VERITAS™

VERITAS Cluster Server™ 4.0

Release Notes

Solaris

January 2004

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

VERITAS Software

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650–527–8000 Fax 650–527–2901
www.veritas.com

Third-Party Copyrights

Apache Software

This product includes software developed by the Apache Software Foundation (http://www.apache.org/).

The Apache Software License, Version 1.1

Copyright (c) 1999 The Apache Software Foundation. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. The end-user documentation included with the redistribution, if any, must include the following acknowledgement:

This product includes software developed by the Apache Software Foundation (http://www.apache.org/).

Alternately, this acknowledgement may appear in the software itself, if and wherever such third-party acknowledgements normally appear.

4. The names "The Jakarta Project", "Tomcat", and "Apache Software Foundation" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact apache@apache.org.

5. Products derived from this software may not be called "Apache" nor may "Apache" appear in their names without prior written permission of the Apache Group.

THIS SOFTWARE IS PROVIDED "AS IS'' AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE APACHE SOFTWARE FOUNDATION OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This software consists of voluntary contributions made by many individuals on behalf of the Apache Software Foundation. For more information on the Apache Software Foundation, please see http://www.apache.org/.

Data Encryption Standard (DES)

Support for data encryption in VCS is based on the MIT Data Encryption Standard (DES) under the following copyright:

SNMP Software

SNMP support in VCS is based on CMU SNMP v2 under the following copyright:

VCS 4.0 Release Notes

This document provides important information regarding VERITAS Cluster Server™ (VCS) version 4.0 for Solaris 2.6 (32-bit) and Solaris 7, 8, and 9 (32-bit and 64-bit). Please review this entire document before installing VCS.

Package Contents

There are multiple software discs in this VERITAS product distribution. VCS is on *VERITAS Storage Solutions 4.0* Disc 1.

VCS Packages

The following packages for VCS are in the `cluster_server/pkgs` directory:

- `VRTScpi`, VERITAS Common Product Installer
- `VRTScscm`, VCS Cluster Manager (Java Console)
- `VRTScscw`, VCS Configuration Wizards
- `VRTScspro`, VCS VEA Provider
- `VRTScsim`, VCS Simulator
- `VRTSgab`, Group Membership and Atomic Broadcast
- `VRTSllt`, Low Latency Transport
- `VRTSperl`, VERITAS Perl
- `VRTSvcs`, VERITAS Cluster Server
- `VRTSvcsag`, VCS Bundled Agents
- `VRTSvcsdc`, VCS Documentation
- `VRTSvcsjre`, VCS redistribution of JRE
- `VRTSvcsmg`, VCS Message Catalogs
- `VRTSvcsmn`, VCS Manual Pages

- `VRTSvcsw`, Cluster Manager (Web Console)
- `VRTSvlic`, VERITAS License Utilities
- `VRTSvxfen`, VCS Fencing Driver
- `VRTSweb`, VERITAS Web GUI Engine
- `WindowsClusterManager`, Cluster Manager for Windows clients
- `WindowsSimulator`, VCS Simulator for Windows clients
- `WindowsWebConsole`, VCS Web Console for Windows clients

VCS Documentation

Documentation for VCS is included on the *VERITAS* software discs in Adobe Portable Document Format (PDF). 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_ig.pdf`, *Installation Guide*
- `vcs_notes.pdf`, *Release Notes*

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

Additional documentation for VCS is in the `/VRTSvcsdc` package:

- `vcs_adg.pdf`, *Agent Developer's Guide*
- `vcs_barg.pdf`, *Bundled Agents Reference Guide*
- `vcs_ug.pdf`, *User's Guide*
- `vcs_appnote_f15kdr.pdf`, *Application Note: Sun Fire 12K/15K Dynamic Reconfiguration*
- `vcs_appnote_s6800dr.pdf`, *Application Note: Sun Fire 6800 Dynamic Reconfiguration*
- `vcs_appnote_e10kdr.pdf`, *Application Note: Sun Enterprise 10000 Dynamic Reconfiguration*

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 DocStore™ at http://www.veritas.com/docstore.

