Veritas Storage Foundation™ for Oracle® RAC Release Notes

AIX

5.0 Maintenance Pack 3

symantec™

Veritas Storage Foundation for Oracle RAC Release Notes

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Product version 5.0MP3

Documentation version 5.0MP3.0

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About this release

This document includes the following topics:

About Veritas Storage Foundation for Oracle RAC

Veritas Storage Foundation™ for Oracle® Real Application Clusters (RAC) is an integrated set of software products. It enables administrators of Oracle 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.

Storage Foundation for Oracle RAC (SF Oracle RAC) includes the following components:

Cluster Volume Manager	Enables simultaneous access to shared volumes based on technology from Veritas Volume Manager (VxVM).
Cluster File System (CFS)	Enables simultaneous access to shared file systems based on technology from Veritas File System (VxFS).
Veritas Cluster Server (VCS)	Enables management of Oracle RAC databases and infrastructure components based on technology from Veritas Cluster Server.
Database Accelerator	Provides the interface with the Oracle Disk Manager (ODM) API.
RAC Extensions	Manages cluster membership and communications between cluster nodes.

For more information on the SF Oracle RAC components, see the following documents:

Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide

Veritas Storage Foundation for Oracle RAC Administrator's Guide

About SF Oracle RAC Release Notes

This document provides important information regarding SF Oracle RAC 5.0 Maintenance Pack 3. Review this document before you install or upgrade SF Oracle RAC.

For the latest information on updates, patches, and software issues of this release, see the TechNote on the Symantec Enterprise Support website:

http://entsupport.symantec.com/docs/282024

The document also covers important, though not comprehensive, information about issues pertaining to component products of SF Oracle RAC. For comprehensive information about the component products, refer to the appropriate product documentation.

For information regarding software limitations, fixed issues, and known issues of Veritas Cluster Server:

See *Veritas Cluster Server Release Notes*.

For information regarding software limitations, fixed issues, and known issues of Storage Foundation:

See *Veritas Storage Foundation Release Notes*.

Changes in SF Oracle RAC 5.0 MP3

This section describes the list of changes in SF Oracle RAC 5.0 MP3. For more information on the features, see *Veritas Storage Foundation for Oracle RAC Administrator's Guide*.

For the latest information on support for Oracle database versions, see the Veritas Technical Support TechNote:

http://entsupport.symantec.com/docs/280186

Support for Oracle RAC 11g Release 1

SF Oracle RAC now supports Oracle RAC 11g Release 1.

See "Supported software" on page 17.

Support for MultiPrivNIC

MultiPrivNIC monitors multiple IP addresses configured over multiple private links. When a private link breaks down, it fails over the configured IP addresses on these links to another link with maximum node visibility. This ability to manage multiple links by configuring a single resource reduces the number of active agents and resources within SF Oracle RAC.

Support for MultiPrivNIC agent

The MultiPrivNIC agent provides resources for UDP/IP support for Oracle RAC 11g cache fusion capabilities. Symantec recommends adding all LLT private interfaces to the MultiPrivNIC resource.

Support for hardware-based replication

SF Oracle RAC now supports hardware-based replication technologies to replicate data from a primary array to a secondary array.

Table 1-1 lists the technologies and the supporting agents.

Table 1-1   Hardware-based replication technologies

Replication technology	Supporting agents
EMC SRDF	SRDF

Table 1-1   Hardware-based replication technologies *(continued)*

Replication technology	Supporting agents
EMC Mirror View	MirrorView
Hitachi True Copy	HTC
IBM Metro Mirror	MetroMirror
IBM SVC	SVC CopyServices
Oracle Data Guard	Oracle Data Guard

Support for Database Dynamic Storage Tiering

SF Oracle RAC now supports configuration of Database Dynamic Storage Tiering (DST) with SF Oracle RAC for efficient and cost-effective management of data. DST enables the database administrator to manage data in a way that ensures less frequently used data is stored on slower, less expensive disks. This permits frequently accessed data to be stored on faster disks for quicker retrieval.

Support for Veritas Cluster Server Fire Drill

SF Oracle RAC now supports Veritas Cluster Server (VCS) Fire Drill that enables organizations to validate the ability of business-critical applications in resuming operations at hot standby data centers following critical outages and disasters.

Fire Drill automates creation of point-in-time snapshots and testing of the applications that use the replicated data in the event of a site-to-site application failover, often referred to as an High Availability Disaster Recovery (HA/DR) failover. All operations are managed within the VCS HA/DR framework through replication technologies that use VCS agents.

The Fire Drill setup wizard allows automated configuration of a Fire Drill. The resultant Fire Drill configuration is also fully customizable. The Fire Drill wizard is invoked from the disaster recovery site (Veritas Volume Replicator or hardware replication secondary) by executing the script /opt/VRTSvcs/bin/fdsetup.

Support for AIX version 6.1

SF Oracle RAC now supports AIX version 6.1.

See "Supported operating systems" on page 18.

