

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

Solaris

5.0



# Veritas Storage Foundation for Oracle RAC Release Notes

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## Storage Foundation for Oracle RAC

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20330 Stevens Creek Blvd.  
Cupertino, CA 95014  
[www.symantec.com](http://www.symantec.com)

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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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For technical assistance, visit <http://support.veritas.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.



# Veritas Storage Foundation for Oracle RAC Release Notes

This document provides important information regarding Veritas™ Storage Foundation for Oracle RAC (SF Oracle RAC) for Solaris. 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/281987>

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
- Compliance with Solaris JumpStart technology

## 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 Gigabit Ethernet using enterprise-class switches for the private links. The 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).

Item	Description
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

### Solaris operating system and patches

Within a cluster, all nodes must use the same operating system version and patch level. Run SF Oracle RAC on these operating systems at the required patch levels.

- Solaris 10
- Solaris 9
- Solaris 8

Some required operating system patches may already be present on your system. Use the `showrev -p` command to display the patches on your system. If the Solaris patches in the following list are not already installed on your system, install the patches before installing SF Oracle RAC:

- Solaris 10: 119254-06
- Solaris 9: 116670-04, 112964-07
- Solaris 8: 111413-06, 108993-18, 108528-18

## Veritas software

Only versions of VCS, VxVM, and VxFS provided on the software disc are supported. Other versions must be removed before the software from the Veritas Storage Foundation for Oracle RAC software disc is installed.

## 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/281987>

## Oracle software patches

- Oracle 10g Release 1: requires Oracle Patches 4435949, 4637591, 5082958
- Oracle 10g Release 2: requires Oracle Patch 4637591

## No longer supported

Support is no longer provided for:

- Oracle 9i Release 1

## 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.

## 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.

## 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.

## 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.

### 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 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

## Solaris JumpStart

To use Solaris JumpStart to install SF Oracle RAC, use the following procedure.

For JumpStart instructions:

See the documentation that came with your Solaris operating system software.

### To install SF Oracle RAC using Solaris JumpStart

- 1 List the SF Oracle RAC packages and their installation order.

```
# cd /cdrom/dvd1/storage_foundation_for_oracle_rac
# ./installsfrac -installpkgs
```

On the SF Oracle RAC DVD-ROM these packages are in the tar gzip format.

- 2 Copy these files on to the jumpstart server and expand them.

- 3 Create an `admin_file` on your JumpStart server with the following contents:

```
mail=
instance=overwrite
partial=nocheck
runlevel=quit
idepend=quit
rdepend=nocheck
space=quit
setuid=nocheck
conflict=nocheck
action=nocheck
basedir=default
```

- 4 Add a command to your JumpStart script for each of the SF Oracle RAC package using one of the following:

- If there is no response file:

```
# pkgadd -R /pathname -a admin_file -d pkg_dir package
```

- If there is a response file:

```
# pkgadd -n -R /pathname -a admin_file -d pkg_dir \
-r package.response_file package
```

- 5 The following packages need empty response files:

```
VRTSdcli
VRTSjre
VRTSvsvc
VRTSvxxm
VRTSweb
```

To create an empty response file:

```
# touch package.response_file
```

- 6 The following packages need the following values in the corresponding response files:

```
VRTSobc33
VXPALSECURITY=n
```

```

VXPALLOCALHOSTNAME=
VXPALDOMAINCONTROLLER=
VXPALAUTHENTICATIONBROKER=
VRTSob
SECURITYADMINPASSWORD=
ROOTAGENTPASSWORD=
CONFIGURESECURITY=n
VRTSvdid
OPT=/opt
VRTScssim
PKGDIR=VRTScssim
BASEDIR=/opt

```

### To configure SFRAC

- 1 Add the SF Oracle RAC license.
 

```
# cd /cdrom/dvd1/storage_foundation_for_oracle_rac
# ./installsfrac [-rsh] -license
```
- 2 Invoke the installsfrac script to configure SF Oracle RAC.
 

```
# ./installsfrac [-rsh] -configure
```

## Installing on an alternate root

To install SF Oracle RAC on an alternate root using the installer, use the following procedure.

