

Symantec NetBackup Clustered Master Server Administrator's Guide

for Windows, UNIX, and Linux

Release 7.7



Symantec NetBackup Clustered Master Server Administrator's Guide

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Contents

Technical Support	3	
Chapter 1	Introduction to NetBackup Master Server Clustering	10
	About this guide	10
	About NetBackup clustering	10
	Netbackup clustering in virtual environment	11
	About NetBackup failover server data protection in a cluster	11
	About NetBackup failover server support	12
	NetBackup supported cluster solutions	12
	Accessing NetBackup cluster compatibility lists	13
	About configuring LiveUpdate with clustered NetBackup	14
	About NetBackup limitations with clustering solutions	14
Chapter 2	NetBackup in a Windows Server Failover Clustering	15
	About NetBackup on Windows Server Failover Clustering	15
	Installation prerequisites for NetBackup on WSFC cluster	16
	Installing a NetBackup failover server on WSFC cluster	17
	Configuring a NetBackup server on WSFC cluster	18
	Upgrading a NetBackup failover server on WSFC cluster	19
	Restoring the cluster quorum	20
	Restoring the cluster quorum to a node with directory services	22
	Preparation for disaster recovery of WSFC	23
	Disaster recovery of WSFC	23
	Recovering the entire WSFC cluster	23
	Recovering all shared disks	24
	About recovering NetBackup data on a shared disk	25
Chapter 3	NetBackup in a Veritas Cluster Server on UNIX/Linux	26
	About NetBackup on a Veritas Cluster Server on UNIX/Linux	26
	Installation prerequisites for NetBackup on VCS on UNIX/Linux	27

	About preinstallation checklist for a NetBackup failover server	
	installation on VCS on Unix/Linux	28
	NetBackup installation information for all VCS configurations	28
	NetBackup installation information for specific VCS	
	configurations	29
	Installing a failover NetBackup server on VCS on UNIX/Linux	30
	Configuring a failover NetBackup server on VCS on UNIX/Linux	32
	About adding a node to existing cluster	33
	Installing or upgrading NetBackup options on VCS on UNIX/Linux	
	33
	Upgrading a NetBackup failover server on VCS on Unix/Linux	34
Chapter 4	NetBackup in a Veritas Cluster Server on Windows	
	37
	About NetBackup in a Veritas Cluster Server on Windows	37
	About NetBackup agent for VCS on Windows	38
	Installation prerequisites for NetBackup on VCS on Windows	38
	Installing a NetBackup failover server on VCS on Windows	40
	Configuring a NetBackup server on VCS on Windows	41
	Upgrading a NetBackup failover server on VCS on Windows	42
	About detailed monitoring for the NetBackup server	43
	Setting up a detailed monitoring script for the NetBackup server on	
	VCS on Windows	43
	Enabling detailed monitoring in VCS Cluster Manager for the	
	NetBackup server	44
	Disabling detailed monitoring in VCS Cluster Manager for the	
	NetBackup server	45
Chapter 5	NetBackup in a SunCluster	46
	About NetBackup on SunCluster	46
	Installation prerequisites for NetBackup on SunCluster	47
	Preinstallation checklist for a NetBackup failover server installation on	
	SunCluster	48
	Installing NetBackup on SunCluster	48
	Configuring NetBackup on SunCluster	50
	Installing or upgrading NetBackup options on SunCluster	51
	Upgrading a NetBackup failover server on SunCluster	52
	SunCluster commands for bringing the resource group online or	
	offline	53

Chapter 6	NetBackup on HP Service Guard cluster	55
	About NetBackup on HP Service Guard cluster	55
	Installation prerequisites for NetBackup on HP Service Guard cluster	56
	Preinstallation checklist for a NetBackup failover server installation on HP Service Guard cluster	57
	Installing NetBackup on HP Service Guard cluster	58
	Configuring NetBackup on HP Service Guard cluster	60
	Installing or upgrading NetBackup options on HP Service Guard Cluster	61
	Upgrading a NetBackup failover server on HP Service Guard Cluster	61
	Service Guard commands for bringing the resource group online or offline	63
Chapter 7	NetBackup on HACMP cluster for AIX	64
	About NetBackup on HACMP cluster for AIX	64
	Installation prerequisites for NetBackup on HACMP cluster for AIX	65
	Preinstallation checklist for a NetBackup failover server installation on HACMP cluster for AIX	66
	Installing NetBackup on HACMP cluster for AIX	67
	Configuring NetBackup on HACMP cluster for AIX	68
	Installing NetBackup options on HACMP cluster for AIX	69
	Upgrading a NetBackup failover server on HACMP cluster for AIX	71
	Bringing the NetBackup resource group online or offline	72
Chapter 8	Configuring NetBackup	74
	NetBackup configuration overview	75
	NetBackup configuration guidelines	76
	Device configuration guidelines	77
	Configuring devices	78
	Configuring NetBackup catalog backups in a cluster	79
	About configuring backup policies for a NetBackup clustered server	80
	What to back up	80
	Guidelines for backing up local disks in a cluster	80
	Guidelines for backing up the shared disks	81
	Verifying NetBackup configuration	82

	Configuring robotic daemons for monitoring (UNIX/Linux clusters)	82
	Configuring additional services (UNIX/Linux clusters)	83
	Configuring add-ons for monitoring (UNIX/Linux clusters)	83
	Configuring additional services (Windows)	84
	Configuring add-ons for monitoring (Windows)	84
	About adding license keys	85
Chapter 9	Operational notes	86
	General notes on clustered master server administration	86
	About delay in detecting of loss of connection (WSFC and VCS on Windows)	87
	About WSFC clusters	88
	About NetBackup cluster application management	88
	Logging information	88
	About NetBackup's IPv6 support	89
Appendix A	NetBackup master server in a cluster using multiple interfaces	91
	About NetBackup master server in a cluster using multiple interfaces	91
	Requirements for use of a NetBackup master server in a cluster with multiple interfaces	93
	Configuring the NetBackup master server in a cluster using multiple interfaces	93
Index		95

Introduction to NetBackup Master Server Clustering

This chapter includes the following topics:

- [About this guide](#)
- [About NetBackup clustering](#)
- [About NetBackup failover server data protection in a cluster](#)
- [About NetBackup failover server support](#)
- [NetBackup supported cluster solutions](#)
- [Accessing NetBackup cluster compatibility lists](#)
- [About configuring LiveUpdate with clustered NetBackup](#)
- [About NetBackup limitations with clustering solutions](#)

About this guide

The *Symantec NetBackup Clustered Master Server Administrator's Guide* provides information about making NetBackup highly available by clustering the NetBackup master servers. Use the *Symantec NetBackup Clustered Master Server Administrator's Guide* to configure a clustered master server.

About NetBackup clustering

Clusters provide high availability of applications and data to users. In a cluster, two or more servers (called nodes) are linked in a network. These servers run the cluster software that allows each node access to the shared disks. If a node becomes

unavailable, cluster resources migrate to an available node (this process is called failover). The shared disks and the virtual server are kept available. During failover, users experience only a short interruption in service.

In this documentation, the various cluster solutions are abbreviated as follows:

- Windows Server Failover Clustering as WSFC
- Veritas Volume Manager as Volume Manager
- Veritas Cluster Server as VCS
- HP MC/Service Guard as Service Guard
- IBM's High Availability Cluster Multiprocessing as HACMP

Netbackup clustering in virtual environment

The NetBackup master servers running on virtual machines can be clustered using supported clustering technologies in similar way as that of physical machines clustering. For the general statement of support for NetBackup in a clustered virtual environment, refer following technote.

<http://www.symantec.com/docs/TECH127089>

You can install products like Storage Foundation HA on virtual machines in the same way as you install those on physical machines. However it is different than using VMware HA or vMotion because these two work at the virtual machine container level rather than the application level within the virtual machine.

Note: Using NetBackup within VM high availability, replication or transfer solutions is supported but not qualified by Symantec. (Examples of such solutions are vSphere HA, host-based replication, vMotion, and Storage vMotion (but not limited to VMware)). As a virtualized application, NetBackup is unaware of being deployed within a VM, and support for such operations is provided by the hypervisor vendor.

About NetBackup failover server data protection in a cluster

NetBackup protects the data in a cluster environment in several ways.

When NetBackup is installed as a failover server, a NetBackup server is installed on the cluster as a virtual server application. Then the server can fail over from one of the nodes to the other. The server is assigned a network name resource (the virtual server name), an IP address resource, and a disk resource. The NetBackup

server fails over from one node to another if a failure occurs on the active node. This failover provides high availability of the NetBackup server itself.

For failover master servers, the virtual server name is used as the name of the master server. This virtual name is used for all media servers and clients that use this master server.

When a failover occurs, the backup jobs that were running are rescheduled with the normal NetBackup retry logic for a failed backup. The NetBackup services are started on another node and the backup processing resumes.

The NetBackup failover master servers and media servers operate in an active or a passive failover configuration. The active node and the passive (or failover node) must be the same version of the master server.

The use of stand-alone media servers and NetBackup clients in a cluster is also briefly described later in this document.

About NetBackup failover server support

For the NetBackup release 7.5 and later, the master server supports upgrade of clustered media servers. However, if the master server is also a media server, then the master server also supports configuration of clustered media servers. For more information about supported NetBackup versions for upgrade, refer to the [NetBackup Installation Guide](#).

The upgrade procedure for master and media server is the same.

Follow the instructions in the following *Upgrading a NetBackup failover server* sections for each clustering technology in this guide:

- See [“Upgrading a NetBackup failover server on WSFC cluster”](#) on page 19.
- See [“Upgrading a NetBackup failover server on VCS on Unix/Linux”](#) on page 34.
- See [“Upgrading a NetBackup failover server on VCS on Windows”](#) on page 42.
- See [“Upgrading a NetBackup failover server on SunCluster”](#) on page 52.
- See [“Upgrading a NetBackup failover server on HP Service Guard Cluster”](#) on page 61.
- See [“Upgrading a NetBackup failover server on HACMP cluster for AIX”](#) on page 71.

NetBackup supported cluster solutions

NetBackup supports several cluster environments. More information is available on how to install and configure NetBackup in particular type of cluster.

Table 1-1 lists the topics that describe how to install and configure NetBackup in each supported cluster environment.

Table 1-1 Supported cluster solutions

Cluster solution	See
Windows Server Failover Clustering	See "About NetBackup on Windows Server Failover Clustering" on page 15.
Veritas Cluster Server Windows 2003, 2008, 2008R2	See "About NetBackup in a Veritas Cluster Server on Windows" on page 37.
Veritas Cluster Server on UNIX/Linux	See "About NetBackup on a Veritas Cluster Server on UNIX/Linux" on page 26.
SunCluster	See "About NetBackup on SunCluster" on page 46.
HP MC/Service Guard	See "About NetBackup on HP Service Guard cluster" on page 55.
HACMP for AIX	See "About NetBackup on HACMP cluster for AIX" on page 64.

Accessing NetBackup cluster compatibility lists

The Symantec Support Web site now contains the most current platform support information for NetBackup. To locate the latest information on the Web site, perform the following procedure.

To access NetBackup cluster compatibility lists

- 1 Go to the following Web site:
<http://entsupport.symantec.com>
- 2 In the **Find Your Product** box, type `NetBackup Enterprise Server` and click the **>** option.

For Windows Server Failover Clustering and Veritas Cluster Server for Windows, you also can indicate `NetBackup Server`.
- 3 From the list on the right, click **Compatibility List**.

- 4 For information on supported cluster environments, see the following list:
Symantec NetBackup (tm) Enterprise Server x.x / NetBackup Server x.x Cluster Compatibility (updated *date*).
For x.x, look for the current release. For *date*, look for the most recent date.
- 5 Click the link for the PDF document.

About configuring LiveUpdate with clustered NetBackup

Information is available on how to configure LiveUpdate to work with a clustered NetBackup server.

See the [NetBackup LiveUpdate Guide](#).

About NetBackup limitations with clustering solutions

The following general limitations exist for NetBackup in a cluster:

- NetBackup does not support the conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise Technical Support .
- All NetBackup nodes must be running the same operating system and NetBackup version.
- NetBackup clustering does not support multiple master servers in a single cluster.
- NetBackup Server clustering is supported only on Windows and not on UNIX and Linux platforms.
- NetBackup Enterprise Server clustering is supported on Windows as well as Linux platforms.
- NetBackup Enterprise Server is supported with all cluster solutions
See "[NetBackup supported cluster solutions](#)" on page 12.
- Refer to the [NetBackup Release Notes](#) for limitations specific to NetBackup options. Refer to the [NetBackup Administrator's Guides](#) for limitations specific to Media Manager.

NetBackup in a Windows Server Failover Clustering

This chapter includes the following topics:

- [About NetBackup on Windows Server Failover Clustering](#)
- [Installation prerequisites for NetBackup on WSFC cluster](#)
- [Installing a NetBackup failover server on WSFC cluster](#)
- [Configuring a NetBackup server on WSFC cluster](#)
- [Upgrading a NetBackup failover server on WSFC cluster](#)
- [Restoring the cluster quorum](#)
- [Restoring the cluster quorum to a node with directory services](#)
- [Preparation for disaster recovery of WSFC](#)
- [Disaster recovery of WSFC](#)
- [Recovering the entire WSFC cluster](#)
- [Recovering all shared disks](#)
- [About recovering NetBackup data on a shared disk](#)

About NetBackup on Windows Server Failover Clustering

Windows Server Failover Clustering (WSFC) (formerly known as Microsoft Cluster Server or MSCS) is a high-availability solution for cluster configurations. With

Windows Server Failover Clustering you can monitor systems and application services. Refer to the documentation for WSFC to get a detailed understanding of how WSFC works and how it is installed and administered.

For detailed information on how NetBackup is installed and administered, see the [NetBackup Installation Guide](#) and [NetBackup Administrator's Guide, Volume I](#).

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. For more information, refer to the [NetBackup in Highly Available Environments Administrator's Guide](#).

Installation prerequisites for NetBackup on WSFC cluster

The following requirements must be met before you install and configure a NetBackup failover server in a WSFC environment:

- Verify that WSFC and NetBackup 7.7 support your hardware. For a list of supported storage devices, visit the following Web site. Also consult the WSFC documentation.
<http://entsupport.symantec.com>
- Verify that storage devices are properly installed and configured to work in a Windows environment. Refer to the information on configuring storage devices in the [NetBackup Installation Guide](#).
- Verify that Windows Server Failover Clustering is correctly installed and configured. NetBackup can be installed on as many nodes as WSFC supports. WSFC supports up to 4 or 8 nodes in a cluster, depending on the level of Windows that is installed.
- Physically connect the robotic devices and tape devices to each node where you want to install NetBackup). Connect devices by SCSI or Fibre Channel. Use OS commands to verify that all the devices are connected properly.
See the [NetBackup Device Configuration Guide](#).
- Verify that you have an IP address and host name (virtual name) to be assigned to the NetBackup cluster group. Use these only for the NetBackup cluster group. Also, verify that the disk resource is online on the node from which the NetBackup installation is about to be performed for the first time on the cluster.
With this release IPv6 is supported with NetBackup.
See ["About NetBackup's IPv6 support"](#) on page 89.
- Use Cluster Administrator to verify that the Possible Owners list for each disk resource that NetBackup uses includes each node to which NetBackup can failover.