The following guides for VCS 4.0 on Solaris are available:

- *Installation Guide*
- *User's Guide*
- *Agent Developer's Guide*
- *Bundled Agents Reference Guide*
- *Application Note: Sun Fire 12K/15K Dynamic Reconfiguration*
- *Application Note: Sun Fire 6800 Dynamic Reconfiguration*
- *Application Note: Sun Enterprise 10000 Dynamic Reconfiguration*

Manual Pages

The manual pages for the `VRTSllt`, `VRTSgab`, and `VRTSvcs` are installed in `/opt/VRTS/man`. Set the `MANPATH` environment variable so the `man`(1) command can point to the VCS manual pages.

For Bourne or Korn shell (`sh` or `ksh`), type:

```
# MANPATH=$MANPATH:/opt/VRTS/man
# export MANPATH
```

For C shell (`csh` or `tcsh`), type:

```
# setenv MANPATH ${MANPATH}:/opt/VRTS/man
```

For more information, refer to the `man`(1) manual page.

Getting Help

VERITAS offers you a variety of support options.

Accessing the VERITAS Support Web Site

For technical assistance, visit the VERITAS Technical Services Web site at http://support.veritas.com. From there you can:

- Contact the VERITAS Technical Services staff and post questions.
- Download the latest patches and utilities.
- View the VERITAS Cluster Server Frequently Asked Questions (FAQ) page.
- Search the knowledge base for answers to technical support questions.
- Receive automatic notice of product updates.
- Learn about VERITAS Cluster Server training.
- Read white papers related to VERITAS Cluster Server.
- Access the latest product documentation and technical notes.

Subscribing to VERITAS Email Notification Service

Subscribe to the VERITAS Email notification service to be informed of software alerts, newly published documentation, beta programs, and other services.

Go to http://support.veritas.com. Select a product and click “E-mail Notifications” on the right side of the page. Your customer profile ensures you receive the latest VERITAS technical information pertaining to your specific interests.

Accessing VERITAS Telephone and Fax Support

Telephone support for VERITAS Cluster Server is only available with a valid support contract. To contact VERITAS for technical support, dial the appropriate phone number listed on the Support Guide included in the product box and have your product license information ready for quick navigation to the proper support group.

The address for the VERITAS telephone support directory is http://support.veritas.com. Select a product and click “Contact Support” on the right side of the page.

Contacting VERITAS Licensing

For license information, call 1-650-527-0300 or fax 1-650-527-0952.

Using VRTSexplorer

The `VRTSexplorer` program can help VERITAS Technical Support engineers diagnose technical problems associated with VERITAS products. You can install this program from the VERITAS CD or download it from the VERITAS FTP site. For more information, consult the README file in the `VRTSexplorer` directory on the VERITAS CD.

▼ To install VRTSexplorer from the VERITAS CD

1. Log in as root.

2. Place the VERITAS CD into a CD-ROM drive connected to your system and enter:

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

3. Move to the `/support` directory and install the `VRTSspt` package:

```
# cd /mnt/support
# pkgadd -d . VRTSspt
```

   The program is installed in the `/opt/VRTSspt` directory.

▼ To download VRTSexplorer from the VERITAS FTP site

1. Use a web browser or the `ftp` program to download the `VRTSexplorer` program from the following URL:

   ftp://ftp.veritas.com/pub/support/vxexplore.tar.Z

   Save the file to the `/opt/VRTSspt` directory. Create the directory `/opt/VRTSspt` if it does not exist.

2. Log in as root on the affected system, and use the following commands to extract the contents of the downloaded file to the directory **`/opt/VRTSspt`**:

```
# cd /opt/VRTSspt
# zcat vxexplore.tar.Z | tar xvf -
```

▼ To run the VRTSexplorer program

1. Run the `VRTSexplorer` program from the VRTSexplorer directory by entering the following command:

   ```
   # /opt/VRTSspt/VRTSexplorer/VRTSexplorer
   ```

   `VRTSexplorer` prompts you for a destination directory for the information that it collects.

