



Configuring Veritas NetBackup 6.5.1 with VCB 1.1 Proxy Server

This document provides the steps necessary to configure Veritas NetBackup 6.5.1 with VMware's Consolidated Backup Framework. NetBackup 6.5.1 now provides file-level backup and restores of Windows virtual machines as well as individual file restore from full virtual machine backups. This functionality is built directly into NetBackup 6.5.1 without the need for integration scripts.

Note: This is not an official VMware whitepaper or document. This is simply a record of one man's journey to satisfy the quest for knowledge. Please use at your own discretion.

This document assumes the following configuration:

- VirtualCenter 2.5
- ESX 3.5
- VCB 1.1 proxy server
- Veritas NetBackup 6.5.1
- Windows Services for Unix 3.5.

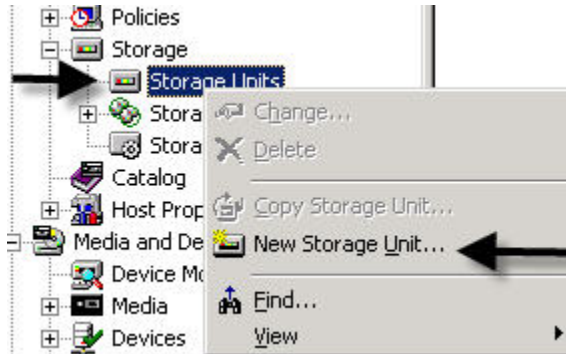
Installing Veritas NetBackup on VCB Proxy Server

Start by downloading and installing VMware Consolidated Backup 1.1 to a Windows 2003 server. Once you've obtained the source files for NetBackup 6.5, proceed with the install followed by the NetBackup 6.5.1 Update.

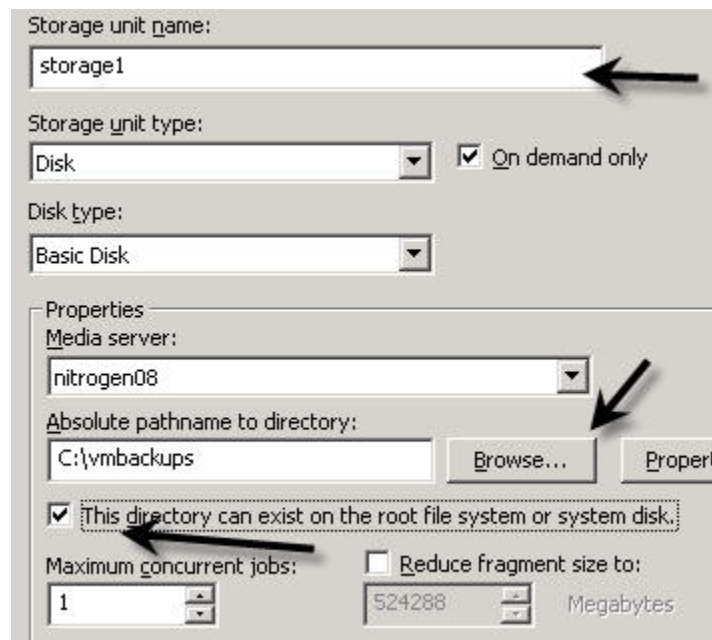
1. Navigate to the above folder and run `launch.bat`.
2. Select the **NetBackup Installation** link from the splash screen.
3. Now select **Install Server Software**.
4. Click **Next**.
5. Accept EULA and click **Next**.
6. Choose **Typical** and leave default selection, **Install to this computer only**. Click **Next**.
7. Enter license key, click the **NetBackup Master Server**.
8. Accept default Master Server name and click **Next**.
9. Accept default for Enterprise Media Master Server and click **Next**.
10. Click **Install** and wait.
11. Once it's done, click **Finish**.

Configuring Veritas NetBackup 6.5.1

1. When the **NetBackup Administration Console** comes up, cancel out of the wizard since setup will be done manually.
2. Create two new folders such as `C:\vmbackups` and `C:\mnt` on the VCB Proxy Server. Make sure they are empty.
3. From within the **NetBackup Administration Console**, expand **Storage** and right-click the **Storage Units** object and choose **New Storage Unit...**



4. Enter any name and browse to the `C:\vmbackups` folder. Check the **This directory can exist on the root file system or system disk** box. Click **OK**.

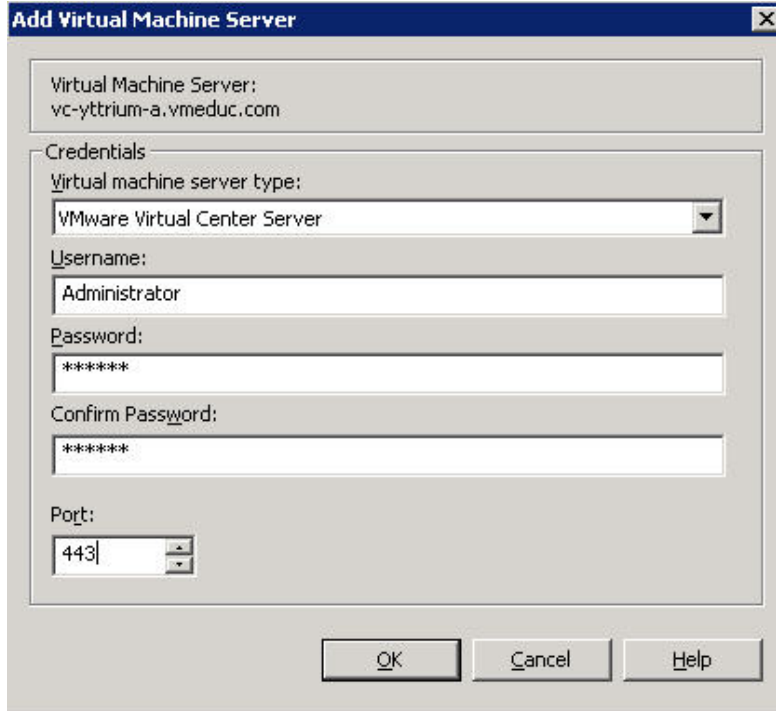


The screenshot shows the 'New Storage Unit' dialog box. The 'Storage unit name' field contains 'storage1'. The 'Storage unit type' is set to 'Disk' and 'On demand only' is checked. The 'Disk type' is set to 'Basic Disk'. Under 'Properties', the 'Media server' is set to 'nitrogen08'. The 'Absolute pathname to directory' field contains 'C:\vmbackups'. The checkbox 'This directory can exist on the root file system or system disk' is checked. The 'Maximum concurrent jobs' is set to 1. The 'Reduce fragment size to' field is set to 524288 Megabytes. Arrows point to the 'Storage unit name' field, the 'Browse...' button, and the checked checkbox.

