

NetBackup™ for VMware configuration

This document describes how to use NetBackup 6.5 with VMware virtual machines that run on VMware ESX servers.

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License requirements

The NetBackup for VMware feature requires the NetBackup Snapshot Client license, which is included in the NetBackup Enterprise Client license.

See the following for more detail on NetBackup licensing requirements:

<http://score.corp.symantec.com/products/200>

Features available in NetBackup 6.5 releases

The initial release of NetBackup 6.5 provides file-level backup and restore of Windows VMware virtual machines. In future 6.5.x releases, NetBackup will support full virtual machine backup and restore as well as individual file restore from full virtual machine backups.

What is NetBackup for VMware?

NetBackup for VMware provides backup and restore of VMware virtual machines that run on VMware ESX servers. NetBackup for VMware uses the VMware Consolidated Backup (VCB) framework.

The main features of NetBackup for VMware

NetBackup for VMware provides the following.

- Reduces the backup processing load on the VMware ESX server.
- Automatically creates quiesced snapshots using the VMware SYNC driver (Windows only).
- Uses snapshot technology to keep virtual machines 100% available to users.
- Backs up and restores individual files or (in a NetBackup 6.5.x release) the full virtual machine.
- In a NetBackup 6.5.x release, restores individual files from a full virtual machine backup, by means of FlashBackup-Windows.
- Can back up virtual machines even when they are powered off.

NetBackup for VMware overview

This section describes the NetBackup for VMware environment.

Backup type: file-level and full virtual machine

NetBackup for VMware supports two kinds of virtual machine backup: file-level in this initial release of NetBackup 6.5, and full virtual machine (image-level) in a NetBackup 6.5.x release.

- **File-level:** backs up files and folders on the virtual machine that are referenced by the Windows guest operating system, such as ordinary user files. The backed up files and folders can be individually restored. Does not support restore of the guest OS or of the virtual machine.

Note: *a file-level backup cannot back up the following:*

- VMware system files that define the virtual machine.
- Windows system protected files (System State).
- Windows system files (such as C:\WINDOWS\system or C:\WINDOWS\system32).
- Windows system database files (such as RSM Database and Terminal Services Database).
- **Full virtual machine** (in a NetBackup 6.5.x release): backs up all files and folders as well as operating system files and VMware system files. Supports a restore of the entire virtual machine and of the guest OS. Also supports individual file restore.

NetBackup components

NetBackup for VMware uses a NetBackup master server and media server plus a special host called a *VMware backup proxy server*. The VMware backup proxy server is a NetBackup client that performs backups on behalf of the virtual machines. A single proxy server can perform backups of many virtual machines. The host that contains the proxy server can also be configured as a NetBackup master or media server.

The virtual machine data to back up must reside on a disk array that both the VMware backup proxy server and the VMware ESX server can access.

No primary client

The VMware backup proxy server is the only NetBackup client in the NetBackup for VMware environment. No NetBackup client is required on the VMware virtual machines.

In the NetBackup policy, you specify the virtual machine or machines to back up as “clients.” The proxy server performs the backup of the virtual machines.

VMware components

NetBackup for VMware works with VMware ESX servers and other components, such as the VMware VirtualCenter.

VMware ESX server

The VMware ESX server presents a virtualized hardware environment to multiple *virtual machines*; each virtual machine runs an independent operating system. Users can run applications in the virtualized OS as if the OS was installed in its own physical machine.

VMware VirtualCenter server

The VirtualCenter server coordinates multiple ESX servers and performs load leveling by migrating virtual machines from one ESX server to another. The VirtualCenter server is optional in the NetBackup for VMware environment.

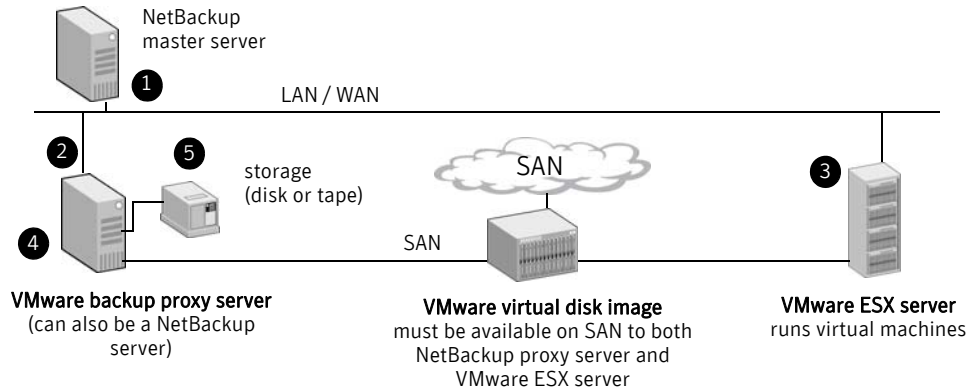
VMware Converter server

Not currently used.

