VERITAS

VERITAS Storage Foundation™ 4.1 *for Oracle RAC*

Release Notes

HP-UX

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VERITAS Storage Foundation 4.1
for Oracle RAC Release Notes

VERITAS Storage Foundation 4.1 *for Oracle RAC* is an integrated set of software products. The products enable administrators of Oracle Real Application Clusters (RAC) to operate a database in an environment running VERITAS Cluster Server (VCS) and using the cluster features of VERITAS Volume Manager and VERITAS File System (CVM and CFS).

Release Notes Topics

This document addresses the following topics:

New Features

Features introduced with VERITAS Storage Foundation 4.1 *for Oracle RAC* include:

◆ Support for the VERITAS product installer

◆ VERITAS Storage Mapping

◆ VERITAS Storage Checkpoints

◆ Changes to the VCS resource list and hierarchy. The `Qlogckd` resource is removed from the VCS resource list. The `SQLNet` resource is replaced by the `Netlsnr` resource.

◆ Support to enable VCS to control VxFEN. The user has an option to include VxFEN in VCS configuration file (`main.cf`).

Hardware and Software Compatibility

The compatibility list contains the latest information about supported hardware and software and is updated regularly.

> **Note** Before installing or upgrading Storage Foundation *for Oracle RAC*, review the latest compatibility list to confirm the compatibility of your hardware and software.

You can find the current compatibility list on the VERITAS Support Web site: http://support.veritas.com.

If you do not find your hardware or software listed or if you have questions about the information in the compatibility list, please contact VERITAS Support.

Hardware Requirements

Review the hardware compatibility information on http://support.veritas.com for details. VERITAS routinely updates the list of supported hardware items.

◆ Server systems must be one of the HP-UX systems listed in the "Supported Hardware" table. For this release, VERITAS Storage Foundation *for Oracle RAC* supports RAC clusters of two or four nodes. VERITAS recommends that each system have two CPUs.

◆ Disk space, locally: approximately 20 GB; review the installation requirements in the *VERITAS Storage Foundation for Oracle RAC Installation and Configuration Guide*.

◆ RAM, minimum per each server node: 2 GB.

◆ Shared storage: The storage units used by Storage Foundation 4.1 *for Oracle RAC* must support and be enabled for SCSI-3 Persistent Reservations (PR), a requirement for I/O fencing.

Software Requirements

VERITAS Storage Foundation 4.1 *for Oracle RAC* requires the following software items:

HP Operating Systems

All nodes in the cluster must run the same level and release of the HP-UX operating system. SFRAC 4.1 requires the September 2004 (also called AR0904) HP-UX 11i Version 2.0 (B11.23) release for HP 9000/Itanium servers, 64-bit. If necessary, upgrade the operating system to this version or a later version.

To identify the Operating Environment (OE) currently installed on your system, use the `swlist` command. For example:

```
# swlist | grep HPUX
HPUX11i-OE-MC               B.11.23.0409   HP-UX Mission
   Critical Operating Environment Component
HPUXBaseAux                B.11.23.0409   HP-UX Base OS
   Auxiliary
HPUXBaseOS                 B.11.23        HP-UX Base OS
OnlineDiag                 B.11.23.03.16  HPUX 11.23 Support
   Tools Bundle, Sep 2004
```

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

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

Operating Environments

HP-UX 11i OEs are bundles of key applications available to users to help them install a complete operating system in a single-pass process. SFRAC on HP-UX supports the following OEs:

◆ HPUX11i-OE

◆ HP-UX 11i v2 Foundation OE

◆ HPUX11i-OE-Ent

◆ HP-UX 11i v2 Enterprise OE

◆ HPUX11i-OE-MC

◆ HP-UX 11i v2 Mission Critical OE

HP Patches

Install the following HP packages and patches on each node before installing SFRAC:

- DiskQuota-Enh
- FSCmdsEnh
- FSLibEnh
- PHCO_32385
- PHCO_32387
- PHCO_32388
- PHCO_32389
- PHCO_32390
- PHCO_32391
- PHCO_32392
- PHCO_32393
- PHCO_32488
- PHCO_32523
- PHCO_32524
- PHCO_32551
- PHCO_32552
- PHCO_32596
- PHCO_32608
- PHCO_32609
- PHCO_32610
- PHCO_32611
- PHKL_32272
- PHKL_32425
- PHKL_32430
- PHKL_32431

All systems in a cluster must have the same operating system and patch level.