Setting up the NetBackup Credentials for VMware

1. Expand **Media and Device Management**, next expand the **Credentials** option and right-click **Virtual Machine Servers**. Choose **New...**
2. Enter the fully qualified name of the VirtualCenter server and click **Ok**.
3. In the drop down box, select VMware Virtual Center Server. Enter administrative credentials and password and click **Ok**.

Note: For VCB 1.1 use port 443, VCB 1.0.3 or earlier use port 902.



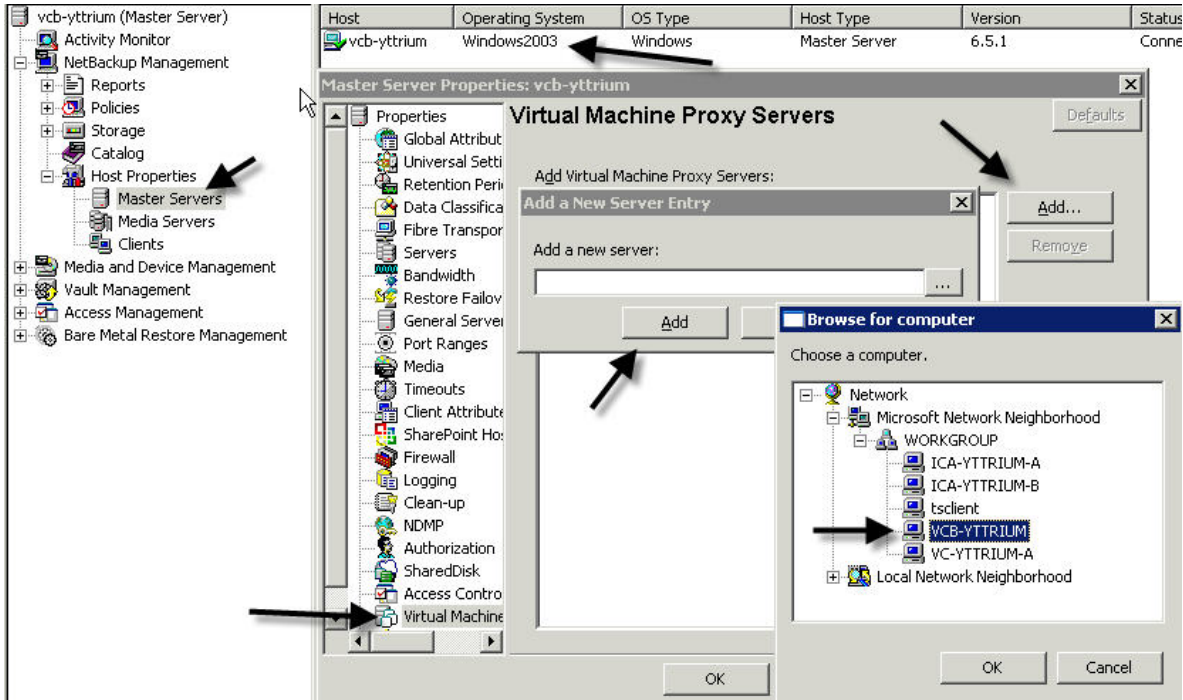
4. At this point a warning message will be presented stating that the NetBackup service will need to be restarted. Click **Ok** to acknowledge. The services will be restarted later.



Adding VCB Proxy Server to NetBackup Host Properties

1. Expand **NetBackup Management** in the left pane, expand **Host Properties** and select **Master Servers**.

2. Double the VCB Proxy in the right pane, scroll down and select **Virtual Machine Proxy Servers**.
3. Click the **Add** button followed by the ellipse button and choose the VCB proxy server from the list or enter the FQDN and click **Ok**.
4. Click **Add** and **Close**. Now click **Apply** and **Ok**.
5. Click **Ok** to acknowledge the warning again.

