

# Veritas™ Cluster Server Application Agent for Microsoft Exchange 2003 Configuration Guide

Windows Server 2003

5.1

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Veritas Cluster Server 5.1

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# Contents

Chapter 1	Introducing the VCS application agent for Exchange	
	About the VCS application agent for Exchange .....	10
	VCS application agent for Microsoft Exchange .....	10
	Exchange Service agent .....	11
	Exchange Protocol agent .....	12
	How the agent makes Microsoft Exchange highly available .....	13
	Typical Exchange configurations in a VCS cluster .....	13
	Setting up an Exchange cluster .....	16
Chapter 2	Installing the VCS application agent for Exchange	
	About installing the VCS application agent for Exchange .....	18
	Before installing the VCS agent for Exchange .....	18
	Installing the VCS application agent for Exchange .....	19
	Configuring the cluster .....	20
	Configuring Web console .....	32
	Configuring notification .....	33
Chapter 3	Installing Microsoft Exchange	
	About installing Microsoft Exchange .....	38
	Before installing Microsoft Exchange .....	38
	Supported software .....	40
	Privileges requirements .....	40
	Configuring the network and storage .....	41
	Managing storage using SFW .....	43
	Creating disk groups .....	43
	Importing disk groups .....	45
	Creating volumes .....	45
	Mounting volumes .....	50
	Installing Exchange on first node .....	51
	Exchange pre-installation: first node .....	51
	Exchange server installation: first node .....	53
	Exchange post-installation: first node .....	54
	Moving Exchange database to shared storage .....	55
	Installing Exchange on additional nodes .....	59
	Exchange pre-installation: additional nodes .....	59

	Exchange server installation: additional nodes .....	61
	Exchange post-installation: additional nodes .....	63
<b>Chapter 4</b>	<b>Configuring the Exchange service group</b>	
	About configuring the Exchange service group .....	66
	Before configuring the Exchange service group .....	66
	Configuring additional dependencies for folder mounts .....	68
	Configuring the VCS Exchange service group .....	69
	Verifying the Exchange service group configuration .....	76
	Bringing the service group online .....	76
	Taking the service group offline .....	77
	Switching the service group .....	78
<b>Chapter 5</b>	<b>Administering the Exchange service group</b>	
	About administering the Exchange service group .....	80
	Modifying the service group configuration .....	80
	Before modifying the service group .....	80
	Instructions .....	81
	Deleting the Exchange service group .....	81
<b>Chapter 6</b>	<b>Removing the VCS agent for Exchange</b>	
	About removing the VCS application agent for Exchange .....	84
	Before removing the VCS application agent for Exchange .....	84
	Overview of tasks .....	84
	Removing Microsoft Exchange .....	85
	Removing a node without uninstalling Microsoft Exchange .....	86
	Removing a node and uninstalling Microsoft Exchange .....	86
	Removing the Microsoft Exchange application agent .....	89
<b>Chapter 7</b>	<b>Troubleshooting</b>	
	About troubleshooting the VCS agent for Exchange .....	92
	VCS logging .....	92
	Exchange Protocol agent error messages .....	93
	Exchange Service agent error messages .....	95
	Troubleshooting Microsoft Exchange uninstallation .....	97
	Troubleshooting Exchange Setup Wizard issues .....	98

Appendix A	Resource type definitions	
	About resource type definitions .....	100
	Exchange Service agent .....	100
	Resource type definition .....	100
	Attribute definitions .....	100
	Exchange Protocol agent .....	101
	Resource type definition .....	101
	Attribute definitions .....	102
Appendix B	Sample configurations	
	About sample configurations .....	104
	Active-Passive failover configuration .....	105
Index		111



# Introducing the VCS application agent for Exchange

This chapter contains the following topics:

- [“About the VCS application agent for Exchange”](#) on page 10
- [“VCS application agent for Microsoft Exchange”](#) on page 10
- [“How the agent makes Microsoft Exchange highly available”](#) on page 13
- [“Setting up an Exchange cluster”](#) on page 16

## About the VCS application agent for Exchange

Microsoft Exchange server provides a reliable and scalable messaging and collaboration infrastructure. The VCS application agent for Microsoft Exchange provides high availability for Microsoft Exchange in a VCS cluster.

This manual provides instructions on installing the VCS agent for Microsoft Exchange 2003, and making Microsoft Exchange 2003 highly available in an Active-Passive configuration.

For detailed instructions on deploying HA and Disaster Recovery solutions for Microsoft Exchange 2003, see the *Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange*.

For more information on the VCS agent for Microsoft Exchange 2007 and detailed instructions on deploying HA and Disaster Recovery solutions for Microsoft Exchange 2007, see the *Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange 2007*.

## VCS application agent for Microsoft Exchange

The VCS application agent for Microsoft Exchange monitors Exchange services and Exchange protocol servers in a VCS cluster, brings them online, and takes them offline.

The VCS application agent for Microsoft Exchange contains two agents:

- Exchange Service agent—Monitors core Exchange services.
- Exchange Protocol agent—Monitors Exchange protocol servers configured under the Exchange protocol services.

Both agents work in conjunction to provide high availability for Microsoft Exchange.

## Exchange Service agent

The Exchange Service (ExchService) agent brings the following Exchange services online, monitors their status, and takes them offline:

- Microsoft Exchange Information Store (MSEExchangeIS): The Exchange storage used to hold messages in users' mailboxes and in public folders.
- Microsoft Exchange System Attendant (MSEExchangeSA): The Exchange component responsible for maintenance and ensuring that operations run smoothly.
- Microsoft Exchange Message Transfer Agent (MSEExchangeMTA): The Exchange component responsible for routing messages.
- Microsoft Exchange Routing Engine (RESvc): The Exchange routing engine service.
- Microsoft Exchange Management Service (MSEExchangeMGMT): Provides Exchange management information through WMI.

Each Microsoft Exchange service is configured as a VCS resource of type ExchService.

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**Note:** The agent does not support the Active Directory Connector and the Site Replication Service. Do not run these services on systems that are part of the VCS Exchange cluster.

---

### Agent Operations

- Online—Starts the configured Exchange service.
- Offline—Stops the configured Exchange service.
- Monitor—Determines the state of the configured Exchange service by querying the Service Control Manager (SCM).

---

**Note:** The agent verifies the state of the enabled databases (databases that are automatically mounted when the service starts up). If an enabled database is dismounted, the agent returns UNKNOWN state. The VCS application agent for Microsoft Exchange monitors *only* the enabled databases. To enable databases, run Microsoft Exchange System Manager and clear the **Do not mount this store at start-up** check box in database properties. If the agent detects that an enabled database is not mounted, it returns an UNKNOWN state. So, to disable the database, check the **Do not mount this store at start-up** check box if you want to dismount a database.

---

## Exchange Protocol agent

The Exchange Protocol (ExchProtocol) agent starts, stops, and monitors Exchange protocol servers configured under the following Exchange protocols:

- Post Office Protocol (POP3SVC): Internet messaging protocol used to access email from a remote location.
- Simple Mail Transfer Protocol (SMTPSVC): TCP/IP protocol used to transfer email over the internet, which is also the native mail transport in Microsoft Exchange.
- Internet Message Access Protocol (IMAP4SVC): Internet messaging protocol used to access email messages stored on a remote server.
- World Wide Web (W3SVC): World Wide Web service.

The agent can monitor multiple virtual servers. Each virtual server to be monitored is configured as a VCS resource of type ExchProtocol.

### Agent Operations

- Online—Starts the configured Exchange protocol servers.
- Offline—Stops the configured Exchange protocol servers.
- Monitor—Determines the state of the configured Exchange protocol servers.

## How the agent makes Microsoft Exchange highly available

The VCS application agent for Microsoft Exchange detects an application failure if a configured Exchange service is not running or if a configured Exchange protocol server is not available. When this occurs, the Exchange service group is failed over to the next available system in the service group's SystemList. The configured Exchange services and Exchange protocol servers are started on the new system, thus ensuring continuous availability for Exchange data, including configured mailboxes.

### Typical Exchange configurations in a VCS cluster

The VCS application agent for Microsoft Exchange does not support an Active/Active configuration for Exchange. The agent supports the Active/Passive and the Any-to-Any configurations. The agent also supports the Disaster Recovery configuration.

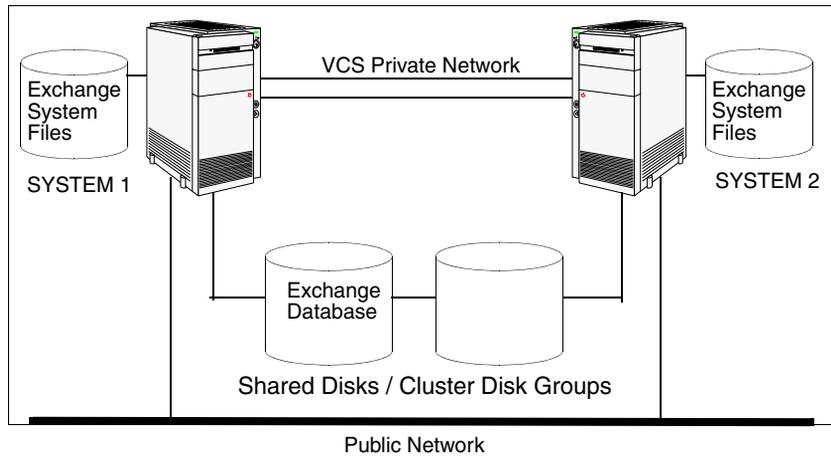
#### **Active-Passive failover configuration**

An Active-Passive setup involves one to one failover capabilities. For instance, if you have two nodes (SYSTEM1 and SYSTEM2), the service group configured on SYSTEM1 can fail over to SYSTEM2.

In an Active-Passive configuration, one or more Exchange virtual servers can exist in a cluster, but each server must be managed by a service group configured with a distinct set of nodes in the cluster.

In a typical two-node configuration, the Microsoft Exchange Server and the VCS application agent for Microsoft Exchange are installed on both nodes. The Exchange database is on shared storage.

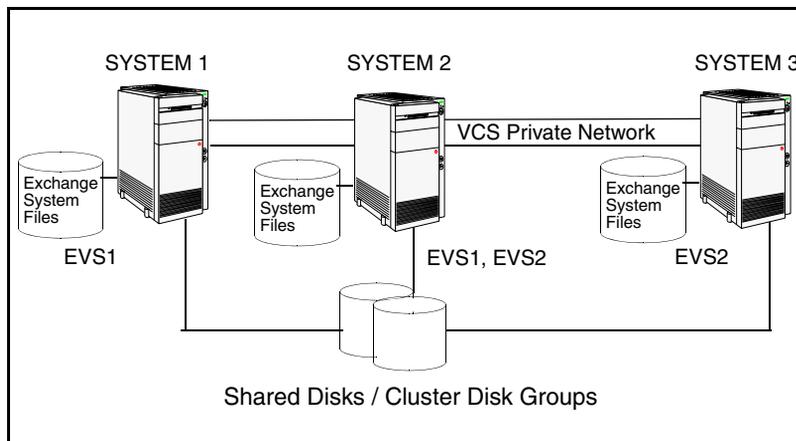
**Figure 1-1** Active-Passive failover configuration



### Any-to-Any failover configuration

In an Any-to-Any configuration, each Exchange virtual server in the cluster can be configured in a separate service group. Each service group can fail over to any configured node in the cluster, provided that no other Exchange virtual server is online on that node. In other words, you must ensure that an Exchange service group does not fail over to a node on which another Exchange service group is online.

**Figure 1-2** Any-to-Any failover configuration



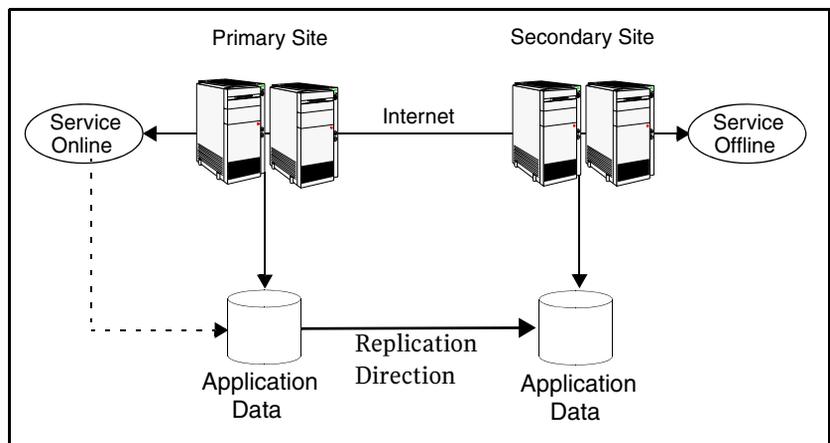
For example, consider a three-node cluster hosting two Exchange virtual servers, EVS1 and EVS2. The virtual servers are configured in VCS in two

service groups such that nodes 1 and 2 host the EVS1 service group and nodes 2 and 3 host the EVS2 service group. If node 1 (or node 3) fails, the service group containing the EVS resources is failed over to node 2.

## Disaster recovery configuration

A Disaster Recovery (DR) configuration enables you to restore application data and services in the event of a catastrophic failure. A typical DR solution requires primary and secondary sites, and clusters within those sites. The cluster at the primary site provides data and services during normal operation, and the cluster at the secondary site provides data and services if the primary site fails.

**Figure 1-3** Disaster Recovery configuration



The illustration displays an environment that is prepared for a disaster with a DR solution. In this case, the primary site is replicating its application data to the secondary site.

When a failure occurs, such as an earthquake that destroys the data center in which the primary site resides, the DR solution is activated. The data that was replicated to the secondary site is used to restore the application services to clients.

For more information about setting up an Any-to-Any or a Disaster Recovery configuration, see the *Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange*.

## Setting up an Exchange cluster

Setting up an Exchange cluster in a VCS environment involves the following tasks:

- Installing the VCS agent for Microsoft Exchange.  
See “[Installing the VCS application agent for Exchange](#)” on page 17 for instructions.
- Setting up a VCS cluster.  
See “[Configuring the cluster](#)” on page 20.
- Installing Microsoft Exchange.  
See “[Installing Microsoft Exchange](#)” on page 37 for instructions.
- Configuring the Exchange service group.  
See “[Configuring the Exchange service group](#)” on page 65 for instructions.

Each task is described in detail in subsequent chapters.

# Installing the VCS application agent for Exchange

This chapter contains the following topics:

- [“About installing the VCS application agent for Exchange”](#) on page 18
- [“Before installing the VCS agent for Exchange”](#) on page 18
- [“Installing the VCS application agent for Exchange”](#) on page 19
- [“Configuring the cluster”](#) on page 20

## About installing the VCS application agent for Exchange

This chapter describes how to install the VCS application agent for Microsoft Exchange, provided it was not selected while installing SFW HA. The agent is installed using the installer for Veritas Storage Foundation and HA for Windows. The installer installs the agent on selected systems in the cluster and adds the ExchService and the ExchProtocol resource types to the cluster configuration.

Complete these steps if you did not install the agent while installing SFW HA.

## Before installing the VCS agent for Exchange

This section lists the prerequisites for installing VCS application agent for Microsoft Exchange in a VCS cluster.

- Verify that you have SFW HA 5.1 installed on all cluster nodes. Refer to the *Veritas Storage Foundation and High Availability Solutions for Windows, Installation and Upgrade Guide* for instructions.
- Verify that you have local administrator privileges on the node where you are installing the agent.

---

**Caution:** The VCS application agent for Microsoft Exchange changes the active computer name in the registry of the active system to the virtual computer name. When this occurs, you may not be able to use applications that depend on the active computer name until you take the Exchange agent offline on the system. For best results, do not install additional applications that rely on the active computer name.

---

# Installing the VCS application agent for Exchange

Complete these steps on all systems on which you wish to configure Exchange with VCS.

## To install the VCS application agent for Exchange

- 1 Start Windows Add/Remove Programs, click **Storage Foundation HA 5.1 for Windows - HA (Server Components)** and click **Change**.
- 2 In the Storage Foundation 5.1 for Windows dialog box, choose the **Add or Remove** option and click **Next**.
- 3 In the Storage Foundation HA options panel, click **Next**.
- 4 Check **Veritas Cluster Server Application Agent for Exchange** and click **Next**.

The disk space required for the installation is displayed towards the bottom of the screen. When you add or remove an option, the total space changes.

- 5 The installer validates the system for prerequisites. After the system is accepted, click **Next**.  
If a system is rejected, the Comments column displays the cause for rejecting the system. Highlight the system to view a detailed information about the failure in the Details box. Resolve the error, highlight the system from the list, and click **Validate Again**.
- 6 An informational message appears if you selected the DMP option. Review the information and click **OK** to continue.
- 7 Review the summary of your selections and click **Update** to start the installation. The installer displays the status of installation.
- 8 After the installation is complete, review the installation report, click **Next** and then click **Finish**.

## Configuring the cluster

After installing the agent, set up the components required to run a cluster. The VCS Cluster Configuration Wizard (VCW) sets up the cluster infrastructure, including LLT and GAB, and configures Symantec Product Authentication Service in the cluster. The wizard also configures the ClusterService group, which contains resources for the Cluster Management Console (Single Cluster Mode), also referred to as the Web Console, notification, and global clusters.