Support for secure communication in global clusters

SF Oracle RAC now provides the option of making the following communications secure in global clusters:

■ Communication between wide-area connectors

■ Communication between wide-area connectors and the Steward process

Support for Automated Storage Management (ASM)

ASM is a feature of Oracle that provides an integrated cluster file system and volume management capabilities for Oracle database files. ASM may be configured with Veritas Volume Manager (VxVM) or Cluster Volume Manager (CVM) to take advantage of the volume management and dynamic multi-pathing (DMP) features of SF Oracle RAC.

Support for ASM agents

Symantec provides the following ASM agents for configuring Oracle ASM with Veritas Cluster Volume Manager:

ASM Instance agent	The ASM Instance agent (ASMInst) monitors the ASM instance, brings the instance online, or takes the instance offline.
ASM disk group agent	The ASM disk group (ASMDG) agent mounts, dismounts, and monitors the ASM disk groups required for ASM enabled databases.

Support for campus clusters using VxVM remote mirror configuration

You can now configure VxVM disk groups for remote mirroring in a campus cluster setup.

Supported Oracle versions on Storage Foundation database components

The Oracle versions supported on the Storage Foundation database components are as follows:

■ Oracle RAC 9i Release 2 (R2)

■ Oracle RAC 10g Release 1 (R1)

■ Oracle RAC 10g Release 2

■ Oracle RAC 11g Release 1

I/O fencing supports iSCSI devices

You can now use iSCSI devices as coordinator disks for I/O fencing. However, I/O fencing supports iSCSI devices only when you use DMP disk policy. Make sure that the /etc/vxfenmode file has the disk policy set to DMP before you use iSCSI devices as coordinator disks.

For the latest information on supported hardware visit the following URL:

http://entsupport.symantec.com/docs/283161

See the *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide* for instructions to configure I/O fencing using DMP policy.

Changes to I/O fencing commands

Following are the changes to the I/O fencing commands:

■ The `vxfentsthdw` command now supports –d option for dmp devices.

■ The `vxfenconfig -l` command lists the coordinator disks that the vxfen driver uses.

Refer to the corresponding manual pages for more information on the commands.

Support to replace coordinator disks in a running cluster

You can now replace the coordinator disks in a running cluster using the vxfenswap utility.

See the *Veritas Storage Foundation for Oracle RAC Administrator's Guide* for more details.

Changes in SF Oracle RAC 5.0 MP1 Update 1 for AIX 6.1

SF Oracle RAC 5.0 MP1 Update 1 for AIX 6.1 includes the following changes:

■ Support for AIX 6.1

■ For the latest information on support for Oracle database versions, see the following TechNote:
http://entsupport.symantec.com/docs/280186

Changes in SF Oracle RAC 5.0 MP1

SF Oracle RAC 5.0 MP1 includes the following changes:

■ VCS FEN error messages are now VXFEN error messages

■ For the latest information on support for Oracle database versions, see the
following TechNote:
http://entsupport.symantec.com/docs/280186

Features introduced in SF Oracle RAC 5.0

The following features were introduced in SF Oracle RAC 5.0:

■ Fencing with DMP disks

■ Support for Oracle RAC 10g Release 2

■ Support for up to 8 nodes. A typographical error in the SF Oracle RAC 5.0
Release Notes indicated 9 nodes.

Installation requirements

Make sure that each node on which you want to install or upgrade SF Oracle RAC
meets the following installation requirements:

■ Hardware requirements

■ Supported software

■ Supported operating systems

Before you install SF Oracle RAC, you must read the Late Breaking News TechNote:

http://entsupport.symantec.com/docs/282024

Hardware requirements

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

■ Review the current compatibility list to confirm compatibility of your hardware:
http://entsupport.symantec.com/docs/283161

■ Review recommendations in Oracle's documentation for your version of Oracle.

■ Review the hardware requirements for an SF Oracle RAC installation using
SCSI-3 disks.
Table 1-2 lists the hardware requirements.

Table 1-2   Hardware requirements

Item	Description
SF Oracle RAC systems	Two to eight systems with two or more CPUs at 2GHz or higher.
DVD drive	One drive that is accessible to all nodes in the cluster.
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).
	Note: The coordinator disk does not store data, so configure the disk as the smallest possible LUN on a disk array to avoid wasting space.
Disk space	See "Disk space (local)" on page 14.
RAM	Each SF Oracle RAC system requires at least 2 GB.
	Symantec recommends additional amount of at least twice the Oracle SGA size.
Swap space	The minimum requirement is 4 GB of swap space.
	Symantec recommends two times the size of RAM for swap space.
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. These links must be of the same type; you cannot mix 100BaseT and Gigabit.
	Symantec recommends Gigabit Ethernet using enterprise-class switches for the private links.
	You can also configure aggregated interfaces.
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.

Disk space (local)

Confirm that your system has enough free disk space to install SF Oracle RAC. You can evaluate your systems for available disk space by running the 'installmp' or the 'installsfrac' script with the '-precheck' option. The output of the script compares the required disk space against the available disk space on your system.

