

Veritas™ Cluster Server Application Agent for Microsoft Exchange Configuration Guide

Windows 2000, Windows Server 2003

5.0

Veritas Cluster Server Application Agent for Microsoft Exchange Configuration Guide

Copyright © 2007 Symantec Corporation. All rights reserved.

Veritas Cluster Server 5.0

Symantec, the Symantec logo, Veritas, and Veritas Storage Foundation are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.

The product described in this document is distributed under licenses restricting its use, copying, distribution, and decompilation/reverse engineering. No part of this document may be reproduced in any form by any means without prior written authorization of Symantec Corporation and its licensors, if any.

THIS DOCUMENTATION IS PROVIDED “AS IS” AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID, SYMANTEC CORPORATION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

The Licensed Software and Documentation are deemed to be “commercial computer software” and “commercial computer software documentation” as defined in FAR Sections 12.212 and DFARS Section 227.7202.

Symantec Corporation
20330 Stevens Creek Blvd.
Cupertino, CA 95014
www.symantec.com

Third-party legal notices

Third-party software may be recommended, distributed, embedded, or bundled with this Symantec product. Such third-party software is licensed separately by its copyright holder. All third-party copyrights associated with this product are listed in the accompanying release notes.

Windows is a registered trademark of Microsoft Corporation.

Licensing and registration

Veritas Cluster Server is a licensed product. See the *Storage Foundation and High Availability Solutions for Windows, Installation and Upgrade Guide* for license installation instructions.

Technical support

For technical assistance, visit <http://entsupport.symantec.com> and select phone or email support. Use the Knowledge Base search feature to access resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and our customer email notification service.

Contents

Chapter 1	Introduction	
	VCS application agent for Microsoft Exchange	9
	Exchange Service agent	10
	Exchange Protocol agent	11
	How the agent makes Microsoft Exchange highly available	12
	Typical Exchange configurations in a VCS cluster	12
	Setting up an Exchange cluster	15
Chapter 2	Installing the Microsoft Exchange application agent	
	Prerequisites	17
	Installing the agent	18
Chapter 3	Installing Microsoft Exchange	
	Overview of tasks	19
	Prerequisites	20
	Supported software	22
	Privileges requirements	23
	Configuring the network and storage	24
	Managing storage using SFW	26
	Creating disk groups	26
	Importing disk groups	27
	Creating volumes	27
	Mounting volumes	30
	Installing Exchange on first node	32
	Exchange pre-installation: first node	32
	Exchange server installation: first node	35
	Exchange post-installation: first node	36
	Moving Exchange database to shared storage	37
	Installing Exchange on additional nodes	41
	Exchange pre-installation: additional nodes	41
	Exchange server installation: additional nodes	43
	Exchange post-installation: additional nodes	44

Chapter 4	Configuring the Exchange service group	
	Prerequisites	45
	Configuring additional dependencies for folder mounts	47
	Configuring the service group using configuration wizard	48
	Configuration instructions	48
	Verifying the Exchange service group configuration	55
	Bringing the service group online	55
	Taking the service group offline	56
	Switching the service group	57
Chapter 5	Adding nodes to an Exchange cluster	
	Prerequisites	59
	Overview of tasks	60
	Installing Exchange on additional nodes	61
	Exchange pre-installation: additional nodes	61
	Exchange server installation: additional nodes	63
	Exchange post-installation: additional nodes	63
	Configuring the agent on the new node: additional considerations	64
Chapter 6	Administering the Exchange service group	
	Modifying the service group configuration	65
	Prerequisites	65
	Instructions	66
	Deleting the Exchange service group	66
Chapter 7	Removing the Microsoft Exchange application agent	
	Prerequisites	67
	Overview of tasks	68
	Removing Microsoft Exchange	68
	Removing a node without uninstalling Microsoft Exchange	69
	Removing a node and uninstalling Microsoft Exchange	69
	Removing the Microsoft Exchange application agent	72
Chapter 8	Troubleshooting	
	VCS logging	73
	Exchange Protocol agent error messages	75
	Exchange Service agent error messages	77
	Troubleshooting Microsoft Exchange uninstallation	79
	Troubleshooting Exchange Setup Wizard issues	80

Appendix A	Resource type definitions	
	Exchange Service agent	81
	Resource type definition	81
	Attribute definitions	82
	Exchange Protocol agent	83
	Resource type definition	83
	Attribute definitions	83
Appendix B	Sample configurations	
	Active/Passive failover configuration	86
Index		91

Introduction

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, and making Microsoft Exchange highly available in an Active/Passive configuration. See the *Veritas Storage Foundation™ and High Availability Solutions HA and Disaster Recovery Solutions Guide for Microsoft Exchange* for detailed instructions on deploying HA and Disaster Recovery solutions for Microsoft Exchange.

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.

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

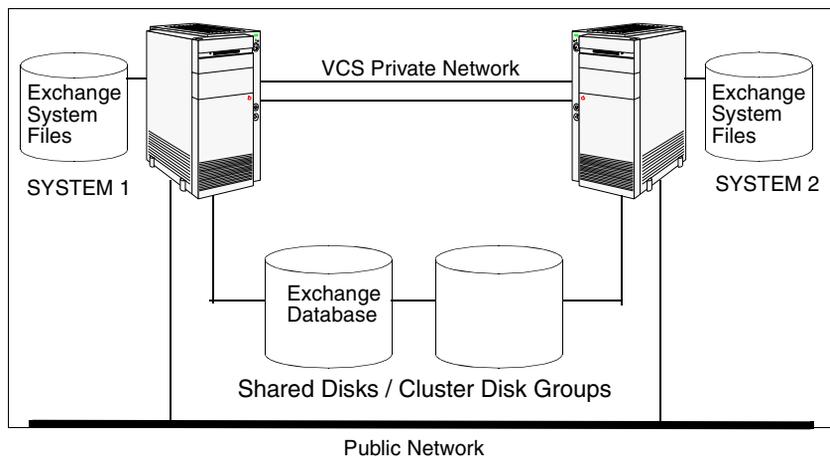
The VCS application agent for Microsoft Exchange does not support an Active/Active configuration for Exchange. The agent supports the Active/Passive and the Any-to-Any configurations. The agent also supports the Disaster Recovery configuration.

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.

