

Veritas™ Cluster Server Release Notes

AIX

5.0



Veritas Cluster Server Release Notes

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Veritas Cluster Server 5.0

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Veritas Cluster Server is a licensed product. See the *Veritas Cluster Server Installation Guide* for license installation instructions.

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Introduction

This document provides important information regarding Veritas Cluster Server (VCS) version 5.0 for AIX. Please review this entire document before installing VCS.

For the latest information on updates, patches, and software issues regarding this release, see the following TechNote on the Veritas Technical Support website:

<http://support.veritas.com/docs/282024>

New features

We offer the following new features in this release of Veritas Cluster Server. See *Veritas Cluster Server User's Guide* for details.

Cluster Management Console

The new Cluster Management Console replaces Cluster Manager (Web Console) and CommandCentral Availability.

Cluster Management Console enables administration and analysis for VCS clusters in your enterprise from a single console. You can install Cluster Management Console on a standalone system to manage multiple clusters or you can install the console on cluster nodes to manage a local cluster. When installed to manage a local cluster, the console is configured as part of the ClusterService group and the AppName attribute is set to `cmc`.

Cluster Monitor is now called Cluster Connector

CommandCentral Availability installed a component called Cluster Monitor on cluster nodes. The updated component is called Cluster Connector.

VCS privileges for operating system user groups

VCS 5.0 lets you assign VCS privileges to native users at an operating system (OS) user group level in secure clusters.

Assigning a VCS role to a user group assigns the same VCS privileges to all members of the user group, unless you specifically exclude individual users from those privileges.

See the *Veritas Cluster Server User's Guide* for more information.

Five levels of service group dependencies

VCS now supports configuring up to five levels of service group dependencies. The exception is the online local hard dependency, for which only two levels are supported.

New RemoteGroup agent to monitor service groups in remote clusters

The new RemoteGroup agent monitors and manages service groups in a remote cluster. See the *Veritas Cluster Server Bundled Agents Reference Guide* for more information about the agent.

Enhancements to the hastop command

You can customize the behavior of the hastop command by configuring the new EngineShutdown attribute for the cluster.

EngineShutdown Value	Description
Enable	Process all hastop commands. This is the default behavior.
Disable	Reject all hastop commands.
DisableClusStop	Do not process the hastop -all command; process all other hastop commands.
PromptClusStop	Prompt for user confirmation before running the hastop -all command; process all other hastop commands.
PromptLocal	Prompt for user confirmation before running the hastop -local command; reject all other hastop commands.
PromptAlways	Prompt for user confirmation before running any hastop command.

Simulator supports deleting simulated clusters

VCS Simulator now supports deleting simulated clusters.

Symantec recommends using the same tool (command line or Java Console) to create and delete a cluster. For example, if you created the cluster from the Java Console, delete the cluster from the Java Console.

Fencing updates: DMP support

Dynamic multi-pathing (DMP) allows coordinator disks to take advantage of the path failover and the dynamic adding and removal capabilities of DMP. You can configure coordinator disks to use Veritas Volume Manager DMP feature.

You can set the coordinator disks to use either raw or DMP as the hardware path to a drive. See the *Veritas Cluster Server Installation Guide* for more information.

Minimal downtime upgrade

See the *Veritas Cluster Server Installation Guide* for a strategy on upgrading to VCS 5.0 while ensuring a minimal downtime for your applications.

Backup of VCS configuration files

VCS backs up all configuration files (<config>.cf) including main.cf and types.cf to <config>.cf.autobackup. The configuration is backed up only if the BackupInterval is set and the configuration is writable.

When you save a configuration, VCS saves the running configuration to the actual configuration file (i.e. <config>.cf) and removes all autobackup files. This does away with the VCS behavior of creating .stale files

If you do not configure the BackupInterval attribute, VCS does not save the running configuration automatically.

See the *Veritas Cluster Server User's Guide* for more information.

Support for security services

VCS 5.0 uses the Symantec Product Authentication Service to provide secure communication between cluster nodes and clients, including the Java and the Web consoles. VCS uses digital certificates for authentication and uses SSL to encrypt communication over the public network.

HAD diagnostics

When the VCS engine HAD dumps core, 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`.

Separate logger thread for HAD

The VCS engine, HAD, runs as a high-priority process to send heartbeats to kernel components and to respond quickly to failures. In VCS 5.0, HAD runs logging activities in a separate thread to reduce the performance impact on the engine due to logging.

Enhanced NFS lock failover

The new NFSRestart agent provides high availability to NFS locks. Use the agent in conjunction with the NFS agent. See the *Veritas Cluster Server Bundled Agents Reference Guide* for more information.

Support for VLAN interfaces

The NIC, MultiNIC, MultiNICA, and MultiNICB agents now support VLAN interfaces. The agents do not configure the NICs, but can monitor them.

See the OS vendor's documentation on how to configure VLAN on your host, and ensure that the switch or router connected to such an interface is compatible with your configuration. Both server-side and switch-side VLAN configurations are supported.

Virtual fire drill

VCS supports a virtual fire drill capability that lets you test whether a resource can fail over to another node in the cluster. Virtual fire drills detect discrepancies between the VCS configuration and the underlying infrastructure on a node; discrepancies that might prevent a service group from going online on a specific node. See the *Veritas Cluster Server User's Guide* for more information on running virtual fire drills.

New term: Daemon Down Node Alive (DDNA)

Daemon Down Node Alive (DDNA) is a condition in which the VCS high availability daemon (HAD) on a node fails, but the node is running. When HAD fails, the hashadow process tries to bring HAD up again. If the hashadow process succeeds in bringing HAD up, the system leaves the DDNA membership and joins the regular membership. See the *Veritas Cluster Server User's Guide* for more information.

Change in behavior: Use comma or semicolon as delimiter

VCS 5.0 does not support using spaces as delimiters to separate vector, association, or keylist values. You must use a comma or a semicolon as a delimiter.

Change in behavior: New format for engine version

The new `EngineVersion` attribute replaces the `MajorVersion` and `MinorVersion` attributes. VCS stores version information in the following format:

```
<major>.<minor>.<maintenance_patch_num>.<point_patch_num>
```

Change in behavior for the resfault trigger

VCS now provides finer control over the resfault trigger. The resfault trigger is now invoked if the `TriggerResFault` attribute is set to 1.

Change in behavior: New location for enterprise agents

VCS enterprise agents are now installed in the `/opt/VRTSagents/ha/bin` directory.

The `<agent>Types.cf` files are now located at `/etc/VRTSagents/ha/conf/<agent>`.