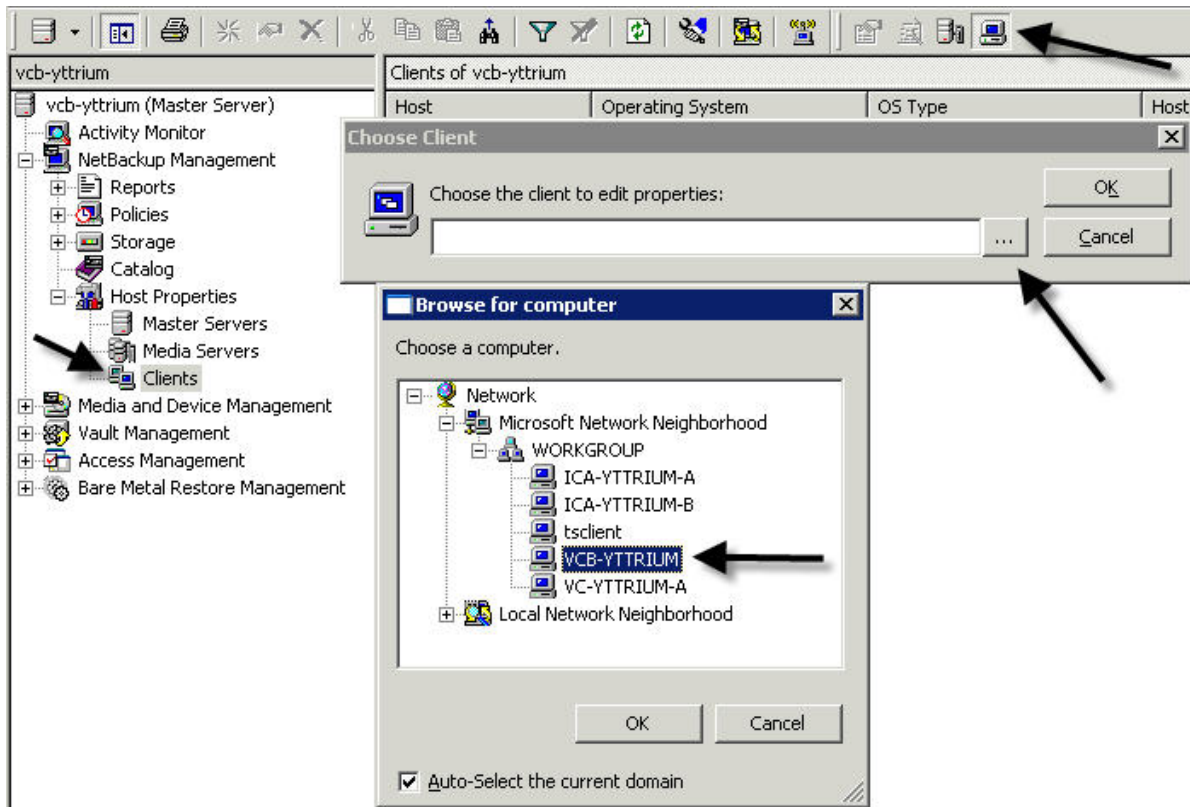


Set the Client Host Properties for Timestamps

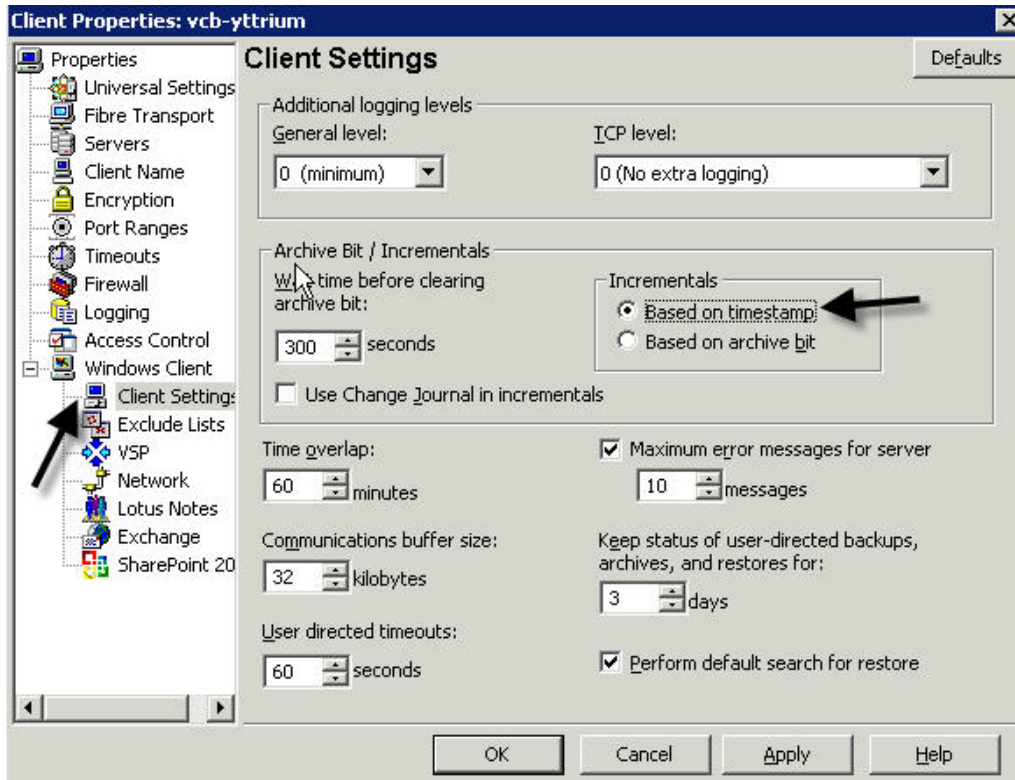
When performing physical machine backups, NetBackup can use different methods to determine which files have changed since the previous backup. NetBackup can either use the **archive bit** or **timestamps**. Furthermore, NetBackup can consult the **Windows Change Journal** for incremental backups.

Since VCB virtual machine backups are always performed on snapshots of virtual machine disk images, only timestamp-based backups will work. Therefore, NetBackup must be configured to use timestamps and the Change Journal has to be ignored. This can be done by performing the following steps:

1. In the left-hand pane of the **NetBackup Administration Console**, navigate to **NetBackup Management/Host Properties/Clients**.
2. This will activate the client button on the menu bar. Click the button to choose the client.
3. Using the ellipse button, choose the VCB proxy server and click **Ok** twice.



4. In the **Client Properties** dialog box, expand **Windows Client** in the left pane and select **Client Settings**.
5. In the right-hand pane of this window (which is now labeled **Client Settings**) locate the setting **Incrementals**.
6. Change the default for this setting from **Based on archive bit** to **Based on timestamps**.
7. Make sure that the Checkbox for **Use Change Journal in incrementals** is *not* checked. Now click **Ok**.



8. At this point, it might be wise to reboot the VCB proxy server to ensure all the changes are reset and the warning message from earlier is addressed.

Creating a Virtual Machine Backup Job in NetBackup

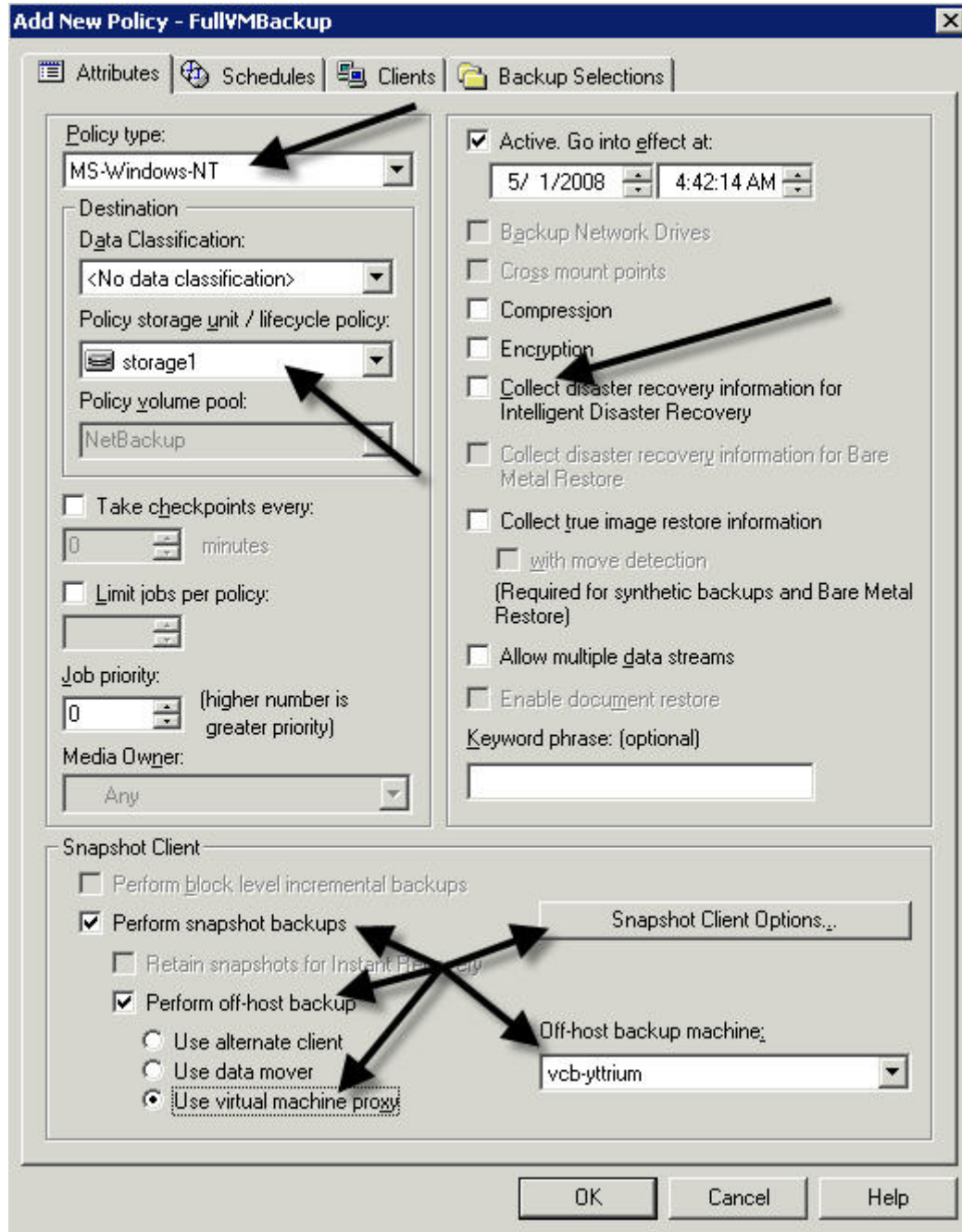
The next step is to configure NetBackup to schedule periodic backups for specific virtual machines.