Checking Currently Installed Patches

Use the `swlist` command. For example, to check for patch PHKL_31500, type:

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

Oracle Software

VERITAS Storage Foundation 4.1 *for Oracle RAC* supports the following Oracle RAC software:

◆ Oracle9i RAC (64-bit), releases through 9.2.0.6.

VERITAS Software

Only versions of VCS, VxVM, and VxFS provided on the VERITAS software disc are supported. Remove other versions before installing software from the VERITAS Storage Foundation 4.1 *for Oracle RAC* disc.

Software Packages

VERITAS Storage Foundation 4.1 for Oracle RAC (SFRAC) installation utility installs the software components and packages described below.

Infrastructure Packages Installed with SFRAC 4.1

The installer checks for the presence of VRTSvlic (VERITAS Licensing) and VRTScpi (VERITAS product installer) infrastructure packages. If the packages are missing or have an incorrect version, the utility installs the packages.

Software Components Installed with SFRAC 4.1

The software components installed with SFRAC include:

- ◆ VERITAS Storage Foundation 4.1 *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 enterprise agent for Oracle

See the next section for a list of the specific software packages.

Packages Installed with SFRAC 4.1

VERITAS Storage Foundation *for Oracle RAC* packages include:

VRTSperl - VERITAS Perl 5.8.0 Redistribution

VRTSob - VERITAS Enterprise Administrator Service

VRTSobgui - VERITAS Enterprise Administrator

VRTSvxvm - VERITAS Volume Manager Binaries

VRTSalloc - VERITAS Volume Manager Intelligent Storage Provisioning

VRTSvmpro - VERITAS Volume Manager Management Services Provider

VRTSddlpr - VERITAS Device Discovery Layer Services Provider

VRTSfspro - VERITAS File System Management Services Provider

VRTSvmdoc - VERITAS Volume Manager Documentation

VRTSfsman - VERITAS File System Manual Pages

VRTSfsdoc - VERITAS File System Documentation

VRTSap - VERITAS Action Provider

VRTStep - VERITAS Task Provider

VRTSllt - VERITAS Low Latency Transport

VRTSgab - VERITAS Group Membership and Atomic Broadcast

VRTSvxfs - VERITAS File System with CFS

VRTSat - VERITAS Authentication Service

VRTSvxfen - VERITAS I/O Fencing

VRTSvcs - VERITAS Cluster Server

VRTSvcsmg - VERITAS Cluster Service Message Catalogs

VRTSvcsag - VERITAS Cluster Server Bundled Agents

VRTSvcsmn - VERITAS Cluster Manager Manual Pages

VRTSvcsdc - VERITAS Cluster Server Documentation

VRTSjre - VERITAS Java Runtime Environment Redistribution

VRTScutil - VERITAS Cluster Utilities

VRTScssim - VERITAS Cluser Server Simulator

VRTScscw - VERITAS Cluster Server Configuration Wizards

VRTSweb - VERITAS Java Web Server

`VRTSvcsw` - VERITAS Cluster Server Web Server

`VRTScscm` - VERITAS Cluster Server Cluster Manager

`VRTScavf` - VERITAS Cluster Server Agents for Cluster File System

`VRTSglm` - VERITAS Group Lock Manager

`VRTSgms` - Group Messaging Services

`VRTSodm` - VERITAS Oracle Disk Manager

`VRTSvail` - VERITAS Array Provider

`VRTSdbac` - VERITAS Oracle Real Application Cluster Support Package

`VRTSvcsor` - VERITAS Cluster Server Oracle Enterprise Extension

`VRTScsocw` - VERITAS Cluster Server Oracle 9i RAC Wizard

`VRTSdbckp` - VERITAS Storage Foundation Checkpoint Scripts

`VRTSvxmsa` - VERITAS Mapping Service, Application Libraries

`VRTSormap` - VERITAS Oracle Mapping

Software Limitations and Known Issues

The following issues exist in VERITAS Storage Foundation 4.1 for Oracle RAC.

