Veritas™ Cluster Server Installation and Upgrade Guide

Windows Server 2012 (x64)

6.0.2

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Veritas Cluster Server Installation and Configuration Guide

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Legal Notice

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When you contact Technical Support, please have the following information available:

- Product release level

- Hardware information
- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
  - Error messages and log files
  - Troubleshooting that was performed before contacting Symantec
  - Recent software configuration changes and network changes

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Support agreement resources

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Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

Documentation

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions. Include the title and document version (located on the second page), and chapter and section titles of the text on which you are reporting. Send feedback to:

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For information regarding the latest HOWTO articles, documentation updates, or to ask a question regarding product documentation, visit the Storage and Clustering Documentation forum on Symantec Connect.

https://www-secure.symantec.com/connect/storage-management/forums/storage-and-clustering-documentation

About Symantec Connect

Symantec Connect is the peer-to-peer technical community site for Symantec's enterprise customers. Participants can connect and share information with other product users, including creating forum posts, articles, videos, downloads, blogs and suggesting ideas, as well as interact with Symantec product teams and Technical Support. Content is rated by the community, and members receive reward points for their contributions.

http://www.symantec.com/connect/storage-management

Contents

Chapter 1

Preinstallation and planning

This chapter includes the following topics:

About the preinstallation and planning tasks

Before you begin to install VCS, you must perform the following tasks as a part of product installation planning.

- Review the release notes for your product
- Review the product installation requirements
- Review the supported hardware and software list
- Review the licensing details
- Review the specific requirements for your configuration
- Perform the applicable pre-requisite tasks
- For latest updates refer to the Late Breaking News (LBN) http://www.symantec.com/docs/TECH161556

- Exit all running applications

Installation requirements

Review the following product installation requirements for your systems.

For the latest information on requirements for this release, see the following Symantec Technical Support TechNote:

http://www.symantec.com/docs/TECH152806

Operating system requirements

The server and client components of the software run on specific Windows operating systems. For information about the supported Windows operating systems, refer to the following:

- Supported operating systems for VCS for Windows servers
  See "Supported operating systems for server components" on page 10.
- Supported operating systems for VCS for Windows clients
  See "Supported operating systems for client components" on page 11.

For the latest information on supported software, see the Software Compatibility List at:

http://www.symantec.com/docs/TECH201485

Supported operating systems for server components

Note: SFW software for servers supports Hyper-V and parent partitions.

Your server must run one of the operating systems listed below to install the VCS server software.

Note: VCS software for servers does not support Hyper-V and parent partitions.

Table 1-1 Supported operating systems for servers

Windows Server	Platform	Edition	Version
Windows 2012 Server Core	x64	Standard, Datacenter, Foundation, Essential	RTM

Table 1-1 Supported operating systems for servers *(continued)*

Windows Server	Platform	Edition	Version
Windows Server 2012	x64	Standard, Datacenter, Foundation, Essential	RTM

Note: Installation of VCS server components in a VMware environment is supported on Windows Server 2012 (x64) and Windows 2012 Server Core (x64).

Supported operating systems for client components

Your system must run one of the following operating systems to install the VCS client software:

- Any one of the operating system versions, editions, and architectures that the Server Components are supported on except Server Core:
  See "Supported operating systems for server components" on page 10.
- Windows 8 x86, x64: Professional Edition, Enterprise Edition

Supported VMware versions

The following VMware Servers and management clients are currently supported:

- VMware ESX Support
  In this release, VMware ESX 3.0 or higher is required for installing and configuring VCS on VMware virtual machines.
- VMware Workstation support
  In this release, VMware Workstation 6.5 is required for running VCS on VMware virtual machines.

Disk space requirements

For installation, space required is calculated regardless of selected options or components.

Table 1-2 summarizes the disk space requirements for installing VCS.

Table 1-2 Disk space requirements

Installation options	Required disk space
VCS + all options	832 MB
VCS Client components	287 MB

Hardware requirements

Before you install VCS, verify that your configuration meets the following criteria and that you have reviewed the Hardware Compatibility List to confirm supported hardware:

http://www.symantec.com/docs/TECH152806

Table 1-3 displays the required hardware requirements.

Table 1-3 Hardware requirements

Requirements	Specifications
Memory	1 GB of RAM required
32-bit processor requirements (for client components only)	800-megahertz (MHz) Pentium III-compatible or faster processor 1GHz or faster processor recommended
x64 processor requirements	1GHz AMD Opteron, AMD Athlon 64, Intel Xeon with Intel EM64T support, Intel Pentium IV with EM64T support processor or faster
Display	Minimum resolution: 1024 X 768 pixels or higher VCS Cluster Manager (Java Console) requires an 8-bit (256 colors) display and a graphics card that can render 2D images
Storage requirememts	■ Shared disks to support applications that migrate between nodes in the cluster. Campus clusters require more than one array for mirroring. Disaster recovery configurations require one array for each site. ■ SCSI or Fibre Channel Host Bus Adapters (HBAs), or iSCSI Initiator supported NICs to access shared storage. ■ Two NICs: one shared public and private, and one exclusively for the private network; Symantec recommends three NICs: one public and two for the VCS private network.

Network requirements

Ensure that you have performed the following tasks and kept the required network information handy, before you install Veritas Cluster Server.

- Verify that the systems on which you install the software are part of a Windows Active Directory domain.
- Ensure that the static IP addresses are available for the following purposes:
  - One IP address per site for each virtual server.

- One IP address for each physical node in the cluster
- One IP address per cluster when configuring Notification. The same IP address can be used for other options, such as GCO.

- Configure name resolution for each node.
- Verify that the DNS Services are available. AD-integrated DNS or BIND 8.2 or higher are supported. Make sure a reverse lookup zone exists in the DNS.
  Refer to the application documentation for instructions on creating a reverse lookup zone.
- DNS scavenging affects virtual servers configured in VCS, because the Lanman agent uses Dynamic DNS (DDNS) to map virtual names with IP addresses. If you use scavenging, then you must set the DNSRefreshInterval attribute for the Lanman agent. This will enable the Lanman agent to refresh the resource records on the DNS servers.
  Refer to the Lanman agent description in the *Veritas Cluster Server Bundled Agents Reference Guide* for more information.
- If Network Basic Input/Output System (NetBIOS) is disabled over the TCP/IP, then you must set the Lanman agent's DNSUpdateRequired attribute to 1 (True).
- Make sure that the NetApp filers and the systems on which you plan to install VCS reside in the same domain.
- Make sure that the NetApp filers are reachable; ensure that you can ping the filers using the DNS name.
- If you plan to set up a disaster recovery configuration, make sure that:
  - The volumes at both sites are of the same size.
  - The NetApp filers can replicate in both directions.
- For IPv6 networks, VCS supports the following:

IP address configuration	Global unicast addresses are supported. Global unicast addresses are equivalent to public IPv4 addresses. Unique local unicast addresses are supported. Multicast and anycast addresses are not supported. Link local and site local addresses are not supported.

IP address configuration	Only stateless automatic configuration is supported. In stateless mode, the IP address is configured automatically based on router advertisements. The prefix must be advertised. Mixed mode configuration with stateful and stateless configurations are not allowed. DHCPv6 is not used for assignment of IP addresses. Manual configuration is not supported.
Transition technologies	The other types of automatic configuration (stateful or "both") are not supported. DHCPv6 is not used for assignment of IP addresses. Manual configuration is not supported.
LLT over UDP	LLT over UDP is supported on both IPv4 and IPv6.
VCS agents, wizards, and other components	VCS agents that require an IP address attribute and wizards that configure or discover IP addresses now support IPv6 addresses (of the type described above).

- In an IPv6 environment, the Lanman agent relies on the DNS records to validate the virtual server name on the network. If the virtual servers configured in the cluster use IPv6 addresses, you must specify the DNS server IP, either in the network adapter settings or in the Lanman agent's AdditionalDNSServers attribute.
- If you plan to use Fibre Channel (FC) for connecting the LUNs, type hba_info on the command prompt, and verify that the FC initiators are displayed.
  If FC initiators are not displayed, install the mini port driver provided by your vendor and run the command again to verify that the FC initiators are displayed.
- Ensure that the LUNs are mounted. In case of Multi Pathing I/O (MPIO), ensure that the LUNs are mounted using the required initiators.

  Note: MPIO support is available only with FC.

- Do not install VCS on servers that are assigned the role of a Domain Controller. Configuring a cluster on a domain controller is not supported.

- If the domain controller and the computer running the installation program are on different subnets, the installer may be unable to locate the computers selected for installation. In this situation, after the installation program displays an error message, type the host names and the IP addresses of the missing computers manually.

Firewall port settings and anti-spyware

Before installing the product software, disable spyware monitoring and removal software. This must be done only as pre-installation requirement and should be re-enabled immediately after installation.

Ensure that your firewall settings allow access to ports used by VCS wizards and services.

See "About VCS services and ports" on page 67.

Supported applications

This section provides the details on the supported applications and their versions.

Supported SQL Server 2008 and 2008 R2 versions

Table 1-4 lists the Microsoft SQL Server 2008 versions supported with this release of VCS.