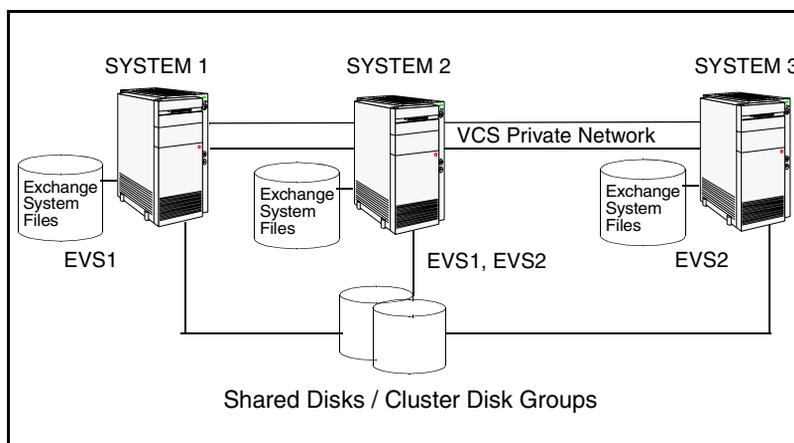
In an Active/Passive configuration, one or more Exchange virtual servers can exist in a cluster, but each server must be managed by a service group configured with a distinct set of nodes in the cluster.

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

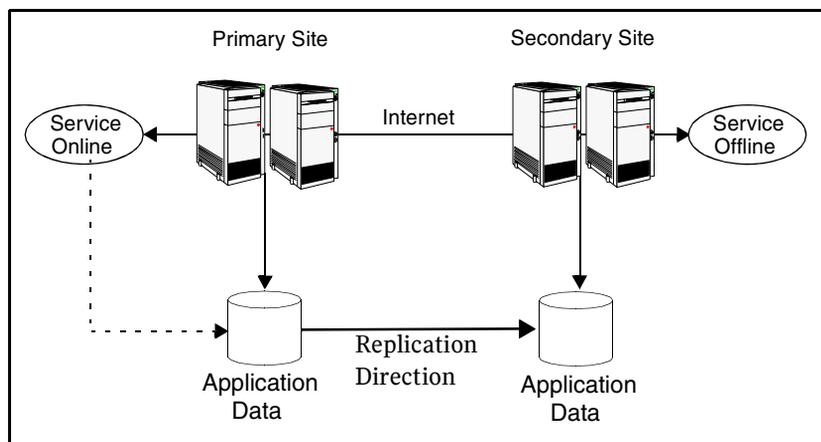
For example, consider a three-node cluster hosting two Exchange virtual servers, EVS1 and EVS2. The virtual servers are configured in VCS in two

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:

- Setting up a VCS cluster. Refer to the *Veritas Cluster Server Administrator's Guide* for instructions.
- Installing the VCS agent for Microsoft Exchange. See “[Installing the Microsoft Exchange application agent](#)” on page 17 for instructions.
- Installing Microsoft Exchange. See “[Installing Microsoft Exchange](#)” on page 19 for instructions.
- Configuring the Exchange service group. See “[Configuring the Exchange service group](#)” on page 45 for instructions.
- Adding failover nodes to an existing Exchange virtual server in an Exchange cluster. See “[Adding nodes to an Exchange cluster](#)” on page 59 for instructions.

Each task is described in detail in subsequent chapters.

Installing the Microsoft Exchange application agent

This chapter describes how to install the VCS application agent for Microsoft Exchange in a VCS cluster, provided it was not selected while installing SFW HA. The agent is installed using the installer for Storage Foundation 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.

Prerequisites

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

- Verify that you have SFW HA 5.0 installed on all cluster nodes.
- 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 agent

Repeat these steps on all systems where VCS application agent for Microsoft Exchange is to be installed.

To install the agent

- 1 Start the installer for SFW. In the Add/Remove Programs applet, click Storage Foundation 5.0 for Windows - HA (Server Components) and click **Change**.
- 2 In the Storage Foundation 5.0 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**.

Repeat these steps on all systems where VCS application agent for Microsoft Exchange is to be installed.

Installing Microsoft Exchange

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

Note: If you have a non-clustered Exchange server set up, 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, that is pre-installation, Microsoft Exchange installation, and post-installation. The Exchange Setup Wizard for VCS performs the pre-installation and post-installation steps.

Overview of tasks

Complete the following steps for installing Microsoft Exchange in a VCS cluster:

- Verify the prerequisites for installing Microsoft Exchange. See “[Prerequisites](#)” on page 20 for more information.
- Install Microsoft Exchange on the first node. See “[Installing Exchange on first node](#)” on page 32 for instructions.
- Move Microsoft Exchange databases to shared disks. See “[Moving Exchange database to shared storage](#)” on page 37 for instructions.
- Install Microsoft Exchange on additional nodes. See “[Installing Exchange on additional nodes](#)” on page 41 for instructions.

Prerequisites

- Verify SFW HA 5.0 is installed in the cluster along with the VCS application agent for Microsoft Exchange. If a previous version of SFW HA exists, upgrade it.
- Verify you have configured a VCS cluster using VCS Configuration Wizard (VCW). See *Veritas Cluster Server Administrator's Guide* for instructions.
- Verify 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 application agent for Microsoft Exchange requires the operating system to be installed on the same local drive on all nodes. For example if you install Windows 2003 on drive C of one node, installations on all other nodes must be on their respective C drives. Make sure the same drive letter is available on all nodes and has adequate space for the installation.
- 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.
See the Microsoft Exchange documentation for information on how to join a domain that includes an Exchange 5.5 organization.

- 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

For instructions on creating disk groups and volumes using SFW, see “[Managing storage using SFW](#)” on page 26. If you mount these volumes as folders, make sure that the folders are on shared disks too.

- 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 30 for more information.

Supported software

- Microsoft Exchange servers and their operating systems. Note that all systems must be running the same operating system:
 - Microsoft Exchange Server 2003 Standard Edition or Enterprise Edition (SP2 required)
with
Windows 2000 Server, Advanced Server, or Datacenter Server (all require Service Pack 4 with Update Rollup1)
or
Windows Server 2003 (Standard Edition, Enterprise Edition, or Datacenter Edition) (SP 1 required for all editions)
or
Windows Server 2003 R2 (Standard Edition, Enterprise Edition, or Datacenter Edition)
or
 - Microsoft Exchange 2000 Server or Microsoft Exchange 2000 Enterprise Server (SP3 with August 2004 rollup patch required for both editions)
with
Windows 2000 Server, Advanced Server, or Datacenter Server (all require Service Pack 4 with Update Rollup1)

Note: Microsoft support for Exchange Server 2003 is limited to 32-bit versions of the Windows 2003 operating system.

- Veritas Storage Foundation HA 5.0 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 HAD Helper 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.
Use Windows Disk Management (**Start > Control Panel > Administrative Tools > Computer Management**) or Veritas Enterprise Administrator (VEA) on each system to verify that the attached shared disks are visible.

