Veritas Storage Foundation and High Availability Solutions Release Notes

Solaris

5.1 Rolling Patch 1

Storage Foundation and High Availability Solutions Release Notes 5.1 Rolling Patch 1

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Release Notes

This document includes the following topics:

Introduction

This document provides information about the Storage Foundation and High Availability Solutions 5.1 Rolling Patch 1.

For important updates regarding this release, review the Late-Breaking News TechNote on the Symantec Technical Support website:

http://entsupport.symantec.com/docs/334829

The hardware compatibility list contains information about supported hardware and is updated regularly. For the latest information on supported hardware visit:

http://entsupport.symantec.com/docs/330441

Before installing or upgrading Storage Foundation and High Availability Solutions products, review the current compatibility list to confirm the compatibility of your hardware and software.

System Requirements

This section describes the system requirements for this release

Supported Solaris operating systems

This release of the Veritas products is supported on the following Solaris operating systems:

- Solaris 9 (SPARC Platform 32-bit and 64-bit) with Update 8 or later
- Solaris 10 (SPARC or x64 Platform 64-bit) with Update 6 or later

If necessary, upgrade Solaris before you install the Veritas products.

Install all the latest required Solaris patches listed in this *Release Notes*.

See "Required Solaris patches" on page 8.

For important updates regarding this release, review the Late-Breaking News TechNote on the Symantec Technical Support website:

http://entsupport.symantec.com/docs/334829

Required Solaris patches

Before installing Veritas SFHA, ensure that the correct Solaris patches are installed.

See http://sunsolve.sun.com for the latest Solaris patch updates.

The following patches (or a later revision of those patches) are required for Solaris SPARC:

Table 1-1 Solaris SPARC patches

Operating system	Sun patch number
Solaris 9	114477-04 122300-29 - required for Live Upgrade
Solaris 10	119254-06 119042-02 125731-02 128306-05 127111-01

The following patches (or a later revision of those patches) are required for Solaris x64:

Table 1-2 Solaris x64 patches

Operating system	Sun patch number
Solaris 10	118344-14 118855-36 119043-11 119131-33 120012-14 125732-05 127128-11

Database requirements

The following TechNote identifies the most current information on supported databases (Oracle Single Instance, DB2, and Sybase) and operating system combinations:

http://entsupport.symantec.com/docs/331625

Note: SF and SFCFS support running Oracle, DB2, and Sybase on VxFS and VxVM.

SF and SFCFS do not support running SFDB tools with DB2 and Sybase.

List of products

Apply this patch for the following Veritas Storage Foundation and High Availability products:

- Veritas Storage Foundation (SF)
- Veritas Storage Foundation and High Availability (SFHA)
- Veritas Storage Foundation Cluster File System (SFCFS)
- Veritas Storage Foundation Cluster File System and High Availability (SFCFSHA)
- Veritas Storage Foundation for Oracle RAC (SF Oracle RAC)
- Veritas Volume Manager (VM)
- Veritas File System (FS)
- Veritas Cluster Server (VCS)

Fixed issues

The following sections describe the Veritas Storage Foundation High Availability issues that were fixed in this release.

Veritas Volume Manager fixed issues in 5.1 RP1 release

Table 1-3 Veritas Volume Manager 5.1 RP1 fixed issues

Fixed issues	Description
1972852, 1972848	vxconfigd dumped core in dg_config_compare() while upgrading to 5.1.
1955693	VxVM 5.0MP3RP3 patch 122058-13 disables vxfsldlic service and prevents boot multi-user mode after jumpstart
1938484	EFI: Prevent multipathing don't work for EFI disk
1937841	VxVM: checkin the fmrshowmap utility
1915356	I/O stuck in vxvm caused cluster node panic
1935297	vxconfigd dumps core in get_prop()
1907796	Corrupted Blocks in Oracle after Dynamic LUN expansion and vxconfigd core dump
1901827	vxdg move failed silently and drops disks.
1899688	[VVR] Every I/O on smartsync enabled volume under VVR leaks memory
1889747	vxlustart customer is unable to do live upgrade with Solaris Zone on vxfs
1886007	vxconfigd lose license information, vxesd leaking File descriptors
1884070	When running iotest on volume, primary node runs out of memory
1881336	VVR: Primary Panic in vol_ru_replica_sent()
1872743	Layered volumes not startable due to duplicate rid in vxrecover global volume list.
1870049	Dump device changed to none after boot disk encapsulation
1860892	Cache Object corruption when replaying the CRECs during recovery
1857729	CVM master in the VVR Primary cluster panic when rebooting the slave during VVR testing
1850166	vxvm vxdisk error v-5-1-8643 device 0_bpcs001_fra: resize failed:
1846165	Data corruption seen on cdsdisks on Solaris-x86 in several customer cases
1840832	vxrootadm does not update the partition table while doing a grow operation

Table 1-3 Veritas Volume Manager 5.1 RP1 fixed issues *(continued)*

Fixed issues	Description
1840673	After adding new luns one of the nodes in 3 node CFS cluster hangs
1835139	CERT : pnate test hang I/O greater than 200 seconds during the filer giveback
1834848	TP:Solaris:reclamation causes data corruption
1826088	After pulling out FC cables of local site array, plex became DETACHED/ACTIVE
1825516	Unable to initialize and use ramdisk for VxVM use
1825270	Need for dmp_revive_paths(in dmp reconfiguration/restore_demon code path.
1792795	supportability feature/messages for plex state change, DCO map clearance, usage of fast re-sync by vxplex
1766452	VVR: VRAS: AIX: vradmind dumps core during collection of memory stats.
1664952	Refreshing private region structures degrades performance during "vxdisk listtag" on a setup of more than 400 disks.
1528160	An ioctl interrupted with EINTR causes frequent vxconfigd exit()'s on 4.1MP4RP3
1479735	CVR: I/O hang on slave if master (logowner) crashes with DCM active.

Veritas File System fixed issues in 5.1 RP1 release

Table 1-4 Veritas File System 5.1 RP1 fixed issues (listed incident number/parent number)

Fixed issues	Description
1979429	mount usage error message is thrown while using from /opt/VRTS/bin
1978029	fsadm -R returns EFAULT in certain scenarios.
1976287	conform.backup test is skipped even if no local zone is available.
1973739	vxdisk reclaim fails on dg version 140 works only with ver 150-Cannot reclaim space on dg/vols created on 5.0MP3 after 5.1 upgrade.
1973539	Wrong boundary for reclamation on Hitachi AMS2000 Series

Table 1-4 Veritas File System 5.1 RP1 fixed issues (listed incident number/parent number) *(continued)*

Fixed issues	Description
1972882	use separate structures for ioctl interfaces and CFS messages
1972207	full fsck is very slow on an fs with many ilist holes.
1969334	CFS-Command "vxupgrade" test failed.
1967027	LM-conform test odm hits an assert of "f:fdd_advreload:2"
1961790	LM.CMDS->fsck->full->scripts->fextop_12 fails
1960436	CFS.Comform->revnlookup hit "vx_msgprint" via "vx_cfs_iread" on the slave node
1958198	cfs odm stress/noise tests failed due to "bcmp error"
1957365	CFS-Conformance test failed
1957296	CFS-Conformance-Reconfig test hit assert "f:vx_validate_cistat:3"
1957043	LM -conformance/fcl/fcl_fsetquota.3 is failing
1957035	CFS cmds:fsck is failing
1957032	fsqa lm vxmssnap.9 test fails
1956926	cfs-cmds aborting due to fsck, mount, fsted, libtst 64-bit binaries
1954897	CFS-Conformance test hit assert "f:vx_mark_fset_clean:2"
1953913	LM-Command "vxedquota" test failed.
1952827	LM / CFS - Cmds-> alerts test failed.
1952818	LM / CFS -Cmds-> vxtunefs test failed.
1949962	Fix the vxrsh and vxproxyrshd processes for cfs reconfig testing.
1949077	cfs.conform.dbed hits assert "..f:vx_imap_process_inode:4a". by "..vx_workitem_process".
1948451	kernel-conform "sunppriv" and "getattr" tests are missing
1947359	mkdstfs fails to add new volumes
1947356, 1883938	Due to incorrect Makefile 'make clobber' is removing mkdstfs

Table 1-4 Veritas File System 5.1 RP1 fixed issues (listed incident number/parent number) *(continued)*

Fixed issues	Description
1946442	tot build setup machine running LM-cmds -> fsppadm got failures.
1946433	Enhance mkdstfs for explicitly selecting the purpose of volumes data vs metadata
1946431	mkdstfs only adds to existing volume tags
1946134	fsadm keeps relocating and copying already relocated and copied reorg-ed regions of a file in subsequent passes.
1944283	fcl close is not happening properly
1943116	mkdstfs uses wrong perl instead of /opt/VRTS/bin/perl
1943116	mkdstfs uses wrong perl instead of /opt/VRTS/bin/perl
1940870	Documentation/Test discrepancies
1940409	CFS support for cached ODM
1940390	Cached ODM needs improvements for async requests codm
1934107, 1891400	[VxFS][281-815-793]SLES10 VxFS 5.0MP3 - Incorrect ACL inheritance
1934103	[PRI-1] Performance issues with mmap VxFS 4.1MP4 RP2
1934101	cfs Test cfs-stress-enterprise hit the same assert :f:vx_cwfrz_wait:2
1934098, 1860701	clone removal can block resive ops
1934096, 1746491	NASGW:core dump of fsvmap.
1934095, 1838468	Data page fault at vx_qiostats_update due to fiostats structure already free'd
1934094, 1846461	[VxFS] Customer requests vxfsstat metrics to monitor UNHASHED entries in the dcache
1934085, 1871935	secondaries ias_ilist not updated fully.
1933975, 1844833	fsadm shrink fs looping in vx_reorg_emap due to VX_EBMAPMAX from vx_reorg_enter_zfod

Table 1-4 Veritas File System 5.1 RP1 fixed issues (listed incident number/parent number) *(continued)*

Fixed issues	Description
1933844	[VxFS 5.0MP2RP4] [281-803-975] bad mutex panic in VxFS
1933635, 1914625	[VxFS] Behavior of DST Access age-based file placement policy with preffered files
1931973	fsppadm gives spurious messages when run fron multiple CFS nodes found only from 5.1 onwards
1908776	[VxFS][320-219-830] UX:vxfs mount: ERROR: V-3-22168: Cannot open portal device...
1906521	CFS-conform/quotas test hit assert vx_populate_pnq via vx_detach_fset
1902241	9-15a driver regression observed on SFCFSORA TPCC test
1897458, 1805046	wrong alert generation from vxfs when file system usage threshold is set
1895454	Sol10x86 lm.conform->ts some TCs fail
1878583	CFS: getattr call optimization to speedup the case when binaries are being mmapped from many nodes on CFS.

Veritas Storage Foundation fixed issues in 5.1 RP1

Table 1-5 Veritas Storage Foundation fixed issues in 5.1 RP1

Fixed issues	Description
1974086	reverse_resync_begin fails after successfully unmount of clone database on same node when primary and secondary host names do not exactly match.
1940409, 471276	Enhanced support for cached ODM
1901367, 1902312	dbed_vmclonedb failed to umount on secondary server after a successful VM cloning in RAC when the primary SID string is part of the snapplan name.
1896097	5.1 GA Patch:dbed_vmclonedb -o recoverdb for offhost get failed

Table 1-5 Veritas Storage Foundation fixed issues in 5.1 RP1 *(continued)*

Fixed issues	Description
1873738, 1874926	dbed_vmchecksnap fails on standby database, if not all redologs from primary db are present.
1810711, 1874931	dbed_vmsnap reverse_resync_begin failed with server errors.

Veritas Storage Foundation Cluster File System fixed issues in 5.1 RP1 release

Table 1-6 Veritas Storage Foundation Cluster File System 5.1 RP1 fixed issues (listed incident number, parent number)

Fixed issues	Description
1980842, 1983222	Fixed issue in cfsadmin command for RVG volumes.
1961790, 1986445	Fixed issue in the mount(1M) command to correctly set the master node.
1878583, 1544221	getattr call optimization to speedup the case when binaries are being mmapped from many nodes on CFS.

Veritas Storage Foundation for Oracle RAC fixed issues in 5.1 RP1

Table 1-7 Veritas Storage Foundation for Oracle RAC 5.1 RP1fixed issues

Fixed issues	Description
1980842, 1983222	Fixed issue in cfsadmin command for RVG volumes.
1938797	LMX should register with NULL canput for performance.
1934892	Issue: PrivNIC Agent support for Sun 10GbE NICs (nxge interfaces) with native 64k MTU default value. Resolution: Change the mtu of the active link (where the ip address is currently plumbed). Then change the mtu of the other links (other than active link) to high value and bring the active link down.

Table 1-7 Veritas Storage Foundation for Oracle RAC 5.1 RP1fixed issues *(continued)*

Fixed issues	Description
1908916	Issue: Panic lmx buffer modified after being freed. Resolution: Fix the manipulation of the work queue tail pointer/done queue tail pointer whenever the request is removed.
1853839	Issue: MultiPrivNIC resource state change to UNKNOWN once member node shutdown Resolution: The sum of the number nodes that are visible from all the devices would be zero if there is no valid LLT device. The code has been changed to handle this case.