1. On the VCB Proxy, open the **NetBackup Administration Console**.
2. In the left pane, highlight **Policies**. Right-click, choose **New Policy**. Enter a name for the backup job but do not check the **Use Backup Policy Configuration Wizard**. Click **OK**.
3. On the **Attributes** tab, click the drop down menu for the **Policy type**:
 - **MS-Windows-NT** – Backs up individual drives, folders and/or files for Windows guest operating systems.
 - **FlashBackup-Windows** – Performs full virtual machine backups or individual drives for Windows guest operating systems. This method potentially backs up faster if virtual machine is heavily populated with small files.

Configuring a Virtual Machine Backup Policy

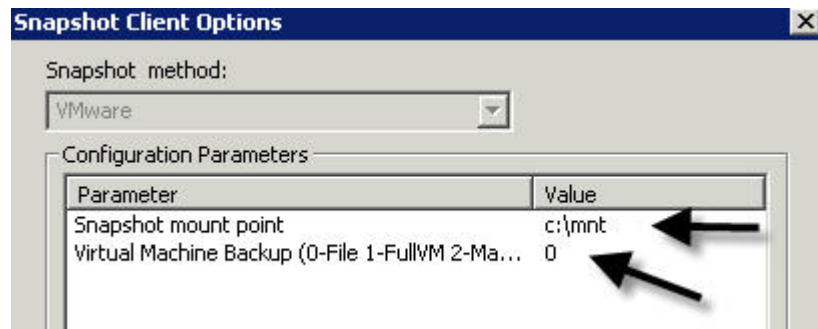
1. Select a storage unit.
2. Deselect **Collect disaster recovery information for Bare Metal Restore** checkbox.

3. Select **Perform snapshot backups** and select **Perform off-host backup**, next click **Use virtual machine proxy** option.
4. Click **Snapshot Options**.

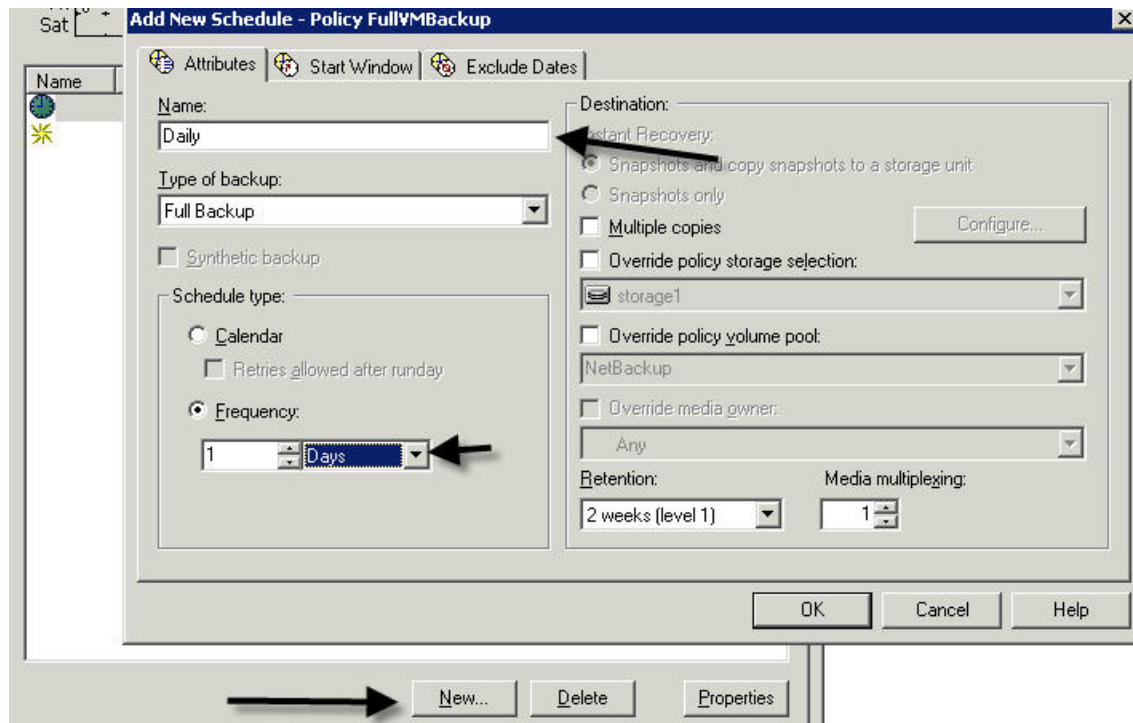


5. On the **Snapshot Client Options** page, click inside the **Snapshot mount point** configuration column and enter the Windows path to the mount directory created earlier, `c:\mnt.` (this must be a local drive, not a network mount point).

6. The **Virtual Machine Backup** parameter can be set as follows:
 - **0-File** – Individual folders or files, drives, or all local drives with **MS-Windows-NT** policy.
 - **1-FullVM** – entire virtual machine – **FlashBackup-Windows** policy only, no individual file restores.
 - **2-Mapped FullVM** – entire virtual machine – **FlashBackup-Windows** policy only, two restore options – entire virtual machine or individual files or folders.



7. Click **Ok**.
8. Click the **Schedules** tab and select **New** button. Enter name for schedule, the frequency and click **OK**.

