Restore guest files and folders

SnapCenter Plug-in for VMware vSphere

NetApp
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Restore guest files and folders

Workflow, prerequisites, and limitations

You can restore files or folders from a virtual machine disk (VMDK) on a Windows guest OS.

Guest restore workflow

Guest OS restore operations include the following steps:

1. Attach

   Attach a virtual disk to a guest VM or proxy VM and start a guest file restore session.

2. Wait

   Wait for the attach operation to complete before you can browse and restore. When the attach operation finishes, a guest file restore session is automatically created and an email notification is sent.

3. Select files or folders

   Browse the VMDK in the Guest File Restore session and select one or more files or folders to restore.

4. Restore

   Restore the selected files or folders to a specified location.

Prerequisites for restoring guest files and folders

Before you restore one or more files or folders from a VMDK on a Windows guest OS, you must be aware of all the requirements.

- VMware tools must be installed and running.

  SnapCenter uses information from VMware tools to establish a connection to the VMware Guest OS.

- The Windows Guest OS must be running Windows Server 2008 R2 or later.

  For the latest information about supported versions, refer to NetApp Interoperability Matrix Tool (IMT).

- Credentials for the target VM must specify the built-in domain administrator account or the built-in local administrator account. The username must be "Administrator." Before starting the restore operation, the credentials must be configured for the VM to which you want to attach the virtual disk. The credentials are required for both the attach operation and the subsequent restore operation. Workgroup users can use the built-in local administrator account.

  If you must use an account that is not the built-in administrator account, but has administrative privileges within the VM, you must disable UAC on the guest VM.

- You must know the backup Snapshot and VMDK to restore from.

  SnapCenter Plug-in for VMware vSphere does not support searching of files or folders to restore. Therefore, before you begin you must know the location of the files or folders with respect to the Snapshot and the corresponding VMDK.

- Virtual disk to be attached must be in a SnapCenter backup.

  The virtual disk that contains the file or folder you want to restore must be in a VM backup that was performed using the virtual appliance for SnapCenter Plug-in for VMware vSphere.

- To use a proxy VM, the proxy VM must be configured.

  If you want to attach a virtual disk to a proxy VM, the proxy VM must be configured before the attach and restore operation begins.

- For files with non-English-alphabet names, you must restore them in a directory, not as a single file.

  You can restore files with non-alphabetic names, such as Japanese Kanji, by restoring the directory in which the files are located.

- Restoring from a Linux guest OS is not supported

  You cannot restore files and folders from a VM that is running Linux guest OS. However, you can attach a VMDK and then manually restore the files and folders. For the latest information on supported guest OS, refer to NetApp Interoperability Matrix Tool (IMT).

Guest file restore limitations

Before you restore a file or folder from a guest OS, you should be aware of what the feature does not support.

- You cannot restore dynamic disk types inside a guest OS.
- If you restore an encrypted file or folder, the encryption attribute is not retained. You cannot restore files or folders to an encrypted folder.
- The Guest File Browse page displays the hidden files and folder, which you cannot filter.
- You cannot restore from a Linux guest OS.

  You cannot restore files and folders from a VM that is running Linux guest OS. However, you can attach a VMDK and then manually restore the files and folders. For the latest information on supported guest OS, refer to the NetApp Interoperability Matrix Tool (IMT).

- You cannot restore from a NTFS file system to a FAT file system.

  When you try to restore from NTFS-format to FAT-format, the NTFS security descriptor is not copied because the FAT file system does not support Windows security attributes.

- You cannot restore guest files from a cloned VMDK or an uninitialized VMDK.
- You cannot restore from secondary backups if the backup was performed on a system running ONTAP 9.2 or later and if the VMware consistency option was on.
- You cannot restore the directory structure for a file.

  If a file in a nested directory is selected to be restored, the file is not restored with the same directory

structure. The directory tree is not restored, only the file. If you want to restore a directory tree, you can copy the directory itself at the top of the structure.

- You cannot restore guest files from a vVol VM to an alternate host.
- You cannot restore encrypted guest files.

Restore guest files and folders from VMDKs

You can restore one or more files or folders from a VMDK on a Windows guest OS.

About this task

By default, the attached virtual disk is available for 24 hours and then it is automatically detached. You can choose in the wizard to have the session automatically deleted when the restore operation completes, or you can manually delete the Guest File Restore session at any time, or you can extend the time in the **Guest Configuration** page.

Guest file or folder restore performance depends upon two factors: the size of the files or folders being restored; and the number of files or folders being restored. Restoring a large number of small-sized files might take a longer time than anticipated compared to restoring a small number of large-sized files, if the data set to be restored is of same size.

Only one attach or restore operation can run at the same time on a VM. You cannot run parallel attach or restore operations on the same VM.

The guest restore feature allows you to view and restore system and hidden files and to view encrypted files. Do not attempt to overwrite an existing system file or to restore encrypted files to an encrypted folder. During the restore operation, the hidden, system, and encrypted attributes of guest files are not retained in the restored file. Viewing or browsing reserved partitions might cause an error.