2. Press Return to accept the default directory `/tmp`, or enter a path name of your own choice.

   `VRTSexplorer` writes information to a compressed tar file named `VRTSexplorer_`*casenumber_hostname*`.tar.Z` in the specified directory.

3. Use the file upload facility of your web browser, or the `ftp` program, to transfer the `VRTSexplorer` output file to the VERITAS Technical Support anonymous FTP site:

   `ftp://ftp.veritas.com/incoming`

4. When you call VERITAS Technical Support, provide the name of the file you transferred to the FTP site.

   Alternatively, if you have already been assigned a call ID number by VERITAS Technical Support, email `support@veritas.com` and include your case ID number in the subject line.

Supported Hardware

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

Supported Software

- Solaris 2.6 (32-bit), and 7, 8, and 9 operating systems (32-bit and 64-bit)

  For each platform, we recommend applying the latest Solaris operating system patches available from Sun. See the following site:

  `http://sunsolve.Sun.com`

- VERITAS Volume Manager™ (VxVM) 3.2, 3.5, and 4.0
- VERITAS File System™ (VxFS) 3.4 P2, 3.5, and 4.0

System Requirements

Requirements for the VCS Graphical User Interface

The minimum requirements on Solaris clients are Ultra5 or greater, 256MB RAM, and 1280x1024 display resolution. The color depth of the monitor must be at least 8-bit (256 colors), although 24-bit is recommended.

The minimum requirements on Windows 2000 clients are Pentium II, 300MHz, 128MB RAM, and 800x600 display resolution. 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.

The following supported Internet browsers have been tested:

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

Patches for Configuration Editor and Cluster Manager

Patches from Sun for Java 2 Standard Edition (J2SE) are required to use the automated offline configuration tool, Configuration Editor; the Java-based graphical user interface, Cluster Manager (Java Console); and the web-based graphical user interface, Cluster Manager (Web Console). Apply the patches for J2SE that are required for your Solaris operating system. Patches are available from Sun at:

```
http://java.sun.com/j2se/1.4.2/download.html
```

Do Not Use Solaris 2.8 Patch 110934-10 or Solaris 2.9 Patch 113713-01

Solaris 2.8 patch 110934-10 and Solaris 2.9 patch 113713-01 prevent the installation of VCS, VxVM, and GLM patches.

By using the `showrev -p` command, you can display the currently installed patches and their levels. For example, to check for patch 110934-10, enter:

```
# showrev -p | grep 110934
```

If you have patch 110934-10 (Solaris 2.8) or patch 113713-01 (Solaris 2.9) installed, you must remove it using the `patchrm` command:

```
# patchrm 110934-10
```

After the Solaris patch is removed, VERITAS packages can be installed.

For Solaris 2.8, you can use patch 110934-08 or lower. If you do not have or cannot obtain patch 110934-08, do not install 110934-10. You can successfully install the VERITAS packages without either patch.

The latest status of patches 110934-10 and 113713-01 for use with specific VERITAS products is available at http://support.veritas.com.

Installing or Upgrading to VCS 4.0

Refer to the *VERITAS Cluster Server 4.0 Installation Guide* for instructions on how to install VCS 4.0 and how to upgrade to VCS 4.0 from earlier versions of VCS. The *VCS 4.0 Installation Guide* is in the `cluster_server/docs` directory of the software disc.

Obtaining License Keys for VCS

VCS is a licensed software product. For information on obtaining licence keys for VCS, refer to the *Getting Started Guide* or the *VCS 4.0 Installation Guide.*

New Features in VCS 4.0

The features described below are introduced in VCS version 4.0.

Global Cluster Option

The Global Cluster option to VCS enables a collection of VCS clusters to work together to provide wide-area disaster recovery. Previously, the wide-area functionality was available in a separate product, "Global Cluster Manager." The functionality has now been incorporated into VCS 4.0.

VCS Simulator

VCS Simulator is a tool for simulating cluster configurations and determining how service groups will behave during cluster or system faults. With the simulator, you can designate and fine-tune configuration parameters, view state transitions, and evaluate complex, multinode configurations. The tool is especially valuable because it enables you to design and evaluate a specific configuration without test clusters or changes to existing production configurations.