Installing Oracle Binaries on a Cluster File System

The two sections below describe issues stemming from installing Oracle binaries on a cluster file system. To fix these problems generated by the operating system, HP will release an HP-UX patch. Information will become available in the following TechNote: http://library.veritas.com/docs/277395.

Unmounting Mount Points for Oracle Binaries

If you install Oracle binaries on a cluster file system and unmount the mount point on one node, the oracle instances and listeners running on some or all of the other cluster nodes fail. To safeguard against this problem, VERITAS suggests two alternatives:

◆ Move the following shared libraries for Oracle from `$ORACLE_HOME/lib/` to the local file system: `libodm9.sl`, `libskgxp9.sl`, `libjox9.sl`, `libwtc9.sl`, and `libclntsh.sl.9.0`.

   For PA clusters, the path is `/usr/lib/pa20_64`. For IA clusters, the path is `/usr/lib/hpux64`.

◆ Install the Oracle binaries on the local file system.

hawizard Impact on Oracle Listeners and Instances

If you install Oracle binaries on a cluster file system and use `hawizard` to add the oracle service group to VCS, the oracle instances and listeners running on some or all of the other cluster nodes fail.

To safeguard against this problem, VERITAS suggests moving the following shared libraries for Oracle from `$ORACLE_HOME/lib/` to the local file system: `libodm9.sl`, `libskgxp9.sl`, `libjox9.sl`, `libwtc9.sl`, and `libclntsh.sl.9.0`.

For PA clusters, the path is `/usr/lib/pa20_64`. For IA clusters, the path is `/usr/lib/hpux64`.

hawizard Requirements for Oracle Database and Binaries

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

Bringing CVMVolDg Resource Online After Stopping VCS with -force Option

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

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

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

swconfig on PHKL_31500

Run the following command prior to running the `installer` utility:

```
# swconfig PHKL_31500
```

HP-UX Panic; Port h Halts

The HP-UX operation system may panic when HAD fails to communicate with GAB within a predetermined interval. Verify whether you need to tune the operating system to accommodate the workload. Some tunable parameters to check are swap space, operating system, and application parameters.

Deporting and Importing of Shared Disk Groups

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

Importing Shared Disk Groups After a Reboot

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

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

vxfentsthdw Requires "+ +" in /.rhosts File

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

Removal of SFRAC Configuration Files

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

◆ `/etc/llttab`

◆ `/etc/llthosts`

◆ `/etc/gabtab`

◆ `/etc/vcsmmtab`

◆ `/etc/vxfendg`

◆ `/etc/VRTSvcs/conf/config/main.cf`

Shutdown for Systems with I/O Fencing Configured

The I/O fencing feature protects against data corruption resulting from a failed cluster interconnect, or "split brain." See the *VCS User's Guide* section titled "VCS Communications, Membership and I/O Fencing" for a description of the problems a failed interconnect can create and the protection I/O fencing provides.

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

Using the `reboot` command rather than the `shutdown` command bypasses shutdown scripts and can leave keys on the coordinator disks and data disks. Depending on the order of reboot and subsequent startup events, the cluster might warn of a possible split brain condition and fail to start up.
Workaround: Instead of using the `reboot` command, use the `/usr/sbin/shutdown -r now` command to perform a graceful reboot for systems.

VERITAS FlashSnap Agent for Symmetrix (Not Supported)

SFRAC does not support the FlashSnap Agent for Symmetrix (EMC TimeFinder) mapping functionality (package: `VRTSfas`).

Storage Checkpoints Require Version 6 File System Layout

File systems for Storage Checkpoints must use file system layout version 6. Use the `vxupgrade`(1M) command to check the current layout version and change the version if necessary.

Note	After you upgrade a system to layout version 6, the file system is no longer compatible with VxFS 3.5 file systems.