Table 1-4 Supported Microsoft SQL Server 2008 versions

SQL Server 2008	Windows Servers
Microsoft SQL Server 2008 SP3 32-bit Standard , Enterprise, or Web Edition	Windows Server 2012 x64: Standard, Datacenter, Hyper-V, or Server Core editions
Microsoft SQL Server 2008 SP3 64-bit Standard, Enterprise, Enterprise Web Edition	Windows Server 2012 x64: Standard, Datacenter, Hyper-V, or Server Core editions

Table 1-5 lists the Microsoft SQL Server 2008 R2 versions supported with this release of VCS.

Table 1-5 Supported Microsoft SQL Server 2008 R2 versions

SQL Server 2008 R2	Windows Servers
Microsoft SQL Server 2008 R2 SP2 32-bit Standard, Enterprise, or Datacenter Edition	Windows Server 2012 x64: Standard, Datacenter, Hyper-V, or Server Core editions
Microsoft SQL Server 2008 R2 SP2 64-bit Standard, Enterprise, Datacenter Edition	Windows Server 2012 x64: Standard, Datacenter, Hyper-V, or Server Core editions

Supported SQL Server 2012 versions

Table 1-6 lists the Microsoft SQL Server 2012 versions supported with this release of VCS

Table 1-6 Supported Microsoft SQL Server 2012 versions

SQL Server 2012	Windows Servers
Microsoft SQL Server 2012 32-bit / 64-bit Standard, Business Intelligence, Enterprise, or Web Edition	Windows Server 2012 x64: Standard, Datacenter, Server Core, or Hyper-V editions

Supported NetApp applications and other applications

The supported versions of NetApp applications and other applications are as follows:

- NetApp SnapManager for Exchange 4.0, 5.0, 6.0 with Exchange Server 2007
- NetApp SnapManager for SQL 2.0, 2.1, and 5.0
- NetApp Data ONTAP 7.3, 7.3.3
- NetApp SnapDrive 4.1, 4.2.1, 5.0, 6.0, 6.1, and 6.2

When installing SnapDrive, you must specify a user account in the SnapDrive Service Credentials dialog box. The user account must be a domain user and part of the Administrators group of the local system and the filer.

- Data ONTAP DSM for Windows MPIO 3.1, 3.2, 3.3, 3.3.1
- Microsoft iSCSI software initiator version 2.03 or later versions

Verifying the system configuration using the Windows Data Collector

It is recommended to verify your system configuration before you begin to install the product. The Windows data collector enables you to gather information about the systems in your network. It thus helps you verify your system configuration before you begin with the product installation.

Installing the Windows Data Collector

To install and run the Windows data collector, your system must be running at a minimum Windows 2000 SP4.

You can download the data collector using the product software disc or from the Symantec Operations Readiness Tools (SORT) Web site.

- To download the data collector using the product software disc, insert the product software disc into your system drive and double-click **setup.exe**.
  This launches the CD Browser.
  Click **Windows Data Collector** and extract all the files on to your system.
- To download the Windows data collector from the SORT Web site,
  - Go to the Symantec Operations Readiness Tools (SORT) Web site: https://sort.symantec.com
  - Under the SORT tab, select **My SORT**.
  - On the Custom Reports widget, follow the instructions to download the data collector.

Running the verification reports

The data collector uses the gathered information to generate the reports that enable you to perform the following:

- Determine whether a system is ready to install or upgrade to this release of VCS.

- Analyze the configuration of your current Symantec products and make recommendations about availability, use, performance, and best practices.
- Get detailed information about your installed Symantec products, versions, and licenses.

The report contains a list of passed and failed checks and details about each of them. After the Windows data collector completes the check, you can save a summary report as an HTML file and an XML file.

For more details on running a verification report, refer to the platform-specific README file located on the Custom Reports widget on the SORT Web site.

Licensing

VCS for Windows is available in Standard and HA DR editions.

The available product options are based on the edition you choose.

Table 1-7 provides the product options available per VCS license edition.

Table 1-7 License edition and available product options

License edition	Available features	
	GCO	Hyper-V DR
VCS HA-DR The HA DR edition includes both, the GCO and Hyper-V DR solution. No separate license is available only for the Hyper-V DR solution.	✓	✓
VCS Standard	Not available	Not available

Each of the license edition is further categorized based on the operating system edition. Depending on the operating system edition in use, you can choose a compatible product license edition.

Table 1-8 provides the compatibility matrix for the product license edition and the Windows operating system in use.

Table 1-8 Compatibility matrix with the Windows operating system

Windows operating system edition	Compatible VCS edition	Veritas Cluster Server licensing terms
■ Server Edition ■ Standard Edition ■ Web Edition	■ Standard edition for standard, enterprise, and datacenter operating system ■ HA DR edition for standard, enterprise, and datacenter operating system	A separate license is required for each virtual or physical server, where the software is installed.
■ Advanced Edition ■ Enterprise Edition	■ Standard edition for enterprise, and datacenter operating system ■ HA DR edition for enterprise, and datacenter operating system	For each license, you may run one instance on a physical server and up to four simultaneous instances on virtual servers located on that physical server.
Datacenter Edition	■ Standard edition for datacenter operating system ■ HA DR edition for datacenter operating system	For each license, you may run one instance on one physical server and an unlimited instances on virtual servers located on that physical server.

During installation, the product installer provides the following options to specify the license details.

- Keyless
- User Entered Key

Note: Evaluation licenses are now deprecated.

A keyless license installs the embedded keys and allows you to use all the available product options listed in Table 1-7.

You can use the keyless license for 60 days. If you install the product using the keyless option, a message is logged everyday in the Event Viewer indicating that you must perform any one of the following tasks, within 60 days of product installation. Failing this, a non-compliance error is logged every four hours.

- Add the system as a managed host to a Veritas Operations Manager (VOM) Management Server.
  For more details, refer to the VOM documentation.
- Add an appropriate and valid license key on this system using the Symantec product installer from Windows Add/Remove Programs.

In case of an User Entered Key license, you must procure an appropriate license key from the Symantec license certificate and portal. The user entered license allows you to use the product options based on the license key you enter.

https://licensing.symantec.com/

The product installer enables you to switch from a keyless license to a user entered license and vice-a-versa. It thus helps you to overcome the issues faced while removing the left-over temporary keys.

Licensing notes

Review the following licensing notes before you install or upgrade the product.

- If you are installing the product for the first time, the "Keyless" option is available by default.
- While repairing the product installation, licenses can be managed only if "Keyless" license option was selected during the installation. You cannot manage the licenses, if the license option selected was "User Entered Key".
  To manage the licenses in case of "User Entered Key" option, you must use the Windows Add/Remove Programs.
  While managing the licenses, you can change the license option from Keyless to User Entered or vice a versa.
- If you are installing SFW Basic, a basic license key is installed by default. Keyless option is not available in case of SFW Basic installation. Using the Windows Add/Remove Programs you can change the option to Keyless or User Entered Key. If you choose the Keyless option, the product installation changes to SFW. After selecting the Keyless option, you cannot revert back to SFW Basic.
- You must configure Veritas Operations Manager (VOM) within two months of product installation. Failing this, a warning message for non compliance is displayed periodically.
  For more details on configuring VOM, refer to VOM product documentation.
- You can install new licenses or remove the existing licenses using the product installer.

vxlicrep command

The `vxlicrep` command generates a report of the licenses in use on your system.

To use the vxlicrep command to display a license report

1. Access a command prompt.
2. Enter the `vxlicrep` command without any options to generate a default report.
3. Enter the `vxlicrep` command with any of the following options to produce the type of report required:

   -g default report

   -s short report

   -e enhanced/detailed report

   -I print report for valid keys only

   -k <key1, key2, ---- > print report for input keys key1, key2, ----

   -v print version

   -h display this help

Planning a VCS installation

Review the following pre-installation tasks that you must perform, if you plan to install VCS.

Enabling the Computer Browser service for Windows Server 2012

The Microsoft Computer Browser service helps maintain an updated list of domains, workgroups, and server computers on the network and supplies this list to client computers upon request. This service must be enabled for the Symantec product installer to discover and display all domain members during an VCS installation.

By default, systems running Windows Server 2012 (x64) disable the Computer Browser service. With this service disabled, remote domain members on the computer lists do not display during an VCS installation.

Enable the Computer Browser Service on your Windows Server 2012 (x64) systems before installing VCS.

Refer to your Microsoft documentation for information about enabling the Computer Browser service.

Activating Microsoft Windows on your server

Symantec recommends that you activate Microsoft Windows before proceeding with your product installation.

If you do not activate Microsoft Windows before the installation, an "Optional update delivery is not working message" may appear. You can ignore this message, click Close, and continue with the installation.

Chapter 2

Installing VCS

This chapter includes the following topics:

About installing VCS

This section describes the process for a new installation of VCS.

You can perform the installation using either the product installer wizard or the command line interface (CLI).

Note: If you are installing VCS in a VMware environment, it is recommended to first install the Symantec High Availability Console and then install VCS.

As part of the Console installation, the installer registers the Symantec High Availability plugin for VMware vCenter Server. This plugin enables integration of Symantec High Availability with VMware vSphere Client and adds the following options to the VMware vSphere Client:

- Menu to install the Symantec High Availability guest components

- Symantec High Availability home page

- Symantec High Availability tab

- Symantec High Availability dashboard

For details, refer to the *Symantec High Availability Solution for VMware* Guide.

Before you begin to install the product, ensure that you have reviewed and performed the required preinstallation and planning tasks.

Note: If the VOM Managed Host components of any version earlier to 5.0 are installed in your environment, then the guest components installer upgrades these components to its latest version.

During the installation you can choose to separately install the server components or the client components.