Use the 'installsfrac' script with the '-precheck' option if you are installing SF
Oracle RAC 5.0 MP3 or upgrading from version 4.x.

```
# ./installsfrac -precheck node_name
```

Use the 'installmp' script with the '-precheck' option if you are upgrading from
version 5.0x to SF Oracle RAC 5.0 MP3.

```
# ./installmp -precheck node_name
```

For example, to evaluate the system 'galaxy' for sufficient disk space before
upgrading from version 5.0 to SF Oracle RAC 5.0 MP3, run the following command:

```
# ./installmp -precheck galaxy
```

```
Veritas Maintenance Pack 5.0 Pre-Installation Check Program
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computer software" and "commercial computer software documentation" as
:
The following MP3 installation issues have been found on galaxy:
389518 KB is required in the /opt volume and
only 122216 KB is available on galaxy

844874 KB is required in the /usr volume and
only 436296 KB is available on galaxy

485767 KB is required in the /var volume and
only 473108 KB is available on galaxy

installmp log files are saved at /opt/VRTS/install/logs/installmp-y8ITho
---
```

You may also use the following information as a guideline to ensure that you have
sufficient local disk space to install the SF Oracle RAC filesets.

/opt	1.8 G
/usr	390 MB
/tmp	512 MB

/var	636 MB
/var/tmp	700 MB
/	120 MB
total	4.2 G

Additional space is required for Oracle. For details on the space required for Oracle, consult the Oracle documentation.

To check for current RAM, swap space, and /tmp

1   To check the current RAM installed on a system, enter the following command:

```
# /usr/sbin/lsattr -E -l sys0 -a realmem
```

If the current RAM is insufficient, you must install more memory before proceeding with the installation.

2   To check the amount of swap space configured for a system, enter:

```
# /usr/sbin/lsps -a
```

Symantec recommends two times the main memory for swap space. Additionally, refer to the Oracle documentation for recommendations on swap space.

Refer to the operating system documentation for information about configuring swap space.

See the *Oracle Database Administrator's Reference for UNIX* for more information.

3   To check for the current space available in the /tmp directory, enter:

```
 # df -k /tmp
```

If the space remaining in /tmp is insufficient, complete one of the following operations:

■   Delete unnecessary files in /tmp, and recheck the available space.

■   Extend the file system that contains the /tmp directory.

■   Set the TEMP and TMPDIR environment variables when setting the Oracle user's environment.

Supported software

Caution: SF Oracle RAC software must be at the same version across all nodes in an SF Oracle RAC cluster, in this case 5.0MP3++. All components and point products of SF Oracle RAC must be from the same version of the release, in this case 5.0MP3++.

Symantec strongly recommends upgrading all SF Oracle RAC component products to the same version at the same time. In a CVM/CFS environment, dependencies between SF Oracle RAC component products will not be met if you do not upgrade all components to the same version.

For information on upgrade options:

See the *Veritas Storage Foundation for Oracle RAC 5.0 MP3 Installation and Configuration Guide*.

Software versions that SF Oracle RAC supports include:

Oracle RAC	■ Oracle RAC 9i Release 2
	■ Oracle RAC 10g Release 1
	■ Oracle RAC 10g Release 2
	■ Oracle RAC 11g Release 1
AIX operating system	See "Supported operating systems" on page 18.
VCS, VxVM, VxFS, VVR	Use only versions of VCS, VxVM, VxFS, and VVR provided on the software disc. Remove other versions before you install the software from the SF Oracle RAC product disc.

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

http://entsupport.symantec.com/docs/280186

Oracle software patches

The following Oracle patches are mandatory for proper functioning of SF Oracle RAC.

Oracle RAC 10g Release 2 Patchset 1 (10.2.0.1)	Patch 4637591
	Patch 4435949
	Patch 5082958
Oracle RAC 10g Release 2 Patchset 2 (10.2.0.2)	Patch 4637591

Oracle RAC 10g Release 2 Patchset 3 (10.2.0.3)	Patch 4430244
	Patch 5752399
	Patch 5769259
	Patch 6613550 (AIX 6.1 only)
Oracle RAC 10g Release 2 Patchset 4 (10.2.0.4)	None
Oracle RAC 11g Release 1 Patchset 6 (11.1.0.6)	Patch 6849184
	Patch 6442900
	Patch 6792086

Additionally, see the Oracle documentation for other patches that may be required by Oracle for each release.

Supported operating systems

SF Oracle RAC can be installed on the following operating systems:

- AIX 5.3 TL7 SP2

- AIX 6.1 TL0 SP4

For the most current information on downloads, service pack availability, fixes, and other important issues related to 5.0 MP releases on AIX:

http://entsupport.symantec.com/docs/282024

At the time this document is published, AIX 6.1 supports only Oracle RAC 10g R2.