I/O Fencing

VCS 4.0 provides a new capability, called I/O fencing, to arbitrate cluster membership and ensure data integrity in the event of communication failure among cluster members. The I/O fencing kernel module uses SCSI-III Persistent Reservations and designated coordinator disks, as described in the *VCS 4.0 User's Guide.*

Fire Drill

Fire drill is a procedure for testing the fault readiness of a configuration. A fire drill on a VCS-controlled application uses a separate fire drill service group that contains a copy of the live application's resources. See the *VCS 4.0 User's Guide* for more information.

Steward

The Steward mechanism minimizes chances of a wide-area split-brain in two-node clusters. The steward process can run on any system outside of the clusters in a Global Cluster configuration. See the *VCS 4.0 User's Guide* for more information.

Web Console Features

- Support for Global Clustering
- Home Portal
- User Management

Java Console Features

- Support for Global Clustering
- VCS Simulator
- Display of agent logs

The cpuusage Event Trigger

The new cpuusage event trigger is invoked on systems where CPU usage exceeds the configured threshold value. See the *VCS 4.0 User's Guide* for more information.

The multinicb Event Trigger

The new multinicb event trigger is invoked when a network device under MultiNICB control changes its state. The trigger is also always called in the first monitor cycle. See the *VCS 4.0 User's Guide* for more information.

Action Entry Point

The action entry point enables agents to perform actions that can be completed within a few seconds and that are outside the scope of traditional actions such as online and offline.

Info Entry Point

The info entry point enables agents to gather specific information for an online resource.

Tunable gab_isolate_time Kernel Parameter

Change in Behavior: Previously, GAB would panic a node if it could not kill the HAD process. Now, GAB isolates a HAD client it cannot kill by closing off the HAD port. GAB then panics the node only if HAD survives beyond the time limit set in gab_isolate_time. See the *VCS 4.0 User's Guide* for more information.

Output of had -version Command

Change in Behavior: VCS 4.0 changes the output format of `had -version`. The new output format is:

```
# /opt/VRTSvcs/bin/had -version
  Engine Version    4.0
  Join Version      4.0
  Build Date        Thu 26 Jun 2003 02:11:00 AM PDT
  PSTAMP            4.0 06/26/03-02:11:00
```

New Bundled Agent

The following bundled agent is added in the VCS 4.0 Release. For details, refer to the *VCS 4.0 Bundled Agents Reference Guide*.

- DNS

New Attributes

- Resource Type Attributes
  - ActionTimeout
  - FireDrill
  - InfoInterval
  - InfoTimeout
  - LogDbg
  - MonitorStatsParam
  - SupportedActions

- Resource Attributes
  - ComputeStats
  - MonitorTimeStats
  - ResourceInfo
- Service Group Attributes
  - Authority
  - ClusterFailoverPolicy
  - ClusterList
- System Attributes
  - CPUUsage
  - CPUUsageMonitoring
  - NoAutoDisable
- Cluster Attributes
  - AutoStartTimeout
  - ClusState
  - ClusterAddress
  - ConnectorState
  - Stewards
  - UseFence
  - VCSi3Info

New Attribute Category

Heartbeat attributes are introduced to VCS 4.0 with the new global cluster features.

- Heartbeat Attributes
  - AgentState
  - Arguments
  - AYAInterval
  - AYARetryLimit
  - AYATimeout
  - CleanTimeOut
  - ClusterList
  - InitTimeout
  - LogDbg
  - State
  - StartTimeout
  - StopTimeout

Bundled Agents

The following agents are included with VCS. For information on any of the agents listed below, refer to the *VCS 4.0 Bundled Agents Reference Guide*.

Application	Disk	DiskGroup
DiskReservation	DNS	ElifNone
FileNone	FileOnOff	FileOnOnly
IP	IPMultiNIC	IPMultiNICB
Mount	MultiNICA	MultiNICB
NFS	NIC	NotifierMngr
Phantom	Process	Proxy
ServiceGroupHB	Share	Volume
VRTSWebApp		

Enterprise Agents

Enterprise agents are sold separately. Contact your VERITAS sales representative for details about these agents, additional agents under development, and agents available as part of Storage Foundation products or through VERITAS Consulting Services.