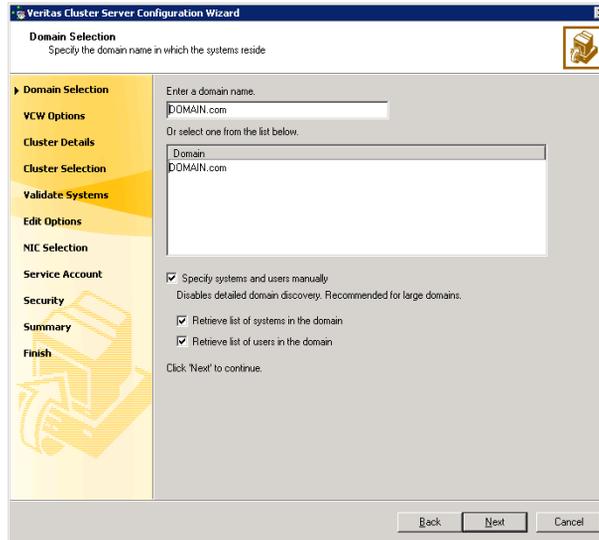
Complete the following tasks before configuring a cluster:

- Verify that each node uses static IP addresses (DHCP is not supported) and name resolution is configured for each node.
- Set the required permissions:
  - You must have administrator privileges on the system where you run the wizard. The user account must be a domain account.
  - You must have administrative access to all systems selected for cluster operations. Add the domain user to the Local Administrators group of each system.
  - If you plan to create a new user account for the VCS Helper service, you must have Domain Administrator privileges or belong to the Domain Account Operators group.
  - When configuring a user account for the VCS Helper service, make sure that the user account is a domain user. The VCS HAD, which runs in the context of the local system built-in account, uses the VCS Helper Service user context to access the network. This account does not require domain admin privileges.
  - Make sure the VCS Helper Service domain user account has “Add workstations to domain” privilege enabled in the Active Directory.

### To configure a VCS cluster

- 1 Start the VCS Cluster Configuration Wizard.  
Click **Start > All Programs > Symantec > Veritas Cluster Server > Configuration Tools > Cluster Configuration Wizard**.
- 2 Read the information on the Welcome panel and click **Next**.
- 3 On the Configuration Options panel, click **Cluster Operations** and click **Next**.

- 4 On the Domain Selection panel, select or type the name of the domain in which the cluster resides and select the discovery options.



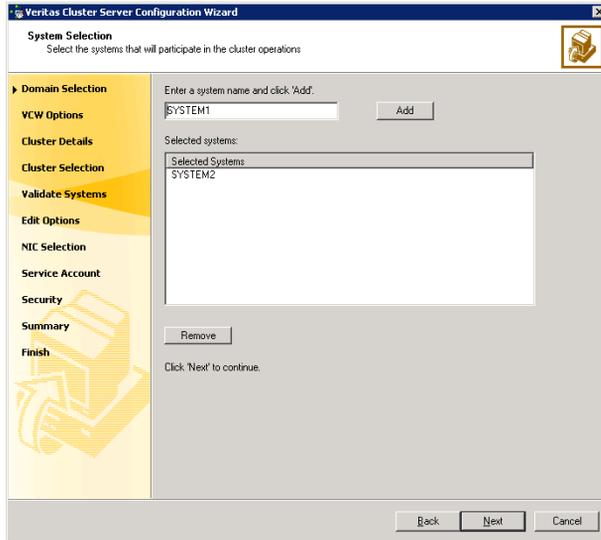
To discover information about all systems and users in the domain:

- Clear the **Specify systems and users manually** check box.
- Click **Next**.  
Proceed to [step 8](#) on page 23.

To specify systems and user names manually (recommended for large domains):

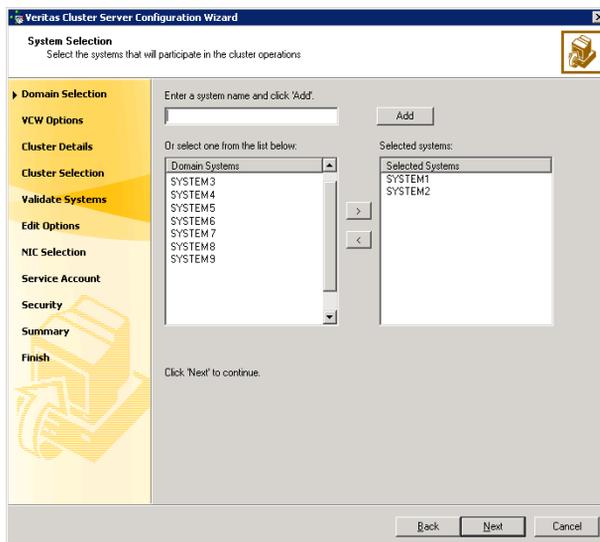
- Check the **Specify systems and users manually** check box.  
Additionally, you may instruct the wizard to retrieve a list of systems and users in the domain by selecting appropriate check boxes.
- Click **Next**.  
If you chose to retrieve the list of systems, proceed to [step 6](#) on page 22.  
Otherwise, proceed to the next step.

- 5 On the System Selection panel, type the name of each system to be added, click **Add**, and then click **Next**. Do not specify systems that are part of another cluster.



Proceed to [step 8](#) on page 23.

- 6 On the System Selection panel, specify the systems to form a cluster and then click **Next**. Do not select systems that are part of another cluster.



Enter the name of the system and click **Add** to add the system to the **Selected Systems** list, or click to select the system in the Domain Systems list and then click the > (right-arrow) button.

- 7 The System Report panel displays the validation status, whether *Accepted* or *Rejected*, of all the systems you specified earlier.

A system can be rejected for any of the following reasons:

- System is not pingable.
- WMI access is disabled on the system.
- Wizard is unable to retrieve the system architecture or operating system.
- VCS is either not installed on the system or the version of VCS is different from what is installed on the system on which you are running the wizard.

Click on a system name to see the validation details. If you wish to include a rejected system, rectify the error based on the reason for rejection and then run the wizard again.

Click **Next** to proceed.

- 8 On the Cluster Configuration Options panel, click **Create New Cluster** and click **Next**.
- 9 On the Cluster Details panel, specify the details for the cluster and then click **Next**.

The screenshot shows the 'Veritas Cluster Server Configuration Wizard' window, specifically the 'Cluster Details' step. The window title is 'Veritas Cluster Server Configuration Wizard'. The main heading is 'Cluster Details' with the subtitle 'Enter necessary details to create the new cluster'. On the left, a navigation pane shows 'Cluster Details' selected. The main area contains the following fields and options:

- Cluster Name: MYCLUSTER
- Cluster ID: 2
- Operating System: Windows 2003 (x86)
- Section: Select the systems to create the cluster.
  - Select all systems
  - Available Systems list:
    - SYSTEM1
    - SYSTEM2
- Total number of systems selected to create the cluster : 2
- Click 'Next' to continue.

At the bottom, there are 'Back', 'Next', and 'Cancel' buttons.

**Cluster Name** Type a name for the new cluster. Symantec recommends a maximum length of 32 characters for the cluster name.

**Cluster ID** Select a cluster ID from the suggested cluster IDs in the drop-down list, or type a unique ID for the cluster. The cluster ID can be any number from 0 to 255.

**Caution:** If you chose to specify systems and users manually in [step 4](#) on page 21 or if you share a private network between more than one domain, make sure that the cluster ID is unique.

**Operating System** From the drop-down list, select the operating system that the systems are running.

**Available Systems** Select the systems that will be part of the cluster. The wizard discovers the NICs on the selected systems. For single-node clusters with the required number of NICs, the wizard prompts you to configure a private link heartbeat. In the dialog box, click **Yes** to configure a private link heartbeat. Check the **Select all systems** check box to select all the systems simultaneously.

**10** The wizard validates the selected systems for cluster membership. After the systems are validated, click **Next**.

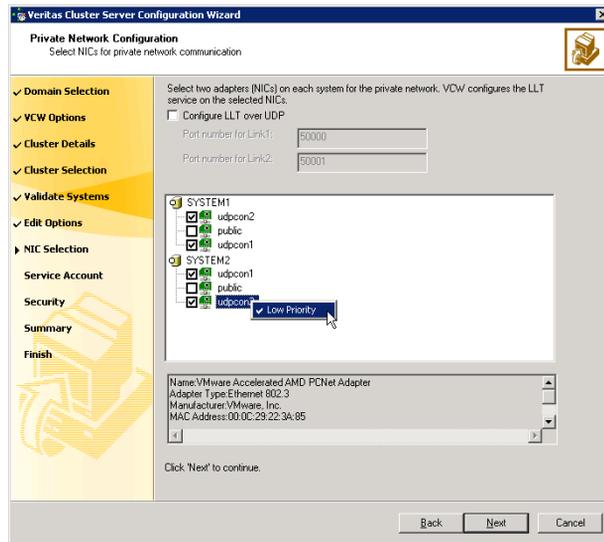
If a system is not validated, review the message associated with the failure and restart the wizard after rectifying the problem.

If you chose to configure a private link heartbeat in [step 9](#) on page 23, proceed to the next step. Otherwise, proceed to [step 12](#) on page 27.

**11** On the Private Network Configuration panel, configure the VCS private network and click **Next**.

Do one of the following:

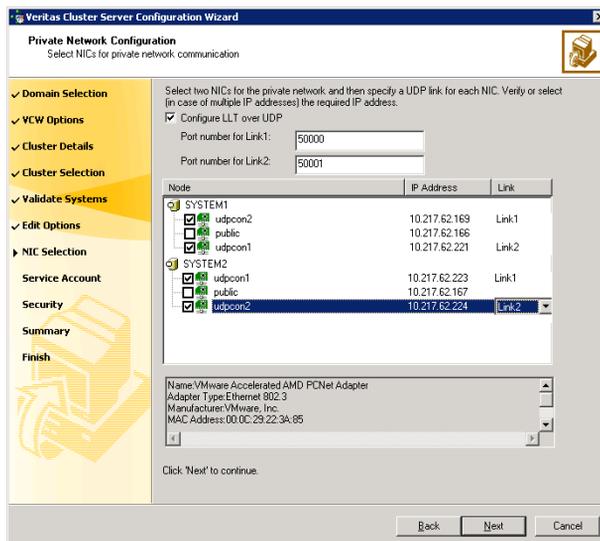
- To configure the VCS private network over Ethernet



- Select the check boxes next to the two NICs to be assigned to the private network.  
 Symantec recommends reserving two NICs exclusively for the private network. However, you could lower the priority of one NIC and use the low-priority NIC for public and private communication.
- If you have only two NICs on a selected system, it is recommended that you lower the priority of at least one NIC that will be used for private as well as public network communication.  
 To lower the priority of a NIC, right-click the NIC and select **Low Priority** from the pop-up menu.
- If your configuration contains teamed NICs, the wizard groups them as "NIC Group #N" where "N" is a number assigned to the teamed NIC. A teamed NIC is a logical NIC, formed by grouping several physical NICs together. All NICs in a team have an identical MAC address. Symantec recommends that you do not select teamed NICs for the private network.

The wizard will configure the LLT service (over Ethernet) on the selected network adapters.

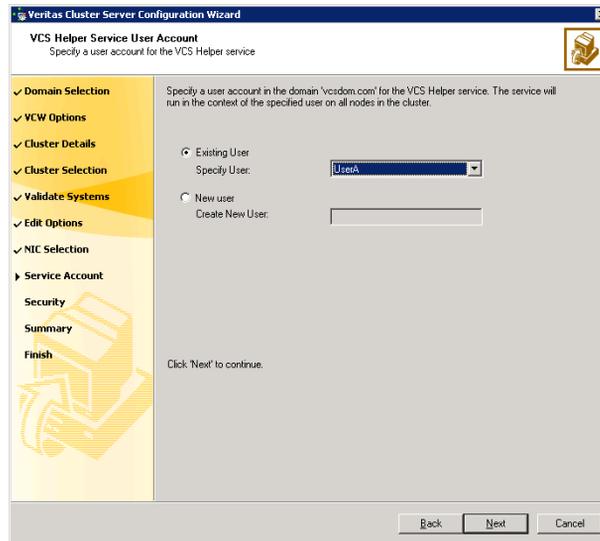
- To configure the VCS private network over the User Datagram Protocol (UDP) layer



- Check the **Configure LLT over UDP** check box.
- Specify a unique UDP port in the **Port number for Link1** and **Port number for Link2** fields. You can use ports in the range 49152 to 65535. The default ports numbers are 50000 and 50001 respectively.
- Select the check boxes next to the two NICs to be assigned to the private network. Symantec recommends reserving two NICs exclusively for the VCS private network.
- For each selected NIC, verify the displayed IP address. If a selected NIC has multiple IP addresses assigned, double-click the field and choose the desired IP address from the drop-down list. Each IP address can be in a different subnet.  
The IP address is used for the VCS private communication over the specified UDP port.
- For each selected NIC, double-click the respective field in the Link column and choose a link from the drop-down list. Specify a different link (Link1 or Link2) for each NIC. Each link is associated with a UDP port that you specified earlier.

The wizard will configure the LLT service (over UDP) on the selected network adapters. The specified UDP ports will be used for the private network communication.

- 12 On the VCS Helper Service User Account panel, specify the name of a domain user for the VCS Helper Service. The VCS HAD, which runs in the context of the local system built-in account, uses the VCS Helper Service user context to access the network. This account does not require domain admin privileges.



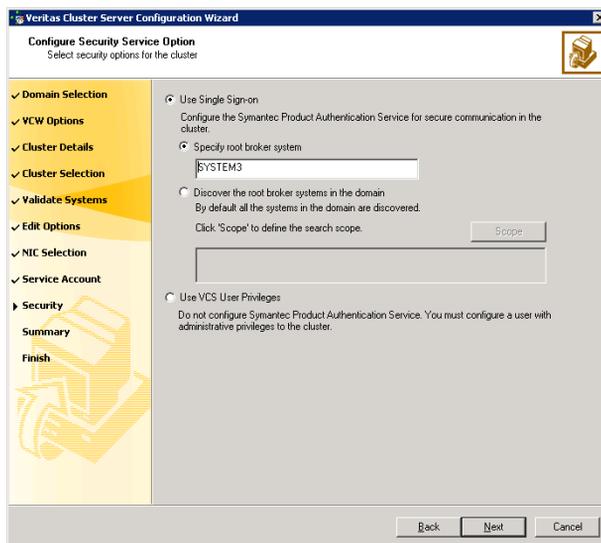
- To specify an existing user, do one of the following:
  - Click **Existing user** and select a user name from the drop-down list,
  - If you chose not to retrieve the list of users in [step 4](#) on page 21, type the user name in the **Specify User** field, and then click **Next**.
- To specify a new user, click **New user** and type a valid user name in the **Create New User** field, and then click **Next**.

Do not append the domain name to the user name; do not type the user name as DOMAIN\user or user@DOMAIN.

- In the Password dialog box, type the password for the specified user and click **OK**, and then click **Next**.

- 13 On the Configure Security Service Option panel, specify security options for the cluster and then click **Next**.  
Do one of the following:

- To use the single sign-on feature



- Click **Use Single Sign-on**. In this mode, VCS uses SSL encryption and platform-based authentication. The VCS engine (HAD) and Veritas Command Server run in secure mode.

For more information about secure communications in a cluster, see the *Veritas Storage Foundation and High Availability Solutions Quick Start Guide for Symantec Product Authentication Service*.

- If you know the name of the system that will serve as the root broker, click **Specify root broker system**, type the system name, and then click **Next**.

If you specify a cluster node, the wizard configures the node as the root broker and other nodes as authentication brokers.

Authentication brokers reside one level below the root broker and serve as intermediate registration and certification authorities.

These brokers can authenticate clients, such as users or services, but cannot authenticate other brokers. Authentication brokers have certificates signed by the root.

If you specify a system outside of the cluster, make sure that the system is configured as a root broker; the wizard configures all nodes in the cluster as authentication brokers.

- If you want to search the system that will serve as root broker, click **Discover the root broker systems in the domain** and click **Next**. The wizard will discover root brokers in the entire domain, by default.

- If you want to define a search criteria, click **Scope**. In the Scope of Discovery dialog box, click **Entire Domain** to search across the domain, or click **Specify Scope** and select the Organization Unit from the Available Organizational Units list, to limit the search to the specified organization unit. Use the Filter Criteria options to search systems matching a certain condition.

For example, to search for systems managed by a user *Administrator*, select **Managed by** from the first drop-down list, **is (exactly)** from the second drop-down list, type the user name **Administrator** in the adjacent field, click **Add**, and then click **OK**.

[Table 2-1](#) contains some more examples of search criteria.

**Table 2-1** Search criteria examples

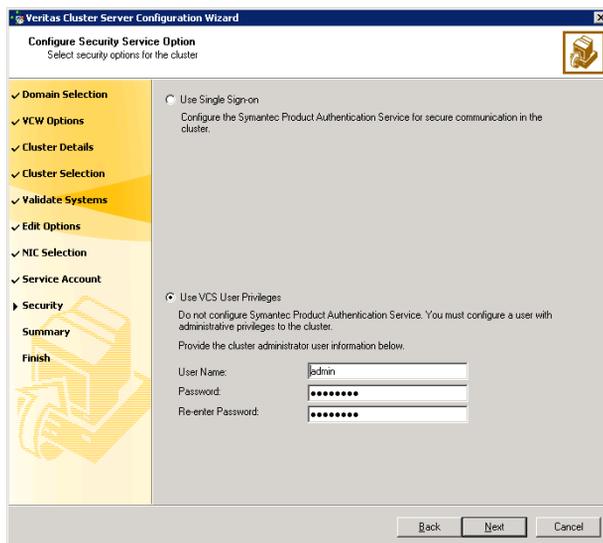
1st drop-down list value	2nd drop-down list value	Adjacent field entry	Search result
Name	is (exactly)	*system	Displays all systems with names that end with <i>system</i> .
Name	is (exactly)	*vcsnode*	Displays all systems with names that contain <i>vcsnode</i> .
Operating System	is (exactly)	*2003*	Displays all Windows Server 2003 systems.
Operating System	is (exactly)	*Enterprise*	Displays all Windows Server 2003 Enterprise Edition systems.
Operating System Version	is (exactly)	5.*	Displays all systems whose operating system version is 5.x, where x could be 0, 1, 2, etc.