If you choose to install the server components, the following options are installed by default:

Client components	This installs the VCS Java Console on the same nodes where the server components are installed.
High Availability Hardware Replication Agents	Veritas Cluster Server Hardware Replication Agent for NetApp
High Availability Database Agents	Veritas Cluster Server Database Agent for SQL This installs the VCS agent for SQL Server 2008 SP3, SQL Server 2008 R2 SP2, and SQL Server 2012
VRTSvbs package	Enables you to add the system as a managed host to the Virtual Business Services. For more details about configuring Virtual Business Services, refer to *Virtual Business Service–Availability User's Guide*

Note: The high availability agents that get installed with the product software are also available in the form of an agent pack. The agent pack is released on a quarterly basis. The agent pack includes support for new applications as well as fixes and enhancements to existing agents. You can install the agent pack on an existing VCS installation.

Refer to the Symantec Operations Readiness Tools (SORT) Web site for information on the latest agent pack availability.

https://sort.symantec.com

Refer to the agent-specific configuration guide for more details about the application agents.

To install the server or client components, using the product installer,

See "Installing the VCS server components using the product installer" on page 25.

See "Installing the VCS server components using the product installer" on page 25.

To install the server or client components, using the CLI,

See "Installing VCS server or client components using CLI" on page 33.

Installing the VCS server components using the product installer

The Symantec product installer enables you to install the server components for the following products:

- Veritas Storage Foundation for Windows (SFW)
- Veritas Storage Foundation and High Availability Solutions for Windows (SFW HA)
- Dynamic Multi-Pathing (DMP) for Windows
- Veritas Cluster Server for Windows

For installing SFW, SFW HA, or DMP refer to the respective installation guide.

Perform the following steps to install VCS server components

1. Insert the software disc containing the installation package into your system's disc drive or download the installation package from the following location:

   https://fileconnect.symantec.com

2. Allow the autorun feature to start the installation or double-click **Setup.exe**.

   The CD browser appears.

Note: If you are installing the software using the product software disc, the CD browser displays the installation options for all the products specified earlier. However, if you are downloading the installation package from the Symantec website, the CD browser displays the installation options only for the product to be installed.

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3 Click to download the required contents.

Note: The client components are installed by default along with the server components. However, on a server core machine, the client components will not be installed.

Veritas Cluster Server 6.0.2	Click to install the server components for Veritas Cluster Server for Windows.
Late Breaking News	Click to access the latest information about updates, patches, and software issues regarding this release.
Windows Data Collector	Click to verify that your configuration meets all pertinent software and hardware requirements.
SORT	Click to access the Symantec Operations Readiness Tools site. In addition to the product download you can also download the custom reports about your computer and Symantec enterprise products, a checklist providing configuration recommendations, and system and patch requirements to install or upgrade your software.
Browse Contents	Click to view the software disc contents.
Technical Support	Click to contact Symantec Technical Support.

4 On the Welcome panel, review the list of prerequisites and click **Next**.

Note that the **Check for product updates** check box is selected by default. The product installer searches for the available product updates on the SORT website. You can then download and apply the available updates. If you do not want to apply the available patches, clear the selection of **Check for product updates** check box.

5 On the License panel, read the license terms, select **I accept the terms of License Agreement**, and then click **Next**.

The **Participate in the Symantec Product Improvement Program by submitting system and usage information anonymously** check box is selected by default. The Product Improvement Program allows the product installer to collect installation, deployment, and usage data and submit it anonymously to Symantec. The collected information helps identify how customers deploy and use the product. If you do not want to participate in the product improvement program, clear the selection of the check box.

6 On the Product Updates panel, review the list of available product updates.

This panel appears only if you have selected the **Check for product updates** check box on the Welcome panel.

The product updates comprise of the pre-installation patches, post-installation patches, High Availability Agents, and Array-Specific Modules. The panel lists the available pre-installation patches and the post-installation patches. Download and apply the pre-installation patches in the sequence shown in the table and rerun the wizard. After the successful installation of the product, apply the post-installation patches. Also download and install the High Availability Agents and Array-Specific Modules from the SORT website.

7 On the System Selection panel, select the systems and the desired Installation and Product options:

You can select the systems in one of the following ways:

- In the System Name or IP text box, manually type the system name or its IP address and click **Add**.

  Note: The wizard does not support the Internet Protocol version 6. To add the systems having Internet Protocol version 6, you must type the system name.

  The local host is populated by default.

- Alternatively, browse to select the systems.
  The systems that belong to the domain in which you have logged in are listed in the Available Systems list. Select one or more systems and click the right arrow to move them to the Selected Systems list. Click **OK**.

Once you add or select a system, the wizard performs certain validation checks and notes the details in the Verification Details box. To review the details, select the desired system.

To select the installation and product options, perform the following tasks on each of the selected system.

Note: To apply the selection to multiple systems, select the system for which you have selected the installation and product options and then click **Apply to multiple systems**.

See "Applying the selected installation and product options to multiple systems" on page 30.

- By default the wizard uses %ProgramFiles%\Veritas as the installation directory. To customize the installation directory, click **Browse** and select the desired location. Click **OK**.
  Install the product at the same location on all the cluster nodes.

  Note: If you plan to configure the cluster for single sign-on authentication, the installation directory must contain only English characters.

  In case your system runs a non-English locale operating system, ensure that the installation directory contains only English characters.

- Select the required license type from the **License key** drop-down list.

  Note: The default license type is "Keyless".

  If you select the "Keyless" license type, all the available product options are displayed and are selected by default.
  If you select "User entered license key" as your license type, the License Details panel appears by default. On the License Details panel, enter the license key and then click **Add**. You can add multiple licenses for the various product options you want to use.
  The wizard validates the entered license keys and displays the relevant error if the validation fails. After the validation is complete, click **OK**.

- From the list of product options, select the options to be installed.
  While you select the options, note the following points:
  - The client components, high availability hardware replication agents, high availability application agents, and the high availability database agents are installed by default.
    For details,

  The options differ depending on your product and environment.
  The following options are available for VCS:

Global Cluster Option (GCO)	Global Cluster Option (GCO) enables you to link clusters to provide wide-area failover and disaster recovery.
Disaster Recovery Manager for Microsoft Hyper-V	Installs the components required for configuring disaster recovery for virtual machines in a Hyper-V environment. For more details on configuring disaster recovery for virtual machines in a Hyper-V environment, refer to *Veritas Storage Foundation™ and Disaster Recovery Solutions Guide for Hyper-V™*.

8 On the System Selection panel, click **Next**.

Note that the wizard fails to proceed with the installation, unless all the selected systems have passed the validation checks and are ready for installation. In case the validation checks have failed on any of the system, review the details and rectify the issue. Before you choose to proceed with the installation, select the system and click **Re-verify** to re-initiate the validation checks for this system.

9 On the Pre-install Summary panel, review the summary and click **Next**.

Note that the **Automatically reboot systems after installer completes operation** check box is selected by default. This will reboot all the selected remote systems immediately after the installation is complete on the respective system. If you do not want the wizard to initiate this auto reboot, clear the selection of **Automatically reboot systems after installer completes operation** check box.

10 On the Installation panel, review the progress of installation and click **Next** after the installation is complete.

If an installation is not successful on any of the systems, the status screen shows a failed installation.

11 On the Post-install Summary panel, review the installation result and click **Next**.

If the installation has failed on any of the system, refer to the log file for details. You may have to re-install the software.

12 On the Finish panel, click **Finish**.

If you had chosen to initiate the auto reboot, a confirmation message to reboot the local system appears. Click **Yes** to reboot immediately or **No** to reboot later.

In case you had not selected to initiate the auto reboot, ensure that you manually reboot these systems.

Note: If you plan to configure the MSMQ service for high availability, you must reboot the system before configuring an MSMQ service group. Otherwise, the clustered MSMQ service fails to initiate, and therefore, the MSMQ resource fails to come online.

This completes the product installation. For configuring application service groups refer to the application implementation guide. For any administrative tasks to be performed, refer to the *Veritas Cluster Server Administrator's Guide*.

Applying the selected installation and product options to multiple systems

To apply the selected installation and product options to multiple systems, perform the following steps:

1. Click on any one of the selected system and select the desired installation and product options.
2. Click **Apply to multiple systems**.
3. On the Apply Installation Options panel, select the installation options to be applied and then select the desired systems. Click **OK**.

Installing the VCS client components using the product installer

The Symantec product installer enables you to install the client components for the following products:

- Veritas Storage Foundation for Windows (SFW)
- Veritas Storage Foundation and High Availability Solutions for Windows (SFW HA)
- Dynamic Multi-Pathing (DMP) for Windows
- Veritas Cluster Server for Windows

For installing SFW, SFW HA or DMP refer to the respective installation guide.

Note: Client components cannot be installed on server core systems.

Before you begin with the installation, ensure that there are no parallel installations, live updates, or Microsoft Windows updates in progress on the systems where you want to install the client components.

Perform the following steps to install VCS client components

1. Insert the software disk containing the installation package into your system's disc drive or download the installation package from the following location:

   https://fileconnect.symantec.com

2. Allow the autorun feature to start the installation or double-click **Setup.exe**.

   The CD browser appears.