Note Before configuring an enterprise agent with VCS 4.0, verify that you have the latest version of the agent.

Supported Enterprise Agents

Available VCS 4.0 enterprise agents are listed below. Refer to this table for supported application and operating system versions. VCS agents support a specified application version on Solaris 9 if the application vendor supports that version on Solaris 9.

Supported VCS Agent	Agent version	VCS version				Application		OS			
		1.3	2.0	3.5	4.0			2.6	7	8	9
Sun ONE	4.0	p	p	p	s	Administration Server		s	s	s	s
						Messaging Server	5.0, 5.1, 5.2				
						Messaging Multiplexor	5.0, 5.1, 5.2				
						Directory Server	5.0, 5.1, 5.2				
						Web Server	4.1, 6.0				
						Proxy Server	3.6				
						SOCKS Server	3.6				
Oracle	4.0	p	p	p	s	Oracle	8.0.x, 8*i*, 9*i* R1, 9*i* R2 10g	s	s	s	s
DB2	4.0	p	p	p	s	DB2 Enterprise Server Edition	7.2, 8.1	s	s	s	s
Sybase	4.0	p	p	p	s	Sybase Adaptive Server	11.x–11.9.2 12.0, 12.5	s	s	s	s
NetBackup	1.3.0	p	p	p	s	NetBackup	3.4 4.5 MP3 4.5 FP3	s	s	s	s
Informix	1.3	s	s	s	s	Informix Dynamic Server	7.1–9.21	s	s	s	s
SRDF	4.0	n	n	n	s	EMC Symmetrix Remote Data Facility		s	s	s	s
PPRC	4.0	n	n	n	s	IBM Peer-to-Peer Remote Copy		s	s	s	s

s – supported configuration n – not supported p – supported by previous version of agent

Custom Agents

Compiling Custom Agents

Custom agents developed in C++ must be compiled using SUNWspro 5.0 or Forte Developer 6 compilers. Note that an agent framework library is available for use with custom agents compiled with SUNWspro 4.x compilers.

The following is the layout of `libvcsagfw.so` in `/usr/lib`:

`/usr/lib/libvcsagfw.so --> /usr/lib/libvcsagfw.so.2`

(compatible with SUNWspro5.0 and Forte Developer 6 compilers)

`/usr/lib/libvcsagfw.so.1`

(compatible with SUNWspro 4.x)

All the agents developed on VCS 1.3 and 2.0 will continue to work since they link with `libvcsagfw.so.1`. If SUNWspro 4.x is used to compile a new custom agent, `libvcsagfw.so` should link to `libvcsagfw.so.1` during link time. After the agent is developed, relink `libvcsagfw.so` to `libvcsagfw.so.2`.

Upgrading Custom Agents

Custom agents developed prior to VCS 1.3 must be upgraded before they can be used with VCS 4.0. See the *VCS 4.0 Agent Developer's Guide* for instructions on how to upgrade custom agents.

Software Limitations in VCS 4.0

The following limitations apply to VCS version 4.0.

Cluster Manager (Java Console)

Java Console for VCS 4.0 is Required

Cluster Manager (Java Console) from VCS versions earlier than 2.0 cannot be used to manage VCS 4.0 clusters. VERITAS recommends always using the latest version of Cluster Manager. See the *VERITAS Cluster Server 4.0 Installation Guide* for instructions on upgrading to the VCS 4.0 version of Cluster Manager.

Running Java Console on a Non-Cluster System is Recommended

VERITAS strongly recommends not running Cluster Manager (Java Console) for an extended period on a system in the cluster. The Solaris version of the Java Virtual Machine has a memory leak that can gradually consume the host system's swap space. This leak does not occur on Windows systems.