Change in behavior: New location of message catalogs and attribute pools

VCS stores binary message catalogs (BMCs) at the following location:

```
/opt/VRTS/messages/language/module_name
```

The variable *language* represents a two-letter abbreviation.

The attribute pools also move from `/var` to `/opt`.

Change in behavior: New option for the hastart and had commands

Use the `-v` option to retrieve concise information about the VCS version. Use the `-version` option to get verbose information.

Changes to bundled agents

VCS introduces the following new agents:

- NFSRestart—Provides high availability for NFS record locks.
- RemoteGroup—Monitors and manages a service group on another system.
- Apache (now bundled on all platforms)—Provides high availability to an Apache Web server.

See “[No longer supported](#)” on page 22.

Changes to licensing for VCS

VCS now follows the licensing scheme described below:

License	What's included
VCS	<ul style="list-style-type: none">■ VCS■ Cluster Management Console■ Database agents■ Application agents■ Virtual fire drill support
VCS HA/DR	<ul style="list-style-type: none">■ VCS■ Cluster Management Console■ Database agents■ Application agents■ Replication agents■ Global clustering■ Fire Drill support

Note: Database agents are included on the VCS 5.0 disc. The replication and application agents are available via the Veritas Cluster Agent Pack.

New attributes

VCS 5.0 introduces the following new attributes. See the *Veritas Cluster Server User's Guide* for more information.

Resource type attributes

- **AgentFile**—Complete name and path of the binary for an agent. Use when the agent binaries are not installed at their default locations.
- **AgentDirectory**—Complete path of the directory in which the agent binary and scripts are located. Use when the agent binaries are not installed at their default locations.

Cluster attributes

- **EngineShutDown**—Provides finer control over the `hastop` command.
- **BackupInterval**—Time period in minutes after which VCS backs up configuration files.
- **OperatorGroups**—List of operating system user account groups that have Operator privileges on the cluster.
- **AdministratorGroups**—List of operating system user account groups that have administrative privileges on the cluster.
- **Guests**—List of users that have Guest privileges on the cluster.

System attributes

- **EngineVersion**—Specifies the major, minor, maintenance-patch, and point-patch version of VCS.

Service group attributes

- **TriggerResFault**—Defines whether VCS invokes the resfault trigger when a resource faults.
- **AdministratorGroups**—List of operating system user account groups that have administrative privileges on the service group.
- **OperatorGroups**—List of operating system user account groups that have Operator privileges on the service group.
- **Guests**—List of users that have Guest privileges on the service group.

Removed attributes

- **DiskHbStatus**—Deprecated. This release does not support disk heartbeats. Symantec recommends using I/O fencing.
- **MajorVersion**—The **EngineVersion** attribute provides information about the VCS version.
- **MinorVersion**—The **EngineVersion** attribute provides information about the VCS version.

Updates to the DB2 agent

The Veritas High Availability Agent for DB2 introduces the following changes:

- The attributes **StartUpOpt** and **ShutDownOpt** provide new start up and shut down options. Using the **StartUpOpt** attribute, you can start the instance or partition, activate database commands after processes start, or create customized start up sequences. Using the **ShutDownOpt** attribute, you can perform a normal stop or customize your shut down sequence.
- In previous releases when you enabled in-depth monitoring (**IndepthMonitor=1**), it executed a default SQL query. The in-depth monitor now allows you to classify actions for DB2 errors according to their severity. You can associate predefined actions with each error code with a monitoring script that you can customize. You can find a sample of in-depth monitoring script in the following directory:
`/etc/VRTSagents/ha/conf/Db2udb/sample_db2udb`.
You must install the custom script in the `/opt/VRTSagents/ha/bin/Db2udb` directory to enable indepth monitoring.
- You can enable the **AgentDebug** attribute to get more debugging information from the agent and the database.

Updates to the Sybase agent

The Veritas High Availability Agent for Sybase agent supports Sybase 12.5.x and 15 on AIX, HP-UX, Linux, and Solaris.

The agent supports encrypted passwords.

Updates to the Oracle agent

- New monitoring option—The basic monitoring option of the Oracle agent now allows health check monitoring in addition to the process check monitoring. You can choose the health check monitoring option for Oracle 10g and later.
- Support for virtual fire drills—VCS requires you to keep the configurations in sync with the underlying infrastructure on a cluster node. Virtual fire drills detect such discrepancies that prevent a service group from going online on a specific system. Refer to the *Veritas Cluster Server User's Guide* for more information.
The agent uses the Action entry point to support the virtual fire drill functionality.

Veritas agents

Bundled agents

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

Apache	Application	DiskGroup
DNS	ElifNone	FileNone
FileOnOff	FileOnOnly	IP
IPMultiNIC	IPMultiNICB	LVMVG
Mount	MultiNICA	MultiNICB
NFS	NFSRestart	NIC
NotifierMngr	Phantom	Process
ProcessOnOnly	Proxy	RemoteGroup
Share	Volume	VRTSWebApp

Enterprise agents

Enterprise agents monitor enterprise applications. In addition to the agents provided in this release, other agents are available through an independent Symantec offering called the Veritas Cluster Server Agent Pack. The agent pack includes the currently shipping agents and is re-released regularly to add new agents that are now under development. Contact your Symantec sales representative for information about agents included in the agent pack, agents under development, and agents available through Symantec consulting services.

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

Veritas agents support a specified application version on AIX if the application vendor supports that version on AIX.

Agent	Agent version	VCS version			Application	OS	
		3.5	4.0	5.0		5.2	5.3
DB2	5.0	p	p	s	DB2 Enterprise Server Edition	8.1, 8.2, 9.1	s s
Oracle	5.0	p	p	s	Oracle	9i, 10g R1, 10g R2	s s
Sybase	5.0	p	p	s	Sybase Adaptive Server	12.5.x, 15	s s

s – supported configuration

p – supported by previous version of the agent

Custom agents

Custom agents developed in C++ must be compiled using the IBM C for AIX Compiler Version 5.0. Use the `-brtl` flag for runtime linking with the framework library.

System requirements

System requirements for VCS are as follows.

Supported hardware

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

<http://support.veritas.com/docs/283161>

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

Supported software for VCS cluster nodes

Product installation scripts verify the required update levels. The installation process terminates if the target systems do not meet the maintenance level requirements.