Veritas Cluster Server fixed issues in 5.1 RP1

Table 1-8 Veritas Cluster Server 5.1 RP1 fixed issues

Fixed issues	Description
1975424	[IPMultiNICB][410-647-713][AIG] In a zone, if there are multiple IPMultiNICB resources on same subnet, issues with source address of IP pkts.
1972789	[VCS ASMInstAgent]ASMInstAgent Monitor problem inside a zone where the oracle home directory is NFS / NAS mounted inside the zone
1972770	[VCSOR]ASMInstAgent does not detect the state of the instance correctly inside local zones.
1968572	Postpatch script throws an error while installing in the non-global zone though llt and gab are hollow packages
1962548	ASMInstAgent dumpipng core.
1954723	[VCS Oracle Agent] [410-989-573] Oracle Agent Monitor problem inside a zone where the oracle home directory is NFS / NAS mounted inside the zone
1950427	[VCSOR] ASMDGAgent should disable and enable diskgroups in offline and online EPs for 11g R2.
1941647	haalert CLI hangs if engine is not in running state.
1922411	vxfentsthdw should detect storage arrays which interpret NULL keys as valid for registrations/reservations

Table 1-8 Veritas Cluster Server 5.1 RP1 fixed issues *(continued)*

Fixed issues	Description
1916022	[VCSOR][240-998-619] Changes made to Oracle agent via e1722109 do not honour ContainerName attribute
1916004	ASMagent connecting as sysdba instead of sysasm for 11gR2
1915909	[VCS][281-889-442] hares allows to create resources which has "." special character
1911287	group stuck at OFFLINE|STOPPING state when there is no ip to be cleaned in IPMultiNICB.
1874267	[ENGINE] Don't set MonitorOnly to 0 if ExternalStateChange does not have "OfflineGroup" value
1870424	LLT should give error if an attempt is made to configure more than 8 links (LLT_MAX_LINK) under LLT
1848114	SxRT5.1:Oakmont:IPMultiNICB:Resource does not come online when failover from paniced node
1504123	[SFW-HA 5.1 GCO] Symantec SE - GCO failover does not work when user account has "!" in name.

Veritas Cluster Server agents for Veritas Volume Replicator fixed issues in 5.1 RP1

No addtional fixed issues exist for Veritas Cluster Server agents for Veritas Volume Replicator in the 5.1 RP1 release.

Storage Foundation Manager fixed issues in 5.1 RP1

Table 1-9 Storage Foundation Manager 5.1 RP1 fixed issues

Fixed issues	Description
1934914	Configuration fails if 2.1 CS is not configured and directly upgraded to 2.1RP1 CS
1931017	Copyright year for Windows, Solaris and HP-UX patches are 2009
1918582	Licenses not getting discovered in case default locale is non-English

Table 1-9 Storage Foundation Manager 5.1 RP1 fixed issues *(continued)*

Fixed issues	Description
1917308	when had is stopped/started vcs based monitoring should continue to function
1910997	Checkpoint size showing zero in Webgui
1904090	LDR fails to display deployment summary
1897156	Paths are not shown for one of the array ports whereas Luns information is shown
1894441	'Refresh host' needed to populate the MHs info, after upgrading package/patch through sysaddon
1893699	Unable to add a host to the management server. V-39-4095-903 401 Unauthorized User Error
1893244	Unable to add a host to the management server. V-39-4095-803 401 Unauthorized User Error
1889739	LoP hosts get list out in 'Not Installed Hosts', when deployed the sysaddon for Linux x86 MH
1888082	After deploying sysaddon patch the operation status pop up is not having host details
1887241	remove use of threads in Perl discovery
1878876	vxlist core dumping after server firmware upgrade
1878266	too many hareg processes seen on a machine where sfmh is installed
1873461	DCLI does not properly handle 2 vdids for one OShandle
1872805	prtdiag and psrinfo -v not supported in Solaris 8, causing LDR not to display correct results
1869752	Add support for DB2 9.x support
1865225	IPv6 address not discovered in SFM gui for AIX hosts
1861664	Fix the library path for gvdid to work in case of HP 11.11
1858963	SFMH is uninstalled even if it was installed prior to install of SFW/SFWHA
1857468	VEA/vxpal continuously generate errors 0xc1000039 in vm_vxisis.log with no apparent reason

Table 1-9 Storage Foundation Manager 5.1 RP1 fixed issues *(continued)*

Fixed issues	Description
1855466	When a VVR RVG goes offline it is reported as at risk, however when it goes online again the state does not change in the UI
1855087	vxlist incorrectly shows nolabel flag for labeled disks
1854459	db2exp process is frequently core dumping on cluster node
1853081	vxship missing in VRTSsfmh for Linux
1850797	DMP Connectivity Summary view slow and causes high db CPU
1839795	Path type is empty on HP for SF 5.0 on 11.31-IA/PA
1831711	Volume Migration fails because it cannot find a target enclosure
1831697	Managing Storage Enclosure Summary reports 1 enclosure when actually 3 exist
1827451	Addhost log information is off by one month
1826556	dcli vdid can fail on HPUX LVM disks
1826409	SFM needs vxsvc service running to administer but service is not started
1825858	CS showing wrong gab port information
1809918	Servlet Exception error after adding Opteron MH to CS
1804496	postremove error messages on SFM uninstall
1797382	SFM is reporting numerous could not set locale correctly messages in error.log
1791528	VRTSsfmh error log reporting numerous errors from managed hosts
1791063	dclisetup.sh needs to be run again after upgrade to VxVM 5.1
1712298	WEBUI shows MH status as "Faulted - VEA: vxsvc or StorageAgent is not running" though all services running

VEA fixed issues in 5.1 RP1

Table 1-10 VEA 5.1 RP1 fixed issues

Fixed issues	Description
1961540	vmprov does not calculate disk nolabel state correctly.
1961519	vxsvc running as a daemon shows stderr and stdout printf's
1958763	isisd wont start, core file generated.
1958351	VEA gui fails to show controller-enclosures mapping.
1954150	Appropriate message should be display while creating Multiple Volume when size is incorrect
1954118	Not able to edit Log Settings for Alert/Task log.
1954101	While launching Gui, VEA Error message thrown "creating an instance of a class vrts.vvr.ce.REntryPoint failed"
1954047	Incorrect host version in VEA gui for 5.1RP1.
1953701	vxsvc does not start after installing RP1.
1925365	the replicated data size is showing with a negative value in VEA. (>TB)
1879928	Finish button for Break-off Snapshot for a Vset does nothing
1873583	VVR event notification sending 2 messages per event
1857207	Enabling FastResync has no effect when creating a RAID-5 volume
1846581	Core generated while downloading extension using client utility.
1840050	Core got generated while performing Volume Set operation.
1635720	Need to support volume tagging related operations of GUI in VMPROVIDER

Known issues

The following are new additional Storage Foundation and High Availability known issues in this 5.1 RP1 release.

- Veritas Storage Foundation known issues in 5.1 RP1 release
- Veritas Volume Manager known issues in 5.1 RP1 release
- Veritas File System known issues in 5.1 RP1 release

For the 5.1 known issues, see the 5.1 Release Notes for your Veritas product.

Veritas Storage Foundation known issues in 5.1 RP1 release

The following are new additional Storage Foundation known issues in this 5.1 RP1 release.

Live Upgrade may fail on Solaris 2.10 x86 (1984664)

This Live Upgrade issue is specific to Solaris 2.10 x86 operating system. If you run the VxVM `vxlustart` script and choose a disk for the destination boot environment (BE) that is missing the `fdisk` "SOLARIS System" partition, the Live Upgrade operation fails to properly setup the destination BE.

Workaround:

Run the `fdisk` command on the destination BE disk before performing the Live Upgrade operation. If the fdisk table is missing or does not contain a "SOLARIS System" partition, it must be setup.

To setup the fdisk table

- Run the `fdisk` command on the root of the destination BE:

```
# fdisk /dev/rdsk/c1t1d0p0
No fdisk table exists. The default partition for the disk is:

  a 100% "SOLARIS System" partition

Type "y" to accept the default partition,
otherwise type "n" to edit the partition table.
Please answer with "y" or "n": y
```

On Solaris x86 the disks must be initialized with a fdisk table and Solaris system partition before it can be used.

dbed_clonedb of offline checkpoint fails with ORA-00600 with Oracle 11gR2 when ODM is enabled (1982674)

When performing offline checkpoint database cloning on Oracle 11gR2 and ODM is enabled, the `dbed_clonedb` command fails with error:

```
$ dbed_clonedb -S mofcln1 -m /tmp/mofcln1 -c \
Checkpoint_1267604996
SFORA dbed_clonedb ERROR V-81-4920 Database mofcln1 is still in
recovery mode.
SFORA dbed_clonedb ERROR V-81-4881 Log file is at /tmp/oralog.out.10392.
```

The `/tmp/oralog.out.10392` file indicates an error.

Sample output of the `/tmp/oralog.out.10392` file:

```
ALTER DATABASE OPEN RESETLOGS
*
ERROR at line 1:
ORA-00600: internal error code, arguments: [ksfdgmsn4],
[ODM ERROR V-41-4-2-207-1 Operation not permitted],
[], [], [], [], [], [], [], [], [], []
ORA-00318: log 1 of thread 1, expected file size 512 doesn't match 512
ORA-00312: online log 1 thread 1:
'/tmp/mofcln1/snap_data11r2/FLAS11r2/redo01.log'
```

Note: This issue may occur in a VVR environment.

Workaround:

Perform the offline checkpoint cloning for 11gR2 on another `ORACLE_HOME` where ODM is disabled.

Dbed_ckptrollback fails for -F datafile option for Oracle database version 11gr2 (1959400)

On Oracle 11gr2 database, dbed_ckptrollback fails with following error "SFORA rb.file ERROR V-81-3038 Error occurred while querying Oracle Database." The root cause of this problem is an Oracle 11GR2 defect (8367917).

Workaround:

To manually recover the datafile

1. Take the corrupt data file offline.
2. Mount the checkpoint using dbed utilities.

3 Restore the corrupt file manually.

4 Recover the datafile.

5 Bring the datafile online.

Veritas Volume Manager known issues in 5.1 RP1 release

The following are new additional Veritas Volume Manager known issues in this 5.1 RP1 release.

Changing naming scheme fails (1958711)

Changing naming scheme fails for devices controlled by MPxIO driver on Solaris.

There is no workaround at this time.

vxesd dump core when it starts (1897007)

This issue happens during the case when the system is connected to a switch with more than 64 ports.

Workaround: To fix the issue, change the switch to lesser port number.

Veritas File System known issues in 5.1 RP1 release

No additional known issues exist for Veritas File System in the 5.1 RP1 release.

Veritas Storage Foundation Cluster File System known issues in 5.1 RP1 release

The following are new additional Veritas Storage Foundation Cluster File System known issues in this 5.1 RP1 release.

NFS issues with VxFS checkpoint (1974020)

NFS clients mounting VxFS checkpoints that are NFS-exported by SFCFS or SFHA cluster nodes using a Virtual IP may receive the following error message upon Virtual IP failover:

```
Stale NFS file handle
```

This is a result of major numbers of VxFS checkpoints not necessarily being the same on all SFCFS or SFHA cluster nodes.

There is no workaround at this time.

installrp recognizes SFCFSHA 5.1RP1 as SFCFS after installing SFCFSHA 5.1RP1 using JumpStart (1991079)

The installrp script recognizes SFCFSHA 5.1RP1 as SFCFS after installing SFCFSHA 5.1RP1 using JumpStart.

Workaround:

After you finish running JumpStart, use the `installcfs -license -ha` command to license SFCFSHA. Run installrp to finish the configuration.

Veritas Storage Foundation for Oracle RAC known issues in 5.1 RP1

The following are new additional Veritas Storage Foundation for Oracle RAC known issues in this 5.1 RP1 release.

Message about mmpl_reconfig_iocti in system log

If the Veritas Cluster Server Membership Module (VCSMM) calls the mmpl_reconfig_iocti function of the fencing module (VxFEN) at the time of system startup, the call fails displaying the following error message on the console and the `/var/adm/messages` file:

```
mmpl_reconfig_iocti: dev_iocti failed, vxfen may not be configured
```

You may ignore this message.

Veritas Cluster Server known issues in 5.1 RP1

The following are new additional Veritas Cluster Server known issues in this 5.1 RP1 release.

VCS agent for Oracle: Health check monitoring is not supported for Oracle database 11g R1 and 11g R2 (1985055)

Health check monitoring is not supported for Oracle database 11g R1 and 11g R2.

Workaround:

Set MonitorOption attribute for Oracle resource to 0.

VCS agent for Oracle: Make sure that the ohasd has an entry in the init scripts (1985093)

Make sure that the ohasd process has an entry in the init scripts so that when the process is killed or the machine is rebooted, this automatically restarts the process.

VCS agent for Oracle: Intentional Offline does not work

Intentional Offline does not work for the VCS agent for Oracle.

The ASMInstAgent does not support having pfile/spfile for the ASM Instance on the ASM diskgroups

The ASMInstAgent does not support having pfile/spfile for the ASM Instance on the ASM diskgroups.

Workaround:

Have a copy of the pfile/spfile in the default $GRID_HOME/dbs directory to make sure that this would be picked up during the ASM Instance startup.

