

VERITAS Cluster Server 4.1

Release Notes

Linux

Maintenance Pack 2

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Release Notes: VERITAS Cluster Server 4.1 Maintenance Pack 2

This document provides important information regarding VERITAS Cluster Server (VCS) version 4.1 Maintenance Pack 2 (MP2) for Red Hat Enterprise Linux 4 and SUSE Linux Enterprise Server 9. Review this entire document before installing VCS.

Before installing any product, read the following VERITAS Technical Support TechNote for information on the latest supported kernels, service pack and errata updates, patches, and software issues regarding this release:

<http://support.veritas.com/docs/277033>

Features Introduced in VCS 4.1

The following features have been introduced since VCS version 4.1.

Web Console Features

- ◆ Support for modifying the system list
- ◆ Support for overriding static resource type attributes

Java Console Features

- ◆ Support for overriding static resource type attributes
- ◆ VCS Simulator Console for managing simulated clusters

NIC Bonding

The NIC agent can now monitor a bond, which supports the network interfaces (bond0, bond1, etc.) that the bonding driver exports. See the *VERITAS Cluster Server Bundled Agents Reference Guide* for more information.



CommandCentral Availability Cluster Monitor

VERITAS CommandCentral™ Availability runs a cluster monitor agent on VCS nodes to enable centralized management of clusters. VCS 4.1 includes packages for this cluster monitor agent in the directory `/opt/VRTSvcs/ccacm`. Previously, the agent was distributed only with CommandCentral Availability.

For information about installing and using CommandCentral Availability, see the *VERITAS CommandCentral Availability 4.1 Installation Guide* and the *VERITAS CommandCentral Availability 4.1 Administrator's Guide*.

Output of `had -version` Command

Change in Behavior: VCS 4.1 changes the output format of `had -version`. The output format for VCS 4.1 is:

```
# /opt/VRTSvcs/bin/had -version
Engine Version      4.1
Join Version        4.1000
Build Date          Thu Mar 17 09:41:00 2005
PSTAMP              4.1 03/17/05-09:41:00
```

HAD Diagnostics

When the VCS engine HAD core dumps, the core is written to the directory `/var/VRTSvcs/diag/had`, where the diagnostic information is stored. When HAD and GAB encounter heartbeat problems, VCS runs the script `/opt/VRTSvcs/bin/vcs_diag` to collect the diagnostic information.

The current working directory of VCS engine is `VCS_DIAG` whose default value is `$VCS_HOME/diag`. In earlier versions of VCS, the default directory of HAD was `VCS_HOME` whose default value was `/opt/VRTSvcs`.

Change to AutoStart Policy When HAD Restarts

Change in Behavior: If a service group is offline in the cluster and you restart the VCS engine on a node that is part of the group's system list, then VCS will now initiate autostart policy of the group. Previously, when the HAD was restarted on any of the nodes, VCS did not initiate the autostart policy.

Changes to Bundled Agents

For details about bundled agents in the VCS 4.1 release, refer to the *VERITAS Cluster Server Bundled Agents Reference Guide*.

- ◆ New LVM2 agents: LVMLogical Volume, LVMVolumeGroup
- ◆ New CampusCluster Agent to support Fast Mirror Resync feature of VxVM
- ◆ Enhanced DNS agent to support secure DNS updates
- ◆ Enhanced NFS Agent

The type of resource is changed from None to OnOff.

- ◆ Enhanced Mount Agent to support layered, nested mounts
- ◆ Enhanced DiskGroup agent

To maintain control of a disk group resource, VCS requires the `noautoimport` flag of the disk group to be explicitly set to true. Previously, the DiskGroup agent took a service group offline if a disk group without `noautoimport` set to true was imported outside VCS.

Change in Behavior: To avoid disruption to applications, the DiskGroup agent now changes the value of the `noautoimport` flag to true when a disk group resource is brought under VCS control. VxVM provides a new command option for changing the value of the `noautoimport` flag to false.

VCS must be able to failover a service group when the disk group imported with a SCSI-3 Persistent Group Reservation (SCSI-3 PGR) loses disk connectivity. Previously, the DiskGroup agent kept the resources online even when the SCSI cable was pulled out.

Change in Behavior: The DiskGroup agent now reports the resource to be online in such a scenario and allows you to configure the disk group resource to panic the system.

New Attribute

- ◆ Cluster Attribute
 - PanicOnNoMem

Removed Attribute

- ◆ Cluster Attribute
 - AllowNativeCliUsers



VCS Agents

Bundled Agents

The following agents are included with VCS 4.1. For information on any of the agents listed below, refer to the *VERITAS Cluster Server Bundled Agents Reference Guide*.

Apache	Application	CampusCluster
DiskGroup	DiskReservation	DNS
ElifNone	FileNone	FileOnOff
FileOnOnly	IP	IPMultiNIC
LVMLogicalVolume	LVMVolumeGroup	Mount
MultiNICA	NetBios	NFS
NIC	NotifierMngr	Phantom
Process	Proxy	Samba agents
Share	Volume	VRTSWebApp



Enterprise Agents

VCS enterprise agents must be purchased separately before use. Contact your VERITAS sales representative for details about these agents, additional agents under development, and agents available through VERITAS Consulting Services.

Note Before configuring an enterprise agent with VCS 4.1, verify that you have the latest version of the agent.

Supported Enterprise Agents

VCS enterprise agents for Linux are listed below. Refer to this table for supported application and operating system versions. VCS agents support a specified application version on Linux if the application vendor supports that version on Linux.

To verify the latest information on support for Oracle database versions, see the VERITAS Technical Support TechNote: <http://support.veritas.com/docs/277033>.