NetBackup for VMware environment

The main hardware components for NetBackup for VMware are shown in [Figure 1-1](#).

Figure 1-1 NetBackup for VMware: backup environment

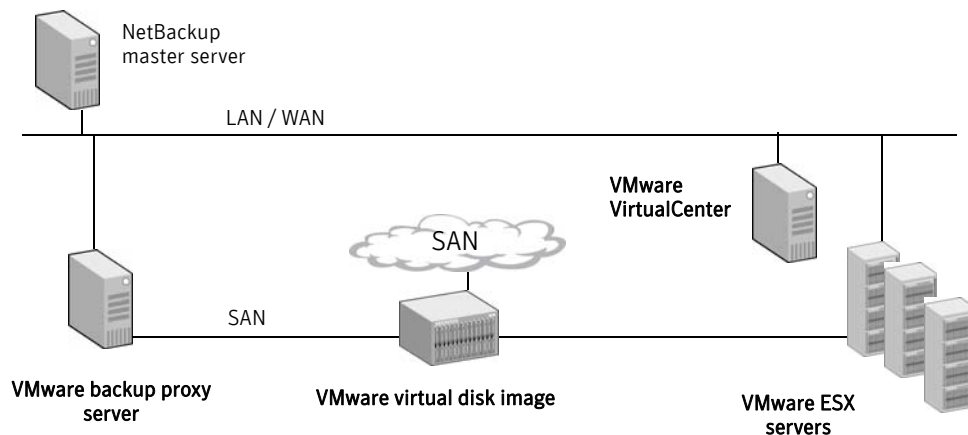


Basic backup process:

1. The NetBackup master server initiates the backup.
2. The VMware backup proxy server initiates a snapshot request.
3. The VMware ESX server synchronizes the file system on the virtual machine.
4. The VMware backup proxy server creates the snapshot by reading the virtual machine files (for full VM backup) or mounted volumes (for file-level backup) from the VMware virtual disk image.
5. The media server on the proxy reads the snapshot data and writes it to local storage.

As shown in [Figure 1-2](#), the NetBackup for VMware environment may have a VMware VirtualCenter that manages multiple ESX servers.

Figure 1-2 VirtualCenter with multiple ESX servers



Notes and restrictions

Note the following about NetBackup for VMware.

- NetBackup supports VMware ESX servers version 3.0 or later.
- NetBackup master and media servers and the VMware backup proxy server must run NetBackup 6.5 or later.
- The VMware backup proxy server must be on Windows 2003. The supported hardware types are the same as for any NetBackup Windows server.
- Symantec recommends that the proxy server is also the NetBackup media server.
- NetBackup for VMware does not support the NetBackup Instant Recovery feature.

Configuration tasks: overview

VMware configuration

The VMware components including ESX servers and virtual machines must be set up before you configure NetBackup. These VMware-specific tasks (listed in [Table 1-1](#)) are not described in this guide. Assistance with these tasks may be found in your VMware documentation.

Table 1-1 VMware tasks

Tasks for the VMware administrator	
1	Set up a disk storage device on a SAN, to be accessed by the VMware backup proxy server, and by the ESX servers or the VirtualCenter.
2	Install the VMware ESX server and virtual machines.
3	Install VMware Tools on the virtual machines that you plan to back up.
4	Optional: install the VirtualCenter server. Note: the VirtualCenter server must not be installed on the same host as the VMware backup proxy server.
5	Install the VMware Consolidated Backup Framework on the VMware backup proxy server.
6	Configure the VMware backup proxy server to access the VMware datastores.

NetBackup configuration

[Table 1-2](#) lists the configuration tasks described later in this chapter and in other NetBackup documentation, as indicated.

Table 1-2 NetBackup tasks

Tasks for the NetBackup administrator	
1	Install the NetBackup 6.5 master server and media server. See the <i>NetBackup 6.5 Installation Guide</i> .
2	Install the NetBackup 6.5 Snapshot Client license on the master server, and Snapshot Client software on the VMware backup proxy server. Note: the proxy server must be installed on Windows 2003. See the Installation chapter of the <i>NetBackup Snapshot Client Guide</i> .

Table 1-2 NetBackup tasks

Tasks for the NetBackup administrator	
3	Set NetBackup access credentials for the VMware VirtualCenter (if any) or VMware ESX servers. See “ Add NetBackup credentials for VMware ” on page 8.
4	Add the VMware backup proxy server to your NetBackup configuration. See “ Add proxy server to NetBackup host properties ” on page 9.
5	Create a NetBackup Snapshot Client policy for VMware. See “ Configure a VMware policy ” on page 10.
6	Perform a backup or restore. See “ Back up VMware files ” on page 19 and “ Restore VMware files ” on page 20.
7	Troubleshoot the configuration. See “ Best practices ” on page 22 and “ Troubleshooting ” on page 23.