To verify the DNS settings and binding order for all systems

- 1 Open the Control Panel (**Start>Control Panel**).
- 2 Right-click on 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 From the status window, click **Properties**.

- 6 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

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.

VCS application agent for Microsoft Exchange requires four volumes to be created, 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. Perform the following tasks to create volumes and make them accessible from cluster nodes:

- Create disk groups. See “[Creating disk groups](#)” on page 26 for instructions.
- Import disk groups. See “[Importing disk groups](#)” on page 27 for instructions.
- Create volumes on disk groups. See “[Creating volumes](#)” on page 27 for instructions.
- Mount volumes. See “[Mounting volumes](#)” on page 30 for instructions.

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.

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

To create a dynamic (cluster) disk group

- 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**.
 - 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.
 - Click **Next**.
- 6 Click **Next** to accept the confirmation screen with the selected disks.
- 7 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

Note: 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.

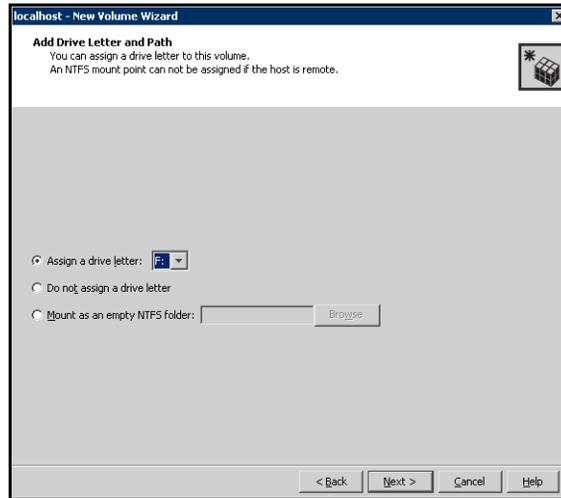
To create dynamic volumes

- 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.
- 5 At the New Volume wizard opening screen, click **Next**.
- 6 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.
- 7 Click **Next**.
 - 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.
- 8 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.



9 Click Next.

- 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**.

10 Click Finish to create the new volume.

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 [step 3](#) through [step 5](#) 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](#) through [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: first node

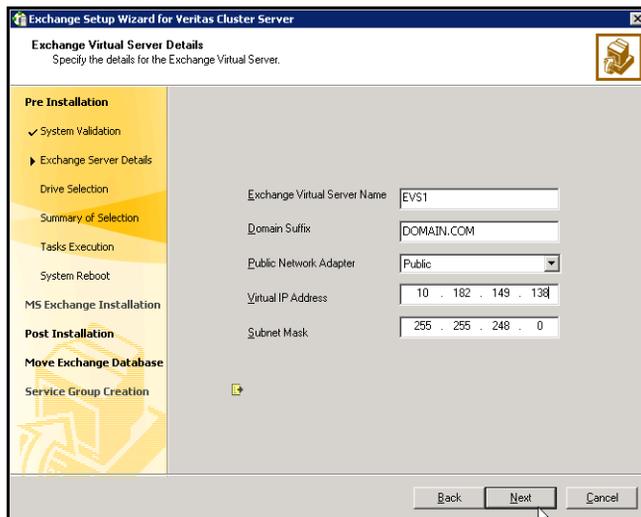
Use the Exchange Server Setup Wizard for Veritas Cluster Server to complete the pre-installation phase. This process changes the physical name of the node to a virtual name.

Note: After you have run the wizard, you will be requested to restart the node. So, 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 > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Setup Wizard** to start the Exchange Setup Wizard for VCS.
- 3 Review the information in the Welcome panel and click **Next**.
- 4 In the Available Option panel, click **Install Exchange Server for High Availability** and click **Next**.
- 5 In the Select Option panel, click **Create a new Exchange Virtual Server** 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 On the Exchange Virtual Server Details panel, specify the network related information and click **Next**.



- | | |
|------------------------------|---|
| Exchange Virtual Server Name | Type a unique virtual name for the Exchange server.
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. |
| Domain Suffix | Type a domain suffix for the virtual server. |
| Public Network Adapter | From the drop-down list select the appropriate public NIC.
The wizard lists the public adapters and low-priority TCP/IP enabled private adapters on the system. |
| Virtual IP Address | Type a unique virtual IP address for the Exchange virtual server. |
| Subnet Mask | Type the subnet mask for the virtual IP address. |

- 8 Select a drive where the registry replication data will be stored and click **Next**.

- 9 On the Summary panel, review the summary of your selections and click **Next**.
- 10 Click **Yes** on the message dialog box that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts running commands to set up the VCS environment. Various messages indicate the status of each task.
- 11 After all the commands are executed, click **Next**.
- 12 Click **Reboot** and then click **Yes** when the wizard prompts you to reboot the node.

After you reboot the node, the value specified for the Exchange virtual server is temporarily assigned to the node. 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 physical name to the node.

On rebooting the node, the Exchange Server Setup wizard is launched automatically. Review the information in the wizard dialog box and proceed to installing Microsoft Exchange Server. See “[Exchange server installation: first node](#)” on page 35 for instructions.

Click **Revert** to undo all actions performed by the wizard during the pre-installation procedure.

Exchange server installation: first node

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

To install Exchange

- 1 Install Exchange Server using the Microsoft Exchange installation program. Make sure you install the Microsoft Exchange System Management Tools also. See the Microsoft Exchange documentation for instructions.
- 2 Reboot the node if prompted to do so.
- 3 If you installed Exchange Server 2000, make sure you install Service Pack 3 with August 2004 rollup patch. For Exchange 2003, make sure you install Service Pack 2.
- 4 Proceed to [“Exchange post-installation: first node”](#) on page 36 for instructions on performing the post-installation tasks.

Exchange post-installation: first node

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 and sets the Exchange services to manual so that the Exchange services can be controlled by VCS.

To perform Exchange post-installation

- 1 If the Exchange installation did not prompt you to reboot the node, click **Continue** from the Exchange Setup Wizard and proceed to [step 3](#).
If you rebooted the node after Microsoft Exchange installation, the Exchange Setup Wizard is launched automatically.
- 2 Review the information in the Welcome panel and click **Next**.
- 3 Click **Yes** on the message dialog box that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts performing the post-installation tasks. Various messages indicate the status.
- 4 After all the commands are executed, click **Next**.
- 5 Click **Finish** and click Yes when the wizard prompts you 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.