Supported VCS Agent	Agent version	VCS version				Application	OS	
		2.0	2.2	4.0	4.1		RHEL 4.0	SLES 9
DB2	4.1	p	p	s	s	DB2 Enterprise Server Edition 32-bit and 64-bit 7.2, 8.1, 8.2	s	s
Oracle	4.1	p	p	s	s	Oracle 9i R1, R2 32-bit and 64-bit 10 g, 10 g R1 10 g R2	s	s

s – supported configuration

n – not supported

p – supported by previous version of agent



Installation Notes

The following section describes system requirements for VERITAS Cluster Server and provides information about installing VCS 4.1 and upgrading to 4.1 MP2.

Supported Hardware

The compatibility list contains information about supported hardware and is updated regularly. These lists are subject to change as testing of other systems takes place. Visit <http://support.veritas.com> for the latest information on supported hardware, or contact your VERITAS sales representative.

Note Before installing or upgrading VERITAS Cluster Server, review the current compatibility list to confirm the compatibility of your hardware and software.

Required Disk Space

Confirm that your system has enough free disk space to install VCS. The following tables show the approximate disk space usage by directory for the VERITAS Cluster Server packages.

Packages	/	/opt	/usr	/var
Required VCS Packages	3 MB	143 MB	25 MB	168 MB
Optional VCS Packages	3 MB	39 MB	1 MB	7 MB
Required Infrastructure Packages	2 MB	59 MB	0 MB	1 MB

Supported Software

- ◆ VERITAS Volume Manager (VxVM) 4.1 MP2
- ◆ VERITAS File System (VxFS) 4.1 MP2

Supported Linux Operating Systems

VCS 4.1 MP2 operates on the following architectures and operating systems shown below. VERITAS supports only those kernel binaries distributed by Red Hat and SUSE.

Operating System	Kernel	Architecture
Red Hat Enterprise Linux 4 (RHEL 4) Update 1	2.6.9-11.EL	x86 (32-bit)
	2.6.9-11.ELsmp	Intel Xeon (32-bit, 64-bit)
	2.6.9-11.ELhugemem	AMD Opteron (32-bit, 64-bit) Intel IA64
Red Hat Enterprise Linux 4 (RHEL 4) Update 2	2.6.9-22.EL	x86 (32-bit)
	2.6.9-22.smp	Intel Xeon (32-bit, 64-bit)
	2.6.9-22.hugemem	AMD Opteron (32-bit, 64-bit) Intel IA64
Red Hat Enterprise Linux 4 (RHEL 4) Update 3	linux-2.6.9-34.EL-up	x86 (32-bit)
	linux-2.6.9-34.EL-smp	Intel Xeon (32-bit, 64-bit)
	linux-2.6.9-34.EL-hugemem	AMD Opteron (32-bit, 64-bit) Intel IA64
SUSE Linux Enterprise Server 9 (SLES 9) with SP1	2.6.5-7.139	x86 (32-bit)
	2.6.5-7.139-smp	Intel Xeon (32-bit, 64-bit)
	2.6.5-7.139-bigsmpp	AMD Opteron (32-bit, 64-bit)
	2.6.5-7.145	Intel IA64
	2.6.5-7.145-smp	
SUSE Linux Enterprise Server 9 (SLES 9) with SP2	2.6.5-7.145-bigsmpp	
	2.6.5-7.201	x86 (32-bit)
	2.6.5-7.201-smp	Intel Xeon (32-bit, 64-bit)
SUSE Linux Enterprise Server 9 (SLES 9) with SP3	2.6.5-7.201-bigsmpp	AMD Opteron (32-bit, 64-bit) Intel IA64
	2.6.5-7.241	x86 (32-bit)
	2.6.5-7.241-smp	Intel Xeon (32-bit, 64-bit)
	2.6.5-7.241-bigsmpp	AMD Opteron (32-bit, 64-bit) Intel IA64



Supported Linux Operating System Updates

VERITAS products will operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

Information about the latest supported Red Hat erratas and updates and SUSE service packs is available in the following TechNote. Read this TechNote *before* installing any VERITAS product.

<http://support.veritas.com/docs/277033>

System Requirements

Requirements for Accessing the VCS Web Console

On all supported Linux platforms, an Internet browser is required to access the VCS Web Console. The following supported Internet browsers have been tested:

- ◆ Internet Explorer 5.0, 5.5, and 6.0
- ◆ Netscape 6.2 and 7.0

Requirements for Accessing the VCS Java Console

The VCS Java Console on Linux or Windows clients requires a minimum of Pentium II, 300MHz, 256MB RAM, and 800x600 display resolution. VERITAS recommends using at least Pentium III and 400MHz. The color depth of the monitor must be at least 8-bit (256 colors), and the graphics card must be able to render 2D images.

Obtaining License Keys for VCS

VCS is a licensed software product. For information on obtaining license keys for VCS, refer to the *Getting Started Guide* or the *VERITAS Cluster Server Installation Guide* available on the VERITAS 4.1 software discs.

Installing VCS for the First Time

Installing VERITAS Cluster Server 4.1 MP2 involves the following tasks:

- ✓ Installing VCS 4.1 using `installvcs` script (`-installonly` option)

Note that to upgrade to VCS 4.1 MP2, you must have VCS 4.1 GA installed. Refer to the 4.1 *VERITAS Cluster Server Installation Guide* for pre-installation instructions. Also review the 4.1 *VERITAS Cluster Server Release Notes* for important release information.

- ✓ Install VCS 4.1 MP2 using `installmp` script
- ✓ Configuring VCS using `installvcs` script (`-configure` option)

▼ To install the VERITAS Cluster Server software

1. Log in as superuser.
2. Install the VERITAS Cluster Server 4.1 GA software from the release CD as described in the *VERITAS Cluster Server Installation Guide*, but run the product installation script instead of the generic installer script. For example, to install VCS, enter the following command from the top-level directory of the mounted CD:

```
# ./installvcs -installonly [-usersh]
```

The `-installonly` option is required to perform the installation without configuring the software. The `-usersh` option is required if you are using the remote shell (RSH) rather than the secure shell (SSH) to install 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 cluster nodes.

