA dbed_vmclonedb ERROR V-81-4918 Database has not been correctly recovered
```

**Workaround:** To recover the clone database, mount the database with `dbed_vmclonedb -o mountdb` and then do the recovery manually. After doing manual recovery, run `dbed_vmclonedb -o update_status` to update the repository.

## Error message on Red Hat for `dbed_vmchecksnap` and `dbed_vmsnap`

In an Oracle RAC environment on Red Hat, `snapplan` validation succeeds but also produces the following error:

```
valid_dg_info: /opt/VRTS/bin/dbed_vmchecksnap[2011]: [: MASTER: unexpected
```

**Workaround:** Create a link to `/usr/bin/grep` for `/bin/grep`.

## Avoid using `lltconfig -u` in an Oracle 10g RAC environment

Using `lltconfig -u` in an Oracle 10g RAC environment to unconfigure a link with Oracle's private IP address plumbed on it prevents the `PrivNIC` agent from failing over this IP address. This usage may result in a machine reboot by the Oracle CRS.

## Netdump - Network console and crash dump facility

Symantec advises that `netdump` to be installed and configured on all Red Hat and SUSE installations. This is not specifically for the Veritas product stack, but because this is recommended as good systems administration practice.

For information on `netdump` installations for Red Hat systems, see:

<http://www.redhat.com/support/wpapers/redhat/netdump/>

For information on `netdump` installations for SUSE systems, see:

</usr/share/doc/packages/lkcdutils/README.SuSE>

## SCSI reservation errors during bootup

If you reboot a node of an SF Oracle RAC cluster, SCSI reservation errors may be observed during bootup. For example:

```
Nov 23 13:18:28 galaxy kernel: scsi3 (0,0,6) :  
RESERVATION CONFLICT
```

This message is printed for each disk that is a member of any shared disk group which is protected by SCSI-3 I/O fencing. The message may be safely ignored.

## I/O fencing module may not be able to write the reservation keys

If you exit the product installer without stopping all the SF Oracle RAC components, you may encounter problems with the I/O fencing module, `vxfen`.

**Workaround:** If `vxfen` has problems coming up after the reboot, SCSI-3 PR registration keys should be fixed using `vxfenclearpre` command. See the *Storage Foundation for Oracle RAC Installation and Configuration Guide*.

## 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 that the agent sets the state of the resource 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.

# 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>
Veritas Storage Foundation	
<i>Veritas Storage Foundation Release Notes</i>	<code>sf_notes.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
595651	The <code>vcsmmddebug</code> command with <code>-s</code> option gives segmentation fault.
596047	The <code>vcsmmconfig -c</code> command hangs if <code>mm_slave_max</code> parameter value on the newly joining node does not match with that of the existing nodes.
542851	Command <code>vcsmm unconfigure</code> fails due to leftover Oracle processes.
538897	Panic in VCSMM driver when processing second deregistration request for the same process.
534950	Fencing shuts down the larger cluster after a split brain.
515274	Installer unable to back up Oracle membership and IPC libraries.
516131	Database startup may fail.
496151	Infinite start check loop in <code>init.cssd</code> .
346204]	Error messages in uninstaller log.
303864	Wizards do not start if the <code>/etc/hosts</code> file contains ipv6 entries.



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## Apache Commons-dbcp

## 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

## Apache Tomcat

## Xerces C++

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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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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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