Steps

1. From the vSphere client shortcuts window, select **Hosts and Clusters** and select a VM.
2. Right-click on the VM and select **SnapCenter Plug-in for VMware vSphere** > **Guest File Restore**.
3. On the **Restore Scope** page, specify the backup that contains the virtual disk you want to attach by doing the following:
   a. In the **Backup Name** table, select the backup that contains the virtual disk that you want attach.
   b. In the **VMDK** table, select the virtual disk that contains the files or folders you want to restore.
   c. In the **Locations** table, select the location, primary or secondary, of the virtual disk that you want to attach.
4. On the **Guest Details** page, do the following.
   a. Choose where to attach the virtual disk:

Select this option…	If…
Use Guest VM	You want to attach the virtual disk to the VM that you right-clicked before you started the wizard, and then select the credential for the VM that you right-clicked. Credentials must already be created for the VM.
Use Guest File Restore proxy VM	You want to attach the virtual disk to a proxy VM, and then select the proxy VM. The proxy VM must be configured before the attach and restore operation begins.

b. Select the **Send email notification** option.

This option is required if you want to be notified when the attach operation finishes, and the virtual disk is available. The notification email includes the virtual disk name, the VM name, and the newly assigned drive letter for the VMDK.

Enable this option because a guest file restore is an asynchronous operation and there might be a time latency to establish a guest session for you.

This option uses the email settings that are configured when you set up the VMware vSphere client in vCenter.

5. Review the summary, and then click **Finish**.

Before you click **Finish**, you can go back to any page in the wizard and change the information.

6. Wait until the attach operation completes.

You can view the progress of the operation in the Dashboard job monitor, or you can wait for the email notification.

7. To find the files that you want to restore from the attached virtual disk, select **SnapCenter Plug-in for VMware vSphere** from the vSphere client shortcuts window.
8. In the left navigator pane Select **Guest File Restore** > **Guest Configuration**.

In the Guest Session Monitor table, you can display additional information about a session by clicking *… *in the right column.

9. Select the guest file restore session for the virtual disk that was listed in the notification email.

All partitions are assigned a drive letter, including system reserved partitions. If a VMDK has multiple partitions, you can select a specific drive by selecting the drive in the drop-down list in the drive field at the top of the Guest File Browse page.

10. Click the **Browse Files** icon to view a list of files and folders on the virtual disk.

    When you double click a folder to browse and select individual files, there might be a time latency while fetching the list of files because the fetch operation is performed at run time.

    For easier browsing, you can use filters in your search string. The filters are case-sensitive, Perl expressions without spaces. The default search string is `.*`. The following table shows some example Perl search expressions.

This expression…	Searches for…
.	Any character except a newline character.
.*	Any string. This is the default.
a	The character a.
ab	The string ab.
a [vertical bar] b	The character a or b.
a*	Zero or more instances of the character a.
a+	One or more instances of the character a.
a?	Zero or one instance of the character a.
a{x}	Exactly x number of instances of the character a.
a{x,}	At least x number of instances of the character a.
a{x,y}	At least x number of instances of the character a and at most y number.
\	Escapes a special character.

    The Guest File Browse page displays all hidden files and folders in addition to all other files and folders.

11. Select one or more files or folders that you want to restore, and then click **Select Restore Location**.

    The files and folders to be restored are listed in the Selected File(s) table.

12. In the **Select Restore Location** page, specify the following:

Option	Description
Restore to path	Enter the UNC share path to the guest where the selected files will be restored. IPv4 example: `\\10.60.136.65\c$` IPv6 example: `\\fd20-8b1e-b255-832e–61.ipv6-literal.net\C\restore`

Option	Description
If original file(s) exist	Select the action to be taken if the file or folder to be restored already exists on the restore destination: Always overwrite or Always skip. If the folder already exists, then the contents of the folder are merged with the existing folder.
Disconnect Guest Session after successful restore	Select this option if you want the guest file restore session to be deleted when the restore operation completes.

13. Click **Restore**.

    You can view the progress of the restore operation in the Dashboard job monitor, or you can wait for the email notification. The time it takes for the email notification to be sent depends upon the length of time the restore operation takes to complete.

    The notification email contains an attachment with the output from the restore operation. If the restore operation fails, open the attachment for additional information.

Set up proxy VMs for restore operations

If you want to use a proxy VM for attaching a virtual disk for guest file restore operations, you must set up the proxy VM before you begin the restore operation. Although you can set up a proxy VM at any time, it might be more convenient to set it up immediately after the plug-in deployment completes.