You can add multiple search criterion; the wizard will search for systems that match *ALL* the conditions specified.

- Click **Next**. The wizard discovers and displays a list of all the root brokers. Click to select a system that will serve as the root broker and then click **Next**.

If the root broker is a cluster node, the wizard configures the other cluster nodes as authentication brokers. If the root broker is outside the cluster, the wizard configures all the cluster nodes as authentication brokers.

- To use VCS user privilege:



- Click **Use VCS User Privileges**.

The default user name for the VCS administrator is *admin* and the default password is *password*. Both are case-sensitive. You can accept the default user name and password for the VCS administrator account or type a new name and password.

It is recommended that you specify a new user name and password.

Use this account to log on to VCS using Cluster Management Console (Single Cluster Mode) or Web Console, when VCS is not running in secure mode.

- Click **Next**.

- 14 Review the summary information on the Summary panel, and click **Configure**. The wizard configures the VCS private network. If the selected systems have LLT or GAB configuration files, the wizard displays an informational dialog box before overwriting the files. In the dialog box, click **OK** to overwrite the files. Otherwise, click **Cancel**, exit the wizard, move the existing files to a different location, and rerun the wizard. The wizard starts running commands to configure VCS services. If an operation fails, click **View configuration log file** to see the log.
- 15 On the Completing Cluster Configuration panel, click **Next** to configure the ClusterService service group; this group is required to set up components for the Cluster Management Console (Single Cluster Mode) or Web Console, notification, and for global clusters.

To configure the ClusterService group later, click **Finish**.

At this stage, the wizard has collected the information required to set up the cluster configuration. After the wizard completes its operations, with or without the ClusterService group components, the cluster is ready to host application service groups. The wizard also starts the VCS engine (HAD) and the Veritas Command Server at this stage.

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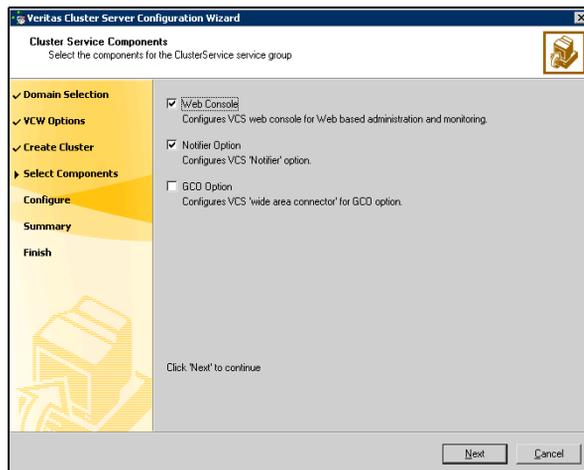
**Note:** After configuring the cluster you must not change the names of the nodes that are part of the cluster. If you wish to change a node name, run this wizard to remove the node from the cluster, rename the system, and then run this wizard again to add the system to the cluster.

---

You are not required to configure the Cluster Management Console (Single Cluster Mode) or Web Console, for this HA environment. Refer to the *Veritas Cluster Server Administrator's Guide* for complete details on VCS Cluster Management Console (Single Cluster Mode), and the Notification resource.

The GCO Option applies only if you are configuring a Disaster Recovery environment and are not using the Disaster Recovery wizard. The Disaster Recovery chapters discuss how to use the Disaster Recovery wizard to configure the GCO option.

- 16 On the Cluster Service Components panel, select the components to be configured in the ClusterService service group and click **Next**.



- Check the **Web Console** checkbox to configure the Cluster Management Console (Single Cluster Mode), also referred to as the Web Console. See “[Configuring Web console](#)” on page 32.

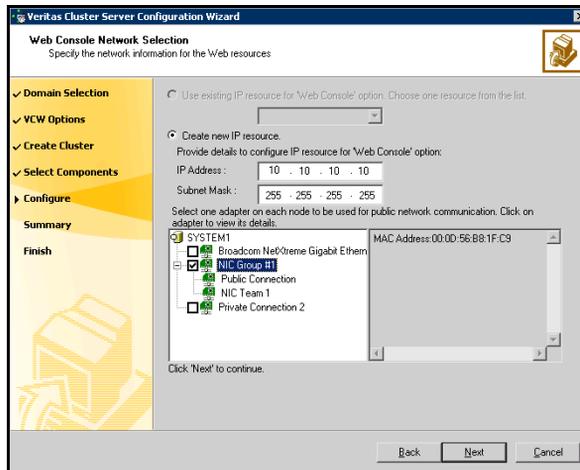
- Check the **Notifier Option** checkbox to configure notification of important events to designated recipients.  
See “[Configuring notification](#)” on page 33.

## Configuring Web console

This section describes steps to configure the VCS Cluster Management Console (Single Cluster Mode), also referred to as the Web Console.

### To configure the Web console

- 1 On the Web Console Network Selection panel, specify the network information for the Web Console resources and click **Next**.



- If the cluster has a ClusterService service group configured, you can use the IP address configured in the service group or configure a new IP address for the Web console.
  - If you choose to configure a new IP address, type the IP address and associated subnet mask.
  - Select a network adapter for each node in the cluster. Note that the wizard lists the public network adapters along with the adapters that were assigned a low priority.
- 2 Review the summary information and choose whether you want to bring the Web Console resources online when VCS is started, and click **Configure**.
  - 3 If you chose to configure a Notifier resource, proceed to: “[Configuring notification](#)” on page 33.

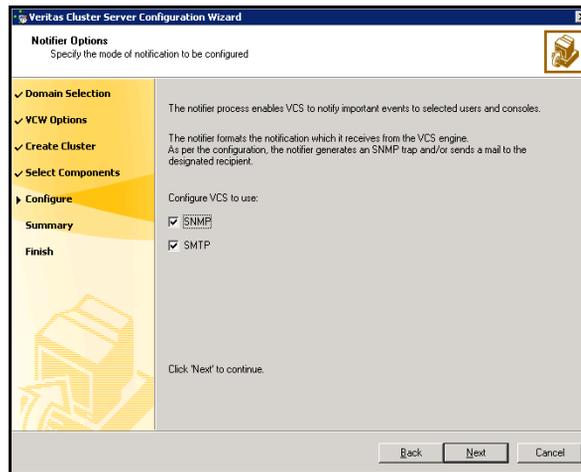
Otherwise, click **Finish** to exit the wizard.

## Configuring notification

This section describes steps to configure notification.

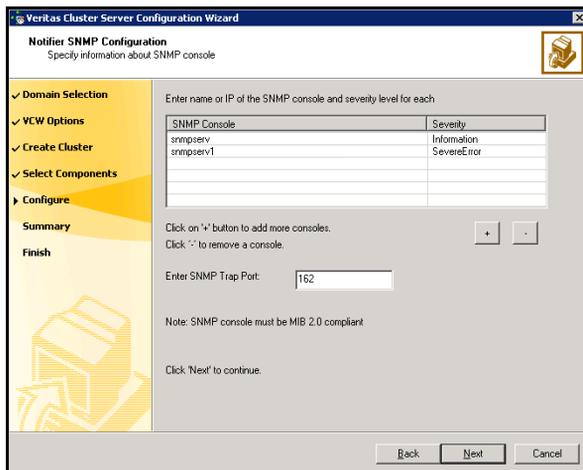
### To configure notification

- 1 On the Notifier Options panel, specify the mode of notification to be configured and click **Next**.



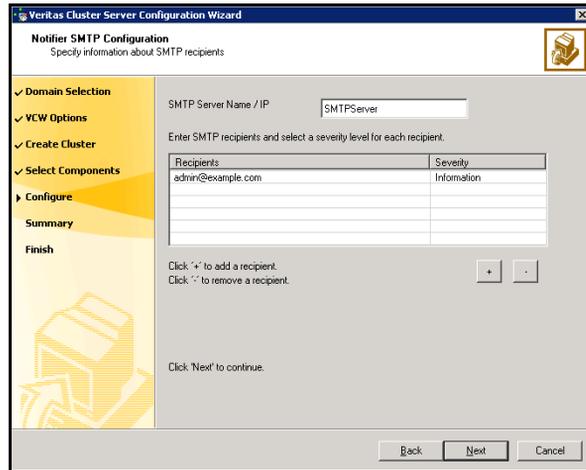
You can configure VCS to generate SNMP (V2) traps on a designated server and/or send emails to designated recipients in response to certain events.

- 2 If you chose to configure SNMP, specify information about the SNMP console and click **Next**.



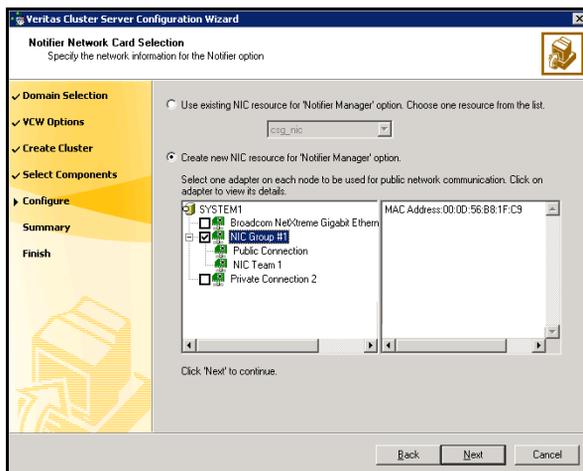
- Click a field in the SNMP Console column and type the name or IP address of the console. The specified SNMP console must be MIB 2.0 compliant.
- Click the corresponding field in the Severity column and select a severity level for the console.
- Click '+' to add a field; click '-' to remove a field.
- Enter an SNMP trap port. The default value is "162".

- 3 If you chose to configure SMTP, specify information about SMTP recipients and click **Next**.



- Type the name of the SMTP server.
- Click a field in the Recipients column and enter a recipient for notification. Enter recipients as admin@example.com.
- Click the corresponding field in the Severity column and select a severity level for the recipient. VCS sends messages of an equal or higher severity to the recipient.
- Click + to add fields; click - to remove a field.

- 4 On the Notifier Network Card Selection panel, specify the network information and click **Next**.



- If the cluster has a ClusterService service group configured, you can use the NIC resource configured in the service group or configure a new NIC resource for notification.
  - If you choose to configure a new NIC resource, select a network adapter for each node in the cluster. The wizard lists the public network adapters along with the adapters that were assigned a low priority.
- 5 Review the summary information and choose whether you want to bring the notification resources online when VCS is started.
  - 6 Click **Configure**.
  - 7 Click **Finish** to exit the wizard.

# Installing Microsoft Exchange

This chapter contains the following topics:

- [“About installing Microsoft Exchange”](#) on page 38
- [“Before installing Microsoft Exchange”](#) on page 38
- [“Managing storage using SFW”](#) on page 43
- [“Installing Exchange on first node”](#) on page 51
- [“Moving Exchange database to shared storage”](#) on page 55
- [“Installing Exchange on additional nodes”](#) on page 59

## About installing Microsoft Exchange

This chapter describes how to install and configure Microsoft Exchange and its components in a VCS cluster.

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**Note:** If you have set up a non-clustered Exchange server (standalone setup), and you want to make it highly available, refer to the *Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange* for instructions.

---

Installing Microsoft Exchange in a VCS cluster involves three major steps; pre-installation, Microsoft Exchange installation, and post-installation. The Exchange Setup Wizard for VCS performs the pre-installation and post-installation steps.

## Before installing Microsoft Exchange

- Verify SFW HA 5.1 is installed in the cluster along with the VCS application agent for Microsoft Exchange. If a previous version of SFW HA exists, upgrade it. Refer to the *Veritas Storage Foundation and High Availability Solutions for Windows, Installation and Upgrade Guide* for instructions.
- Verify you have configured a VCS cluster using VCS Cluster Configuration Wizard (VCW).  
See “[Configuring the cluster](#)” on page 20.
- Verify the Veritas High Availability Engine (HAD) is running on the node where you will install Microsoft Exchange.
- Verify all systems in the cluster have adequate resources to run the Microsoft Exchange server and VCS.
- Verify the DNS and Active Directory Services are available. Make sure that a reverse lookup zone is created in the DNS. Refer to Microsoft Exchange documentation for instructions on creating a reverse lookup zone.
- Verify the Dynamic Update option for the DNS server is set to "Secure Only."
- Verify DNS settings for all systems on which Microsoft Exchange will be installed.
- Verify all systems on which Microsoft Exchange server is to be installed have IIS installed; the SMTP, NNTP, and WWW services must be installed on all systems. For installing Exchange on Windows Server 2003, ASP.NET service must also be installed.

- VCS requires Microsoft Exchange to be installed on the same local drive on all nodes. For example if you install Exchange on drive C of one node, installations on all other nodes must be on their respective C drives. Make sure that the same drive letter is available on all nodes and has adequate space for the installation.
- Before installing Microsoft Exchange in a VCS cluster, make sure that the forest and the domain have been prepared. See the Microsoft Exchange documentation for instructions.
- Symantec recommends that you have a minimum of four volumes on shared disks (or volumes on cluster disk groups), one each for the following:
  - Exchange database
  - Registry replication information
  - Transaction logs for the first storage group
  - MTA data

If you mount these volumes as folders, make sure that the folders are on shared disks too.

See “[Managing storage using SFW](#)” on page 43 for instructions on creating disk groups and volumes using SFW.

---

**Note:** If your storage devices are SCSI-3 compliant, and you wish to use SCSI-3 Persistent Group Reservations (PGR), you must enable SCSI-3 support using the Veritas Enterprise Administrator (*VEA - Control Panel - System Settings*). See the *Veritas Storage Foundation Administrator's Guide* for more information.

---

- Verify that the volumes created to store the registry replication database are mounted on the node where you install Microsoft Exchange and unmounted from other nodes in the cluster.  
See “[Mounting volumes](#)” on page 50.

## Supported software

- Microsoft Exchange servers and their operating systems. Note that all systems must be running the same operating system:

For Exchange 2003:

- |  |   |
|--|---|
| Microsoft Exchange Server 2003 Standard Edition or Enterprise Edition (SP2 required) | ■ Windows Server 2003 (32-bit) Standard Edition, Enterprise Edition, or Datacenter Edition (SP2 required for all editions)    |
|  | ■ Windows Server 2003 (32-bit) R2 Standard Edition, Enterprise Edition, or Datacenter Edition (SP2 required for all editions) |

For Exchange 2007:

- |   |  |
|---|--|
| Microsoft Exchange Server 2007 (SP1 supported on Windows Server 2003, SP1 required on Windows Server 2008), Standard Edition or Enterprise Edition (Mailbox server role only) | ■ Windows Server 2003 x64 Standard Edition or Enterprise Edition (SP2 required for all editions)                                       |
|   | ■ Windows Server 2003 R2 x64 Standard Edition, Enterprise Edition (SP2 required for all editions)                                      |
|   | ■ Windows Server 2008 x64 Editions (for AMD64 or Intel EM64T): Standard x64 Edition, Enterprise x64 Edition, or Datacenter x64 Edition |

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**Note:** The instructions in this agent guide are specific to Exchange 2003 only. For configuring an HA and DR environment for Exchange 2007, refer to the *Veritas Storage Foundation and High Availability Solutions HA and Disaster Recovery Solutions Guide for Exchange 2007*.

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- Veritas Storage Foundation HA 5.1 for Windows (SFW HA)

## Privileges requirements

- You must be a domain user.
- You must be an Exchange Full Administrator.
- You must be a member of the Exchange Domain Servers group.
- You must be a member of the Local Administrators group on all nodes on which Microsoft Exchange will be installed. Make sure to enable write permissions for objects corresponding to these nodes in the Active Directory.

- You must have write permissions on the DNS server to perform DNS updates.
- You must be an Enterprise Administrator, Schema Administrator, Domain Administrator, or Local Administrator to run ForestPrep; you must be a Domain Administrator or Local Administrator to run DomainPrep. Refer to the Microsoft documentation for permissions requirements during Microsoft procedures that do not involve Symantec wizards.
- Make sure the VCS Helper Service domain user account has “Add workstations to domain” privilege enabled in the Active Directory.
- If a computer object corresponding to the Exchange virtual server exists in the Active Directory, you must have delete permissions on the object.
- The same user, or a user with the same privileges must perform the pre-installation, installation, and post-installation phases for Microsoft Exchange.

## Configuring the network and storage

Use the following procedures to configure the hardware and verify DNS settings. Repeat this procedure for every node in the cluster.

### To configure the hardware

- 1 Install the required network adapters, and SCSI controllers or Fibre Channel HBA.
- 2 Connect the network adapters on each system.
  - To prevent lost heartbeats on the private networks, and to prevent VCS from mistakenly declaring a system down, Symantec recommends disabling the Ethernet autonegotiation options on the private network adapters. Contact the NIC manufacturer for details on this process.
  - Symantec recommends removing TCP/IP from private NICs to lower system overhead.
- 3 Use independent hubs or switches for each VCS communication network (GAB and LLT). You can use cross-over Ethernet cables for two-node clusters. LLT supports hub-based or switch network paths, or two-system clusters with direct network links.
- 4 Verify that each system can access the storage devices. Verify that each system recognizes the attached shared disk and that the attached shared disks are visible.