- Verify that you have the NetBackup Enterprise Server 7.7 or NetBackup server 7.7 installation program and a valid license key.
- The Windows Server Failover Clustering Administrator must be installed on all NetBackup servers that you use to administer the NetBackup failover master server remotely. Microsoft Cluster Administrator must also be installed on any NetBackup administration clients.
- You must have administrator rights or domain administrator credentials on the server cluster.
- On Windows, the public network names must be the same on both nodes of the cluster for push installs.
- You should install NetBackup on the same path on all the nodes.

Installing a NetBackup failover server on WSFC cluster

Before you begin installation, review the following notes:

- These instructions assume that this installation is a new installation of a NetBackup failover server.
To upgrade NetBackup rather than complete an initial installation, follow the upgrade procedure.
See [“Upgrading a NetBackup failover server on WSFC cluster”](#) on page 19.
- You must install the same type of NetBackup server on each node to which NetBackup may failover.
- The virtual name cannot be more than 15 characters because of a Microsoft limitation.

Note: After you configure NetBackup as a cluster group in WSFC, do not change the group name.

The installation program does the following:

- Installs NetBackup on the node with shared disk resource online.
- Pushes the install to each inactive node, including the single license key you provided for a master server installation.
- Brings the NetBackup resources online.

To upgrade NetBackup rather than complete an initial installation, you follow a different procedure.

See [“Upgrading a NetBackup failover server on WSFC cluster”](#) on page 19.

To install a NetBackup failover server in an WSFC cluster

- 1 Install NetBackup on all nodes of the cluster. This installation can be done in the following ways:
 - Install on the cluster node (with shared disk online) and push install to all other nodes in the cluster.
Or
 - Install on the cluster node (with shared disk online). After the first node installation, manually install on all other nodes in the cluster.

Follow the instructions for NetBackup in a clustered environment as described in the [NetBackup Installation Guide](#).

- 2 When you are prompted to provide the list of servers, enter all servers that need to have access to the NetBackup failover server.
- 3 Post installation, if you have added additional license keys (for example for OpsCenter), then perform a failover and add these keys to each node in the cluster.

See [“About adding license keys”](#) on page 85.

- 4 Install any options that require separate installations.

Most Windows options only require a special license key and do not require a separate installation. See the appropriate NetBackup documentation for the specific option for more information.

- 5 After the installation is complete, continue with the configuration of NetBackup.

See [“Configuring a NetBackup server on WSFC cluster”](#) on page 18.

Configuring a NetBackup server on WSFC cluster

Do the following steps to configure NetBackup server in a cluster.

Table 2-1 Configuring a NetBackup server on WSFC cluster

Step	Action
1	Review the guidelines for how to configure NetBackup. See “NetBackup configuration guidelines” on page 76.

Table 2-1 Configuring a NetBackup server on WSFC cluster *(continued)*

Step	Action
2	<p>Configure the devices in the cluster.</p> <p>See “Device configuration guidelines” on page 77.</p> <p>See “Configuring devices” on page 78.</p> <p>Note: Devices must be configured on each node in the cluster.</p>
3	<p>Verify that the entries for the NetBackup Catalog backups are correct.</p> <p>See “Configuring NetBackup catalog backups in a cluster” on page 79.</p> <p>Catalog backup information is stored on the shared disk and does not need to be configured for each node.</p>
4	<p>Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node.</p> <p>See “About configuring backup policies for a NetBackup clustered server” on page 80.</p>
5	<p>By default, NetBackup options (such as NetBackup Vault) do not cause NetBackup to failover if they fail. You can configure NetBackup options to failover NetBackup if a service or the option fails.</p> <p>See “Configuring add-ons for monitoring (Windows)” on page 84.</p>
6	<p>When you have completed the configuration of NetBackup, verify that NetBackup can fail over properly in the cluster.</p> <p>See “Verifying NetBackup configuration” on page 82.</p>

Upgrading a NetBackup failover server on WSFC cluster

Follow these instructions if you want to upgrade NetBackup.

Note: NetBackup does not support conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise Technical Support .

Note: If you have modified NetBackup cluster configuration manually or the configuration has been modified due to external script, make sure that it is reflected correctly in NetBackup cluster registry.

To upgrade a NetBackup failover server on WSFC cluster

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.

See “[Configuring NetBackup catalog backups in a cluster](#)” on page 79.

- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list should contain the name of each node where NetBackup can run and the name of the virtual server.
- 3 Take all NetBackup resources offline except for the disk resource, virtual IP, and virtual name before you begin the upgrade install.
- 4 Follow the instructions for how to upgrade NetBackup in a clustered environment as described in the [NetBackup Installation Guide](#).

The installation program does the following:

- Upgrades NetBackup on the active node.
- Pushes the install to each inactive node.
- Brings the NetBackup resources online.

- 5 Upgrade and configure any options.

Most options require only a license key and do not need to be upgraded separately. For information on how to install and configure a specific option, see the appropriate NetBackup documentation for that option.

Restoring the cluster quorum

The cluster quorum is backed up as part of System State or Shadow Copy Components for each node. To restore the cluster quorum, other nodes in the cluster must be offline. If you cannot take the other nodes in the cluster offline before you restore the cluster quorum, follow the instructions in the next procedure.

To force the restore of the cluster quorum when other nodes are online

- 1 Create the following registry entry:

```
HKEY_LOCAL_MACHINE\Software\VERITAS\NetBackup\CurrentVersion\  
Config\Cluster_Database_Force_Restore
```

The actual registry entry must be on a single line. If required, create this registry value as data type REG_SZ with a value of YES. When this value is set, the cluster service is stopped for any nodes that are online.

- 2 If Active Directory is running on the target server or the target server is currently a domain controller, the restore procedure is different.

See [“Restoring the cluster quorum to a node with directory services”](#) on page 22.

To restore the cluster quorum

- 1 If the other nodes in the cluster are online, create the registry entry as described in the previous procedure.
- 2 In the NetBackup **Backup, Archive, and Restore** interface, open a **Restore** window.
- 3 Select the backup image (or range of images) that contains the backup of the **System State** or **Shadow Copy Components** for this node of the cluster.
- 4 In the **All Folders** pane, select **System_State** or **Shadow Copy Components**.
- 5 If the disk where the cluster quorum previously resided is changed, set the registry entry. This action forces the restore to continue.

See [“To force the restore of the cluster quorum when other nodes are online”](#) on page 21.

The disk may have been replaced with a new one. Or the disk configuration may have been changed so that the cluster quorum now resides on a different disk. In the latter case, the drive letter can remain the same for the disk that contained the cluster quorum. The drive letter can remain the same even if the configuration has changed. It can also remain the same if the disk signatures in the restore media do not match the signatures in the cluster quorum.

- 6 Continue the restore.
- 7 When the restore operation is complete, restart the cluster node. Or use the Microsoft Cluster Administrator to restart the cluster service on any nodes where it was stopped.

Restoring the cluster quorum to a node with directory services

To restore the quorum to a node that is either running Active Directory or that is currently a domain controller, the node must be in Directory Services Restore Mode. The cluster services cannot run in this mode. So the cluster quorum must be restored separately, after the System State or the Shadow Copy Components are restored and after the node is restarted.

To restore the cluster quorum to a node running Active Directory or that is currently a domain controller

- 1 In the NetBackup Backup, Archive, and Restore interface, open a **Restore** window.
- 2 Select the backup image (or range of images) that contains the backup you want to restore.
- 3 Exclude the cluster quorum from the restore, as follows:
 - For Windows 2000, expand **System_State** and then deselect **Cluster_Database**.
 - For Windows 2003, expand **Shadow Copy Components > System State** and then deselect **Cluster_Quorum**.
- 4 Continue the restore.
- 5 When the restore operation is complete, restart the cluster node in Safe (repair) mode. Then select Directory Services Restore Mode.
- 6 Start the NetBackup service(s).
- 7 Open the NetBackup Backup, Archive, and Restore interface.
- 8 Select only the cluster quorum, as follows:
 - For Windows 2000, expand **System_State** and select only **Cluster_Database**.
 - For Windows 2003, expand **Shadow Copy Components > System State** and select only **Cluster_Quorum**.

- 9 If the disk where the cluster quorum previously resided is changed, you may have to set the registry entry. This action forces the restore to continue.

See [“To force the restore of the cluster quorum when other nodes are online”](#) on page 21.

The disk may have been replaced with a new one. Or the disk configuration may have been changed so that the cluster quorum now resides on a different disk. In the latter case, the drive letter can remain the same for the disk that contained the cluster quorum. The drive letter can remain the same even if the configuration has changed. It can also remain the same if the disk signatures in the restore media do not match the signatures in the cluster quorum.
- 10 Continue the restore.
- 11 When the restore is complete, restart the target node.
- 12 Use Microsoft Cluster Administrator to restart the cluster service on any nodes where it was stopped.

Preparation for disaster recovery of WSFC

For complete instructions on recovery of WSFC, refer to the Microsoft documentation. Symantec only provides the instructions for how to restore the objects that you have backed up using NetBackup.

Disaster recovery of WSFC

Various disaster recovery scenarios are discussed in the following topics:

- See [“Recovering the entire WSFC cluster”](#) on page 23.
- See [“Recovering all shared disks”](#) on page 24.
- See [“About recovering NetBackup data on a shared disk”](#) on page 25.
This last topic describes how to recover the shared disk where the NetBackup application resides.

Recovering the entire WSFC cluster

The following procedure describes how to recover the nodes in a cluster to their pre-disaster state.

To recover the entire WSFC cluster

- 1 On the first node you want to recover, reinstall the Windows operating system, including the last service pack that was applied before the failure.
- 2 Install any other drivers or applications to make the node operational.
- 3 After you start the nodes in a cluster, ensure that the drive letters match the original cluster configuration. If the original configuration does not match, you can use the Disk Administrator to control the hard drive numbering scheme of the Windows devices.
- 4 On all remaining nodes you need to recover, reinstall Windows, including the last service pack that was applied before the failure.
- 5 Reinstall the cluster services and bring the cluster online.
- 6 Reinstall the same NetBackup software on the cluster that was installed before the failure.
- 7 Use the appropriate NetBackup catalog recovery procedure to restore the NetBackup catalog information before continuing.

See the [NetBackup Troubleshooting Guide](#) for more information on recovering the NetBackup catalog database.

- 8 If the clustered NetBackup server is a media server, verify that the restored `vm.conf` file contains the correct host-specific `MM_SERVER_NAME` configuration entry for the active node. If `MM_SERVER_NAME` is different from the local host name, server name to the local host name:

`MM_SERVER_NAME=local host name`
- 9 Restore the data files through the virtual server.
- 10 If you must restore a database to the shared drives, see the [NetBackup Administrator's Guides](#) for your NetBackup agent to continue the restore.

Recovering all shared disks

The following procedure describes how to recover the shared disks in WSFC cluster.

To recover all shared disks

- 1 Uninstall the cluster software from both nodes.
- 2 Replace and repartition the shared disks.
- 3 Reinstall the cluster software.
- 4 Ensure that all NetBackup shared disks are assigned the same drive letters that were used when NetBackup was originally installed and configured.

5 To reconfigure NetBackup for the cluster, do the following on the active node:

- Run the following command:

```
bpclusterutil -ci
```

- Recreate the database.
- Run the following commands:

```
tpext  
bpclusterutil -online
```

6 Use the appropriate NetBackup catalog recovery procedure to restore the NetBackup catalog information on the shared disk before continuing. See the [NetBackup Troubleshooting Guide](#) for more information on recovering the NetBackup catalog database.

7 If the clustered NetBackup server is a media server, verify that the restored `vm.conf` file contains the correct host-specific `MM_SERVER_NAME` configuration entry for the active node. If `MM_SERVER_NAME` is different from the local host name, server name to the local host name:

```
MM_SERVER_NAME=local host name
```

8 Use NetBackup to restore any data on the shared disks. For details on how to perform a restore, see the [NetBackup Backup, Archive, and Restore Getting Started Guide](#).

About recovering NetBackup data on a shared disk

To recover the shared disk that the NetBackup failover server used, follow the appropriate NetBackup catalog recovery procedure to restore the catalog information on the shared disk.

If the clustered NetBackup server is a media server, verify that the restored `vm.conf` file contains the correct host-specific `MM_SERVER_NAME` configuration entry for the active node. If `MM_SERVER_NAME` is different from the local host name, server name to the local host name:

```
MM_SERVER_NAME=local host name
```

See the [NetBackup Troubleshooting Guide](#) for more information on recovering the NetBackup catalog database.

NetBackup in a Veritas Cluster Server on UNIX/Linux

This chapter includes the following topics:

- [About NetBackup on a Veritas Cluster Server on UNIX/Linux](#)
- [Installation prerequisites for NetBackup on VCS on UNIX/Linux](#)
- [About preinstallation checklist for a NetBackup failover server installation on VCS on Unix/Linux](#)
- [Installing a failover NetBackup server on VCS on UNIX/Linux](#)
- [Configuring a failover NetBackup server on VCS on UNIX/Linux](#)
- [About adding a node to existing cluster](#)
- [Installing or upgrading NetBackup options on VCS on UNIX/Linux](#)
- [Upgrading a NetBackup failover server on VCS on Unix/Linux](#)

About NetBackup on a Veritas Cluster Server on UNIX/Linux

Veritas Cluster Server (VCS) is a high-availability solution for cluster configurations. VCS enables you to monitor systems and application services and to restart services on a different system when hardware or software fails.

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. Refer to the [NetBackup in Highly Available Environments Administrator's Guide](#) for more information.

NetBackup supports the use of the Global Cluster Option (GCO) with VCS. For information on how to configure and use GCO with NetBackup, refer to [NetBackup in Highly Available Environments Administrator's Guide](#).

Installation prerequisites for NetBackup on VCS on UNIX/Linux

The following requirements must be met before you install and configure a NetBackup failover server:

- Verify that VCS and NetBackup Enterprise Server 7.7 support your hardware. For a list of supported storage devices, visit the following Web site:
<http://entsupport.symantec.com>
- Verify that the supported version of VCS is correctly installed and configured on Solaris, HP-UX, AIX, or Linux. Follow the steps in the *Veritas Cluster Server Installation Guide*.
- Verify that no VCS resource group and resource exist with the same name as the one you intend to use for NetBackup.
- Make sure that the shared disk is configured and accessible to all cluster nodes where you want to install NetBackup. Also, verify that you can mount the disk.
- Verify that you have an IP address (virtual IP) and a host name (virtual name) to assign to the NetBackup resource in VCS. Use these only for the NetBackup resource.

Also, ping the IP address and verify that the IP address is not plumbed.

For VCS-UNIX, IP address of the Nodes and Virtual Name must be of same type (IPv6 or IPv4).

With this release IPv6 is supported with NetBackup.

See "[About NetBackup's IPv6 support](#)" on page 89.

Note: Node IP type must be same as virtual IP type.

- Make sure that each node in the cluster, where you want to install NetBackup, is SSH or RSH (On HP Service Guard, the command is `remsh`) equivalent. As the root user you must be able to perform a remote logon to each node in the cluster without entering a password. This configuration is only necessary for installation, upgrades, and configuration of the NetBackup server and any

NetBackup options. After installation and configuration are complete SSH or RSH can be disabled.