- AIX 5.2 ML6 (legacy) or later
- AIX 5.3 TL4 with SP4
SP 4 was not available at the time of this release. Veritas 5.0 products also operate on AIX 5.3 with Service Pack 3, but you must install an AIX interim fix. See the following TechNote for information on downloads, service pack availability, and other important issues related to this release.
<http://support.veritas.com/docs/282024>
- Logical Volume Manager (LVM)
- Journaled File System (JFS) and Enhanced Journaled File System (JFS2)
- Veritas Volume Manager (VxVM) 4.0, 5.0
- Veritas File System (VxFS) 4.0 5.0

Required patches

The following patches are required for this release of Veritas Cluster Server.

- If you are running the MultiNICB agent on AIX 5.3, you must have the following APAR:
AIX 5.3–IY65664
The APAR is available on the IBM Web site. Search by APAR number IY65664 for the specific fix for AIX 5.3.

Supported software for Cluster Management Console

You can install Cluster Management Console on a standalone system to manage multiple clusters or you can install the console on cluster nodes to manage a local cluster.

When you set up a management server to manage multiple clusters, you can connect to the clusters directly or install the cluster connector on cluster nodes to enable connection across firewalls.

Install Mode

Multi-cluster mode. To manage multiple clusters. Installed on a standalone system designated the *management server*.

Single cluster mode. To manage a single cluster. Installed on cluster nodes.

Supported software

- Solaris 8, 9, and 10, with patches indicated by Sun.
- Windows 2000 Server, Advanced Server, and Datacenter, with SP4 or patches as indicated by Microsoft.
- Windows Server 2003 Standard Edition, Datacenter Edition, Enterprise Edition, and Web Edition, with patches as indicated by Microsoft.

Note: Windows Management Instrumentation (WMI) must be installed on Windows 2003 systems prior to installing Cluster Management Console.

You can install Cluster Management Console in this mode only with VCS 5.0 in a fresh install or upgrade scenario. See “[Supported software for VCS cluster nodes](#)” on page 18.

Install Mode

Cluster Connector.

Installed on cluster nodes to enable a management server to manage a cluster across a firewall

Supported software

AIX

- VCS versions: 4.0, 4.0 MP1, 4.0 MP2, 4.0 MP3, and 5.0
- OS versions: AIX 5.2 ML6 (legacy) or later; AIX 5.3 TL4 with SP 3

Note: Cluster connector installs are not supported on clusters running on AIX 5.1 systems. Use direct connection to manage clusters running on AIX 5.1 systems.

HP-UX

- VCS versions: 4.1 and 5.0
- OS versions: HP-UX 11i v2

Linux

- VCS versions: 4.0, 4.0 MP1, 4.0 MP2, 4.1, 4.1 MP1, 4.1 MP2, and 5.0
- OS versions: RHEL 4 Update 3, SLES 9.

Note: Cluster connector installs are not supported on clusters running on RHEL 3.0 systems. Use direct connection to manage clusters running on RHEL 3.0 systems.

Solaris

- VCS versions: 4.0, 4.0 MP1, 4.0 MP2, 4.1, 4.1 MP1, and 5.0
- OS versions: Solaris 8, 9, and 10

Note: Cluster connector installs are not supported on clusters running on Solaris 7 systems. Use direct connection to manage clusters running on Solaris 7 systems.

Windows

- VCS versions: 4.1, 4.2, 4.2 RP1, 4.2 RP2, 4.3, 4.3 MP1
- OS versions: Windows 2000 Server, Advanced Server, and Datacenter, with SP4 or patches as indicated by Microsoft. Windows Server 2003* Standard Edition, Datacenter Edition, Enterprise Edition, and Web Edition, with patches as indicated by Microsoft

* Windows Management Instrumentation (WMI) must be installed on Windows 2003 systems prior to installing Cluster Management Console.

Supported browsers

Veritas Cluster Management Console is supported on the following browsers:

- Microsoft Internet Explorer 6.0 with SP2 or newer
- Firefox 1.5 or newer

Veritas Cluster Management requires the Macromedia Flash Plugin v8.0.

Requirements for accessing Cluster Manager (Java Console)

Cluster Manager (Java Console)

The VCS Java Console requires a minimum of 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 for Windows clients are Pentium II, 300MHz, 256MB RAM, and 800x600 display resolution. (Symantec recommends a minimum of Pentium III, 400MHz, and 512MB RAM.) 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.

Cluster Manager requires AIX developer kit for Java (AIX)

Cluster Manager (Web Console and Java Console) requires the IBM AIX Developer Kit, Java 2 Technology Edition, Version 1.3.0.

No longer supported

Support is no longer provided for:

- ServiceGroupHB agent. This release does not support disk heartbeats. Symantec recommends using I/O fencing.
- Disk heartbeats (GABDisk). This release does not support disk heartbeats. Symantec recommends using I/O fencing.
- The updated Oracle agent does not support Oracle 8.0.x and Oracle 8.1.x.
- The updated DB2 Agent does not support DB2 7.2

Installation notes

Refer to the *Veritas Cluster Server Installation Guide* for instructions on how to install VCS 5.0 and how to upgrade to VCS 5.0 from earlier versions of VCS. The Installation Guide is in the cluster_server/docs directory of the software disc.

The following information includes guidelines, tips, and other considerations for installing the product.

Change default password after installing VCS

When you install and configure VCS, if you do not choose the secure mode, the `installvcs` program creates a user *admin* with the password *password*. The user has administrative privileges to the cluster

Symantec recommends you change the password of the user after installing and configuring VCS.

If you used the AllowNativeCliUsers attribute

If you used the AllowNativeCliUsers attribute, see the *Veritas Cluster Server Installation Guide* for information on how to use the `halogin` utility after upgrading to VCS 5.0.

Fixed issues

Concurrency violation with online firm dependencies

The concurrency violation trigger could not offline a service group if the group had a parent online on the system with local firm dependency. The concurrency violation continued until the parent was manually taken offline.

Web server configuration page offers two locale options

The configuration page for the Symantec Web server (VRTSWeb) offered two Japanese locale options. Both options had UTF-8 encoding, and there were no functional difference between the two.

Oracle agent uses pfile for initialization

The agent for Oracle obtained its initialization parameters from the pfile. VCS could not monitor Oracle instances created from the spfile.

Cluster Manager installation on Windows XP

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

Other fixed issues

The following issues were fixed in this release.

- 246238 Information required when had is restarted either by hashadow or gab.
- 247698 Need to move logging activities out of single-threaded HAD.
- 248069 Commands do not close socket after successful termination.
- 620378 Complex group dependencies and timing issues leads to different failovers.
- 252347 Behavior of parent group is incorrect when groups are linked with online global firm and child group faults.
- 308607 The Monitor process for the MultiNICB agent sometimes returns status 111 (HAPING_TIMED_OUT).
- 515644 hacf does not handle MAXARG values of vector/associative attributes in the main.cf.
- 584243 hares options do not filter correctly.
- 254947 GAB and LLT device files have open permissions.
- 426932 Indeterministic service thread cancellation.
- 520034 Issues supporting multiple instances of MultiNICA agent.
- 418971 Cannot configure multiple Sybase servers with VCS.
- 271167 Provide finer control over the hastop -all command.
- 297779 Support multiple MultiNICB instances.
- 393849 Performance issues with the Mount agent.