APAR and fileset information

You will need the following AIX filesets for Oracle installation:

- bos.adt.libm

- perfagent.tools

- bos.perf

- Java14

- rsct.core

- rsct.compat.basic

- rsct.compat.clients

- rsct.basic

- rsct.clients

The Veritas High Availability Agent for Oracle on AIX requires the following runtime fileset level for the xlC.rte filesets:

```
xlC.aix61.rte            9.0.0.1  COMMITTED  XL C/C++ Runtime for AIX 6.1
xlC.cpp                  9.0.0.0  COMMITTED  C for AIX Preprocessor
xlC.msg.en_US.cpp        9.0.0.0  COMMITTED  C for AIX Preprocessor
xlC.msg.en_US.rte        9.0.0.1  COMMITTED  XL C/C++ Runtime
xlC.rte                  9.0.0.1  COMMITTED  XL C/C++ Runtime
```

No longer supported

This section lists software versions and features that are no longer supported. Symantec advises customers to minimize the use of these features.

SF Oracle RAC does not support the following:

- Dissimilar version upgrades of SF Oracle RAC components
  For example, if you have SF Oracle RAC 4.1 installed with Oracle RAC 10g R2, you can not upgrade VCS to version 5.0 MP3.

- Oracle RAC 9i Release 1

- AIX 5.2

- Use of crossover cables
  Oracle no longer supports use of crossover cables.

Fixed issues

This section describes the list of issues fixed in SF Oracle RAC. The list includes the issues fixed in version 5.0 and later releases upto the current version. The issues are categorized on the basis of the release version and are referenced by the incident number.

For a list of additional issues fixed in this release, see the following TechNote:

http://entsupport.symantec.com/docs/285869

Issues fixed in SF Oracle RAC 5.0 MP3

Table 1-3 lists the issues fixed in SF Oracle RAC 5.0 MP3.

Table 1-3   SF Oracle RAC 5.0 MP3 fixed issues

Incident number	Description
853363	The VAIL Symmetrix provider now does not invoke the "symcfg discover" command during each polling discovery interval. The "symcfg discover" is run only when a user manually initiates the discovery of Symmetrix arrays.
	The discovery mode can now be set to discover only those LUNs or devices of the Symmetrix array that are mapped or masked to the host on which the VAIL array discovery is configured.
1284014	The lock "lmx_minor_lock" is now released before calling the function "lmx_aix_untimeout". This resolves the deadlock that caused the Oracle process to wait indefinitely in the function "lmx_aix_untimeout".
1044590	Failure of an Oracle instance on one node in the cluster does not adversely impact the other Oracle instances in the cluster.
1242220	Internal checks now ensure that the length of the spfile parameter 'instance_group' is restricted to 18 bytes even if Oracle appends SKGXN 'group_name' to the parameter.
900779	Oracle query in suspend mode no longer crashes Oracle. [Titan case: 320-018-260]
	For more information on the issue, refer to the *Veritas Storage Foundation Release Notes*.
1111678	DBED patch installation no longer fails on an AIX Trusted Computing Base enabled machine. [Titan case: 230-407-473]
	For more information on the issue, refer to the *Veritas Storage Foundation Release Notes*.

Issues fixed in SF Oracle RAC 5.0 MP1 Update 1 for AIX 6.1

Table 1-4 lists the issues fixed in SF Oracle RAC 5.0 MP1 Update 1 for AIX 6.1.

Table 1-4   SF Oracle RAC 5.0 MP1 Update 1 for AIX 6.1 fixed issues

Incident	Description
1049285	Closing a connection by invoking skgxpdis() results in ORA-0600 error if stale request handles (rqhs) associated with the connection (cnh) are not removed from doneq.
1053546	The cssd-monitor script fails to recognize the state of the CSSD resource in Oracle RAC 10g clusters running version 10.2.0.3.
1069665	The file IPCVERSION is overwritten due to parallel builds for different IPC libraries.
1096492	The function lmxupdate() calls the sleep() function.
1121569	An error in the function "VCSMM_BUSYUNLOCK" causes Oracle processes to fail.
1160712, 1014281	Oracle instances fail under high interconnect traffic with VCSIPC error 12.
1161581	When a node in a cluster crashes, the LMS process freezes in skgxpwait().
1169001	The SF Oracle RAC installer causes the Oracle RAC 10g R2 installation to fail.
1169887	The PrivNIC agent shows the state of a resource online even if the interface is not configured with LLT.
1194474	Running the SF Oracle RAC installer using the command "installsfrac - rsh -configure" fails to launch the Oracle 10.2.0.3 GUI installer.

Issues fixed in SF Oracle RAC 5.0 MP1

Table 1-5 lists the issues fixed in SF Oracle RAC 5.0 MP1.

Table 1-5   SF Oracle RAC 5.0 MP1 fixed issues

Incident	Description
626451	Sometimes, the VCS installer fails to display the global clustering configuration screen.
780737	The IPC library causes data corruption when the LMX helper thread is enabled.
790019	Performance degrades when the LMX helper thread is enabled.