Add NetBackup credentials for VMware

NetBackup requires login credentials to access the VMware ESX servers or the VMware VirtualCenter. To enter this login information, do the following.

- 1 Start the NetBackup Administration Console:
On UNIX, enter: `/usr/opensv/netbackup/bin/jnbSA &`
On Windows, click **Start > Programs > Veritas NetBackup > NetBackup Administration Console**.
- 2 Click **Media and Device Management > Credentials > Virtual Machine Servers**.
- 3 Click **Actions > New > New Virtual Machine Server** and enter the name of the virtual machine server (VirtualCenter or ESX server).
- 4 In the **Credentials** pane of the New Virtual Machine Server dialog box, enter the following:
Virtual Machine Server Type
Select the type of virtual machine:
 - **VMware VirtualCenter:** for a VirtualCenter that manages multiple VMware ESX servers. Note: if you have a VirtualCenter, do not enter login credentials for individual ESX servers. NetBackup uses credentials for the VirtualCenter only.
 - **VMware ESX server:** for ESX servers where there is no VirtualCenter. Use this dialog box to enter credentials for each ESX server.

- **VMware Converter:** Not currently implemented.

Password

Enter the password (and confirm it) for the virtual machine server type you selected.

Port Number

Specify the Internet port for the ESX server. The default is 902. (The port number is set during installation of the ESX server.)

- 5 Click **OK**.
- 6 If your site has multiple ESX servers but no VMware VirtualCenter, use the New Virtual Machine Server dialog box to enter credentials for each ESX server.

Add proxy server to NetBackup host properties

You must add the VMware backup proxy server to your NetBackup configuration. In the NetBackup Administration Console, do the following.

- 1 Click **Host Properties > Master Server > double click NetBackup master server > Virtual Machine Proxy Servers**.
- 2 Click **Add**.
- 3 In the New Server dialog box, enter the name of the VMware backup proxy server, and click **Add**.
- 4 When you are finished adding proxies, click **Close**.
- 5 Click **Apply** and then **OK**.

Set client host properties for timestamps

For a file-level VMware backup, incremental backups must be based on timestamps, not archive bit. You can configure this setting in one of two ways, depending on whether the client on the VMware backup proxy server is included in a NetBackup policy.

If the client is included in a policy:

- 1 In the NetBackup Administration Console on the master server, click **Host Properties > Clients > double click VMware backup proxy server > Windows Client > Client Settings**.

Note: this is the NetBackup client installed on the VMware backup proxy server (not on a VMware virtual machine).

- 2 Under **Incrementals**, click **Based on timestamp**.

3 Click **Apply**.

Detail from Windows Client Properties dialog box



Note: This timestamp setting applies to any incremental backup of this client, whether for VMware virtual machine backup or regular NetBackup.

If the client is not included in a policy:

- 1 Start the Backup, Archive, and Restore interface from the NetBackup client that is installed on the VMware backup proxy server. For example: click **Start > All Programs > Veritas NetBackup > Backup, Archive, and Restore**.
- 2 Click **File > NetBackup Client Properties**.
- 3 On the General tab, make sure **Perform incrementals based on archive bit** is clear (unchecked).
- 4 Click **OK**.

Configure a VMware policy

The following procedure describes how to create a policy for VMware backup. (You can also use the **Snapshot Policy Configuration wizard** to create a policy.)

- 1 Start the NetBackup Administration Console as follows:
On UNIX, enter: `/usr/opensv/netbackup/bin/jnbSA &`
On Windows, click **Start > Programs > Veritas NetBackup > NetBackup Administration Console**.

- 2 Click on **Policies** and select **Actions > New > Policy** to create a new policy.

The screenshot shows the 'Backup Selections' dialog box in NetBackup. The 'Policy type' is set to 'FlashBackup-Windows'. The 'Destination' is '<No data classification>'. The 'Policy storage' is 'dstu'. The 'Policy volume pool' is 'NetBackup'. The 'Active, Go into effect at' date is '06/15/2007 09:28:56'. The 'Snapshot Client' section has 'Perform snapshot backups' and 'Perform off-host backup' checked. The 'Virtual Machine Proxy Server' is set to 'proxy-1'. The 'Use virtual machine proxy' radio button is selected.

Select the policy type: **MS-Windows-NT** or **FlashBackup-Windows**

Select storage unit or group

Click **Perform snapshot backups** and **Perform off-host backup**.

Click **Use virtual machine proxy** and select the proxy.

- 3 Select one of the following policy types:

MS-Windows-NT

For backup of individual drives or individual folders and files (Windows only). Cannot back up the entire virtual machine. For a backup of the entire virtual machine (available in a NetBackup 6.5.x release), choose FlashBackup-Windows.