Steps

1. From the vSphere client shortcuts window, select **SnapCenter Plug-in for VMware vSphere** under plug-ins.
2. In the left navigation select **Guest File Restore**.
3. In the **Run As Credentials** section, do one of the following:

To do this…	Do this…
Use existing credentials	Select any of the configured credentials.
Add new credentials	1. Select **Add**. 2. In the **Run As Credentials** dialog box, enter the credentials. 3. Click **Select VM**, then select a VM in the **Proxy VM** dialog box. Click **Save** to return to the **Run As Credentials** dialog box. 4. Enter the credentials. For Username, you must enter “Administrator”.

SnapCenter Plug-in for VMware vSphere uses the selected credentials to log into the selected proxy VM.

The Run As credentials must be the default domain administrator that is provided by Windows or the built-in local administrator. Workgroup users can use the built-in local administrator account.

4. In the **Proxy Credentials** section, click **Add** to add a VM to use as a proxy.
5. In the **Proxy VM** dialog box, complete the information, and then click **Save**.

You need to delete the proxy VM from the SnapCenter Plug-in for VMware vSphere UI before you can delete it from ESXi host.

Configure credentials for VM guest file restores

When you attach a virtual disk for guest file or folder restore operations, the target VM for the attach must have credentials configured before you restore.

About this task

The following table lists the credential requirements for guest restore operations.

	User access control enabled	User access control disabled
Domain user	A domain user with “administrator” as the username works fine. For example, “NetApp\administrator”. However, a domain user with “xyz” as the username that belongs to a local administrator group will not work. For example, you cannot use “NetApp\xyz”.	Either a domain user with “administrator” as the username or a domain user with “xyz” as the username that belongs to a local administrator group, works fine. For example, “NetApp\administrator” or “NetApp\xyz”.
Workgroup user	A local user with “administrator” as the username works fine. However, a local user with “xyz” as the username that belongs to a local administrator group will not work.	Either a local user with “administrator” as the username or a local user with “xyz” as the username that belongs to a local administrator group, works fine. However, a local user with “xyz” as the username that does not belong to local administrator group will not work.

In the preceding examples, “NetApp” is the dummy domain name and “xyz” is the dummy local username

Steps

1. From the vSphere client shortcuts window, select **SnapCenter Plug-in for VMware vSphere** under plug-ins.
2. In the left navigation select **Guest File Restore**.
3. In the **Run As Credentials** section, do one of the following:

To do this…	Do this…
Use existing credentials	Select any of the configured credentials.

To do this…	Do this…
Add new credentials	1. Select **Add**. 2. In the **Run As Credentials** dialog box, enter the credentials. For Username, you must enter “Administrator”. 3. Click **Select VM**, then select a VM in the **Proxy VM** dialog box. Click **Save** to return to the **Run As Credentials** dialog box. Select the VM that should be used to authenticate the credentials.

SnapCenter Plug-in for VMware vSphere uses the selected credentials to log on to the selected VM.

4. Click **Save**.

Extend the time of a guest file restore session

By default, an attached Guest File Restore VMDK is available for 24 hours and then it is automatically detached. You can extend the time in the **Guest Configuration** page.

About this task

You might want to extend a guest file restore session if you want to restore additional files or folders from the attached VMDK at a later time. However, because guest file restore sessions use a lot of resources, extending the session time should be performed only occasionally.

Steps

1. In the VMware vSphere client, click **Guest File Restore**.
2. Select a guest file restore session and then click the Extend Selected Guest Session icon in the Guest Session Monitor title bar.

   The session is extended for another 24 hours.

Guest file restore scenarios you might encounter

When attempting to restore a guest file, you might encounter any of the following scenarios.

Guest file restore session is blank

This issue occurs when you create a guest file restore session and while that session was active, the guest operating system is rebooted. When this occurs, VMDKs in the guest OS might remain offline. Therefore, when you try to browse the guest file restore session, the list is blank.

To correct the issue, manually put the VMDKs back online in the guest OS. When the VMDKs are online, the guest file restore session will display the correct contents.

Guest file restore attach disk operation fails

This issue occurs when you start a guest file restore operation, but the attach disk operation fails even though VMware tools is running and the Guest OS credentials are correct. If this occurs, the following error is returned:

```
Error while validating guest credentials, failed to access guest system using specified credentials: Verify VMWare tools is running properly on system and account used is Administrator account, Error is SystemError vix error codes = (3016, 0).
```

To correct the issue, restart the VMware Tools Windows service on the Guest OS, and then retry the guest file restore operation.

Guest email shows ?????? for the file name

This issue occurs when you use the guest file restore feature to restore files or folders with non-English characters in the names and the email notification displays "??????" for the restored file names. The email attachment correctly lists the names of the restored files and folders.

Backups are not detached after guest file restore session is discontinued

This issue occurs when you perform a guest file restore operation from a VM-consistent backup. While the guest file restore session is active, another VM-consistent backup is performed for the same VM. When the guest file restore session is disconnected, either manually or automatically after 24 hours, the backups for the session are not detached.

To correct the issue, manually detach the VMDKs that were attached from the active guest file restore session.

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