Known issues

The following issues are open for VCS version 5.0.

Security configuration may not work if you use encrypted files

If you choose to configure security using the encrypted file during VCS installation, Authentication Service may not be configured successfully.

Workaround: To configure the cluster in secure mode using the encrypted files option, do the following:

- 1 Configure the cluster.
- 2 Enable security using `installvcs -security option`

See the *Veritas Cluster User's Guide* for more information.

Saving large configuration results in very large file size for main.cf (616818)

If your service groups have a large number resources or resource dependencies, and if the PrintTree attribute is set to 1, saving the configuration may cause cause the configuration file to become excessively large in size and may impact performance.

Workaround: Disable printing of resource trees in regenerated configuration files by setting the PrintTree attribute to 0.

Root broker name cannot use fully qualified domain name (617616)

When configuring security, VCS does not support specifying the fully qualified domain name (FQDN) for the root broker. You must ensure that the root broker can be looked up by its unqualified domain name. Make sure that your name resolution mechanism can resolve the host names of the Root Broker and all cluster nodes in either local (mysys) or fully-qualified (mysys.example.com) form.

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.

Trigger not invoked in REMOTE_BUILD state

In some situations, VCS does not invoke the injeopardy trigger if the system is a REMOTE_BUILD state. VCS fires the trigger when the system goes to the RUNNING state.

Node cannot join cluster because port v is not ready for configuration

This behavior is observed when a node leaves a cluster and another node tries to join the cluster at the same time. If the GAB thread is stuck in another process, the new node cannot join the cluster and GAB logs the following warning:

```
GAB WARNING V-15-1-20126 Port v not ready for reconfiguration, will
retry.
```

The haclus -wait command hangs when cluster name is not specified (612587)

If you do not specify the cluster name when running the `haclus -wait` command, the `haclus -wait` command may hang.

Using the coordinator attribute

This release contains an attribute for disk groups called coordinator, which configures disks as coordinator disks by the I/O fencing driver. Setting the attribute prevents the coordinator disks from being reassigned to other disk groups. See the Veritas Volume Manager documentation for additional information about the coordinator attribute.

The attribute requires that the disk group contain an odd number of disks. Symantec recommends that you use only three coordinator disks. Using more (five or seven) disks may result in different subclusters.

HAD cannot join clusters if ulimit is low

The default ulimit may restrict the amount of memory that can be allocated by a process. Run the following command to verify this limit:

```
# ulimit -a  
data seg size (kbytes -d) 131072
```

In case of very large main.cf configurations (example 10,000 lines) or multi-node large clusters, or a combination of these, the VCS engine HAD fails to join clusters. This could be a result of HAD not being able to allocate enough memory to facilitate transfer of main.cf across cluster nodes.

Workaround: Increase the data seg size to an appropriate value by running the `ulimit -d <value>` command.

Some alert messages do not display correctly (612268)

The following alert messages do not display correctly:

- 51030 Unable to find a suitable remote failover target for global group %s. administrative action is require
- 51031 Unable to automatically fail over global group %s remotely because local cluster does not have Authority for the group.
- 50913 Unable to automatically fail over global group %s remotely because clusters are disconnected and ClusterFailOverPolicy is set to %s. Administrative action is required.
- 50914 Global group %s is unable to failover within cluster %s and ClusterFailOverPolicy is set to %s. Administrative action is required.
- 50916 Unable to automatically failover global group %s remotely due to inability to communicate with remote clusters. Please check WAN connection and state of wide area connector.
- 50761 Unable to automatically fail over global group %s remotely because ClusterList values for the group differ between the clusters. Administrative action is required.
- 50836 Remote cluster %s has faulted. Administrative action is required.
- 51032 Parallel global group %s faulted on system %s and is unable to failover within cluster %s. However, group is still online/partial on one or more systems in the cluster
- 51033 Global group %s is unable to failover within cluster %s and AutoFailOver is %s. Administrative action is required.

Issues related to the VCS engine

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`.

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.

Issues related to fencing

Preexisting split brain after rebooting nodes (609407)

The fencing driver in 5.0 uses Veritas DMP to handle SCSI commands to the disk driver if fencing is configured in "dmp" mode. This allows fencing to use Veritas DMP for access to the coordinator disks. With certain disk arrays, when paths are failed over due to a path failure, the SCSI-3 persistent reservation keys for the previously active paths are not removed. If the nodes in a cluster are all rebooted at the same time, then the cluster will not start due to a "Preexisting split brain" message.

Workaround: Use the `vxfenclearpre` script to remove the keys from the coordinator disks as well as from the data disks.

Stopping vxfen when the fencing module is being configured

Trying to stop the vxfen driver when the fencing module is being configured results in the following error.

```
VCS FEN vxfenconfig ERROR V-11-2-1013 Unable to unconfigure vxfen
VCS FEN vxfenconfig ERROR V-11-2-1022 Active cluster is currently
fencing.
```

Workaround: This message may be safely ignored.

Fencing configuration fails if fencing module is running on another node

The `vxfenconfig -c` command fails if any of the following commands are running on other nodes in the cluster:

```
vxfenconfig -U  
vxfenconfig -c
```

Some vxfenadm options do not work with DMP paths

Some options of the `vxfenadm` utility do not work well with DMP paths such as `/dev/vx/rdmp/sdt3`.

Workaround: Use the `-a` option to register keys instead of `-m` option for DMP paths.

Issues related to global service groups

Switch across clusters 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.

Global service group does not go online on AutoStart node

At cluster startup, if the last system where the global group is probed is not part of the group's `AutoStartList`, then the group does not AutoStart in the cluster. This issue affects only global groups. Local groups do not display 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.

Issues related to VCS bundled agents

NIC agent does not detect failure when you pull network cable (565151)

A link test using the `haping -l` command may not report the correct status of the NIC. The ethernet driver relies on the software state to detect the status of the NIC. The driver does not use the hardware state to detect NIC status.

If you set the `LinkTestRatio` to a value other than 1, the agent relies on the OS driver for the status of the interface, so if the cable is pulled the agent does not detect a failure.

Workaround: Make sure the `LinkTestRatio` attribute is set to 1.