FlashBackup-Windows

For backup of individual drives (Windows), or backup of the entire virtual machine (available in a NetBackup 6.5.x release).

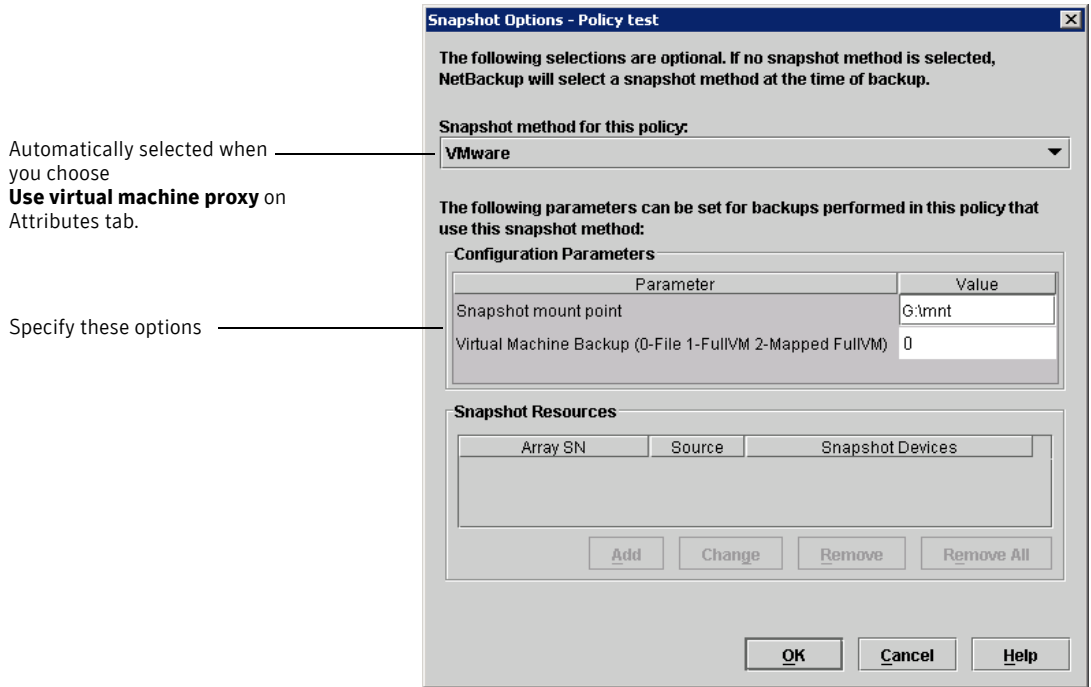
FlashBackup-Windows has the following advantage:

- Increases backup speed as compared to standard file-ordered backup methods, if the virtual machine is heavily populated with small files.

- 4 Select a policy storage unit or storage unit group.
Storage unit groups are described in the *NetBackup Administrator's Guide, Volume I*.
- 5 Select **Perform snapshot backups**.
If Bare Metal Restore is installed, you must deselect **Collect disaster recovery information for Bare Metal Restore** in order to select **Perform snapshot backups**.
The FlashBackup-Windows policy type automatically selects **Perform snapshot backups**.
- 6 Select **Perform off-host backup** and **Use virtual machine proxy**.
- 7 In the **Virtual Machine Proxy Server** field (**Off-host backup machine** on Windows): select the name of the VMware backup proxy server from the pull-down list.

Note: If the proxy server does not appear in the pull-down, make sure it was added to the Host Properties setting as described under "[Add proxy server to NetBackup host properties](#)" on page 9. You may have to close and reopen the policy for the added proxy server to appear in the list.

- 8 Click **Snapshot Options**.



Specify these values for the **VMware** snapshot method:

Snapshot mount point

Specify a folder on the VMware backup proxy server. An example folder for the mount point is:

G: \mnt

For file-level backups (0-File), the VMware backup proxy server places a link in this folder. The link points to the VMware virtual disk image that is associated with the data files on the virtual machine. No virtual machine data is copied to this folder.

Note: For Windows virtual machines, the mount point must be a local drive, not network mounted.

Virtual Machine Backup

0-File: For backup of either of the following:

- Individual folders and files, individual drives, or all local drives, with the MS-Windows-NT policy type.

- Individual drives or all local drives, with the FlashBackup-Windows policy type.