- For a clustered NetBackup master server, if the master server is the robotic control host, physically connect the robotic devices and tape devices to each node where you want to install NetBackup. Connect devices by SCSI or Fibre Channel. Use OS commands to verify that all the devices are connected properly. Refer to the [NetBackup Device Configuration Guide](#).
- Verify that you have the NetBackup Enterprise Server 7.7 installation program and a valid license key.

About preinstallation checklist for a NetBackup failover server installation on VCS on Unix\Linux

The NetBackup Enterprise Server requests certain cluster-related information during installation. Fill up the checklist for all configurations and the checklist for your specific configuration before you begin installation.

See [“NetBackup installation information for all VCS configurations”](#) on page 28.

See [“NetBackup installation information for specific VCS configurations”](#) on page 29.

Note: The configuration utility unless specified otherwise treats all attribute values globally.

NetBackup installation information for all VCS configurations

The following information is required for all VCS cluster configurations:

- Virtual name for NetBackup
- IP address
- Subnet mask or Prefix length
- Node name

Following information is required for each node:

- IP address
- Network device name (NIC)

NetBackup installation information for specific VCS configurations

The following information is required if you use VCS. Review the scenario that fits your configuration.

Table 3-1 Scenario 1 - VCS with VxVM

Resource	Example
Disk group Resource	
Disk group	nbudg
Start Volumes	0 or 1
Stop Volumes	0 or 1
Volume Resource (optional)	
Volume	nbuvol
Mount Resource	
Mount Point	/opt/VRTSnbu
Block Device	/dev/vx/dsk/nbudg/nbuvol
FS Type	vxfs
Mount Option	(optional)
Fsck Option	(if you add other options, -y is also required)

Table 3-2 Scenario 2- VCS with no Volume Manager

Resource	Example
Mount Point	/opt/VRTSnbu
Block Device	/dev/dsk/clt1dos3
FS Type	vxfs
Mount Option	(optional)
Fsck Option	(if you add other options, -y is also required)

Table 3-3 VCS with AIX LVMVG

Resource	Example
Volume Group	nbuvg
Major Number	58
Disks	hdisk1 or hdisk2
ImportvgOpt	(optional)
VaryonvgOpt	(optional)
SyncODM	(optional)
Mount Resource	
Mount Point	/opt/VRTSnbu
Block Device	/dev/nbudev
FS Type	jfs2
Mount Option	(optional)
Fsck Option	(if you add other options, -y is also required)

Table 3-4 Scenario 4 - VCS in HP-UX with logical volume manager

Resource	Example
LVM Volume Group Resource	
Volume Group	vg0a
LVM Logical Volume Resource	
Volume Group	vg0a
Logical Group	lv01

Installing a failover NetBackup server on VCS on UNIX/Linux

This topic describes how to install and configure a new NetBackup Enterprise Server as a failover application on a VCS on UNIX or Linux. To upgrade NetBackup, you must follow a different procedure.

See [“Upgrading a NetBackup failover server on VCS on Unix/Linux”](#) on page 34.

Note: You must install the NetBackup master server on each node to which NetBackup may failover. You cannot have a separate failover master server in your NetBackup configuration.

The following procedure describes how to install and configure a NetBackup failover server in a VCS cluster.

Note: NetBackup automatically detects supported clustering technology and prompts questions based on it. If you are not prompted for these questions on a clustered setup, please exit from the script and verify that cluster is configured correctly.

To install a NetBackup failover server

- 1 Fill out the checklist for all configurations and the checklist for your specific environment.

See [“NetBackup installation information for all VCS configurations”](#) on page 28.
See [“About preinstallation checklist for a NetBackup failover server installation on VCS on Unix/Linux”](#) on page 28.
- 2 Make sure that the shared disk is not mounted on any node in the cluster.

If applicable, unmount the NetBackup shared mount point. Stop the volume the mount point is on and deport the disk group for that volume on all nodes of the cluster.
- 3 Follow the instructions for how to install NetBackup in the [NetBackup Installation Guide](#).

Be sure that you:
 - Install NetBackup on each node to which it can failover.
 - Use the virtual name for the NetBackup server name.

Caution: When you are prompted, you must provide the same virtual cluster name that you provided during the installation. This name must be in the same format (FQDN/short) on all the nodes.

- 4 When NetBackup is installed on the clustered setup a confirmation prompt is displayed.
 - When you install NetBackup on the first node, you are prompted to confirm creation of a NetBackup cluster. Type **Yes** to set up NetBackup in HA mode.

- When you install NetBackup on the subsequent nodes, information about already created NetBackup cluster group is displayed. You are prompted to join the group.
- 5 When you are prompted for cluster-specific configuration details, refer to the checklist and provide details accordingly.
- 6 Allow NetBackup to be installed in a cluster. When a NetBackup failover server is installed:
 - On the first node, a single node cluster resource group for NetBackup is created and brought online.
 - On the other nodes, the installed node is added to the cluster resource group.
- 7 Install any NetBackup options.
 See [“Installing or upgrading NetBackup options on VCS on UNIX/Linux”](#) on page 33.
- 8 Continue with configuration of NetBackup. See [“Configuring a failover NetBackup server on VCS on UNIX/Linux”](#) on page 32.

Configuring a failover NetBackup server on VCS on UNIX/Linux

To configure NetBackup server in a cluster, do the following:

Table 3-5 Configuring a failover NetBackup server on VCS on UNIX/Linux

Step	Action
1	Review the guidelines for how to configure NetBackup. See “NetBackup configuration guidelines” on page 76.
2	Configure the devices in the cluster. See “Device configuration guidelines” on page 77. See “Configuring devices” on page 78. Note: Devices must be configured on each node in the cluster.
3	Verify that the entries for the NetBackup Catalog backups are correct. See “Configuring NetBackup catalog backups in a cluster” on page 79. Catalog backup information is stored on the shared disk and does not need to be configured for each node.

Table 3-5 Configuring a failover NetBackup server on VCS on UNIX/Linux
(continued)

Step	Action
4	Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node. See “About configuring backup policies for a NetBackup clustered server” on page 80.
5	When you have completed configuration of NetBackup, verify that NetBackup can failover properly in the cluster. See “Verifying NetBackup configuration” on page 82.

About adding a node to existing cluster

To add a node to the existing cluster, add the node to the VCS cluster before NetBackup is installed. The installer automatically detects the new node and adds it to the NetBackup cluster configuration.

Installing or upgrading NetBackup options on VCS on UNIX/Linux

Install or upgrade NetBackup options (for example, Language Packs) on all cluster nodes where the NetBackup server is installed. In addition, freeze the NetBackup group before installing any options.

Note: Before you upgrade any options, ensure that the NetBackup resource is online in the cluster. Also ensure that server processes are running on the active node.

To install or upgrade a NetBackup option on VCS on UNIX/Linux

- 1 Enable the VCS configuration in read and write mode with `haconf -makerw`
- 2 Freeze the NetBackup group with `hagrp -freeze nbu_group_name -persistent`.
- 3 Run the following command on the active node to disable the NetBackup agent monitor:

```
touch /usr/openv/netbackup/bin/cluster/frozen
```

- 4 Install the options on each inactive node in the cluster where NetBackup is installed. See the specific NetBackup documentation for each option for instructions on installation and configuration.
- 5 On the active node, perform the same installation.
- 6 Unfreeze the NetBackup group with `hagrp -unfreeze nbu_group_name -persistent`
- 7 Enable the VCS configuration in read-only mode with `haconf -dump -makero`
- 8 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/openv/netbackup/bin/cluster/frozen
```

Upgrading a NetBackup failover server on VCS on Unix/Linux

Follow these instructions if you want to upgrade from NetBackup 6.0 or later.

Note: NetBackup does not support conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise technical support.

Note: Symantec requires that you use the latest VCS agent that is installed with NetBackup 7.7. Older versions of the agent are not supported.

To upgrade a NetBackup failover server

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.
 See [“Configuring NetBackup catalog backups in a cluster”](#) on page 79.
- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list should contain the name of each node where NetBackup can run and the name of the virtual server.
- 3 Take the VCS NetBackup cluster resource offline before you begin the upgrade.

Note: Make sure that shared disk and IP resources are online during the upgrade on active node.

4 Enable the VCS configuration in read and write mode with `haconf -makerw`

5 Freeze the NetBackup group using the following command:

```
hagrp -freeze <nbu_group_name> -persistent
```

6 Stop the NetBackup cluster agent on all nodes of the NetBackup Group using the following command:

```
haagent -stop NetBackup -force -sys <node>
```

7 On the active node, install the NetBackup server software.

Note the following:

- Follow the instructions for how to upgrade NetBackup as described in the [NetBackup Installation Guide](#).
- If required to specify the server name, provide the virtual name of the server.

8 On each inactive node to which NetBackup may failover, install the NetBackup server software.

Note the following:

- Follow the instructions for how to upgrade NetBackup as described in the [NetBackup Installation Guide](#).
- If required to specify the server name, provide the virtual name of the server.

9 Start the VCS NetBackup cluster agent on all nodes of the NetBackup Group. Use the following command:

```
haagent -start NetBackup -sys <node>
```

10 Enable the VCS configuration in read and write mode with `haconf -makerw`

11 Unfreeze the NetBackup group using the following command:

```
hagrp -unfreeze <nbu_group_name> -persistent
```

12 Enable the VCS configuration in read-only mode with `haconf -dump -makero`

13 Take the NetBackup group offline and then bring online.

14 On each node where NetBackup server is installed, upgrade NetBackup options. See [“Installing or upgrading NetBackup options on VCS on UNIX/Linux”](#) on page 33.

15 Verify that NetBackup can failover properly in the cluster.

See [“Verifying NetBackup configuration”](#) on page 82.

Note: During freezing or unfreezing the groups, make sure that the status of configuration is in Read-Write mode.

NetBackup in a Veritas Cluster Server on Windows

This chapter includes the following topics:

- [About NetBackup in a Veritas Cluster Server on Windows](#)
- [About NetBackup agent for VCS on Windows](#)
- [Installation prerequisites for NetBackup on VCS on Windows](#)
- [Installing a NetBackup failover server on VCS on Windows](#)
- [Configuring a NetBackup server on VCS on Windows](#)
- [Upgrading a NetBackup failover server on VCS on Windows](#)
- [About detailed monitoring for the NetBackup server](#)
- [Setting up a detailed monitoring script for the NetBackup server on VCS on Windows](#)
- [Enabling detailed monitoring in VCS Cluster Manager for the NetBackup server](#)
- [Disabling detailed monitoring in VCS Cluster Manager for the NetBackup server](#)

About NetBackup in a Veritas Cluster Server on Windows

Veritas Cluster Server(VCS) is a high-availability solution for cluster configurations. With VCS you can monitor systems and application services, and restart services on a different system when hardware or software fails. For information about VCS, refer to the *Veritas Cluster Server Administrator's Guide*.

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. Refer to the [NetBackup in Highly Available Environments Administrator's Guide](#) for more information.

About NetBackup agent for VCS on Windows

The NetBackup agent for VCS monitors specific NetBackup resources, determines the status of these resources, and starts or stops NetBackup according to external events. The agent includes VCS type declarations and agent executables. The NetBackup resource type represents the agent. When the agent detects an application failure, the NetBackup service group is failed over to another system in the cluster. NetBackup is installed and configured on this stem.

The following table describes the specific agent operations.

Online	Brings the NetBackup services online.
Offline	Takes the NetBackup services offline.
Monitor	Verifies the status of NetBackup services. Detailed monitoring is also available. See "Setting up a detailed monitoring script for the NetBackup server on VCS on Windows" on page 43.
Clean	Stops all NetBackup daemons if there is a detection of an unexpected offline operation or an ineffective online operation.

Additional monitoring capabilities are available for add-on products.

See ["Configuring add-ons for monitoring \(Windows\)"](#) on page 84.

NetBackup supports the use of the Global Cluster Option (GCO) with VCS. For information on how to configure and use GCO with NetBackup, refer to [NetBackup in Highly Available Environments Administrator's Guide](#).

Installation prerequisites for NetBackup on VCS on Windows

The following requirements must be met before you install and configure a NetBackup failover server:

- Verify that VCS and NetBackup 7.7 support your hardware. For a list of supported storage devices, visit the following Web site:
<http://entsupport.symantec.com>

- Verify that storage devices have been properly installed and configured to work in a Windows environment. Refer to the section on how to configure storage devices in the [NetBackup Installation Guide](#).
- Verify that you have installed Veritas Storage Foundation HA and correctly configured VCS. NetBackup can be installed on as many nodes as VCS supports. The NetBackup service group is created during the installation.
- For VCS Windows (SFW-HA 4.1 and SFW-HA 4.2) make sure the patch available through Technote 278307 is installed before you install or upgrade to NetBackup 7.7. The patch is available at the following Web site:
<http://entsupport.symantec.com/docs/278307>.

Note: In few cases, after the NetBackup master cluster installation, the resource is not installed into the service group. In case the resource of type "NetBackupVCS" is added manually, the attributes of NetBackupVCS are blank and this resource cannot probe on cluster servers. For work-around, contact Technical Support Team.

- Verify the cluster disk group(s) and dynamic volume(s) for NetBackup have been created on the shared storage. Refer to the *Veritas Storage Foundation Administrator's Guide* for details on how to create these.
- All disk resources that you want NetBackup to use must be configured in Veritas Enterprise Administrator (VEA) before you install NetBackup.
- Verify that you have an IP address and host name (virtual name) to be assigned to the NetBackup resource in VCS. Only use these for the NetBackup cluster group. The virtual name cannot be more than 15 characters. Also, verify that the disk resource is online on the node from which the NetBackup installation is about to be performed for the first time on the cluster.
- For a clustered NetBackup master server, if the master server is the robotic control host, physically connect the robotic devices and tape devices to each node where you want to install NetBackup. Connect devices by SCSI or Fibre Channel. Use OS commands to verify that all the devices are connected properly. Refer to the [NetBackup Device Configuration Guide](#).
- Verify that you have the NetBackup Enterprise Server 7.7 or NetBackup server 7.7 installation program and a valid license key.
- On Windows, the public network names must be same on both nodes of the cluster for push-installs.
- You should install NetBackup on the same path on all nodes.

Installing a NetBackup failover server on VCS on Windows

This section describes how to install and configure a new NetBackup Enterprise Server as a failover application in a VCS for Windows cluster. If you want to upgrade NetBackup, rather than complete an initial installation, you must follow a different procedure.

See [“Upgrading a NetBackup failover server on VCS on Windows”](#) on page 42.

Review the following notes before you begin installation:

- These instructions assume that this installation is a new installation of a NetBackup failover server.
- You must install the same type of NetBackup server on each node to which NetBackup may failover. You cannot have a separate failover master server and a separate failover media server in your NetBackup configuration.
- After you configure NetBackup as a cluster group in VCS, do not change the group name.
- The virtual name cannot be more than 15 characters.

The installation program does the following:

- Installs NetBackup on the active node.
- Pushes the install to each inactive node, including the single license key you provided for the master server.
- Brings the NetBackup resources online.

The following procedure describes how to install a NetBackup failover server in a VCS cluster.

To install a NetBackup failover server on a VCS cluster

- 1 Install NetBackup on all nodes of the cluster. This installation can be done in the following ways:
 - Install on the cluster node (with shared disk online) and push install to all other nodes in the cluster.
Or
 - Install on the cluster node (with shared disk online). After the first node installation, manually install on all other nodes in the cluster.

Follow the instructions for how to install NetBackup in a clustered environment as described in the [NetBackup Installation Guide](#).

- 2 When you are prompted to provide the list of servers, enter all servers that must have access to the NetBackup failover server.
- 3 If you added license keys at the end of the installation, fail over and add these keys to each node in the cluster.
 See [“About adding license keys”](#) on page 85.
- 4 Install options that require separate installations.
 Most options only require a special license key and do not require a separate installation. See the appropriate NetBackup documentation for the specific option for more information.
- 5 After the installation is complete, continue with the configuration of NetBackup. See [“Configuring a NetBackup server on VCS on Windows”](#) on page 41.

Configuring a NetBackup server on VCS on Windows

Do the following steps to configure NetBackup server on a VCS cluster on Windows.

Table 4-1 Configuring a NetBackup server on VCS on Windows

Step	Action
1	Review the guidelines for how to configure NetBackup. See “NetBackup configuration guidelines” on page 76.
2	Configure the devices in the cluster. See “Device configuration guidelines” on page 77. See “Configuring devices” on page 78. Note: Devices must be configured on each node in the cluster.
3	Verify that the entries for the NetBackup Catalog backups are correct. See “Configuring NetBackup catalog backups in a cluster” on page 79.

Table 4-1 Configuring a NetBackup server on VCS on Windows (*continued*)

Step	Action
4	<p>Catalog backup information is stored on the shared disk and does not need to be configured for each node.</p> <p>Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node.</p> <p>See “About configuring backup policies for a NetBackup clustered server” on page 80.</p>
5	<p>By default, NetBackup options (such as NetBackup Vault) do not cause NetBackup to failover if they fail. You can configure NetBackup options to failover NetBackup if a service or the option fails.</p> <p>See “Configuring add-ons for monitoring (Windows)” on page 84.</p>
6	<p>When you have completed the installation and configuration of NetBackup, verify that NetBackup can fail over properly in the cluster.</p> <p>See “Verifying NetBackup configuration” on page 82.</p>

Upgrading a NetBackup failover server on VCS on Windows

Follow these instructions if you want to upgrade from NetBackup 6.0 or later.

Note: NetBackup does not support conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise technical support.

Note: If you have modified NetBackup cluster configuration manually or the configuration has been modified due to external script, make sure that it is reflected correctly in NetBackup cluster registry.

To upgrade a NetBackup failover server

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.
See [“Configuring NetBackup catalog backups in a cluster”](#) on page 79.
- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list should contain the name of each node where NetBackup can run and the name of the virtual server.

- 3 Take the VCS NetBackup resource offline before you begin the upgrade.

Note: Make sure that shared disk and IP resources are online during the upgrade on active node.

- 4 Follow the instructions for how to upgrade NetBackup as described in the [NetBackup Installation Guide](#).

The installation program does the following:

- Upgrades NetBackup on the active node.
- Pushes the install to each inactive node.
- Brings online all the NetBackup resources .

- 5 Upgrade and configure NetBackup options.

Most options require only a license key and do not need to be upgraded separately. For information on how to install and configure a specific option, see the appropriate NetBackup documentation for that option.

Note: When you upgrade NetBackup on cluster, NetBackup resource goes into faulted state. You must clear the fault after upgrade is complete. For details, contact Symantec enterprise technical support.

About detailed monitoring for the NetBackup server

In the detail monitoring mode, the NetBackup agent runs a script to verify that NetBackup is available. A sample script, `DetailedMonitor.bat`, is provided with the agent for this purpose. You can customize the script to meet your configuration requirements.

Note: Before setting up detailed monitoring, the NetBackup agent must run base level of monitoring.

Setting up a detailed monitoring script for the NetBackup server on VCS on Windows

This topic describes how to set up detailed monitoring for a NetBackup server that is installed in a VCS for Windows environment. The script file must exist on all nodes in the service group's system list.

To set up a detailed monitoring script for the NetBackup server on VCS on Windows

- 1 Configure and run the NetBackup agent with the basic monitoring.
- 2 For each node in the NetBackup service group, create a backup policy that performs a user backup of the file
`install_path\bin\cluster\VCS\DetailedMonitor.txt`.
install_path is the home directory of NetBackup.
 For example, C:\Program Files\VERITAS\NetBackup
 For example, if your NetBackup service group contains five nodes, you must create five different policies, each referencing a different node.
- 3 Make a copy of following file and edit it to fit your configuration.
`install_path\bin\cluster\DetailedMonitor.bat`
 - Replace VIRTSRVR with the virtual server name for the NetBackup master or media server.
 - Make any other edits necessary.
- 4 From the command line, type the following command to verify the script runs without errors:
`DetailedMonitorProd`
- 5 Continue with the following topic to enable detailed monitoring:
 See [“Enabling detailed monitoring in VCS Cluster Manager for the NetBackup server”](#) on page 44.

Enabling detailed monitoring in VCS Cluster Manager for the NetBackup server

This topic describes how to set the detail monitoring option for the NetBackup server from the VCS Cluster Manager.

To enable detailed monitoring in VCS Cluster Manager for the NetBackup server

- 1 In Cluster Explorer, right-click the NetBackup service group, choose **Offline**, and select the node where you want to bring the service group offline.
- 2 Click **Yes**.
- 3 In the left pane, click the NetBackup resource.
- 4 On the **Properties** tab, select the `Monscript` attribute from the list, and click **Edit**.

- 5 Provide the full path to the NetBackup monitor script that you created.
See [“About detailed monitoring for the NetBackup server”](#) on page 43.
- 6 Click **OK**.
- 7 Save your configuration.
- 8 In the left pane, right-click the NetBackup service group, select **Online**, and select the node where you want to bring the service group online.
- 9 Click **Yes**.

Disabling detailed monitoring in VCS Cluster Manager for the NetBackup server

This section describes how to disable the detail monitoring option for the NetBackup server from the VCS Cluster Manager.

To disable detailed monitoring in VCS Cluster Manager for the NetBackup server

- 1 In Cluster Explorer, right-click on the NetBackup service group, choose **Offline**, and select the node where you want to bring the service group offline.
- 2 Click **Yes**.
- 3 In the left pane, click the NetBackup resource.
- 4 On the **Properties** tab, select the **Monscript** attribute from the list, and click **Edit**.
- 5 Remove the path information.
- 6 Click **OK**.
- 7 Save your configuration.
- 8 In the left pane, right-click the NetBackup service group, select **Online**, and select the node where you want to bring the service group online.
- 9 Click **Yes**.

NetBackup in a SunCluster

This chapter includes the following topics:

- [About NetBackup on SunCluster](#)
- [Installation prerequisites for NetBackup on SunCluster](#)
- [Preinstallation checklist for a NetBackup failover server installation on SunCluster](#)
- [Installing NetBackup on SunCluster](#)
- [Configuring NetBackup on SunCluster](#)
- [Installing or upgrading NetBackup options on SunCluster](#)
- [Upgrading a NetBackup failover server on SunCluster](#)
- [SunCluster commands for bringing the resource group online or offline](#)

About NetBackup on SunCluster

NetBackup supports the HA Storage Plus option for Sun Clusters. Refer to the [NetBackup Administrator's Guide, Volume I](#), for a detailed understanding of how NetBackup is installed and administered. Refer to the documentation for SunCluster for a detailed understanding of how SunCluster works and how it is installed and administered.

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. Refer to the [NetBackup in Highly Available Environments Administrator's Guide](#) for more information.

Installation prerequisites for NetBackup on SunCluster

This topic contains information about the requirements that must be met before you install and configure a NetBackup failover server in a SunCluster environment.

Type of prerequisite	Description
General prerequisites	<p>The following prerequisites apply to both types of SunCluster installations, HA Storage Plus, and Global File System.</p> <ul style="list-style-type: none"> ■ Verify SunCluster and NetBackup Enterprise Server 7.7 support your hardware. For a list of supported storage devices, visit the following Web site. Also consult the SunCluster documentation. http://entsupport.symantec.com ■ Verify that you have an IP address and host name (virtual name) to be assigned to the NetBackup resource group. Only use these for the NetBackup resource group. ■ Physically connect the robotic devices and tape devices to each node where you want to install NetBackup). Connect devices by SCSI or Fibre Channel . Use OS commands to verify that all the devices are connected properly. Refer to the NetBackup Device Configuration Guide. ■ Make sure that each node in the cluster, where you want to install NetBackup, is SSH or RSH equivalent. As the root user you must be able to perform a remote logon to each node in the cluster without entering a password. This configuration is only necessary for installation, upgrades, and configuration of the NetBackup server and any NetBackup options. After installation and configuration are complete, SSH or RSH can be disabled. ■ Verify that you have the NetBackup Enterprise Server 7.7 installation program and a valid license key.
HA Storage Plus prerequisites	<p>The following prerequisites must be met for HA Storage Plus:</p> <ul style="list-style-type: none"> ■ Make sure that the disk has enough space for the NetBackup database files and directories. ■ Mount the disk on the computer that you want to configure NetBackup on.

Type of prerequisite	Description
Global File System prerequisites	<p>The following prerequisites must be met for Global File System:</p> <ul style="list-style-type: none"> ■ The shared disk must be configured and accessible to all cluster nodes where you want to install NetBackup. See the SunCluster documentation for more information on how to create and configure a shared disk. ■ Make sure that the shared disk has enough space for the NetBackup database files and directories. ■ You must be able to mount the disk on all nodes at the same time.
Zettabyte File System (ZFS) prerequisites	<p>The following prerequisites must be met for Zettabyte File System:</p> <ul style="list-style-type: none"> ■ The shared disk must be configured and accessible to all cluster nodes where you want to install NetBackup. See the SunCluster documentation for more information on how to create and configure a shared disk. ■ Make sure that the shared disk has enough space for the NetBackup database files and directories. ■ You must create a zpool and must configure it on the primary or starting node.

Preinstallation checklist for a NetBackup failover server installation on SunCluster

The following information is required for SunCluster cluster configurations.

Resource	Example
Virtual name for NetBackup:	vname
Mount Point (Shared Directory Path):	/opt/VRTSnbu
HASStoragePlus Resource for NetBackup Data	y or n

Installing NetBackup on SunCluster

This topic describes how to install a new NetBackup Enterprise Server as a failover application in a SunCluster . If you want to upgrade NetBackup, rather than complete an initial installation, you must follow a different procedure.

See [“Upgrading a NetBackup failover server on SunCluster”](#) on page 52.

Review the following notes before you begin installation:

- These instructions assume that this installation is a new installation of a NetBackup failover server.
- The NetBackup resource group name in a SunCluster is always `scnb-harg`. The user cannot configure this name.
- Two SunCluster resource files are installed with NetBackup and should not be edited: `scnb.VRTS` and `scnb.conf`.

Note: Cluster configuration is performed along with the installation process. Do not run the `cluster_config` script to perform cluster configuration.

The following procedure describes how to install and configure a NetBackup failover server in a SunCluster .

Note: Additional commands are required to properly freeze and unfreeze NetBackup in a SunCluster , due to Sun bug #5017826. When NetBackup is started under `pmf` with automatic restarts enabled, `pmf` intervenes if the tag dies. This intervention happens whether the monitor is enabled or not.

Note: If the shared disk is a raw disk with Global File System (GFS) and the primary (active) node is turned off , the shared disk is not accessible from any of the remaining nodes. As a result, the NetBackup server fails to come online on any other node.

To install NetBackup on SunCluster

- 1 Fill out the checklist for all configurations and the checklist for your specific environment.

See [“Preinstallation checklist for a NetBackup failover server installation on SunCluster”](#) on page 48.

- 2 Follow the instructions for how to install NetBackup in the [NetBackup Installation Guide](#).

Be sure that you:

- Install NetBackup on each node to which it can failover.
- Use the virtual name for the NetBackup server name.

Caution: When you are prompted, you must provide the same virtual cluster name that you provided during the installation. This name is case-sensitive and must be in same format (FQDN/short) on all the nodes.

- 3 When NetBackup is installed on the clustered setup a confirmation prompt is displayed.
 - When you install NetBackup on the first node, you are prompted to confirm creation of a NetBackup cluster. Type **Yes** to set up NetBackup in HA mode.
 - When you install NetBackup on the subsequent nodes, information of already created NetBackup cluster group is displayed. You are prompted to join the group.

- 4 When you are prompted for cluster-specific configuration details, refer to the checklist and provide details accordingly.

- 5 Allow NetBackup to be installed in a cluster. When a NetBackup failover server is installed:
 - On the first node, a single node cluster resource group for NetBackup is created and brought online.
 - On the other nodes, the installed node is added to the cluster resource group.

- 6 Install any NetBackup options.
 You must freeze the NetBackup group before you install any NetBackup options.
 See [“Installing or upgrading NetBackup options on SunCluster”](#) on page 51.

- 7 Continue with the configuration of NetBackup. See [“Configuring NetBackup on SunCluster”](#) on page 50.

Configuring NetBackup on SunCluster

To configure NetBackup server in a cluster, do the following:

Table 5-1 Configuring NetBackup on SunCluster

Step	Action
1	Review the guidelines for how to configure NetBackup. See “NetBackup configuration guidelines” on page 76.

Table 5-1 Configuring NetBackup on SunCluster *(continued)*

Step	Action
2	<p>Configure the devices in the cluster.</p> <p>See “Device configuration guidelines” on page 77.</p> <p>See “Configuring devices” on page 78.</p> <p>Note: Devices must be configured on each node in the cluster.</p>
3	<p>Verify that the entries for the NetBackup Catalog backups are correct.</p> <p>See “Configuring NetBackup catalog backups in a cluster” on page 79.</p> <p>Catalog backup information is stored on the shared disk and does not need to be configured for each node.</p>
4	<p>Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node.</p> <p>See “About configuring backup policies for a NetBackup clustered server” on page 80.</p>
5	<p>When you have completed configuration of NetBackup, verify that NetBackup can fail over properly in the cluster.</p> <p>See “Verifying NetBackup configuration” on page 82.</p>

Installing or upgrading NetBackup options on SunCluster

To install or upgrade NetBackup options, NetBackup daemons must be brought offline without causing a failover. SunCluster must be configured to stop monitoring NetBackup, but keep NetBackup resources online.

See [“Configuring robotic daemons for monitoring \(UNIX/Linux clusters\)”](#) on page 82.

See [“Configuring add-ons for monitoring \(UNIX/Linux clusters\)”](#) on page 83.

To install or upgrade NetBackup options

- 1 Freeze the NetBackup group by executing the following:

```
/usr/cluster/bin/scswitch -n -j scnb-hars
```

- 2 Run the following command on the active node to disable the NetBackup agent monitor:

```
touch /usr/opensv/netbackup/bin/cluster/frozen
```

- 3 On active node, install or upgrade any NetBackup options. See the specific NetBackup documentation for each option for instructions on installation and configuration.
- 4 On the inactive node, perform the same installation.
- 5 After you complete the installations of any options, run the following commands:

```
/usr/cluster/bin/scswitch -e -j scnb-hars
```

- 6 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/openv/netbackup/bin/cluster/frozen
```

The NetBackup resources are brought online and SunCluster resumes monitoring the NetBackup resource.

Upgrading a NetBackup failover server on SunCluster

Follow these instructions if you want to upgrade NetBackup. You must also have the SunCluster agent that was installed with your previous version of NetBackup.

Note: NetBackup does not support conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise technical support .

To upgrade a NetBackup failover server on SunCluster

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.