Table 1-5   SF Oracle RAC 5.0 MP1 fixed issues *(continued)*

Incident	Description

850513	Oracle RAC 10.2.0.1 returns the following error in the alert log file when the helper thread is disabled:
	
	 `Errors in file /oracle/10g/rdbms/log/oce2_ora_1441964.trc:`
	 `ORA-00704: bootstrap process failure`

830225	The PrivNIC agent does not work with Oracle Clusterware.

Issues fixed in SF Oracle RAC 5.0

Table 1-6 lists the issues fixed in SF Oracle RAC 5.0.

Table 1-6   SF Oracle RAC 5.0 fixed issues

Incident	Description
496151	The clsinfo script is called frequently from /etc/init.cssd resulting in infinite startcheck loops in the init.cssd script.

Known issues

For Oracle issues:

See "Oracle issues" on page 22.

For SF Oracle RAC issues:

See "SF Oracle RAC issues" on page 25.

For Storage Foundation issues:

See "Storage Foundation issues" on page 31.

Oracle issues

This section describes the known issues of Oracle in this release.

Asynchronous I/O error messages on executing rootpre.sh script on AIX 6.1

The "Install Oracle Clusterware (CRS)" option does not check for the "Asynchronous I/O" package when using `installsfrac -configure` (ssh). [1201863]

Problem: When running the rootpre.sh program, messages like the following are displayed:

```
Configuring Asynchronous I/O....
Asynchronous I/O is not installed on this system.
You will need to install it, and either configure it yourself using
smit aio' or rerun the Oracle root installation procedure.

Configuring POSIX Asynchronous I/O....
Posix Asynchronous I/O is not installed on this system.
You will need to install it, and either configure it yourself using
smit aio' or rerun the Oracle root installation procedure.
1.7.2.3
```

Workaround: Ignore the errors. The error message is generated because rootpre.sh is enabling the POSIX AIO and Legacy AIO devices for Oracle use. In AIX 6.1, Asynchronous I/O (AIO) is installed and enabled automatically and the individual AIX Asynchronous I/O devices like aio0 and posix_aio0 no longer exist. Therefore this is not a problem. However, users must verify that no other script failures have occurred.

For more details on the AIX 6.1 update requirement:

See Oracle Note 282036.1 from metalink.

A replacement rootpre.sh is available for download from Oracle MetaLink. Reference Oracle bug# 6613550 or ARU# 9638501.

Oracle VIP Configuration Assistant fails with an error message

During Oracle RAC 10g Release 2 installation, the VIP Configuration Assistant may fail with the following error message:

```
The given interface(s), "en0" is not public.
Public interfaces should be used to configure virtual IPs.
```

This message appears only when the VIP is not from the regular public IP range (for example, 200.). [1182220]

Workaround: Invoke the vipca utility manually.

```
# export DISPLAY=nebula:0.0
# $CRS_HOME/bin/vipca
```

Oracle Cluster Verification utility displays a warning message

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

For example:

```
Utility
============================================================
OUI-25031: Some of the configuration assistants failed. It is
strongly recommended that you retry the configuration
assistants at this time. Not successfully running any "
Recommended" assistants means your system will not be correctly
configured.
1. Check the Details panel on the Configuration Assistant Screen
to see the errors resulting in the failures.
2. Fix the errors causing these failures.
3. Select the failed assistants and click the 'Retry' button
to retry them.
============================================================
```

Workaround: You may safely ignore this message if the cluster is operating satisfactorily.

Oracle RAC 10g databases created by DBCA may fail on reboot

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

Workaround: For the latest information on this problem, see the following TechNote:

http://entsupport.symantec.com/docs/275388

REUSE option mandatory when ODM is enabled for Oracle RAC 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 RAC 10g onwards, the REUSE clause of SQL is mandatory when Oracle Disk Manager (ODM) is enabled. [540429]

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 TechNote:

http://entsupport.symantec.com/docs/283362

CRS daemons must be stopped before stopping VCS in Oracle RAC 10g clusters

In SF Oracle RAC clusters running Oracle RAC 10g, if Oracle Clusterware is not under VCS control, stop the CRS daemons before using `hastop -all` command to stop VCS.

For details on enabling VCS to control the CRS daemons, see the information on configuring VCS service groups for Oracle RAC 10g in the *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide*.

Using lltconfig -u in an Oracle RAC 10g environment may cause IP failover issues

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

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.

For a description of the actions:

See the *Veritas High Availability Agent for Oracle Installation and Configuration Guide*.

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. If you want to change this behavior, 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.

SF Oracle RAC issues

This section lists the known issues in SF Oracle RAC for this release.

Installer may not discover all the aggregated interfaces

The product installer may not discover all the aggregated interfaces. So, during the product configuration you must choose the NICs or the aggregated interfaces that the installer discovers for private heartbeats. [1286021]

Workaround: If you want to choose aggregated interfaces that the installer did not discover for private heartbeats then you must manually edit the /etc/llttab file to replace name of NICs with that of aggregated interfaces before you start when the installer prompts after product configuration.