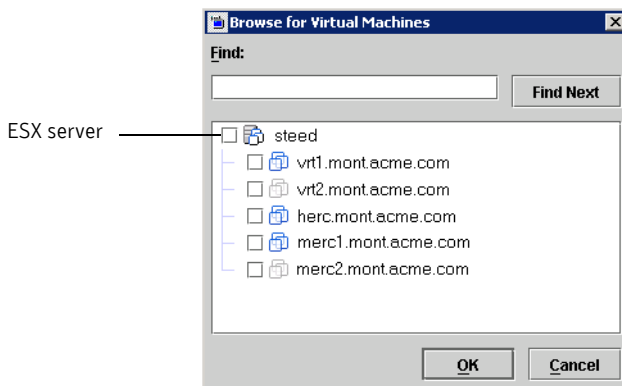
Note: The 0-File option cannot back up Windows system files or VMware system files. See “[Backup type: file-level and full virtual machine](#)” on page 3.

1-FullVM: *in a NetBackup 6.5.x release:* For backup of the entire virtual machine. This option works with the FlashBackup-Windows policy type only. Individual files cannot be restored from this backup.

2-Mapped FullVM: *in a NetBackup 6.5.x release:* For backup of the entire virtual machine. This option works with the FlashBackup-Windows policy type only. Two kinds of restore are possible: restore of the entire virtual machine or of individual folders and files.

For a tabular presentation of these parameters and the type of backup and restore they enable, see “[VMware backup options compared](#)” on page 17.

- 9 To save these settings, click **OK** and then **Apply**.
- 10 Use the **Schedules** tab to define a schedule.
- 11 On the **Clients** tab, click **New** to specify virtual machines to back up. NetBackup searches for virtual machines on the SAN and displays them in the following dialog box.
The virtual machines are listed beneath their ESX server.

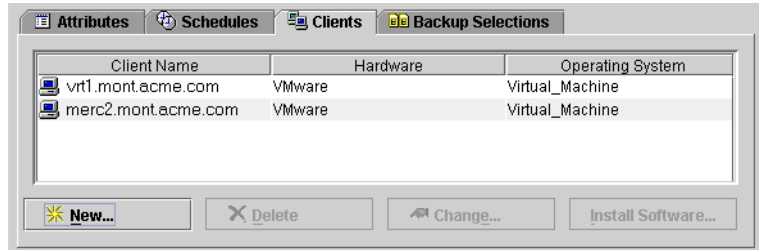


- Click the checkbox for the entire ESX server, or select individual machines.
- Click **OK**.

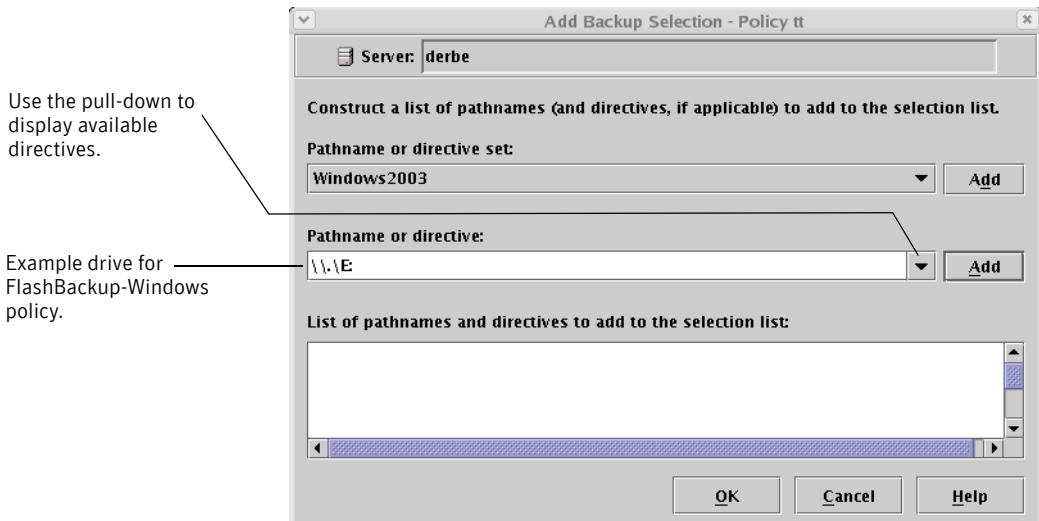
Note: for NetBackup to access virtual machines, the following are required:

- The VMware VCB framework must be installed on the VMware backup proxy server.

- The NetBackup master server must have credentials for the VMware VirtualCenter or ESX server(s).
See “[Add NetBackup credentials for VMware](#)” on page 8.
The virtual machines you selected are listed in the Clients tab.



- 12 Use the **Backup Selections** tab to specify the virtual machine files to back up.
Click **New**. You can make entries manually, or click on the pull-down (UNIX) or hand icon (Windows) to select from available directives.
Note: the `System_State` directive (Windows 2000) and the `ShadowCopy Components` directive (Windows 2003) are not supported.



Enter any of the following and then click **Add** (on UNIX) or press Enter (Windows):

- Individual Windows folders and files, if the policy type is MS-Windows-NT.