RemoteGroup agent cannot authenticate on a remote host (616964)

In a secure environment, the `RemoteGroup` agent cannot authenticate on a remote host for the first time.

Workaround: Authenticate the remote host manually.

- 1 Remove the certificates from the node.
- 2 Restart VCS on all nodes.
- 3 Verify the state of the `RemoteGroup` resource.
The resource goes to the `UNKNOWN` state
- 4 Manually authenticate the remote machine.

```
vssat authenticate --domain domaintype:domainname \  
--prplname principal --password password \  
--broker brokerdomain:port
```
- 5 After the authentication succeeds, probe the `RemoteGroup` resource.

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.

Notifier agent becomes unstable if multiple entries are used for Smtprcipients (617965)

If you set multiple recipients using the Smtprcipients, the Notifier agent may become unstable.

Taking a group with the Mount resource offline can take several minutes if the file system is busy

When a file system has heavy I/O, the umount command can take several minutes to respond. However, the umount command deletes the mount point from mount command output before returning. Per IBM, this is the expected and supported behaviour on AIX. The umount command's processing later puts the mount point back if the mount point is found busy. Meanwhile, the default OfflineTimeout value of the Mount agent can get exceeded, which in turn invokes the Clean agent function. The Clean function can find the mount point's entry absent from the mount command output and exit with success.

The unmounting, however, may not have happened yet. If unmounting did not occur, offlining resources below the Mount resource (for example the LVMVG or DiskGroup resources) can fail.

The Mount resource's Offline agent function then proceeds to unmount the mount point. After several attempts, the Clean scripts that clean the resources below the Mount resource succeed and the group goes offline.

See the *Veritas Cluster Server User's Guide* for more information about the OfflineTimeout attribute.

LVMVG agent with big and scalable volume groups

For big and scalable volume groups, the LVMVG agent does not properly synchronize the ODM.

Workaround: Set the attribute `SyncODM = 0` and manually synchronize the ODM when adding a volume group.

Manually reattach the MultiNICB agent interfaces after failover

In order to prevent the OS from attempting to send packets through a broken interface (cable unplugged), VCS detaches the interface when it detects that the interface is down. However when the interface is brought up (cable plugged in) again, you need to re-attach the interface to enable VCS to monitor it.

To attach the interface, type:

```
# chdev -l <interface> -a state='up'
```

For example, if the fixed interface is en4, enter:

```
# chdev -l en4 -a state='up'
```

This release does not address the failure of standby interfaces—the standby interfaces are the ones where the virtual IP is not configured. If a standby interface fails, the current agent does not detach it. Hence, if there are two interfaces within the MultiNICB resource, this can result in a 50% packet loss when the virtual IP address is pinged from within the subnet. No packet loss occurs if the virtual IP address is pinged from outside the subnet.

Workaround: Manually detach the broken interface and reattach it after it is fixed.

The command to detach an interface is:

```
#chdev -l <interface> -a state='detach'
```

NFS cannot handle minor number greater than 255 (143897)

NFS cannot handle minor numbers greater than 255.

Workaround: Ensure that minor number of the VxVM diskgroup is not greater than 255.

Issues related to the DB2 agent

All partitions fault even if there are errors on only one partition with the IndepthMonitor database (568887)

This issue occurs in an MPP environment when multiple partitions use the same database. If the Databasename is changed to an incorrect value, all partitions using the database fault.

Missing section in template file for DB2 UDB MPP (608926)

The template file for the DB2 agent does not contain the complete information for building a DB2 MPP configuration. The template does not include a service group required in the configuration.

Db2udb resource faults when IndepthMonitor is configured with a Japanese database (590010)

For locales other than English, you need to add the following lines to the \$INSTHOME/sql/lib/userprofile file.

The following example adds Japanese support for AIX:

```
export LANG=Ja_JP
```

Issues related to the Oracle agent

NOFAILOVER action specified for certain Oracle errors

The Veritas High Availability 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 High Availability Agent for Oracle Installation and Configuration Guide* for a description of the actions.

Currently, the reference file specifies the NOFAILOVER action 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 you restart the agent.

Health check may not work (589934)

If you set `MonitorOption` to 1, health check monitoring may not function when the following message is displayed:

Warning message - Output after executing Oracle Health Check is:
GIM-00105: Shared memory region is corrupted.

Workaround: Set `MonitorOption` to 0 to continue monitoring the resource.

Issues related to Cluster Manager (Java Console)

The template for the NFS service has an incorrect definition for the NIC resource (616652)

The template for the NFS service group specifies the `NetworkType` as `""`. The correct value for the attribute should be `ether`.

Exception when selecting preferences (585532)

On Windows systems, selecting the Java (Metal) look and feel of the Java Console may cause a Java exception.

Workaround: After customizing the look and feel, close restart the Java Console.

Java Console errors in a localized environment (585532)

When connected to cluster systems using locales other than English, the Java Console does not allow importing resource types or loading templates from localized directories.

Workaround: The workaround is to copy the types files or templates to directories with english names and then perform the operation.

Printing to file from the VCS Java Console throws exception

VCS Java Console and Help throw 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.

Workaround: Before printing, make sure at least one printer is configured on the system where the VCS Java Console is launched.

Common system names in a global cluster setup

If both local and remote systems have a common system name in a global cluster setup, group operations cannot be performed on those systems using the Java console.

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

Issues related to VCS Simulator

Importing resource types fails on Simulator on Windows systems (616580)

When you try to import a resource type, the following error is displayed:
This application has failed to start because MFC70U.DLL was not found. Re-installing the application may fix this problem.

Workaround: Do not use the file browser to select the .cf file. Enter the fully qualified path of the file in the File Name field.

Simulator does not stop in some situations (598476)

If you have a service group with the name ClusterService online on the last running node on the cluster, then the `hasim -stop` command appears to hang.

Workaround: Take the ClusterService group offline before running the `hasim -stop` command.

Issues related to Cluster Management Console

Default SMTP and SNMP addresses in notification policies for Cluster Management Console

When you configure notification settings, the Edit SMTP Settings task asks you to provide default email or default SNMP console addresses. The policy configuration wizard uses these addresses only to populate the recipient lists during policy configuration. The wizard does not automatically configure policies with these addresses.

When you launch the Notification Policy Configuration wizard, the default email address you specified appears in the Notification Recipients dialog box.

If you add email addresses to this list, the wizard adds them to the policy along with the default address. However, if you delete all the addresses from the Email Recipients list, including the default email address, the wizard configures no email addresses in the policy.

Leave default email addresses in the recipients list to configure them into the policy.