Veritas Cluster Server agents for Veritas Volume Replicator known issues in 5.1 RP1

No known issues exist for Veritas Storage Foundation Cluster File System in the 5.1 RP1 release.

Software limitations

The following are additional Veritas Storage Foundation and High Availability software limitations in this release.

Veritas Storage Foundation software limitations in 5.1 RP1 release

The following are additional Veritas Storage Foundation software limitations in this release.

Thin reclamation support limitations

The thin reclamation feature has the following limitations:

- Thin reclamation only supports VxFS file systems on VxVM volumes. Other file systems are not supported.
- Thin reclamation is only supported for mounted volumes.
  The file system map is not available to reclaim the unused storage space on unmounted file systems.

- Thin reclamation is not supported on raw VxVM volumes.
  VxVM has no knowledge of application usage on raw volumes. Therefore, VxVM cannot perform the reclamation on raw volumes. The application must perform the reclamation on raw volumes.
- Thin reclamation is not supported on the RAID-5 layout.
  The thin reclamation is storage dependent and the space underneath may or may not be reclaimed fully. Thin reclamation is not supported in a RAID-5 layout, because data consistency cannot be ensured.
- Thin Reclamation is not supported on volumes with snapshots or snapshots themselves. Any reclamation requests on such volumes or snapshots or their corresponding mount points will not result in any reclamation of their underlying storage.

Veritas Volume Manager software limitations in 5.1 RP1 release

The following are additional Veritas Volume Manager software limitations in this release.

Cluster Volume Manager (CVM) fail back behavior for non-Active/Active arrays (1441769)

This describes the fail back behavior for non-Active/Active arrays in a CVM cluster. This behavior applies to A/P, A/PF, APG, A/A-A, and ALUA arrays.

When all of the Primary paths fail or are disabled in a non-Active/Active array in a CVM cluster, the cluster-wide failover is triggered. All hosts in the cluster start using the Secondary path to the array. When the Primary path is enabled, the hosts fail back to the Primary path. However, suppose that one of the hosts in the cluster is shut down or brought out of the cluster while the Primary path is disabled. If the Primary path is then enabled, it does not trigger failback. The remaining hosts in the cluster continue to use the Secondary path. When the disabled host is rebooted and rejoins the cluster, all of the hosts in the cluster will continue using the Secondary path. This is expected behavior.

For A/P,APG, A/A-A, and ALUA arrays, if the disabled host is rebooted and rejoins the cluster before the Primary path is enabled, enabling the path does trigger the failback. In this case, all of the hosts in the cluster will fail back to the Primary path.

DMP settings for NetApp storage attached environment

To minimize the path restoration window and maximize high availability in the NetApp storage attached environment, set the DMP restore daemon cycle to 60

seconds. The default value of this tunable is 300 seconds. The change is persistent across reboots.

Issue the following command at the prompt:

```
# vxdmpadm settune dmp_restore_internal=60
```

To verify the new setting, use the following command:

```
# vxdmpadm gettune dmp_restore_internal
```

Veritas Storage Foundation for Oracle RAC software limitations in 5.1 RP1

The following are additional Veritas Storage Foundation for Oracle RAC software limitations in this release.

CRSResource agent

CRSResource agent is not supported for Oracle 11g Release 2.

Changes in Storage Foundation High Availability

The following sections describe changes in product behavior in this release.

About the new installrp script

Veritas Storage Foundation and High Availability Solutions 5.1 RP1 provides a new upgrade script. To upgrade from Veritas Storage Foundation and High Availability Solutions version 5.1 or later, the recommended upgrade method is to use the new upgrade script. The `installrp` script allows you to upgrade all the patches associated with the packages installed and then starts all the processes.

installrp script options

Table 1-11 shows command line options for the product upgrade script

Command Line Option	Function
`[ system1 system2... ]`	Specifies the systems on which to run the upgrade options. If not specified, the command prompts for a system name.

Table 1-11 shows command line options for the product upgrade script *(continued)*

Command Line Option	Function
`[ -precheck ]`	The -precheck option is used to confirm that systems meet the products install requirements before installing.
`[ -logpath log_path ]`	The `-logpath` option is used to select a directory other than `/opt/VRTS/install/logs` as the location where installrp log files, summary file, and response file are saved.
`[ -responsefile response_file ]`	The `-responsefile` option is used to perform automated installations or uninstallations using information stored in a file rather than prompting for information. *<response_file>* is the full path of the file that contains configuration definitions.
`[ -tmppath tmp_path ]`	The `-tmppath` option is used to select a directory other than `/var/tmp` as the working directory for `installrp`. This destination is where initial logging is performed and where filesets are copied on remote systems before installation.
`[ -hostfile hostfile_path ]`	The `-hostfile` option specifies the location of a file containing the system names for installer.
`[ -jumpstart jumpstart_path`	The `-jumpstart` option is used to generate finish scripts which can be used by Solaris JumpStart Server for automated installation of all packages and patches for every product, an available location to store the finish scripts should be specified as a complete path. The `-jumpstart` option is supported on Solaris only.
`[ -keyfile ssh_key_file ]`	The `-keyfile` option specifies a key file for SSH. When this option is used, `-i` *<ssh_key_file>* is passed to every SSH invocation.

Table 1-11 shows command line options for the product upgrade script *(continued)*

Command Line Option	Function
`[ -patchpath patch_path ]`	The `-patchpath` option is used to define the complete path of a directory available to all install systems (usually NFS mounted) that contains all patches to be installed by `installrp`.
`[ -rootpath root_path ]`	The `-rootpath` option is used to re-root the install of all packages to the given path. On Solaris, -rootpath passes -R <root_path> to pkgadd.

Table 1-11 shows command line options for the product upgrade script *(continued)*

Command Line Option	Function
`[ -rsh | -redirect | -listpatches | -pkginfo | -serial | -upgrade_kernelpkgs | -upgrade_nonkernelpkgs ]`	The `-rsh` option is used when rsh and rcp are to be forced for communication though ssh and scp is also setup between the systems. The `-redirect` option is used to display progress details without showing the progress bar. The `-listpatches` option is used to display product patches in the correct installation order. The `-pkginfo` option is used to display the correct installation order of packages and patches. This option is available with or without one of following options: -allpkgs, -minpkgs, and -recpkgs. The `-serial` option is used to perform installation, uninstallation, start, and stop operations, typically performed simultaneously on all systems, in a serial fashion. The `-upgrade_kernelpkgs` option is used for the rolling upgrade's upgrade of kernel packages to the latest version The `-upgrade_nonkernelpkgs` option is used for the rolling upgrade's upgrade of non-kernel packages. In this phase, VCS packages and other agent packages are upgraded to the latest versions. Product kernel drivers are upgraded to the latest protocol version.

CVM master node needs to assume the logowner role for VCS managed VVR resources

If you use VCS to manage VVR resources in a SFCFS or SF Oracle RAC environment, Symantec strongly recommends that you perform the steps in the section “Using the preonline_vvr trigger for RVGLogowner resources.” These steps ensure that the CVM master node always assumes the logowner role. Not doing this can result

in unexpected issues. These issues are due to a CVM slave node that assumes the logowner role.

See "Using the preonline_vvr trigger for RVGLogowner resources" on page 87.

Downloading the rolling patch archive

The patches included in the 5.1 RP1 release are available for download from the Symantec website. After downloading the 5.1 RP1 file, use the gunzip and tar to uncompress and extract.

For the 5.1 RP1 download archive and instructions, see the following TechNote on the Symantec Technical Support website:

http://entsupport.symantec.com/docs/334829

List of patches

This section lists the patches and packages.

Table 1-12 Patches and packages for Solaris 9 on SPARC

Patch ID	5.1 package names	Products affected	Patch size
142633-02	VRTSvxfs	FS	35912 KB
142631-02	VRTSdbed	SF, SFHA, SFCFS, SFCFSHA, SF Oracle RAC	39 MB
143696-01	VRTSdbac	SF Oracle RAC	7.1 MB
142629-02	VRTSvxvm	VM	71 MB
143270-02	VRTSodm	SF, SFCFS	1540 KB
143273-02	VRTScavf	SFCFS	695 KB
143260-02	VRTSllt	VCS	839 KB
143262-02	VRTSgab	VCS	812 KB
143706-02	VRTSvxfen	VCS	114 KB
143264-02	VRTSvcs	VCS	9497 KB
143265-02	VRTSvcsag	VCS	8 KB

Table 1-12 Patches and packages for Solaris 9 on SPARC *(continued)*

Patch ID	5.1 package names	Products affected	Patch size
143279-02	VRTScps	VCS	890 KB
143276-02	VRTSvcsea	VCS	151 KB
143687-01	VRTSob	VEA	27566 KB
141270-02	VRTSsfmh	SFMH	9531 KB

Table 1-13 Patches and packages for Solaris 10 on SPARC

Patch ID	5.1 package names	Products affected	Patch size
142634-02	VRSTvxfs	FS	46436 KB
142631-02	VRTSdbed	SF, SFHA, SFCFS, SFCFSHA, SF Oracle RAC	39 MB
143697-01	VRTSdbac	SF Oracle RAC	5.8 MB
142629-02	VRTSvxvm	VM	73 KB
143271-02	VRTSodm	SF, SFCFS	1540 KB
143274-02	VRTScavf	SFCFS	697 KB
143261-02	VRTSllt	VCS	723 KB
143263-02	VRTSgab	VCS	1533 KB
143707-02	VRTSvxfen	VCS	933 KB
143264-02	VRTSvcs	VCS	18916 KB
143265-02	VRTSvcsag	VCS	755 KB
143279-02	VRTScps	VCS	1781 KB
143276-02	VRTSvcsea	VCS	299 KB
143687-01	VRTSob	VEA	45.6 MB
141270-02	VRTSsfmh	SFMH	26 MB

Table 1-14 Patches and packages for Solaris 10 on x64

Patch ID	5.1 package names	Products affected	Patch size
142635-02	VRTSvxfs	FS	28663 KB
142632-02	VRTSdbed	SF, SFHA, SFCFS, SFCFSHA, SF Oracle RAC	19 MB
143698-01	VRTSdbac	SF Oracle RAC	4.98 MB
142630-02	VRTSvxvm	VM	423 MB
143272-02	VRTSodm	SF, SFCFS	972 KB
143275-02	VRTScavf	SFCFS	701 KB
143266-02	VRTSllt	VCS	739 KB
143267-02	VRTSgab	VCS	581 KB
143708-02	VRTSvxfen	VCS	916 KB
143268-02	VRTSvcs	VCS	20061 KB
143269-02	VRTSvcsag	VCS	1046 KB
143280-02	VRTScps	VCS	1848 KB
143277-02	VRTSvcsea	VCS	4343 KB
143693-01	VRTSob	VEA	52955 KB
141752-02	VRTSsfmh	SFMH	23552 KB

Installing the Veritas software for the first time

This section describes how to install a Storage Foundation and High Availability Solutions product for the first time on a host and install 5.1 RP1. Review the 5.1 Installation Guide and Release Notes for your product.

To install the Veritas software for the first time

1 Mount the 5.1 product disc and navigate to the folder that contains the installation program to install 5.1 GA binaries. Choose one of the following to start the installation:

- For Storage Foundation:

```
# ./installsf node1 node2 ... nodeN
```

- For Storage Foundation HA:

```
# ./installsf -ha node1 node2 ... nodeN
```

- For Storage Foundation Cluster File System:

```
# ./installsfcfs node1 node2 ... nodeN
```

- For Storage Foundation Cluster File System HA:

```
# ./installsfcfs -ha node1 node2 ... nodeN
```

- For Storage Foundation for Oracle RAC:

```
# ./installsfrac node1 node2 ... nodeN
```

- For Veritas Cluster Server:

```
# ./installvcs node1 node2 ... nodeN
```

2 Review the installation prerequisites for upgrading to 5.1 RP1.

See "Prerequisites for upgrading to 5.1 RP1" on page 47.

3 Mount the 5.1 RP1 product disc and navigate to the folder that contains the installation program.

- If the 5.1 product is installed and configured, then run the `installrp` script to install 5.1 RP1.

```
# ./installrp [-rsh] node1 node2 ... nodeN
```

See "About the new installrp script" on page 28.

- If the 5.1 product is installed and not configured, run the `installrp` script to install 5.1 RP1 and configure the product.

```
# ./installrp [-rsh] node1 node2 ... nodeN
```

See "About the new installrp script" on page 28.

The `installrp` script will give you an option to configure the product. If you choose not to configure the product at the time of the 5.1 RP1 installation, then proceed to step 4.

4 Mount the 5.1 product disc and navigate to the folder that contains the installation program. Run the same 5.1 installation script that you used in step 1, this time specifying the `-configure` option to configure the software.

- For Storage Foundation:

```
# ./installsf -configure node1 node2 ... nodeN
```

- For Storage Foundation HA:

```
# ./installsf -ha -configure node1 node2 ... nodeN
```

- For Storage Foundation Cluster File System:

```
# ./installsfcfs -configure node1 node2 ... nodeN
```

- For Storage Foundation Cluster File System HA:

```
# ./installsfcfs -ha -configure node1 node2 ... nodeN
```

- For Storage Foundation for Oracle RAC:

```
# ./installsfrac -configure node1 node2 ... nodeN
```

- For Veritas Cluster Server:

```
# ./installvcs -configure node1 node2 ... nodeN
```

See the 5.1 Installation for your product.