- Individual drive letters. The drive letter format depends on the policy type:

MS-Windows-NT policy type

Enter the drive letter as follows (for example):

E:\

The drive letter must not be a network (shared) drive: it must specify a drive on the virtual machine.

For this initial 6.5 release of NetBackup, you cannot back up the following: Windows System State files, Windows OS partitions that contain the Windows system files (usually C:), or VMware server definition files.

FlashBackup-Windows policy type

Enter the drive letter as follows (for example):

\\.\E:

For the FlashBackup-Windows policy type, the drive must be designated exactly as shown (E:\ is not correct).

Note: If NetBackup cannot obtain the volume ID of a drive, none of the drives listed in this policy for the client are backed up. The backup fails with NetBackup status code 156.

See [“Backup and restore problems”](#) on page 24.

- The `ALL_LOCAL_DRIVES` directive: backs up all local drives on the virtual machines that are selected on the Clients tab.
IMPORTANT: the kinds of files included in an `ALL_LOCAL_DRIVES` backup depend on the policy type and the VMware snapshot options, as follows.
 - **MS-Windows-NT policy:** the `ALL_LOCAL_DRIVES` directive backs up all data files on the virtual machines that are selected on the Clients tab. *For MS-Windows-NT policies, this directive does not back up the following:* Windows System State files, Windows OS partitions that contain the Windows system files (usually C:), or VMware server definition files. Support for backing up these files will be included in a NetBackup 6.5.x release.
 - **FlashBackup-Windows policy:** the `ALL_LOCAL_DRIVES` directive backs up all data files on the virtual machines.
In a NetBackup 6.5.x release, the `ALL_LOCAL_DRIVES` directive also backs up the following, if the snapshot option is 1-FullVM or 2-Mapped FullVM: Windows System State files, Windows OS partitions that contain the Windows system files (usually C:), and

VMware server definition files. See “[VMware backup options compared](#)” on page 17 for more details.

- 13 On the policy Attributes tab: if you click **Apply** or **OK**, a validation process checks the policy and reports any errors. If you click **Close**, no validation is performed.

VMware backup options compared

This section describes the available VMware policy configuration options. [Table 1-3](#) is for MS-Windows-NT policies and [Table 1-4](#) is for FlashBackup-Windows policies.

In brief, the advantages of each policy type are these:

- MS-Windows-NT backs up individual folders or files that reside on a Windows virtual machine. This policy type, however, does not support backup of Windows system files or VMware system files.
- In a 6.5.x release: FlashBackup-Windows can back up the full virtual machine including the operating system and VMware system files. FlashBackup-Windows performs a faster backup if the virtual machine is heavily populated with small files.

Table 1-3 VMware backup options for MS-Windows-NT policies

Backup Selections entry	Virtual Machine Backup parameter	What is backed up	What can be restored
Individual folders and files	0-File	Specified folders and files, but not Windows or VMware system files	Individual folders and files
Individual drives For example: E: \	0-File	All data files in specified drives, but not Windows system or VMware system files	Individual folders and files
ALL_LOCAL_DRIVES directive	0-File	All data files on all local virtual machine drives, but not Windows or VMware system files	Individual folders and files

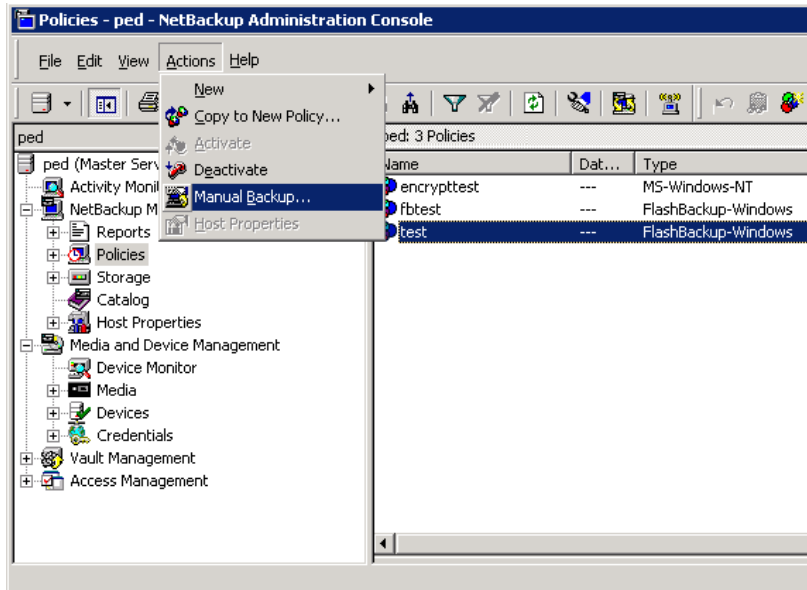
Table 1-4 VMware backup options for *FlashBackup-Windows* policies