3 Click to download the required contents.

Veritas Cluster Server 6.0.2	Click to install the server or client components for Veritas Cluster Server for Windows.
Late Breaking News	Click to access the latest information about updates, patches, and software issues regarding this release.
Windows Data Collector	Click to verify that your configuration meets all pertinent software and hardware requirements.
SORT	Click to access the Symantec Operations Readiness Tools site. In addition to the product download you can also download the custom reports about your computer and Symantec enterprise products, a checklist providing configuration recommendations, and system and patch requirements to install or upgrade your software.
Browse Contents	Click to view the software disc contents.
Technical Support	Click to contact Symantec Technical Support.

4 On the Welcome panel, review the list of prerequisites and click **Next**.

Note that the **Check for product updates** check box is selected by default. The wizard searches for the available product updates on the SORT website. You can then download and apply the available updates. If you do not want to apply the available patches, clear the selection of **Check for product updates** check box.

5 On the License Agreement panel, read the license terms, select **I accept the terms of License Agreement**, and then click **Next**.

The **Participate in the Symantec Product Improvement Program by submitting system and usage information anonymously** check box is selected by default. The Product Improvement Program allows the product installer to collect installation, deployment, and usage data and submit it anonymously to Symantec. The collected information helps identify how customers deploy and use the product. If you do not want to participate in the product improvement program, clear the selection of the check box.

6 On the Product Updates panel, review the list of available product updates.

This panel appears only if you have selected the **Check for product updates** check box on the Welcome panel.

The product updates comprise of the pre-installation patches, post-installation patches, High Availability Agents, and Array-Specific Modules. The panel lists the available pre-installation patches and the post-installation patches. Download and apply the pre-installation patches in the sequence shown in the table and rerun the wizard. After the successful installation of the product, apply the post-installation patches. Also download and install the High Availability Agents and Array-Specific Modules from the SORT website.

7 On the System Selection panel, select the systems and the installation directory.

You can select the systems in one of the following ways:

- In the System Name or IP text box, manually type the system name or its IP address and click **Add**.

  Note: The wizard does not support the Internet Protocol version 6. To add the systems having Internet Protocol version 6, you must type the system name.

  Local host is populated by default.

- Alternatively, browse to select the systems.
  The systems that belong to the domain in which you have logged in are listed in the Available Systems list. Select one or more systems and click the right arrow to move them to the Selected Systems list. Click **OK**.

Once you add or select a system, the wizard performs certain validation checks and notes the details in the Verification Details box. To review the details, select the desired system.

By default the wizard uses %ProgramFiles%\Veritas as the installation directory. To customize the installation directory, click **Browse** and select the desired location. Click **OK**.

To apply the customized directory to multiple systems, click **Apply to multiple systems**. On the Apply Installation Options panel, select the systems to apply the customized directory. Click **OK**.

Note: If you plan to configure the cluster for single sign-on authentication, the installation directory must contain only English characters. In case your system runs a non-English locale operating system, ensure that the installation directory contains only English characters.

8 On the System Selection panel, click **Next**.

Note that the wizard fails to proceed with the installation, unless all the selected systems have passed the validation checks and are ready for installation. In case the validation checks have failed on any of the system, review the details and rectify the issue. Before you choose to proceed with the installation, select the system and click **Re-verify** to re-initiate the validation checks for this system.

9 On the Pre-install Summary panel, review the summary and click **Next**.

10 On the Installation panel, review the progress of installation and click **Next** after the installation is complete.

If an installation is not successful on any of the systems, the status screen shows a failed installation.

11 On the Post-install Summary panel, review the installation result and click **Next**.

If the installation has failed on any of the system, refer to the log file for details. You may have to re-install the software.

12 On the Finish panel, click **Finish**.

This completes the installation of the client components.

Installing VCS server or client components using CLI

You can perform a silent installation using the command line interface at the command prompt with the Setup.exe command. With a silent installation, you can only install on one computer at a time.

During the installation ensure that you verify the following points:

- There are no parallel installations, live updates, or Microsoft Windows updates in progress.
- For Windows Server 2012, all CLI commands must run in the command window in the "run as administrator" mode.

Note: If you plan to configure the MSMQ service for high availability, you must reboot the system after installing VCS for Windows and before configuring an MSMQ service group. Otherwise, the clustered MSMQ service fails to initiate, and therefore, the MSMQ resource fails to come online.

To install from the command line

1. If you are installing the package from the software disc, insert the product software disc into your system's drive.
2. Log into a console session.
3. Open a command window by clicking **Start** > **Run**.
4. Enter `cmd` in the Open field and click **OK**.
5. Navigate to the root directory of your software disc.

   If you are downloading the installation software from the Symantec web site, then navigate to the download path where the setup.exe is located.
6. Use the following command syntax to install the product software.

   For example,

   ```
   Setup.exe /s Solutions="SolutionID"
   Install_mode=InstallMode
   Telemetry=Telemetry
   Installdir="InstallDirPath" Reboot=RebootMode
   NODE="SysA" Licensekey="LicenseKey"
   options="a,b,c,..."
   NoOptionDiscovery=NoOptionDiscovery
   GetPatchInfo=GetPatchInfo
   ```

   Where the maximum length of the argument string is 2,048 characters and the syntax is not case sensitive.

   Note: The "Licensekey" parameter is applicable only if you plan to use the "User entered license key" as your license type. You need not specify this parameter for "Keyless" license type.

Parameters for setup.exe

Table 2-1 contains information about the possible parameter values.

Table 2-1 Parameters for setup.exe

Parameter	Use
/s	Set for silent mode. If not set, boots the product installer GUI.
INSTALL_MODE	Set to indicate an installation or uninstallation. 1 = To install 4 = To repair 5 = To uninstall Example: INSTALL_MODE=1
SOLUTIONS	Set to the type of installation. 6 = VCS Server Components (includes client components) 7 = VCS Client Components only Example: SOLUTIONS="6"
Telemetry	Set this parameter to participate in the Symantec Product Improvement Program by submitting system and usage information anonymously. The Product Improvement Program allows the product installer to collect installation, deployment, and usage data and submit it anonymously to Symantec. The collected information helps identify how customers deploy and use the product. If you do not want to participate in the product improvement program, set this parameter to 0.
Install_dir	Set the installation directory path. The path must start and end with a quotation mark. The default setting is SystemDrive: \Program files\Veritas Example: INSTALLDIR="C:\InstallationDirectory" This is an optional parameter. **Note:** If you plan to configure the cluster for single sign-on authentication and your system runs a non-English locale operating system, ensure that the installation directory contains only English characters.

Table 2-1 Parameters for setup.exe *(continued)*

Parameter	Use
Reboot	Set for the automatic reboot of the system at the completion of the installation. 0 = No reboot 1 = Reboot The default setting is 0 for no system reboot. Example: Reboot=1 **Note:** This is an optional parameter.
Node	Set the node name. Specify only one node at a time. The local node is the default setting when the node is unspecified. The machine name of the node must start and end with a quotation mark ("). Example: Node="PC177VM-3"
LICENSEKEY	Set the license key for the installation. Enter multiple keys by separating them with a comma (e.g. 123-345-567-789-123, 321-543-765-789-321, etc.) The license key must start and end with a quotation mark ("). LicenseKey has no default setting. Example: LICENSEKEY="123-234-123-234-345" **Note:** This parameter is applicable only if you plan to use the "User entered license key" as your license type. You need not specify this parameter for "Keyless" license type.

Table 2-1 Parameters for setup.exe *(continued)*

Parameter	Use
Options	Set the desired options, if any. The option must start and end with a quotation mark ("). Multiple options can be entered, using a comma as a separator. Options differ depending on your product and environment. There are no default settings. The options for VCS are: ■ GCO (Global Cluster Option) ■ HYPERV (Disaster Recovery Manager for Microsoft Hyper-V) ■ ALL (To install all the available options) Example: OPTIONS="GCO" **Note:** During an upgrade, you must specify the previously installed options in the OPTIONS parameter, else they will be uninstalled. To include the previously installed options in this parameter, either specify these options individually in the OPTIONS parameter or specify “Installed” in the OPTIONS parameter to upgrade all options (example: options=”Installed,GCO”).
NoOptionDiscovery	Set this parameter to uninstall the previously installed options during an upgrade. Default value is 0. If this parameter is set to 0, the setup discovers the previously installed options which are not specified in the OPTIONS parameter, and the setup exits. Rerun the setup and either include the previously installed options individually in the OPTIONS parameter or specify "Installed" in the OPTIONS parameter. If you set this parameter to 1 during an upgrade, the setup uninstalls the previously installed options which are not specified in the OPTIONS parameter.

Table 2-1 Parameters for setup.exe *(continued)*

Parameter	Use
GetPatchInfo	Set this parameter to search for available product updates. 1 = Lists available updates 0 = Does not list available updates Default value is 1. The product updates comprise of the pre-installation patches, post-installation patches, High Availability Agents, and Array-Specific Modules. If you set this parameter to 1, then the available pre-installation patches and post-installation patches are listed. If any pre-installation patches are available, then the setup exits to let you download and apply the pre-installation patches. Apply the pre-installation patches in the sequence displayed and rerun the setup with GetPatchInfo = 0. After the successful installation of the product, apply the post-installation patches. Also download and install the High-Availability Agents and Array-Specific Modules from the SORT website.