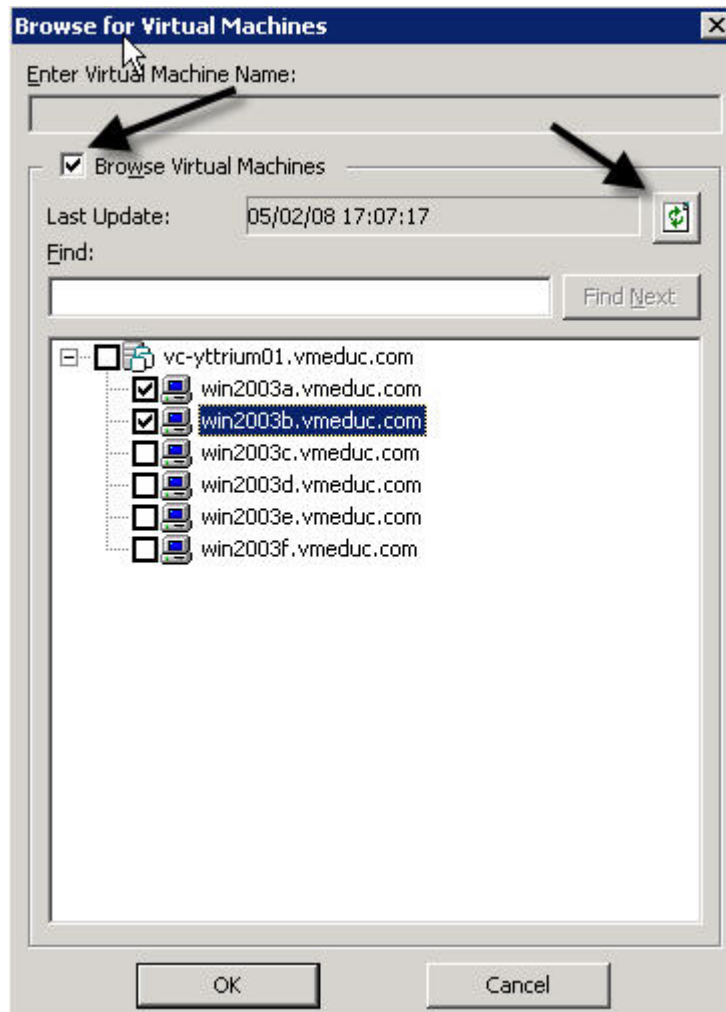


9. Choose the **Clients** tab and click **New**. Select the **Browse virtual machines** checkbox and expand the VirtualCenter server. Click **Ok** when finished.

Note: NetBackup uses DNS lookups to populate this list. Make sure that the virtual machine's FQDNs can be resolved or they are listed in the HOSTS file on the VCB proxy server. This populated list is cached in a file on the VCB proxy server in:

`C:\Program Files\Veritas\NetBackup\online_util\fi_cntl\vcbnames_vc-FQDN_Any`

In a few cases, the directory may not have been created during the install. If this is true, manually create and recreate the policy. This list may be outdated if new virtual machines have been added. Simply click the refresh button to update the list.



10. Choose the **Backup Selections** tab and click the **New** button. NetBackup 6.5.1 uses Windows Volume Shadow Copy for Windows 2003 Servers by default. To ensure that it can successfully snapshot the virtual machine, make sure that the following has been enabled:

Volume Shadow Copy (VSS) - Windows 2003 Virtual Machines Only

To increase the cache size when VSS is used on Windows 2003 Server clients:

- a. In Windows, right-click **My Computer** and select **Manage**.
- b. In the console tree, right-click **Shared Folders**, select **All Tasks**, and then **Configure Shadow Copies**.
- c. Select the volume on which to make changes, and then click the **Settings** button.
- d. In the **Settings** dialog box, change the **Maximum Size** setting to either **No Limit** or a size large enough to suit the requirements of the installation and usage of VSS.

Use the table below to configure full backups or file and/or folder backups. Additional information is available at <http://entsupport.symantec.com/docs/293350> on page17:

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 only, excluding Windows system files	Individual folders and files
Individual drives For example: E:\	0-File	All data files and folders in specified drives, excluding Windows system files	Individual folders and files
ALL_LOCAL_DRIVES directive	0-File	All data files and folders on all local virtual machine drives, excluding Windows system files	Individual folders and files

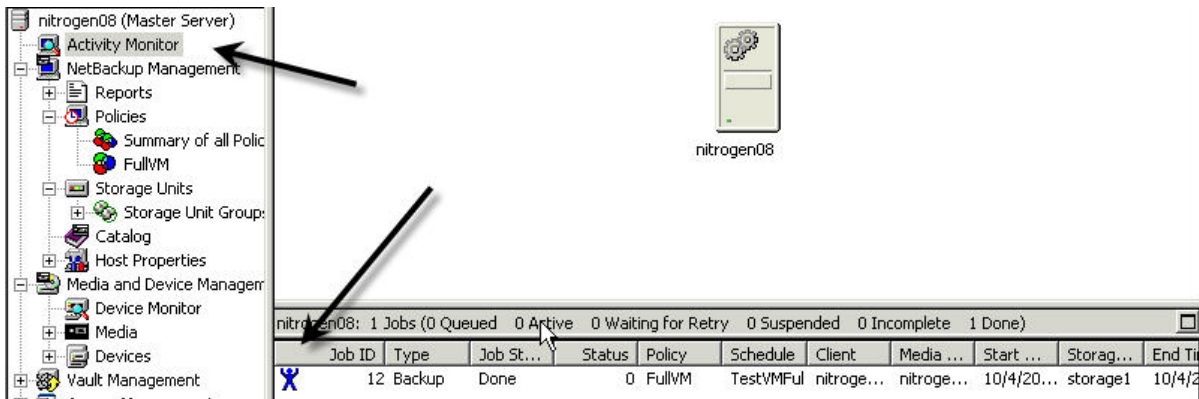
VMware backup options for FlashBackup-Windows policies

Backup Selections entry	Virtual Machine Backup parameter	What is backed up	What can be restored
Individual drives For example: \\E:	0-File	Individual drives as raw devices .	Individual folders and files, or entire drive (not including operating system or VMware virtual disk files)
ALL_LOCAL_DRIVES directive	0-File	All individual drives in virtual machine as raw devices .	Individual folders and files, or entire drives (not including operating system or VMware virtual disk files)
ALL_LOCAL_DRIVES directive	1-FullVM	VMware virtual disk files. Backup is "raw partition" type.	Entire virtual machine only
ALL_LOCAL_DRIVES directive	2-Mapped FullVM	VMware virtual disk files. Backup is "raw partition" type.	Entire virtual machine or individual folders and files

Source: Symantec Corporation

11. In the **Netbackup Administration Console**, select the new policy, right-click and choose **Manual Backup**. Click **OK** to start job.