For Windows Server 2003, use the following procedure.

**To verify the DNS settings and binding order for Windows Server 2003 systems**

- 1 Open the Control Panel (**Start>Control Panel**).
- 2 Double-click **Network Connections**, or right-click **Network Connections** and click **Open**.
- 3 Ensure the public network adapter is the first bound adapter:
  - From the Advanced menu, click **Advanced Settings**.
  - In the Adapters and Bindings tab, verify the public adapter is the first adapter in the Connections list. If necessary, use the arrow button to move the adapter to the top of the list.
  - Click **OK**.
- 4 In the Network and Dial-up Connections window, double-click the adapter for the public network.  
When enabling DNS name resolution, make sure that you use the public network adapters, and not those configured for the VCS private network.
- 5 In the Public Status dialog box, in the General tab, click **Properties**.
- 6 In the Public Properties dialog box, in the General tab:
  - Select the **Internet Protocol (TCP/IP)** check box.
  - Click **Properties**.
- 7 Select the **Use the following DNS server addresses** option.
- 8 Verify the correct value for the IP address of the DNS server.
- 9 Click **Advanced**.
- 10 In the DNS tab, make sure the **Register this connection's address in DNS** check box is selected.
- 11 Make sure the correct domain suffix is entered in the **DNS suffix for this connection** field.
- 12 Click **OK**.

## Managing storage using SFW

Veritas Storage Foundation for Windows (SFW) manages data by creating disk groups from physical disks. These disk groups are further divided into volumes, which can be mounted from the cluster nodes.

Symantec recommends that you create four volumes, one each for Exchange database, registry replication information, transaction logs for the first storage group, and MTA data. These volumes must be accessible from all cluster nodes.

---

**Note:** If your storage devices are SCSI-3 compliant, and you wish to use SCSI-3 Persistent Group Reservations (PGR), you must enable SCSI-3 support using the Veritas Enterprise Administrator (*VEA - Control Panel - System Settings*). See the Veritas Storage Foundation Administrator's Guide for more information.

---

Perform the following tasks to create volumes and make them accessible from cluster nodes:

- Create disk groups.  
See “[Creating disk groups](#)” on page 43.
- Import disk groups.  
See “[Importing disk groups](#)” on page 45.
- Create volumes on disk groups.  
See “[Creating volumes](#)” on page 45.
- Mount volumes.  
See “[Mounting volumes](#)” on page 50.

### Creating disk groups

This section describes how to create disk groups and volumes using the Veritas Enterprise Administrator (VEA) console installed with SFW. Symantec recommends creating a disk group for every storage group when configuring Microsoft Exchange. This is also an opportunity to grow existing volumes, add storage groups, and add databases for existing storage groups.

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**Note:** You must have an external, basic disk to create a cluster disk group.

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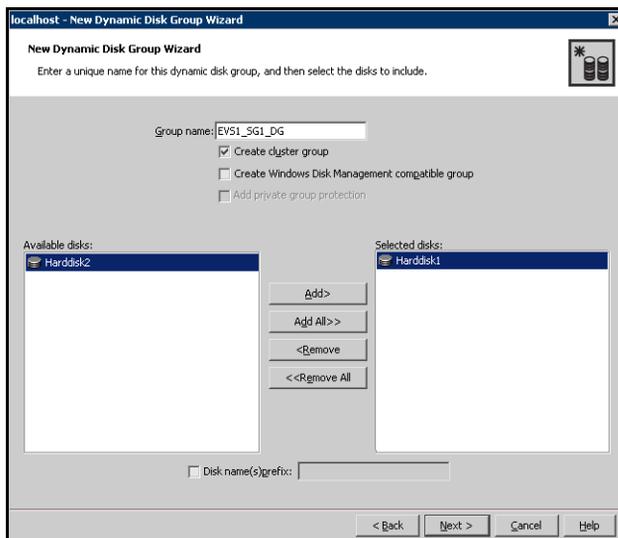
### To create a dynamic (cluster) disk group

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**Note:** Dynamic disks belonging to a Microsoft Disk Management Disk Group do not support cluster disk groups.

---

- 1 Open the VEA console by clicking **Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator** and select a profile if prompted.
- 2 Click **Connect to a Host or Domain**.
- 3 In the Connect dialog box, select the host name from the pull-down menu and click **Connect**.  
To connect to the local system, select **localhost**. Provide the user name, password, and domain if prompted.
- 4 To start the New Dynamic Disk Group wizard, expand the tree view under the host node, right click the **Disk Groups** icon, and select **New Dynamic Disk Group** from the context menu.
- 5 In the Welcome screen of the New Dynamic Disk Group wizard, click **Next**.
- 6 Provide information about the cluster disk group:



- Enter the name of the disk group (for example, EVS1\_SG1\_DG).
- Click the checkbox for **Create cluster group**.

- Select the appropriate disks in the **Available disks** list, and use the **Add** button to move them to the **Selected disks** list. Optionally, check the **Disk names prefix** checkbox and enter a disk name prefix to give the disks in the disk group a specific identifier. For example, entering TestGroup as the prefix for a disk group that contains three disks creates TestGroup1, TestGroup2, and TestGroup3 as internal names for the disks in the disk group.

---

**Note:** For Windows Server 2003, Windows Disk Management Compatible Dynamic Disk Group creates a disk group that is compatible with the disk groups created with Windows Disk Management and with earlier versions of Volume Manager for Windows products. For Windows Server 2008, Windows Disk Management Compatible Dynamic Disk Group creates a type of disk group that is created by Windows Disk Management (LDM).

---

- Click **Next**.
- 7 Click **Next** to accept the confirmation screen with the selected disks.
  - 8 Click **Finish** to create the new disk group.

## Importing disk groups

- 1 From the VEA Console, right-click a disk name in the dynamic group or the dynamic group name in the **General** tab or tree view.
- 2 Click **Import Dynamic Disk Group** from the menu.
- 3 In the Import Dynamic Disk Group dialog box, click **OK**.

## Creating volumes

To ensure that the drive letters you assign to the new volumes will always be available on all nodes, assign drive letters starting in the middle of the alphabet. This way when drive letters are assigned as additional internal devices are added to a node there will not be a conflict with the volume drive letters.

### To create dynamic volumes

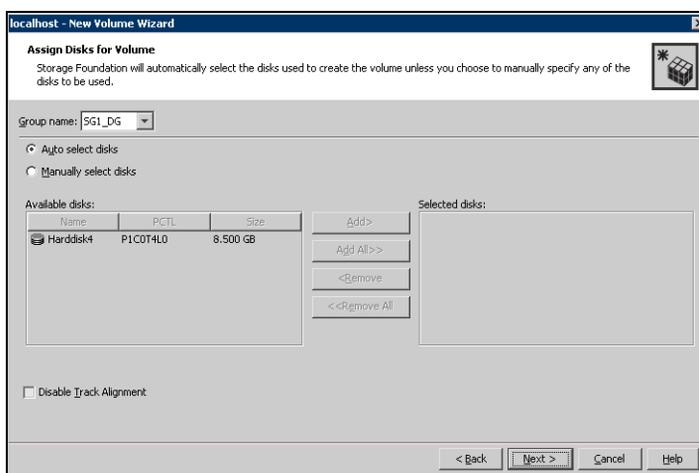
- 1 If the VEA console is not already open, click **Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator** and select a profile if prompted.
- 2 Click **Connect to a Host or Domain**.
- 3 In the Connect dialog box select the host name from the pull-down menu and click **Connect**.

To connect to the local system, select **localhost**. Provide the user name, password, and domain if prompted.

- 4 To start the New Volume wizard, expand the tree view under the host node to display all the disk groups. Right click a disk group and select **New Volume** from the context menu.

You can right-click the disk group you have just created, for example EVS1\_SG1\_DG.

- 5 At the New Volume wizard opening screen, click **Next**.
- 6 Select the disks for the volume. Make sure the appropriate disk group name appears in the Group name drop-down list.

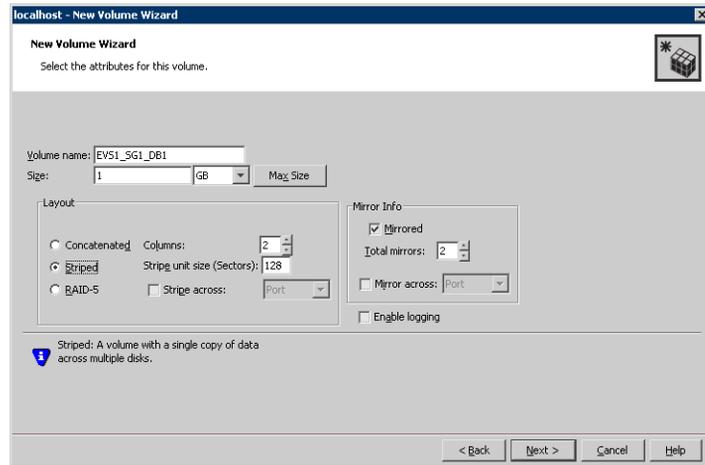


- 7 Automatic disk selection is the default setting. To manually select the disks, click the **Manually select disks** radio button and use the **Add** and **Remove** buttons to move the appropriate disks to the “Selected disks” list. Manual selection of disks is recommended.

You may also check **Disable Track Alignment** to disable track alignment for the volume. Disabling Track Alignment means that the volume does not store blocks of data in alignment with the boundaries of the physical track of the disk.

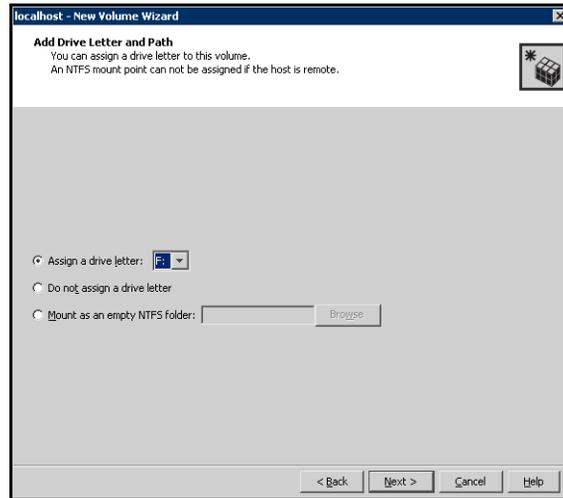
- 8 Click **Next**.

## 9 Specify the volume attributes.

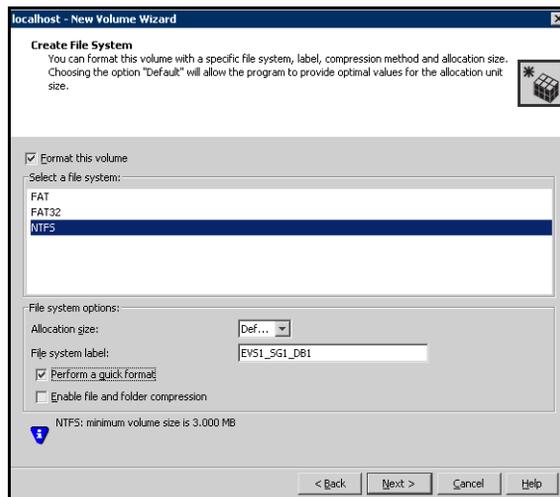


- Enter a volume name. The name is limited to 18 ASCII characters and cannot contain spaces or forward or backward slashes.
  - Select a volume layout type. To select mirrored striped, click both the **Mirrored** checkbox and the **Striped** radio button.
  - If you are creating a striped volume, the **Columns** and **Stripe unit size** boxes need to have entries. Defaults are provided.
  - Provide a size for the volume.
  - If you click on the **Max Size** button, a size appears in the Size box that represents the maximum possible volume size for that layout in the dynamic disk group.
  - In the Mirror Info area, select the appropriate mirroring options.
- 10 In the Add Drive Letter and Path dialog box, assign a drive letter or mount point to the volume. You must use the same drive letter or mount point on all systems in the cluster. Make sure to verify the availability of the drive letter before assigning it.
- To assign a drive letter, select **Assign a Drive Letter**, and choose a drive letter.

- To mount the volume as a folder, select **Mount as an empty NTFS folder**, and click **Browse** to locate an empty folder on the shared disk.



- 11 Click **Next**.
- 12 Create an NTFS file system.



- Make sure the **Format this volume** checkbox is checked and click **NTFS**.
- Select an allocation size or accept the Default.

- The file system label is optional. SFW makes the volume name the file system label.
  - Select **Perform a quick format** if you want to save time.
  - Select **Enable file and folder compression** to save disk space. Note that compression consumes system resources and performs encryption and decryption, which may result in reduced system performance.
  - Click **Next**.
- 13 Click **Finish** to create the new volume.
- 14 Repeat these steps to create the log volume (EVS1\_SG1\_LOG) in the EVS1\_SG1\_DG disk group. (The EVS1\_SG1\_LOG volume resides on its own disk.) Also, repeat these steps to create any additional volumes required. Create the cluster disk group and volumes on the first node of the cluster only.

## Mounting volumes

Before installing Microsoft Exchange server, mount the volumes created to store the registry replication information. Unmount the volumes from other systems in the cluster.

Mounting a volume involves importing the disk group and assigning a drive letter or the folder path. Unmounting a volume involves removing the drive letter or the folder path and deporting the disk group.

### To mount a volume

- 1 Open the Veritas Enterprise Administrator. (**Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator**)
- 2 If the disk group is not imported, import it. From the VEA console's tree view, right-click the disk group and then click **Import Dynamic Disk Group**.
- 3 Right-click the volume, and then click **File System > Change Drive Letter and Path**.
- 4 On the Drive Letter and Paths dialog box, click **Add**.
- 5 In the Assign drive letter dialog box, select one of the following options depending on whether you want to assign a drive letter to the volume or mount it as a folder, and click **OK**.
  - *To assign a drive letter*  
Click **Assign a Drive Letter** and select a drive letter from the drop-down list.
  - *To mount the volume as a folder*  
Click **Mount as an empty NTFS folder** and click **Browse** to locate an empty folder on the shared disk.

Repeat these steps for all the volumes to be mounted.

### To unmount a volume and deport the dynamic disk group

- 1 Open the Veritas Enterprise Administrator if it is not already open. (**Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator**)
- 2 From the VEA console's tree view, right-click on the volume, and then click **File System > Change Drive Letter and Path**.
- 3 On the Drive Letter and Paths dialog box, click **Remove** and click **OK**.
- 4 Repeat step 2 and step 3 for all the volumes to be unmounted.
- 5 From the VEA console's tree view, right-click the disk and then click **Deport Dynamic Disk Group**.

# Installing Exchange on first node

The tasks to be performed on the first node are described in three stages. Exchange pre-installation, Exchange installation, Exchange post installation.

## Exchange pre-installation: first node

Use the Exchange Server Setup Wizard for Veritas Cluster Server to complete the pre-installation phase. This process changes the physical name of the node to a virtual name.

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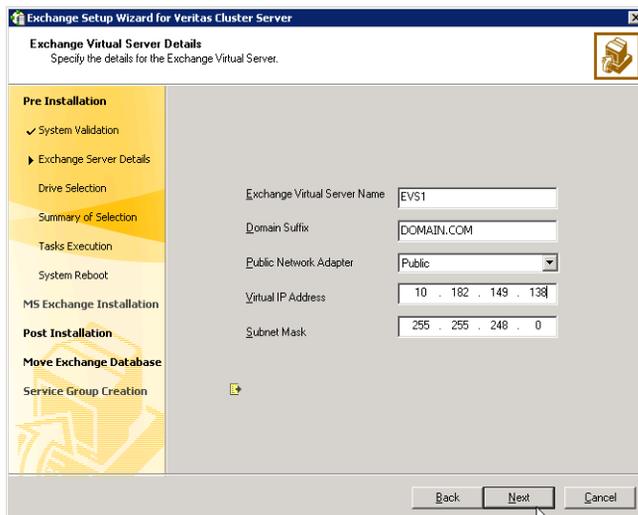
**Note:** After you have run the wizard, you will be requested to restart the node. Close all open applications and save your data before running the wizard.

---

### To perform Exchange pre-installation

- 1 Verify the volume created to store the registry replication information is mounted on this node and unmounted from other nodes in the cluster.
- 2 Click **Start > Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Setup Wizard** to start the Exchange Setup Wizard for VCS.
- 3 Review the information in the Welcome dialog box and click **Next**.
- 4 In the Available Option dialog box, choose the **Install Exchange Server for High Availability** option and click **Next**.
- 5 In the Select Option dialog box, choose the **Create a new Exchange Virtual Server** option and click **Next**.
- 6 The wizard validates the system for prerequisites. Various messages indicate the validation status. Once all the validations are done, click **Next**.

7 Specify information related to the network.



- Enter a unique virtual name for the Exchange server.

---

**Warning:** Once you have assigned a virtual name to the Exchange server, you cannot change the virtual name later. To change the virtual name, you must uninstall Exchange from the VCS environment and again install it using the Exchange Setup Wizard for VCS.

---

- Enter a domain suffix for the virtual server.
  - Select the appropriate public NIC from the drop-down list. The wizard lists the public adapters and low-priority TCP/IP enabled private adapters on the system.
  - Enter a unique virtual IP address for the Exchange virtual server.
  - Enter the subnet mask for the virtual IP address.
  - Click **Next**.  
The installer verifies that the selected node meets the Exchange requirements and checks whether the Exchange virtual server is unique on the network.
- 8 Select a drive where the registry replication data will be stored and click **Next**.
  - 9 Review the summary of your selections and click **Next**.
  - 10 A warning message appears indicating, that the system will be renamed and rebooted when you exit the wizard. Click **Yes** to continue.