Silent installation example: VCS client

This sample command installs the client components at the specified installation path and tells the system not to reboot at the end of the installation.

```
Setup.exe /s Solutions=7 Install_mode=1 Telemetry=1
Installdir="C:\InstallationDirectory"
```

Silent installation: VCS server and client

This sample command installs the server components in the directory C:\InstallationDirectory and tells the system to reboot at the end of the installation. It also installs with a license key of 123-234-123-234-345, and with the GCO option.

```
Setup.exe /s Solutions=6 Install_mode=1 Telemetry=1
INSTALLDIR="C:\InstallationDirectory" REBOOT=1
licensekey="123-234-123-234-345" options="GCO"
```

Chapter 3

Administering VCS installation

This chapter includes the following topics:

Adding or removing product options

After you have installed VCS, you may need to add or remove the product options.

Note the following points before you begin to add or remove the product options:

- You cannot add or remove the product options on a system that runs Server Core operating system. To add or remove the product options on these systems you must uninstall the product and then install it again using the new licenses.
- You can add or remove the product options on the local system only.
- You can add or remove the product options only if you have installed the server components.

Before you choose to add any product option, ensure that you have reviewed and performed the required pre-installation and planning tasks, if any, for the option you want to install.

To add or remove features

1. Open the Windows Control Panel and click **Programs and Features**.
2. Select **Veritas Cluster Server 6.0.2 for Windows** and click **Change**.

3 On the **Mode Selection** panel, select **Add or Remove** and then click **Next**.

4 On the System Selection panel, the wizard performs the verification checks and displays the applicable installation and product options. In case the verification checks have failed, review the details and rectify the issue. Before you choose to proceed with the installation click **Re-verify** to re-initiate the verification checks.

Note that the wizard enables you to proceed only if the verification checks are passed.

To add or remove the options, select or clear the product option check boxes to add or remove the respective component.

Note: You can add or remove the features only if you have selected **User entered license key** as your license type. Also, only the options included in your product license, will be enabled for selection. To select any other option, you must first enter the required license details.

For details on managing your licenses See "Managing VCS licenses" on page 41.

---

5 On the System Selection panel, click **Next**.

The wizard performs the verification checks and proceeds to the Pre-install Summary panel.

Note that the wizard proceeds only if the verification checks are passed.

6 On the Pre-install Summary panel, review the summary and click **Next**.

Note that the **Automatically reboot systems after installer completes operation** check box is selected by default. This will reboot all the selected remote systems immediately after the installation is complete on the respective system. If you do not want the wizard to initiate this auto reboot, clear the selection of **Automatically reboot systems after installer completes operation** check box.

7 On the Installation panel, review the progress of installation and click **Next** after the installation is complete.

If an installation is not successful, the status screen shows a failed installation. Refer to the Post-install summary for more details. Rectify the issue and then proceed to re-install the component.

8 On the Post-install Summary panel, review the installation result and click **Next**.

If the installation has failed, refer to the log file for details.

9 On the Finish panel, click **Finish**.

If you had chosen to initiate the auto reboot, a confirmation message to reboot the local system appears. Click **Yes** to reboot immediately or **No** to reboot later.

In case you had not selected to initiate the auto reboot, ensure that you manually reboot these systems.

For adding the DMP DSMs, if you had disconnected all but one path, you must reconnect the additional physical path now.

You can now proceed to configure the service groups for the newly added options.

For details, refer to *Veritas Cluster Server Administrator's Guide*.

Managing VCS licenses

After you have installed VCS, you may need to manage the product licenses to add or remove the product options.

You can manage your licenses by performing any of the following tasks:

- Changing the license type that you had selected during the installation.
  You can change the type of license you had selected during the installation.
  For the **Keyless** license type, all the product options are enabled by default. You can choose to clear the options that you do not intend to use.
  For the **User entered license key**, the product options available are based on the licenses you enter.
- Adding or removing the license keys.
  You can add or remove the license keys only if the license type selected is "User entered license key".

Note the following points before you begin to manage the licenses:

- You cannot manage licenses on a system that runs Server Core operating system. To manage licenses on these systems you must uninstall the product and then install it again using the new licenses.
- You can manage the licenses on the local system only.
- You can manage the licenses only if you have installed the server components.

To manage licenses

1. Open the Windows Control Panel and click **Programs and Features**.
2. Select **Veritas Cluster Server 6.0.2 for Windows** and click **Change**.
3. On the Mode Selection panel, select **Add or Remove** and then click **Next**.
4. On the System Selection panel, the wizard performs the verification checks and displays the applicable installation and product options. In case the verification checks have failed, review the details and rectify the issue. Before you choose to proceed with the installation click **Re-verify** to re-initiate the verification checks.

   Note that the wizard enables you to proceed only if the verification checks are passed.

   To manage the licenses, perform any of the following applicable task:

   - To change the license type, select the required license type from the **License key** drop-down list.
     If you change your license type to "Keyless", all the available product options appear and are selected by default. Clear the selection for the product options that you do not intend to use and then proceed through step 7.
     If you change your license type to "User entered license key", the License Details panel appears by default. Proceed through step 5 to add the license keys.
   - To add or remove the licenses, click **Edit**.
5. On the License Details panel, enter the license key and then click **Add**.

   Repeat the step to add multiple licenses for the various product options you want to use.

   The wizard validates the entered license keys and displays the relevant error if the validation fails.
6. On the License Details panel, click **OK**.

   The wizard displays the applicable installation and product options on the System Selection panel.

7 On the System Selection panel, select or clear the required product options and then click **Next**.

The wizard performs the verification checks and proceeds to the Pre-install Summary panel. In case the verification checks have failed, review the details and rectify the issue. Before you choose to proceed with the installation click **Re-verify** to re-initiate the verification checks.

Note that the wizard proceeds only if the verification checks are passed.

8 On the Pre-install Summary panel, review the summary and click **Next**.

Note that the **Automatically reboot systems after installer completes operation** check box is selected by default. This will reboot all the selected remote systems immediately after the installation is complete on the respective system. If you do not want the wizard to initiate this auto reboot, clear the selection of **Automatically reboot systems after installer completes operation** check box.

9 On the Installation panel, review the progress of installation and click **Next** after the installation is complete.

If an installation is not successful, the status screen shows a failed installation. Refer to the Post-install summary for more details. Rectify the issue and then proceed to re-install the component.

10 On the Post-install Summary panel, review the installation result and click **Next**.

If the installation has failed, refer to the log file for details.

11 On the Finish panel, click **Finish**.

If you had chosen to initiate the auto reboot, a confirmation message to reboot the local system appears. Click **Yes** to reboot immediately or **No** to reboot later.

In case you had not selected to initiate the auto reboot, ensure that you manually reboot these systems.

Note: If you make any changes to the licenses, you must restart VCS High Availability Engine service for the changes to take effect. If remove all the licenses, VCS High Availability Engine service fails to start. To start the VCS High Availability Engine service you must enter the required licenses and then run the `hastart` command or manually start VCS High Availability Engine service.

Repairing the VCS installation

The product installer can repair an existing installation of the VCS client and server components.

The **Repair** option restores the installation to its original state. This option fixes missing or corrupt files, shortcuts, and registry entries on the local computer.

You can repair the installation only on the local system.

Note: Before you proceed to repair the installation, you must save your configuration to another system and failover the service groups for your applications to another node.

To repair the installation

1. Open the Windows Control Panel and click **Programs and Features**.
2. Select **Veritas Cluster Server 6.0.2 for Windows**.

   If you have installed the client components, select **Veritas Cluster Server 6.0.2 for Windows (Client Components)**.
3. Click **Change**.
4. On the Mode Selection panel, select **Repair**. Click **Next**.
5. On the System Selection panel, installer performs the verification checks. Click **Next** once the status is "Ready for repair".

   In case the verification checks have failed, review the details and rectify the issue. Before you choose to proceed with the installation, click **Re-verify** to re-initiate the verification checks.

   Note: You cannot select the installation and product options.

   ---
6. On the Pre-install Summary panel, review the information and click **Next** to begin the repair process.

   Note that if you are repairing the server installation, the **Automatically reboot systems after installer completes operation** check box is selected by default. This will reboot the node immediately after the repair operation is complete. If you do not want the wizard to initiate this auto reboot, clear the selection of **Automatically reboot systems after installer completes operation** check box.

7 On the Installation panel, review the list of services and processes running on the systems. Select a system to view the services and processes running on it.

The wizard stops the product-specific services and discovers the processes running, if any, on the systems. These processes need to be stopped to proceed with the operation. Click **Next** to forcefully stop the processes and proceed with the operation. Alternatively, you can manually stop the processes.

If the services or processes cannot be stopped, the operation fails. Rectify the error and then click **Retry** to validate the affected system again. Click **Retry All** to validate all the systems again.

8 On the Post-install Summary panel, review the summary and click **Next**.

9 On the Finish panel, click **Finish**.

In case you had not selected to initiate the auto reboot, ensure that you manually reboot the node.

About reinstalling VCS

If your product installation has failed due to some reason, you can choose to reinstall it without uninstalling the components that were installed during the failed attempt.

Note: You must reboot your system before you begin to reinstall the product.

To reinstall the product, rectify the cause of failure and then procced with the installation.

If you choose to install the product using the product installer wizard, during the installation a confirmation message is displayed on the System Selection panel. Click **Yes** to proceed with the installation.

Chapter 4

Uninstalling VCS

This chapter includes the following topics:

About uninstalling VCS

You can completely uninstall the product using the product installer wizard or through CLI. However, if you want to uninstall any of the installed product options, you must choose the Add or Remove feature.