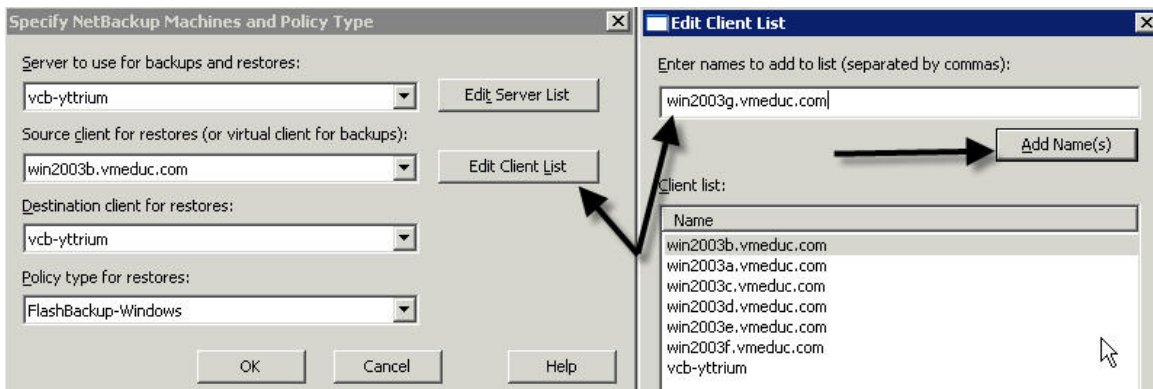
12. Once the backup has started, click the **Activity Monitor** in the left pane monitor the backup progress. The little blue man with his arms up in the air indicates success.



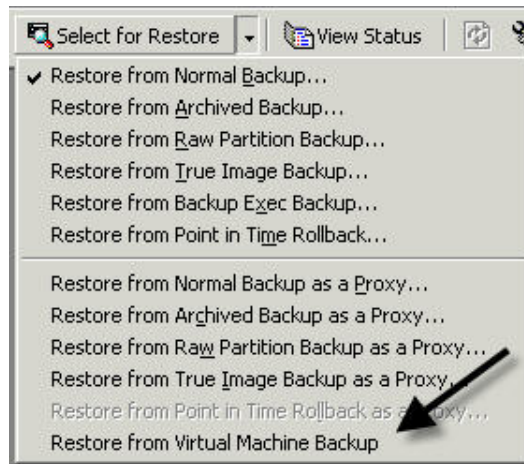
Restoring a Full Virtual Machine Using NetBackup

There are a couple of steps to restoring a full virtual machine. First, restoring the NetBackup version of the virtual machine's backup files using the **Backup, Archive, and Restore** application. Next, locate the restored files from the VCB proxy server to the Service Console using `vcbRestore`, VirtualCenter 2.5 Converter utility, or NetBackup's restore application.

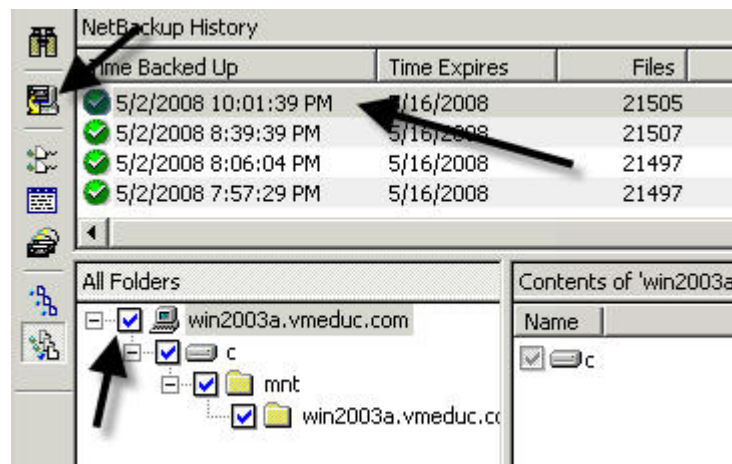
1. Launch the NetBackup **Backup, Archive, and Restore** application.
2. On the menu, choose **File > Specify NetBackup Machines and Policy Type...**
3. Specify the following in the drop down list:
 - a. **Server to use for backups and restores** → VCB proxy server.
 - b. **Source client for restores** → the virtual machine to be restored. Click the **Edit Client List** button to manually add the FQDNs of the virtual machines.
 - c. **Destination client for restores** → VCB proxy server.
 - d. **Policy type for restores** → FlashBackup-Windows (see **Configuring a Virtual Machine Backup Policy** for the correct option).
4. Click **Ok**.



5. On the menu bar, click the down arrow next to **Select to restore...** button and choose the **Restore from Virtual Machine Backup** option.



6. Select the backup job to restore from date/time list, check the virtual machine and click the restore button in the left column.



7. When the **Restore Marked Files** dialog box opens, there will be two options for restoring:
 - a. **Restore the entire virtual machine** → In the drop down list, select the appropriate VirtualCenter server. Choose the VCB proxy server as the staging server and enter the path to the `c:\Restore` directory. This method will restore the virtual machine to its original, backed up location using VMware-supplied scripts.

Restore Options

Restore the entire virtual machine

Restore all virtual machine files to the staging machine

Restore Destination Choices

Virtual machine server:
vc-yttrium01.vmeduc.com

Staging machine for restoration:
vcb-yttrium

Restore staging location:
c:\restore

Note: the virtual machine cannot exist in the VirtualCenter inventory prior to restoration.

- b. **Restore all virtual machine files to the staging machine** → Select the VCB proxy server as the staging machine and:
 - i. Run `vcbRestore` from the ESX Service Console using Windows Services for Unix (see below) from `C:\restore`.
 - ii. Using VirtualCenter 2.5, run the import wizard from Converter to restore the virtual machine.

Restore Marked Files

General

Restore Options

Restore the entire virtual machine

Restore all virtual machine files to the staging machine

Restore Destination Choices

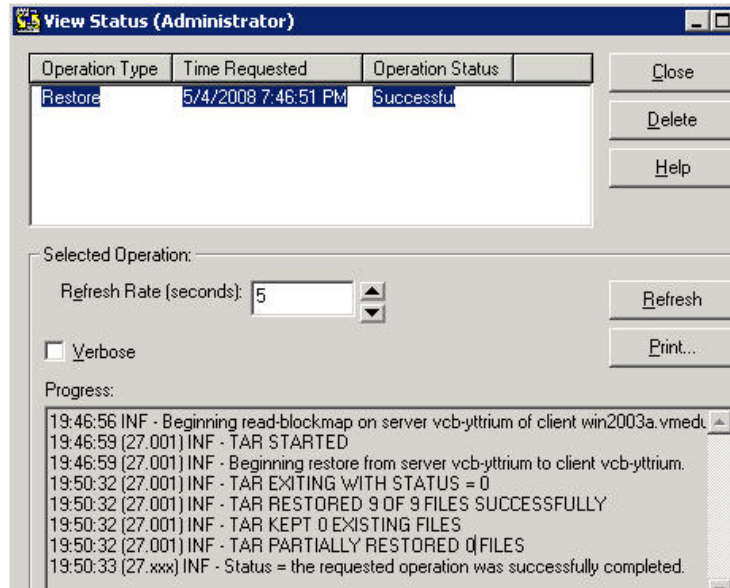
Virtual machine server:
vc-yttrium01.vmeduc.com