### To install the packages on alternate root

- 1 Verify that the Solaris OS is installed on the alternate root.  
For example: /dev/dsk/c0t8d0s0.
- 2 Mount your alternate root disk to a mount point (on all nodes).
 

```
# mkdir /disk1
# mount /dev/dsk/c0t8d0s0 /disk1
```

 The mount point must be by the same name on all systems.
- 3 Start the installer with the -rootpath option.
 

```
# cd /cdrom/dvd1/storage_foundation_for_oracle_rac
# ./installsfrac [-rsh] -rootpath /disk1
```

### To configure SFRAC

- 1 Restart the systems with the new root (disk1).
- 2 Add the SF Oracle RAC license.
 

```
# cd /cdrom/dvd1/storage_foundation_for_oracle_rac
# ./installsfrac [-rsh] -license
```
- 3 Invoke the installsfrac script to configure SF Oracle RAC.
 

```
# ./installsfrac [-rsh] -configure
```

## 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:

### Issues affecting Oracle 10g Release 2

#### VIP Configuration Assistant

During Oracle 10g Release 2 installation, the VIP Configuration Assistant may fail with the following error message: "(e.g. hme0) is not a public interface."

**Workaround:** Invoke the vipca utility manually.

#### Oracle Cluster Verification Utility Warning message

During the final stage of Oracle 10g Release 2 installation, you may receive a warning message with the Oracle Cluster Verification Utility.

**Workaround:** You can safely ignore this message.

#### Database Configuration Assistant

The Database Configuration Assistant utility displays the error, "SGA size cannot be greater than maximum shared memory segment size (0)."

**Workaround:** Ignore this message and manually configure the database memory parameters for Oracle. In the **Memory** tab of the Oracle Database Creation Assistant (DBCA), select a **Custom** and **Manual** shared memory management configuration and enter the appropriate values.

## GAB and LLT kernel modules are still loaded after uninstallation

After a successful uninstallation of SF Oracle RAC, the GAB and LLT kernel modules are still loaded.

## The `vxfsentsthdw` command requires "+" in `/.rhosts` file

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

## 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 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>.

### 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>

## Stopping CRS before stopping VCS in Oracle 10g clusters

In SF Oracle RAC clusters with Oracle 10g, stop the CRS daemons before using the `hastop -all` command to stop VCS. The required sequence of commands is:

- 1 Stop Oracle on each node:
 

```
# hagrps -offline oracle_group -sys -system_name
```
- 2 Stop the CRS daemons on each node:
 

```
# /etc/init.d/init.crs stop
```
- 3 Stop VCS. From one node, type:
 

```
# hastop -all
```

To enable VCS to stop CRS daemons, refer to the information on configuring VCS service groups for Oracle 10g in the *Veritas 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.

## 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 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.

## Storage Foundation for Oracle RAC in Japanese locales

### Japanese VEA may not display properly on English Windows

To avoid garbled characters, do not change the font setting in the “Preference” dialog box when using the VEA client in a non-English locale.

**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.

### CRS may not work on Japanese OS

Cluster Ready Service (CRS) does not work properly on the Japanese operating system.

**Workaround:** Edit the following scripts:

```
/opt/ORCLcluster/bin/clsinfo  
/opt/ORCLcluster/bin/clspvtname
```

- 1 For each script containing the following first line:

```
#!/bin/sh
```

add these lines below the first line:

```
LANG=C  
export LANG
```

- 2 Save and close the files.



# 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>
<i>Veritas Storage Foundation Installation Guide</i>	<code>sf_install.pdf</code>
<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
569071	Increase the lmx_max_buffer default value from 500 to 1000.
544172	Utility to get the Oracle IPC version number at the time of configuration.
542004	IPC library for Oracle 10gR2 gives ORA-27504: IPC error creating OSD context.
520193	Change of naming, build scheme for IPC libraries for Oracle.
512383	Changes to IPC for Oracle 10gR2 and oracle 9.2.0.7.
511554	Enhancements to the SF Oracle RAC installer
492961	Changes to IPC for 10gR2.
425505	LMX: Adding support of protocol versioning in LMX header.

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## 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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## 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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Archive-Tar-1.24

Compress-Zlib-1.41

Crypt-CBC-2.17

File-Spec-0.90

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