3. Insert the disc containing the VCS 4.1 MP2 software into the CD-ROM drive, and mount the CD-ROM on a suitable mount point, for example:

```
# mount -o ro /dev/cdrom /mnt/cdrom
```

4. Move to the top-level directory on the CD-ROM:

```
# cd /mnt/cdrom
```

5. From this directory, enter the following command if you are installing on the local system only:

```
# ./installmp
```



If you are using the secure shell (SSH) utilities to install on several systems, use this form of the command:

```
# ./installmp system_name1 system_name2 ...
```

If you are using the remote shell (RSH) utilities to install on several systems, additionally specify the `-usersh` option:

```
# ./installmp -usersh system_name1 system_name2 ...
```

6. After the initial system checks have completed successfully, press Enter to start the requirements checks for the upgrade.

Note All the VCS processes are stopped before uninstalling the RPMs. While stopping these processes, you may see messages such as: "GAB /sbin/gabconfig ERROR V-15-2-25022 unknown error." You can safely ignore these messages.

7. After the requirement checks have completed successfully, press Enter to begin upgrading the packages.
8. If you are upgrading multiple systems, you can choose to upgrade the systems simultaneously.
9. After the upgrade of the packages is complete, press Enter.
10. Run the product installation script, this time specifying the `-configure` option to configure the software, for example:

```
# ./installvcs -configure [-usersh]
```

For help on how to respond to the installation prompts, see the *VERITAS Cluster Server Installation Guide*.

Upgrading VCS to Release 4.1 MP2

You can upgrade to 4.1 MP2 only if VERITAS Cluster Server 4.1 or 4.1 MP1 is installed and configured.

You can perform a rolling upgrade in the following phases:

- ✓ Select a group of one or more cluster nodes to upgrade and leave a group of one or more nodes running.
- ✓ Upgrade the selected group of nodes:
 - ◆ Switch over the service group to the nodes that are running.
 - ◆ Freeze service group operations and stop VCS on the cluster.
 - ◆ Install the maintenance patch.
 - ◆ Restart cluster services.
 - ◆ Switch back the service group to the upgraded nodes.
- ✓ Upgrade the remaining nodes in the second group.

Note If you upgraded the operating system from RHEL4 U1 or RHEL4 U2 to one of the supported operating systems, or SLES9 SP1 to SLES9 SP2, then you must manually install VRTSperl package before starting the `installmp` script. Note that during the OS upgrade, the VRTSperl package is removed.

Upgrading a group of nodes

Let us consider a cluster of two nodes (north and south) where you want to upgrade VCS. The example upgrade demonstrates how to perform a rolling upgrade from VCS 4.1 to VCS 4.1 MP2 on north. Repeat the steps on south to completely upgrade the cluster.

▼ To upgrade the selected group of one or more nodes to VCS 4.1 MP2

1. Log in as superuser on one of the nodes where you want to upgrade VCS.
2. Verify that `/opt/VRTS/bin` is in your `PATH` so you can execute all product commands.
3. Switch over the service group to a node that is running.


```
# hagrps -switch service_group -to south
```
4. Make the VCS configuration writable. On a node that you want to upgrade, type:


```
# haconf -makerw
```



5. Freeze the service group operations. Perform the task on each node if you had selected a group of nodes to upgrade.

```
# hasys -freeze -persistent north
```

6. Make the VCS configuration read-only.

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

7. Stop VCS. If you have a group of nodes, the command stops VCS on all nodes in the cluster.

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

8. Stop the VCS command server:

```
# killall CmdServer
```

9. Stop GAB and LLT.

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

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

10. If necessary, upgrade your operating system.

- a. Upgrade your operating system and patch it to a kernel version. See [“Supported Linux Operating Systems”](#) on page 7.

- b. Shut down and reboot the system.

- c. Manually install the VRTSperl package before starting the `installmp` script. Note that during the OS upgrade, the VRTSperl package is removed.

11. Insert the disc containing the VCS 4.1 MP2 software into the disc drive, and mount the CD-ROM on a suitable mount point, for example:

```
# mount -o ro /dev/cdrom /mnt/cdrom
```

12. Move to the top-level directory on the CD-ROM:

```
# cd /mnt/cdrom
```

13. From this directory, enter the following command if you are installing on the local node only:

```
# ./installmp
```

If you are using the secure shell (SSH) utilities to install on several nodes, use this form of the command:

```
# ./installmp node_name1 node_name2 ...
```

If you are using the remote shell (RSH) utilities to install on several nodes, additionally specify the `-usersh` option:

```
# ./installmp -usersh node_name1 node_name2 ...
```

14. The installer checks that the nodes are ready for installation. At the conclusion of these initial checks, and before installing any RPMs, the installer:
 - ◆ Creates a log called `installmpdate_time` on each node in the directory `/var/tmp`.
 - ◆ Specifies the utilities it uses to communicate with the remote nodes; typically this is `ssh -x` and `scp`.
 - ◆ lists the RPMs that it will replace on each node
 - ◆ backs up the Maintenance Pack 2 (MP2) configuration files

After the installer has all the configuration information, it can replace the RPMs on the cluster nodes.

VERITAS Cluster Server processes must be stopped before adding patches. You are prompted:

```
Do you want to stop these processes and install patches on sysA?
[y,n,q] (y)
Press Enter to continue.
```

Note All the VERITAS Cluster Server processes will be stopped before uninstalling the RPMs. While stopping these processes, you may see messages such as: "GAB /sbin/gabconfig ERROR V-15-2-25022 unknown error." You can safely ignore these messages.

15. Choose whether to upgrade to the 4.1 MP2 RPMs consecutively or simultaneously.
16. After you choose the sequence of installing the RPMs, the installation process begins to uninstall the RPMs that will be replaced, indicating the total number of steps required, based on the number of nodes and the chosen configuration options. The installer copies the 4.1 MP2 RPMs to remote nodes before installing them.

Press Enter to continue.

The installer replaces VERITAS Cluster Server RPMs.