See *Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide.*

Warning messages displayed on adding VVR resource definitions to the VCS configuration

When you run the script "addVVRTypes.sh" for adding VVR resource definitions to the VCS configuration, the following warning messages are displayed:

```
VCS WARNING V-16-1-10421 Non static attribute does not exist 'Primary' (RVG)
VCS WARNING V-16-1-10421 Non static attribute does not exist 'SRL' (RVG)
VCS WARNING V-16-1-10421 Non static attribute does not exist 'RLinks' (RVG)
```

These warnings may be ignored. [1314205]

Deporting issues with 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.

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."

For more information, see *Veritas Cluster Server User's Guide*.

I/O fencing uses SCSI-3 Persistent Reservation 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 command instead of the reboot command to perform a graceful reboot for systems.

```
# /usr/sbin/shutdown -r
```

The vxfen driver reports an error when stopping I/O fencing

If I/O fencing is started in disabled mode, and if you change the /etc/vxfenmode file later to scsi3, the vxfen driver throws the following spurious error when you stop vxfen:

```
ERROR: failed to stop vxfen
```

However, the actual I/O fencing stop operation is successful. [1301698]

Workaround: This error may be safely ignored.

Recovering a cloned Oracle RAC database

If you clone an Oracle RAC database using the interactive mode, then the recovery of the cloned database should be performed manually by following the Oracle recovery procedure for a RAC database. [#1215075]

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 RAC 10g Clusterware 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.

To bring down port f

1   Kill all the Oracle processes.

```
# kill -9 'ps -u oracle|awk '{print $1}''
```

2   Verify that all CFS file systems are unmounted.

```
# mount | grep cluster
```

3   Unregister port f from GAB membership.

```
# fsclustadm cfsdeinit
```

The gcoconfig command assigns priority 0 to all nodes

If you configure GCO using the /opt/VRTSvcs/bin/gcoconfig command, the gcoconfig utility assigns the priority '0' to all the nodes that are in the SystemList of the ClusterService group. [857159]

Workaround: Edit the configuration file " main.cf" and provide the correct priority number for the cluster nodes in the SystemList of the ClusterService group.

Use one of the following approaches to edit main.cf:

■   Veritas Cluster Server graphical user interface (hagui)

■   VCS commands

■   Stop VCS and manually edit the main.cf file. Note that this approach introduces HA downtime.

GAB error messages on running installsfrac during an add node or install only configuration

After running the "installsfrac" utility (install only) during an add node or install only configuration, the following error messages may appear:

```
AIX Version 6
Copyright IBM Corporation, 1982, 2007.
Console login: GAB WARNING V-15-1-20115
Port d registration failed, GAB not configured
VRTS:GMS: vxgms: GAB_API_REGISTER error=161

VRTS:ODM: ODM WARNING V-41-6-5 odm_gms_api_start_msgs fails
0513-059 The ctrmc Subsystem has been started. Subsystem PID is 225394.
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
```

```
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
GAB ERROR V-15-1-20109 Port h registration failed, GAB not configured
^^^ NOTE: notice these error messages
```

Workaround: You may safely ignore these error messages. [1241070]

Error messages during uninstallation

When you uninstall SF Oracle RAC using the command ./uninstallsfrac -rsh, the following message may appear on your console:

```
# /usr/lib/vxvm/bin/vxconfigbackupd[248]: 790574 Killed
```

You may safely ignore this error message. [1241070]

VxVM vxnotify error messages during maintenance pack upgrade

Running the command ./installmp to upgrade SF Oracle RAC from version 5.0 MP1 to version 5.0 MP3 may result in the following error messages:

```
VxVM vxnotify ERROR V-5-1-915
Reconnection to vxconfigd failed:
Configuration daemon is not accessible
VxVM vxnotify ERROR V-5-1-915
Reconnection to vxconfigd failed:
Configuration daemon is not accessible
VxVM vxnotify ERROR V-5-1-915
Reconnection to vxconfigd failed:
Configuration daemon is not accessible
VxVM vxnotify ERROR V-5-1-915
Reconnection to vxconfigd failed:
Configuration daemon is not accessible
```

You may safely ignore this error message. [1241070]

DBED features are not integrated with GCO

DBED features are not integrated with Global Cluster Option (GCO). After GCO migration, be aware that DBED features will not be functional. [1241070]

Storage checkpoints may fail to roll back on AIX 6.1

Sometimes, the dbed_ckptrollback command fails on AIX 6.1 with the following error message:

```
ERROR V-81-4804 Thread 4 pwrite error.
SFORA rollback ERROR V-81-4818 Rollback failed for file
/oracle/oradata/patil1/bmf.dbf
```

Workaround: Mount the checkpoint using the 'dbed_ckptmount' command.Then, use the 'cp' command to copy the files that failed to roll back. [1396168]

Issue with format of the last 8-bit number in PrivNIC IP addresses

The command "hares ora_priv" fails if the PrivNIC IP addresses have a format as displayed in the following two-node example:

- On galaxy: 192.168.12.01

- On nebula: 192.168.12.02

The format for the PrivNIC IP addresses must not be "X.X.X.01" as shown in the above example. [1164506]

When configuring private IP addresses for Oracle Clusterware, ensure that the last 8-bit number in these IP addresses have a format as displayed in the following two-node example:

- On galaxy: 192.168.12.1

- On nebula: 192.168.12.2

The format for the PrivNIC IP addresses must be " X.X.X.1".