Installing with JumpStart

These JumpStart instructions assume a working knowledge of JumpStart. See the JumpStart documentation that came with your operating system for details on using JumpStart. Only fresh installations of Veritas product are supported using JumpStart. Upgrading is not supported. The following procedure assumes a stand-alone configuration.

For the language pack, you can use JumpStart to install packages. You add the language packages in the script, and put those files in the JumpStart server directory.

Overview of JumpStart installation tasks

The following instructions apply to the following Veritas products:

- Storage Foundation
- Storage Foundation for Oracle RAC
- Storage Foundation Cluster File System (HA)
- Veritas Cluster Server

Review the summary of tasks before you perform the JumpStart installation.

Summary of tasks

1. Add a client (register to the JumpStart server). See the JumpStart documentation that came with your operating system for details.
2. Read the JumpStart installation instructions.
3. Generate the finish scripts.

   See "Generating the finish scripts" on page 37.
4. Prepare installation resources.

   See "Preparing installation resources" on page 42.
5. Run JumpStart to install the Veritas product.

   Note: JumpStart may reboot systems after product installation.
6. Run the `installer` command from the disc or from directory `/opt/VRTS/install` directory to configure the Veritas software.

   ```
   # /opt/VRTS/install/installer installprod -configure
   ```

   Where *`installprod`* is the product's installation command.
7. Modify the rules file for JumpStart.

   See the JumpStart documentation that came with your operating system for details.

Generating the finish scripts

Perform these steps to generate the finish script to install Veritas product.

To generate the script

1 Run the `installrp` program to generate the scripts.

```
# installrp -jumpstart directory_to_generate_scripts
```

Where the *directory_to_generate_scripts* is where you want to put the scripts.

For example:

```
# ./installrp -jumpstart /js_scripts
```

2 When you are prompted to encapsulate the root disk automatically, choose **yes** to do so. If you do not want to encapsulate it automatically, choose **no** and go to step 6.

3 Specify a disk group name for the root disk.

```
Specify the disk group name of the root disk to be encapsulated:
rootdg
```

4 Specify private region length.

```
Specify the private region length of the root disk to be
encapsulated: (65536)
```

5 Specify the disk's media name of the root disk to encapsulate.

```
Specify the disk media name of the root disk to be encapsulated:
(rootdg_01)
```

6 JumpStart finish scripts, installer scripts, uninstaller scripts of Veritas products, and encapsulation scripts are generated in the directory you specified in step 1. Output resembles:

```
The finish scripts for AT50 is generated at
/js4/jumpstart_at50.fin
The installer script to configure AT is generated at
/js4/installat
The installer script to uninstall AT is generated at
/js4/uninstallat
The finish scripts for FS51 is generated at
/js4/jumpstart_fs51.fin
The installer script to configure FS is generated at
/js4/installfs
The installer script to uninstall FS is generated at
/js4/uninstallfs
The finish scripts for SF51 is generated at
/js4/jumpstart_sf51.fin
The installer script to configure SF is generated at
/js4/installsf
The installer script to uninstall SF is generated at
/js4/uninstallsf
The finish scripts for SFCFS51 is generated at
/js4/jumpstart_sfcfs51.fin
The installer script to configure SFCFS is generated at
/js4/installsfcfs
The installer script to uninstall SFCFS is generated at
/js4/uninstallsfcfs
The finish scripts for SFCFSHA51 is generated at
/js4/jumpstart_sfcfsha51.fin
The installer script to configure SFCFSHA is generated at
/js4/installsfcfsha
The installer script to uninstall SFCFSHA is generated at
/js4/uninstallsfcfsha
The finish scripts for SFHA51 is generated at
/js4/jumpstart_sfha51.fin
The installer script to configure SFHA is generated at
/js4/installsfha
The installer script to uninstall SFHA is generated at
/js4/uninstallsfha
The finish scripts for SFRAC51 is generated at
/js4/jumpstart_sfrac51.fin
The installer script to configure SF Oracle RAC is generated at
```

```
/js4/installsfrac
The installer script to uninstall SF Oracle RAC is generated at
/js4/uninstallsfrac
The finish scripts for VCS51 is generated at
/js4/jumpstart_vcs51.fin
The installer script to configure VCS is generated at
/js4/installvcs
The installer script to uninstall VCS is generated at
/js4/uninstallvcs
The finish scripts for VM51 is generated at
/js4/jumpstart_vm51.fin
The installer script to configure VM is generated at
/js4/installvm
The installer script to uninstall VM is generated at
/js4/uninstallvm
The encapsulation boot disk script for VM is generated at
/js4/encap_bootdisk_vm51001000.fin
```

List the js_scripts directory.

```
# ls /js_scripts
```

You could select scripts according to the products. For example.

For SF:

```
encap_bootdisk_vm51001000.fin installsf jumpstart_sf51.fin uninstallsf
```

For SF Oracle RAC:

```
encap_bootdisk_vm51001000.fin installsfrac jumpstart_sfrac51.fin
uninstallsfrac
```

For SFHA:

```
encap_bootdisk_vm51001000.fin installsfha jumpstart_sfha51.fin
uninstallsfha
```

For VCS:

```
encap_bootdisk_vm51001000.fin jumpstart_vcs51.fin installvcs
uninstallvcs
```

7 Modify the JumpStart script according to your requirements. You must modify the BUILDSRC and ENCAPSRC values. Keep the values aligned with the resource location values.

```
BUILDSRC="hostname_or_ip:/path_to_pkgs_patches_scripts"
// If you don't want to encapsulate the root disk automatically
// comment out the following line.
ENCAPSRC="hostname_or_ip:/path_to_encap_script"
```

8 If you want to install different products, use the following command to get the sequence for the product. In the following commands, replace the variable *prod* with the product's acronym. See the product documentation for more information.

- For the minimum set of packages, use:

  ```
  # installprod -minpkgs
  ```

- For the recommended set of packages, use:

  ```
  # installprod -recpkgs
  ```

An example of this command is:

For SF:

```
# ./installsf -minpkgs
SF: PKGS: VRTSvlic VRTSperl VRTSvxvm VRTSaslapm VRTSvxfs
```

For SF Oracle RAC:

```
# ./installsfrac -minpkgs
SF Oracle RAC: PKGS: VRTSvlic VRTSperl VRTSvxvm VRTSaslapm VRTSvxfs
VRTSllt VRTSgab VRTSvxfen VRTSvcs VRTSvcsag VRTSat VRTSvcsea VRTSdbed
VRTSglm VRTScavf VRTSgms VRTSodm VRTSdbac
```

For SFCFS:

```
# ./installsfcfs -minpkgs
SFCFS: PKGS: VRTSvlic VRTSperl VRTSvxvm VRTSaslapm VRTSvxfs VRTSllt
VRTSgab VRTSvxfen VRTSvcs VRTSvcsag VRTSat VRTSglm VRTScavf
```

For VCS:

```
# ./installvcs -minpkgs
VCS: PKGS: VRTSvlic VRTSperl VRTSllt VRTSgab VRTSvxfen VRTSvcs
VRTSvcsag VRTSat
```

Use the list of packages that is generated to replace the package list in the finish scripts.

Preparing installation resources

Prepare resources for the JumpStart installation.

To prepare the resources

1 Copy the contents of the installation disc to the shared storage.

```
# cd /cdrom/cdrom0
# cp -r * BUILDSRC
```

Note: After you copied the patches, you must unzip and untar them.

2 Generate the response file for the package list that you found in Generating the finish scripts step 8. In this example the packages are:

For SF:

VRTSvlic VRTSperl VRTSspt VRTSvxvm VRTSaslapm VRTSob VRTSsfmh VRTSvxfs VRTSfssdk VRTSdbed VRTSodm VRTSat

For SF Oracle RAC:

VRTSvlic VRTSperl VRTSvxvm VRTSaslapm VRTSvxfs VRTSllt VRTSgab VRTSvxfen VRTSvcs VRTSvcsag VRTSat VRTSvcsea VRTSdbed VRTSglm VRTScavf VRTSgms VRTSodm VRTSdbac

For SFCFS:

VRTSvlic VRTSperl VRTSspt VRTSvxvm VRTSaslapm VRTSob VRTSsfmh VRTSvxfs VRTSfssdk VRTSat VRTSllt VRTSgab VRTSvxfen VRTSvcs VRTScps VRTSvcsag VRTScutil VRTSvcsea VRTSdbed VRTSglm VRTScavf VRTSgms VRTSodm

For VCS:

VRTSvlic VRTSperl VRTSspt VRTSat VRTSllt VRTSgab VRTSvxfen VRTSvcs VRTScps VRTSvcsag VRTScutil VRTSvcsea

```
# cd BUILDSRC/pkgs/
# pkgask -r package_name.response -d /BUILDSRC/pkgs/packages_name.pkg
```

3 Create the adminfile file under *BUILDSRC*/pkgs/ directory. The adminfile file's contents follow:

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

4 If you want to encapsulate the root disk automatically when perform the JumpStart installation, copy the scripts `encap_bootdisk_vm51001000.fin` generated in Generating the finish scripts step 6 to *ENCAPSRC*

5 Modify the rules file as required.

For example:

```
any - - profile_sf jumpstart_sf51.fin
```

For detailed instructions, see the *Sun Microsystems' JumpStart* documentation.

Adding language pack information to the finish file

For the language pack, copy the language packages from the language pack installation disc to the shared storage.

```
# cd /cdrom/cdrom0/pkgs
# cp -r * BUILDSRC/pkgs
```

Add lines for the language packages in the finish script. If the finish file resembles:

```
. . .
for PKG in VRTSperl VRTSvlic VRTSicsco . . .

do
.
.
.
done
```

Add the following lines for the language pack after the patch information for VCS. Copy the command syntax between the "do" and "done" lines and add that for the language pack lines as well. Note that the line that starts "for PKG" is on three lines in this guide, but should be on a single line in the file.

```
. . .
for PKG in VRTSmulic VRTSatJA VRTSjacav VRTSjacs VRTSjacse
VRTSjacsu VRTSjadba VRTSjafs VRTSjavm VRTSjadbe VRTSjaodm
VRTSatZH VRTSzhvm

do
.
.
.
done
```

Installing 5.1 RP1 using the web-based installer

This section describes how to install 5.1 RP1 using the web-based installer.

Note: Installing SF Oracle RAC using the web-based installer is not supported in this release.

About the Web-based installer

The `webinstaller` script is used to start and stop the Veritas XPortal Server `xprtlwid` process. The `webinstaller` script can also be used to check the status of the XPortal Server.

When the `webinstaller` script starts the `xprtlwid` process, the script displays a URL. Use this URL to access the Web-based installer from a Web browser such as Internet Explorer or FireFox.

The Web installer creates log files whenever the Web installer is operating. While the installation processes are operating, the log files are located in a session-based directory under the `/var/tmp` directory. After the install process completes, the log files are located in the `/opt/VRTS/install/logs` directory. It is recommended that you keep the files for auditing, debugging, and future use.

The location of the Veritas XPortal Server configuration file is `/var/opt/webinstaller/xprtlwid.conf`.

Before using the Veritas Web-based installer

The Veritas Web-based installer requires the following configuration.

Table 1-15 Web-based installer requirements

System	Function	Requirements
Target system	The system(s) where the Veritas products will be installed.	Must be a supported platform for Veritas product 5.1 RP1
Installation server	The server from which to initiate the installation. The installation media is mounted and accessible from the installation server.	Must be the same OS as the system(s) on which to install.
Administrative system	The system on which you run the web browser to perform the installation.	Web browser

Starting the Veritas Web-based installer

This section describes starting the Veritas Web-based installer.

To start the Web-based installer

1. Start the Veritas XPortal Server process `xprtlwid`, on the installation server:

   ```
   # ./webinstaller start
   ```

   The webinstaller script displays a URL.
2. On the administrative server, start the Web browser.
3. Navigate to the URL displayed from step 1.
4. The browser may display the following message:

   ```
   Secure Connection Failed
   ```

   Obtain a security exception for your browser.
5. When prompted, enter `root` and root's password of the installation server.

Obtaining a security exception on Mozilla Firefox

You may need to get a security exception on Mozilla Firefox.

To obtain a security exception

1. Click **Or you can add an exception** link.
2. Click **Add Exception** button.
3. Click **Get Certificate** button.
4. Uncheck **Permanently Store this exception checkbox (recommended)**.
5. Click **Confirm Security Exception** button.
6. Enter root in User Name field and root password of the web server in the Password field.

Performing a pre-installation check with the Veritas Web-based installer

This section describes performing a pre-installation check with the Veritas Web-based installer.

To perform a pre-installation check

1. Start the Web-based installer.

   See "Starting the Veritas Web-based installer" on page 45.
2. On the Select a task and a product page, select **Perform a Pre-installation check** from the **Task** drop-down list.
3. Indicate the systems on which to perform the precheck. Enter one or more system names, separated by spaces. Click **Validate**.
4. The installer performs the precheck and displays the results.
5. If the validation completes successfully, click **Next**. The installer prompts you to begin the installation. Click **Yes** to install Veritas product on the selected system. Click **No** to install later.
6. Click **Finish**. The installer prompts you for another task.

Installing products with the Veritas Web-based installer

This section describes installing Veritas product with the Veritas Web-based installer.