Print Option in Java Console Help Requires Configured Printer

A Solaris system running Cluster Manager (Java Console) must have a printer configured if the printing option is to be used. If a printer is not configured to the system on which the Java Console runs, the Java Console may hang when the "Print" button is clicked in the online JavaHelp. This is a known problem related to components of JavaHelp.

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 4.0 Solaris Does Not Support Secured VCS 4.0 Clusters

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

IBM Home Page Reader Does Not Enable Service Group Priority and Startup Options

The Priority and Startup options are not enabled when a service group is configured using IBM Home Page Reader.
Workaround: If necessary, edit the Priority and AutoStartList attributes after adding the service group.

Stopping Systems in Clusters with I/O Fencing Configured

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

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

Reboot Command Bypasses Shutdown Scripts

Using the `reboot` command rather than the `shutdown` command bypasses shutdown scripts and can leave keys on the coordinator disks and data disks. Depending on the order of reboot and subsequent startup events, the cluster may warn of a possible split brain condition and fail to start up.
Workaround: Use the `shutdown -r` command on one node at a time and wait for each node to complete shutdown.

Simultaneous Shutdown of Multiple Nodes May Panic Nodes

If multiple nodes are shut down simultaneously, one or more nodes may panic under certain timing situations. This situation occurs when one node leaves, the remaining nodes elect a "racer" to fence off the departed node, and the designated racer also leaves. The remaining nodes panic with the following message: "Local cluster node ejected from cluster to prevent potential data corruption since RACER died in RACE."
Workaround: Stop VCS on all nodes with the `hastop -all` command and then shut down each node individually, rather than shutting down all nodes at the same time. If keys remain on the data disks, you may have problems importing storage in a CVM environment. Contact VERITAS technical support for a procedure to remove the keys.

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.

Upgrades from Pre-2.0 Versions of VCS Using installvcs Utility

The `installvcs` utility does not configure Cluster Manager (Web Console), SNMP, and SMTP during upgrades of VCS from versions before 2.0. To use these features, you must manually configure them in the `main.cf` file after upgrading. Refer to the *VCS 4.0 User's Guide* for information on manually creating a ClusterService service group in which to configure these resources.

NameRule Attribute is Deprecated in VCS 4.0

The resource type attribute, NameRule, has been removed from VCS 4.0. Previously, NameRule was used to generate a resource name when none was specified.

Change in Behavior: Specifying a resource name is mandatory. VCS reports an error if a resource name is not specified in the configuration. Now, if NameRule is defined in a `types.cf` file, it is recognized as a valid keyword but is not interpreted.

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/nodename` and `/etc/llthosts`. If the name listed in `/etc/nodename` 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.

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.

Link to VCS Traffic Director from the TDService Group in VCS

Navigation from the TDService Group Summary page in the VCS Web Console takes you to the System Overview page in VCS Traffic Director. There, you can select a domain from the list of configured VCS Traffic Director domains.

The installvcs Utility on Solaris 2.6 Requires Solaris Patch

If you are running `installvcs` on Solaris 2.6 you must have the latest Solaris operating system patch update installed. Obtain it from `http://www.sun.com/patches`.

MultiNicB Agent on Solaris 8 Requires Solaris Patch

If you are running MultiNicB Agent on Solaris 8 you must have Solaris patch update 2 10/00. Obtain it from `http://www.sun.com/patches`.

Using Agents in NIS

Programs using networked services (for example, NIS, NFS, RPC, or a TCP socket connection to a remote host) can hang if the host is disconnected from the network. If such a program is used as an agent entry point, a network disconnect can cause the entry point to hang and possibly timeout. For example, if the host is configured to use NIS maps as a client, basic commands such as `ps -ef` can hang if there is network disconnect. VERITAS recommends creating users locally and that /etc/nsswitch.conf reflect local users.

Networking Agents Do Not Support IPv6 Protocol

The VCS 4.0 bundled IP, NIC, IPMultiNICB, and MultiNICB agents do not support the IPv6 enhanced IP protocol made available in Solaris 8.

VCS Oracle Agent Uses pfile for Initialization

The VCS Enterprise Agent for Oracle obtains its initialization parameters from the pfile. If an Oracle instance is created from the spfile, VCS cannot monitor the instance. To obtain initialization parameters from the spfile, specify the path to the spfile in your pfile entry.