Backup Selections entry	Virtual Machine Backup parameter	What is backed up	What can be restored
Individual drives For example: \\ . \E :	0-File	All data files in specified drives, but not operating system or VMware system files. Backup is “raw partition” type.	Individual folders and files, or entire drive (not including operating system or VMware system files)
ALL_LOCAL_DRIVES directive	0-File	All data files in virtual machine, but not operating system or VMware system files. Backup is “raw partition” type.	Individual folders and files, or entire drives (not including operating system or VMware system files)
ALL_LOCAL_DRIVES directive	1-FullVM <i>(available in a NetBackup 6.5.x release)</i>	All data files in virtual machine, plus operating system and VMware system files. Backup is “raw partition” type.	Entire virtual machine (not individual folders or files)
ALL_LOCAL_DRIVES directive	2-Mapped FullVM <i>(available in a NetBackup 6.5.x release)</i>	All data files in virtual machine, plus operating system and VMware system files. Backup is “raw partition” type.	Entire virtual machine, or individual folders and files

Back up VMware files

You can initiate a VMware backup in the same manner as any NetBackup backup.

For instance, to start a backup manually, click on the **Policies** node in the NetBackup Administration Console, select the policy, and click **Actions > Manual Backup**.



See the *NetBackup Backup, Archive, and Restore Getting Started Guide* for further instructions.

Note: NetBackup for VMware does not support user backups: only manual or scheduled backups are allowed.

Restore VMware files

You can use the NetBackup Backup, Archive, and Restore interface to restore VMware backups, as explained in this section.

VMware restore procedures

Individual file restore

The following restore procedures are supported:

- One-stage process: restore individual files from the VMware backup proxy server to a Windows virtual machine. The restored files are sent directly from the proxy server to the virtual machine. Note: the VMware virtual machine drives must be shared on a NetBackup client, or NetBackup client software must be installed on the VMware virtual machine.
- Two-stage process:
 - 1, Restore individual files from the VMware backup proxy server to a NetBackup Windows client which does not share a drive on the VMware virtual machine.
 - 2, Manually copy the restored files to the Windows virtual machine. (This step is not performed by means of NetBackup.)

Full VMware virtual machine restore

This feature is not available in the initial release of NetBackup 6.5. Full virtual machine restore is to be included in a NetBackup 6.5.x release.


Notes

Note the following.

- Unless a NetBackup client is installed on the virtual machine, NetBackup for VMware backups do not allow user-directed restore; only server-directed restores performed by the administrator are allowed.
- In the NetBackup Backup, Archive, and Restore interface, restore types labelled “proxy restore” do not apply to VMware backups. An example of such a restore type is “from Normal Backup as a Proxy.” These restore types do not refer to the VMware backup proxy server. Use the restore procedures described in this chapter.

Restore individual folders and files

If the VMware backup was made with either of the following, you can restore individual files:

- MS-Windows-NT policy
 - FlashBackup-Windows policy with the **0-File** virtual machine backup option (or with **2-Mapped FullVM** in a NetBackup 6.5.x release)
- 1 Start the Netbackup Backup, Archive, and Restore interface.
On UNIX servers, you can start the interface from the NetBackup Administration Console.
On Windows, you must start the Backup, Archive, and Restore interface separately.
 - 2 To specify the source and destination client and type of policy:
UNIX (on the **Restore Files** tab): click 
Windows: click **Files > Specify NetBackup Machines and Policy Type**.
 - 3 Specify the following:
 - **Server to use for backup and restores:** the NetBackup master server that directed the backup.
 - **Source client for restores:** the VMware virtual machine that was backed up.
 - **Destination client for restores:** specify one of the following:
 - The VMware virtual machine that was originally backed up, if NetBackup client software has been installed on the virtual machine.
 - A different NetBackup client. If a drive on the virtual machine is shared with the NetBackup client you designate, the files are restored to the client and to the virtual machine. If no virtual

machine drive share exists on the NetBackup client, you must manually copy the files from the NetBackup client to the virtual machine.

- **Policy type for restores:** the type of policy that made the backup (MS-Windows-NT or FlashBackup-Windows)
- 4 To select the type of restore:
On UNIX: in the Restore Files tab, select **Normal Backups**.
On Windows: click **Files > Select Files and Folders to Restore > from Normal Backup**
- 5 UNIX: enter the **Browse directory** that contains the folders or files to restore.
- 6 Click the files you want to restore.
- 7 Start the restore:
UNIX: click **Restore**.
Windows: click **Actions > Start Restore of Marked Files**.
- 8 Make selections on the Restore Marked Files dialog as desired.

See the *NetBackup Backup, Archive, and Restore Getting Started Guide* for more instructions on performing restores.

Restore the full VMware virtual machine

This feature will be available in a NetBackup 6.5.x release.

Use of the **Virtual Machine Backups** restore type is not supported in this initial 6.5 release.