Before you uninstall VCS, you must unconfigure the cluster. Use the Veritas Cluster Configuration Wizard (VCW) to unconfigure the cluster. See the *Veritas Cluster Server Administrator's Guide* for more information.

Uninstalling VCS using the product installer

The Symantec Product Installer wizard enables you to uninstall the product software. You can simultaneously uninstall the product from multiple remote nodes. To uninstall the product from remote nodes, ensure that the product is installed on the local node.

Uninstalling the Server components, uninstalls the client components and the high availability, replication and the database agents.

To uninstall using the product installer

1. In the Windows Control Panel, select **Programs and Features**.
2. Select **Veritas Cluster Server 6.0.2 for Windows**.

   If you had installed the client components, click **Veritas Cluster Server 6.0.2 for Windows (Client Components)**.
3. Click **Uninstall**.
4. Review the information on the Welcome panel and then click **Next**.
5. On the System Selection panel, add the nodes from which you want to uninstall the product software.

   Note: By default the local system is selected for uninstallation. In case you are performing a remote uninstallation and do not want to uninstall the software from the local system, you must remove the node from the list.

   You can add the nodes in one of the following ways:

   - In the System Name or IP text box, manually type the node name and click **Add**.

     Note: The wizard does not support the internet protocol version 6. To add the systems having internet protocol version 6, you must type the system name.

   - Alternatively, browse to select the nodes.
     The nodes that belong to the domain in which you have logged in are listed in the Available Systems list. Select one or more nodes and click the right arrow to move them to the Selected Systems list. Click **OK**. Once you add or select a node, wizard performs the verification checks and notes the verification details.
6. Click **Next**.

   Note that the wizard fails to proceed with the uninstallation, unless all the selected nodes have passed the verification checks and are ready for uninstallation. In case the verification checks have failed on any of the system, review the details and rectify the issue. Before you choose to proceed with the uninstallation click **Re-verify** to re-initiate the verification checks for this node.

7 On the Pre-install Summary panel, review the summary and click **Next**.

Note that the **Automatically reboot systems after installer completes operation** check box is selected by default. This will reboot the remote systems immediately after the installation is complete on the respective system. If you do not want the wizard to initiate this auto reboot, clear the selection of **Automatically reboot systems after installer completes operation** check box.

8 On the Uninstallation panel, review the list of services and processes running on the systems. Select a system to view the services and processes running on it.

The wizard stops the product-specific services and discovers the processes running, if any, on the systems. These processes need to be stopped to proceed with the operation. Click **Next** to forcefully stop the processes and proceed with the operation. Alternatively, you can manually stop the processes.

If the services or processes cannot be stopped, the operation fails. Rectify the error and then click **Retry** to validate the affected system again. Click **Retry All** to validate all the systems again.

9 On the Post-uninstall Summary panel, review the uninstallation results and click **Next**.

If the uninstallation has failed on any of the system, review its summary report and check the log file for details.

10 On the Finish panel, click **Finish**.

In case you had not selected to initiate the auto reboot for the remote nodes, ensure that you manually reboot these nodes.

Uninstalling VCS using the command line

You can silently uninstall the product software through the command prompt, using the `VPI.exe` command.

The `VPI.exe` command syntax is as follows:

```
%Installation Directory%\Veritas Shared\VPI\
{F834E070-8D71-4c4b-B688-06964B88F3E8}\{6.0.2.xxx}\VPI.exe install_mode=5
solutions=1 telemetry=1 reboot=1
```

Table 4-1 displays information about the possible parameter values for uninstalling the software:

Table 4-1 Parameters for uninstalling the software

Parameter	Use
/s	Set for silent mode.
INSTALL_MODE	Set to indicate an install or uninstall. *1* = To install *4* = To repair *5* = To uninstall The default setting is *1* to install. Set this parameter to 5 for uninstall. Example: INSTALL_MODE=*5*
SOLUTIONS	Set to the type of uninstallation. *6* - VCS Server Components (includes client components) *7* - VCS Client Components only Example: Solutions="6" Example: SOLUTIONS=1
TELEMETRY	Set this parameter to participate in the Symantec Product Improvement Program by submitting system and usage information anonymously. The Product Improvement Program allows the product installer to collect installation, deployment, and usage data and submit it anonymously to Symantec. The collected information helps identify how customers deploy and use the product. If you do not want to participate in the product improvement program, set this parameter to 0.
REBOOT	Set for the automatic reboot of the system at the completion of the installation. *0* = No reboot *1* = Reboot The default setting is *0* for no system reboot. Example: REBOOT=*1*

Table 4-1 Parameters for uninstalling the software *(continued)*

Parameter	Use
NODE	Set the node name. You can enter only one node at a time. The local node is the default setting when the node is unspecified. The machine name of the node must start and end with a quotation mark ("). Example: Node="*SysA*" **Note:** Reboot the system at the end of uninstallation to ensure that all components are uninstalled correctly. You do not have to reboot after uninstalling the client.

The following procedure describes how to uninstall the software from the command prompt.

To uninstall from the command prompt

1. Open a command window by clicking **Start > Run**.
2. Enter `cmd` in the Open field and click **OK**.
3. In the command window, navigate to the root directory of the product software disk.
4. Use the following command syntax to silently uninstall VCS:

```
VPI.exe /s INSTALL_MODE=InstallMode
 SOLUTIONS="1'
Telemetry=Telemetry
[REBOOT=RebootMode ] [NODE="SysA"]
```

Uninstall command examples

The following uninstall command example completely uninstalls the VCS client components from the local node, and reboots the system at the end of the uninstall process:

```
VPI.exe /s Solutions=7 Install_mode=5 Telemetry=1 Reboot=0
```

The following uninstall command example completely uninstalls the VCS server components from the local node, and reboots the system at the end of the uninstall process:

```
VPI.exe /s Solutions=6 Install_mode=5 Telemetry=1 Reboot=1
```

Chapter 5

Application upgrades

This chapter includes the following topics:

About the application upgrades in a VCS cluster

This section describes the tasks to be performed if you plan to upgrade your application or its compatible service pack in a VCS environment.

Before you begin to upgrade, refer to, the list of supported applications.

See "Supported applications" on page 15.

For application upgrade,

See "Upgrading SQL Server" on page 53.

For service pack upgrade,

See "Upgrading application service packs in a VCS cluster" on page 63.

Upgrading SQL Server

This section describes the following Microsoft SQL Server upgrade scenarios, in VCS environment:

SQL Server upgrade scenarios	Refer to
Upgrading Microsoft SQL Server 2008 to Microsoft SQL Server 2008 R2	See "Upgrading Microsoft SQL Server 2008 to SQL Server 2008 R2 " on page 54.

SQL Server upgrade scenarios	Refer to
Upgrading Microsoft SQL Server 2008 or 2008 R2 to Microsoft SQL Server 2012	See "Upgrading from Microsoft SQL Server 2008 or SQL Server 2008 R2 to SQL Server 2012 " on page 60.

Note: If you plan to upgrade SQL Server with its compatible service pack

See "Upgrading SQL Server 2008 or 2008 R2 with the latest service packs in a VCS cluster" on page 64.

Upgrading Microsoft SQL Server 2008 to SQL Server 2008 R2

The following steps describe how to upgrade SQL Server 2008 to SQL Server 2008 R2 in a VCS cluster. Complete these steps on all the cluster nodes that are part of the SQL service group, one node at a time.

Note: These steps are applicable only if you already have SQL Server 2008 set up in a VCS cluster environment.

At a high level, upgrading Microsoft SQL Server 2008 to SQL Server 2008 R2 involves the following tasks:

- Ensure that you have installed VCS on all the SQL service group cluster nodes that you wish to upgrade.
- Take a backup of the SQL databases.
- Upgrade SQL Server on the first cluster node.
- Upgrade SQL Server on each additional failover node.
- In case of a Disaster Recovery configuration, ensure that the databases on the primary and secondary sites are synchronized and then proceed to upgrade the cluster.
  You can upgrade the cluster using one of the following method:
  - Adding a temporary disk and creating the volumes similar to that on the primary site.
    To upgrade the cluster using this method, perform the set of pre-upgrade tasks and then proceed to upgrade the cluster on both the sites. You must follow the same upgrade sequence simultaneously at both sites, upgrade first node and then the additional nodes, as described in the procedures.
    See "Preupgrade tasks for upgrading SQL Server 2008 to 2008 R2 in a disaster recovery environment" on page 55.

- Deleting the SQL Server 2008 and then creating the service group for SQL Server 2008 R2.
  Follow this method only if the data size is small. After you re-create the service groups and setup replication across the two sites, the entire data will be replicated. This involves a considerable amount of time.
  See "Deleting the SQL Server 2008 service group and creating the service group SQL Server 2008 R2" on page 59.

- Run the SQL Server 2008 configuration wizard in the modify mode, to modify the SQL Server 2008 service group.

To configure a new HA and DR environment for SQL Server, refer to the *Veritas Cluster Server Implementation Guide for Microsoft SQL Server* .

Preupgrade tasks for upgrading SQL Server 2008 to 2008 R2 in a disaster recovery environment

Before you proceed to upgrade the cluster nodes in case of a disaster recovery setup, ensure that you perform the following tasks on the secondary site for the SQL instances you want to upgrade.

