VERITAS™

VERITAS Cluster Server 4.1

Release Notes

HP-UX

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VCS 4.1 Release Notes

This document provides important information regarding VERITAS Cluster Server (VCS) version 4.1 for the September 2004 HP-UX 11i version 2.0 operating system. Please review this entire document before installing VCS.

New Features

The features described below are introduced in VCS version 4.1.

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 4.1 on HP-UX.

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.

VERITAS Security Services (VxSS)

VCS 4.1 integrates with VERITAS Security Services (VxSS) to provide secure communication between cluster nodes and clients, including the Java and the Web consoles. VxSS uses digital certificates and uses SSL to encrypt communication over the public network.

User Management in the Secure Mode

Change in Behavior: If VCS is running in the secure mode, you can add system or domain users to VCS and assign them privileges. You must specify user names in the format username@domain. You cannot assign or change passwords for users when VCS is running in the secure mode.

Web Console Features

- Support for Global Clustering
- Support for Secured Clusters

Java Console Features

- Support for Global Clustering
- Support for Secured Clusters

CommandCentral Availability Cluster Monitor

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

You must use version 4.1 MP1 of the CommandCentral Availability management server to manage clusters running VCS in secure mode, and VERITAS recommends using 4.1 MP1 for all managed clusters. For information about installing and using CommandCentral Availability, see the *VERITAS CommandCentral Availability 4.1 MP1 Installation Guide* and the *VERITAS CommandCentral Availability 4.1 MP1 Administrator's Guide*.

New Bundled Agents

The following bundled agents have been added since the VCS 3.5 release. For details, refer to the *VCS 4.1 Bundled Agents Reference Guide*.

- DNS
- IPMultiNICB
- MultiNICB
- ProcessOnOnly
- VRTSWebApp
- CampusCluster

New Event Triggers

The following event triggers have been added since the VCS 3.5 release. For details, refer to the *VCS 4.1 User's Guide*.

cpuusage

The cpuusage event trigger is invoked on systems where CPU usage exceeds the configured threshold value.

multinicb_postchange

The multinicb_postchange 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.

resadminwait

The resadminwait event trigger is invoked when a resource enters ADMIN_WAIT state.

unable_to_restart_agent

The unable_to_restart_agent event trigger is invoked when HAD is unable to restart the agent.

unable_to_restart_had

The unable_to_restart_had event trigger is invoked when hashadow cannot restart HAD.
Change in Behavior: Previously, hashadow logged a message and terminated when it could not restart HAD. The default behavior of the new trigger is to restart HAD on the system where the trigger is invoked.

violation

The violation event trigger is invoked on a system that causes a concurrency violation. The trigger takes the service group offline on that system.

Change in hacli Command

Change in Behavior: The attribute value CLUSTERADMIN is no longer supported for hacli.

Updates to the IP and NIC Agents

The IP and NIC agents are updated to support Auto Port Aggregation (APA).

Change to Default Scheduling Priority of HAD

Change in Behavior: The HAD process now uses the POSIX RealTime priority and the SCHED_FIFO scheduling policy. Previously, the HAD process used the HP-UX RealTime priority and SCHED_RTPRIO scheduling policy. If no priority is specified, the priority is set by default to two less than the strongest.

New Attributes

- Resource Type Attributes
  - ActionTimeout
  - ContainerType
  - FireDrill
  - InfoInterval
  - InfoTimeout
  - LogDbg
  - MonitorStatsParam
  - SupportedActions
- Resource Attributes
  - ComputeStats
  - MonitorTimeStats
  - ResourceInfo
- Service Group Attributes
  - Authority
  - ClusterFailoverPolicy
  - ClusterList
  - DeferAutoStart
  - FaultPropagation
  - ManageFaults

- System Attributes
  - CPUBinding
  - CPUUsage
  - CPUUsageMonitoring
  - EngineRestarted
  - LicenseType
  - NoAutoDisable
  - VCSFeatures
- Cluster Attributes
  - AutoStartTimeout
  - ClusState
  - ClusterAddress
  - ClusterTime
  - ClusterUUID
  - ConnectorState
  - LinkMonitoring
  - PanicOnNoMem
  - Stewards
  - UseFence
  - VCSFeatures
  - VCSi3Info
  - WACPort

New Attribute Category

Heartbeat attributes are introduced to VCS 4.1 with the new global cluster features.

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

Removed Attributes

The following attributes have been removed since VCS 3.5 on HP-UX.