The same behavior applies to specifying default SNMP addresses.

Cluster Management Console controls not immediately active (603415)

In some versions of Internet Explorer, you may need to click GUI controls (buttons, drop-down menus, radio buttons, and so on) once before the control becomes active. Controls that require this activating click show the following message when you roll over them with your mouse pointer:

Press SpaceBar or Click to activate this Control

Login screen may not display after inactivity timeout

If your Cluster Management Console is inactive and the session times out, your next action in the console should return you to the login screen. However, if your next action is to request a sort or a new page, the console will not sort the data or load the page.

Workaround: Use the browser refresh feature and the login screen will display.

Very large clusters may not load into Cluster Management Console (493844)

Very large clusters may not load into Cluster Management Console.

Workaround: To accommodate very large clusters, increase the value of the loadClusterQueryTimeout property in the management server configuration

file, `/opt/VRTScmc/conf/ManagementServer.conf`. The management server generates this file upon startup.

- 1 Stop the Cluster Management Server web console:

```
/opt/VRTSweb/bin/stopApp cmc
```

- 2 Add the following line to the file `/opt/VRTScmc/conf/ManagementServer.conf`:

```
loadClusterQueryTimeout=60000
```

Adjust the value as needed to allow complete initial load of your cluster information.

- 3 Start the Cluster Management Server web console:

```
/opt/VRTSweb/bin/startApp cmc ../VERITAS
```

Web Console does not display icons properly (595305)

In Internet Explorer, some HTML pages in the Web Console may not display icons properly when connected to a remote Web server.

Workaround: Right click the missing icon symbol and select Show Picture from the drop down menu.

Log entries in the Management Server:Logs view (610333)

The Management Server:Logs view might contain log entries for the management server and for the cluster. Management server log entries have the value "site" in the Object Type column. Cluster log entries have the value "cluster" in the Object Type column.

Cluster Management Console does not display localized logs (620529)

If you install language packs on the management server and on VCS 5.0 cluster nodes, Cluster Management Console does not initially show localized logs.

To resolve this issue

- 1 On each on each node of the cluster, create the following symbolic links:
 - From `/opt/VRTS/messages/ja` to `/opt/VRTSvc/messages/ja`
 - From `/opt/VRTSvc/messages/ja` to `/opt/VRTS/messages/ja`.
- 2 If the cluster is connected to the management server, disconnect and then reconnect the cluster.

Upgrading from VCS 4.0 MP3 changes the CMC service group configuration

This issue applies to VCS 4.0 MP3 clusters that have the cluster connector installed. When you upgrade the cluster to VCS 5.0, the upgrade process removes the MSPort and ClusterType attributes from the main.cf. This causes connection to the management server to fail.

Workaround: Set the attribute values manually after upgrading VCS.

- 1 Take the CMC service group offline

```
# hagrps -offline CMC -any
```
- 2 Make the configuration read/write.

```
# haconf -makerw
```
- 3 Edit the MSPort and ClusterType attributes

```
# hares -modify CMC_ClusterConfig MSPort 14145  
# hares -modify CMC_ClusterConfig ClusterType vcs
```
- 4 Save the updated configuration.

```
# haconf -dump -makero
```
- 5 Bring the CMC service group online.

```
# hagrps -online CMC -any
```

Cannot install if VxAT 4.3 is installed (617861)

If you have installed Symantec Product Authentication Services on a system using the 4.3 client/server installer, install of Cluster Management Console will not succeed because the path to the AT binaries is not in the path. Since this path is not present, the custom action DLL in our MSI will not be able to run certain AT-related commands.

Workaround: Add the path for the AT binaries before attempting a Cluster Management Console install.

Uninstall of Cluster Connector in a secure cluster leaves the VxSS service group frozen (619106)

On UNIX, when you remove the cluster connector from a secure cluster, the VxSS service group is frozen.

Workaround: Manually unfreeze the VxSS group. Run the following commands.

```
haconf -makerw  
hagrps -unfreeze VxSS -persistent  
haconf -dump -makero
```

Windows management server uninstall using Add or Remove Programs leaves folder

After using Add or Remove Programs to remove (uninstall) the Windows management server, an empty Cluster Management Console folder remains:

The default path is C:\Program Files\VERITAS.

Workaround: Delete the empty folder after the uninstall.

Windows cluster monitor uninstall leaves folder

After a Windows cluster monitor uninstall, an empty folder remains:

The default path is C:\Program Files\VERITAS.

Workaround: Delete the empty folder after the uninstall.

Uninstalling Cluster Connector does not remove entry from Add\Remove Programs on Windows (599424)

After you uninstall cluster connector on Windows cluster nodes, the Add or Remove Programs control panel continues to show an entry for cluster connector. This persistent entry prevents any reinstallation of cluster connector.

Workaround: Remove the Veritas Cluster Management Console entry from the list using Windows Installer Cleanup Utility. Run the utility to remove the entry on each node. If you do not have the utility, you may download it from the Microsoft support site.

Windows install over Terminal Services needs Service Pack 4

Per Microsoft, Windows 2000 without at least Service Pack 4 has problems installing multiple MSI files that alter the same registry key over Terminal Services.

Workaround: If you want to install to a Windows 2000 host using Terminal Services, first ensure that the system has Windows 2000 Service Pack 4 installed.

Errors when running ga commands on Windows (620628)

Upon attempting to run any ga- command on Windows platforms, the management server generates the following error messages:

```
System.load(C:\ProgramFiles\Veritas\Security\Authentication\bin\AtWrapper.dll) failed
CMC (cli.unsatisfiedLinkError): The JVM could not link with a necessary DLL to run the command.
Error: no AtWrapper in java.library.path
```


The cause of this error is that the path to the Symantec Product Authentication Service authentication broker is not specified in the system Path variable.

Workaround:

- 1 In the registry location
HKEY_LOCAL_MACHINE\SOFTWARE\VERITAS\Security\Authentication,
check the value of the InstallDir key to find the installation directory of the
Symantec Product Authentication Service authentication broker.
- 2 Append the directory path to the value of the system Path variable.

Documentation errata

Documentation does not mention VFD support for the Oracle agent (617554)

The User's Guide and the online Help does not list the Oracle agent in the list of agents that support virtual fire drills.

Software limitations

The following limitations apply to this release.

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.

System names in VCS

Systems specified in the VCS configuration file, `main.cf`, and in the files `/etc/nodename` and `/etc/llthosts`, must be consistent. The names cannot include periods and thus must not be in the fully qualified form. If you create the file `/etc/VRTSvcs/conf/sysname` to contain system names used by `main.cf`, VCS uses the file to verify the names.