See [“Configuring NetBackup catalog backups in a cluster”](#) on page 79.

- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list should contain the name of each node where NetBackup can run and the name of the virtual server.
- 3 Put NetBackup in the unmanaged state by executing the following commands:

```
/usr/cluster/bin/scswitch -n -j scnb-hars
```

- 4 On active node, install the NetBackup server.

Note the following:

- Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).

- If required to specify the server name, provide the virtual name of the server.
- 5 On each inactive node to which NetBackup may failover, install the NetBackup server.
Note the following:
 - Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).
 - If required to specify the server name, provide the virtual name of the server.
 - 6 Run the following commands:


```
/usr/cluster/bin/scswitch -e -j scnb-hars
```

The NetBackup resources are brought online and SunCluster resumes monitoring the NetBackup resource.
 - 7 Bring the NetBackup resource group offline and online.
 - 8 On each node where NetBackup server is installed, upgrade NetBackup options.
You must freeze the NetBackup group before you install any options.
See [“Installing or upgrading NetBackup options on SunCluster”](#) on page 51.
 - 9 Verify that NetBackup can failover properly in the cluster.
See [“Verifying NetBackup configuration”](#) on page 82.

SunCluster commands for bringing the resource group online or offline

To bring the NetBackup resource group online or offline, special SunCluster commands must be used. See the SunCluster documentation for more information on these and other commands.

[Table 5-2](#) describes the commands you use to bring the NetBackup resource group online or offline.

Table 5-2 SunCluster commands

Action	Enter this command
To bring the NetBackup resource group online	<code>/usr/cluster/bin/scswitch -z -g scnb-harg -h hostname</code>
To bring the NetBackup resource group offline	<code>/usr/cluster/bin/scswitch -F -g scnb-harg</code>

Table 5-2 SunCluster commands (*continued*)

Action	Enter this command
To verify that the NetBackup resource is online	<code>/usr/cluster/bin/scstat -g</code>

NetBackup on HP Service Guard cluster

This chapter includes the following topics:

- [About NetBackup on HP Service Guard cluster](#)
- [Installation prerequisites for NetBackup on HP Service Guard cluster](#)
- [Preinstallation checklist for a NetBackup failover server installation on HP Service Guard cluster](#)
- [Installing NetBackup on HP Service Guard cluster](#)
- [Configuring NetBackup on HP Service Guard cluster](#)
- [Installing or upgrading NetBackup options on HP Service Guard Cluster](#)
- [Upgrading a NetBackup failover server on HP Service Guard Cluster](#)
- [Service Guard commands for bringing the resource group online or offline](#)

About NetBackup on HP Service Guard cluster

HP Service Guard is a high-availability solution for cluster configurations. With HP Service Guard you can monitor systems and application services, and restart services on a different system when hardware or software fails. Refer to the documentation for Service Guard for a detailed understanding of how Service Guard works and how it is installed and administered.

Refer to the [NetBackup Administrator's Guide, Volume I](#), for a detailed understanding of how NetBackup is installed and administered.

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. Refer to the [NetBackup in Highly Available Environments Administrator's Guide](#) for more information.

Installation prerequisites for NetBackup on HP Service Guard cluster

The following requirements must be met before you install and configure a NetBackup failover server in a Service Guard environment:

- Verify Service Guard and NetBackup Enterprise Server 7.7 support your hardware. For a list of supported storage devices, visit the following Web site. Also consult the Service Guard documentation.
<http://entsupport.symantec.com>
- Verify that the supported version of Service Guard is correctly installed and configured.
- Verify that you have an IP address and host name (virtual name) to be assigned exclusively to the NetBackup resource. With this release IPv6 is supported with NetBackup.
See "[About NetBackup's IPv6 support](#)" on page 89.
- The shared disk must be configured and accessible to all cluster nodes where you want to install NetBackup. See the Service Guard and the appropriate Volume Manager (Veritas or HP) documentation for more information on how to create and configure a shared disk. Make sure that the shared disk has enough space for the NetBackup database files and directories. Make sure that the disk is not mounted on any system and that all volume groups are offline and volumes are stopped before installing NetBackup.
- You can have the database spread across multiple shared disks for performance reasons. This configuration can be performed after the initial cluster configuration.
- Physically connect the robotic devices and tape devices to each node where you want to install NetBackup. Connect devices by SCSI or Fibre Channel. Use OS commands to verify that all the devices are connected properly. Refer to the [NetBackup Device Configuration Guide](#).
- Make sure that each node in the cluster, where you want to install NetBackup, is `remsh` equivalent. As the root user you need to be able to perform a remote logon to each node in the cluster without entering a password. This configuration is only necessary for installation, upgrades, and configuration of the NetBackup server and NetBackup options. After installation and configuration are complete, `remsh` can be disabled.

- Verify that you have the NetBackup Enterprise Server 7.7 installation program and a valid license key.

Preinstallation checklist for a NetBackup failover server installation on HP Service Guard cluster

The NetBackup Enterprise Server requests certain cluster-related information during installation. Fill out the checklist for all configurations and the checklist for your specific configuration before you begin installation.

The following information is required for all HP Service Guard cluster configurations.

Table 6-1 All HP Service Guard cluster configurations

Resource	Example
Virtual name for NetBackup:	vname
IP address:	10.209.14.54
Subnet for the virtual name:	10.209.14.0

The following information is required if you use HP Service Guard for different configurations.

Table 6-2 HP Service Guard with VxVM volume group

Resource	Example
Disk Group Name:	nbudg
Logical Volume Path:	dev/dsk/nbudg/nbuvol
Mount Point:	/opt/VRTSnbu
File System:	vxfs
Mount Options:	
Unmount Options:	
fsk Options:	

Table 6-3 HP Service Guard with Veritas cluster volume manager

Resource	Example
Disk Group Name:	nbudg

Table 6-3 HP Service Guard with Veritas cluster volume manager (*continued*)

Resource	Example
Logical Volume Path:	/dev/dsk/nbudg/nbuvol
Mount Point:	/opt/VTRSnbu
File System:	vxfs
Mount Options:	
Unmount Options:	
fsk Options:	

Table 6-4 HP Service Guard with LVM volume group

Resource	Example
Disk Group Name:	nbuvg
Logical Volume Path:	dev/nbuvg/lvo1
Mount Point:	opt/VRTSnbu
File System:	vxfs
Mount Options:	
Unmount Options:	
fsk Options:	

Installing NetBackup on HP Service Guard cluster

This section describes how to install NetBackup Enterprise Server as a failover application in a Service Guard cluster. If you want to upgrade NetBackup, rather than complete an initial installation, you need to follow a different procedure.

See [“Upgrading a NetBackup failover server on HP Service Guard Cluster”](#) on page 61.

Review the following notes before you begin installation:

- These instructions assume that this installation is a new installation of a NetBackup failover server.
- The NetBackup package name in a Service Guard cluster is always NetBackup. The user cannot configure this name.

- The following package ASCII file is installed with NetBackup. You can change the values for any of the timeout settings in this file. Do not make changes to any settings that are not related to timeouts.

```
/etc/cmcluster/netbackup/netbackup.config
```

Note: Cluster configuration is performed along with the installation process. Do not run the `cluster_config` script to perform cluster configuration.

The following procedure describes how to install and configure a NetBackup failover server on a Service Guard cluster.

To install NetBackup on HP Service Guard cluster

- 1 Fill out the checklist for all configurations and the checklist for your specific environment.
 See [“Preinstallation checklist for a NetBackup failover server installation on HP Service Guard cluster”](#) on page 57.
- 2 Make sure that the shared disk is not mounted on any node in the cluster.
 If applicable, unmount the NetBackup shared mount point. Stop the volume the mount point is on and stop the disk group for that volume on all nodes of the cluster.
- 3 Follow the instructions for how to install NetBackup in the [NetBackup Installation Guide](#).

Be sure that you:

- Install NetBackup on each node to which it can failover.
- Use the virtual name for the NetBackup server name.

Caution: When you are prompted, you must provide the same virtual cluster name that you provided during the installation. This name is case-sensitive and must be in same format (FQDN/short) on all the nodes.

- 4 When NetBackup is installed on the clustered setup a confirmation prompt is displayed.
 - When you install NetBackup on the first node, you are prompted to confirm creation of a NetBackup cluster. Type **Y** to set up NetBackup in HA mode.
 - While you install NetBackup on the subsequent nodes, information of already created NetBackup cluster group is displayed. You are prompted to join the group.

- 5 When you are prompted for cluster-specific configuration details, refer to the checklist and provide details accordingly.
- 6 Allow NetBackup to be installed in a cluster. When a NetBackup failover server is installed:
 - On the first node, a single node cluster resource group for NetBackup is created and brought online.
 - On the other nodes, the installed node is added to the cluster resource group.
- 7 Continue with the configuration of NetBackup. See [“Configuring NetBackup on HP Service Guard cluster”](#) on page 60.

Configuring NetBackup on HP Service Guard cluster

To configure NetBackup server in a cluster, do the following:

Table 6-5 Configuring NetBackup on HP Service Guard cluster

Step	Action
1	Review the guidelines for how to configure NetBackup. See “NetBackup configuration guidelines” on page 76.
2	Configure the devices in the cluster. See “Device configuration guidelines” on page 77. See “Configuring devices” on page 78. Note: Devices must be configured on each node in the cluster.
3	Verify that the entries for the NetBackup Catalog backups are correct. See “Configuring NetBackup catalog backups in a cluster” on page 79. Catalog backup information is stored on the shared disk and does not need to be configured for each node.
4	Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node. See “About configuring backup policies for a NetBackup clustered server” on page 80.
5	When you have completed configuration of NetBackup, verify that NetBackup can fail over properly in the cluster. See “Verifying NetBackup configuration” on page 82.

Installing or upgrading NetBackup options on HP Service Guard Cluster

To install or upgrade NetBackup options, NetBackup daemons must be brought offline without causing a failover. Service Guard must be configured to stop monitoring NetBackup, but keep NetBackup resources online (or frozen).

See [“Configuring robotic daemons for monitoring \(UNIX/Linux clusters\)”](#) on page 82.

See [“Configuring add-ons for monitoring \(UNIX/Linux clusters\)”](#) on page 83.

To install or upgrade NetBackup options on HP Service Guard Cluster

- 1 Place NetBackup in a frozen state by executing the following:

```
cmmodpkg -d netbackup
```

- 2 Run the following command on the active node to disable the NetBackup agent monitor:

```
touch /usr/openv/netbackup/bin/cluster/frozen
```

- 3 On the active node where NetBackup server is installed, install an option. See the specific NetBackup documentation for each option for instructions on installation and configuration.

- 4 Perform the same installation on each inactive node.

- 5 After you complete the installations of the options, run the following:

```
cmmodpkg -e netbackup
```

- 6 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/openv/netbackup/bin/cluster/frozen
```

The NetBackup resources are brought online and Service Guard resumes monitoring the NetBackup resource.

Upgrading a NetBackup failover server on HP Service Guard Cluster

Follow these instructions to upgrade NetBackup failover server.

Note: Before upgrading NetBackup on HP Service Guard cluster, please refer to technote 145810.

To upgrade a NetBackup failover server on HP Service Guard Cluster

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.

See “[Configuring NetBackup catalog backups in a cluster](#)” on page 79.

- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list must contain the name of each node on which NetBackup can run and the name of the virtual server.

- 3 Place NetBackup in a frozen state by executing the following:

```
cmmmodpkg -d netbackup
```

- 4 Run the following command on the active node to disable the NetBackup agent monitor:

```
touch /usr/openv/netbackup/bin/cluster/frozen
```

- 5 On active node, install the NetBackup server.

Note the following:

- Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).
- If required to specify the server name, provide the virtual name of the server.

- 6 On each inactive node to which NetBackup may failover, install the NetBackup server.

Note the following:

- Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).
- If required to specify the server name, provide the virtual name of the server.

- 7 During an upgrade of a NetBackup in a Service Guard cluster you see the messages that indicate that the database is created twice. These messages appear because the database is created in the default location (/usr/openv/db/) during `install_bp`. Later, it is moved or recreated on the shared disk.

- 8 Run the following command:

```
cmmmodpkg -e netbackup
```

- 9 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/opensv/netbackup/bin/cluster/frozen
```

The NetBackup resources are brought online and Service Guard resumes monitoring the NetBackup resource.

- 10 Bring the NetBackup resource group offline and online. See [“Service Guard commands for bringing the resource group online or offline”](#) on page 63.
- 11 Verify that NetBackup can failover properly in the cluster.
 See [“Verifying NetBackup configuration”](#) on page 82.

Service Guard commands for bringing the resource group online or offline

To bring the NetBackup resource group online or offline, special Service Guard commands must be used. See the Service Guard documentation for more information on these and other commands.

[Table 6-6](#) describes the commands you use to bring the NetBackup resource group online or offline.

Table 6-6 HP Service Guard commands

Task	Command
Bring the NetBackup resource group online	<code>/usr/sbin/cmrunpkg netbackup</code>
Bring the NetBackup resource group offline	<code>/usr/sbin/cmhaltpkg netbackup</code>
Verify that the NetBackup resource is online	<code>/usr/sbin/cmviewcl</code>

NetBackup on HACMP cluster for AIX

This chapter includes the following topics:

- [About NetBackup on HACMP cluster for AIX](#)
- [Installation prerequisites for NetBackup on HACMP cluster for AIX](#)
- [Preinstallation checklist for a NetBackup failover server installation on HACMP cluster for AIX](#)
- [Installing NetBackup on HACMP cluster for AIX](#)
- [Configuring NetBackup on HACMP cluster for AIX](#)
- [Installing NetBackup options on HACMP cluster for AIX](#)
- [Upgrading a NetBackup failover server on HACMP cluster for AIX](#)
- [Bringing the NetBackup resource group online or offline](#)

About NetBackup on HACMP cluster for AIX

This topic provides information on how to install and configure NetBackup Enterprise Server as a highly available application with High Availability Cluster Multiprocessing (HACMP).

Note: With AIX version 6.1 and later, AIX-HACMP is referred as PowerHA and the cluster manager is referred as PowerHA Cluster Manager.

HACMP is a high-availability solution for cluster configurations. With HACMP you can monitor systems and application services, and restart services on a different

system when hardware or software fails. Refer to the documentation for HACMP for a detailed understanding of how HACMP works and how it is installed and administered.

Refer to the [NetBackup Administrator's Guide, Volume I](#), for a detailed understanding of how NetBackup is installed and administered.

NetBackup can be configured in a cluster as a non-failover server and as a standalone media server with virtual storage units. For more information, refer to the [NetBackup in Highly Available Environments Administrator's Guide](#).

Installation prerequisites for NetBackup on HACMP cluster for AIX

This section contains information about the requirements that must be met before install and configure a NetBackup failover server in a HACMP environment.

- Verify that HACMP and NetBackup Enterprise Server 7.6 support your hardware. For a list of supported storage devices, visit the following Web site. Also consult the HACMP documentation.
<http://entsupport.symantec.com>
- Verify that supported version of AIX is installed.
- Verify that supported version of HACMP is correctly installed and configured. It also must pass cluster verification and synchronization.
- Physically connect the robotic devices and tape devices to each node where you want to install NetBackup). Connect devices by SCSI or Fibre Channel . Use OS commands to verify that all the devices are connected properly. Refer to the [NetBackup Device Configuration Guide](#).
- Make sure that each node in the cluster, where you want to install NetBackup, is SSH or RSH equivalent. As the root user you need to be able to perform a remote logon to each node in the cluster without entering a password. This ability is only necessary for installation, upgrades, and configuration of the NetBackup server and any NetBackup options. When installation and configuration are complete, SSH or RSH can be disabled.
- There must be a pre-existing file system available for use by the NetBackup resource group that is configured on all nodes. This file system must be resident on a volume group that is accessible to all nodes where you want to configure NetBackup. It must not be configured as a resource for an existing HACMP resource group. It must not be configured to mount at boot time on any node.