Staging machine for restoration:
vcb-yttrium

Restore staging location:
c:\restore

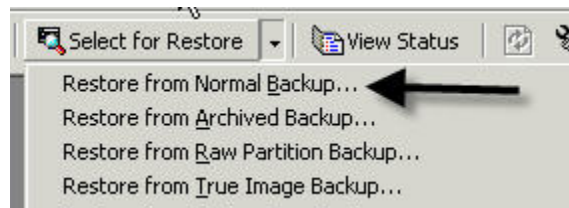
Warning: Restore will fail if the virtual machine already exists ! ←

8. Then click the **Start Restore** button to begin. Click **Yes** to view the progress. Below is a successful restore:

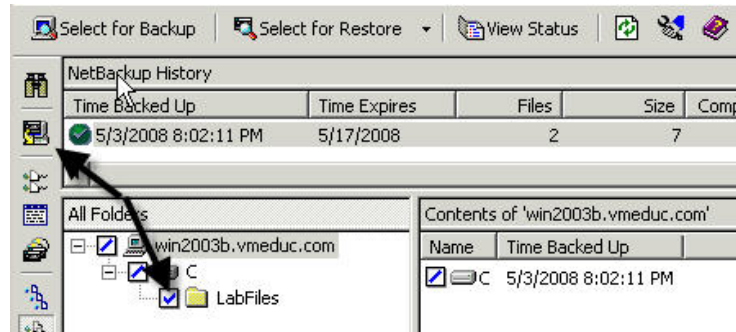


Restoring a File to a Virtual Machine Using NetBackup

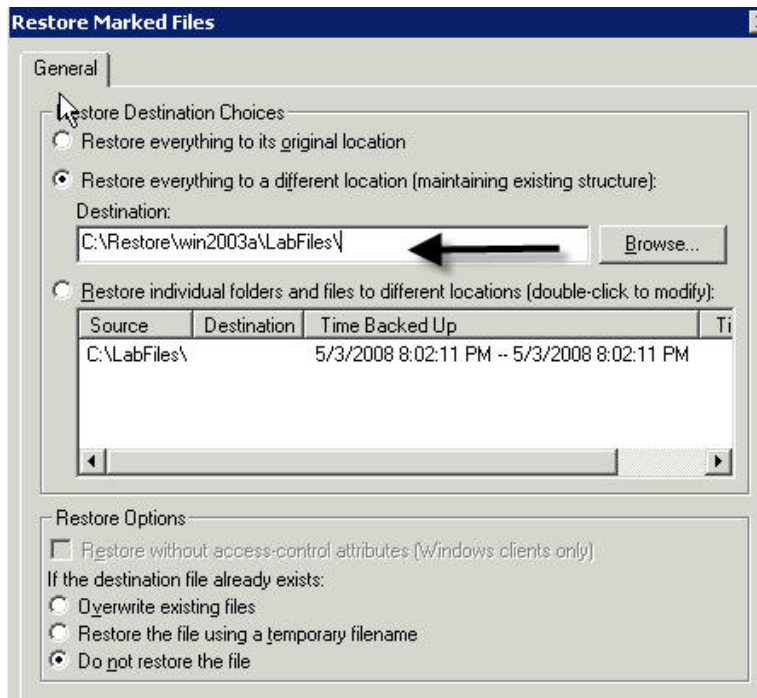
1. Launch the NetBackup **Backup, Archive, and Restore** application.
2. On the menu, choose **File > Specify NetBackup Machines and Policy Type...**
3. Specify the following in the drop down list:
 - a. **Server to use for backups and restores** → VCB proxy server.
 - b. **Source client for restores** → the virtual machine to be restored. Click the **Edit Client List** button to manually add the FQDNs of the virtual machines.
 - c. **Destination client for restores** → VCB proxy server.
 - d. **Policy type for restores** → MS-Windows-NT or FlashBackup-Windows with virtual Machine parameter set to either **0-File** or **2-Mapped FullVM** (see **Configuring a Virtual Machine Backup Policy** for the correct option).
4. On the menu bar, click the down arrow next to **Select to restore...** button and choose the **Restore from Normal Backup...** option.



5. Select the backup job to restore from date/time list, check the folder to restore and click the restore button in the left column.



- When the **Restore Marked Files** dialog box opens, choose the appropriate restore option and click **Start Restore**. Click **Yes** to view the progress if desired.



- Once the restore is complete, navigate to the `c:\restore` folder on the VCB proxy server and copy it to the correct virtual machine.

Configuring Windows Services for Unix 3.5 (Optional)

By installing **Windows Services for Unix** (installed in Windows 2003 R2 by default), `vcbRestore` can be executed from the Service Console directly for restores without needing to copy the virtual machine's backup files manually first. This allows a mount point to be created on the Windows Server that can be accessed directly from the Service Console by using the `mount` command.

- Download **Windows Services for Unix 3.5** from the Microsoft web site to a directory such as, `C:\unixservice` on the VCB Proxy Server:

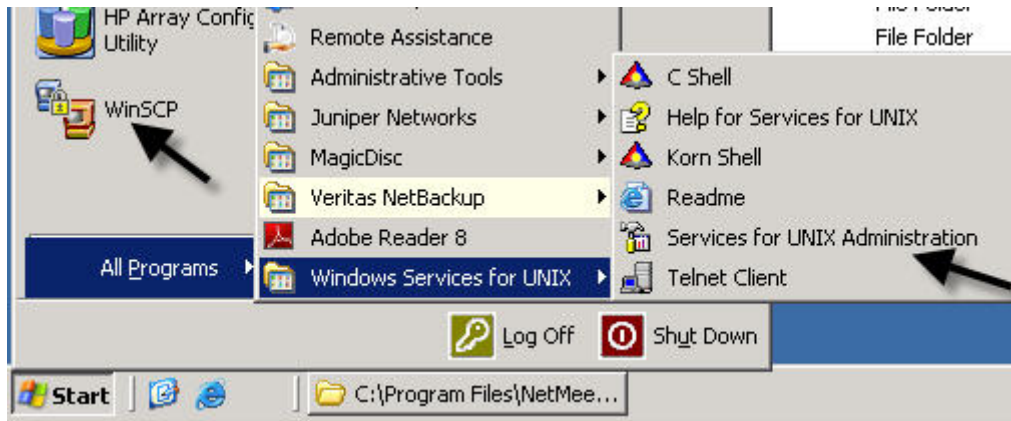
<http://www.microsoft.com/downloads/details.aspx?FamilyID=896c9688-601b-44f1-81a4-02878ff11778&DisplayLang=en>

2. After the files have finished unzipping, run `C:\unixservice\setup.exe`.
3. Accept EULA and all other default settings. When finished, do not reboot server yet.
4. Change the following Server Service settings by going into `Start > Administrative Tools > Services`:

ONC/RPC Port Mapper	→	Stopped and Manual
Server for NFS	→	Started and Automatic
User Name Mapping	→	Started and Automatic

Note: If NFS service won't start, configure ONC/RPC Port Mapper service as listed above and reboot server.