To install Veritas product

1. Perform preliminary steps.
2. Start the Web-based installer.

   See "Starting the Veritas Web-based installer" on page 45.

3 On the Select a task and product page, select **Install RP1** from the **Task** drop-down list.

4 Select Veritas product or Veritas product High Availability from the Product drop-down list, and click Next.

5 On the License agreement page, select whether you accept the terms of the End User License Agreement (EULA). To continue, select **Yes, I agree** and click **Next**.

6 Indicate the systems on which to install. Enter one or more system names, separated by spaces. Click **Validate**.

7 After the validation completes successfully, click **Next** to install Veritas product on the selected system.

8 For Storage Foundation, click Next to complete the configuration and start the product processes.

For Storage Foundation High Availability, the installer prompts you to configure the cluster.

Note that you are prompted to configure only if the product is not yet configured.

If you select n, you can exit the installer. You must configure the product before you can use Veritas product.

See the Veritas product's Installation Guide to configure the product.

After the installation completes, the installer displays the location of the log and summary files. If required, view the files to confirm the installation status.

9 Select the checkbox to specify whether you want to send your installation information to Symantec.

```
Would you like to send the information about this installation
to Symantec to help improve installation in the future?
```

Click **Finish**. The installer prompts you for another task.

Prerequisites for upgrading to 5.1 RP1

The following list describes prerequisites for upgrading to the 5.1 RP1 release:

- For any product in the Storage Foundation stack, regardless of your operating system, you must have the 5.1 release installed before you can upgrade that product to the 5.1 RP1 release.
- Each system must have sufficient free space to accommodate patches.

Supported upgrade paths

This section describes the supported upgrade paths for this release.

- 5.1 to 5.1 RP1
- 5.1 P1 to 5.1 RP1
- 5.1 to 5.1 P1 to 5.1 RP1

Upgrading 5.1 to 5.1 RP1

This section describes how to upgrade from 5.1 to 5.1 RP1 on a cluster or a standalone system.

- Performing a full upgrade to 5.1 RP1 on a cluster
  Use the procedures to perform a full upgrade to 5.1 RP1 on a cluster that has VCS, SFHA, SFCFS, or SF Oracle RAC installed and configured.
- Upgrading Veritas product with the Veritas Web-based installer
  Use the procedure to upgrade your Veritas product with the Web-based installer.
- Performing a rolling upgrade using the installer
  Use the procedure to upgrade your Veritas product with a rolling upgrade.
- Performing a rolling upgrade manually
  Use the procedure to upgrade your Veritas product manually with the rolling upgrade.
- Upgrading to 5.1 RP1 on a standalone system
  Use the procedure to upgrade to 5.1 RP1 on a system that has SF and VCS installed.

Performing a full upgrade to 5.1 RP1 on a cluster

Performing a full upgrade on a cluster requires stopping cluster failover functionality during the entire procedure. However, if you use SFCFS and Cluster Volume Manager (CVM), the SFCFS and CVM services remain available.

The following are the stages of performing a full upgrade on a cluster:

- Freeze service group operations and stop VCS on the cluster.
- Take the nodes offline and install the software patches.
- Bring the nodes online to restart cluster failover services.

Depending on your cluster's configuration, select one of the following procedures to upgrade to 5.1 RP1:

- Performing a full upgrade to 5.1 RP1 for VCS
- Performing a full upgrade to 5.1 RP1 on a SFHA cluster
- Performing a full upgrade to 5.1 RP1 on a SFCFS cluster
- Performing a full upgrade to 5.1 RP1 on a SF Oracle RAC cluster

Performing a full upgrade to 5.1 RP1 for VCS

The following procedure describes performing a full upgrade on a VCS cluster.

You need to make sure that IPv4RouteOptions attribute is configured, otherwise network connection may be interrupted.

To upgrade VCS

1. Review the installation prerequisites.

   See "Prerequisites for upgrading to 5.1 RP1" on page 47.

2. Check the readiness of the nodes where you plan to upgrade. Start the pre-upgrade check:

   ```
   # ./installrp -precheck -rsh node1 node2 ... nodeN
   ```

   See "About the new installrp script" on page 28.

3. Resolve any issues that the precheck finds.

4. Start the upgrade:

   ```
   # ./installrp  node1 node2 ... nodeN
   ```

5. After the upgrade, review the log files.

6. Verify the upgrade.

   See "Verifying software versions" on page 73.

Performing a full upgrade to 5.1 RP1 on a SFHA cluster

The following procedure describes performing a full upgrade on a SFHA and VCS cluster.

To perform a full upgrade to 5.1 RP1 on a SFHA cluster

1. Log in as superuser.
2. Verify that `/opt/VRTS/bin` is in your `PATH` so that you can execute all product commands.
3. Make the VCS configuration writable on a node that is being upgraded:

   ```
   # haconf -makerw
   ```

4. Freeze the HA service group operations. Enter the following command on each node, if you selected a group of nodes on which to upgrade the operating system:

   ```
   # hasys -freeze -persistent nodename
   ```

5. Make the VCS configuration read-only:

   ```
   # haconf -dump -makero
   ```

6. Close any instance of VCS GUI that is running on the node.
7. Stop VCS:

   ```
   # hastop -local
   ```

8. Stop the VCS command server:

   ```
   # ps -ef | grep CmdServer
   # kill -9 pid_of_CmdServer
   ```

   where *pid_of_CmdServer* is the process ID of CmdServer.

9. Stop cluster fencing, GAB, and LLT.

   ```
   # /etc/init.d/vxfen stop
   # /etc/init.d/gab stop
   # /etc/init.d/llt stop
   ```

10. If required, apply the OS kernel patches.

    See "System Requirements" on page 8.

    See *Sun Microsystems'* documentation for the procedures.

11. Repeat step 7 through step 9 if the system reboots after upgrading the operating system. You need to perform this to stop the components that started by the init scripts, if any.

12 Mount the 5.1 RP1 product disc and navigate to the folder that contains the installation program. Enter the installrp script. If ssh key authentication is configured then enter:

```
# ./installrp  node1 node2
```

If ssh is not configured then enter:

```
# ./installrp -rsh node1 node2
```

where *node1* and *node2* are nodes which are to be upgraded.

13 After all of the nodes in the cluster are upgraded, shut down and reboot each of the nodes. After the nodes come up, application failover capability is available.

14 Make the VCS configuration writable again from any node:

```
# haconf -makerw
```

15 Unfreeze the service group operations on each node:

```
# hasys -unfreeze -persistent nodename
```

16 Make the VCS configuration read-only:

```
# haconf -dump -makero
```

Performing a full upgrade to 5.1 RP1 on a SFCFS cluster

The following procedure describes performing a full upgrade on an SFCFS cluster.

To perform a full upgrade to 5.1 RP1 on an SFCFS cluster

1 Log in as superuser.

2 Verify that `/opt/VRTS/bin` and `/opt/VRTSvcs/bin` is in your `PATH` so that you can execute all product commands.

3 From any node in the cluster, make the VCS configuration writable:

```
# haconf -makerw
```

4 Enter the following command to freeze HA service group operations on each node:

```
# hasys -freeze -persistent nodename
```

5 Make the configuration read-only:

```
# haconf -dump -makero
```

6 On each node, enter the following command to check if any Storage Checkpoints are mounted:

```
# df -F vxfs
```

If any Storage Checkpoints are mounted, on each node in the cluster unmount all Storage Checkpoints.

```
# umount /checkpoint_name
```

7 On each node, enter the following command to check if any VxFS file systems are mounted:

```
# df -F vxfs
```

- If any VxFS file systems are present, on each node in the cluster unmount all of the VxFS file systems:

  ```
  # umount /filesystem
  ```

8 If you have created any Veritas Volume Replicator (VVR) replicated volume groups (RVGs) on your system, perform the following steps:

- Stop all applications that are involved in replication. For example, if a data volume contains a file system, unmount it.
- Use the `vxrvg stop` command to stop each RVG individually:

  ```
  # vxrvg -g diskgroup stop rvg_name
  ```

- On the Primary node, use the `vxrlink status` command to verify that all RLINKs are up-to-date:

  ```
  # vxrlink -g diskgroup status rlink_name
  ```

  Caution: To avoid data corruption, do not proceed until all RLINKs are up-to-date.

9 Stop activity to all VxVM volumes.

For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

10 On each node, stop all VxVM volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup stopall
```

Verify that no volumes remain open:

```
# vxprint -Aht -e v_open
```

11 Stop VCS:

```
# hastop -all
```

12 On each node, stop the VCS command server:

```
# ps -ef | grep CmdServer
# kill -9 pid_of_CmdServer
```

where *pid_of_CmdServer* is the process ID of CmdServer.

13 On each node, stop ODM, cluster fencing, GAB, and LLT in the following order:

- Solaris 9:

```
# /etc/init.d/odm stop
# /etc/init.d/vxfen stop
# /etc/init.d/gab stop
# /etc/init.d/llt stop
```

- Solaris 10:

```
# svcadm disable -t vxfen
# svcadm disable -t vxodm
# svcadm disable -t gab
# svcadm disable -t llt
```

14 If required, apply the OS kernel patches.

See "System Requirements" on page 8.

See *Sun Microsystems'* documentation for the procedures.

15 On each node, check if the VEA service is running:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is running, stop it:

```
# /opt/VRTS/bin/vxsvcctrl stop
```

16 Navigate to the folder that contains the `installrp` program and start the `installrp` program:

```
# ./installrp  [-rsh] node1
    node2 ... nodeN
```

Review the output.

17 Start services for LLT, GAB, cluster fencing and ODM on all upgraded nodes:

For Solaris 9:

```
# /etc/init.d/llt start
# /etc/init.d/gab start
# /etc/init.d/vxfen start
# /etc/init.d/odm start
```

For Solaris 10:

```
# svcadm enable llt
# svcadm enable gab
# svcadm enable vxfen
# svcadm enable vxodm
```

18 Start vcs on all upgraded nodes:

```
# /opt/VRTSvcs/bin/hastart
```

19 If necessary, reinstate any missing mount points in the `/etc/vfstab` file on each node.

20 Make the VCS configuration writable again from any node:

```
# haconf -makerw
```

21 Enter the following command on each node to unfreeze HA service group operations:

```
# hasys -unfreeze -persistent nodename
```

22 Make the configuration read-only:

```
# haconf -dump -makero
```

23 Bring the CVM service group online on each node:

```
# hagrp -online cvm -sys nodename
```

24 Restart all the volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup startall
```

25 If you stopped any RVGs in step 10, restart each RVG:

```
# vxrvg -g diskgroup start rvg_name
```

26 Remount all VxFS file systems on all nodes:

```
# mount /filesystem
```

27 Remount all Storage Checkpoints on all nodes:

```
# mount /checkpoint_name
```

Performing a full upgrade to 5.1 RP1 on a SF Oracle RAC cluster

The following procedure describes performing a full upgrade on an SF for Oracle RAC cluster.

To upgrade to 5.1 RP1 on a SF Oracle RAC cluster

1 Log in as superuser.

2 Verify that `/opt/VRTSvcs/bin` is in your `PATH` so that you can execute all product commands.

3 From any node in the cluster, make the VCS configuration writable:

```
# haconf -makerw
```

4 Enter the following command to freeze HA service group operations on each node:

```
# hasys -freeze -persistent nodename
```

5 Make the configuration read-only:

```
# haconf -dump -makero
```

6 If CRS is not controlled by VCS, enter the following command on each node of the cluster to stop CRS:

```
# /etc/init.d/init.crs stop
```

7 Stop VCS.

```
# hastop -all
```

8 Stop the VCS command server:

```
# ps -ef | grep CmdServer
# kill -9 pid_of_CmdServer
```

where *pid_of_CmdServer* is the process ID of CmdServer.

9 Stop VCSMM and LMX if they are running:

For Solaris 9:

```
# /etc/init.d/vcsmm stop
# /etc/init.d/lmx stop
```

For Solaris 10:

```
# svcadm disable -t vcsmm
# svcadm disable -t lmx
```

10 Stop cluster fencing, ODM, and GAB:

For Solaris 9:

```
# /etc/init.d/vxfen stop
# /etc/init.d/odm stop
# /etc/init.d/gab stop
```

For Solaris 10:

```
# svcadm disable -t vxfen
# svcadm disable -t vxodm
# svcadm disable -t gab
```

11 On each node, unload the vxfen, LMX, GAB, VCSMM, GMS, and GLM kernel modules if they are still loaded:

- Verify if the `vxfen` kernel module is loaded. For example:

```
# modinfo|grep vxfen
210 7ba44000 39488 258 1 vxfen (VRTS Fence 5.1)
```

If the vxfen kernel module is loaded then unload it. For example:

```
# modunload -i 210
```

- Verify if the LMX kernel module is loaded. For example:

```
# modinfo | grep lmx
239 ffffffff1253000  13a30 236   1  lmx (LLT Mux '5.1')
```

If the LMX kernel module is loaded then unload it. For example:

```
# modunload -i 239
```

- Verify if the VCSMM kernel module is loaded. For example:

```
# modinfo | grep vcsmm
   312 78bc0000  43ae8 293   1  vcsmm (VRTSvcsmm 5.1)
```

If the VCSMM kernel module is loaded then unload it. For example:

```
# modunload -i 312
```

- Verify if the GMS kernel module is loaded. For example:

```
# modinfo | grep gms
311 78289c91   4867 292   1  vxgms (VxGMS 5.1 (SunOS))
```

If the GMS kernel module is loaded then unload it. For example:

```
# modunload -i 311
```

- Verify if the GLM kernel module is loaded. For example:

```
# modinfo | grep glm
310 78b68000  24268 291   1  vxglm (VxGLM 5.1 (SunOS 5.10))
```

If the GLM kernel module is loaded then unload it. For example:

```
# modunload -i 310
```

- Verify if the GAB kernel module is loaded. For example:

```
# modinfo | grep gab
149 50cc6000 2b451 112 1 gab (GAB device 5.1)
```

If the GAB kernel module is loaded then unload it. For example:

```
# modunload -i 149
```

12 Stop LLT:

For Solaris 9:

```
# /etc/init.d/llt stop
```

For Solaris 10:

```
# svcadm disable -t llt
```

- Verify if the LLT kernel module is loaded. For example:

  ```
  # modinfo|grep llt
  147 50ca4000 d6bc 110 1 llt (LLT 5.1)
  ```

  If the LLT kernel module is loaded then unload it. For example:

  ```
  # modunload -i 147
  ```

13 If required, apply the OS kernel patches.

See "System Requirements" on page 8.