17. When installation is complete, note the locations of the installation summary, log and response files.
 - ◆ `/opt/VRTS/install/logs/installmpxxxxxxxx.summary`
 - ◆ `/opt/VRTS/install/logs/installmpxxxxxxxx.log`



◆ `/opt/VRTS/install/logs/installmpxxxxxxxxx.response`

The summary, the log, and the response files contain the date as part of their names.

18. Start LLT, GAB, and VCS.

```
# /etc/init.d/llt start
# /etc/init.d/gab start
# /etc/init.d/vcs start
```

19. Make the VCS configuration writable again from any node in the upgraded group.

```
# haconf -makerw
```

20. Unfreeze the service group operations. Perform this task on each node if you had upgraded a group of nodes.

```
# hasys -unfreeze -persistent north
```

21. Make the configuration read-only.

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

22. Switch back the service group to the original node.

```
# hagrps -switch service_group -to north
```

23. After installation is complete, verify that the MP2 patch is installed.

On each node, type:

```
# rpm -q VRTSvcs
```

For example, the information displayed after a successful installation is:

```
VRTSvcs-4.1.20.00-MP2_dist
```

Where *dist* is the Linux distribution, RHEL4 or SLES9.

Removing VCS 4.1 MP2 Packages

Roll back of the MP2 packages to the 4.1 or 4.1 MP1 version of the packages is not supported. To restore a previous release on your node, you must completely remove 4.1 MP2, then reinstall VERITAS Cluster Server 4.1 and any other maintenance packs.

▼ To uninstall VCS 4.1 MP2

1. Backup current configuration files on each cluster node. For example:

```
# mkdir -p /var/vcs41mp2-config-save/etc/VRTSvcs/conf/config
# cp -p /etc/llttab /etc/llthosts /etc/gabtab /etc/vxfendg
/etc/vxfenmode /var/vcs41mp2-config-save/etc/
# cp -p /etc/VRTSvcs/conf/config/main.cf
/var/vcs41mp2-config-save/etc/VRTSvcs/conf/config/
```

Note that some of the files mentioned in the example may not exist.

2. Stop VCS along with all the resources. Then stop remaining resources manually.

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

3. Stop the VCS command server:

```
# killall CmdServer
```

4. Uninstall VCS.

```
# cd /opt/VRTS/install
# ./uninstallvcs
```

5. Install VCS 4.1 using `-installonly` option.

6. Restore the VCS configuration on each cluster node:

```
# cd /var/vcs41mp2-config-save/etc/vx
```

7. If `vxfen` was originally configured in enabled mode, type the following on all the nodes:

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

8. Reboot all nodes.



Removing License Keys

You can remove unwanted license keys from your system using the following procedure.

▼ To remove license keys

1. Determine the license keys you have installed on a system. Enter:

```
# /sbin/vxlicrep
```

The output lists the license keys and information about their respective products.

2. Go to the directory containing the license key files and list them. Enter:

```
# cd /etc/vx/licenses/lic
# ls -a
```

3. Using the output from [step 1](#), identify and delete unwanted license keys listed in [step 2](#). Delete unwanted license keys by removing the license key file.

Network Console and Crash Dump Facility (Netdump)

VERITAS recommends installing and configuring the Netdump facility on all Red Hat and SUSE installations. The facility is not specifically for VERITAS products, but we recommend it as good systems administration practice.

For information on Netdump installations for Red Hat systems, refer to:
<http://www.redhat.com/support/wpapers/redhat/netdump/>

For information on Netdump installations for SUSE systems, refer to:
</usr/share/doc/packages/lkcdutils/README.SuSE>

VCS Packages

The following packages are in the \pkgs directory of the VERITAS 4.1 software discs:

Infrastructure Packages

- ◆ VRTScpi, VERITAS Common Product Installer
- ◆ VRTSjre, VERITAS Java Runtime Environment
- ◆ VRTSperl, VERITAS Perl
- ◆ VRTSvlic, VERITAS License Utilities
- ◆ VRTSweb, VERITAS Web GUI Engine

Cluster Server Packages

- ◆ VRTScscm, VCS Cluster Manager (Java Console)
- ◆ VRTScscw, VCS Configuration Wizards
- ◆ VRTScssim, VCS Simulator
- ◆ VRTScutil, VERITAS Cluster Utilities
- ◆ VRTSgab, Group Membership and Atomic Broadcast
- ◆ VRTSl1t, Low Latency Transport
- ◆ VRTSvcs, VERITAS Cluster Server
- ◆ VRTSvcsag, VCS Bundled Agents
- ◆ VRTSvcsApache, VCS Apache Agent
- ◆ VRTSvcsdc, VCS Documentation
- ◆ VRTSvcsdr, VERITAS SCSI-II DiskReserver module
- ◆ VRTSvcsmsg, VCS Message Catalogs
- ◆ VRTSvcsmn, VCS Manual Pages
- ◆ VRTSvcsww, Cluster Manager (Web Console)
- ◆ VRTSvxfen, VCS Fencing Driver



Packages for Windows Clients

The following packages are in the \windows\WindowsInstallers directory of the VERITAS 4.1 software discs:

- ◆ WindowsClusterManager, Cluster Manager
- ◆ WindowsSimulator, VCS Simulator
- ◆ WindowsWebConsole, VCS Web Console

VCS 4.1 MP1 Packages

Installing VCS 4.1 MP1 replaces the following VCS 4.1 RPMs; it does not install all the VCS 4.1 RPMs.

- ◆ VRTSgab, Group Membership and Atomic Broadcast
- ◆ VRTSllt, Low Latency Transport
- ◆ VRTSvcS, VERITAS Cluster Server
- ◆ VRTSvcSdr, VERITAS SCSI-II DiskReserver module
- ◆ VRTSvcxfen, VCS Fencing Driver

VCS 4.1 MP2 Packages

Installing VCS 4.1 MP2 replaces the following RPMs; it does not install all the VCS 4.1 RPMs.