Best practices

- For more efficient backup processing, the NetBackup media server and the VMware backup proxy server should be installed on the same host.
- VMware recommends that you run no more than 4 simultaneous backups of virtual machines that reside on the same datastore.
- On the VMware backup proxy server, the file system that contains the snapshot mount point should be reserved for snapshots only, and should be routinely defragmented. A heavily fragmented file system can adversely affect the performance of a FlashBackup-based backup.

More information on VMware

VMware Inc. provides an extensive set of manuals on VMware products. See the VMware ESX Server and VirtualCenter documentation at:
<http://www.vmware.com/support/pubs/>

VMware logging

For log messages relating to VMware backup or restore, see the following NetBackup legacy log folders.

Table 1-5 NetBackup logs that contain VMware messages

Log folder	Contains	Resides on
<code>install_path\NetBackup\logs\bpfis</code>	Messages on snapshot creation and backup	VMware backup proxy server
<code>install_path\NetBackup\logs\bpcd</code>	Messages on snapshot creation and backup	VMware backup proxy server
<code>install_path\NetBackup\logs\bprd</code>	Messages on restore	NetBackup master server

Note: These log folders *must already exist* in order for logging to occur. If these folders do not exist, create them.

For more detail on snapshot logging, logging levels, and the required folders, see “[Gathering Information and Checking Logs](#)” in the *NetBackup 6.5 Snapshot Client Administrator’s Guide*. For a broader discussion of NetBackup logging, see the “Using logs and reports” chapter of the *NetBackup Troubleshooting Guide*.

Troubleshooting

This section covers a variety of troubleshooting topics.

VMware environment—important!

Unsupported equipment can cause many problems. Make sure that your VMware environment (including ESX servers, SAN devices, and backup proxy) conform to all requirements and recommendations spelled out by VMware. For instance, if your HBAs, device drivers, or virtual machine operating systems are not supported by VMware, NetBackup cannot work.

For support details, see VMware documentation at the VMware support site (for example, the VMware compatibility guides).

Notes and tips

- Make sure you have the latest version of the VMware Consolidated Backup Framework on the VMware backup proxy server.
- For incremental backups with the file-level backup setting (0-File), make sure the VMware backup proxy server's host properties are set to timestamp, not archive bit. Otherwise, NetBackup performs only full backups. See "[Set client host properties for timestamps](#)" on page 9.
- You cannot restore Windows operating system files from a file-level backup of a virtual machine. You can restore standard data files only. A restore of the operating system requires a full virtual machine backup. Support for full virtual machine backup will be available in a NetBackup 6.5.x release.
- Make sure the VMware Tools are installed on each virtual machine. Otherwise, a variety of communication and processing problems can result.
- You cannot restore VMware files onto the virtual machine itself, except under certain conditions. See "[VMware restore procedures](#)" on page 20.

Backup and restore problems

NetBackup cannot obtain the volume ID of a drive

If NetBackup cannot obtain the volume ID of a drive listed in the policy's Backup Selections list, none of the drives listed in the policy for the client are backed up. The backup fails with NetBackup status code 156. Try one of the following:

- Use the ALL_LOCAL_DRIVES directive in the Backup Selections list, instead of listing individual drives.
- A drive letter specified in the policy's Backup Selections list may be incorrect, or the drive may be down. Update the client's include list (Exceptions to exclude list), and fix the drive or remove the drive entry in the Backup Selections list.

A backup job does not complete

An incremental backup for a FlashBackup-Windows policy may not complete if no changes have occurred on the VMware drive since the last backup. (This problem will be fixed in a NetBackup 6.5.x release.) The following error appears in the Job Details dialog box in the NetBackup Activity Monitor:

```
8/15/2007 9:58:56 AM - Error bpbrm(pid=1496) db_flist_complete
failed: events out of sequence - image inconsistency (229)
namurvm6.min.veritas.com flash-backup-kas 1 1187189877
8/15/2007 10:07:16 AM - Error bptm(pid=5544) read of TIR file
failed: the file list is incomplete
```

Recommended action: manually delete the snapshot that was created by this backup job and retry the backup, as follows.

- 1 Cancel the hung backup job.
- 2 Enter the following on the VMware backup proxy server to get the id of the snapshot that was created by the job.

```
install_path\bin\bpfis query
```

The snapshot ids consist of the virtual machine name followed by a numeric identifier, in the form *fullyqualifiedhostname_nnnnnnnnnn*. For example:

```
vmhost22.hotvmshop.com_1185255767
```
- 3 Enter `bpfis delete -id id` to remove the snapshot.
For example:

```
bpfis delete -id vmhost22.hotvmshop.com_1185255767
```
- 4 Re-initiate the backup.
You can avoid this problem by changing the policy type from FlashBackup-Windows to MS-Windows-NT.