- 11 The wizard starts running commands to set up the VCS environment. Various messages indicate the status of each task. After all the commands are executed, click **Next**.
- 12 Click **Reboot**.  
The wizard prompts you to reboot the node. Click **Yes** to reboot the node.

---

**Warning:** After you reboot the node, the name specified for the Exchange virtual server is temporarily assigned to the node. After installing Microsoft Exchange, you must rerun this wizard to assign the original name to the node.

---

On rebooting the node, the Exchange Server Setup wizard is launched automatically with a message that Pre-Installation is complete. Review the information in the wizard dialog box and proceed to installing Microsoft Exchange Server.

Do *not* click **Continue** at this time. Wait until after the Exchange installation is complete.

If you wish to undo all actions performed by the wizard during the pre-installation procedure, click **Revert**.

## Exchange server installation: first node

Install Exchange on the node where the Exchange Server Setup Wizard was run for the pre-installation tasks.

Exchange 2003 requires service pack 2. The procedure below is based on Exchange 2003 SP2.

This is a standard Microsoft Exchange Server installation. Refer to the Microsoft documentation for details on this installation.

### To install Exchange

- 1 Install Exchange Server using the Microsoft Exchange installation program. See the Microsoft Exchange documentation for instructions.
- 2 Reboot the node if prompted to do so.
- 3 For Exchange 2003, install the required service pack.

## Exchange post-installation: first node

After completing the Microsoft Exchange installation, use the Exchange Setup Wizard for Veritas Cluster Server to complete the post-installation phase. This process reverts the node name to the physical name, and sets the Exchange services to manual so that the Exchange services can be controlled by VCS.

### To perform Exchange post-installation

- 1 Make sure that the Veritas High Availability Engine (HAD) is running on the node on which you plan to perform the post-installation tasks.  
Type the following on the command line:  

```
C:\>hasys -state
```

The state should display as RUNNING.  
If HAD is not running, start it. Type the following on the command line:  

```
C:\>net stop had  
C:\>net start had
```
- 2 Make sure the registry replication volume is online and mounted on the node on which you plan to perform the post-installation tasks.
- 3 If the Exchange installation did not prompt you to reboot the node, click **Continue** from the Exchange Setup Wizard and proceed to [step 5](#) on page 54. If you reboot the node after Microsoft Exchange installation, the Exchange Setup Wizard is launched automatically.
- 4 Review the information in the Welcome dialog box and click **Next**.
- 5 A message appears indicating that the system will be renamed and restarted after you quit the wizard. This sets the node back to its physical host name. Click **Yes** to continue.
- 6 The wizard starts performing the post-installation tasks. Various messages indicate the status. After all the commands are executed, click **Next**.
- 7 Click **Finish**.
- 8 The wizard prompts you to reboot the node. Click **Yes** to reboot the node. Changes made during the post-installation steps do not take effect till you reboot the node.

# Moving Exchange database to shared storage

After completing Microsoft Exchange installation on the first node, move the Exchange databases from the local drive of the first node to a location on shared storage.

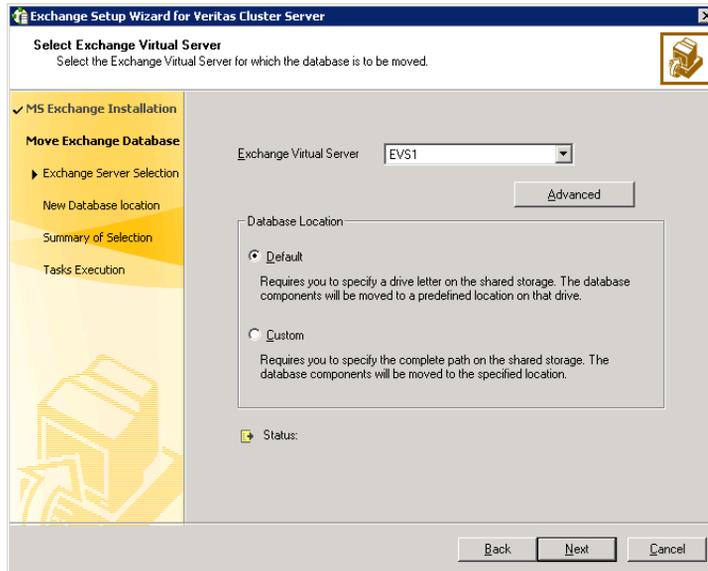
## Prerequisites

- Make sure that there is no queued data on the SMTP server.
- Make sure that the volumes created to store the Exchange database, the MTA data, and the transaction logs are mounted. Unmount the volumes from other nodes in the cluster.

## To move Exchange databases

- 1 Click **Start > Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Setup Wizard** to start the Exchange Setup Wizard for VCS.
- 2 Review the information in the Welcome dialog box and click **Next**.
- 3 In the Available Option dialog box, choose the **Configure/Remove highly available Exchange Server** option and click **Next**.
- 4 In the Select Option dialog box, choose the **Move Exchange Databases** option and click **Next**.

5 In the Select Exchange Virtual Server dialog box:



- Select the Exchange virtual server.
- If desired, click **Advanced** to specify details for the Lanman resource.
  - Select the distinguished name of the Organizational Unit for the virtual server. By default, the Lanman resource adds the virtual server to the default container "Computers."

---

**Warning:** The user account for VCS Helper service must have adequate privileges on the specified container to create and update computer accounts.

---

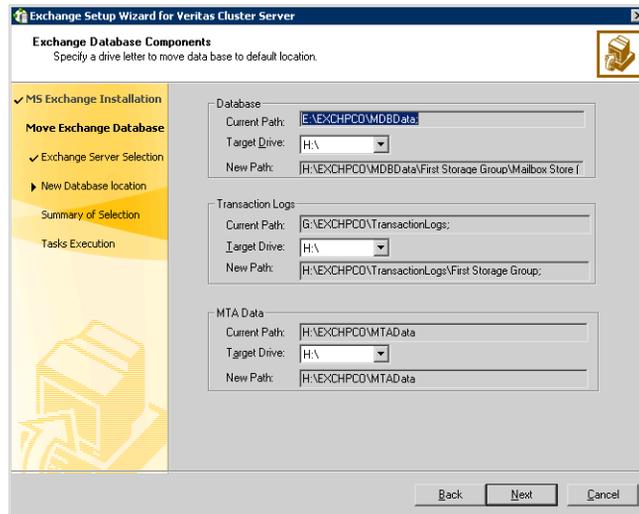
- Click **OK**.
  - Specify whether you want to move the Exchange databases to a default or custom location. Choosing a custom location allows you to specify the Exchange database and streaming path.
  - Click **Next**.
- 6 Do one of the following:
- If you would like to move the first mailbox store, public store, and MTA data to the generated default paths on the volumes for these components, proceed to the next step.
  - Otherwise, proceed to [step 8](#) on page 58 to specify the path location on the volumes that you will designate for these components.

---

**Warning:** The Exchange data files and the MTA must be in different paths, and the MTA cannot be at the root level (for example K:\).

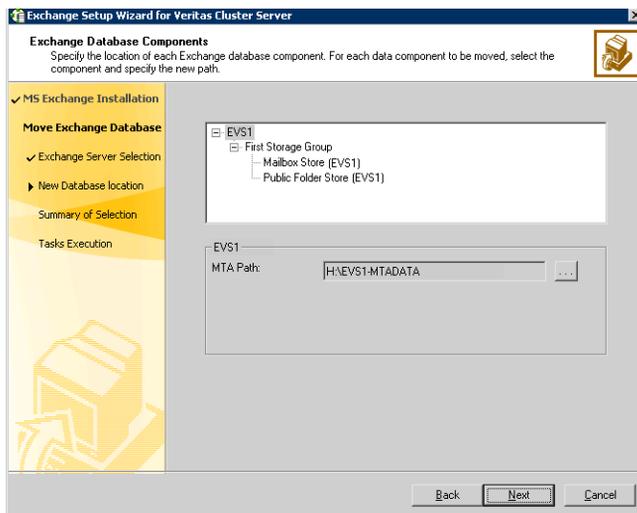
---

- 7 For the option of a default database location, specify the drives where the Exchange database components will be moved. The database components will be moved to a default location on that drive. In the Exchange Database Components dialog box:



- Specify the drive where the Exchange database will be moved.
- Specify the drive where the Exchange Transaction Logs will be moved.
- Specify the drive where the Exchange MTA Data will be moved.
- Click **Next** and proceed to [step 9](#) on page 58.

- 8 For the option of a custom database location, specify the location for specific Microsoft Exchange data components. In the Exchange Database Components dialog box:



For each data component to be moved select the component and specify the path to which the component is to be moved. Click the ellipsis (...) to browse for folders. Click **Next**.

Make sure the path for the Exchange database components contains only ANSI characters.

- 9 Review the summary of your selections and click **Next**.
- 10 The wizard performs the tasks to move the Exchange databases. Messages indicate the status of each task. After all the tasks are completed successfully, click **Next**.
- 11 Click **Finish** to exit the wizard.

# Installing Exchange on additional nodes

After moving the Exchange databases to shared storage, install Exchange on additional nodes in the cluster for the same Exchange virtual server. You must run the pre-installation, installation, and post-installation procedures on each additional node.

## Exchange pre-installation: additional nodes

Use the Exchange Server Setup Wizard for Veritas Cluster Server to complete the pre-installation phase. This process changes the physical name of the node to a virtual name.

---

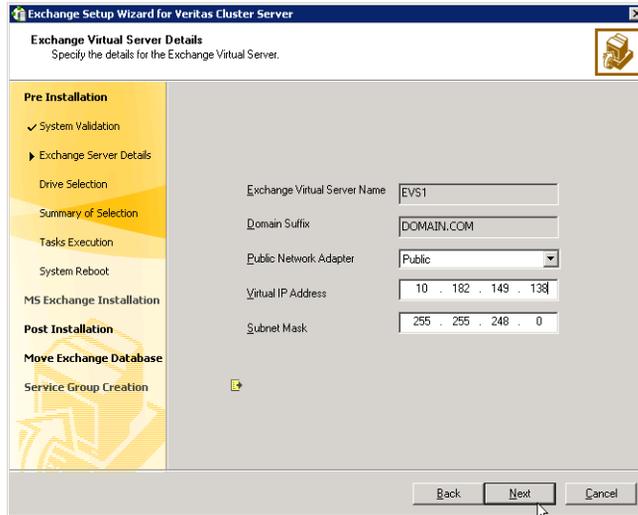
**Note:** Before adding a node to the Exchange cluster, make sure you meet the prerequisites listed under “[Before installing Microsoft Exchange](#)” on page 38.

---

### To perform Exchange pre-installation

- 1 Make sure that the volume created to store the registry replication information is mounted on this node and unmounted on other nodes in the cluster.
- 2 From the node to be added to an Exchange cluster, click **Start > Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Setup Wizard** to start the Exchange Setup Wizard for VCS.
- 3 Review the information in the Welcome dialog box and click **Next**.
- 4 In the Available Option dialog box, choose the **Install Exchange Server for High Availability** option and click **Next**.
- 5 In the Select Option dialog box, choose the **Create a failover node for existing Exchange Virtual Server** option and click **Next**.
- 6 Select the Exchange virtual server for which you are adding the failover node and click **Next**.
- 7 The wizard validates the system for the prerequisites. Various messages indicate the validation status. When the validations are done, click **Next**.

8 Specify network information for the Exchange virtual server.



The wizard discovers the Exchange virtual server name and the domain suffix from the Exchange configuration. Verify this information and provide values for the remaining text boxes.

- Select the appropriate public NIC from the drop-down list. The wizard lists the public adapters and low-priority TCP/IP enabled private adapters on the system.
  - Optionally, enter a unique virtual IP address for the Exchange virtual server. By default, the text box displays the IP address assigned when the Exchange Virtual Server (EVS1) was created on the first node. You should not have to change the virtual IP address that is automatically generated when setting up an additional failover mode for the virtual server in the same cluster.
  - Enter the subnet mask for the virtual IP address.
  - Click **Next**.
- 9 Review the summary of your selections and click **Next**.
  - 10 A message appears informing you that the system will be renamed and restarted after you quit the wizard. Click **Yes** to continue.
  - 11 The wizard runs commands to set up the VCS environment. Various messages indicate the status of each task. After all the commands are executed, click **Next**.
  - 12 Click **Reboot**.

The wizard prompts you to reboot the node. Click **Yes** to reboot the node.

---

**Warning:** After you reboot the node, the Exchange virtual server name is temporarily assigned to the node on which you run the wizard. So, all network connections to the node must be made using the temporary name. After installing Microsoft Exchange, you must rerun this wizard to assign the original name to the node.

---

On rebooting the node, the Exchange Setup wizard is launched automatically with a message that Pre-Installation is complete. Review the information in the wizard dialog box and proceed to installing Microsoft Exchange Server.

Do *not* click **Continue** at this time. Wait until after the Exchange installation is complete.

If you want to undo all actions performed by the wizard during the pre-installation procedure, click **Revert**.

## Exchange server installation: additional nodes

Install Exchange on the node where the Exchange Server Setup Wizard was run for the pre-installation tasks.

### To install Exchange

- Install any required service packs.
- Install the same Exchange version and components on all nodes.

The procedure below is based on Exchange 2003. This is a standard Microsoft Exchange Server installation. Refer to the Microsoft documentation for details on this installation.

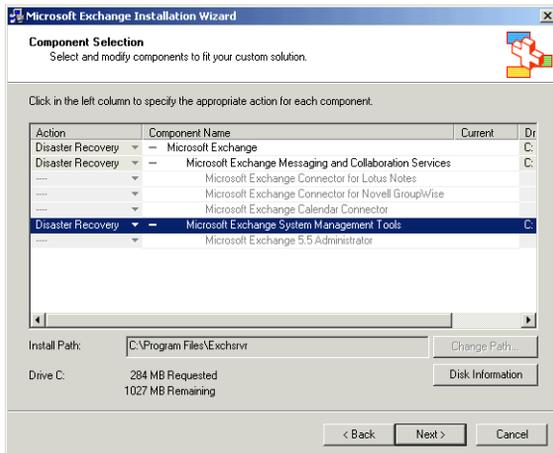
### To install Exchange

- 1 Begin the Exchange installation for disaster recovery at the command prompt using the /disasterrecovery option :  

```
<drive letter>:\SETUP\I386\setup.exe  
/disasterrecovery
```

where **<drive letter>** is the location where the Exchange software is located.
- 2 During the wizard, verify or select **Disaster Recovery** in the **Action** column for the Microsoft Exchange, Microsoft Exchange Messaging and Collaboration services and Microsoft Exchange System Management Tools

components. Be sure to install the same components on all the nodes in the cluster.



- 3 When notified to restore databases from backup and reboot the node after completing the installation, click **OK** and complete the Microsoft Exchange wizard.
- 4 If prompted to reboot the node, click **Yes**.
- 5 For Exchange 2003, install the service packs listed in the requirements. When installing service packs enter the following from the command line:  
`SETUP\I386\update.exe /disasterrecovery`

## Exchange post-installation: additional nodes

After completing the installation, use the Exchange Server Setup Wizard to complete the post-installation tasks. This process reverts the name of the node to its physical name.

After completing the Microsoft Exchange installation, use the Exchange Setup Wizard for Veritas Cluster Server to complete the post-installation phase. This process reverts the node name to the physical name.

### To perform Exchange post-installation

- 1 Make sure that the Veritas High Availability Engine (HAD) is running on the node on which you plan to perform the post-installation tasks.  
Type the following on the command line:  

```
C:\>hasys -state
```

The state should display as RUNNING.  
If HAD is not running, start it. Type the following on the command line:  

```
C:\>net stop had  
C:\>net start had
```
- 2 Make sure that the volume created to store the registry replication information is mounted on this node and unmounted on other nodes in the cluster.
- 3 If the Exchange installation did not prompt you to reboot the node, click **Continue** from the Exchange Setup Wizard and proceed to [step 5](#) on page 63. If you rebooted the node after Microsoft Exchange installation, the Exchange Setup Wizard is launched automatically.
- 4 Review the information in the Welcome dialog box and click **Next**.
- 5 A message appears informing you that the system will be renamed and restarted after you quit the wizard. The system will be renamed to the physical host name. Click **Yes** to continue.
- 6 The wizard starts performing the post-installation tasks. Various messages indicate the status. After the commands are executed, click **Next**.
- 7 If service groups are already configured for the EVS, specify whether you want to add the node to the system list of the service group for the EVS selected in the Exchange pre-installation step. You can also add nodes to a system list when configuring or modifying a service group with the Exchange service group configuration wizard.
- 8 Click **Finish**.
- 9 The wizard prompts you to reboot the node. Click **Yes** to reboot the node. Changes made during the post-installation steps do not take effect till you reboot the node.

**10** If you are using the Disaster Recovery wizard, return to the Disaster Recovery wizard to continue with disaster recovery configuration.

After installing Exchange Server on all systems that will participate in the service group, proceed to “[Configuring the Exchange service group](#)” on page 65 for instructions on how to configure the service group.