- ◆ VRTSvcSag, VCS Bundled agents
- ◆ VRTSgab, Group Membership and Atomic Broadcast
- ◆ VRTSllt, Low Latency Transport
- ◆ VRTSvcS, VERITAS Cluster Server
- ◆ VRTSvcSdr, VERITAS SCSI-II DiskReserver module
- ◆ VRTSvcxfen, VCS Fencing Driver

Software Limitations

The following limitations apply to VCS version 4.1.

Installing the IA-32 Execution Layer on IA64 Systems

The IA-32 Execution Layer (IA-32 EL) is a software package that enables IA-32 applications to run on Itanium-based systems. The IA-32 Execution Layer must be present on IA64 systems before you install VERITAS products. See *VERITAS Storage Foundation and High Availability Solutions Getting Started Guide* for more information on installation procedures.

Driver Requirements for DiskReservation Agent

The DiskReservation agent has a reserver module in the kernel mode that reserves disks persistently. Any driver that works correctly with the `scsiutil` utility shipped with the `VRTSvcsdr` package is supported. Refer to the manual page for `scsiutil` functionality.

Mount Agent

The Mount agent mounts a block device at only one mount point on a system. After a block device is mounted, the agent cannot mount another device at the same mount point.

Share Agent

To ensure proper monitoring by the Share agent, verify that the `/var/lib/nfs/etab` file is clear upon system reboot. Clients in the Share agent must be specified as fully qualified host names to ensure seamless failover.

Using Agents in NIS

Programs using networked services (for example, NIS, NFS, RPC, or a TCP socket connection to a remote host) can serve as agent entry points. If the host is disconnected from the network, these entry points may hang and possibly time-out. For example, if the host is configured to use NIS maps as a client and the network connection is severed, basic commands such as `ps -ef` may hang.



NFS Locking

Due to RHEL 4 Update 1 and SLES 9 SP1 issues, lock recovery is not yet supported. Refer to issue 73985 for RHEL 4 Update 1 issues and bugzilla id 64901 for SLES 9 SP1 issues. The same issues exist in RHEL 4 Update 2 and SLES 9 SP2.

System Reboot After Panic

If the VCS kernel module issues a system panic, a system reboot is required. The supported Linux kernels do not automatically halt (cpu) processing. Set the Linux “panic” kernel parameter to a value other than zero to forcibly reboot the system. Append the following two lines at the end of the `/etc/sysctl.conf` file:

```
# force a reboot after 60 seconds
kernel.panic = 60
```

Service Group Dependencies

No Failover for Some Instances of Parent Group

In service groups in which the group dependency is configured as parallel parent/failover child, online global, remote soft or firm, the parent group may not online on all nodes after a child group faults.

Online Local Firm Dependency Violation

If the parent group and the child group are online on node 1, and the child group faults, VCS begins to take the parent group offline. However, this occurs at the same time the child group is failing over to node 2. If the parent group fails to go completely offline and the child group goes online on node 2, a dependency violation occurs.

Online Remote Firm Dependency Violation

If the parent group is online on node 1 and the child group is online on node 2 and faults, the child group selects node 1 as its failover target. This scenario results in a dependency violation because the parent group fails to go offline on node 1.

System Names in VCS

The name of a system specified in the VCS configuration file, `main.cf`, must not use the fully qualified form; that is, it must not include periods. The name in `main.cf` must be consistent with the name used in `/etc/hosts` and `/etc/llthosts`. If the name listed in `/etc/hosts` is fully qualified, VCS uses only the first segment of the name. If you create the file `/etc/VRTSvcs/conf/sysname` such that it contains the system name to be used by `main.cf`, VCS uses it to verify the system name.

Undocumented Commands, Command Options, and Libraries

VCS contains undocumented commands and command options intended for VERITAS development use only. Undocumented commands are not supported by VERITAS.

Networking Agents Do Not Support IPv6 Protocol

The VCS 4.1 bundled IP, NIC, IPMultiNICA, and MultiNICA agents do not support the IPv6 enhanced IP protocol.

Cluster Manager and Wizards Do Not Support IPv6 Protocol

VCS Cluster Manager and Wizards fail to connect to the VCS engine if the `/etc/hosts` file contains IPv6 entries.

Workaround: Remove IPv6 entries from the `/etc/hosts` file.

Cluster Address for Global Cluster Requires Resolved Virtual IP

The Virtual IP address must have a DNS entry if virtual IP is used for heartbeat agents.

Volume Agent Clean May Forcibly Stop Volume Resources

When the attribute `FaultOnMonitorTimeouts` calls the Volume agent `clean` entry point after a monitor time-out, the `vxvol -f stop` command is also issued. This command forcibly stops all volumes, even if they are still mounted.



VCS Does Not Provide a Bundled Agent for Volume Sets

VCS 4.1 does not provide a bundled agent to detect Volume Manager volume sets. Problems with volumes and volume sets can only be detected at the DiskGroup and Mount resource levels.

Workaround: Set StartVolumes and StopVolumes attributes of the DiskGroup resource that contains volume set to 1. If a file system is created on the volume set, use a Mount resource to mount the volume set.

Fire Drill Does Not Support Volume Sets

The fire drill feature for testing fault readiness of a VCS configuration supports only regular Volume Manager volumes. Volume sets are not supported in this release.

Systems in a Cluster Must Have Same System Locale Setting

VCS 4.1 does not support clustering of systems with different system locales. All systems in a cluster must be set to the same locale.

False Concurrency Violation When Using PidFiles to Monitor Application Resources

The PID files created by an application contain the PIDs for the processes that are monitored by Application agent. These files continue to exist even after a node running the application crashes. On restarting the node, the operating system may assign the PIDs listed in the PID files to other processes running on the node.

Thus, if the Application agent monitors the resource using the PidFiles attribute *only*, the agent may discover the processes running and report a false concurrency violation. This could result in some processes being killed that are not under VCS control.

Using the KDE Desktop

Some menus and dialog boxes on Cluster Manager (Java Console) may appear misaligned or incorrectly sized on a KDE desktop. To ensure the proper appearance and functionality of the console on a KDE desktop, use the Sawfish window manager. You must explicitly select the Sawfish window manager even if it is supposed to appear as the default window manager on a KDE desktop.