- Resource Type Attributes
  - LogLevel
  - LogTags
- System Attributes
  - SystemState
  - UsrStr
- Cluster Attribute
  - AllowNativeCliUsers

VCS Agents

Bundled Agents

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

Application	CampusCluster	DiskGroup
DNS	ElifNone	FileNone
FileOnOff	FileOnOnly	IP
IPMultiNIC	IPMultiNICB	LVMCombo
LVMLogicalVolume	LVMVolumeGroup	Mount
MultiNICA	MultiNICB	NFS
NIC	NotifierMngr	Phantom
Process	ProcessOnOnly	Proxy
ServiceGroupHB	Share	Volume
VRTSWebApp		

Enterprise Agents

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

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

Supported Enterprise Agents

Available VCS enterprise agents are listed below. Refer to this table for supported application and operating system versions. VCS agents support a specified application version on September 2004 HP-UX 11i version 2.0 if the application vendor supports that version on September 2004 HP-UX 11i version 2.0.

Supported VCS Agent	Agent version	VCS version			Application		OS		
		1.3.1	3.5	4.1			11iv2 04/09	11.0	11i
Oracle	4.1	p	p	s	Oracle	9*i* R1, 9*i* R2 10g, 10g R1	s	n	n
Sybase	4.1	p	p	s	Sybase Adaptive Server	12.5, 12.5.2	s	n	n
Informix	4.1	p	p	s	Informix Dynamic Server	9.40	s	n	n
True Copy	4.1	n	n	s	Hitachi True Copy		s	n	n
SRDF	4.1	n	n	s	EMC Symmetrix Remote Data Facility		s	n	n

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

Custom Agents

Compiling Custom Agents

Custom agents must be developed using compilers from one of the products listed below:

- HP C/ANSI C Developer's Bundle (S800), part number B3901BA.
- HP aC++ Compiler (S800), part number B3913DB.

These products may be identified by various part numbers in addition to those listed.

Existing custom agents written to run on VCS versions earlier than 1.2 must be recompiled for use with VCS 4.1.

Upgrading Custom Agents

Custom agents developed prior to VCS 1.3 must be upgraded before they can be used with VCS 4.1. See the *VCS 4.1 Agent Developer's Guide* for instructions on how to upgrade custom agents.

Installation Notes

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

- September 2004 HP-UX 11i version 2.0

  For each platform, VERITAS recommends applying the latest HP-UX operating system patches available from HP.

  Note Within a cluster, all systems must run on the same processor type and use the same operating system version and patch level. Mixed PA-RISC and Itanium clusters are not supported.

- VERITAS Volume Manager (VxVM) 3.5 and 4.1
- VERITAS File System (VxFS) 3.5 and 4.1

System Requirements

Requirements for Cluster Manager Consoles

The minimum requirements on HP clients are 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 clients are Pentium II, 300MHz, 256MB RAM, and 800x600 display resolution. (VERITAS 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.

The following supported Internet browsers have been tested:

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

Obtaining License Keys for VCS

VCS is a licensed software product. For information on obtaining licence keys for VCS, refer to the *VCS 4.1 Installation Guide.*

Installing VCS 4.1

Refer to the *VERITAS Cluster Server 4.1 Installation Guide* for instructions on how to install VCS 4.1. The *VCS 4.1 Installation Guide* is in the `cluster_server/docs` directory of the software disc.

VCS Packages

The following packages for VCS are on the VERITAS software disc:

- `VRTSat`, VERITAS Authentication Service
- `VRTScpi`, VERITAS Common Product Installer
- `VRTScscm`, VCS Cluster Manager (Java Console)
- `VRTScscw`, VCS Configuration Wizards
- `VRTScssim`, 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
- `VRTSjre`, VCS redistribution of JRE
- `VRTSvcsmg`, VCS Message Catalogs
- `VRTSvcsmn`, VCS Manual Pages
- `VRTSvcsw`, Cluster Manager (Web Console)
- `VRTScutil`, Cluster Server Utility
- `VRTSvlic`, VERITAS License Utilities
- `VRTSvxfen`, VCS Fencing Driver
- `VRTSweb`, VERITAS Web GUI Engine

The following packages for VCS are in the `windows` directory on the VERITAS software disc:

- `WindowsClusterManager`, Cluster Manager for Windows clients
- `WindowsSimulator`, VCS Simulator for Windows clients
- `WindowsWebConsole`, VCS Web Console for Windows clients

Software Limitations

The following limitations apply to VCS version 4.1.

Cluster Manager (Java Console)

Java Console for VCS 4.x is Required

Cluster Manager (Java Console) from VCS versions earlier than 2.0 cannot be used to manage VCS 4.x clusters. VERITAS recommends always using the latest version of Cluster Manager. See the *VERITAS Cluster Server 4.1 Installation Guide* for instructions on upgrading Cluster Manager.

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.

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.

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.

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.

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 4.1 bundled networking agents do not support the IPv6 enhanced IP protocol.

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 4.1 does not provide a bundled agent to detect Volume Manager volume sets, Problems with volumes and volume sets can only be detected at the DiskGroup and Mount resource levels.
Workaround: Set StartVolumes and StopVolumes attributes of the DiskGroup resource that contains volume set to 1. If a file system is created on the volume set, use a Mount resource to mount the volume set.