Volume Agent Clean May Forcibly Stop Volume Resources

When the attribute FaultOnMonitorTimeouts calls the Volume agent `clean` entry point after a monitor timeout, 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 4.0 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.

VCS Simulator Does Not Support I/O Fencing

When running the Simulator, be sure the UseFence attribute is set to the default, "None."

Custom Agents

Releases before VCS 1.1 included the libraries `libvcsprimitives.a` and `libvcscommon.a`. Agent developers had to link with the agent framework library (`libvcsagfw.so` or `libvcsagfw.a`) and `libvcsprimitives.a`. (The library `libvcscommon.a` was not required.) In the current release, the *only* VCS library required for custom agents is the agent framework library. The `VRTSvcs` package does *not* include `libvcsprimitives.a` and `libvcscommon.a`. Agent developers using C++ must change their makefiles to delete any references to these two libraries.

Custom agents must be developed using the SUNWspro 4.0, 4.2, or 5.0 C++ compilers. You must specify the `-compat` flag when compiling and linking with the 5.0 compiler. Other C++ compilers are not supported.

Systems in a Cluster Must Have Same System Locale Setting

VCS 4.0 does not support clustering of systems with different system locales. All systems in a cluster must be set to the same locale.

NFS Locking

NFS lock failover is not supported.

Service Group Dependency Limitations

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 if 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, thus resulting in a dependency violation.

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.

Concurrency Violation with Online Firm Dependencies

The concurrency violation trigger cannot offline a service group if the group has a parent online on the system with local firm dependency. The concurrency violation continues until the parent is manually taken offline.
Workaround: In this situation, VCS sends notification that the violation trigger failed to offline a service group that is in concurrency violation. The administrator can manually offline the parent group and then the child group.

Limitations for Solaris 2.6 and Solaris 7 Clusters

The VCS 4.0 Cluster Manager uses JRE 1.4.2, which is not supported on Solaris 2.6.

Cluster Manager (Java Console and Web Console)

Cluster Manager cannot run on a Solaris 2.6 system. Run the Java Console or Web Console remotely on a Windows system or on a system running Solaris 7 or later.

Configuration Wizards

Configuration wizards are not supported on Solaris 2.6 systems.

I/O Fencing Driver

The I/O fencing driver is not supported on Solaris 2.6 or Solaris 7.

Known Issues in VCS 4.0

The following issues have been reported for VCS version 4.0.

Cluster Manager Installation on Windows XP

When installing Cluster Manager on a Windows XP system, you may encounter the error: "The installer has insufficient privileges to access this directory: C:\Config.Msi."

Workaround: Select Retry rather than Cancel in the error dialog. The installer continues to install Cluster Manager correctly.

Global Service Groups

Cross-Cluster Switch May Cause Concurrency Violation

If you try to switch a global group across clusters while the group is in the process of switching across systems within the local cluster, then the group may go online on both the local and remote clusters. This issue affects only global groups. Local groups do not experience this behavior
Workaround: Ensure that the group is not switching locally before attempting to switch the group remotely.

Group Does Not Go Online on AutoStart Node

Upon cluster startup, if the last system on which the global group is probed is not part of the group's AutoStartList, then the group will not AutoStart in the cluster. This issue affects only global groups. Local groups do not experience this behavior
Workaround: Ensure that the last system to join the cluster is a system in the group's AutoStartList.

Declare Cluster Dialog May Not Display Highest Priority Cluster as Failover Target

When a global cluster fault occurs, the Declare Cluster dialog enables you to fail groups over to the local cluster. However, the local cluster may not be the cluster assigned highest priority in the cluster list.
Workaround: To bring a global group online on a remote cluster, do one of the following:

- From the Java Console, right-click the global group in the Cluster Explorer tree or Service Group View, and use the Remote Online operation to bring the group online on a remote cluster.
- From the Web Console, use the Operations links available on the Service Groups page to bring the global group online on a remote cluster.