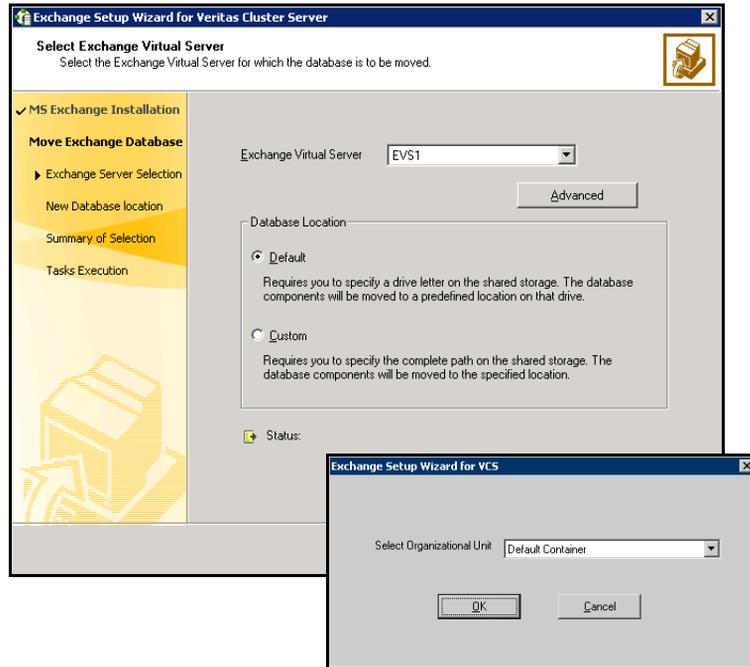
Prerequisites

- 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 database to a shared storage

- 1 Click **Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Setup Wizard** to start the Exchange Server Setup Wizard for VCS.
- 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 **Move Exchange Databases** and click **Next**.

- 5 On the Select Exchange Virtual Server panel, complete the following and click **Next**:



Exchange Virtual Server

From the drop-down list, select the Exchange virtual server for which you want to move the database components.

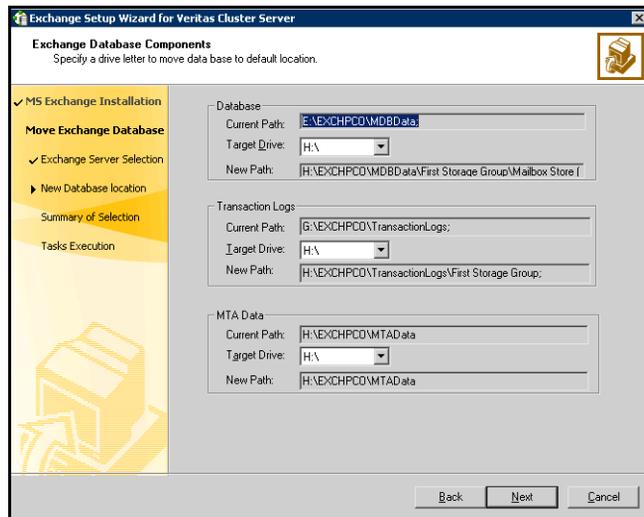
Advanced

To specify the Lanman resource details:

- 1 Click **Advanced**.
- 2 From the Organizational Unit drop-down list, select the distinguished name for the Exchange 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
- 3 Click **OK**.

- | | |
|---------|--|
| Default | Select this option if you want to move the database to a default location on the shared storage.
After you click Next , the wizard prompts you for the drive letter on the shared storage. The database components will be moved to a predefined location on the drive letter that you select. |
| Custom | Select this option if you want to move the database to a custom location on the shared disk.
After you click Next , the wizard prompts you for the drive letter and the complete path on the shared storage. The database components will be moved to the location that you specify. |

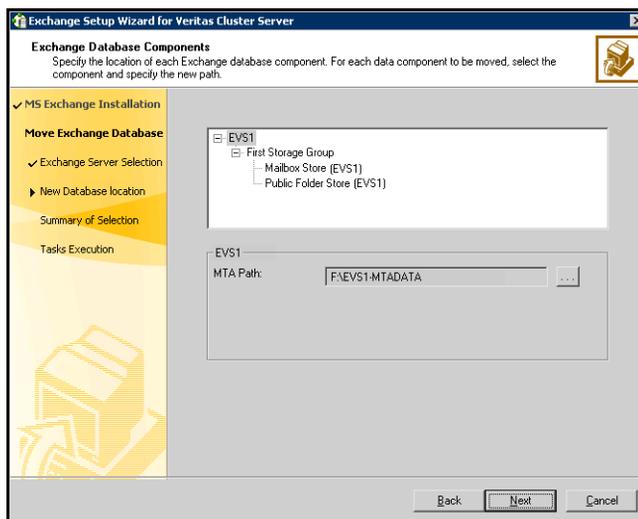
- 6 On the Exchange Database Components panel, complete the following and click **Next**:
 - If you chose to move the Exchange database to a default location:



Select a drive letter for each of the Exchange database components (Database, Transaction Logs, and MTA Data) from the respective drop-down list.

The database components will be moved to a default location on that drive.

- If you chose to move the Exchange database to a custom location:



Select the database component, click ... (ellipsis button) to browse for folders, and specify the path where the component is to be moved. Repeat this for each Exchange database component.

The database components will be moved to the specified location.

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

- 7 Review the summary of your selections and click **Next**.
The wizard starts performing tasks to move the Exchange databases. Various messages indicate the status of each task.
- 8 After all the tasks are complete, click **Next** and then click **Finish** to exit the wizard.
To install Microsoft Exchange on additional nodes, proceed to [“Installing Exchange on additional nodes”](#) on page 41.

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 “[Prerequisites](#)” on page 20.

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 Start the Exchange Server Setup Wizard for VCS from the node to be added to an Exchange cluster. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Setup Wizard**)
- 3 Review the information in the Welcome panel and click **Next**.
- 4 In the Available Option panel, click **Install Exchange Server for High Availability** and click **Next**.
- 5 In the Select Option panel, click **Create a failover node for existing Exchange Virtual Server** and click **Next**.
- 6 Select the Exchange virtual server for which you are adding the failover node and click **Next**. The wizard validates the system for the prerequisites. Various messages indicate the validation status.
- 7 Once all the validations are done, click **Next**.

8 Specify network information for the Exchange virtual server and click **Next**.

Exchange Virtual Server	Displays the Exchange virtual server name. Verify this information.
Domain Suffix	Displays the domain suffix name for the Exchange virtual server. Verify this information.
Public Network Adapter	From the drop-down list select the appropriate public NIC. The wizard lists the public adapters and low-priority TCP/IP enabled private adapters on the system.
Virtual IP Address	Type a unique virtual IP address for the Exchange virtual server. By default, the field displays the IP address that you assigned while creating a new Exchange cluster.
Subnet Mask	Type the subnet mask for the virtual IP address.