Cluster Manager (Web Console)

Cluster Name Should Not Include Single or Double Quotes

If a cluster name includes single or double quotes, some cluster views and operations in the Web Console will not function correctly.

Workaround: Verify that the ClusterName attribute for the cluster includes only valid characters.

Changes to UserStrGlobal for ClusterService May Disrupt Cross-Product Navigation

The Web Console uses the UserStrGlobal attribute of the ClusterService service group. Changes to this attribute may disrupt cross-product navigation through the Web Console.

Workaround: Do not edit the default value of UserStrGlobal for the ClusterService service group.

Web Console for VCS 4.1 Linux Does Not Support Secured VCS 4.1 Clusters

The Web Console for VCS 4.1 on Linux is not designed to connect with post-4.0 VCS clusters that have the VERITAS Security Subsystem (VxSS) enabled.

Cluster Manager (Java Console)

Java Console for VCS 4.1 is Required

Cluster Manager (Java Console) from VCS versions earlier than 2.0 cannot be used to manage VCS 4.1 clusters. VERITAS recommends always using the latest version of Cluster Manager. See the *VERITAS Cluster Server Installation Guide* for instructions on upgrading to the VCS 4.1 version of Cluster Manager.



Known Issues

The following issues have been reported for VCS version 4.1.

Agent entry points time out

In specific situations, the entry points for VCS agents may time out. This may lead to the agents not sending heartbeats to the VCS engine.

Workaround: If the symptoms do not appear repeatedly, ignore the symptoms. VCS takes care of this situation by restarting the agent.

GAB Panics the Systems While VCS Gets Diagnostic Data

On receiving a SIGABRT signal from GAB, VCS engine forks off `vcs_diag` script. When VCS engine fails to heartbeat with GAB, often due to heavy load on the system, the `vcs_diag` script does a `sys_req` to dump the stack trace of all processes in the system to collect diagnostic information. The dump of stack trace is intended to give useful information for finding out which processes puts heavy load. However, the dumping puts extra load on the system that causes GAB to panic the system in such heavy loads. See *VERITAS Cluster Server User's Guide* for more information.

Workaround: Disable the `vcs_diag` script. To disable, rename the file `/opt/VRTSvcs/bin/vcs_diag` to `/opt/VRTSvcs/bin/vcs_diag.backup`.

Network Interfaces Change Their Names After Reboot

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

Workaround: Use `PERSISTENT_NAME= ethX` where `X` is the interface number for all interfaces.

Problem in RHEL 4 Update 1 on 32-bit Operating Systems

There is a known problem in Red Hat Enterprise Linux 4 Update 1 on 32-bit systems that is unlikely to occur but which may result in a stack overflow. The issue was reported to Red Hat and is documented in Bugzilla incident 162257.

Service Group Failover

While the cluster service group is failing over, “Not Found (404)” error appears on the VCS Web Console.

AutoStart May Violate Limits and Prerequisites Load Policy

The load failover policy of Service Group Workload Management may be violated during AutoStart when all of the following conditions are met:

- ◆ More than one autostart group uses the same Prerequisites.
- ◆ One group, G2, is already online on a node outside of VCS control, and the other group, G1, is offline when VCS is started on the node.
- ◆ The offline group is probed before the online group is probed.

In this scenario, VCS may choose the node where group G2 is online as the AutoStart node for group G1 even though the Prerequisites load policy for group G1 is not satisfied on that node.

Workaround: Persistently freeze all groups that share the same Prerequisites before using `hastop -force` to stop the cluster or node where any such group is online. This workaround is not required if the cluster or node is stopped without the force option.

Common System Names in GCO Setup

If both local and remote systems have a common system name in a GCO setup, group operations cannot be performed on those systems using Java and Web consoles.

Workaround: Use command-line interface to perform group operations.

VCS Engine May Get Killed in a Large Cluster

In case of a cluster with many nodes and large configuration, VCS engine may get killed due to high memory usage.

Workaround: Set the cluster attribute `LockMemory` to `NONE` or `CURRENT`.



VCS Simulator Gives Erroneous Message

When the `main.cf` configuration file is read-write, simulator gives an erroneous message for the command `hasim -stop`. The correct message is:

```
VCS WARNING V-16-1-10028 Cluster configuration is writable.  
Must do 'hasim -conf -dump -makero'
```

Unloading DiskRes Driver Requires a Reboot on RHEL4

On systems running RHEL4, you cannot unload the DiskRes driver. The node must be rebooted.

Performance Issues with LLT over UDP

Slow Performance of LLT over UDP if a Link Goes Down

If LLT is configured over UDP and a link goes down, then you may encounter severe degradation in the performance over the remaining link.

Workaround: On all nodes in the cluster, set the LLT window size to small values. The default value is 400. Setting it to 100 can bring the performance close to normal.

To set window limit add this line in `/etc/llttab`:

```
set-flow    window:100
```

To change at runtime use `lltconfig(1m)`

```
$ lltconfig -F window:100
```

Slow Performance of LLT over UDP on SLES 9

LLT over UDP requires properly assigned IP addresses for the Ethernet interfaces used for the LLT private links. In this prerelease, using `ifconfig` to set up the IP addresses for Ethernet interfaces may not be reliable on SLES 9.

Workaround: The issue is not observed when IP addresses are set using YaST or YaST2.

Log Message When Running VCS Enterprise Agent For DB2

When the VCS enterprise agent for DB2 is run on a VCS system with `ja_JP.eucJP` locale, VCS logs the message “Failed to open file `/opt/VRTSvcs/messages/ja/HAD.bmcmap`.” The agent is functioning correctly, and this message can be safely ignored.