See *Sun Microsystems'* documentation for the procedures.

Note: If you are upgrading a SF Oracle RAC cluster, you must upgrade the nodes of the cluster at this stage to one of the operating system versions that this release supports.

---

14 On each node of the cluster, enter the following command to check if any VxFS file systems are mounted:

```
# df -F vxfs
```

- If any VxFS file systems are present, on each node of the cluster unmount all the VxFS file systems:

  ```
  # umount /filesystem
  ```

- On each node of the cluster, verify that all file systems have been cleanly unmounted:

  ```
  # echo "8192B.p S" | fsdb -F vxfs filesystem | grep clean
  flags 0 mod 0 clean clean_value
  ```

  A *clean_value* value of 0x5a indicates the file system is clean, 0x3c indicates the file system is dirty, and 0x69 indicates the file system is dusty. A dusty file system has pending extended operations.

- If a file system is not clean, enter the following commands for that file system:

```
# fsck -F vxfs filesystem
# mount -F vxfs filesystem mountpoint
# umount mountpoint
```

This should complete any extended operations that were outstanding on the file system and unmount the file system cleanly. There may be a pending large fileset clone removal extended operation if the umount command fails with the following error:

```
file system device busy
```

You know for certain that an extended operation is pending if the following message is generated on the console:

```
Storage Checkpoint asynchronous operation on file_system
file system still in progress.
```

- If an extended operation is pending, you must leave the file system mounted for a longer time to allow the operation to complete. Removing a very large fileset clone can take several hours.
- Repeat the following command to verify that the unclean file system is now clean:

```
# echo "8192B.p S" | fsdb -F vxfs filesystem | grep clean
flags 0 mod 0 clean clean_value
```

15 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

16 On each node of the cluster, stop all VxVM volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup stopall
```

Verify that no volumes remain open:

```
# vxprint -Aht -e v_open
```

17 Check if the VEA service is running:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is running, stop it:

```
# /opt/VRTS/bin/vxsvcctrl stop
```

18 Mount the 5.1 RP1 product disc and navigate to the folder that contains the installation program. Enter the `installrp` script. If ssh key authentication is configured then enter:

```
# ./installrp  galaxy
    nebula
```

If ssh is not configured then enter:

```
# ./installrp -rsh galaxy
    nebula
```

where `node1` and `node2` are nodes which are to be upgraded.

19 After the entire cluster is upgraded, reboot all of the nodes of the cluster.

```
# /usr/sbin/shutdown -g0 -y -i6
```

20 If necessary, reinstate any missing mount points in the `/etc/vfstab` file on each node.

21 Run the following commands to start the Storage Foundation for Oracle RAC processes:

For Solaris 9:

```
# /etc/init.d/llt start
# /etc/init.d/gab start
# /etc/init.d/odm start
# /etc/init.d/vxfen start
# /etc/init.d/vcsmm start
# /etc/init.d/lmx start
# /opt/VRTSvcs/bin/hastart
```

For Solaris 10:

```
# svadm enable llt
# svadm enable gab
# svadm enable vxodm
# svadm enable vxfen
# svadm enable vcsmm
# svadm enable lmx
# /opt/VRTSvcs/bin/hastart
```

22 From any node in the cluster, make the VCS configuration writable:

```
# haconf -makerw
```

23 Enter the following command on each node to unfreeze HA service group operations:

```
# hasys -unfreeze -persistent nodename
```

24 Make the configuration read-only:

```
# haconf -dump -makero
```

25 Enter the following command on each node to take service groups online:

```
# hagrp -online service_group -sys nodename
```

26 Restart all the volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup startall
```

27 If CRS is not controlled by VCS, enter the following command on each node to start CRS.

```
# /etc/init.d/init.crs start
```

28 Remount all VxFS file systems on all nodes:

```
# mount /filesystem
```

29 Check if the VEA service was restarted:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is not running, restart it:

```
# /opt/VRTS/bin/vxsvcctrl start
```

Upgrading Veritas product with the Veritas Web-based installer

This section describes upgrading Veritas product with the Veritas Web-based installer. The installer detects and upgrades the product that is currently installed on the specified system or systems. If you want to upgrade to a different product, you may need to perform additional steps.

Note: Upgrading SF Oracle RAC with the Web-based installer is not supported.

To upgrade Veritas product

1. Perform the required steps to save any data that you wish to preserve. For example, take back-ups of configuration files.
2. Start the Web-based installer.

   See "Starting the Veritas Web-based installer" on page 45.
3. Select **Install RP1**.

   The installer detects the product that is installed on the specified system.
4. Indicate the systems on which to upgrade. Enter one or more system names, separated by spaces. Click **Validate**.
5. Click **Next** to complete the upgrade.

   After the upgrade completes, the installer displays the location of the log and summary files. If required, view the files to confirm the installation status.
6. Click **Finish**. After the upgrade, if the product is not configured, the web-based installer asks: "Do you want to configure this product?" If the product is already configured, it will not ask any questions.

If you are upgrading from 4.x, you may need to create new VCS accounts if you used native operating system accounts.

Performing a rolling upgrade using the installer

You can use rolling upgrades to upgrade one product from a release to the next with minimal application downtime.

About rolling upgrades

You can use rolling upgrades to upgrade one product from a release to the next. Rolling upgrades require less downtime. Rolling upgrades are not compatible with phased upgrades. Do not perform "mixed" rolling upgrades with phased upgrades.

Rolling upgrades take two discrete phases. In the first, you upgrade the kernel packages with exception of VCS packages and agent packages. In the second, you upgrade the non-kernel packages, which are VCS packages and agents packages.

You can perform a rolling upgrade for the following products:

- Veritas Cluster Server
- Storage Foundation and High Availability
- Storage Foundation Cluster File System
- Storage Foundation Cluster File System and High Availability

- Storage Foundation for Oracle RAC

You can perform a rolling upgrade from 5.1 to 5.1 RP1 or from 5.1 P1 to 5.1 RP1.

Prerequisites for a rolling upgrades

Meet the following prerequisites before performing a rolling upgrade:

- Make sure that the product you want to upgrade supports rolling upgrades.
- Split up your clusters into sub-clusters for the purpose of upgrade. A sub-cluster can include one or more nodes. This division helps to keep service groups running during the upgrade.
- Make sure you logged in as superuser and have the media mounted.
- VCS must be running before performing the rolling upgrade.

Performing a rolling upgrade on kernel packages: phase 1

Note that in the following instructions that a sub-cluster can represent one or more nodes in a full cluster, but is represented by nodeA.

To perform the rolling upgrade on kernel packages: phase 1

1. On the first sub-cluster, start the installer for the rolling upgrade with the `-upgrade_kernelpkgs` option.

   ```
   ./installrp  -upgrade_kernelpkgs nodeA
   ```

   Review the EULA, if you accept its terms, enter **y** to proceed.
2. Note that if the boot-disk is encapsulated, then you do not need to perform an unencapsulation for upgrades.
3. Note the installation log location. The installer checks system communications, package versions, product versions, and completes prechecks. It then upgrades applicable kernel patches.
4. The installer further replaces kernel components. Review the output.
5. The installer starts processes and brings all the service groups online.
6. Repeat step 1 to 5 on the second subcluster.

Performing a rolling upgrade on non-kernel packages: phase 2

You now upgrade the non-kernel packages..

To perform the rolling upgrade on non-kernel packages: phase 2

1. Start the installer for the rolling upgrade with the `-upgrade_nonkernelpkgs` option. Specify all the nodes in the cluster:

   ```
   ./installrp -upgrade_nonkernelpkgs nodeA nodeB nodeC...
   ```

   Review the EULA, if you accept its terms, enter **y** to proceed.

2. Note the installation log location. The installer checks system communications, package versions, product versions, and completes prechecks. It verifies completion of phase 1.
3. The installer upgrades non-kernel components. Review the output.
4. The installer starts processes and brings all the service groups online.
5. Manually check the cluster's status.

   ```
   # hastatus -sum
   ```

Performing a rolling upgrade manually

You can perform a Split stack rolling upgrade—an independent upgrade of CFS/ODM/CVM/LLT/GAB/VXFEN/LMX/VCSMM and the VCS Engine ('had').

Split stack rolling upgrade—an independent upgrade of CFS/ODM/CVM/LLT/GAB/VXFEN/LMX/VCSMM and the VCS Engine ('had')

Review the following notes:

- It is possible to conduct Rolling Upgrade of one node at a time.
- Recommended for clusters of any number of nodes and Service Group distributions, including N+1 configurations.
- Failover Service Groups will incur downtime 2 times, during failover/failback.

To perform a split stack rolling upgrade—an independent upgrade of CFS/ODM/CVM/LLT/GAB/VXFEN/LMX/VCSMM and the VCS engine ('had')

1. Consider a four node SFRAC cluster. Identify sub-clusters to be upgraded together. A sub-cluster could even be just one of the nodes of the cluster.
2. Review cluster's system list. Confirm that each Service Group will eventually have a target node to run on, when sub-clusters are upgraded in a rolling fashion.
3. Verify that `/opt/VRTS/bin` and `/opt/VRTSodm/bin` are added to `PATH` variable.

4 Display the system list:

```
# hagrp -display ServiceGroup -attribute SystemList
```

5 On the sub-cluster to be upgraded, run module specific commands as below for LLT, GAB, VXFEN, LMX, VCSMM, CVM, CFS, ODM on one of the nodes of the sub-cluster to be upgraded, to get the current protocol version. This version need not be same for all modules.

```
# lltconfig -W
# gabconfig -W
# vxfenconfig -W
# lmxconfig -W
# vcsmmconfig -W
# vxdctl protocolversion
# fsclustadm protoversion
# odmclustadm protoversion
```

6 On the sub-cluster to be upgraded, stop all the applications and resources that are not under VCS control but are still using CVM and CFS stack.

7 Switch the failover Service Groups from the sub-cluster to be upgraded, to the other sub-cluster. The following command needs to be run for each affected Service Group on each node where the Service Group is active, on the sub-cluster to be upgraded. You may also specify a target node for a given Service Group, as required. However there is a downtime to the failover Service Groups at this stage as part of the switch.

```
# hagrp -switch ServiceGroup -to target_system_name
```

8 Validate that the Service Groups are switched over as desired. In case the switch didn't succeed for any of the Service Groups, the user still has a window available to make any changes to the impacted Service Groups at this stage.

9 Unmount all vxfs file systems on the sub-cluster.

10 Stop 'had' on the sub-cluster to be upgraded, and switch any remaining failover Service Groups on this sub-cluster atomically.

```
# hastop -local -evacuate
```

Review the following notes:

- If all the Service Groups had switched over in step 6 itself, the 'evacuate' operation for the above command is idempotent.

- With the above step, it is ensured that if one of the nodes in the remaining sub-cluster goes down at this stage, the Service Groups that have already been moved to the remaining sub-cluster will not attempt to switch back to any of the nodes on the sub-cluster being upgraded. Any pending switches can also occur in this step.
- The parallel Service Groups on the nodes of the sub-cluster to be upgraded are brought down at this stage. They will continue to be available on the remaining sub-cluster.
- CVM, CFS will also be stopped by VCS on the nodes of the sub-cluster being upgraded. They will continue to be available on the remaining sub-cluster.

11 Stop applications/resources that are outside VCS control and use VxFS, VxVM.

12 Manually update the `/etc/vxfenmode`, `/etc/gabtab`, and `/etc/vcsmmtab` files to indicate the protocol version that the corresponding module in the new stack should talk to that on the older stack on each of the nodes. This protocol version is the same as the one obtained in step 5. For CVM, CFS and ODM, run the following commands on each of the nodes, to set the protocol version.

```
# vxdctl setversion N
# fsclustadm protoset N
# odmclustadm protoset N
```

where *N* is the protocol version derived in step 5.

This step ensures that the sub-clusters consistently communicate at the older protocol version should there be any intermediate node joins/leaves until the entire cluster is explicitly rolled over to communicate at the new version.