9 Review the summary of your selections and click **Next**.

10 Click **Yes** on the message that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts running commands to set up the VCS environment. Various messages indicate the status of each task.

11 After all the commands are executed, click **Next**.

12 Click **Reboot** and click **Yes** when the wizard prompts you to reboot the node. 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 physical name to the node.

On rebooting the node, the Exchange Setup wizard is launched automatically. Review the information in the wizard dialog box and proceed to installing Microsoft Exchange Server. See [“Exchange server installation: additional nodes”](#) on page 43 for instructions.

Click **Revert Changes** to undo all actions performed by the wizard during the pre-installation procedure.

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

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

- 1 Install Exchange Server using the Microsoft Exchange installation program. Make sure you install the Microsoft Exchange System Management Tools also. You must install the same components as installed on the first node. See the Microsoft Exchange documentation for instructions. Make sure you select **Disaster Recovery** in the **Action** column for **Microsoft Exchange System Management Tools**.
- 2 Reboot the node if prompted to do so.
- 3 If you installed Exchange Server 2000, make sure you install Service Pack 3 with the August 2004 rollup patch. For Exchange 2003, make sure you install Service Pack 2.
- 4 Proceed to [“Exchange post-installation: first node”](#) on page 36 for instructions on performing the post-installation tasks.

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.

To perform Exchange post-installation

- 1 If the Exchange installation did not prompt you to reboot the node, click **Continue** from the Exchange Server Setup Wizard and proceed to [step 3](#). If you rebooted the node after Microsoft Exchange installation, the Exchange Setup Wizard is launched automatically.
- 2 Review the information in the Welcome panel and click **Next**.
- 3 Click **Yes** on the message that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts performing the post-installation tasks. Various messages indicate the status.
- 4 After all the commands are executed, click **Next**. Specify whether you want to add the node to the SystemList of the service group for the EVS selected in [step 6](#) on page 41. You must do so only if service groups are already configured for the EVS.
If you wish to add the nodes later, you can do so by using the Exchange service group configuration wizard. See “[Modifying the service group configuration](#)” on page 65 for instructions.
- 5 Click **Finish** and then click **Yes** when the wizard prompts you to reboot the node. Changes made during the post-installation steps do not take effect till you reboot the node.

After installing Exchange Server on all systems that will participate in the service group, proceed to “[Configuring the Exchange service group](#)” on page 45 for instructions on how to configure the service group.

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.

Prerequisites

- Verify the VCS application agent for Microsoft Exchange is installed on all cluster nodes. (See [“Installing the Microsoft Exchange application agent”](#) on page 17 for more information.)
- Verify a cluster is configured using VCS Configuration Wizard (VCW).
- 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 47 for instructions.

- 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.
- Make sure to note the list of the Exchange services and Exchange protocol servers to be monitored; the wizard will prompt you for this information.
- 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 30 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 service group using configuration wizard

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 65.

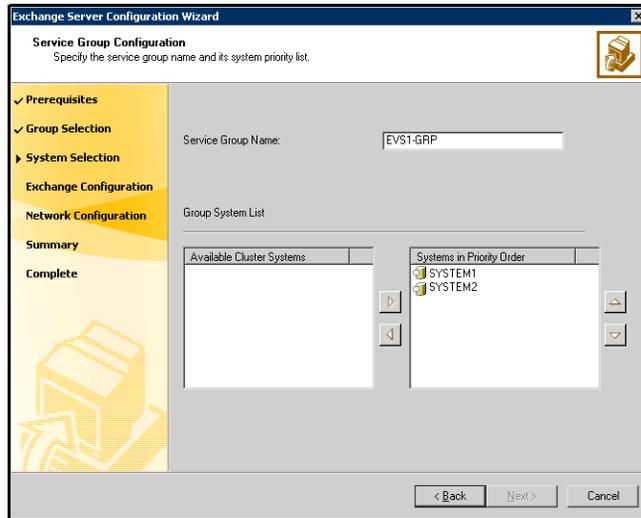
Before configuring the Exchange agent, review the resource types and the attribute definitions of the Exchange agents. See [Appendix A, “”](#) on page 81 for more information. For sample configuration files and resource dependency graphs of the Exchange service group, see [Appendix B, “”](#) on page 85.

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

Configuration instructions

- 1 Start the Exchange Server Configuration Wizard. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Configuration Wizard**)
- 2 Review the information in the Welcome panel and click **Next**.
- 3 In the Wizard Options panel, click **Create service group** and click **Next**.

- 4 On the Service Group Configuration panel, specify the service group name and system priority list and click **Next**.
 The wizard starts validating your configuration. Various messages indicate the validation status.



Service Group Name

Type a name for the Exchange service group.

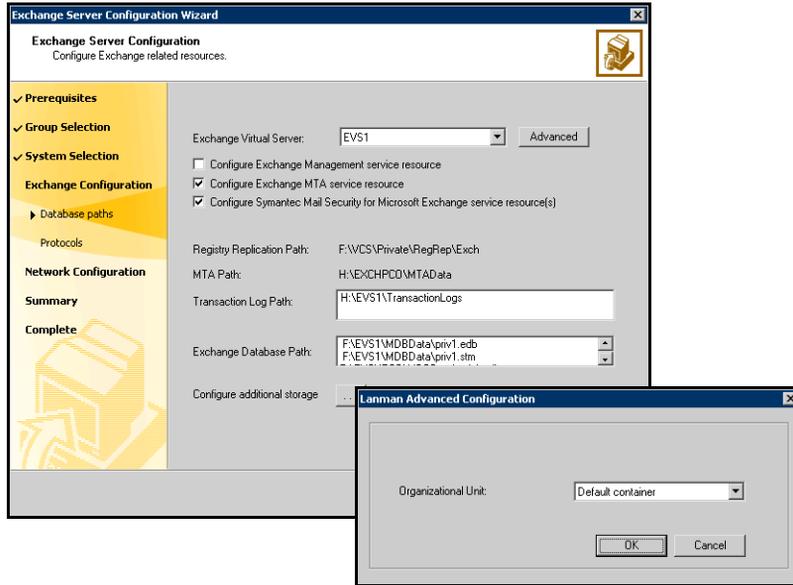
Available Cluster Systems

Select the systems on which to configure the service group and click the right-arrow to move the systems to the Systems in Priority Order box.

Systems in Priority Order

This list represents the service group's system list. To remove a system from the service group's system list, select the a system and click the left arrow. To change a system's priority in the service group's system list, select the system and click the up and down arrows. The system at the top of the list has the highest priority while the system at the bottom of the list has the lowest priority.

- 5 On the Exchange Configuration Database paths panel, complete the following and then click **Next**:



Exchange Virtual Server From the drop-down list, select the Exchange virtual server for which you wish to configure the service group.