Cluster Manager (Web Console)

Cluster Manager or myVCS May Generate Null Pointer Error

You cannot log in to the Web Console or configure myVCS if CmdServer is not running on the systems in the cluster. The message "Error 500. NullPointerException" appears in the browser.
Workaround: Verify that the CmdServer process is running on the cluster systems using the `ps -ef | grep CmdServer` command. If CmdServer is not running, start it by typing `/opt/VRTSvcs/bin/CmdServer` at the command line. Once CmdServer is running, you can log in to Cluster Manager or configure myVCS.

Netscape Browser May Not Display Attribute ScreenTips Completely

The Netscape browser may not display the entire ScreenTip for an attribute in the VCS Web Console.
Workaround: If the ScreenTip for an attribute is not completely visible, open the attribute dialog box to view the full description.

The myVCS Page May Not Display Correctly After Initial Configuration

The Netscape browser may not display the entire ScreenTip for an attribute in the VCS Web Console.
Workaround: If the myVCS page or any Cluster Manager page does not display correctly, refresh the page.

Volume Agent May Hang

Under extreme conditions, the volume agent may hang. This behavior has been observed under the following circumstances:

- Failover was set to 0 for the JNI Fibre Channel driver (JNIfcaPCI). Note this is *not* failover for VCS. There is a variable for the JNI driver called "failover," which defines the number of seconds after the target is declared offline, and before it is declared failed and all pending commands are flushed back to the application. This value is set in the file `/kernel/drv/fca-pci.conf`. Setting failover to 0 means that the target is never declared failed.
- Fibre cable was disconnected from the switch (to simulate failure of the Fibre drives).

Note When failover for JNI driver was set to 30 seconds, VCS agent behavior was normal.

In general, an agent can hang when it attempts to cancel a service thread executing a C++ entry point that has timed out if that entry point has issued a blocking call that is not a valid cancellation point.

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.

Erroneous Message in Engine Log File

When VCS tries to mount a `vxfs` file system for the first time, you may receive a misleading message resembling the following:

```
/dev/vx/dsk/sharedg/vol03 is not a vxfs file system
```

Before VCS can mount a `vxfs` file system for the first time, the `fsck` utility needs to run. The message shown above is displayed, `fsck` is run, and the file system is mounted.

Engine May Hang in LEAVING State

When the command `hares -online` is issued for a parent resource when a child resource faults, and the `hares -online` command is followed by the command `hastop -local` on the same node, then the engine transitions to the LEAVING state and hangs.

Workaround: Issue the command `hastop -local -force`.

HAD May Crash on Reboot of Nodes

Rebooting a node or issuing `hastop -local` with the `-noautodisable` flag may cause HAD to crash on all nodes in the cluster. The VCS shutdown script invokes `hastop` with the `-noautodisable` flag and can cause HAD to crash by incorrectly setting the ToQ attribute. Until HAD restarts and probes all resources, the cluster is not highly available. You should manually online service groups that do not restart after HAD restarts.

VCS in Japanese Locales

The following issues apply to VCS 4.0 in a Japanese locale.

Installer Does Not Create User Account and Password

The product installer does not ask for a VCS user account and password in a Japanese locale. Only the English installer provides this function.
Workaround: Use the `hauser` command to create VCS user accounts after installation is complete.

Web Server Configuration Page Offers Two Locale Options

The VCS Java Console uses a Web server component called VRTSweb. The configuration page for the Web server offers two Japanese locale options. Both options have UTF-8 encoding, and there are no functional difference between the two.
Workaround: Select either Japanese locale when configuring the Web server component.

Error Handling by VCS Enterprise Agent for Oracle

The VCS Enterprise Agent for Oracle provides enhanced handling of Oracle errors encountered during detailed monitoring. The agent uses the reference file `oraerror.dat`, which consists of a list of Oracle errors and the actions to be taken. Refer to the *VERITAS Cluster Server Enterprise Agent 4.0 for Oracle Installation and Configuration Guide* for a description of the actions.

Currently, the reference file specifies that the NOFAILOVER action is taken when the following Oracle errors are encountered:

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

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

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