Confirm the correct format by viewing the PrivNIC resource in the main.cf file.

For example:

```
PrivNIC ora_priv (
                Critical = 0
                Device @galaxy = { e10g2 = 0, e10g3 = 1 }
                Device @nebula = { e10g2 = 0, e10g3 = 1 }
                Address @galaxy = "192.168.99.1"
                Address @nebula = "192.168.99.2"
                NetMask = "255.255.255.0"
                )
```

Storage Foundation issues

This section lists key issues related to Storage Foundation components. For more information on the issue as well as for a comprehensive list of other known issues, see the *Veritas Storage Foundation Release Notes*.

The known issues are as follows:

- After upgrading to 5.0 MP3 from an earlier version of VVR, the disk group version remains at the previous version unless you explicitly upgrade the disk group version. [1371981]

- DMP failover is slow for SAN. [414662]
  DMP failover may take a significant time when a path is disabled from a switch or an array in a SAN environment. This is not a problem if the path is disabled from the host.
  Workaround: Use the dynamic tracking and fast I/O failure features of AIX 5.3 or 6.1 to address this problem.
  Perform the following steps on an AIX 5.3 or 6.1 system where VxVM is already installed and configured:

  - Enter the following commands for each Fiber Channel adapter or controller:
    ```
    # chdev -l fscsiN -a fc_err_recov=fast_fail -P
    # chdev -l fscsiN -a dyntrk=yes -P
    ```
    where N is the number of the controller (0, 1, 2 and so on)

  - Reboot the system.

  - Use the lsattr command to verify that the dyntrk and fast_fail attributes are set to True on each adapter, as shown in this example:

    ```
    # lsattr -El fscsi0
    attach switch How this adapter is CONNECTED False
    dyntrk yes Dynamic Tracking of FC Devices True
    fc_err_recov fast_fail FC Fabric Event Error RECOVERY Policy
    True
    scsi_id 0x10d00 Adapter SCSI ID False
    sw_fc_class 3 FC Class for Fabric
    ```

- Datafile rollback in a Dynamic Storage Tiering environment fails to roll back the files. [1227083]

- You may face the following issues when you work with volume sets:

  - The conversion of a single volume to a volume set using the dbdst_convert command fails with the following error message if the volume set contains volumes in the snapshot chain.

```
VxVM vxvset ERROR V-5-1-10035
Volume set data1vol contains volume(s) in
snapshot chain. This can cause inconsistencies
in the snapshot hierarchy.
Specify "-f" option to force the operation.
Can not add  to data1vol, ERR 1
```

Workaround: Before converting a single volume to a volume set, make sure that the volumes do not have snapshots.

■ Adding a volume without a mirror to a volume set that contains volumes with mirrors results in a partially mirrored volume set. For example, if you have a volume "v1" with a snapshot mirror, then convert it to a volume set by adding another volume "v2" without a mirror, the process results in a volume set having v1 with mirror and v2 without mirror.

Workaround: Before adding volumes to a volume set, if you need mirrors, add the mirrors to the new volume first before adding the new volume to the volume set.

■ The site does not reattach automatically in the case where the site storage has disconnected and reconnected to a CVM slave node, but the master node never lost connection to the site storage. [1256764]

■ With all primary paths inaccessible, the deport operation on a shared disk group fails to clear the PGR keys as the DMP database is not up-to-date. [1368377]

■ In some DMP failover scenarios, I/O retry causes the disk failing flag to be set, although there is nothing wrong with the disks except for the failing flag. [1205380]

Software limitations

The following limitations apply to this release.

Limited global clustering capabilities in Veritas Cluster Server Management Console

The Veritas Cluster Server Management Console (VCS MC) management server currently includes limited capabilities for global clustering. Use the VCS graphical user interface (hagui) to take advantage of global clustering capabilities such as Fire Drill - Readiness and Remote Group Agent for remote groups.

Cluster File System (CFS) limitations

The following are the limitations of CFS:

- CFS supports only disk layout version 6 and 7.

- CFS does not support HSM/DMAPI.

- VxFS does not distribute its own versions of file utilities such as `cpio` or `mv`.

Volume Manager does not support RAID 5 in a cluster environment

Volume Manager does not support software RAID 5 in a shared disk environment.

Performance recommendation for space-optimized volume snapshots

For minimal performance impact, Symantec recommends that the Space Optimized Snapshots (SOS) be created only of data volumes. A mirror breakoff snapshot should be created of the Oracle log volume. The log volumes are typically small in size and do not have significant space overhead.