VCS Simulator Does Not Support I/O Fencing

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

Systems in a Cluster Must Have Same System Locale Setting

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

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 comes online on node 2, then a dependency violation results.

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.

Evacuating a Service Group with Online Global Firm Dependency

When using `hastop -local -evacuate` to evacuate a service group with online global firm dependency, the parent group is taken offline along with the child group. However, the parent group comes online on the failover node while the child group remains offline.

Known Issues

The following issues have been reported for VCS version 4.1.

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 myVCS page may not display correctly the fist time it is opened.
Workaround: If the myVCS page or any Cluster Manager page does not display correctly, refresh the page.

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.

LVM Agents Do Not Detect Disconnected Cable

LVM commands continue to function correctly when the cable to disks is pulled. The LVM agent does not detect a fault in this situation.

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.

Volume Agent May Hang

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

- Failover for the JNI Fibre Channel driver (JNIfcaPCI) was set to 0. Note this is *not* failover for VCS. The JNI driver has a variable called "failover" that defines the number of seconds after the target is declared offline and before it is declared failed. When target is declared failed, all pending commands are flushed back to the application. This failover value is set in the file `/kernel/drv/fca-pci.conf`. Setting failover to 0 means that the target is never declared failed. With failover for the JNI driver set to 30 seconds, VCS agent behavior was normal.
- Fibre cable was disconnected from the switch (to simulate failure of the Fibre drives).

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.

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`.

Monitoring PidFiles May Give False Concurrency Violation

When using PID Files to monitor application resources, the Application agent may report a false concurrency violation after a system crash. The PID files created by an application contain the PIDs for processes that are monitored by the Application agent. These files remain even after a node running the application crashes.

When restarting the node, the operating system may assign the PIDs listed in the PID files to other processes running on the node. 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 scenario could result in some processes that are not under VCS control being killed.

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 4.1 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.

Offline Behavior of VCS Enterprise Agent for Sybase

The Offline operation of the VCS Enterprise Agent for Sybase shuts down the database with the `nowait` option if a shutdown with `wait` fails to complete in 20 seconds.

Trigger Not Invoked in REMOTE_BUILD State

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

The hagetcf Script Reports an Error

Running the hagetcf script to gather information about the VCS cluster generates the following error:

```
tar: cannot stat ./var/VRTSvcs/log/.*A.log.  Not dumped.
```

Workaround: This message may be safely ignored.

Running haipswitch Generates Erroneous Output

Running the `haipswitch` command may generate erroneous output.

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.
```

Default Timeout Values for Some Agents May Cause Commands to Fail

The DiskGroup and CampusCluster agents may not function properly with its default timeout values.

Workaround: Increase the timeout values for the entry points for the DiskGroup and CampusCluster agents. VERITAS recommends the following values for these attributes:

- DiskGroup agent: OnlineTimeout—600; MonitorTimeout—120
- CampusCluster agent: MonitorTimeout—180

Cannot Remove VCS if Enterprise Agents Are Installed

You cannot remove the VRTSvcs package if you have VCS enterprise agents installed.

Workaround: Remove the enterprise agent packages before removing VCS.

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
```

The Installer Limits Cluster IDs to 256

While installing VCS, the installer asks for a cluster ID from 0 to 255. The installer does not support more than 256 IDs.

Upgrading from GCM 3.5 to VCS 4.1

If you are running Global Cluster Manager 3.5 and would like to upgrade to VCS 4.1, contact VERITAS Technical Services.

VCS in Japanese Locales

The following issues apply to VCS 4.1 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.

Systems in a Cluster Must Have Same System Locale Setting

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

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.

Monitor File May Log Warnings About Perl Locale

If the locale setting for a Perl script is invalid for the system on which it runs, Perl generates a warning message about the setting. To suppress the warning, set the environment variable PERL_BADLANG to 0.

Documentation

VCS Documentation

Documentation for VCS is included on the *VERITAS* software disc 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_install.pdf`, *Installation Guide*
- `vcs_notes.pdf`, *Release Notes*

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

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

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

The documents included in the `VRTSvcsdc` package are not the latest for VCS 4.1 on HP-UX. Refer to the `cluster_server/docs` directory on the software disc for the latest documentation.

Manual Pages

The manual pages for the `VRTSllt`, `VRTSgab`, and `VRTSvcs` are installed in `/opt/VRTSvcs/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:/opt/VRTSvcs/man
# export MANPATH
```

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

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

Troubleshooting Problems

VERITAS Technical Services provides diagnostic tools to assist you in troubleshooting problems associated with the product. These tools are available on disc or can be downloaded from the VERITAS FTP site. See the VRTSspt readme file in the /support directory for details.