Advanced To specify the Lanman resource details:

- 1 Click **Advanced**.
- 2 From the Organizational Unit drop-down list, select the distinguished name for the Exchange 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
- 3 Click **OK**.

Configure Exchange Management service resource

Check this option if you want to configure the Exchange Management service resource. If you are running the wizard to modify a service group, unchecking this option will remove the Exchange Management service resource from the service group configuration.

Configure Exchange MTA service resource

Check this option if you want to configure the Exchange Message Transfer Agent (MTA) service resource. If you are running the wizard to modify a service group, unchecking this option will remove the Exchange MTA service resource from the service group configuration.

Configure Symantec Mail Security for Microsoft Exchange service resource(s)

Check this option if you want to configure the resources for the Symantec Mail Security for Microsoft Exchange services. This option is available only if you have installed Symantec Mail Security for Microsoft Exchange on the system.

The wizard will configure resources of type GenericService for the following services:

- smsmse - Symantec Mail Security for Microsoft Exchange
- SAVFMSESpamStatsManager - Symantec Mail Security Statistics

smsmse resource will be the child of the SAVFMSESpamStatsManager resource and SAVFMSESpamStatsManager resource will be the child of the Microsoft Exchange Information Store (MSEExchangeIS) resource.

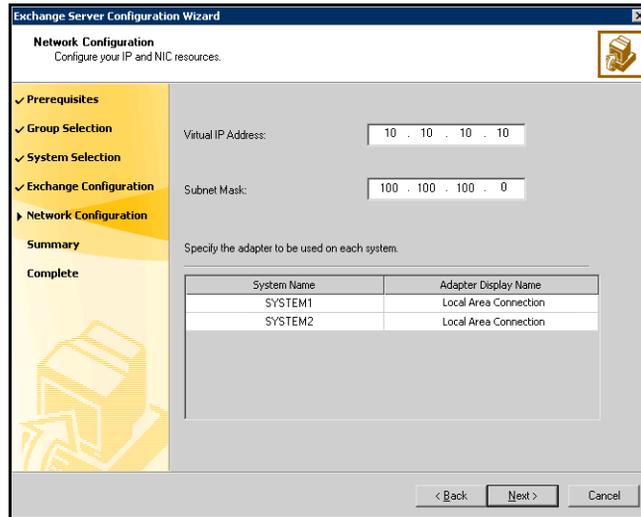
VCS does not replicate data or registry entries related to the Symantec Mail Security for Microsoft Exchange services. You must install and apply the same configuration settings for Symantec Mail Security for Microsoft Exchange, on each failover node in the cluster.

If you are running the wizard to modify a service group, unchecking this option will remove the resources for the Symantec Mail Security for Microsoft Exchange services, from the service group configuration.

Registry Replication Path

Verify the registry replication path for the selected Exchange virtual server.

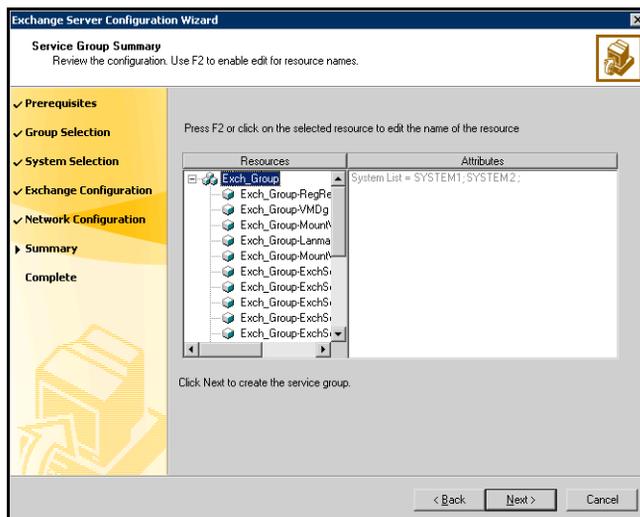
- 7 On the Network Configuration panel, specify the following network related information and then click **Next**.



- The **Virtual IP Address** and the **Subnet Mask** text boxes display the values entered while installing Exchange. You can keep the displayed values or type 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 Display Name** field to view the adapters associated with a node.

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.

- 8 Review the service group configuration, change the resource names, if desired, and click **Next**.



The **Resources** box lists the configured resources. Click 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, click the resource or press the F2 key. Edit the resource, and press the Enter key to confirm the changes. To cancel editing a resource name, press the Esc key.

- 9 Click **Yes** on the message that prompts you that the wizard will run commands to modify the service group configuration. Various messages indicate the status of these commands.
- 10 On the Completing the Exchange Configuration panel, check **Bring the service group online** check box to bring the service group online on the local system and click **Finish**.

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**.

Adding nodes to an Exchange cluster

This chapter describes steps to add a failover node to an *existing* Exchange virtual server in an Exchange cluster. To add a node for a *new* Exchange virtual server, refer to “[Installing Microsoft Exchange](#)” on page 19.

Prerequisites

- Make sure the Microsoft Exchange Server was installed in the cluster using the Exchange Setup Wizard for VCS.
- Make sure the node to be added was configured using the VCS Configuration Wizard (VCW). Refer to *Veritas Cluster Server Administrator's Guide* for more information.
- Verify the system has adequate resources to run the Microsoft Exchange Server and VCS.
- If the node to be added will be configured as a failover node for an Exchange service group, make sure the service group is offline.
- VCS requires the Microsoft Exchange installation be identical on all systems in the cluster. So, you must install Microsoft Exchange Server at the same path on this node as on other nodes in the cluster. Also, you must install all Exchange components that are installed on other nodes in the cluster.

Overview of tasks

Adding a new node to an Exchange cluster involves the following tasks:

- Installing SFW HA on the node. Refer to *Storage Foundation and High Availability Solutions, Installation and Upgrade Guide* for instructions.
- Using the VCS Configuration Wizard (VCW) to configure VCS on the node. Refer to *Veritas Cluster Server Administrator's Guide* for instructions.
- Installing the VCS application agent for Microsoft Exchange. See “[Installing the Microsoft Exchange application agent](#)” on page 17 for instructions.
- Using the Exchange Server Setup Wizard for VCS to complete the pre-installation steps. See “[Exchange pre-installation: additional nodes](#)” on page 61 for instructions.
- Installing Microsoft Exchange. See “[Exchange server installation: additional nodes](#)” on page 63 for instructions.
- Using the Exchange Server Setup Wizard for VCS to complete the post-installation steps. See “[Exchange post-installation: additional nodes](#)” on page 63 for instructions.

Installing Exchange on additional nodes

The tasks to be performed on the additional nodes are described in three stages.