Systems in a cluster must have same system locale setting

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

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`.

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 time out. 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. Symantec recommends creating users locally and configuring `/etc/nsswitch.conf` to reflect local users.

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.

Manually removing VRTSat package erases user credentials

Symantec recommends saving user credentials before manually removing the VRTSat package. If you need the credentials again, you can restore them to their original locations.

To save user credentials

- 1 Run the `vssat showbackuplist` command. The command displays the data files and backs them up into the SnapShot directory `/var/VRTSatSnapShot`. Output resembles the following:

```
# vssat showbackuplist
B| /var/VRTSat/.VRTSat/profile/VRTSatlocal.conf
B| /var/VRTSat/.VRTSat/profile/certstore
B| /var/VRTSat/RBAAuthSource
B| /var/VRTSat/ABAuthSource
B| /etc/vx/vss/VRTSat.conf
Quiescing ...
Snapshot Directory :/var/VRTSatSnapShot
```

- 2 Move the credentials to a safe location. Preserving the directory structure makes restoring the files easier.

To restore user credentials

- 1 Navigate to the SnapShot directory or the safe location where you previously saved credentials:

```
cd /var/VRTSatSnapShot/profile
```

- 2 Restore the files:

```
cp ABAuthSource /var/VRTSat/
cp RBAAuthSource /var/VRTSat/
cp VRTSat.conf /etc/vx/vss
cd /var/VRTSatSnapShot/
cp -r profile /var/VRTSat/.VRTSat
```

Limitation with RDAC driver and FASTT array for coordinator disks For multipathing to connected storage, AIX uses the RDAC driver for FASTT arrays. Since it is an active/passive array, only the current active path is exposed to clients. The I/O fencing driver, `vxfen`, can use

only a single active path and has no foreknowledge of the passive paths to the coordinator disks on an array.

Therefore, if the single active path fails, all nodes in the cluster lose access to the coordinator disks. The loss of the path to the coordinator disks can potentially go unnoticed until a reboot, split brain, or any other reason that leads to a cluster membership change occurs. In any of these conditions, the cluster cannot form, and all nodes panic to prevent data corruption. No data loss occurs. You can avoid this situation by using DMP and specifying paths to coordinator disks as DMP paths rather than raw disks.

I/O fencing limitations

Fencing is not supported in a VIO server environment

Certain SCSI3-PR command subsets that are critical to use fencing are not yet available.

Stopping systems in clusters with I/O fencing configured

The I/O fencing feature protects against data corruption resulting from a failed cluster interconnect, or “split brain.” See the *Veritas Cluster Server User's Guide* 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.

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.

File systems must be listed in `/etc/filesystems` on AIX 5.x

In a cluster running AIX 5.2, the `/etc/filesystems` file on *each* node must contain entries for all JFS and VxFS file systems in the cluster. The VCS Mount agent uses the `fsck` utility when file system corruption occurs. On AIX 5.2

systems, the `fsck` utility requires entries in the `/etc/filesystems` file. If the required entries are not present, an error resembling the following is displayed:

```
Cannot find the Vfs value for file system <BlockDevice> on specifying the Mount resource and creating entries in the /etc/filesystems file. Note that the crfs command creates an entry in /etc/filesystems only on the system where the file system was created. The mkfs command does not create entries for /etc/filesystems.
```

Virtualizing shared storage using VIO servers and client partitions

AIX 5.3, with proper patches to the operating system and client partitions, is capable of running multiple virtualized partitions within a single frame. You can split the CPU, memory, and certain adapters (networking and storage), into smaller virtual units that the partitions can then use.

In an Advanced POWER™ Virtualization (APV) environment, AIX uses the VIO Server to monitor and manage the I/O paths for the virtualized client partitions. At a very high level, the VIO server provides a partition's access to storage that is external to the physical computer. The VIO server encapsulates the physical hardware into virtual adapters called virtual SCSI adapters (server adapter). On the client side, you can create virtual adapters (client adapters) that map to the server adapter and enable a partition to connect to external storage.

Note: Fencing and the LVMVG agent are not supported in a VIO server environment.

The VIO server provides similar mechanisms to share limited networking resources across partitions. Refer to the manual that came with your system to help set up partitions, and to configure and use the various components such as VIO server and HMC, which are integral parts of IBM's APV environment.

The minimum patch levels for using VIO servers and client partitions with VCS are:

- Fix Pack 7.1.2.0.0 for VIO servers
- AIX operating system level 5.3 ML-03 for client partitions

Supported Storage

Refer to the IBM data sheet: <http://techsupport.services.ibm.com/server/vios/documentation/datasheet.html>

Disk Restrictions

When using VCS in combination with VIO servers and their client partitions, you need to ensure that no reservations are placed on the shared storage. This

enables client partitions on different systems to access and use the same shared storage.

- If the shared storage is under MPIO control, set the `reserve_policy` attribute of the disk to `no_reserve`.
- If the shared storage is not under MPIO control, look up the array documentation to locate a similar attribute to set on the disk.

Internal testing on EMC disks shows that this field maps as the `reserve_lock` attribute for EMC disks. In this case, setting it to `no` achieves the same result.

Accessing the same LUNs from Client Partitions on Different Central Electronics Complex (CEC) Modules

This section briefly outlines how to set shared storage so that it is visible from client partitions on different CEC modules.

With the VIO server and client partitions set up and ready, make sure that you have installed the right level of operating system on the client partitions, and that you have mapped the physical adapters to the client partitions to provide access to the external shared storage.

To create a shareable diskgroup, you need to ensure that the different partitions use the same set of disks. A good way to make sure that the disks (that are seen from multiple partitions) are the same is to use the disks serial numbers, which are unique.

Run the following commands on the VIO server (in non-root mode), unless otherwise noted.

Get the serial number of the disk of interest:

```
$ lsdev -dev hdisk20 -vpd
hdisk20
U787A.001.DNZ06TT-P1-C6-T1-W500507630308037C-
L4010401A00000000 IBM FC 2107

Manufacturer.....IBM
Machine Type and Model.....2107900
Serial Number.....7548111101A
EC Level.....131
Device Specific.(Z0).....10
Device Specific.(Z1).....0100
...
```

Make sure the other VIO server returns the same serial number. This ensures that you are viewing the same actual physical disk.

List the virtual SCSI adapters.

```
$ lsdev -virtual | grep vhost
vhost0 Available Virtual SCSI Server Adapter
vhost1 Available Virtual SCSI Server Adapter
```

Note: Usually `vhost0` is the adapter for the internal disks. `vhost1` in the example above maps the SCSI adapter to the external shared storage.