- Freeze the service group using the VCS Cluster Manager (Java Console).
- Obtain the drive letter on which the system database and the analysis service reside, using the following command:
  `hadiscover -discover SQLServer2008 StartUpParams:`*`INSTANCE2K8`*
  The sample output is similar to the following:

```
<Discovery>
<Attr_Name>
StartUpParams:INSTANCE2K8
</Attr_Name>
<Discover_value>
<Scalar_value>
SQLDataPath: E:\Program Files\Microsoft SQL Server\
MSSQL10.INSTANCE2K8\MSSQL\DATA\
</Scalar_value>
</Discover_value>
<Discover_value>
<Scalar_value>
SQLErrLogPath: E:\Program Files\Microsoft SQL Server\
MSSQL10.INSTANCE2K8\MSSQL\LOG\ERRORLOG
</Scalar_value>
</Discover_value>
<Discover_value>
```

```
<Scalar_value>
OLAPDataPath: E:\Program Files\Microsoft SQL Server\
MSAS10.INSTANCE2K8\OLAP\Data
</Scalar_value>
</Discover_value>
</Discovery>
```

- Attach a temporary disk and create a volume with the drive letter same as that for the instance on which the system database resides.

  Note: If you are upgrading more than one instance having system database path and the OLAP data path on separate volumes, you must complete the upgrade of each instance on both the sites and then proceed to upgrade the next instance.

- Review the SQLDataPath, SQLErrLogPath and the OLAPDataPath directory and create the same on the temporary disk.

  Note: In case the directory path exists on different volumes, ensure that you create similar volumes and then create the required directory paths.

- Copy the following files from the primary site to the data path created on the secondary site.
  - master.mdf
  - mastlog.ldf
  - model.mdf
  - modellog.ldf
  - MSDBData.mdf
  - MSDBLog.ldf
  - tempdb.mdf
  - templog.ldf

Upgrading SQL Server 2008 to 2008 R2 on the first cluster node

These steps assume a single SQL Server instance configured in a two-node cluster configuration.

To upgrade SQL Server on the first cluster node

1 On the node on which the SQL service group is online, take all the resources (excluding the storage resources) offline.

From the VCS Cluster Manager (Java Console), right-click the resource and select Offline. Click Yes in the confirmation pop-up box to take the resource offline.

2 Take a backup of the SQL Server 2008 directories from the shared disk and store them in a temporary location.

You will need the backed-up directories while upgrading SQL on the additional failover nodes, later.

3 Delete the RegRep resource.

4 Freeze the SQL service group using the VCS Cluster Manager (Java Console).

From the VCS Cluster Manager (Java Console), right-click the SQL Server service group in tree view on the left pane, and click **Freeze** > **Persistent**.

5 Launch the Microsoft SQL Server installer for SQL Server 2008 R2, and install SQL Server on the node. Make sure that you select the option to upgrade the existing SQL Server instance(s), when prompted to do so. Also, ensure that the instance name or id is the same on all the cluster nodes.

The SQL Server installer then automatically places the SQL data files in the appropriate location.

Refer to the Microsoft SQL Server documentation for instructions.

6 Unfreeze and then take the SQL Server service group offline. From the VCS Cluster Manager (Java Console), right-click the SQL Server service group in tree view on the left pane and click **Unfreeze**, and then take the entire service group offline on the node.

This completes the upgrade steps on the first cluster node. Proceed to upgrading SQL on the additional failover nodes.

Upgrading SQL Server 2008 to 2008 R2 on additional failover nodes

Perform the following steps on each additional failover node that is a part of the SQL service group.

To upgrade SQL Server on the additional node

1. Bring the storage resources online. From the VCS Cluster Manager (Java Console), right-click the resource and select **Online**. Click **Yes** in the confirmation pop-up box to bring the resource online.
2. Delete the original RegRep folder and rename the SQL Server data directories on the shared disks. These directories are updated when the SQL Server 2008 R2 is installed on the first node. You can also delete these directories, if desired.
3. Copy the backed-up SQL Server 2008 databases from the temporary location to the shared disks. The backup directories are the same that you had backed up earlier while upgrading SQL on the first cluster node.
4. Freeze the SQL service group.

   From the VCS Cluster Manager (Java Console), right-click the SQL Server service group in tree view on the left pane and click **Freeze** > **Persistent**.
5. Launch the Microsoft SQL Server 2008 R2 installer and install SQL Server on the node. Make sure that you select the option to upgrade the existing SQL Server instance(s), when prompted to do so. The SQL Server installer then automatically places the SQL data files in the appropriate location.

   Refer to the Microsoft SQL Server documentation for instructions.
6. From the VCS Cluster Manager (Java Console), right-click the SQL Server service group in tree view on the left pane and click **Unfreeze**, and then take the entire service group offline on the node.

   Note: If there are no additional nodes for upgrade, you need not offline the service group.

   This completes the upgrade steps on the additional failover node. Proceed to modify the SQL Server service group configuration.

Modifying the SQL Server 2008 service group configuration

From the last upgraded node, run the SQL Server 2008 Configuration Wizard in modify mode to modify the SQL Server 2008 service group configuration.

Note: In case of a Disaster Recovery setup, repeat these steps on the first cluster node at the secondary site and then reconfigure the DR components.

Refer to *Veritas Cluster Server Implementation Guide for Microsoft SQL Server 2008* for instructions.

To modify the SQL Server configuration

1. Rename the Registry (RegRep) directory on the shared disk.
2. On the first cluster node, bring the storage resources of the SQL service group, online.
3. Run the SQL Server 2008 wizard in the modify mode and follow the wizard steps.

   When asked for, provide the location for the RegRep resource. This creates a new RegRep for the version of SQL Server 2008 R2.

   Refer to the *Veritas Cluster Server Implementation Guide for Microsoft SQL Server 2008* for detailed instructions on how to create the service group using the SQL Server 2008 Configuration Wizard.
4. After modifying the SQL Server service group, verify the configuration by switching the service group to another node in the cluster.
5. Delete the RegRep directory that you renamed in the first step.

Deleting the SQL Server 2008 service group and creating the service group SQL Server 2008 R2

Perform this task only if you are upgrading SQL Server 2008 to 2008 R2 in the following environment:

- The VCS cluster is set up in a disaster recovery environment.
- You have chosen to follow the upgrade by deleting the SQL Server 2008 service group and then creating the service group for SQL Server 2008 R2.

Perform the following tasks, to delete the SQL Server 2008 service group and then create the service group for SQL Server 2008 R2

- Using the VCS Cluster Manager (Java Console), offline and delete the service group for the instance you want to upgrade, on both the sites.
- Stop the replication between the primary and the secondary site.
- For the selected instance mount the created volumes and LUNs on any one of the cluster node, on both the sites.

  Note: Ensure that the instance name and id is the same on all the cluster nodes.

- Launch the Microsoft SQL Server 2008 R2 installer and install SQL Server 2008 R2 on the node. Make sure that you select the option to upgrade the existing SQL Server instance(s), when prompted to do so.

- To upgrade the additional nodes, dismount the volumes on the upgraded node and mount them on the node to be upgraded. Launch the SQL Server 2008 R2 installer to install SQL Server 2008 R2.
  Repeat this task for each additional node.
- Create the SQL Service group, reconfigure the DR components and then set the required resource dependency.
  For details, refer to *Veritas Cluster Server Implementation Guide for Microsoft SQL Server* .

Upgrading from Microsoft SQL Server 2008 or SQL Server 2008 R2 to SQL Server 2012

The following steps describe how to upgrade your existing clustered SQL Server 2008 or SQL Server 2008 R2 setup to SQL Server 2012, in a VCS cluster. Complete these steps on all the cluster nodes that are part of the SQL service group, one node at a time.

Note: These steps are applicable only if you already have SQL Server 2008 or SQL Server 2008 R2 set up in your cluster environment.

At a high level, upgrading to SQL Server 2012 involves the following tasks:

- Upgrade SQL Server on the first cluster node.
- Upgrade SQL Server on each additional failover node.
- In case of a Disaster Recovery configuration, repeat the SQL upgrade procedures on the nodes at the secondary site. First upgrade the first cluster node at the DR site, and then the additional failover nodes.
- Delete the existing SQL Server 2008 or SQL Server 2008 R2 service group, including the service group at the DR site, if applicable.
- Create a SQL Server 2012 service group, using the SQL Server 2012 Configuration Wizard. In case of a DR setup, create a service group at the secondary site also.

Note: In case of a Disaster Recovery setup, you must first upgrade SQL on the cluster nodes at the primary site and then proceed with the nodes at the secondary site. You must follow the same upgrade sequence at both sites, upgrade first node and then the additional nodes, as described in the procedures in this section.

Ensure that you perform the following before the upgrade:

- Take a backup of the SQL databases.
- In case of a Disaster Recovery environment, ensure that the databases on the primary and secondary sites are synchronized and then stop the replication between the sites.
- Ensure that you have installed VCS on all the SQL service group cluster nodes that you wish to upgrade.
- Make a note of the SQL virtual server name and all the IP addresses configured at both the primary and the secondary site, for the SQL setup in the DR environment. You will need these details later.

Upgrading SQL on the first cluster node

These steps assume a single SQL Server instance configured in a two-node cluster configuration.

To upgrade SQL Server on the first cluster node

1. On any one of the cluster node on which you want to upgrade SQL Server, take all the SQL Server 2008 or 2008 R2 service group resources (excluding the storage resources) offline and delete the same.

   If the resources are already offline, bring the storage resources online. To bring the resource online, from the VCS Cluster Manager (Java Console), right-click each of the resource and select **Online**. Click **Yes** in the confirmation pop-up to bring the resource online.