# Configuring the Exchange service group

This chapter contains the following topics:

- [“About configuring the Exchange service group”](#) on page 66
- [“Before configuring the Exchange service group”](#) on page 66
- [“Configuring the VCS Exchange service group”](#) on page 69
- [“Verifying the Exchange service group configuration”](#) on page 76

## About configuring the Exchange service group

VCS provides several ways of configuring a service group, including the service group configuration wizard, Cluster Manager (Java Console), Cluster Management Console, and the command line. This chapter provides instructions on configuring an Exchange service group using the Exchange Server Configuration Wizard and Cluster Manager (Java Console). You must have VCS administrator privileges to create and configure a service group.

## Before configuring the Exchange service group

- If you have configured Windows Firewall, add the following to the Firewall Exceptions list:
  - Port 14150 or the VCS Command Server service,  
`%vcs_home%\bin\CmdServer.exe`.  
Here, `%vcs_home%` is the installation directory for VCS, typically `C:\Program Files\Veritas\Cluster Server`.
  - Port 14141
- For a detailed list of services and ports used by SFW HA, refer to the *Veritas Storage Foundation and High Availability Solutions for Windows Installation and Upgrade Guide*.
- Verify that a cluster is configured using VCS Cluster Configuration Wizard (VCW).  
See “[Configuring the cluster](#)” on page 20.
- You must be a Cluster Administrator. This user classification is required to create and configure service groups.
- You must be a Local Administrator on the node where you run the wizard.
- Verify your DNS server settings. Make sure a static DNS entry maps the virtual IP address with the virtual computer name. Refer to the appropriate DNS document for further information.
- Verify Microsoft Exchange is installed and configured identically on all nodes.
- Verify the Command Server is running on all systems in the cluster.
- Verify the Veritas High Availability Daemon (HAD) is running on the system from where you run the wizard.
- If you are configuring a resource as a folder mount, make sure you also configure the root folder as a VCS resource and link the two resources.  
See “[Configuring additional dependencies for folder mounts](#)” on page 68.

- Mount the shared volumes created to store the following data; unmount the volumes from other nodes in the cluster.
  - Exchange database
  - Registry replication information
  - Transaction logs for the first storage group
  - MTA data

---

**Note:** If you mount these volumes as folders, make sure that the folders are on shared disks too. See “[Mounting volumes](#)” on page 50 for instructions.

---

## Configuring additional dependencies for folder mounts

When using the MountV agent to configure a resource as a folder mount, you must also configure the root folder as a VCS resource and link the two resources. Before configuring a resource for folder mounts, make sure you have configured folder mounts using Veritas Enterprise Administrator.

For example, to mount volume VOL1 at the mount path X:\Folder using the MountV agent:

- 1 Configure the root folder X: as a MountV resource.

```
MountV M1 {  
    MountPath = X:  
    VMDGResName = V1  
    VolumeName = V1  
}
```

- 2 Configure the folder X:\Folder as a MountV resource.

```
MountV M2 {  
    MountPath = X:\Folder  
    VMDGResName = V1  
    VolumeName = VOL1  
}
```

- 3 Link the two resources such that the folder mount resource depends on the root folder resource.

```
M2 requires M1
```

In this example, your configuration would look like:

```
MountV M1 {  
    MountPath = X:  
    VMDGResName = V1  
    VolumeName = V1 }  
  
MountV M2 {  
    MountPath = X:\Folder  
    VMDGResName = V1  
    VolumeName = VOL1 }  
  
VMDg V1 {  
    DiskGroupName = D1 }  
  
M2 requires M1  
M1 requires V1
```

## Configuring the VCS Exchange service group

VCS provides an Exchange Server Configuration Wizard that guides you through the process of configuring an Exchange service group. The wizard also modifies and deletes an Exchange service group. This section describes the steps required to create a new Exchange service group using the wizard.

To modify an existing service group, see “[Modifying the service group configuration](#)” on page 80.

Before configuring the Exchange service group, review the resource types and the attribute definitions of the Exchange agents.

See [Appendix A, “Resource type definitions”](#) on page 99.

For sample configuration files and resource dependency graphs of the Exchange service group, see [Appendix B, “Sample configurations”](#) on page 103.

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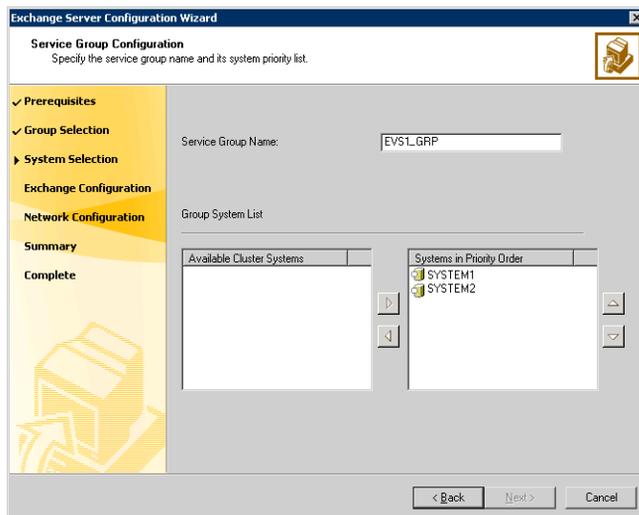
**Note:** Symantec recommends that you configure Microsoft Exchange Server and Microsoft SQL Server on separate failover systems within a cluster.

---

### To configure the Exchange service group

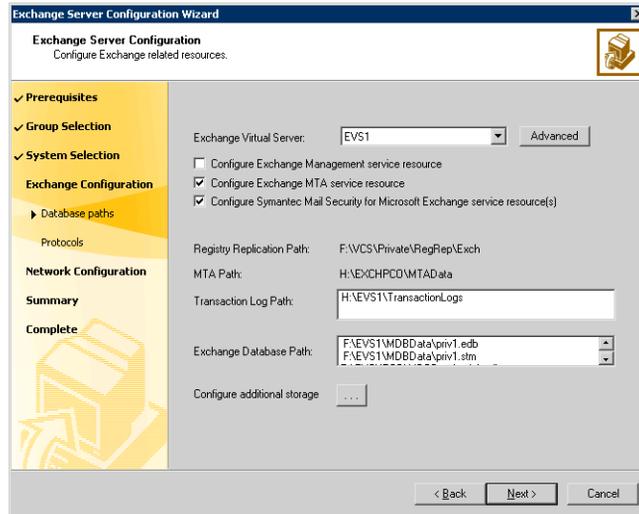
- 1 Start the Exchange Server Configuration Wizard. **Start > Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Configuration Wizard**
- 2 Review the information in the Welcome dialog box and click **Next**.
- 3 In the Wizard Options panel, choose the **Create service group** option and click **Next**.

#### 4 Specify the service group name and system list:



- Enter a name for the Exchange service group.  
If you are configuring the service group on the secondary site, ensure that the name matches the service group name on the primary site.
- In the Available Cluster Systems box, select the systems on which to configure the service group and click the right-arrow icon to move the systems to the service group's system list. Symantec recommends that you configure Microsoft Exchange Server and Microsoft SQL Server on separate failover nodes within a cluster.
- To remove a system from the service group's system list, select the system in the Systems in Priority Order list and click the left arrow.
- To change a node's priority in the service group's system list, select the node in the Systems in Priority Order list and click the up and down arrows. The node at the top of the list has the highest priority while the system at the bottom of the list has the lowest priority.
- Click **Next**. The wizard starts validating your configuration. Various messages indicate the validation status.

- 5 Verify the Exchange virtual server name and the drives or folder mounts created to store Exchange data:



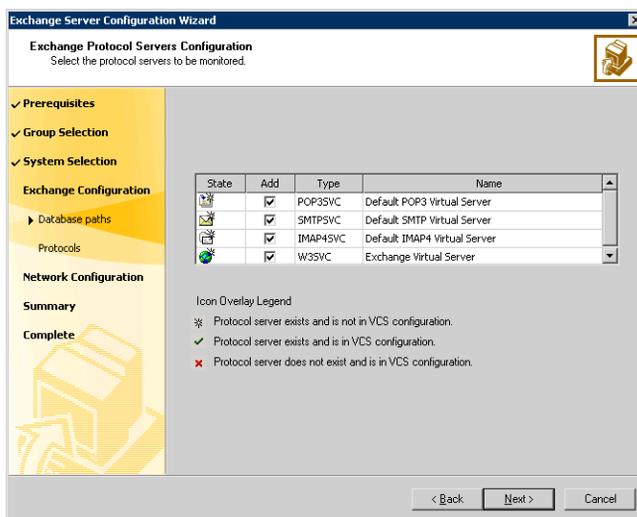
- Specify the Exchange Virtual Server.
- If desired, click **Advanced** to specify details for the Lanman resource.
  - Select the distinguished name of the Organizational Unit for the virtual server. By default, the Lanman resource adds the virtual server to the default container "Computers." The user account for VCS Helper service must have adequate privileges on the specified container to create and update computer accounts.
  - Click **OK**.
- Verify the Exchange Database Path.
- Verify the Transaction Log Path.
- Specify whether you want to configure the Exchange Management service.
  - Specify whether you want to configure the Exchange MTA service resource. The Exchange Message Transfer Agent is specific to legacy Exchange message routing based on X.400. There are specific circumstances where it may or may not be required for your Exchange server. Please refer to Microsoft documentation on Exchange message routing and the use of MTA for further

clarification and applicability to its use within your Exchange environment.

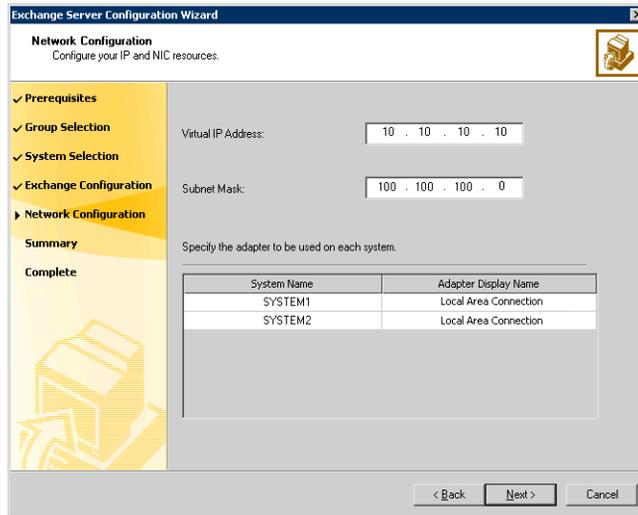
- If you are utilizing Symantec Mail Security for Exchange be sure to indicate that you would like to configure this resource.

- Click **Next**.

- 6 Select the check box next to the protocol servers to be monitored and click **Next**.



7 Specify information related to the network:



- The Virtual IP Address and the Subnet Mask text boxes display the values entered while installing Exchange. You can keep the displayed values or enter new values.  
 If you change the virtual IP address, you must create a static entry in the DNS server mapping the new virtual IP address to the virtual server name.
- For each system in the cluster, select the public network adapter name. Select the Adapter Name field to view the adapters associated with a node.

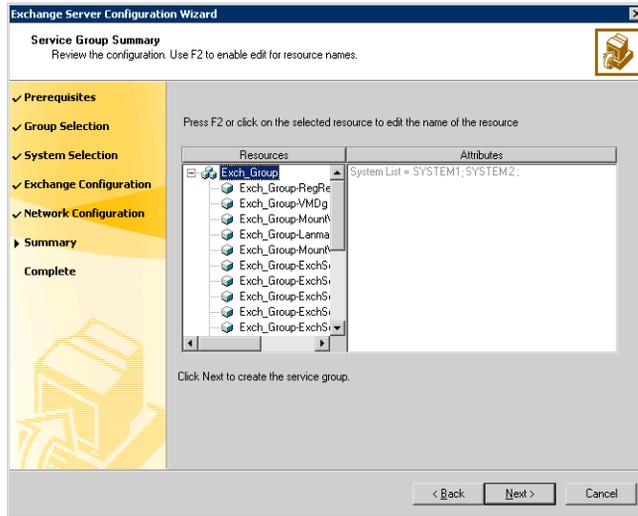
---

**Warning:** The wizard displays all TCP/IP enabled adapters on a system, including the private network adapters, if they are TCP/IP enabled. Make sure you select the adapters to be assigned to the public network, and not those assigned to the private network.

---

- Click **Next**.

- 8 Review the service group configuration and change the resource names, if desired:



The Resources box lists the configured resources. Click on a resource to view its attributes and their configured values in the Attributes box.

- The wizard assigns unique names to resources. Change names of resources, if desired.  
To edit a resource name, select the resource name and either click it or press the F2 key. Press Enter after editing each resource name. To cancel editing a resource name, press Esc.
  - Click **Next**.
  - A message appears informing you that the wizard will run commands to create the service group. Click **Yes** to create the service group. Various messages indicate the status of these commands. After the commands are executed, the completion dialog box appears.
- 9 In the Completing the Exchange Configuration panel, select the **Bring the service group online** check box to bring the service group online on the local system.
  - 10 Click **Finish**.  
After bringing the service group online, you must run the Exchange System Manager so that all the stores are automatically mounted on start-up.

#### To reconfigure mounting of stores at start-up

- 1 Start Exchange System Manager.

- 2 In the left pane, navigate to your storage group.  
If administrative groups are not configured, Servers > Exchange Server > Storage Group.  
If more than one administrative group is configured, expand Administrative Groups > Your Administrative Group > Servers > Exchange Server > Storage Group.
- 3 Right-click the Exchange database and choose **Properties** from the pop-up menu.
- 4 Click the Database tab.
- 5 Clear the **Do not mount this store at start-up** check box.
- 6 Click **OK**.

Repeat these steps for all the Exchange databases that were previously mounted.

If you need to configure additional storage groups or mailbox stores on the shared storage you should do that now. Import disk groups and mount volumes that have been created for the additional storage groups or mailbox stores, and create the new storage groups and mailbox stores in Exchange , and then rerun the Exchange Configuration Wizard to bring them under VCS control. If you already designated the additional mounted volumes and disk groups when you ran the configuration wizard the first time then you can just create the storage groups and mailbox stores in Exchange .

## Verifying the Exchange service group configuration

This section provides steps to verify an Exchange service group configuration by bringing the service group online, taking it offline, and switching the service group to another cluster node.

### Bringing the service group online

Perform the following steps to bring the service group online from the VCS Java or Web Console.

#### To bring a service group online from the Java Console

- 1 In the Cluster Explorer configuration tree, select the Exchange service group to be taken online.
- 2 Right-click the service group name, and then click **Enable Resources**. This enables all resources in the service group.
- 3 Right-click the service group name, and select the system on which to enable the service group. (Right-click > Enable > *system\_name* or Right-click > Enable > All)
- 4 Save your configuration (**File > Close Configuration**).
- 5 Right-click the service group and select to online the service group on the system. (Right-click > Online > *system\_name*)

#### To bring a service group online from the Web Console

- 1 On the **Service Group** page (**Cluster Summary > All Groups > Service Group**), click **Online**.
- 2 In the Online Group dialog box, select the system on which to bring the service group online.
- 3 To run PreOnline script, select the **Run PreOnline Script** check box.
- 4 Click **OK**.

## Taking the service group offline

Perform the following steps to take the service group offline from the VCS Java or Web Console.

### To take a service group offline from the Java Console

- 1 On the **Service Groups** tab of the Cluster Explorer configuration tree, right-click the service group.  
*or*  
Select the cluster in the Cluster Explorer configuration tree, select the **Service Groups** tab, and right-click the service group icon in the view panel.
- 2 Click **Offline**, and choose the appropriate system from the pop-up menu.  
(Right-click > Offline > *system\_name*)

### To take a service group offline from the Web Console

- 1 On the **Service Group** page (**Cluster Summary>All Groups>Service Group**), click **Offline**. This opens the Offline Group dialog box.
- 2 Select the system on which to take the service group offline.
- 3 Click **OK**.

## Switching the service group

The process of switching a service group involves taking it offline on its current system and bringing it online on another system. Perform the following steps to switch the service group from the VCS Java or Web Console.

### To switch a service group from the Java Console

- 1 On the **Service Groups** tab of the Cluster Explorer configuration tree, right-click the service group.  
*or*  
Select the cluster in the Cluster Explorer configuration tree, select the Service Groups tab, and right-click the service group icon in the view panel.
- 2 Click **Switch To**, and choose the appropriate system from the pop-up menu. (Right-click > Switch To > *system\_name*)

### To switch a service group from the Web Console

- 1 From the Service Group page (**Cluster Summary>All Groups>Service Group**), click **Switch**.
- 2 On the Switch Group dialog box, select the system to switch the service group to.
- 3 Click **OK**.

# Administering the Exchange service group

This chapter contains the following topics:

- [“About administering the Exchange service group”](#) on page 80
- [“Modifying the service group configuration”](#) on page 80
- [“Deleting the Exchange service group”](#) on page 81

## About administering the Exchange service group

This chapter describes administrative tasks such as modifying the service group configuration or deleting a service group, that you can perform on an Exchange service group.

## Modifying the service group configuration

You can dynamically modify the Exchange service group configuration in several ways, including the Exchange Server Configuration Wizard, Cluster Manager (Java Console), Cluster Management Console, and the command line. The following steps describe how to modify the service group using the configuration wizard.

### Before modifying the service group

- If the Exchange service group is online, you must run the wizard from a node on which the service group is online. You can then use the wizard to add resources to and remove them from the configuration. You cannot change resource attributes.
- To change the resource attributes, you must take the service group offline. However, the MountV and VMDg resources for the service group should be online on the node where you run the wizard and offline on all other nodes. So, the volumes created to store the Exchange database, the registry replication information, the MTA data, and the transaction logs should be mounted.
- If you are running the wizard to remove a node from the service group's system list, do not run the wizard on the node being removed.