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 “[Prerequisites](#)” on page 20.

To perform the 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 Start the Exchange Server Setup Wizard for VCS from the node to be added to an Exchange cluster. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Setup Wizard**)
- 3 Review the information in the Welcome panel and click **Next**.
- 4 In the Available Option panel, click **Install Exchange Server for High Availability** and click **Next**.
- 5 In the Select Option panel, click **Create a failover node for existing Exchange Virtual Server** and click **Next**.
- 6 Select the Exchange virtual server for which you are adding the failover node and click **Next**. The wizard validates the system for the prerequisites. Various messages indicate the validation status.
- 7 Once all the validations are done, click **Next**.
- 8 Specify network information for the Exchange virtual server and click **Next**.

Exchange Virtual Server	Displays the Exchange virtual server name. Verify this information.
Domain Suffix	Displays the domain suffix name for the Exchange virtual server. Verify this information.

Public Network Adapter	From the drop-down list select the appropriate public NIC. The wizard lists the public adapters and low-priority TCP/IP enabled private adapters on the system.
Virtual IP Address	Type a unique virtual IP address for the Exchange virtual server. By default, the field displays the IP address that you assigned while creating a new Exchange cluster.
Subnet Mask	Type the subnet mask for the virtual IP address.

- 9 Review the summary of your selections and click **Next**.
- 10 Click **Yes** on the message that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts running commands to set up the VCS environment. Various messages indicate the status of each task.
- 11 After all the commands are executed, click **Next**.
- 12 Click **Reboot** and click **Yes** when the wizard prompts you to reboot the node. 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 physical name to the node.
On rebooting the node, the Exchange Server Setup wizard is launched automatically. Review the information in the wizard dialog box and proceed to installing Microsoft Exchange Server. See [“Exchange server installation: additional nodes”](#) on page 63 for instructions.
Click **Revert Changes** to undo all actions performed by the wizard during the pre-installation procedure.

Exchange server installation: additional nodes

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

To install Exchange

- 1 Install Exchange Server using the Microsoft Exchange installation program. Make sure you install the Microsoft Exchange System Management Tools. You must install the same components that are installed on the first node. See the Microsoft Exchange documentation for instructions. Make sure you select **Disaster Recovery** in the **Action** column for **Microsoft Exchange System Management Tools**.
- 2 Reboot the node if prompted to do so.
- 3 If you installed Exchange Server 2000, make sure you install Service Pack 3.
- 4 Proceed to “[Exchange post-installation: additional nodes](#)” on page 63 for instructions on performing the post-installation tasks.

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.

To perform the Exchange post-installation

- 1 If the Exchange installation did not prompt you to reboot the node, click **Continue** from the Exchange Setup Wizard and proceed to [step 3](#). If you rebooted the node after Microsoft Exchange installation, the Exchange Setup Wizard is launched automatically.
- 2 Review the information in the Welcome panel and click **Next**.
- 3 Click **Yes** on the message dialog box that informs you that the system will be renamed and restarted after you quit the wizard. The wizard starts performing the post-installation tasks. Various messages indicate the status.
- 4 After all the commands are executed, click **Next**. Specify whether you want to add the node to the SystemList of the service group for the EVS selected in [step 6](#) on page 61. You must do so only if service groups are already configured for the EVS.
If you wish to add the nodes later, you can do so by using the Exchange service group configuration wizard. See “[Modifying the service group configuration](#)” on page 65 for instructions.

- 5 Click **Finish** and click **Yes** when the wizard prompts you to reboot the node. Changes made during the post-installation steps do not take effect till you reboot the node.

Configuring the agent on the new node: additional considerations

Run the Exchange System Manager so that all the stores that were previously mounted are automatically mounted on start-up.

Before proceeding, make sure the Exchange service group is online. See [“Bringing the service group online”](#) on page 55 for instructions.

To reconfigure mounting of stores at start-up

- 1 Start Exchange System Manager.
- 2 In the left pane, navigate to your storage group.
If you have only one administrative group, expand **Servers > Exchange Server > Storage Group**.
If you have more than one administrative groups, expand **Administrative Groups > Your Administrative Group > Servers > Exchange Server > Storage Group**.
- 3 Right-click the Exchange database and then click **Properties**.
- 4 Click the **Database** tab and then uncheck **Do not mount this store at start-up** check box.
- 5 Click **OK**.

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

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.

Prerequisites

- 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 Wizards > Application Agent for Exchange Server > 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 service group using configuration wizard”](#) on page 48 for more information about the configuration wizard.

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 Wizards > Application Agent for Exchange Server > 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 Microsoft Exchange application agent

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 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.

Prerequisites

- 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 79 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 68 for instructions.
- Removing the VCS application agent for Microsoft Exchange. See [“Removing the Microsoft Exchange application agent”](#) on page 72 for instructions.

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 69 for instructions.
- 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 69 for instructions.

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

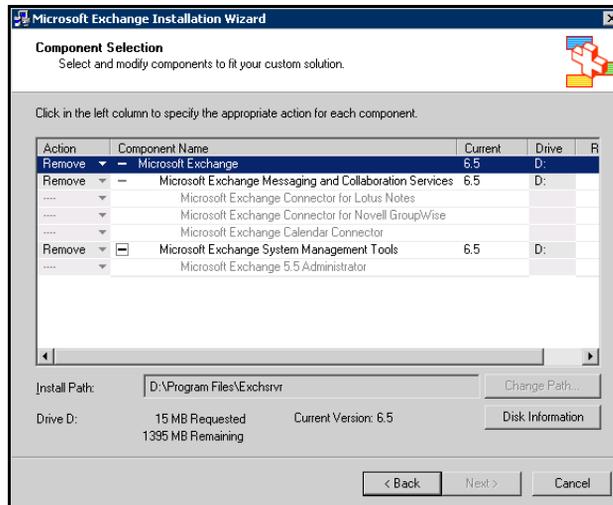
- 1 Start the Exchange Server Setup Wizard for VCS. (**Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Application Agent for Exchange Server > Exchange Server Setup Wizard**)
- 2 Review the information in the Welcome panel and click **Next**.
- 3 In the Available Option 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 72 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 Wizards > Application Agent for Exchange Server > 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 72 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 5.0 for Windows - HA (Server Components) and click **Change**.
- 2 In the Storage Foundation 5.0 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 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
```

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
```

Here,

- 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.

The following table lists the messages of type ERROR and WARNING.

Exchange Protocol agent error messages

Table 8-1 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.
Failed to get protocol virtual servers (<i>Type = 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.