For example, for /etc/vxfenmode:

```
# cat /etc/vxfenmode
#
# vxfen_mode determines in what mode VCS I/O Fencing should work.
#
# available options:
# scsi3      - use scsi3 persistent reservation disks
# customized - use script based customized fencing
# sybase     - use scsi3 disks in kernel but coordinate membership
# with Sybase ASE
# disabled   - run the driver but don't do any actual fencing
#

vxfen_mode=disabled
vxfen_protocol_version=10


# cat /etc/gabtab
/sbin/gabconfig -c -n4 -V33
```

13 Stop VXFEN, ODM, VCSMM, LMX, GAB and LLT in that order, on each of the nodes of the sub-cluster to be upgraded.

14 Simultaneously upgrade of all the components except the VCS Engine ('had') on the sub-cluster chosen for upgrade. VCS engine and agent related packages are not upgraded at this stage. CFS, ODM, CVM, LMX, VCSMM, GAB, LLT, VXFEN will be upgraded together.

- Upgrade (use patchadd on Solaris) all the packages with new product version, except VCS and agent related packages on the sub-cluster being upgraded.
  Some examples of the patch names for SPARC are: VRTSsfmh 141270-02, VRTSvxvm 142629-02, VRTSllt 143260-02/143261-02, VRTSgab 143262-02/143263-02, VRTSvxfen 143706-02/143707-02, VRTSdbac 143696-01/143697-01, VRTSob 143687-01, and VRTScps 143279-02.
- Re-link oracle in case of SFRAC.
- In reverse order, start the components that you previously stopped.
  For example, on Solaris 10:

```
# svcadm enable llt
# svcs -a|grep llt
online          0:22:44 svc:/system/llt:default
# svcadm enable gab
# svcs -a|grep gab
online          0:25:07 svc:/system/gab:default
# svcadm enable vxodm
# svcs -a|grep vxodm
online          0:25:20 svc:/system/vxodm:default
# svcadm enable vxfen
# svcs -a|grep vxfen
online          0:25:37 svc:/system/vxfen:default
```

  For Solaris 9, the commands are listed under /etc/init.d to start modules. For example, to start LLT, use /etc/init.d/llt start, etc.
  LLT and LMX start communicating with the new version automatically when they are started.
  Start HA.

```
# hastart
```

- Once all the services are started, start use the `hastart` command to start HA. All ports should come up successfully and cluster start communication the other nodes.

15 Upgrade the remaining sub-cluster(s) one by one, per above procedure from step 4 onwards.

16 After each of the nodes are upgraded to the new product version, initiate a cluster-wide and across-the-stack rollover of the kernel stack to the new protocol version.

- LLT and LMX are already at new protocol version at the end of step 14.

- Run `gabconfig -R` on one of the nodes of the cluster being upgraded. This command will block until roll over is complete cluster wide. GAB also quiesces I/Os, which will result in flow control.
- Run `vxfenconfig -R` on one of the nodes of the cluster being upgraded. Wait till the command returns.
- Run `vcsmmconfig -R` on one of the nodes of the cluster being upgraded. Wait till the command returns.
- Run `vxdctl upgrade` on the CVM master node of the cluster being upgraded.
- Run `fsclustadm protoclear` to clear the set protocol version on all the nodes in the cluster.
- Run `fsclustadm protoupgrade` from any node of cluster to upgrade the protocol version across the cluster.
- Run `odmclustadm protoclear` to clear the set protocol version on all nodes.
- Run `odmclustadm protoupgrade` on one of the nodes of the sub-cluster being upgraded.
  While upgrading odmcluster protocol version, you might see a message like:

  ```
  "Protocol upgrade precheck fails:
          some nodes do not support multiple protocols"
  ```

  You can ignore this message. The odm module is running on the latest version. You can verify this by using the following command on all the upgraded nodes:

  ```
  # odmclustadm protoversion
  Cluster Protocol Versions:
  Node    #PROTOCOLS   CUR     PREF    FLAGS
  local:  3            3       -
  ```

- Reverse the changes done to `/etc/vxfenmode`, `/etc/gabtab`, and `/etc/vcsmmtab` files in step 12 above.

17 Upgrade VCS engine (‘had’) to the new version. Perform one of the following procedures:

- Force stop 'had' and install the new version.
  - Force stop ‘had’ on all the nodes. There is no HA from this point onwards.

```
# hastop -all -force
```

- Modify the VCS configuration to reflect version specific requirements if any.
- Upgrade VRTSvcs and agent-related patches (the patches on SPARC):

```
VRTSvcs 143264-02
VRTSvcsag 143265-02
VRTScavf 143274-02
VRTSvcsea 143276-02
```

- Start VCS on all nodes. HA for the entire cluster is restored at this stage.

- Upgrade 'had' in a phased manner. This procedure will reduce the overall HA downtime during the upgrade.
  - Divide the cluster into two sub-clusters. Upgrade the first sub-cluster.
  - Force stop VCS on the sub-cluster. There will be no HA for the sub-cluster being upgraded, from this step onwards.

```
# hastop -local -force
```

  - Modify the VCS configuration to reflect version specific requirements if any.
  - Upgrade VRTSvcs and agent-related patches (the patches on SPARC):

```
VRTSvcs 143264-02
VRTSvcsag 143265-02
VRTScavf 143274-02
VRTSvcsea 143276-02
```

  - Force stop VCS on the remaining sub-cluster. There is no HA for the entire cluster from this point onwards.

```
# hastop -local -force
```

  - Start VCS on each of the nodes of the upgraded sub-cluster. VCS will not online the failover Service Groups at this time since they are autodisabled. Now HA is restored for the upgraded sub-cluster.

```
# hastart
```

Upgrading to 5.1 RP1 on a standalone system

You can use this procedure to upgrade on a standalone system that runs SF.

To upgrade to 5.1 RP1 on a standalone system

1. Log in as superuser.
2. Verify that `/opt/VRTS/bin` is in your `PATH` so you can execute all product commands.
3. If required, apply the OS kernel patches.

   See "System Requirements" on page 8.

   See *Sun Microsystems'* documentation for the procedures.
4. Enter the following command to check if any VxFS file systems or Storage Checkpoints are mounted:

   ```
   # df | grep vxfs
   ```
5. Unmount all Storage Checkpoints and file systems:

   ```
   # umount /checkpoint_name
   # umount /filesystem
   ```
6. If you have created any Veritas Volume Replicator (VVR) replicated volume groups (RVGs) on your system, perform the following steps:
   - Stop all applications that are involved in replication. For example, if a data volume contains a file system, unmount it.
   - Use the `vxrvg stop` command to stop each RVG individually:

     ```
     # vxrvg -g diskgroup stop rvg_name
     ```
   - On the Primary node, use the vxrlink status command to verify that all RLINKs are up-to-date:

     ```
     # vxrlink -g diskgroup status rlink_name
     ```

     Caution: To avoid data corruption, do not proceed until all RLINKs are up-to-date.
7. Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

8 Stop all VxVM volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup stopall
```

Verify that no volumes remain open:

```
# vxprint -Aht -e v_open
```

9 Check if the VEA service is running:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is running, stop it:

```
# /opt/VRTS/bin/vxsvcctrl stop
```

10 Mount the 5.1 RP1 product disc and navigate to the folder that contains the installation program. Enter the `installrp` script:

```
# ./installrp nodename
```

11 If necessary, reinstate any missing mount points in the `/etc/vfstab` file.

12 Restart all the volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup startall
```

13 If you stopped any RVGs in step 6, restart each RVG:

```
# vxrvg -g diskgroup start rvg_name
```

14 Remount all VxFS file systems and Storage Checkpoints:

```
# mount /filesystem
# mount /checkpoint_name
```

15 Check if the VEA service was restarted:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is not running, restart it:

```
# /opt/VRTS/bin/vxsvcctrl start
```

Verifying software versions

To verify if the Veritas patches are installed on your system, enter the following command:

```
# showrev -p|grep patch_id
```

Removing and rolling back

Roll back of the 5.1 RP1 to the release 5.1 version is not supported for certain products. It is recommended that you follow the steps in the following sections to remove all the installed Veritas software, and then perform a complete reinstallation of the release 5.1 software. You can roll back 5.1 RP1 to the release 5.1 version for Veritas Cluster Server.

Note: Symantec recommends using the following steps to roll back. There is no uninstallrp to roll back the patches.

Removing 5.1 RP1 from Veritas Cluster Server

Use the following procedure to remove VCS 5.1 RP1 from your cluster manually.

To remove 5.1 RP1 from VCS manually

1. List the service groups in your cluster and their status. On any node, type:

   ```
   # hagrp -state
   ```

2. Take the ClusterService service group offline if it is running. On any node, type:

   ```
   # hagrp -offline -force ClusterService -sys system
   ```

3. Make the VCS configuration writable. On any node, type:

   ```
   # haconf -makerw
   ```

4 Freeze all service groups. On any node, type:

```
# hagrp -freeze service_group -persistent
```

where *service_group* is the name of the service group. Note that the ClusterService group cannot be frozen.

5 Save the configuration (`main.cf`) file with the groups frozen. On any node, type:

```
# haconf -dump -makero
```

6 Make a backup copy of the current `main.cf` and all `types.cf` configuration files. For example, on one node in the cluster, type:

```
# cp /etc/VRTSvcs/conf/config/main.cf \
/etc/VRTSvcs/conf/main.cf.save
# cp /etc/VRTSvcs/conf/config/types.cf \
/etc/VRTSvcs/conf/types.cf.save
```

7 Shut down VCS. On any node, type:

```
# /opt/VRTSvcs/bin/hastop -all -force
```

8 Shut down CmdServer. On each node, type:

```
# /opt/VRTSvcs/bin/CmdServer -stop
```

9 Verify that VCS has shut down. On any node, type:

```
# /sbin/gabconfig -a
```

The output resembles: GAB Port Memberships Port a gen 23dc0001 membership 01 The output shows no membership for port h.

10 For Solaris 10, on nodes that run non-global zones, check if the non-global zones are in the running state. Boot the non-global zones that are not in the running state.

- Check the zone's state. On each node, type:

  ```
  # zoneadm list -icv
  ```

- Boot the zone if it is not in the running state. On each node, type:

  ```
  # zoneadm -z zone boot
  ```

where *zone* is the name of the non-global zone.

Note: Do not configure one or more Solaris zones to boot from the shared storage.

11 Unconfigure vxfen if the VCS cluster uses the fencing option. On each node, type:

```
# /sbin/vxfenconfig -U
```

12 Unload vxfen. On each node, perform the following steps:

- Identify the vxfen kernel module, for example:

```
# modinfo|grep vxfen
210 7ba44000 39488 258 1 vxfen (VRTS Fence 5.0MP3RP3)
```

- Unload vxfen using the module number.

```
# modunload -i 210
```

13 Unconfigure GAB. On each node, type:

```
# /sbin/gabconfig -U
```

14 Unload GAB. On each node, perform the following steps:

- Identify the GAB kernel module. For example:

```
# modinfo | grep gab
149 50cc6000 2b451 112 1 gab (GAB device 5.0MP3RP3)
```

- Unload GAB using the module number:

```
# modunload -i 149
```

15 Unconfigure LLT. On each node, perform the following steps:

- Type:

```
# /sbin/lltconfig -U
```

- Type **y** on each node in response to the message.

16 Unload LLT. On each node, perform the following steps:

- Identify the LLT kernel module. For example:

```
# modinfo | grep llt
147 50ca4000 d6bc 110 1 llt (LLT 5.0MP3RP3)
```

- Unload LLT using the module number:

```
# modunload -i 147
```

17 Remove the VCS 5.1 RP1 patches. On each node, type:

- For Solaris SPARC 8:

```
# patchrm 139356-03
```

- For Solaris SPARC 9:

```
# patchrm 139357-03
```

- For Solaris SPARC 10:

```
# patchrm 142607-03
# patchrm 139359-03
# patchrm 139358-03
```

- For Solaris x64:

```
# patchrm 139361-03
# patchrm 139360-03
# patchrm 142608-03
```

Note: For Solaris SPARC 8, 9, 10, if you must remove the 5.1 RP1 Authentication Service patch (123722-02), you must uninstall the entire VCS product stack, then reinstall VCS.

---

18 Verify that the patches have been removed. On each node, type:

```
# showrev -p | grep VRTS
```

19 If the LLT, GAB, or VXFEN modules cannot be stopped or unloaded following the patch removal, reboot all nodes in the cluster.

20 If you do not perform step 19, start the VCS components manually. On each node, type:

```
# /sbin/lltconfig -c
# /sbin/gabconfig -cx
# /sbin/vxfenconfig -c
# /opt/VRTSvcs/bin/hastart
```

You do not have to start vxfen unless you use the fencing option.

21 After VCS has started, perform the following steps:

- Verify all resources have been probed. On any node, type:

```
# hastatus -summary
```

- Unfreeze all service groups. On any node, type:

```
# haconf -makerw
# hagrp -unfreeze service_group -persistent
# haconf -dump -makero
```

where *service_group* is the name of the service group.

22 Bring online the ClusterService service group, if necessary. On any node type:

```
# hagrp -online ClusterService -sys system
```

where *system* is the node name.

Removing 5.1 RP1 on SF or SFCFS

You can use the following procedure to uninstall 5.1 RP1 on SF or SFCFS.