## Instructions

- 1 Start the Exchange Server Configuration Wizard. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Configuration Wizard**)
- 2 Read the information on Welcome panel and click **Next**.
- 3 On the Wizard Options panel, click **Modify service group**, select the service group to be modified, and click **Next**.
- 4 Follow the wizard instructions and make desired modifications to the service group configuration.  
See “[Configuring the VCS Exchange service group](#)” on page 69.  
If you run the wizard to add a system to an online service group, resources having local attributes may go in an UNKNOWN state for a short duration. These resources will come out of the UNKNOWN state in the next monitor cycle.

## Deleting the Exchange service group

The following steps describe how to delete an Exchange service group using the configuration wizard.

### To delete an Exchange service group

- 1 Start the Exchange Server Configuration Wizard from a cluster node. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Configuration Wizard**)
- 2 Review the information in the Welcome panel and click **Next**.
- 3 In the Wizard Options panel, click **Delete service group**, select the service group to be deleted and click **Next**.
- 4 In the Service Group Summary panel, click **Next**.
- 5 A message appears informing you that the wizard will run commands to delete the service group. Click **Yes** to delete the service group.
- 6 Click **Finish**.



# Removing the VCS agent for Exchange

This chapter contains the following topics:

- [“About removing the VCS application agent for Exchange”](#) on page 84
- [“Before removing the VCS application agent for Exchange”](#) on page 84
- [“Overview of tasks”](#) on page 84
- [“Removing Microsoft Exchange”](#) on page 85
- [“Removing the Microsoft Exchange application agent”](#) on page 89

## About removing the VCS application agent for Exchange

The Exchange Server Setup Wizard for VCS removes Microsoft Exchange server and its components from the local node and must be run from each node on which Exchange server is installed.

If your configuration has more than one Exchange virtual server (EVS) configured on each node, you must run the wizard once for each EVS. The wizard removes Microsoft Exchange server from the node only when you remove the last EVS on that node.

## Before removing the VCS application agent for Exchange

- From the Exchange service group SystemList, remove the node where you are removing Microsoft Exchange.
- Verify that the user mailboxes and routing group connectors are deleted from the system where you are removing Microsoft Exchange.
- Verify that the system from which Microsoft Exchange will be removed is not a Recipient Update Server.
- Verify that the system from which Microsoft Exchange will be removed is not a routing master.

See “[Troubleshooting Microsoft Exchange uninstallation](#)” on page 97 to resolve errors encountered while removing Microsoft Exchange server.

## Overview of tasks

Removing the VCS application agent for Microsoft Exchange from a cluster node involves the following tasks:

- Removing Microsoft Exchange server from the node using the Exchange Setup Wizard for VCS.  
See “[Removing Microsoft Exchange](#)” on page 85.
- Removing the VCS application agent for Microsoft Exchange.  
See “[Removing the Microsoft Exchange application agent](#)” on page 89.

*Repeat these steps on all nodes from where Microsoft Exchange and VCS application agent for Microsoft Exchange are to be removed.*

## Removing Microsoft Exchange

The Exchange Server Setup Wizard for VCS performs the following tasks for removing Microsoft Exchange from a node:

- If the node being removed is configured to host other Exchange virtual servers, the wizard removes the node from the SystemList of the service group for the specified Exchange virtual server. The wizard does not remove Microsoft Exchange from the node.

See “[Removing a node without uninstalling Microsoft Exchange](#)” on page 86.

- If the node being removed is not configured to host other Exchange virtual servers, the wizard removes the node from the SystemList of the service group for the specified Exchange virtual server. The wizard also removes Microsoft Exchange from the node by launching the Microsoft Exchange Installation wizard.

See “[Removing a node and uninstalling Microsoft Exchange](#)” on page 86.

---

**Note:** If you are removing Microsoft Exchange from all nodes in the cluster, delete the service group after taking it offline.

---

## Removing a node without uninstalling Microsoft Exchange

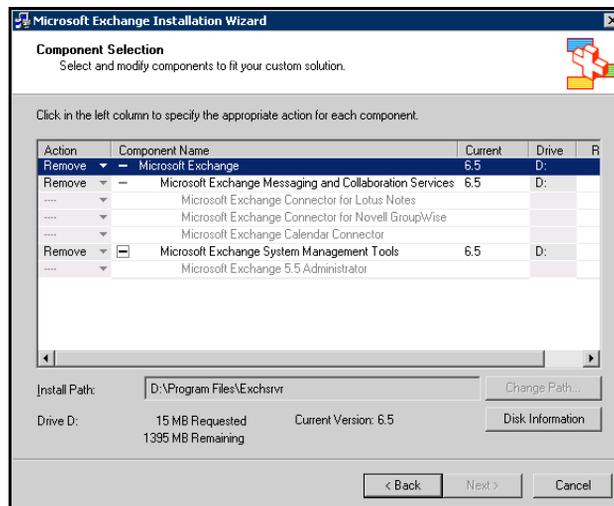
- 1 Start the Exchange Server Setup Wizard for VCS. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Setup Wizard**)
- 2 Review the information in the Welcome panel and click **Next**.
- 3 In the Available Option panel, click **Configure/Remove highly available Exchange Server** and click **Next**.
- 4 In the Select Option panel, click **Remove Exchange Server** and click **Next**. If an Exchange service group is configured on the node, the wizard prompts you to remove the system from the service group's SystemList attribute. Resolve the error and rerun the Exchange Setup Wizard.
- 5 Select the Exchange virtual server for which you are removing the failover node and click **Next**. The wizard starts running commands to set up the VCS environment for removing the node from the Exchange service group. Various messages indicate the status of each command.
- 6 Once all the commands are executed, click **Next**.
- 7 Click **Finish**.  
Proceed to "[Removing the Microsoft Exchange application agent](#)" on page 89 for instructions on uninstalling the agent.

## Removing a node and uninstalling Microsoft Exchange

- 1 Start the Exchange Server Setup Wizard for VCS. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Tools > Exchange Server Setup Wizard**)
- 2 Review the information in the Welcome panel and click **Next**.
- 3 In the Available Option panel, click **Configure/Remove highly available Exchange Server** and click **Next**.
- 4 In the Select Option panel, click **Remove Exchange Server** and click **Next**. If an Exchange service group is configured on the node, the wizard prompts you to remove the system from the service group's SystemList attribute. Resolve the error and rerun the Exchange Setup Wizard.
- 5 Select the Exchange virtual server for which you are removing the failover node and click **Next**.
- 6 A message appears informing that the system will be renamed and restarted after you quit the wizard. Click **Yes** to continue. The wizard starts running commands to set up the VCS environment for removing the node from the

Exchange service group. Various messages indicate the status of each command.

- 7 Once all the commands are executed, click **Next**. The wizard prompts you to choose whether you want to retain the entry for the EVS in the Active Directory. Click **Yes** to remove the entry or **No** to retain the entry.
- 8 Click **Reboot** and click **Yes** when the wizard prompts you to restart the node. If you have other applications running, click **No**, close all applications, and restart the node manually. Restarting the node automatically launches the Exchange Setup Wizard for VCS.
- 9 Review the information in the Welcome panel and click **Next**.
- 10 A message appears informing that the system will be renamed and restarted after you quit the wizard. Click **Yes** to continue.
- 11 On the Microsoft Exchange Installation Wizard Welcome panel, click **Next**.
- 12 In the Component Selection panel, click the **Action** column against each Exchange component, select **Remove** from the drop-down list, and click **Next**.



- 13 In the Installation Summary panel, review the information presented and click **Next**. The Component Progress panel displays the status of the uninstallation.
- 14 On the completion panel, click **Finish**. Do not reboot the node at this stage. The Exchange Setup Wizard for VCS must complete its operations before the node is rebooted. The Exchange Setup Wizard for VCS is launched. The

wizard performs the post-uninstallation tasks. Various messages indicate the status of each task.

- 15 Once all the tasks are complete, click **Next** and then click **Finish**.
- 16 Click **Yes** when the wizard prompts you to restart the node. If you have other applications running, click **No**, close all applications, and restart the node manually.

Proceed to “[Removing the Microsoft Exchange application agent](#)” on page 89 for instructions on uninstalling the agent.

# Removing the Microsoft Exchange application agent

Before removing the VCS application agent for Microsoft Exchange, make sure you meet the following requirements:

- Verify that you have local administrative privileges on the node from where you are removing the agent.
- Verify that all Exchange service groups are offline on all nodes in the cluster.

## To remove the agent

- 1 Start the installer for Storage Foundation for Windows. In the Add/Remove Programs applet, click **Storage Foundation HA 5.1 for Windows - HA (Server Components)** and click **Change**.
- 2 In the Storage Foundation 5.1 for Windows dialog box, click **Add or Remove** and click **Next**.
- 3 In the SFW product options panel, click **Next**.
- 4 Uncheck **Veritas Cluster Server Application Agent for Exchange** and click **Next**. The installer validates the system for prerequisites.
- 5 After the system is accepted, click **Next**.  
 If a system is rejected, the Comments column displays the cause for rejecting the system. Highlight the system to view a detailed information about the failure in the Details box. Resolve the error, highlight the system from the list, and click **Validate Again**. An informational message appears if you selected the DMP option. Review the information and click **OK** to continue.
- 6 Review the summary of your selections and click **Update** to start the uninstallation. The installer displays the status of uninstallation.
- 7 After the uninstallation is complete, review the report, click **Next**, and then click **Finish**. Repeat these steps on all systems from where the VCS application agent for Microsoft Exchange is to be removed.



# Troubleshooting

This chapter contains the following topics:

- [“About troubleshooting the VCS agent for Exchange”](#) on page 92
- [“VCS logging”](#) on page 92
- [“Exchange Protocol agent error messages”](#) on page 93
- [“Exchange Service agent error messages”](#) on page 95
- [“Troubleshooting Microsoft Exchange uninstallation”](#) on page 97
- [“Troubleshooting Exchange Setup Wizard issues”](#) on page 98

## About troubleshooting the VCS agent for Exchange

This chapter describes how to troubleshoot common problems in the VCS application agent for Microsoft Exchange. The chapter lists the error messages, and describes the problem associated with the agent. Recommended solution is included, where applicable.

### VCS logging

VCS generates two error message logs: the engine logs and the agent logs. Log file names are appended by letters. Letter A indicates the first log file, B the second, C the third, and so on.

The agent log is located at %VCS\_HOME%\log\agent\_A.txt. The format of agent log messages is:

Timestamp (Year/MM/DD) | Mnemonic | Severity | UMI | Agent Type |  
Resource Name | Entry Point | Message Text

The agent log message components are defined as follows:

- Timestamp denotes the date and time when the message was logged.
- Mnemonic denotes which Symantec product logs the message. For VCS application agent for Microsoft Exchange, mnemonic is 'VCS'.
- Severity denotes the seriousness of the message. Severity of the VCS error messages is classified into the following types:
  - CRITICAL indicates a critical error within a VCS process. Contact Technical Support immediately.
  - ERROR indicates failure of a cluster component, unanticipated state change, or termination or unsuccessful completion of a VCS action.
  - WARNING indicates a warning or error, but not an actual fault.
  - NOTE informs that VCS has initiated an action.
  - INFO informs about various state messages or comments.Of these, CRITICAL, ERROR, and WARNING indicate actual errors. NOTE and INFO provide additional information.
- UMI or Unique Message ID is a combination of Originator ID, Category ID, and Message ID. For example, the UMI for a message generated by the ExchService agent would resemble: V-16-20024-13  
Originator ID for all VCS products is 'V-16.' Category ID for ExchProtocol agent is 20023 while that for ExchService agent is 20024. Message ID is a unique number assigned to the message text.
- Message text denotes the actual message string.

You can view these message logs using Notepad or any text editor. All messages are logged to the engine and the agent logs. Messages of type CRITICAL and ERROR are also written to the Windows event log.

A typical agent log resembles:

```
2003/12/19 15:09:22 VCS INFO V-16-20024-13
ExchService:d1-ExchService-MSExchangeIS:online:Service
(MSEXCHANGEIS) is taking longer to start. Timeout = 10 seconds
```

## Exchange Protocol agent error messages

**Table 7-2** Exchange Protocol agent error messages

Message	Description
Failed to find the service object. Please check the 'Protocol' attribute	The value specified for "Protocol" attribute is incorrect. Solution: Provide a valid value for the attribute.
Failed to get the Lanman resource state <i>Error Type, Error Code</i> . Please check the 'LanmanResName' attribute.	The value specified for the Lanman resource is incorrect. Solution: Provide a valid value for the Lanman resource. If the value is correct, see error type and error code for further information.
Configuration error. 'Protocol' attribute is not configured.	No value specified for the "Protocol" attribute. Solution: Specify a valid value for the attribute.
Configuration error. 'VirtualServer' attribute is not configured.	No value specified for the "Virtual Server" attribute. Solution: Specify a valid value for the attribute.
Configuration error. 'LanmanResName' attribute is not configured.	No value specified for the "LanmanResName" attribute. Solution: Specify a valid value for the attribute.
Failed to find the specified exchange server ( <i>server name</i> ) in the active directory. <i>Error Type, Error Code</i> .	The value specified for the Exchange server name (lanman resource name) does not pertain to the Exchange server service group. Solution: Provide a valid value for the Lanman resource that pertains to the Exchange server service group.

**Table 7-2** Exchange Protocol agent error messages (Continued)

Message	Description
Failed to get protocol virtual servers (Type = <i>protocol type</i> ). <i>Error Type, Error Code</i> .	The value specified for the protocol type and protocol server do not match.  Solution: Provide a valid combination of protocol type and protocol server.
Failed to find the specified protocol virtual server ( <i>server name</i> ) <i>Error Type, Error Code</i> . Please check the 'VirtualServer' attribute.	The value specified for the protocol virtual server is incorrect. See the associated Windows error type and error code for more information.
Failed to initialize active directory protocol object. <i>Error Type, Error Code</i> .	The agent fails to initialize the Active Directory protocol object. See the associated Windows error type and error code for more information.
Failed to access the active directory. <i>Error Type, Error Code</i> .	The agent fails to access the Active Directory. See the associated Windows error type and error code for more information.
ADsOpenObject() for <i>obj_name</i> returned <i>Error Code</i>	The agent fails to open the Active Directory object. See the associated Windows error code for more information.
The Lanman resource (Virtual name = <i>resource name</i> ) is offline.	The Lanman resource is offline.  Solution: Bring the Lanman resource online.
Failed to start the protocol virtual server ( <i>virtual server name</i> ). <i>Error Type, Error Code</i> .	The agent failed to start the protocol virtual server. See the associated Windows error type and error code for more information.
Failed to stop the protocol virtual server ( <i>virtual server name</i> ). <i>Error Type, Error Code</i> .	The agent failed to stop the protocol virtual server. See the associated Windows error type and error code for more information.
Failed to determine the state of the protocol virtual server ( <i>virtual server name</i> ). <i>Error Type, Error Code</i> .	The agent failed to determine the state of the protocol virtual server. See the associated Windows error type and error code for more information.

## Exchange Service agent error messages

**Table 7-3** Exchange Service agent error messages

Message	Description
Failed to find the service object. Please check the 'Service' attribute.	The value specified for the “Service” attribute is incorrect.  Solution: Provide a valid value for the Lanman resource. If the value is correct, see error type and error code for further information.
Configuration error. 'Service' attribute is not configured.	No value specified for the “Service” attribute. Solution: Specify a valid value for the attribute.
Configuration error. 'LanmanResName' attribute is not configured.	No value specified for the “LanManResName” attribute. Solution: Specify a valid value for the attribute.
Failed to get the Lanman resource state <i>Error Type, Error Code</i> . Please check the 'LanmanResName' attribute.	The value specified for the Lanman resource is incorrect.  Solution: Provide a valid value for the Lanman resource. If the value is correct, see error type and error code for further information.
The Lanman resource (Virtual name = <i>resource name</i> ) is offline.	The Lanman resource is offline. Solution: Bring the Lanman resource online.
Failed to stop the service ( <i>service name</i> ). <i>Error Type, Error Code</i> .	The agent failed to stop the service. See the associated Windows error type and error code for more information.
Failed to start the service ( <i>service name</i> ) <i>Error Type, Error Code</i> .	The agent failed to start the specified service. See the associated Windows error type and error code for more information.
Failed to open the service object.(Service = <i>service name</i> ). <i>Error Type, Error Code</i> .	The agent failed to open the service object. See the associated Windows error type and error code for more information.
Failed to initialize the CExchServer object. <i>Error Type, Error Code</i> .	The agent failed to initialize the Exchange server object.
Failed to query the service status. (Service = <i>service name</i> ). Error = <i>Error Type</i>	The agent failed to query the service object. See the associated Windows error type and error code for more information.

**Table 7-3** Exchange Service agent error messages (Continued)

Message	Description
Failed to terminate the service ( <i>service name</i> ). <i>Error Type</i> , <i>Error Code</i> .	The agent failed to terminate the service. See the associated Windows error type and error code for more information.
Failed to open the service object (Service = <i>service name</i> ). <i>Error Type</i> , <i>Error Code</i> .	The agent failed to open the service object. See the associated Windows error type and error code for more information.

# Troubleshooting Microsoft Exchange uninstallation

You might encounter errors while removing Microsoft Exchange if any of the following requirements are not adhered to:

- User mailboxes exist.
- The Exchange Server to be uninstalled is a Recipient Update Server.
- The Exchange Server to be uninstalled is a Routing Group Master.
- The Exchange Server to be uninstalled has routing group connectors configured.