5. Start **Services for Unix Administration**.



6. Using WinSCP, copy `/etc/passwd` and `/etc/group` from one of the ESX host machines managed by the VirtualCenter server to `C:\netbackup` on the VCB Proxy Server. Close WinSCP.
7. In the Windows Services for Unix application, select **User Name Mapping** from the list. In the right pane, click the **Use Password and Group files** radio button and browse to the folder in which these files reside.

User Name Mapping on local computer

Configuration	Maps	Map Maintenance
---------------	------	-----------------

User Name Mapping creates an association, or map, between Windows user and group names. To configure User Name Mapping settings, select user and group names.

Use Network Information Service (NIS)
 Use Password and Group files

To add simple and advanced maps, use the maps tab.

To identify UNIX user and group names, enter the file path and name of password and group files for those users and groups.

Password file path and name:

C:\netbackup\passwd

Group file path and name:

C:\netbackup\group

8. Next, select the **Maps** heading and click **Simple Maps**. Under **Advanced Maps**, click the **Show User Maps** link.

Configuration	Maps	Map Maintenance
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You can create both simple and advanced maps. When the Windows and UNIX user or group names are identical, select Simple maps. To map one name to several other names or when not identical, use Advanced maps.

Simple maps

Select the name of the Windows domain that contains the Windows user or group name you want to map.

Windows domain name: \\NITROGEN08

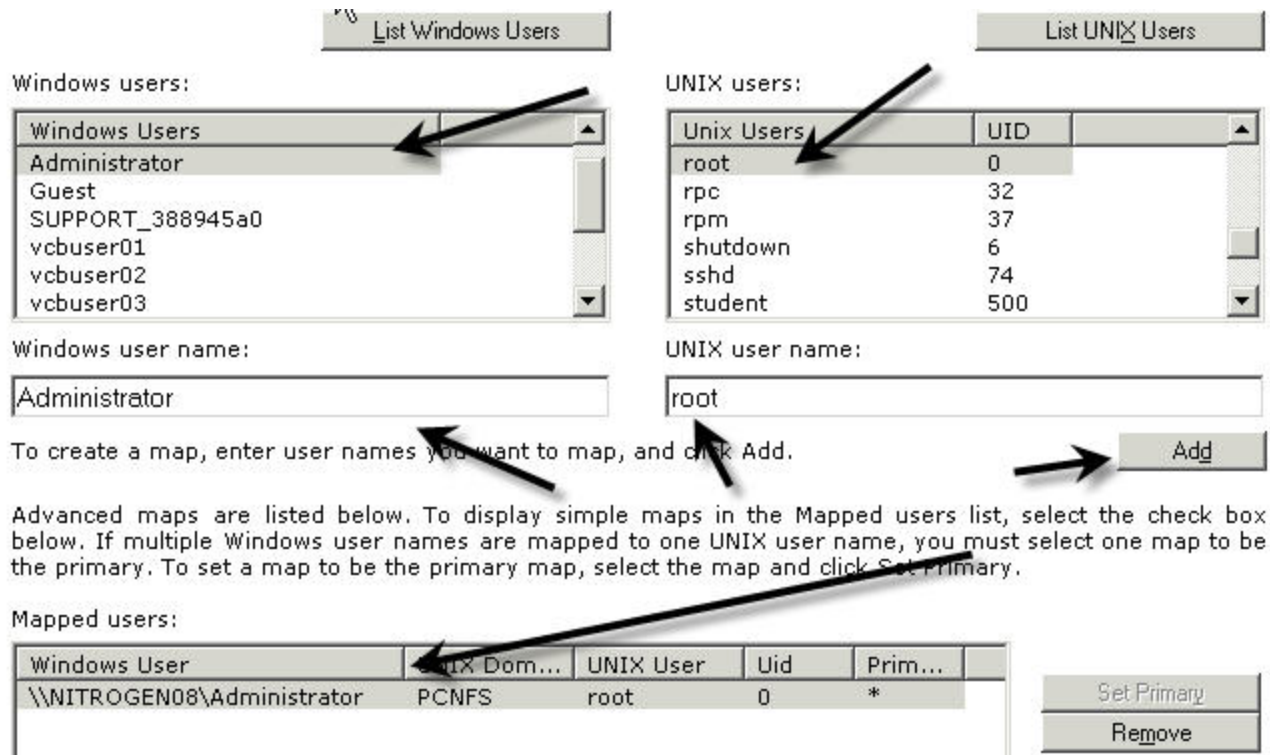
To create maps, click Apply. User Name Mapping creates the maps automatically.

Advanced maps

To map user names, click Show User Maps. To map group names, click Show Group Maps.

Windows domain name: \\NITROGEN08

9. Click the **List Windows Users** and **List Unix Users** buttons and scroll down until Administrator and root are selected. Click **Apply** and close application.



Windows users:

Windows Users
Administrator
Guest
SUPPORT_388945a0
vcbuser01
vcbuser02
vcbuser03

Windows user name:
Administrator

UNIX users:

Unix Users	UID
root	0
rpc	32
rpm	37
shutdown	6
sshd	74
student	500

UNIX user name:
root

To create a map, enter user names you want to map, and click Add.

Advanced maps are listed below. To display simple maps in the Mapped users list, select the check box below. If multiple Windows user names are mapped to one UNIX user name, you must select one map to be the primary. To set a map to be the primary map, select the map and click Set Primary.

Mapped users:

Windows User	UNIX Dom...	UNIX User	Uid	Prim...
\\NITROGEN08\Administrator	PCNFS	root	0	*

Buttons: Add, Set Primary, Remove

10. Create a folder on the VCB Proxy Server called `C:\restore`. Right-click the folder, choose **Properties, NFS Sharing**. Click **Share this folder** and then click the **Permissions** button. Check the box **Allow root access** and click **OK** twice.

Configuring the ESX host for vcbRestore from Windows NFS

Now that Windows Services for Unix has been installed on the VCB Proxy Server, vcbRestore can be run directly from the Service Console without first copying over the backed up files.

WARNING: This is not officially supported by VMware. Use at your own risk!!

1. From a Putty session, log onto the ESX host as root. Start by opening up the firewall port for the NFS Client. Do this through VirtualCenter or Putty.

```
#esxcfg-firewall -e nfsClient
```

2. Next, create a mount point to `C:\restore` on the Windows server.

```
#mkdir -p /mnt/restore
#mount -t nfs ipaddress_or_FQDN_of_VCBProxy:/restore /mnt/restore
```

NOTE: To survive a reboot, modify /etc/fstab.

9. When complete, log onto the Service Console as root and run:



```
#vcbRestore -h IPAddress_or_FQDN_of_VC_or_Host -u username -p  
password -s /mnt/restore
```

10. The virtual machine will restore into its original VMFS volume location.

11. Once the restore is complete, make sure to clean out the `C:\restore` mount point on the VCB Proxy Server.