Preinstallation checklist for a NetBackup failover server installation on HACMP cluster for AIX

- Verify that you have a service IP address and an associated name (virtual name) to configure for NetBackup. This name and address must be present in the `/etc/hosts` file on all nodes before you install NetBackup.
- If you use IPAT by IP Replacement for your service address, then it must be configured in HACMP. The service address must be configured before you start installing NetBackup. The service address must not already be assigned to a resource group. This configuration must be done before you install NetBackup.
- If you use IPAT by IP aliasing, you do not need to configure the service address in HACMP before you install NetBackup. The service address must conform to the restrictions that are described in topic entitled "Planning Cluster Network Connectivity" of the *HACMP Planning and Installation Guide*. If you have already configured the service, it must not be assigned to a resource group already.
- Before you configure NetBackup, the cluster must be stable and able to complete a successful verification and synchronization.
- Verify that you have the NetBackup Enterprise Server 7.7 installation program and a valid license key.

Preinstallation checklist for a NetBackup failover server installation on HACMP cluster for AIX

The NetBackup Enterprise Server requests certain cluster-related information during installation. Fill out the checklist for all configurations and the checklist for your specific configuration before you begin installation.

The following information is required for all HACMP cluster configurations.

Table 7-1 All HACMP cluster configurations

Resource	Example
NetBackup Resource Group Name:	netbackup
NetBackup Server Resource Name:	nbu_server
Mount Point for the Shared Storage:	/nbha1
Top-level Directory on Shared Storage:	/nbha1/dir1

The following information is required if you use HACMP.

Table 7-2 HACMP with IPAT by IP aliasing

Resource	Example
NetBackup Virtual Name:	vname
HACMP Network Name:	net_ether_01

Table 7-3 HACMP with IPAT by IP replacement

Resource	Example
NetBackup Virtual Name:	vname

Installing NetBackup on HACMP cluster for AIX

This topic describes how to install NetBackup Enterprise Server as a failover application on HACMP cluster.

The following procedure describes how to install a NetBackup failover server in an HACMP cluster.

Note: You can ignore the following type of warning message from the cluster configuration script. These messages are generated during the verification and synchronization whenever there are multiple addresses on a network interface.

Warning: There may be an insufficient number of communication interfaces that are defined on node: blazer, network: net_ether_01. Multiple communication interfaces are recommended for networks intending to use IP aliasing.

To install NetBackup on HACMP cluster for AIX

- 1 Fill out the checklist for all configurations and the checklist for your specific environment.

See [“Preinstallation checklist for a NetBackup failover server installation on HACMP cluster for AIX”](#) on page 66.
- 2 The volume group of the pre-existing file system that NetBackup uses must be varied-on, on the node from which you want to start clustered installation of NetBackup. If the volume group is not varied-on, the installer may not detect it as a shareable file system. Use the following command to vary-on the volume group:

```
varyonvg <volume group name>
```

- 3 Follow the instructions for how to install NetBackup in the [NetBackup Installation Guide](#).

Be sure that you:

- Install NetBackup on each node to which it can failover.
- Use the virtual name for the NetBackup server name.

Caution: When you are prompted, you must provide the same virtual cluster name that you provided during the installation. This name is case-sensitive and must be in same format (FQDN/short) on all the nodes..

- 4 When NetBackup is installed on the clustered setup a confirmation prompt is displayed.
 - When you install NetBackup on the first node, you are prompted to confirm creation of a NetBackup cluster. Type **Y** to set up NetBackup in HA mode.
 - While you install NetBackup on the subsequent nodes, information of already created NetBackup cluster group is displayed. You are prompted to join the group.
- 5 When you are prompted for cluster-specific configuration details, refer to the checklist and provide details accordingly.

Allow NetBackup to be installed in a cluster. When a NetBackup failover server is installed:

- On the first node, a single node cluster resource group for NetBackup is created and brought online.
- On the other nodes, the installed node is added to the cluster resource group.

- 6 Continue with the configuration of NetBackup.

See [“Configuring NetBackup on HACMP cluster for AIX”](#) on page 68.

Configuring NetBackup on HACMP cluster for AIX

To configure NetBackup server in a cluster, do the following:

Table 7-4 Configuring NetBackup on HACMP cluster for AIX

Step	Action
1	Review the guidelines for how to configure NetBackup. See "NetBackup configuration guidelines" on page 76.
2	Configure the devices in the cluster. See "Device configuration guidelines" on page 77. See "Configuring devices" on page 78. Note: Devices must be configured on each node in the cluster.
3	Verify that the entries for the NetBackup Catalog backups are correct. See "Configuring NetBackup catalog backups in a cluster" on page 79. Catalog backup information is stored on the shared disk and does not need to be configured for each node.
4	Configure backup policies. Backup policies are stored on the shared disk and do not need to be configured for each node. See "About configuring backup policies for a NetBackup clustered server" on page 80.
5	When you have completed configuration of NetBackup, verify that NetBackup can fail over properly in the cluster. See "Verifying NetBackup configuration" on page 82.

Installing NetBackup options on HACMP cluster for AIX

To install NetBackup options, NetBackup daemons must be brought offline without causing a failover. HACMP must be configured to stop monitoring NetBackup, but keep NetBackup resources online.

See ["Configuring robotic daemons for monitoring \(UNIX/Linux clusters\)"](#) on page 82.

See ["Configuring add-ons for monitoring \(UNIX/Linux clusters\)"](#) on page 83.

To install NetBackup options on HACMP cluster for AIX

- 1 Enter the following command to disable application monitoring for the NetBackup resource group.

```
smitty hacmp
```

- 2 Choose `System Management (C-SPOC)`.
- 3 Choose `HACMP Resource Group and Application Management`.
- 4 Choose `Suspend/Resume Application Monitoring`.
- 5 Choose `Suspend Application Monitoring`.
- 6 Select the NetBackup server and press **Enter**.
- 7 Run the following command on the active node to disable the NetBackup agent monitor:

```
touch /usr/openv/netbackup/bin/cluster/frozen
```

- 8 On the active node where NetBackup server is installed, install or upgrade NetBackup options. See the specific NetBackup documentation for each option for instructions on installation and configuration.
- 9 On the inactive node, perform the same installation.
- 10 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/openv/netbackup/bin/cluster/frozen
```

- 11 Enter the following command to enable application monitoring for the NetBackup resource group.

```
smitty hacmp
```

- 12 Choose `System Management (C-SPOC)`.
- 13 Choose `HACMP Resource Group and Application Management`.
- 14 Choose `Suspend/Resume Application Monitoring`.
- 15 Choose `Resume Application Monitoring`.
- 16 Select the NetBackup server and press **Enter**.

Upgrading a NetBackup failover server on HACMP cluster for AIX

Follow these instructions if you want to upgrade from NetBackup 6.0 and later.

Note: NetBackup does not support conversion of an existing non-failover NetBackup server to a failover NetBackup server. Contact Symantec Enterprise technical support .

To upgrade a NetBackup failover server on HACMP cluster for AIX

- 1 Ensure that a good backup of your cluster environment exists that includes a catalog backup.
 See [“Configuring NetBackup catalog backups in a cluster”](#) on page 79.
- 2 For each NetBackup server that runs outside of the cluster, ensure that the server list is accurate. This list should contain the name of each node where NetBackup can run and the name of the virtual server.
- 3 Enter the following command to disable application monitoring for the NetBackup resource group.

```
smitty hacmp
```

- 4 Choose `System Management (C-SPOC)`.
- 5 Choose `HACMP Resource Group and Application Management`.
- 6 Choose `Suspend/Resume Application Monitoring`.
- 7 Choose `Suspend Application Monitoring`.
- 8 Select the NetBackup server and press Enter.
- 9 On the active node, install the NetBackup server software.
 Note the following:
 - Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).
 - If required to specify the server name, provide the virtual name of the server.
- 10 On each inactive node to which NetBackup may failover, install the NetBackup server software.

Note the following:

- Follow the instructions for how to install NetBackup server as described in the [NetBackup Installation Guide](#).
 - If required to specify the server name, provide the virtual name of the server.
- 11 On each inactive node where NetBackup server is installed, install or upgrade any NetBackup option. See the specific NetBackup documentation for an option for installation and configuration instructions.
 - 12 On the active node, perform the same installation.
 - 13 Run the following command on the active node to enable the NetBackup agent monitor:

```
rm -f /usr/opensv/netbackup/bin/cluster/frozen
```

- 14 Enter the following command to enable application monitoring for the NetBackup resource group.

```
smitty hacmp
```

- 15 Choose `System Management (C-SPOC)`.
- 16 Choose `HACMP Resource Group and Application Management`.
- 17 Choose `Suspend/Resume Application Monitoring`.
- 18 Choose `Resume Application Monitoring`.
- 19 Select the NetBackup server and press **Enter**.

The NetBackup resources are brought online and Service Guard resumes monitoring the NetBackup resource.

- 20 Bring the NetBackup resource group offline and online.
- 21 Verify that NetBackup can failover properly in the cluster.
 See [“Verifying NetBackup configuration”](#) on page 82.

Bringing the NetBackup resource group online or offline

The SMIT tool manages any resource group operations. Use this tool to bring the NetBackup resource group online or offline and to move the location of the resource group.

To bring the NetBackup resource group online

- 1 Enter the following command.

```
smitty
```

- 2 Choose Communications Applications and Services.
- 3 Choose HACMP for AIX.
- 4 Choose System Management (C-SPOC).
- 5 Choose HACMP Resource Group and Application Management.
- 6 Choose Online Group.
- 7 Choose the group that you want to bring online.

To bring the NetBackup resource group offline

- 1 Enter the following command.