When upgrading a CFS file system, issue the command from the primary node. Use the following command to determine the primary node for a cluster file system:

```
# /opt/VRTS/bin/fsclustadm -v showprimary file_system_mount_pt
```

On the primary node, use the following command to check the current file system layout:

```
# /opt/VRTS/bin/vxupgrade filesystem
```

If the file system layout is not version 6, upgrade it. For example:

```
# /opt/VRTS/bin/vxupgrade -n 6 filesystem
```

Refer to the `vxupgrade`(1M) manual page for more information.

Accessing Version 6 File System when Removing VxFS

A disk layout Version 6 file system created with VxFS 4.1 software is not accessible if you remove the VxFS 4.1 software and revert the system to VxFS 3.5. In addition, if a disk layout Version 6 file system exists on a boot disk and you remove the VxFS 3.5 software, the host does not reboot successfully and remains at the `bcheckrc` prompt. To reboot the host successfully, first edit the `fstab` file and comment out entries for disk layout Version 6 file system.

Space-Optimized Volume Snapshots (Not Recommended)

When using VM volume snapshot functionality in an SFRAC cluster, avoid the space-optimized instant volume snapshot that may degrade performance.

VCS Enterprise Agent for Oracle Error Handling

The VCS enterprise agent for Oracle provides enhanced handling of Oracle errors encountered during detailed monitoring. The agent uses the reference file, `oraerror.dat`, which consists of a list of Oracle errors and the actions to take. Refer to the *VCS Enterprise Agent 4.1 for Oracle Installation and Configuration Guide* for description of the actions.

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

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

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

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

Storage Foundation for Oracle RAC in Japanese Locales

Japanese VEA Does Not Display Correctly on English Windows

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

Under Windows MUI, change the user interface language using the **User Locale** setting instead of the **UI Language** setting under **Regional Settings** in the Control Panel.

Software Fixes and Enhancements

Fixed issues and software enhancement requests are referenced by incident number and described briefly below.

Incident Number	Description
124005	Unable to configure or unconfigure VCSMM and VxFEN. Panic may occur when GAB is not configured, and `uninstall` may fail.
126795	Oracle instance fails with `ksfd_odmiol` and `ksfd_odmcrt2` (file number) errors. Check VCS log files, operating system log files, and console messages for any errors.
127013	`uninstall` or `swremove VRTSdbac` fails during module configuration. Disable VXFEN, VCSMM, and LMX startup scripts to prevent configuration of these modules during system startup.
128348, 128627	`uninstall` can generate system panic if processes using the CFS mount point are running.
110518	`fstyp` may fail on VxFS file systems. Several commands that call `fstyp`, including `vxassist` and `fsadm`, may also fail.

Documentation

The VERITAS software discs include documentation for VERITAS Storage Foundation *for Oracle RAC* in Adobe Portable Document Format (PDF). The
/storage_foundation_for_oracle_rac directory contains the installation guide and release notes for SFRAC.

VERITAS recommends copying the installation guide and release notes from the CD to the /opt/VRTS/docs directory so that they are available on your system for reference.

VERITAS Documentation Disc

Documentation is available in HTML format on the searchable VERITAS Documentation Disc included with your software purchase.

VERITAS Documentation Online

Visit the web site for VERITAS Software Technical Services.

http://support.veritas.com

Navigate via the Online Documentation link and select the product for which you require documentation.

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For technical assistance, visit the VERITAS Technical Services Web site at http://support.veritas.com. The site enables you to:

◆ Contact the VERITAS Technical Services staff and post questions.

◆ Download the latest patches and utilities.

◆ Search the knowledge base for answers to technical support questions.

◆ Receive automatic notice of product updates.

◆ Learn about Storage Foundation *for Oracle RAC* training.

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Typeface/Font	Usage
bold	names of screens, windows, tabs, dialog boxes, options, buttons
italic	new terms, book titles, emphasis, variables in tables or body text
`Courier`	computer output, command references within text
`Courier` (bold)	command-line user input, keywords in grammar syntax
`Courier` (bold, italic)	variables in a command
Symbol	**Usage**
#	superuser prompt (for all shells)
$	Oracle user prompt