2. Take a backup of the SQL Server 2008 or 2008 R2 database from the shared disk and store them in a temporary location.

   You will need the backed-up directories while upgrading SQL Server on the additional failover nodes.

3. Launch the Microsoft SQL Server 2012 installer and install SQL Server 2012 on the node. Make sure that you select the option to upgrade the existing SQL Server instance(s), when prompted to do so. The SQL Server 2012 installer then automatically places the SQL data files in the appropriate location.

   Refer to the Microsoft SQL Server 2012 documentation for instructions.

4. Take the entire service group offline on the node.

   This completes the upgrade steps on the first cluster node. Proceed to upgrading SQL on the additional failover nodes.

Upgrading SQL on the additional failover node

Perform the following steps on each additional failover node that is part of the SQL service group.

To upgrade SQL Server on the additional node

1. Bring the storage resources online. From the VCS Cluster Manager (Java Console), right-click each of the resource and select **Online**. Click **Yes** in the confirmation pop-up box to bring the resource online.
2. Rename the SQL Server data directories on the shared disks. These directories are updated when SQL Server is installed on the first node. You can also delete these directories, if desired.
3. Copy the backed-up SQL Server 2008 or 2008 R2 data directories from the temporary location to the shared disks.

   The backed-up directories are the same that you had backed up earlier while upgrading SQL Server on the first cluster node.
4. Launch the Microsoft SQL Server 2012 installer and install SQL Server 2012 on the node. Make sure that you select the option to upgrade the existing SQL Server instance(s), when prompted to do so. The SQL Server 2012 installer then automatically places the SQL data files in the appropriate location.

   Refer to the Microsoft SQL Server 2012 documentation for instructions.
5. Take the entire service group offline on the node.

   Note: If there are no additional nodes for upgrade, you need not offline the service group.

   This completes the upgrade steps on the additional failover node. Delete the existing SQL Server 2008 or 2008 R2 service group and proceed to create SQL Server 2012 service group in the cluster.

Create SQL Server 2012 service group in a VCS cluster

To configure the SQL Server 2012 service group, run the SQL Server 2012 Configuration Wizard, from the last upgraded node.

Refer to *Veritas Cluster Server Implementation Guide for Microsoft SQL Server 2012* for instructions.

Note: In case of a Disaster Recovery setup, repeat these steps on the first cluster node at the secondary site and then reconfigure the DR components.

Refer to the *Veritas Cluster Server Implementation Guide for Microsoft SQL Server 2012* for instructions.

To create the SQL Server 2012 service group

1. Rename the Registry (RegRep) directory, if present, on the shared disk.
2. Create the SQL Server 2012 service group using the SQL Server 2012 Configuration Wizard.

   Refer to *Veritas Cluster Server Implementation Guide for Microsoft SQL Server 2012* for detailed instructions on how to create the service group using the SQL Server 2012 Configuration Wizard.
3. After creating the SQL Server service group, verify the configuration by switching the service group to another node in the cluster.
4. Delete the RegRep directory that you renamed in the first step.

Upgrading application service packs in a VCS cluster

This section describes the tasks to be performed if you plan to upgrade your application to its compatible service pack in a VCS environment.

The outlined procedures are applicable only if you already have the application setup in a VCS cluster environment.

See "Upgrading the SQL Server service packs" on page 63.

Upgrading the SQL Server service packs

This section describes how to upgrade Microsoft SQL Server to its corresponding service packs. The outlined procedures are applicable only if you already have your SQL Server setup in a VCS cluster environment.

SQL Server service pack upgrade scenarios	Refer to
Microsoft SQL Server 2008 SP3 or 2008 R2 SP1 to latest service packs	See "Upgrading SQL Server 2008 or 2008 R2 with the latest service packs in a VCS cluster" on page 64.

Upgrading SQL Server 2008 or 2008 R2 with the latest service packs in a VCS cluster

Consider the following points before you proceed to upgrade SQL Server 2008 SP3 or 2008 R2 SP1 with the latest service packs in a VCS environment:

- You must have administrative privileges to the SQL instance that you want to upgrade.
- Make sure that you have a recent backup of your system and user databases.
- Make sure that the VCS version installed is 6.0.2.
- Refer to the Microsoft documentation for prerequisites related to SQL Server 2008 Service Pack installation.

Consider a two node cluster, Node A and Node B. The SQL service group is ONLINE on Node A, and Node B is the passive node.

You can upgrade SQL Server in any of the following ways:

- Upgrade SQL Server on all the nodes parallely
  See "To parallely upgrade SQL Server on all the cluster nodes" on page 64.
- Upgrade SQL Server on the passive node first and then upgrade the active nodes
  See "To upgrade SQL Server on the passive nodes first" on page 64.

Use the following procedure to parallely upgrade SQL Server on all the cluster nodes.

To parallely upgrade SQL Server on all the cluster nodes

1. Freeze (persistent) the service group on Node A (active node).
2. Upgrade the SQL 2008 instance on Node A and Node B.
3. Reboot the nodes.
4. Unfreeze the service group on Node A, if it is still frozen.

Use the following procedure to upgrade SQL Server on the passive node first and subsequently on the active node.

To upgrade SQL Server on the passive nodes first

1. Freeze the service group on Node A (active node).
2. Confirm all SQL services are stopped on Node B.
3. Upgrade the SQL Server 2008 instance on Node B.
4. Reboot node B.
5. Unfreeze the service group on node A.

6 Fail over the service group to Node B.

7 After the service group comes online, freeze the service group on Node B.

8 Confirm all SQL services are stopped on Node A.

9 Upgrade the SQL Server 2008 instance on Node A.

10 Reboot Node A.

11 Unfreeze the service group on node B.

12 Fail back the service group to Node A.

Appendix A

Services and ports used by VCS

This appendix includes the following topics:

About VCS services and ports

If you have configured a firewall, then ensure that the firewall settings allow access to the services and ports used by VCS.

Table A-1 displays the services and ports used by VCS .

Ensure that you enable the ports and services for both, inbound and outbound communication.

Note: The port numbers marked with an asterisk are mandatory for configuring VCS.

Table A-1 VCS services and ports

Component Name/Process	Port/Protocol	Description
CmdServer.exe	14150*/TCP	Veritas Command Server
had.exe	14141*/TCP	Veritas High Availability Engine Veritas Cluster Manager (Java console) (ClusterManager.exe) VCS Agent driver (VCSAgDriver.exe)

Table A-1 VCS services and ports *(continued)*

Component Name/Process	Port/Protocol	Description
pluginHost.exe	7419*/TCP	Symantec Plugin Host Service Solutions Configuration Center (SFWConfigPanel.exe) CCF Engine (CEngineDriver.exe)
vcsauthserver.exe	14149/TCP/UDP	VCS Authentication Service
vras.dll	8199/TCP	Volume Replicator Administrative Service
vxio.sys	4145/UDP	VCS Cluster Heartbeats
VxSchedService.exe	4888/TCP	Veritas Scheduler Service Use to launch the configured schedule.
User configurable ports created at kernel level by vxio .sys file	49152-65535/TCP/UDP	Volume Replicator Packets
Notifier.exe	14144/TCP/UDP	VCS Notification
hasim.exe	14153, 15550 - 15558/TCP/UDP	VCS Cluster Simulator
wac.exe	14155/TCP/UDP	VCS Global Cluster Option (GCO)

Services and ports used during the installation and configuration of the Symantec High Availability Console

Table A-2 displays the services and ports used during the installation and configuration of the Console.

Table A-2 Services and ports used during the installation and configuration of the Symantec High Availability Console

Component Name/Process	Port/Protocol	Description
File and Printer Sharing		Used by the installer during the Console server installation. The installer uses this to copy the installation files to the machine.
Windows Management Instrumentation (WMI) service		Used by the installer during the Console server installation, to discover the virtual machines.
VMware Web Service	443/ https (Default port)	Used by the installer during the Console server installation, to register plugin and add privileges to the vCenter Server.
Service	14151, 14152/ TCP	Used by the Console host to run Java Servlets that fetch the application monitoring status from the virtual machines and display the information on the tab in the vSphere Client.
Authentication Service	14153/ TCP	Used by the Console to authenticate the single sign-on account configured for a virtual machine.
Symantec ApplicationHA Database Service	14154/ TCP	Used by the Console to read and update the Sybase database.
Veritas Storage Foundation Messaging Service (xprtld)	5634 / TCP	Used for communications between the Console host machine and the virtual machines.

Table A-2 Services and ports used during the installation and configuration of the Symantec High Availability Console *(continued)*

Component Name/Process	Port/Protocol	Description
VMwareDisksAgent	443/https	Used for communication between virtual machines and the ESX hosts.

Appendix B

About SORT

This appendix includes the following topics:

About Symantec Operations Readiness Tools

Symantec Operations Readiness Tools (SORT) is a website that automates and simplifies some of the most time-consuming administrative tasks. SORT helps you manage your datacenter more efficiently and get the most out of your Symantec products.

Among its broad set of features, SORT lets you do the following:

- Generate server-specific reports that describe how to prepare your servers for installation or upgrade of Symantec enterprise products.
- Access a single site with the latest production information, including patches, agents, and documentation.
- Create automatic email notifications for changes in patches, documentation, and array-specific modules.

To access SORT, go to:

https://sort.symantec.com

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