Unsupported scenarios regarding volume location for SRVM, ocrvol, and votevol

The Oracle RAC wizard does not support the following scenarios:

- For Oracle RAC 9i, the SRVM volume can not exist in the same shared disk group as that of the Oracle datafiles.

- For Oracle RAC 10g, the ocrvol volume and votevol volume cannot exist in the same shared disk group as that of the Oracle datafiles. However, you can allow for this scenario when you manually configure Oracle service groups.

Oracle Disk Manager (ODM) limitation

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

For details on asynchronous I/O issues with AIX 6.1:

See "Asynchronous I/O error messages on executing rootpre.sh script on AIX 6.1" on page 22.

Storage Checkpoint and Database FlashSnap limitation

The following are the limitations of Storage Checkpoint 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 version 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 that after you upgrade a system to layout version 6 or version 7, the file system is no longer compatible with the 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.

■ Only online snapshots are supported for an Oracle RAC database, when using the dbed_vmsnap, dbed_vmclonedb, and dbed_vmchecksnap commands.

■ 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 spfile. Then, run dbed_update to update the repository.

■ The Storage Checkpoint and Database FlashSnap features of SF Oracle RAC do not support the graphical user interface of the Veritas Storage Foundation for Oracle product.

■ The Database FlashSnap feature does not support RAID-5 volumes.

RDAC driver and FAStT array limitations for coordinator disks

For multipathing connected storage when using the AIX RDAC driver for FAStT arrays, the following points must be considered:

■ Since it is an active/passive array, only the current active path is exposed to clients.

■ The I/O fencing driver, vxfen, can use only a single active path and has no fore-knowledge of the passive paths to the coordinator disks on an array.

Therefore, if the single active path fails, all nodes in the cluster lose access to the coordinator disks. The loss of the path to the coordinator disks can potentially go unnoticed until a reboot, split brain, or any other reason that leads to a cluster membership change occurs. In any of these conditions, the cluster cannot form, and all nodes panic to prevent data corruption. No data loss occurs.

This limitation does not apply if DMP is used for fencing co-ordinator disks. However, if the scsi3_disk_policy is set to "raw," which is the default setting, this limitation still applies.

LLT low priority heartbeat links not recommended

Symantec does not recommend using the public network as LLT low priority links for SF Oracle RAC. Low priority links reduce network overhead by reducing the frequency of heartbeats, but they are not suited for the typical volume of SF Oracle RAC data.

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.

Table 1-7 lists the documentation for SF Oracle RAC.

Table 1-7   SF Oracle RAC documentation

Document title	File name
Veritas Storage Foundation for Oracle RAC Installation and Configuration Guide	sfrac_install.pdf
Veritas Storage Foundation for Oracle RAC Administrator's Guide	sfrac_admin.pdf
Veritas Storage Foundation for Oracle RAC Release Notes	sfrac_notes.pdf

Table 1-8 lists the documentation for Veritas Cluster Server.

Table 1-8   Veritas Cluster Server documentation

Document title	File name
Veritas Cluster Server Installation Guide	vcs_install.pdf
Veritas Cluster Server Release Notes	vcs_notes.pdf
Veritas Cluster Server User's Guide	vcs_users.pdf
Veritas Cluster Server Bundled Agents Reference Guide	vcs_bundled_agents.pdf
Veritas Cluster Server Agent Developer's Guide	vcs_agent_dev.pdf

Table 1-8   Veritas Cluster Server documentation *(continued)*

Document title	File name
Veritas Cluster Server Enterprise Agent for Oracle Installation and Configuration Guide	vcs_oracle_install.pdf

Table 1-9 lists the documentation for Veritas Storage Foundation.

Table 1-9   Veritas Storage Foundation documentation

Document title	File name
Veritas Storage Foundation Release Notes	sf_notes.pdf
Veritas Storage Foundation Installation Guide	sf_install.pdf
Veritas Storage Foundation Cluster File System Administrator's Guide	sfcfs_admin.pdf
Veritas Storage Foundation Intelligent Storage Provisioning Solutions Guide	sf_isp_solutions.pdf
Veritas FlashSnap Point-in-Time Copy Solutions Administrator's Guide	flashsnap_admin.pdf

Table 1-10 lists the documentation for Veritas Volume Manager and Veritas File System.

Table 1-10   Veritas Volume Manager and Veritas File System documentation

Document title	File name
Veritas Volume Manager Administrator's Guide	vxvm_admin.pdf
Veritas Volume Manager Cross-platform Data Sharing Administrator's Guide	sf_cds_admin.pdf
Veritas Volume Manager Troubleshooting Guide	vxvm_tshoot.pdf
Veritas File System Administrator's Guide	vxfs_admin.pdf

Table 1-11 lists the documentation for Symantec Product Authentication Service.

Table 1-11   Symantec Product Authentication Service documentation

Document title	File name
Symantec Product Authentication Service Installation Guide	at_install.pdf
Symantec Product Authentication Service Administrator's Guide	at_admin.pdf