Issues Related to VERITAS Volume Manager

- ◆ While creating volumes, you must ensure that major number and minor number are the same across all the systems. Otherwise, a stale NFS file handle error displays if the NFS group fails over.
Workaround: Reassign the minor number of volumes to make it uniform across all cluster systems. Refer to VERITAS Volume Manager documentation for details.
- ◆ If the PGR_TRAINING feature is not enabled, then a disk group imported with SCSI-3 Persistent Reservation does not fail over in response to system panic.

NFS Failover

If the NFS share is exported to the world (*) and the NFS server fails over, NFS client displays “Stale NFS file handle” error. To avoid this error, export NFS shares explicitly using FQDN hostnames.

Wizards Do Not Start if the /etc/hosts File Contains ipv6 Entries

If the `/etc/hosts` file contains `ipv6` entries, VCS displays the following error when you try to start a VCS wizard:

```
Error 16-12-6 Could not connect to VCS engine. Cannot proceed
```

Workaround: Remove the `ipv6` entries before running VCS wizards.

Unmount Fails While Taking Service Group Offline

A known issue in Red Hat Enterprise Linux 4 could cause unmount to fail. When an NFS client does some heavy I/O, unmounting a resource in the NFS service group may fail while taking the service group offline. Refer to bugzilla id 154387 for more information.



Segmentation Fault Occurs if utf8 Encoding is Used

The `halog` command results in a core dump if utf8 encoding is used.

For example, if you issue the command:

```
# $VCS_HOME/bin/halog -add "test debug msg" -dbg 1 -sys -msgid  
10000 -encoding utf8 -parameters "test"
```

The following error occurs:

```
Unknown trailer  
Segmentation fault (core dumped)
```

Make sure you specify the encoding as utf-8.

Rebooting May Fail Due to Reservation Conflict

If a shared disk is reserved by one node, the other node may not boot up. During reboot, when the VxVM is coming up, the VM tries to read the private region data for all disks it can see, including the one reserved by the DiskReservation on some other node. The read goes through Dynamic Multipathing, which propagates only the EIO. Consequently, the rest of VM does not realize that a RESERVATION_CONFLICT has occurred, and retries the private region read. The rebooted node comes up *only* after the VM has done all the retries.

Workaround: Use `vxdiskadm` utility to remove all disks from VM that the DiskReservation uses. Reboot each node on which you remove the disks.

NIC Bonding Issues On RHEL 4 Update 1

On RHEL 4 Update 1, you cannot load a bonding driver with a name different from its original name. For example, `modprobe -o bond0 bonding` will not work.

The kernel cannot load two modules with the same name, so any module parameters that are set will affect all the devices that the module handles. That is, the bonding policies and the value of the `miimon` parameter to the bonding driver cannot be set different for different bonds.

If any of the slaves of the bonds configured on the node cannot take `miimon=0`, you must load a bonding module with a non-zero value for the `miimon` parameter. In such a case, all the bonds will use the same non-zero value only. See the *VERITAS Cluster Server Bundled Agents Reference Guide* for details on when to set the `miimon` parameter to zero or non-zero.

DiskReservation Might Fault Mount Resources

When the DiskReservation resource is brought online, the agent also does a BLKRRPART ioctl on the disks. This causes the block subsystem to see new block devices. Consequently, the OS launches the block hotplug agent to handle the events. The hotplug agent, as part of its work, unmounts any stale entries.

Because the hotplug agents are asynchronous, it is difficult to find whether all the hotplug agents have finished processing. So, the DiskReservation resource goes ONLINE even while the hotplug agents are running, which is fine with SCSI reservation as the disks are reserved. However, when the DiskReservation resource goes ONLINE, a dependent Mount resource could also come up. And it is possible that the hotplug agent does its unmount *after* the Mount agent does its mount and a monitor cycle. If the Monitor entry point of the Mount resource is called after the unmount, VCS will never see the Mount resource as online. If the Monitor is called before the unmount, the resource goes ONLINE, and then in the next Monitor cycle, goes to FAULTED state.

Workaround: To avoid this, the DiskReservation agent is hard coded so that the Monitor entry point of the DiskReservation resource is called HOTPLUG_DELAY seconds after the Online entry point of the DiskReservation resource completes. HOTPLUG_DELAY is hardcoded to 5 seconds so that the first monitor happens 5 seconds after the DiskReservation resource is brought online.

If the hotplug agent cannot complete within the default HOTPLUG_DELAY time, set the OnlineRetryLimit and RestartLimit of the Mount type to 1.

When the unmount happens before the Monitor entry point is called, the OnlineRetryLimit setting ensures that the Mount agent does a mount again.

When the umount happens after the first Monitor, the RestartLimit setting ensures that the Mount agent does a mount again. However, the mount point may be unavailable for a maximum of MonitorInterval seconds.

Note Any module calling the ioctl on the disk will unmount the block devices.

DB2 Resource May Not Failover

When NIC cable is pulled out on a node where a DB2 resource is online, the DB2 resource may not failover.



SambaShare Resource Unable to Come Online on SLES9 SP1

When a SambaShare resource tries to come online, the SambaShare agent sends SIGHUP signal to the smbd process to reload the Samba configuration. When the smbd process receives the signal, the process fails to handle the signal and dies. Refer to bugzilla id 93803 for more information.

Workaround: Upgrade Samba to version 3.0.14.

Timing Issues With AutoStart Policy

Consider a case where the service group is offline and engine is not running on node 1. If you restart the engine on node 1 after HAD is killed on node 2 *and* before the engine is restarted on node 2, then VCS does not initiate the autostart policy of the group.

Data Resynchronization Does Not Happen In CampusCluster

In a campus cluster scenario, when the primary site goes down, VCS fails over the service group to the secondary site. When the primary site joins back, the CampusCluster agent starts resynchronizing the data using Fast Mirror Resync (FMR) feature of VxVM. But the VM detects incorrect serial split brain and the synchronization is not started.

Workaround: Deport the diskgroup and manually reimport the diskgroup on the secondary site.

Problem In Failing Over the IP Resource

When a system panics, the IP address remains plumbed to the system for a while. In such a case, VCS may not succeed in failing over the IP resource to another system. This can be observed when a system panics during I/O Fencing.