```
smitty
```

- 2 Choose Communications Applications and Services.
- 3 Choose HACMP for AIX.
- 4 Choose System Management (C-SPOC).
- 5 Choose HACMP Resource Group and Application Management.
- 6 Choose Offline Group.
- 7 Choose the group that you want to bring offline.

Configuring NetBackup

This chapter includes the following topics:

- [NetBackup configuration overview](#)
- [NetBackup configuration guidelines](#)
- [Device configuration guidelines](#)
- [Configuring devices](#)
- [Configuring NetBackup catalog backups in a cluster](#)
- [About configuring backup policies for a NetBackup clustered server](#)
- [What to back up](#)
- [Guidelines for backing up local disks in a cluster](#)
- [Guidelines for backing up the shared disks](#)
- [Verifying NetBackup configuration](#)
- [Configuring robotic daemons for monitoring \(UNIX/Linux clusters\)](#)
- [Configuring additional services \(UNIX/Linux clusters\)](#)
- [Configuring add-ons for monitoring \(UNIX/Linux clusters\)](#)
- [Configuring additional services \(Windows\)](#)
- [Configuring add-ons for monitoring \(Windows\)](#)
- [About adding license keys](#)

NetBackup configuration overview

Configuration of NetBackup includes the creation of storage devices, volumes, the catalog backup, and backup policies. This configuration can be completed most easily with the NetBackup Configuration Wizards in the NetBackup Administration Console. Refer to the [NetBackup Administrator's Guide, Volume I](#), for more details for instructions on how to perform these steps manually. (See information for configuring NetBackup without wizards.) Refer to [Table 8-1](#) before you configure NetBackup.

[Table 8-1](#) summarizes the information that applies to each cluster environment.

Table 8-1 Configuring NetBackup

Cluster Type	Section	Description
All	See "NetBackup configuration guidelines" on page 76.	General guidelines to follow when you configure the NetBackup server in a cluster.
All	See "Device configuration guidelines" on page 77.	General guidelines to follow when you configure devices for a NetBackup server in a cluster.
All	See "Configuring devices" on page 78.	Device configuration guidelines.
All	See "Configuring NetBackup catalog backups in a cluster" on page 79.	Instructions for verifying NetBackup Catalog Backup entries are correct.
All	See "About configuring backup policies for a NetBackup clustered server" on page 80.	Configuring automatic backup policies.
All	See "Verifying NetBackup configuration" on page 82.	Instructions to verify that NetBackup is configured correctly.
UNIX/Linux	See "Configuring robotic daemons for monitoring (UNIX/Linux clusters)" on page 82.	How to configure robotic daemons to fail over NetBackup
UNIX/Linux	See "Configuring add-ons for monitoring (UNIX/Linux clusters)" on page 83.	How to configure NetBackup add-on products to fail over NetBackup in a UNIX/Linux cluster.
Windows	See "Configuring add-ons for monitoring (Windows)" on page 84.	How to configure NetBackup add-on products to fail over NetBackup in Windows.

Table 8-1 Configuring NetBackup (*continued*)

Cluster Type	Section	Description
All	See “About adding license keys” on page 85.	Additional license keys in a cluster environment.

NetBackup configuration guidelines

Review the following guidelines before you configure NetBackup.

- To ensure that all nodes in the NetBackup failover group are properly registered in the EMM database, you must failover the NetBackup Group to all nodes in the NetBackup cluster group.
- The NetBackup server list must be set up correctly on each node where NetBackup is configured as a failover server. For NetBackup in a clustered environment, the virtual server name must appear first. After that name, include the node names within the NetBackup group.
- For each NetBackup server that runs outside of the cluster, the server list must contain the name of each node where NetBackup can run. The list must also contain the name of the virtual server.
- NetBackup depends on names to route information between participants in the backup and restore process. Therefore, the use of names must be consistent within a NetBackup configuration. Specific node names and virtual names should not be used interchangeably.
- CLIENT_NAME should be set to the name of the node.
- CLUSTER_NAME should be the virtual server name that is dedicated to the NetBackup Application that runs on the cluster.
- When you make changes to the NetBackup configuration on the active node, be sure to apply the same changes to each node in the cluster.
- NetBackup Server Host Properties in a cluster
 - The NetBackup Administration Console obtains node information from the EMM database. Therefore, changes to the Host Properties only affect the nodes that are already registered in the EMM database. (You change the Host Properties only when you fail over to the NetBackup Group to each node.)
 - All host names that are listed in the **Properties** panel can have their host properties updated with the Host Properties user interface. The exception is the Authorization host property, which is only updated on the active node.

- The "Add to All" hosts functionality is applicable only for a clustered master server and not for clustered media servers. To update Host Properties on clustered media servers, the user needs to update each node individually or select multiple nodes of the clustered media server.
- Configuration information is stored on the shared disk and cannot be configured separately for each node. (This information includes backup policies, storage units, and the NetBackup catalog backup.) All other configuration changes must be applied by moving the NetBackup server to each node.
- By default, NetBackup tries to complete a backup job two times (within a 12-hour window) before it allows the job to fail. Backup attempts may be exhausted before the failover of the NetBackup media server completes. If this situation happens, increase the **Scheduled backup attempts** setting to 6. You can also avoid this problem; set the **Job retry delay** setting to a lower value.
- The **Job retry delay** setting should be set lower to increase the likelihood that NetBackup is able to initiate all scheduled backups.
- The server list for each client you want to back up should contain the name of each node where NetBackup can run. This list should also contain the name of the virtual server.

Device configuration guidelines

The following are guidelines for configuring the devices for a clustered NetBackup server:

- Choose the **SCSI Persistent reserve** protection option, if possible. The use of persistent reserve is recommended, but take care to ensure that your hardware supports it correctly. See the [NetBackup Administrator's Guide, Volume II](#) for more information.
With this option, NetBackup can recover and use a reserved drive after a failover (if NetBackup owns the reservation). If you use SPC-2 SCSI reserve, a drive reset usually is required because the reservation owner is inoperative. Consult the [NetBackup Administrator's Guide](#) for more information on how to reset a drive and on the **Enable SCSI Reserve** setting.
- Devices that are attached to one node but not to the other node are available only when the node where they are attached is online. For a NetBackup failover master server, attach all of the devices to each node where NetBackup is installed. Use shared SCSI or Fibre Channel connections as necessary to share the devices.

- For a NetBackup media server failover configuration, configure devices from the NetBackup master server with the active node name as the NetBackup media server name.
- For any tape devices that are in a robotic library, ensure that the robot drive number field is set correctly. Use the drive numbering scheme that the manufacturer of the robotic library has implemented. NetBackup considers the first drive in the robot as robot drive number 1. If the manufacturer's drive numbering scheme starts with a different number such as 0, adjust it accordingly.
- Ensure that the robot numbers the failover server uses are consistent on all servers that use that robot. If the robot number that is defined on one node, does not match the number that is defined on another node, backups may fail.
- When you create the storage units that reside on the cluster, select the virtual name of the failover NetBackup server for the **Media server** setting.
- If you choose **Any server** for the media server when you create a storage unit, NetBackup selects the virtual NetBackup server when it performs any backup and restore operations.

Configuring devices

This section describes how to configure devices in NetBackup.

Note: To accommodate disparate SCSI connections on each node of the cluster, you must configure devices on each node. First, configure the devices on the active node. Move the NetBackup group to another node and configure the devices on that node. Then move NetBackup to another node and configure the devices on that node, etc.

You can configure NetBackup to failover if a robotic device fails.

See [“Configuring robotic daemons for monitoring \(UNIX/Linux clusters\)”](#) on page 82.

To configure devices

- 1 Review the device configuration guidelines.
See [“Device configuration guidelines”](#) on page 77.
- 2 On the active node, run the Device Configuration Wizard . This wizard automatically discovers and configures the devices and it creates storage units for those devices.

Symantec recommends that you use the Device Configuration Wizard to configure devices.

- 3 Move the NetBackup group to another node.
- 4 Refresh the view in the Media and Device Management utility.
- 5 Run the Device Configuration Wizard .
- 6 Continue to configure the devices on each node in the cluster. Repeat step 3 through step 5.

If device paths are not displayed after you refresh the Devices node or run `tpconfig`, the active node of the cluster is not configured properly.

To add new devices

Follow the same procedure as when you initially configured devices in the cluster. First, configure the devices on the active node. Move the NetBackup group to another node and configure the devices on that node. Then move NetBackup to another node and configure the devices on that node, and so on.

Configuring NetBackup catalog backups in a cluster

For complete information on how to configure and run online catalog backups, refer to the [NetBackup Administrator's Guide](#). For information on recovery of the NetBackup catalog, see the [NetBackup Troubleshooting Guide](#).

Note: An online catalog backup does not back up information on the inactive nodes. You must create a separate policy as described in the following step.

To configure an online, hot catalog backup in a cluster

- 1 Follow the instructions for creating online catalog backups as described in the [NetBackup Administrator's Guide](#).
- 2 Create a policy to back up the following directory on each node in the cluster.

Windows `install_path\netbackup\var`

UNIX/Linux `/usr/opensv/var`

About configuring backup policies for a NetBackup clustered server

To back up all data in a cluster, create backup policies that back up the local disks, shared disks, and database files in the cluster.

Review the following topics:

See [“What to back up”](#) on page 80.

See [“Guidelines for backing up local disks in a cluster”](#) on page 80.

See [“Guidelines for backing up the shared disks”](#) on page 81.

What to back up

Back up the following to protect all data in the cluster, including file systems and databases:

- Local disks on each node.
See [“Guidelines for backing up local disks in a cluster”](#) on page 80.
- All disks that attach to the shared SCSI bus.
See [“Guidelines for backing up the shared disks”](#) on page 81.
- Virtual servers, which may contain data or contain database applications. Use NetBackup database agents to back up databases.
- In WSFC and VCS for Windows clusters, also be sure to back up the System State and Shadow Copy Components on each node. For WSFC clusters, you must also back up the cluster quorum. The cluster quorum contains recovery information for the cluster and information about changes to the cluster configuration. The cluster quorum is included in the System State or Shadow Copy Components backup.
See [“Guidelines for backing up local disks in a cluster”](#) on page 80.

Guidelines for backing up local disks in a cluster

To protect the data on the node’s local disks, configure a policy that includes the cluster node names in the client list. In addition to this policy, you must also configure a separate policy to back up the shared disks.

See [“Guidelines for backing up the shared disks”](#) on page 81.

The following are guidelines for configuring the policy to back up local disks:

- If NetBackup is installed on the cluster as separate NetBackup media servers, configure a policy for each node. Each policy should include the cluster node name as a client. For each policy, select the storage unit that you created for the NetBackup media server that is installed on that cluster node.
- In the **Backup Selections** list, add all the local disks (excluding the shared disks).
- For Windows cluster, always include System_State:\ or Shadow Copy Components:\ in the file list to back up the System State for each cluster node. In a policy for an WSFC cluster, System_State:\ or Shadow Copy Components:\ also backs up the cluster quorum information.

Guidelines for backing up the shared disks

To protect the data on the shared disks, configure a policy that includes the virtual server name in the **Clients** list. This server name must be associated with the shared disk. In addition to this policy, you must also configure a separate policy to back up the local disks.

See [“Guidelines for backing up local disks in a cluster”](#) on page 80.

The following are guidelines for configuring the policy to back up the shared disks:

- If NetBackup is installed on the cluster as separate NetBackup media servers, select a storage unit that was created for one of the media servers. Or, select **Any Available**.
- If a storage unit does not have local, direct access to the shared disk drives, the data is backed up across the network. This action occurs even if the storage unit refers to a media server running on a node of the cluster that does not currently have control of the shared disk drives. In the **Backup Selections** list, specify the drive letters or mounted directories of the shared disks.
Note that a backup fails if two separate cluster nodes control the cluster resource that defines the virtual server name and the resource that defines the shared disks. Ensure that the virtual server name and the shared disks are configured to failover together so that the same node always controls them.
- System State information is included in the backup of the node’s local disks. You do not need to include System_State:\ or Shadow Copy Components:\ in the file list for this policy.

Verifying NetBackup configuration

After you complete the configuration of storage devices, volumes, the catalog backup, and the backup policies, verify that NetBackup fails over properly in the cluster.

To verify NetBackup configuration

- 1 Confirm that the NetBackup is online on the primary node, then determine if the following can be completed successfully:
 - Scheduled backups
 - User-directed backups
 - NetBackup catalog backups
 - Server-and user-directed restores
- 2 Switch the NetBackup resource group to another node and perform the same tests in the previous step. Repeat for each node in the cluster where NetBackup is installed.

Configuring robotic daemons for monitoring (UNIX/Linux clusters)

By default, robotic daemons do not cause NetBackup to failover if they fail. You can configure robot daemons to failover NetBackup if a daemon fails.

Note: You must configure robots before you perform the following instructions. Refer to the [NetBackup Installation Guide](#) for instructions on how to configure storage devices.

To configure NetBackup to failover if a robotic daemon fails

- 1 Configure your robots on each node in the cluster.
- 2 Run the following script:

```
/usr/opensv/netbackup/bin/cluster/cluster_config -r
```

- 3 Choose a (Add).
- 4 Select your robot from the list.
Multiple robots can be selected.

To remove a robotic daemon from monitoring

- 1 Run the following script:

```
/usr/opensv/netbackup/bin/cluster/cluster_config -r
```

- 2 Choose `d` (Delete).
- 3 Select the robot type you want to remove.

Configuring additional services (UNIX/Linux clusters)

By default, all the necessary NetBackup services are added to the NetBackup Cluster Group.

To add a service to the NetBackup Cluster Group

- ◆ Run the following command:

```
/usr/opensv/netbackup/bin/bpclusterutil  
-addSvc "ServiceName"
```

This command brings up the service when the group comes online, but the service is not monitored. If the service *ServiceName* fails, it does not cause the group to failover.

To delete a service from the NetBackup Cluster Group

- ◆ Run the following command:

```
/usr/opensv/netbackup/bin/bpclusterutil  
-deleteSvc "ServiceName"
```

If you delete a critical service, cluster do not failover if that service fails.

Configuring add-ons for monitoring (UNIX/Linux clusters)

By default, add-on products (such as NetBackup Vault) do not cause NetBackup to failover if they fail. These products can be configured to failover NetBackup if an add-on product fails.

To enable monitoring for the optional services

- ◆ Run the following command:

```
/usr/opensv/netbackup/bin/bpclusterutil  
-enableSvc "ServiceName"
```

To disable monitoring for the optional services

- ◆ Run the following command:

```
/usr/opensv/netbackup/bin/bpclusterutil  
-disbleSvc "ServiceName"
```

Monitoring can be turned on or off for only NetBackup Vault Service and NetBackup Key Management Service. The `ServiceName` parameters for these services are `nbvault` and `nbkms`.

Configuring additional services (Windows)

By default, all the necessary NetBackup services are added to the NetBackup Cluster Group.

To add a service

- ◆ Run the following command:

```
<NetBackup_install_path>\NetBackup\bin\bpclusterutil.exe  
-addSvc "ServiceName"
```

This command brings up the service when the group comes online, but the service is not monitored. If the service `ServiceName` fails, it does not cause the group to failover.

To delete a service from a NetBackup Cluster Group

- ◆ Run the following command:

```
<NetBackup_install_path>\NetBackup\bin\bpclusterutil.exe  
-deleteSvc "ServiceName"
```

Configuring add-ons for monitoring (Windows)

By default, add-on products (such as NetBackup Vault) do not cause NetBackup to failover if they fail. These products can be configured to failover NetBackup if an add-on product fails.

To enable monitoring for the optional services

- ◆ Run the following command:

```
<NetBackup_install_path>\NetBackup\bin\bpclusterutil.exe  
-enableSvc "ServiceName"
```

To disable monitoring for the optional services

- ◆ Run the following command:

```
<NetBackup_install_path>\NetBackup\bin\bpclusterutil.exe  
-disbleSvc "ServiceName"
```

Monitoring can be turned on or off only for NetBackup Vault Service and NetBackup Key Management Service. The *ServiceName* parameters for these services are "NetBackup Vault Service", "NetBackup Key Management Service"

About adding license keys

If you add other licenses at the end of a Windows master server installation, then you must failover and add these licenses to each node in the cluster. If you add new licenses later, you also need to failover to add these licenses to each node in the cluster. On Windows, you can also use the `bpminlicense` command. On UNIX/Linux servers, you can alternatively use the `get_license` command to add license keys without having to failover to each node.

Some features and products (such as NetBackup Shared Storage Option) require the keys to also be installed on the media server.

Operational notes

This chapter includes the following topics:

- [General notes on clustered master server administration](#)
- [About delay in detecting of loss of connection \(WSFC and VCS on Windows\)](#)
- [About WSFC clusters](#)
- [About NetBackup cluster application management](#)
- [Logging information](#)
- [About NetBackup's IPv6 support](#)

General notes on clustered master server administration

Consider the following operational issues to consider when you use NetBackup as a failover server:

- If a NetBackup server fails over and backup jobs are running, one of the following things happen:
 - If checkpoint restart is enabled for backup jobs for the policy, any backups that were running are resumed at the last checkpoint. Note that the schedule window must permit the job to be resumed.
 - If checkpoint restart is not enabled for backup jobs, any backup jobs that were running fail. These jobs show up as failed jobs in the Activity Monitor or NetBackup reports. Scheduled backup jobs are retried according to the normal retry logic. (See the **Job retry delay** and the **Schedule backup attempts** attributes). The schedule window and so on must permit the retry of the job. After a failover occurs, the user must restart user-directed backups and manual backups.

Refer to the [NetBackup Administrator's Guide, Volume I](#), for more information on checkpoint restart, Job retry delay, and Scheduled backup attempts.

- After a failover occurs on a NetBackup failover server, it takes time for the tape devices and media servers to be reset. For example, a tape may have to be rewound before it is made available. Until the device is again ready for use, you may see errors. For example, you may see error 213 (no storage units available for use) or error 219 (the required storage unit is unavailable).
- After a failover, NetBackup may change the status of a drive that is required for a backup or restore to PENDING. More information is available about how to use the NetBackup Administration Console Device Monitor to resolve a pending request or action.
See the [NetBackup Administrator's Guide, Volume I](#).
- If you have the NetBackup Administration Console open when a failover occurs, you need to refresh the display. This refresh ensures that the services on the active node are displayed correctly. In the NetBackup Administration Console (from the View menu) click **Refresh All**.
- The backup and restore process is the same whether you are in a cluster or a non-cluster environment. See the [NetBackup Troubleshooting Guide](#) for further information on backup and archive processes and on restore processes.
- TIR is not supported for clustered shared drives.

About delay in detecting of loss of connection (WSFC and VCS on Windows)

There may be a delay in the detection of the loss of a connection from a NetBackup Windows master server to a media server. For example, consider that a media server goes down while running a backup. There may be a delay on the master server before it detects that the media server is no longer available. It may first appear that a problem exists with the NetBackup Windows master server. This delay is a result of a certain TCP/IP configuration parameter on Windows called `KeepAliveTime`. By default, this parameter is set to 7,200,000 (two hours, in milliseconds). More information about the `KeepAliveTime` and other associated TCP/IP configuration parameters on Windows may be found in the following Microsoft knowledge base articles: Q140325 and Q120642.

Because of the delay jobs appear to be active on that media server even after the connection to the media server has gone down. In some cases an undesirable delay can occur before the current backup job fails. NetBackup tries to retry the job on a different media server, if one is available.

This delay is especially noticeable when the media server in question is a NetBackup failover media server that runs in a Windows Server Failover Clustering (WSFC) environment. NetBackup relies upon the NetBackup master server to restart the NetBackup jobs that were running on the NetBackup failover media server when a failover occurs.

You may want to modify the **KeepAliveTime** configuration parameter on the NetBackup Windows master server. However, exercise extreme caution. The parameter is a system-wide parameter that affects all TCP/IP communications for that system. Also, it may be advantageous to modify this parameter on Windows media servers that use the failover master server.

About WSFC clusters

Note the following points before you use NetBackup as a failover server in an WSFC environment:

- If there are no tape devices configured on the controlling node of the NetBackup failover server, the NetBackup Device Manager service resource takes itself offline. If you do not intend to configure tape devices for the NetBackup failover server, you may want to delete the NetBackup Device Manager service resource from the NetBackup group. This way you can avoid seeing the group in a warning state or failed state.
- For WSFC clusters with three or more nodes, the WSFC Move Group command lists all of the nodes in the cluster. You must pick a node that is valid for the NetBackup failover server to use. (WSFC displays all nodes in the cluster, even those nodes where NetBackup has not been installed.)
- Also refer to the information in the previous sections for further notes that are relevant to all cluster environments.

About NetBackup cluster application management

Only use the cluster application's management tools to start and to stop NetBackup in the cluster. In a UNIX or Linux environment, do not use `bp.start_all` or `bp.kill_all` to start or stop NetBackup.

Logging information

NetBackup records information on the processes. You can use this information to determine why a server has failed over. Logging information is highly useful for troubleshooting.

UNIX and Linux logging

Logging information for UNIX and Linux platforms can be found at the following locations:

- Cluster configuration-related information is recorded in `log.cc.<date>` file, which is located at `/usr/opensv/netbackup/logs/cluster`. The configuration scripts creates the log directory, if it is not present.
- Cluster upgrade-related information is recorded in `trace.cluster_upgrade.<process_ID>` file, which is located at `/usr/opensv/netbackup/logs/cluster`.
- Agent (Online/Offline/Monitor) related information is recorded in `log.<date>` file, which is located at `/usr/opensv/netbackup/logs/cluster`
- Add the following configuration parameter “`DEBUG_LEVEL=1`” to the `/usr/opensv/netbackup/bin/cluster/NBU_RSP` file to generated detailed logging.

Note: This configuration is node-specific and affects the logging level on that enabled node. Enable this option only when required and turn it off when not required for storage considerations.

Windows logging

The cluster configuration status box reports details about cluster configuration. If problems occur, see the status box. Details of the cluster configuration steps that occur during the install are recorded in the install logs. In the logs, you have a record of the parameters used to perform cluster configuration commands and their return statuses.

Logging information for Windows platform can be found at the following locations:

- Cluster configuration and upgrade related information is recorded in `ClusterConfig.<timestamp>.log` file, which is located at `%ALLUSERSPROFILE%\Symantec\NetBackup\InstallLogs`.
- For Agent (WSFC) use Event Viewer.
- For Agent (VCS) use NetBackupVCS agent log file, which is located in the log directory of VCS.

About NetBackup's IPv6 support

To use IPv6 with NetBackup:

- Ensure that the underlying environment supports IPv6.
- The virtual name that is used for NetBackup must always resolve to single IP address. The virtual name can resolve to either single IPv4 or single IPv6 address. If the virtual name resolves to multiple IP addresses, NetBackup does not function properly.
- Migration from IPv4 to IPv6 and vice versa is not supported. Thus, all the upgrades are of IPv4 type.

Note: The NetBackup installer uses the IPv4 type to create IPv6 resource which causes problems in the NetBackup cluster service group going online successfully. Refer Technote 174144 for the workaround.

For more information about using IPv6 with NetBackup, refer to the [NetBackup Administrator's Guide](#).

For supported versions of cluster technologies, see the [NetBackup Cluster Compatability Matrix](#).

NetBackup master server in a cluster using multiple interfaces

This appendix includes the following topics:

- [About NetBackup master server in a cluster using multiple interfaces](#)
- [Requirements for use of a NetBackup master server in a cluster with multiple interfaces](#)
- [Configuring the NetBackup master server in a cluster using multiple interfaces](#)

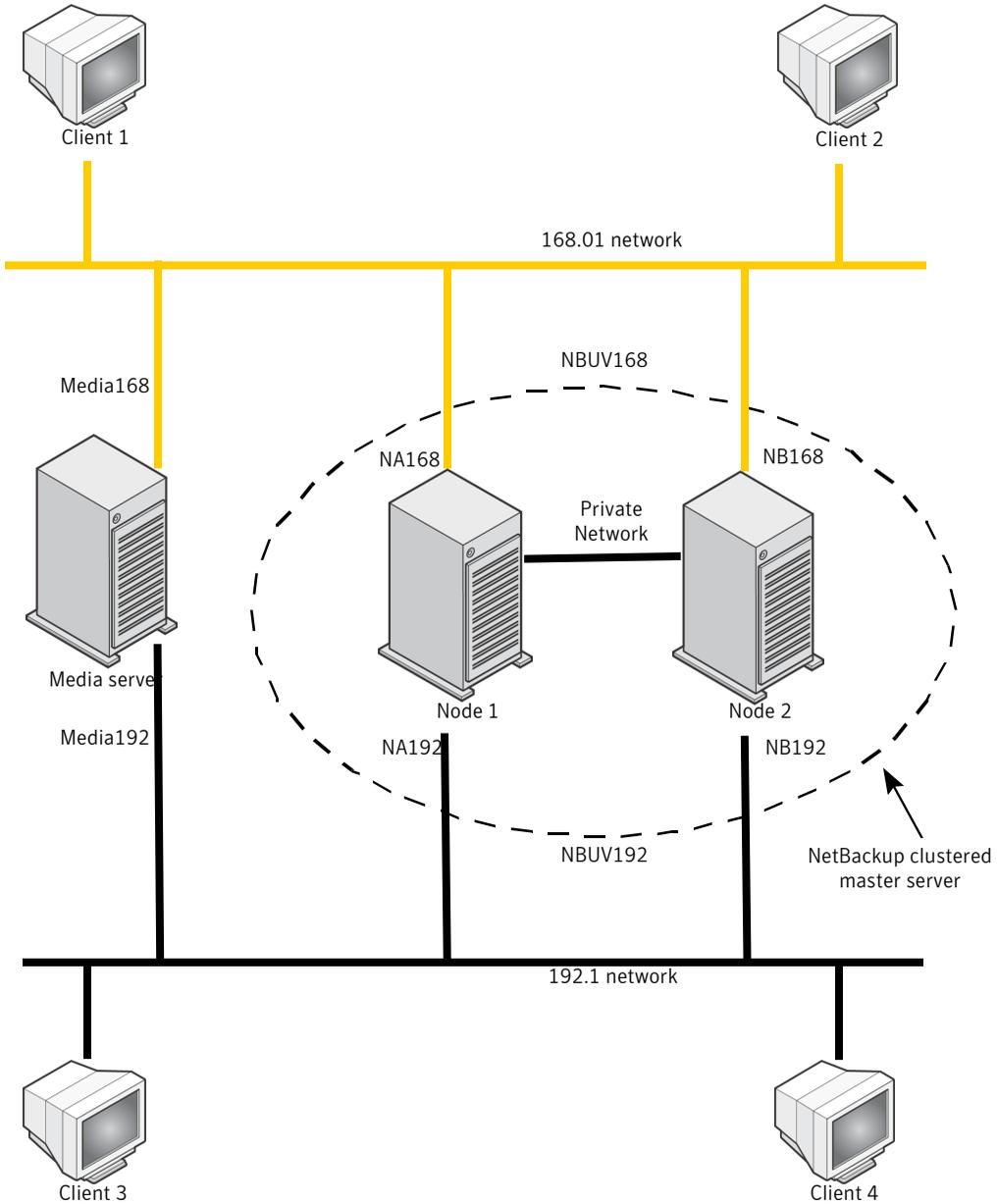
About NetBackup master server in a cluster using multiple interfaces

In a cluster environment, all NetBackup master server traffic and communication flow through the network interface that is associated with the virtual name of the master server. With the ANY_CLUSTER_INTERFACE configuration parameter, you can allow communication through any of the interfaces available to the NetBackup master server.

The following figure depicts a scenario where a clustered NetBackup master server has access to two separate networks (168.1 and 192.1). Client computers are attached to both networks and must be backed up. The virtual name for the master server (for example, NBUV168) can only be associated with one of the networks. So all NetBackup communication only occurs over that specific interface. Clients on other interfaces cannot be contacted.

[Figure A-1](#) shows NetBackup in an environment with multiple network interfaces.

Figure A-1 NetBackup in an environment with multiple network interfaces



Requirements for use of a NetBackup master server in a cluster with multiple interfaces

The following requirements exist when you use a NetBackup master server in a cluster with multiple interfaces:

- A cluster environment that is properly installed and configured.
- Verify that you have a clustered NetBackup master server that is functional.
- A unique virtual name (IP address and host name) associated with each interface.
- NetBackup 6.0 MP1 or higher.

Configuring the NetBackup master server in a cluster using multiple interfaces

Perform the following steps to allow communication over an additional network interface.

To configure the NetBackup master server in a cluster using multiple interfaces

- 1 For each additional interface, add a virtual name and IP address resource in the NetBackup cluster group.

This virtual name is the master server name the clients is referenced on their particular network.

- 2 Configure the ANY_CLUSTER_INTERFACE parameter.
- 3 On Windows, perform the following steps.

- In regedit, go to the following.

```
HKEY_LOCAL_MACHINE\SOFTWARE\VERITAS\NetBackup\CurrentVersion  
\Config
```

- Create a new DWORD value that is called ANY_CLUSTER_INTERFACE.
- Change the **Value Data** to 1.

- 4 On UNIX/Linux, add the following entry to the `bp.conf`.

```
ANY_CLUSTER_INTERFACE = 1
```

- 5 Add the following to the server list of the master server.

- The node names of the master server, for each network interface.

- The virtual name of the master server, for each network interface.

For example, to configure the master server in an environment with multiple network interfaces, add the following: NBUV168, NBUV192, NA168, NA192, NB168, NB192.

See [Figure A-1](#) on page 92.

- 6 Add the node name of each media server to the media server list on the master server.

For example, add Media168 and Media192.

- 7 Repeat step 2 through step 6 for all nodes where the NetBackup master server is installed.

- 8 Update the server list for all NetBackup clients.

The list must include all the possible names for the master server on their network. For example, for clients on the 168.1 network, include the server names NBUV168, NA_168, and NB_168. For clients on the 192.1 network, include the server names NBUV192, NA_192, and NB_192.

Index

A

active/active application
 NetBackup as a 14

B

backup policies 80
backups
 and failovers 86
 of local disks in a cluster 80
 of shared disks 81
 what to back up in a cluster 80

C

catalog backups
 hot backups 79
Checkpoint Restart 86
CLIENT_NAME 76
cluster configurations
 mixed server types not supported 12
 NetBackup failover server 12
cluster quorum
 restoring 20, 23
cluster solutions
 supported 12
CLUSTER_NAME 76
cmhaltpkg 63
cmmodpkg 61
cmrunpkg 63
cmviewcl 63
compatibility lists 13
configuration
 of NetBackup 76–77
 information stored on shared disk 77
 server list 76
 usage of cluster aliases 76
 usage of node names 76
 verifying 82

D

device configuration
 adding new devices 79
 attaching devices to all nodes 77
 guidelines 77–78
 instructions for HP MC/Service Guard 78
 instructions for MSCS 78
 instructions for Sun Cluster 78
 instructions for VCS 78
 specifying active node name 78

E

Enable SCSI reserve 77

F

failover
 and manually refreshing NetBackup
 Administration Console 87
 and storage unit errors 87
 definition 11
 when backup jobs running 86
failover master servers 12
failover media servers 12

H

HACMP
 backups in a 80
 hardware requirements 65
 installation and configuration 67
 installation prerequisites 65
 monitoring NetBackup options 83
 monitoring robotic daemons 82
 NetBackup database agents
 installing or upgrading 69
 NetBackup options
 installing or upgrading 69
 rsh equivalency 65
 upgrading a NetBackup failover server 71–72
HP MC/Service Guard
 backups in a 80

- HP MC/Service Guard *(continued)*
 - device configuration 78
 - hardware requirements 56
 - installation and configuration 58
 - installation prerequisites 56
 - NetBackup database agents
 - installing or upgrading 61
 - NetBackup options
 - installing or upgrading 61
 - NetBackup resource group
 - bringing offline 63
 - bringing online 63
 - verifying it is online 63
 - remshequivalency 56
 - shared disk configuration 56
- HP MC/ServiceGuard
 - monitoring NetBackup options 83
 - monitoring robotic daemons 82

J

- Job retry delay 77, 86

K

- KeepAliveTime 88

L

- license keys
 - adding to master server 85
 - adding to media server 85
- limitations 14
- LiveUpdate 14
- local disks
 - backups of 80
- loss of connection, to NetBackup Windows server 87

M

- Microsoft Cluster Administrator
 - installing on all NetBackup servers 17
- Microsoft Cluster Server (MSCS)
 - backups in a 80
 - device configuration 78
 - disaster recovery 25
 - hardware requirements 16
 - installation notes 17
 - installation prerequisites 16
 - loss of connection to NetBackup server 87
 - monitoring NetBackup options 84
 - Move Group 88

Microsoft Cluster Server (MSCS) *(continued)*

- NetBackup cluster group name 17
- NetBackup Device Manager 88
- Possible Owners list 16
- restoring the cluster quorum 20
- upgrading a failover server 19
- virtual name for NetBackup 16

N

- NetBackup Administration Console
 - refreshing after failover 87
- NetBackup Device Manager 88
- NetBackup failover server
 - installing in a MSCS 17–18, 40
 - installing in a VCS 40
- NetBackup options
 - monitoring on a MSCS cluster 84
 - monitoring on UNIX/Linux clusters 83
- NetBackup Server
 - supported in a cluster 14
- non-failover servers
 - converting to failover servers 14

P

- pending requests 87
- platforms supported for NetBackup in a cluster 13

R

- robotic daemons
 - monitoring on UNIX/Linux clusters 82
- robotic libraries 78

S

- Schedule backup attempts 86
- Scheduled backup attempts 77
- SCSI persistent reserve 77
- scstat 54
- scswitch 51–53
- server list 76
 - for clients 77
- server types
 - mixing 14
- shared disks
 - and storage units 81
- storage units
 - active node name as NetBackup media server 78
 - and NetBackup non-failover media servers 81

Sun Cluster

- backups in a 80
- device configuration 78
- hardware requirements 47
- installation and configuration 48
- installation notes 49
- installation prerequisites 47
- monitoring NetBackup options 83
- monitoring robotic daemons 82
- NetBackup database agents
 - installing or upgrading 51
- NetBackup options
 - installing or upgrading 51
- NetBackup resource group
 - bringing offline 53
 - bringing online 53
 - verifying it is online 54
- RSH equivalency 47
- shared disk configuration 48
- upgrading a NetBackup failover server 52–53
- supported cluster solutions 12

T

- tpconfig 79

V**Veritas Cluster Server (VCS) for UNIX/Linux**

- backups in a 80
 - hardware requirements 27
 - installation notes 31
 - installing and configuring a NetBackup failover server 31
 - monitoring NetBackup options 33, 83
 - monitoring robotic daemons 82
 - NetBackup database agents
 - installing 33
 - NetBackup options
 - installing 33
 - monitoring 33
 - pre-installation checklist 28
 - rsh equivalency 28
 - shared disk configuration 27
 - supported NetBackup agent for 34
 - upgrading a failover server 34
 - virtual name for NetBackup 27
- Veritas Cluster Server (VCS) for Windows**
- installation notes 40
 - installing a NetBackup failover server 40

Veritas Cluster Server (VCS) for Windows *(continued)*

- NetBackup cluster group name 40
 - virtual name for NetBackup 39
- Veritas Cluster Server (VCS) for Windows 2000/2003**
- backups in a 80
 - Clean 38
 - detailed monitoring 43, 45
 - device configuration 78
 - loss of connection
 - to NetBackup Windows server 87
 - Monitor 38
 - NetBackup service group 40
 - Offline 38
 - Online 38
 - requirements 38
 - upgrading a failover server 42
- virtual server name 12
- and backups 81
 - in the Clients list 81