To uninstall 5.1 RP1 on SFor SFCFS

1 Log in as superuser.

2 Verify that `/opt/VRTS/bin` is in your `PATH` so you can execute all product commands.

3 Unmount all Storage Checkpoints and file systems:

```
# umount /checkpoint_name
# umount /filesystem
```

4 Check if the root disk is under VxVM control by running this command:

```
# df -v /
```

The root disk is under VxVM control if `/dev/vx/dsk/rootvol` is listed as being mounted as the root (`/`) file system. If so, unmirror and unencapsulate the root disk as described in the following steps:

- Use the `vxplex` command to remove all the plexes of the volumes `rootvol`, `swapvol`, `usr`, `var`, `opt` and `home` that are on disks other than the root disk. For example, the following command removes the plexes `mirrootvol-01`, and `mirswapvol-01` that are configured on a disk other than the root disk:

  ```
  # vxplex -o rm dis mirrootvol-01 mirswapvol-01
  ```

  Note: Do not remove the plexes on the root disk that correspond to the original disk partitions.

- Enter the following command to convert all the encapsulated volumes in the root disk back to being accessible directly through disk partitions instead of through volume devices. There must be at least one other disk in the rootdg disk group in addition to the root disk for vxunroot to succeed.

  ```
  # /etc/vx/bin/vxunroot
  ```

  Following the removal of encapsulation, the system is restarted from the unencapsulated root disk.

5 Enter the following command to check if any VxFS file systems are mounted:

```
# df -F vxfs
```

If any VxFS file systems are present, unmount all of the VxFS file systems:

```
# umount /filesystem
```

6 If you have created any Veritas Volume Replicator (VVR) replicated volume groups (RVGs) on your system, perform the following steps:

- Stop all applications that are involved in replication. For example, if a data volume contains a file system, unmount it.
- Use the vxrvg stop command to stop each RVG individually:

  ```
  # vxrvg -g diskgroup stop rvg_name
  ```

- On the Primary node, use the vxrlink status command to verify that all RLINKs are up-to-date:

```
# vxrlink -g diskgroup status rlink_name
```

Note: To avoid data corruption, do not proceed until all RLINKs are up-to-date.

7 Stop activity to all VxVM volumes. For example, stop any applications such as databases that access the volumes, and unmount any file systems that have been created on the volumes.

8 Stop all VxVM volumes by entering the following command for each disk group:

```
# vxvol -g diskgroup stopall
```

To verify that no volumes remain open, enter the following command:

```
# vxprint -Aht -e v_open
```

9 Stop VCS along with all its resources. Then, stop the remaining resources manually:

- For Solaris 9:

```
# /etc/init.d/vcs stop
```

- For Solaris 10:

```
# svcadm disable vcs
```

10 If cluster fencing was originally configured in enabled mode, type the following on all the nodes:

```
# rm /etc/vxfenmode
```

11 Unmount `/dev/odm`:

```
# umount /dev/odm
```

12 Unload the ODM module:

```
# modinfo | grep odm
# modunload -i odm_mod_id
```

13 Unload the cluster fencing (`vxfen`) module:

- For Solaris 9:

```
# /etc/init.d/vxfen stop
# modinfo | grep vxfen
# modunload -i vxfen_mod_id
```

- For Solaris 10:

```
# svcadm disable vxfen
# modinfo | grep vxfen
# modunload -i vxfen_mod_id
```

14 Stop GAB and LLT in the following order:

For Solaris 9:

```
# /etc/init.d/gab stop
# /etc/init.d/llt stop
```

For Solaris 10:

```
# svcadm disable -t gab
# svcadm disable -t llt
```

15 Check if the VEA service is running:

```
# /opt/VRTS/bin/vxsvcctrl status
```

If the VEA service is running, stop it:

```
# /opt/VRTS/bin/vxsvcctrl stop
```

16 To shut down and remove the installed Veritas packages, use the appropriate command in the /opt/VRTS/install directory. For example, to uninstall the Storage Foundation or Veritas Storage Foundation Cluster File System, enter the following commands:

```
# cd /opt/VRTS/install
# ./uninstallsf [-rsh]
```

You can use this command to remove the packages from one or more systems. For other products, substitute the appropriate script for `uninstallsf` such as `uninstallsfcfs` for the Storage Foundation Cluster File System software. The `-rsh` option is required if you are using the remote shell (RSH) rather than the secure shell (SSH) to uninstall the software simultaneously on several systems.

Note: Provided that the remote shell (RSH) or secure shell (SSH) has been configured correctly, this command can be run on a single node of the cluster to install the software on all the nodes of the sub-cluster.

---

17 After uninstalling the Veritas software, refer to the appropriate product's 5.1 Installation Guide document to reinstall the 5.1 software.

Removing 5.1 RP1 on Storage Foundation for Oracle RAC

You can use the following procedure to uninstall the 5.1 RP1 on Storage Foundation for Oracle RAC systems.

To uninstall the 5.1 RP1 on SF Oracle RAC

1 Stop Oracle and CRS on each node of the cluster.

- If CRS is controlled by VCS, log in as superuser on each system in the cluster and enter the following command:

  ```
  # hastop -local
  ```

- If CRS is not controlled by VCS, enter the following command on each node of the cluster to stop CRS:
  For 10gr2 or 11gr1:

  ```
  # /etc/init.d/init.crs stop
  ```

  Unmount all VxFS file system used by a database or application and enter the following command to each node of the cluster:

```
# hastop -local
```

2 Stop cluster fencing, VCSMM, LMX, ODM, and GAB:

For Solaris 9:

```
# /etc/init.d/vxfen stop
# /etc/init.d/vcsmm stop
# /etc/init.d/lmx stop
# /etc/init.d/odm stop
# /etc/init.d/gab stop
```

For Solaris 10:

```
# svcadm disable -t vxfen
# svcadm disable -t vcsmm
# svcadm disable -t lmx
# svcadm disable -t vxodm
# svcadm disable -t gab
```

3 On each node, unload the vxfen, LMX, GAB, LTT, VCSMM, GMS, and GLM kernel modules if they are still loaded.

- Verify if the vxfen kernel module is loaded. For example:

```
# modinfo|grep vxfen
210 7ba44000 39488 258 1 vxfen (VRTS Fence 5.1 RP1)
```

If the vxfen kernel module is loaded then unload it. For example:

```
# modunload -i 210
```

- Verify if the LMX kernel module is loaded. For example:

```
# modinfo | grep lmx
257 ffffffff0444000  13f48 257   1  lmx (LLT Mux 5.1 RP1)
```

If the LMX kernel module is loaded then unload it. For example:

```
# modunload -i 257
```

- Verify if the VCSMM kernel module is loaded. For example:

```
# modinfo | grep vcsmm
312 78bc0000  43ae8 293   1  vcsmm (VRTSvcsmm 5.1 RP1)
```

If the VCSMM kernel module is loaded then unload it. For example:

```
# modunload -i 312
```

- Verify if the GMS kernel module is loaded. For example:

```
# modinfo | grep gms
253 ffffffff040c000  4550 244   1  vxgms
(VxGMS 5.1.0.0,REV=13Sep2009 (So))
```

If the GMS kernel module is loaded then unload it. For example:

```
# modunload -i 253
```

4 Verify if the GLM kernel module is loaded. For example:

```
# modinfo | grep glm
247 fffffefb2a000  27390 238   1  vxglm (VxGLM 5.1,REV=13Sep2009
SunOS 5)
```

If the GLM kernel module is loaded then unload it. For example:

```
# modunload -i 247
```

5 Verify if the GAB kernel module is loaded. For example:

```
# modinfo | grep gab
149 50cc6000 2b451 112 1 gab (GAB device 5.1 RP1)
```

If the GAB kernel module is loaded then unload it. For example:

```
# modunload -i 149
```

6 Stop LLT:

For Solaris 9:

```
# /etc/init.d/llt stop
```

For Solaris 10:

```
# svcadm disable -t llt
```

- Verify if the LLT kernel module is loaded. For example:

```
# modinfo|grep llt
147 50ca4000 d6bc 110 1 llt (LLT 5.1 RP1)
```

If the LLT kernel module is loaded then unload it. For example:

```
# modunload -i 147
```

7 To uninstall only 5.1 RP1 patches from SF Oracle RAC cluster, execute following commands on each node of the cluster:

- For Solaris SPARC 9:

```
# patchrm 141270-02
# patchrm 142629-02
# patchrm 142631-02
# patchrm 142633-02
# patchrm 143260-02
# patchrm 143262-02
# patchrm 143264-02
# patchrm 143265-02
# patchrm 143270-02
# patchrm 143273-02
# patchrm 143276-02
# patchrm 143279-02
# patchrm 143687-01
# patchrm 143696-01
# patchrm 143706-02
```

For Solaris SPARC 10:

```
# patchrm 141270-02
# patchrm 142629-02
# patchrm 142631-02
# patchrm 142634-02
# patchrm 143261-02
# patchrm 143263-02
# patchrm 143264-02
# patchrm 143265-02
# patchrm 143271-02
# patchrm 143274-02
# patchrm 143276-02
# patchrm 143279-02
# patchrm 143687-01
# patchrm 143697-01
# patchrm 143707-02

# patchrm 141270-02
# patchrm 142629-02
# patchrm 142631-02
```

```
# patchrm 142633-02
# patchrm 142634-02
# patchrm 143260-02
# patchrm 143261-02
# patchrm 143262-02
# patchrm 143263-02
# patchrm 143264-02
# patchrm 143265-02
# patchrm 143270-02
# patchrm 143271-02
# patchrm 143273-02
# patchrm 143274-02
# patchrm 143276-02
# patchrm 143279-02
# patchrm 143687-01
# patchrm 143696-01
# patchrm 143697-01
# patchrm 143706-02
# patchrm 143707-02
```

- For Solaris 10 on x64:

```
# patchrm 141752-02
# patchrm 142630-02
# patchrm 142632-02
# patchrm 142635-02
# patchrm 143266-02
# patchrm 143267-02
# patchrm 143268-02
# patchrm 143269-02
# patchrm 143272-02
# patchrm 143275-02
# patchrm 143277-02
# patchrm 143280-02
# patchrm 143693-01
# patchrm 143698-01
# patchrm 143708-02
```

8 After removing the patches, reboot the nodes:

```
# /usr/sbin/shutdown -g0 -y -i6
```

After all the nodes are up, SF Oracle RAC 5.1 will be running on all the nodes.

Documentation addendum

The following sections contain additions to current documents.

Disk agent

Monitors a physical disk or a partition. You can use the Disk agent to monitor a physical disk or a slice that is exported to LDoms (available using LDoms 1.2 or later). For LDoms with a physical disk or slice based boot image, a dependency must exist between the guest domain and primary domain. You configure the primary domain as the master of the guest domain.

Perform the following:

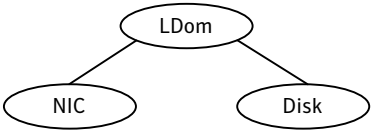
- Set the failure-policy of primary (control) domain to stop. For example, in the primary domain enter the following command to set the dependent domain to stop when the primary domain faults:

  ```
  # ldm set-domain failure-policy=stop primary
  ```

- Set the primary domain as the master for the guest domain.

  ```
  # ldm set-domain master=primary guestldom
  ```

Figure 1-1 Sample service group that includes a Disk resource on Solaris



Agent functions

Monitor—Performs read I/O operations on the raw device to determine if a physical disk or a partition is accessible.

State definitions

ONLINE—Indicates that the disk is working normally

FAULTED—Indicates that the disk has stopped working or is inaccessible.

UNKNOWN—Indicates that a problem exists either with the configuration or the ability to determine the status of the resource.

Attribute

The Disk agent has one required attribute.

Partition—Indicates which partition to monitor. Specify the partition with the full path beginning with a slash (/).

If this path is not specified, the name is assumed to reside in `/dev/rdsk/`.

Example: "`/dev/rdsk/c2t0d0s2`"

Type and dimension: string-scalar

Resource type definition

The following is the agent's resource type definition.

```
type Disk (
static int OfflineMonitorInterval = 60
static str ArgList[] = { Partition }
static str Operations = None
str Partition
)
```

Using the preonline_vvr trigger for RVGLogowner resources

For VCS configurations that use RVGLogowner resources, perform the following steps on each node of the cluster to enable VCS control of the RVGLogowner resources. For a service group that contains a RVGLogowner resource, change the value of its PreOnline trigger to 1 to enable it.

To enable the PreOnline trigger from the command line on a service group that has an RVGLogowner resource

- On each node in the cluster, perform the following command:

  ```
  # hagrp -modify RVGLogowner_resource_sg PreOnline 1 -sys system
  ```

  Where the service group is the service group that contains the RVGLogowner resource (*RVGLogowner_resource_sg*). The *system* is the name of the node where you want to enable the trigger.

On each node in the cluster, merge the preonline_vvr trigger into the default triggers directory.

To merge the preonline_vvr trigger

- On each node in the cluster, merge the preonline_vvr trigger to the /opt/VRTSvcs/bin/triggers directory.

  ```
  # cp /opt/VRTSvcs/bin/sample_triggers/preonline_vvr \
  /opt/VRTSvcs/bin/triggers
  ```

  Refer to the sample configurations directory for samples of how to enable these triggers (/opt/VRTSvcs/bin/sample_triggers.)