Table 8-1 Exchange Protocol agent error messages (continued)

Message	Description
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 8-2 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 8-2 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 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-3 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">■ MExchangeIS■ MExchangeMTA■ MExchangeMGMT■ MExchangeSA■ RESvc
LanmanResName	string-scalar	The name of the Lanman resource on which the ExchService resource depends.

Table A-4 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-5 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">■ POP3SVC■ W3SVC■ IMAP4SVC■ SMTPSVC

Table A-6 Exchange Protocol agent optional attributes

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

Sample configurations

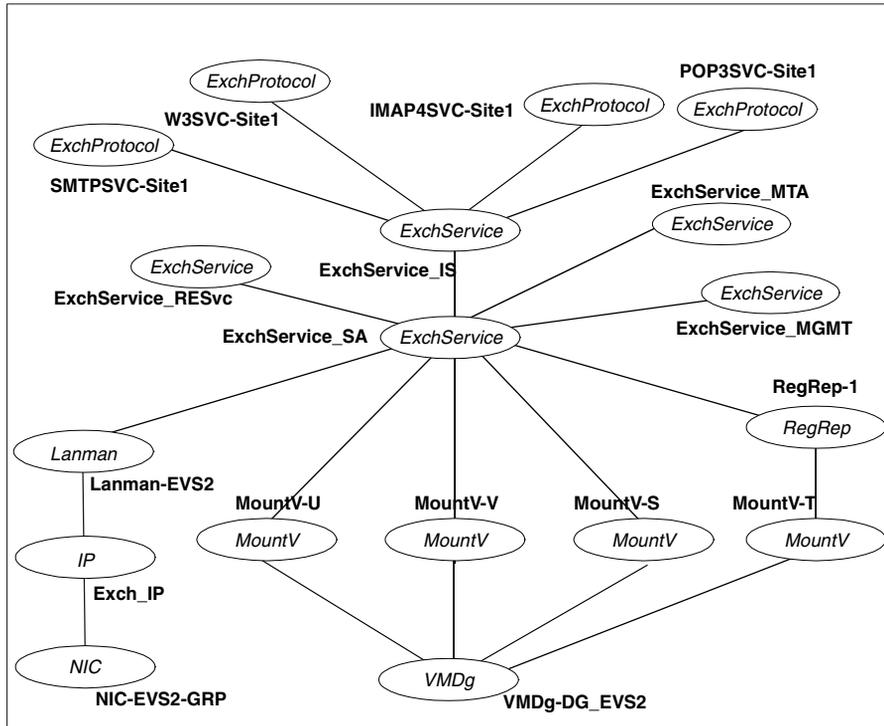
The sample configurations in this appendix describe typical service groups configured to monitor the state of the Exchange Server in a VCS cluster.

The appendix lists the sample configuration for clusters using SFW to manage shared storage. See “[Active/Passive failover configuration](#)” on page 86 for information.

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 (MSEExchangeSA, MSEExchange RESvc, MSEExchangeIS, MSEExchangeMGMT, and MSEExchangeMTA) 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_Site1 requires ExchService_IS
ExchProtocol_POP3_Site1 requires ExchService_IS
ExchProtocol_SMTPSvc_Site1 requires ExchService_IS
```

```
ExchProtocol_W3Svc_Site1 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 17
- Active/Passive failover configuration 12
- agent configuration, modifying 65
- agent operations
 - ExchProtocol agent 11
 - ExchService agent 10
- Any-to-Any failover configuration
 - defined 13
- application failure, detecting 12
- attributes
 - for ExchProtocol agent 83
 - for ExchService agent 82

C

- configuration
 - modifying using wizard 65
 - typical setup 12
- configuration wizards
 - Exchange Server Configuration 48
 - Exchange Setup 32
- configurations
 - Active/Passive failover 12
 - Any-to-Any failover 13
 - Disaster Recovery 14
- creating
 - disk group 26
 - volume 27

D

- dependency graphs 86
- DetailMonitor attribute
 - ExchProtocol agent 84
 - ExchService agent 82
- Disaster Recovery configuration 14
- DNS settings, for Exchange hosts 24

E

- enterprise agent. See Exchange agent

- entry points. See agent operations

Exchange

- post-installation 36
 - pre-installation 32
 - supported versions 22
 - uninstalling 68
- ### Exchange agent
- about 9
 - configuring using wizard 48
 - installing 18
 - removing 72
 - supported protocols 11
 - supported services 10
 - troubleshooting 73
 - typical setup 12
 - uninstalling 72
- ### Exchange cluster
- Active/Passive setup 12
 - Any-to-Any setup 13
 - Disaster Recovery setup 14
 - setting up 15
- ### Exchange cluster configuration
- Active/Passive failover 12
 - Any-to-Any failover 13
 - Disaster Recovery 14
- ### Exchange database, moving 37
- ### Exchange hosts, DNS settings for 24
- ### Exchange Protocol agent 11
- ### Exchange Service agent 10
- ### Exchange service group
- modifying 65
- ### ExchProtocol agent
- attributes 83
 - operations 11
 - troubleshooting 75
 - type definition 83
- ### ExchProtocol agent attributes
- DetailMonitor 84
 - LanmanResName 83
 - Protocol 83
 - VirtualServer 83
- ### ExchService agent

- attributes 82
- operations 10
- troubleshooting 77
- type definition 81
- ExchService agent attributes
 - DetailMonitor 82
 - LanmanResName 82
 - Service 82

F

- failover 12

I

- installing
 - Exchange agent 18
 - prerequisites 20

L

- LanmanResName attribute
 - ExchProtocol agent 83
 - ExchService agent 82

M

- mounting a volume 30

N

- nodes, adding to Exchange cluster 59

O

- offlining service group 56
- operations
 - ExchProtocol agent 11
 - ExchService agent 10

P

- Protocol attribute 83

R

- resource type
 - ExchProtocol agent 83
 - ExchService agent 81

S

- sample configuration 86
- Service attribute 82
- service group
 - dependencies 86
 - modifying 65
 - switching 57
 - taking offline 56
- service group dependencies 86
- SFW
 - creating volumes 27
 - uninstalling 72
- shared disks
 - mounting using SFW 30
 - unmounting using SFW 31
- supported protocols 11
- supported services 10
- supported versions 22
- switching service group 57

T

- troubleshooting
 - Exchange protocol agent 75
 - Exchange service agent 77
 - uninstallation 79
- troubleshooting information 73
- type definition
 - ExchProtocol agent 83
 - ExchService agent 81

U

- uninstalling
 - Exchange 68
 - Exchange agent 72
- unmounting a volume 31

V

- VirtualServer attribute 83
- volumes, creating 27

W

- wizards
 - Exchange Server Configuration 48
 - Exchange Setup 32