Prior to mapping `hdisk20` (in the example) to a SCSI adapter, change the reservation policy on the disk.

```
$ chdev -dev hdisk20 -attr reserve_policy=no_reserve
hdisk20 changed
```

For `hdisk20` (in the example) to be available to client partitions, map it to a suitable virtual SCSI adapter.

If you now print the reserve policy on `hdisk20` the output resembles:

```
$ lsdev -dev hdisk20 attr reserve_policy
value
no_reserve
```

Next create a virtual device to map `hdisk20` to `vhost1`.

```
$ mkvdev -vdev hdisk20 -vadapter vhost1 -dev mp1_hdisk5
mp1_hdisk5 Available
```

Finally on the client partition run the `cfgmgr` command to make this disk visible via the client SCSI adapter.

You can use this disk (`hdisk20` physical, and known as `mp1_hdisk5` on the client partitions) to create a diskgroup, a shared volume, and a eventually a shared file system.

Perform regular VCS operations on the clients vis-a-vis service groups, resources, resource attributes, etc.

Using a switch or interface in a virtual I/O environment requires configuration changes

In a virtual I/O environment, the kernel and the interface card or switch use different maximum transfer unit (MTU) values. If a mismatch exists, packet loss for larger packets can result.

LLT receives its MTU value from the kernel. LLT queries the AIX native DLPI layer to get the MTU size for each private network interface. It then takes the least of all the interface MTU values. LLT uses this least value as an overall MTU value, and uses this value for communication with its peers.

See Veritas technote 278286 for more information.

Example:

If one private link has jumbo frames and the other has normal MTU, then the overall MTU is normal (1,500 bytes). Use the command `lltstat -c` to get the overall MTU value:

```
# lltstat -c | grep overall
overall mtu: 1460
```

If the LLT private network links are virtual Ethernet devices, the AIX DLPI layer returns an MTU size of 65,354 bytes for each link. The overall MTU, as a result, is 65,354 bytes. This value does not match with the maximum MTU that the external switch can handle. As a result, the switch drops any LLT packets greater than 1,500 bytes.

Workaround:

- If the LLT private links are over virtual Ethernet devices, modify the `/etc/llttab` entry to restrict the MTU value to 1500.

Sample `llttab` file restricting the MTU size to 1500:

```
# more /etc/llttab
set-node nodeamp8
set-cluster 90
link en1 /dev/dlpi/en:1 - ether - 1500
link en2 /dev/dlpi/en:2 - ether - 1500
```

Or

- Connect the interfaces with crossover cables instead of a switch. This is restrictive however.

Bundled agent limitations

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.

NFS failover

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

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.

Networking agents do not support IPv6 protocol

The bundled IP, NIC, IPMultiNIC, MultiNICA, IPMultiNICB, and MultiNICB agents for VCS 5.0 do not support the IPv6 enhanced IP protocol.

VCS does not provide a bundled agent for volume sets

VCS 5.0 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.

No LVMVG agent support in a VIO environment

The LVMVG agent is not supported in a VIO environment.

Cluster Management Console limitations

Cluster connector not supported on some OS versions

Cluster Management Console does not support cluster connector on AIX 5.1, Solaris 7, and RHEL 3.0. If your cluster runs on any of these platforms, you must use direct connection to manage the cluster from a management server.

Limited peer management server support

Peer management server support is limited to a configuration of two management servers in an enterprise. An enterprise of three or more management servers is not supported in this release.

Management server cannot coexist with GCM 3.5 Master

The Cluster Management Console management server should not be installed on the same system with a GCM 3.5 Master. These two products will conflict with each other and are not supported running on the same system.

Agent info files needed for Agent Inventory report

By design, the Agent Inventory report requires agent info files that supply the information reported on individual agents. These files are shipped with agents in VCS.

Global clusters must be CMC-managed clusters

All clusters forming a global cluster (using the VCS 4.0 Global Cluster Option) must be managed clusters in order for Veritas Cluster Management Console views to display correct and consistent information. Managed clusters are running the cluster connector or have a direct connection with the management server.

Windows Active Directory installation requires NetBIOS

If you install Cluster Management Console management server in a Windows Active Directory domain, NetBIOS must be turned on. A native (non-NetBIOS) Active Directory environment is not supported in this release.

Remote root broker not supported on Windows

If you set up a management server on a Windows system, you must configure a root broker on the management server system. This release does not support specifying a remote root broker during management server install. The root broker can be changed after install using the `configureRemoteRoot.exe` installed in `C:\Program Files\VERITAS\Cluster Management Console\bin` (default install directory).

Cluster Manager (Java console) limitations

Use the VCS 5.0 Java Console to manage clusters

Cluster Manager (Java Console) from previous VCS versions cannot be used to manage VCS 5.0 clusters. Symantec recommends using the latest version of Cluster Manager. See the *Veritas Cluster Server 5.0 Installation Guide* for instructions on upgrading Cluster Manager.

Run Java Console on a non-cluster system

Symantec 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.

Cluster Manager and wizards do not work if the hosts file contains IPv6 entries

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.

VCS Simulator does not support I/O fencing

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

Undocumented commands, command options, and libraries

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

Documentation

Product guides are available on the documentation disc in PDF and HTML formats. We recommend copying pertinent information, such as installation guides and release notes, from the disc to your system directory `/opt/VRTS/docs` for reference.

VCS 5.0 documentation set

VCS 5.0 includes the following documents.

Title	File Name
<i>Veritas Cluster Server Installation Guide</i>	<code>vcs_install.pdf</code>
<i>Veritas Cluster Server Release Notes</i>	<code>vcs_notes.pdf</code>
<i>Veritas Cluster Server User's Guide</i>	<code>vcs_users.pdf</code>
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	<code>vcs_bundled_agents.pdf</code>
<i>Veritas Cluster Server Agent Developer's Guide</i>	<code>vcs_agent_dev.pdf</code>
<i>Veritas Cluster Server Centralized Management Guide</i>	<code>vcs_central_mg.pdf</code>
<i>Veritas High Availability Agent for DB2 Installation and Configuration Guide</i>	<code>vcs_db2_install.pdf</code>
<i>Veritas High Availability Agent for Oracle Installation and Configuration Guide</i>	<code>vcs_oracle_install.pdf</code>
<i>Veritas High Availability Agent for Sybase Installation and Configuration Guide</i>	<code>vcs_sybase_install.pdf</code>

The manual pages for the `VRTS11t`, `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.

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Java 2 Runtime Environment

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