In any of the above scenarios, carry out the following steps to resolve the error.

- 1 Start the following Exchange services manually using the Service Control Manager:
  - MExchangeSA
  - MExchangeIS
  - MExchangeMTA
  - MExchangeMGMT
  - RESvc
  - POP3
  - IMAP4
- 2 Delete user mailboxes by running the **Active Directory Users and Computers** MMC wizard (**Start > All Programs > Microsoft Exchange > Active Directory Users and Computers**).
- 3 Delete the routing group connector by running the **Exchange System Manager** MMC wizard (**Start > All Programs > Microsoft Exchange > Exchange System Manager**).
- 4 Change the Routing Group Master by running the **Exchange System Manager** MMC wizard.
- 5 Change the Recipient Update Server by running the **Exchange System Manager** MMC wizard.
- 6 Stop all Exchange services started in Step 1.
- 7 Start the Exchange Setup Wizard for VCS and select the *Remove Exchange* option. Note that you must uninstall Exchange *only* by using the Exchange Setup Wizard for VCS.

## Troubleshooting Exchange Setup Wizard issues

When adding a failover node to an existing Exchange cluster, the Exchange Setup Wizard may fail to rename the node during the pre-installation phase, and report the following error message:

```
Failed to rename the node. Refer to the log file for further details.
```

This can happen if the Exchange Setup Wizard is unable to delete the Exchange Virtual Server computer object in the Active Directory.

To resolve this issue, you must manually delete the Exchange Virtual Server computer object from the AD, and run the wizard again.

# Resource type definitions

This chapter contains the following topics:

- [“About resource type definitions”](#) on page 100
- [“Exchange Service agent”](#) on page 100
- [“Exchange Protocol agent”](#) on page 101

## About resource type definitions

This appendix lists the resource type definitions and attribute definitions of the Exchange Service and the Exchange Protocol agents.

The resource type represents the VCS configuration definition of the agent and specifies how the agent is defined in the configuration file main.cf. The Attribute Definitions lists the attributes associated with the agent. The Required attributes table lists the attributes that must be configured for the agent to function properly.

## Exchange Service agent

The Exchange Service agent is represented by the ExchService resource type.

### Resource type definition

```
type ExchService (  
    static i18nstr ArgList[] =  
        {Service, "LanmanResName:VirtualName", DetailMonitor }  
    str Service  
    str LanmanResName  
    int DetailMonitor = 0  
)
```

### Attribute definitions

Review the following information to familiarize yourself with the required agent attributes for an ExchService resource type. This information will assist you during the agent configuration.

**Table A-4** Exchange Service agent required attributes

Required Attributes	Type and Dimension	Definition
Service	string-scalar	The name of the Exchange service to be monitored. This attribute could take any of the following values: <ul style="list-style-type: none"><li>■ MExchangeIS</li><li>■ MExchangeMTA</li><li>■ MExchangeMGMT</li><li>■ MExchangeSA</li><li>■ RESvc</li></ul>

**Table A-4** Exchange Service agent required attributes (Continued)

Required Attributes	Type and Dimension	Definition
LanmanResName	string-scalar	The name of the Lanman resource on which the ExchService resource depends.

**Table A-5** Exchange Service agent optional attributes

Optional Attribute	Type and Dimension	Definition
DetailMonitor	integer-scalar	A flag that determines whether the agent monitors the MExchangeIS service in detail. The value 1 indicates that the agent monitors the service in detail; the value 0 indicates it does not. Set this attribute only for resources configured to monitor the MExchangeIS service; the attribute is ignored for other services.

## Exchange Protocol agent

The Exchange Protocol agent is represented by the ExchProtocol resource type.

### Resource type definition

```

type ExchProtocol (
    static i18nstr ArgList[] =
    { Protocol, VirtualServer, "LanmanResName:VirtualName",
      DetailMonitor }
    str Protocol
    i18nstr VirtualServer
    str LanmanResName
    int DetailMonitor
)

```

## Attribute definitions

Review the following information to familiarize yourself with the required agent attributes for an ExchProtocol resource type. This information will assist you during the agent configuration.

**Table A-6** Exchange Protocol agent required attributes

Required Attributes	Type and Dimension	Definition
VirtualServer	string-scalar	The name of the Exchange protocol server to be monitored. This attribute can take localized values.
LanmanResName	string-scalar	The name of the Lanman resource on which the ExchProtocol resource depends.
Protocol	string-scalar	The Exchange protocol for which the Exchange protocol server is configured. This attribute could take any of the following values: <ul style="list-style-type: none"> <li>■ POP3SVC</li> <li>■ W3SVC</li> <li>■ IMAP4SVC</li> <li>■ SMTPSVC</li> </ul>

**Table A-7** Exchange Protocol agent optional attributes

Optional Attribute	Type and Dimension	Definition
DetailMonitor	integer-scalar	For internal use.

# Sample configurations

This chapter contains the following topics:

- [“About sample configurations”](#) on page 104
- [“Active-Passive failover configuration”](#) on page 105

## About sample configurations

The sample configurations in this appendix describe typical service groups configured to monitor the state of the Exchange Server in a VCS cluster.

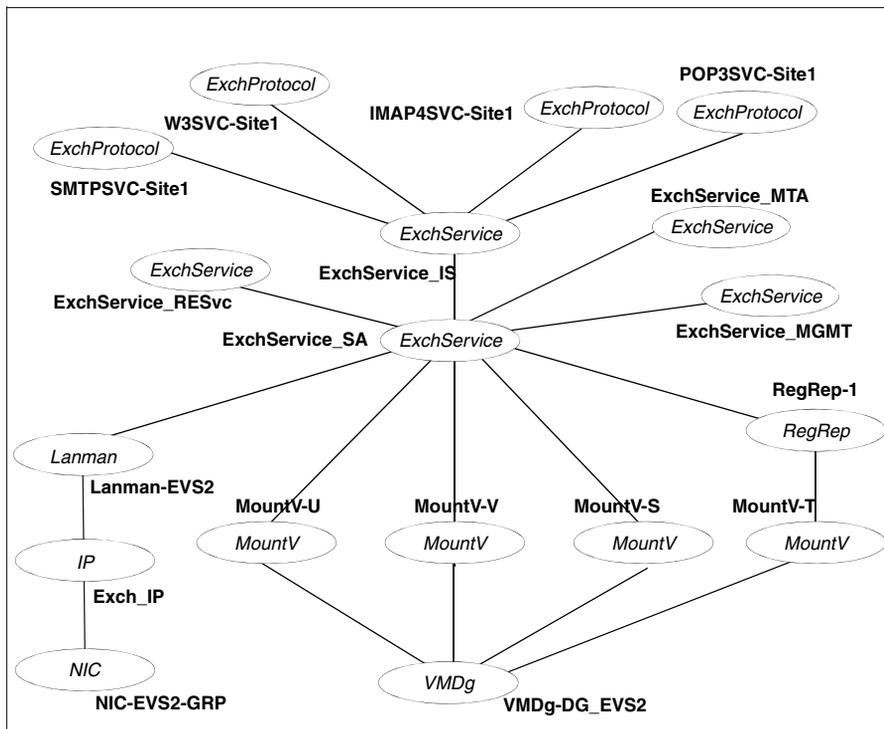
The appendix lists the sample configuration for clusters using SFW to manage shared storage.

See “[Active-Passive failover configuration](#)” on page 105.

The sample configuration graphically depicts the resource types, resources, and resource dependencies within the service group. The sample configuration files (main.cf) are also included for your reference. For more information about these resource types, see the chapter VCS Resource Types and Agents in the *Veritas Cluster Server Administrator's Guide*.

## Active-Passive failover configuration

This section lists the sample configuration for clusters employing Storage Foundation for Windows to manage shared storage. In the sample configuration shown in the dependency graph below, the shared disk group is configured using the Volume Manager Diskgroup (VMDg) agent.



- Four volumes are mounted as drives T, S, U and V respectively, using the MountV agent.  
The Registry Replication resource, configured to replicate the Exchange registry keys, is set up on volume T of the cluster disk group. The Exchange database is installed on volume S. The MTA data is installed on drive V, and the transaction logs on drive U.
- The Exchange services (MSExchangeSA, MSExchange RESvc, MSExchangeIS, MSExchangeMGMT, and MSExchangeMTA) are configured as resources of type ExchService.

- The Exchange virtual servers (SMTPSVC-Site1, W3SVC-Site1, IMAP4SVC-Site1, and POP3SVC-Site1) are configured as resources of type ExchProtocol.
- The virtual name for the server is created using the Lanman resource. The service group virtual IP address for the server is configured using the IP and NIC resource types.

## Sample configuration file

```
include "types.cf"

cluster VCSCluster (
    UserNames = { admin = "LLfWWb[Y_a]d_eY_e^" }
    Administrators = { admin }
    CounterInterval = 5
)

system VCSExch1 (
    CPUUsageMonitoring = { Enabled = 0, ActionThreshold = 0,
        ActionTimeLimit = 0,
        Action = NONE,
        NotifyThreshold = 0,
        NotifyTimeLimit = 0 }
)

system VCSExch2 (
    CPUUsageMonitoring = { Enabled = 0, ActionThreshold = 0,
        ActionTimeLimit = 0,
        Action = NONE,
        NotifyThreshold = 0,
        NotifyTimeLimit = 0 }
)

group Exch_GRP (
    SystemList = { VCSExch1 = 1, VCSExch2 = 2 }
)

VMDg Exch_VMDg (
    DiskGroupName = ExchVCSDG
)

ExchProtocol ExchProtocol_IMAP4Svc_Site1 (
    Protocol = IMAP4SVC
    VirtualServer = "Default IMAP4 Virtual Server"
    LanmanResName = Exch_Lanman
)

ExchProtocol ExchProtocol_POP3_Site1 (
    Protocol = POP3SVC
)
```

```
VirtualServer = "Default POP3 Virtual Server"
LanmanResName = Exch_Lanman
)

ExchProtocol ExchProtocol_SMTPSvc_Site1 (
  Protocol = SMTPSVC
  VirtualServer = "Default SMTP Virtual Server"
  LanmanResName = Exch_Lanman
)

ExchProtocol ExchProtocol_W3Svc_Site1 (
  Protocol = W3SVC
  VirtualServer = "Exchange Virtual Server"
  LanmanResName = Exch_Lanman
)

ExchService ExchService_IS (
  Service = MExchangeIS
  LanmanResName = Exch_Lanman
  DetailMonitor = 1
)

ExchService ExchService_MTA (
  Service = MExchangeMTA
  LanmanResName = Exch_Lanman
)

ExchService ExchService_RESvc (
  Service = RESvc
  LanmanResName = Exch_Lanman
)

ExchService ExchService_SA (
  Service = MExchangeSA
  LanmanResName = Exch_Lanman
)

ExchService ExchService_MGMT (
  Service = MExchangeMGMT
  LanmanResName = Exch_Lanman
)

IP Exch_IP (
  Address = "10.212.102.168"
  SubNetMask = "255.255.254.0"
  MACAddress @VCSExch1 = "00-02-B3-02-86-1D"
  MACAddress @VCSExch2 = "00-02-B3-02-86-35"
)

Lanman Exch_Lanman (
  VirtualName = ExchSRV
  IPResName = Exch_IP
)
```

```
        DNSUpdateRequired = 1
        ADUpdateRequired = 1
        ADCriticalForOnline = 1
    )

MountV Exch_DB_MountV (
    MountPath = "J:"
    VolumeName = Exchange
    VMDGResName = Exch_VMDg
)

MountV Exch_MTA_MountV (
    MountPath = "I:"
    VolumeName = Exchange
    VMDGResName = Exch_VMDg
)

MountV Exch_TrLog_MountV (
    MountPath = "H:"
    VolumeName = Exchange
    VMDGResName = Exch_VMDg
)

MountV Exch_RegRep_MountV (
    MountPath = "G:"
    VolumeName = RegRep
    VMDGResName = Exch_VMDg
)

NIC Exch_NIC (
    MACAddress @VCSExch1 = "00-02-B3-02-86-1D"
    MACAddress @VCSExch2 = "00-02-B3-02-86-35"
)

RegRep Exch_RegRep (
    MountResName = Exch_RegRep_MountV
    ReplicationDirectory = "\\Vcs\Private\RegRep\Exch"
    Keys =
    { "HKLM\SYSTEM\CurrentControlSet\Services\MSExchangeSA",
      "HKLM\SYSTEM\CurrentControlSet\Services\MSExchangeIS",
      "HKLM\SYSTEM\CurrentControlSet\Services\MSExchangeMTA",
      "HKLM\SYSTEM\CurrentControlSet\Services\POP3Svc",
      "HKLM\SYSTEM\CurrentControlSet\Services\IMAP4Svc" }
    ListOpenKeys = 0
    ForceRestore = 0
)

ExchProtocol_IMAP4Svc_Sitel requires ExchService_IS
ExchProtocol_POP3_Sitel requires ExchService_IS
ExchProtocol_SMTPSvc_Sitel requires ExchService_IS
ExchProtocol_W3Svc_Sitel requires ExchService_IS
ExchService_MGMT requires ExchService_SA
ExchService_IS requires ExchService_SA
```

```
ExchService_MTA requires ExchService_SA
ExchService_RESvc requires ExchService_SA
ExchService_SA requires Exch_RegRep
ExchService_SA requires Exch_DB_MountV
ExchService_SA requires Exch_MTA_MountV
ExchService_SA requires Exch_TrLog_MountV
ExchService_SA requires Exch_Lanman
Exch_IP requires Exch_NIC
Exch_Lanman requires Exch_IP
Exch_DB_MountV requires Exch_VMDg
Exch_MTA_MountV requires Exch_VMDg
Exch_TrLog_MountV requires Exch_VMDg
Exch_RegRep_MountV requires Exch_VMDg
Exch_RegRep requires Exch_RegRep_MountV
```



# Index

## A

- active computer name 18
- Active/Passive failover configuration 13
- agent configuration, modifying 80
- agent operations
  - ExchProtocol agent 12
  - ExchService agent 11
- Any-to-Any failover configuration
  - defined 14
- application failure, detecting 13
- attributes
  - for ExchProtocol agent 102
  - for ExchService agent 100

## C

- clusters
  - configuring cluster 20
- configuration
  - modifying using wizard 80
  - typical setup 13
- configuration wizards
  - Exchange Server Configuration 69
- configurations
  - Active/Passive failover 13
  - Any-to-Any failover 14
  - Disaster Recovery 15
- configure
  - LLT over UDP using VCW 26
- configuring
  - cluster (HA) 20
- creating
  - disk group 43
  - volume 45

## D

- dependency graphs 105
- DetailMonitor attribute
  - ExchProtocol agent 102
  - ExchService agent 101
- Disaster Recovery configuration 15

- DNS settings, for Exchange hosts 41

## E

- enterprise agent. See Exchange agent
- entry points. See agent operations
- Exchange
  - post-installation 54
  - pre-installation 51
  - supported versions 40
  - uninstalling 85
- Exchange agent
  - about 10
  - configuring using wizard 69
  - installing 19
  - removing 89
  - supported protocols 12
  - supported services 11
  - troubleshooting 91
  - typical setup 13
  - uninstalling 89
- Exchange cluster
  - Active/Passive setup 13
  - Any-to-Any setup 14
  - Disaster Recovery setup 15
  - setting up 16
- Exchange cluster configuration
  - Active/Passive failover 13
  - Any-to-Any failover 14
  - Disaster Recovery 15
- Exchange hosts, DNS settings for 41
- Exchange Protocol agent 12
- Exchange Service agent 11
- Exchange service group
  - modifying 80
- ExchProtocol agent
  - attributes 102
  - operations 12
  - troubleshooting 93
  - type definition 101
- ExchProtocol agent attributes
  - DetailMonitor 102

- LanmanResName 102
- Protocol 102
- VirtualServer 102
- ExchService agent
  - attributes 100
  - operations 11
  - troubleshooting 95
  - type definition 100
- ExchService agent attributes
  - DetailMonitor 101
  - LanmanResName 101
  - Service 100

**F**

- failover 13

**I**

- installing
  - Exchange agent 19
  - prerequisites 38

**L**

- LanmanResName attribute
  - ExchProtocol agent 102
  - ExchService agent 101
- LLT over UDP
  - configuring using VCW 26

**M**

- mounting a volume 50

**O**

- offlining service group 77
- operations
  - ExchProtocol agent 12
  - ExchService agent 11

**P**

- Protocol attribute 102

**R**

- resource type
  - ExchProtocol agent 101
  - ExchService agent 100

**S**

- sample configuration 105
- Security Services
  - configuring 27
- Service attribute 100
- service group
  - dependencies 105
  - modifying 80
  - switching 78
  - taking offline 77
- service group dependencies 105
- SFW
  - creating volumes 45
  - uninstalling 89
- shared disks
  - mounting using SFW 50
  - unmounting using SFW 50
- supported protocols 12
- supported services 11
- supported versions 40
- switching service group 78

**T**

- troubleshooting
  - Exchange protocol agent 93
  - Exchange service agent 95
  - uninstallation 97
- troubleshooting information 91
- type definition
  - ExchProtocol agent 101
  - ExchService agent 100

**U**

- uninstalling
  - Exchange 85
  - Exchange agent 89
- unmounting a volume 50

**V**

- VCS
  - configuring the cluster for HA 20
- VirtualServer attribute 102
- volumes, creating 45

**W**

- wizards

Exchange Server Configuration 69