Workaround: Increase the value of the OnlineRetryLimit attribute for the IP resource type.

Printing to File From the VCS Java Console Throws Exception

VCS Java Console throws an exception while printing to a file from a system that does not have a printer configured. Also, the content is not written to the file. Before printing, make sure at least one printer is configured on the system where the VCS Java Console is launched.

Warning Messages When Running installmp on SLES 9 i586

The installmp script throws warning messages on SLES 9 i586 systems during installation for few missing packages. The messages can be safely ignored.



Fixed Issues and Software Enhancements

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

Fixes and Enhancements in VCS 4.1 MP2

Incident Number	Description
495226	VCS does not fail over on disk path failure.
526987	The haifconfig command fails to identify the next available interface alias in certain situations.
494495	The hastatus command gives duplicate information.
519631	The topmost non-critical resource in a service group may not come online if the service group fails over. Limitation: If the top most resource in a is non-critical and in a faulted state, the resource may not come online when the group fails over.
518515	Opens on /llt/dev can panic the system if the driver is unloaded before closing the device.
512783	In an llt/dlpi configuration, pulling out cables results in a continuous stream of DL_UDERROR_IND errors.
350511	Pre existing split brain detected and node got out of the cluster.

Fixes and Enhancements in VCS 4.1 MP1

Incident Number	Description
496452	Fixed the order of startup and shutdown of VCS and vxfen.
495518	The installer now takes care if the previously installed vxfen is improperly shut down.
431481	LLT links now do not transition between 'active' and 'in trouble' mode flooding the /var/log/messages file.
424476	Indeterministic service thread cancellation would no longer leave agents in a hung state.



Incident Number	Description
423021	When I/O fencing is not configured, vxfcntlsthdtw no longer gives an incorrect report.
340476	GAB now reorders the membership delivery message before delivering any new messages.
277314	lltshow command no longer looks for /proc/ksyms.

Changes for VERITAS Cluster Server Bundled Agents Reference Guide

The information presented here replaces the existing text in the guide.

On page 5, in the Clean Operation section, add a trailing quote to the command sample:

For ESE version 8, the agent uses the `db2gcf` program to kill a DB2 database partition with either the ESE single-partition instance configuration or the ESE multi-partition instance in SMP or MPP configuration. The command is:

```
su $DB2InstOwner -c "$InstHome/sqlllib/bin/db2gcf -k -i  
$DB2InstOwner -p $nodenum"
```



Documentation

Documentation for VERITAS Cluster Server is available as Adobe Portable Document Format (PDF) files on the product disc. Documentation is also available in HTML format on the software disc included with your software purchase. Note that the packages for VCS documentation (VRTSvcsdc) and VCS manual pages (VRTSvcsmn) are optionally installable.

The following section lists the documents installed with this product.

VCS Documentation

The installation guide for VCS is in the directory `cluster_server/docs`. Release notes for VCS are in the directory `/cluster_server/release_notes`.

- ◆ `vcs_install.pdf`, *Installation Guide*
- ◆ `vcs_notes.pdf`, *Release Notes*

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

Additional documentation for VCS is in the `VRTSvcsdc` RPM:

- ◆ `vcs_agent_dev.pdf`, *Agent Developer's Guide*
- ◆ `vcs_bundled_agents.pdf`, *Bundled Agents Reference Guide*
- ◆ `vcs_users.pdf`, *User's Guide*

VERITAS Documentation Disc

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

VERITAS Documentation Online

Visit the Web site for VERITAS Cluster Server for UNIX:

http://support.veritas.com/menu_ddProduct_CLUSTERSERVER.htm

to download VERITAS Cluster Server documentation from current and previous releases.

Hard-Copy Documentation Set

Copies of VERITAS software guides are available for purchase through the VERITAS Web Store at <http://www.veritas.com/webstore>.

The following guides for VCS 4.1 on Linux are available:

- ◆ *Installation Guide*
- ◆ *User's Guide*
- ◆ *Agent Developer's Guide*
- ◆ *Bundled Agents Reference Guide*
- ◆ *Application Note: High Availability for VMware Virtual Machines*

Manual Pages

The manual pages for VRTSvcs are installed in `/opt/VRTS/man`. Manual pages are divided into sections 1, 1m, 3n, and 4. Edit the `man(1)` configuration file `/etc/man.config` to view these pages.

▼ To edit the man(1) configuration file

Note If you use the `man` command to access manual pages, set `LC_ALL` to “C” in your shell to ensure that the pages are displayed correctly.

```
# export LC_ALL=C
```

See incident 82099 on the Red Hat support website for more information.

1. Add the following line to `/etc/man.config`:

```
MANPATH /opt/VRTS/man
```

where other man paths are specified in the configuration file.

2. Add new section numbers. Change the line:

```
MANSECT          1:8:2:3:4:5:6:7:9:tcl:n:l:p:o
```

to

```
MANSECT          1:8:2:3:4:5:6:7:9:tcl:n:l:p:o:3n:1m
```



Getting Help

For technical assistance, visit <http://support.veritas.com> and select phone or email support. This site also provides access to resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and the VERITAS customer email notification service. Use the Knowledge Base Search feature to access additional product information, including current and past releases of product documentation.

Diagnostic tools are also available to assist in troubleshooting problems associated with the product. These tools are available on disc or can be downloaded from the VERITAS FTP site. See the `README.VRTSspt` file in the `/support` directory for details.

For information on purchasing product documentation, visit <http://webstore.veritas.com>.

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If you have any suggestions, additions, comments, or questions, please let me know.

Douglas C. Schmidt

Digital Encryption Standard (DES) - MIT

MIT and Dennis Ferguson

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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The End

Perl Compatible Regular Expressions

Philip Hazel

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PCRE is a library of functions to support regular expressions whose syntax and semantics are as close as possible to those of the Perl 5 language.

Written by: Philip Hazel <ph10@cam.ac.uk>

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Strcat.c

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Tomcat

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