Restore backups

SnapCenter Plug-in for VMware vSphere

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Restore backups

Restore overview

You can restore VMs, VMDKs, files, and folders from primary or secondary backups.

- VM restore destinations

  You can restore traditional VMs to the original host, or to an alternate host in the same vCenter Server, or to an alternate ESXi host managed by the same vCenter or any vCenter in linked mode.

  You can restore vVol VMs to the original host.

- VMDK restore destinations

  You can restore VMDKs in traditional VMs to either the original or to an alternate datastore.

  You can restore VMDKs in vVol VMs to the original datastore.

You can also restore individual files and folders in a guest file restore session, which attaches a backup copy of a virtual disk and then restores the selected files or folders.

You cannot restore the following:

- Datastores

  You cannot use the SnapCenter Plug-in for VMware vSphere to restore a datastore, only the individual VMs in the datastore.

- Backups of removed VMs

  You cannot restore backups of storage VMs that have been removed. For example, if you add a storage VM using the management LIF and then create a backup, and then you remove that storage VM and add a cluster that contains that same storage VM, the restore operation for the backup will fail.

How restore operations are performed

For VMFS environments, the SnapCenter Plug-in for VMware vSphere uses clone and mount operations with Storage VMotion to perform restore operations. For NFS environments, the plug-in uses native ONTAP Single File SnapRestore (SFSR) to provide greater efficiency for most restore operations. For vVol VMs, the plug-in uses ONTAP Single File Snapshot Restore (ONTAP SFSR) and SnapMirror Restore for restore operations. The following table lists how restore operations are performed.

Restore operations	From	Performed using
VMs and VMDKs	Primary backups	NFS environments: ONTAP Single File SnapRestore VMFS environments: Clone and mount with Storage VMotion

Restore operations	From	Performed using
VMs and VMDKs	Secondary backups	NFS environments: ONTAP Single File SnapRestore VMFS environments: Clone and mount with Storage VMotion
Deleted VMs and VMDKs	Primary backups	NFS environments: ONTAP Single File SnapRestore VMFS environments: Clone and mount with Storage VMotion
Deleted VMs and VMDKs	Secondary backups	NFS environments: Clone and mount with Storage VMotion VMFS environments: Clone and mount with Storage VMotion
VMs and VMDKs	VM-consistent primary backups	NFS environments: ONTAP Single File SnapRestore VMFS environments: Clone and mount with Storage VMotion
VMs and VMDKs	VM-consistent secondary backups	NFS environments: ONTAP SnapMirror Restore VMFS environments: Clone and mount with Storage VMotion
vVol VMs	Crash-consistent primary backups	ONTAP Single File SnapRestore for all protocols
vVol VMs	Crash-consistent secondary backups	ONTAP SnapMirror Restore for all protocols
FlexGroup VMs	Primary backups	NFS environments: * ONTAP Single File SnapRestore if you are using ONTAP Version 9.10.1 and later * Clone and mount with Storage VMotion on ONTAP previous versions VMFS environments: Not supported for FlexGroups
FlexGroup VMs	Secondary backups	NFS environments: • ONTAP SnapMirror Restore if you are using ONTAP Version 9.10.1 and later • Clone and mount with Storage VMotion for ONTAP previous versions VMFS environments: Not supported for FlexGroups

You cannot restore a vVol VM after a vVol container rebalance.

Guest file restore operations are performed using clone and mount operations (not Storage VMotion) in both NFS and VMFS environments.

During a restore operation, you might encounter the error `Host unresolved volumes is null` or `Exception while calling pre-restore on SCV….Error mounting cloned LUN as datastore…` This occurs when the SnapCenter Plug-in for VMware vSphere attempts to resignature the clone. Due to VMware restrictions, the SnapCenter Plug-in for VMware vSphere cannot control the automatic resignature value in advanced ESXi host configurations.
For NVMe over TCP and NVMe over FC storage, SCV cannot add controllers dynamically when a new subsystem is added. You should make the necessary mapping before the mount operation.

Refer to KB article: SCV clone or restores fail with error 'Host Unresolved volumes is null for more information about the error.

Search for backups

You can search for and find a specific backup of a VM or datastore using the Restore wizard. After you locate a backup, you can then restore it.

Steps

1. In the VMware vSphere client GUI, click **Menu** in the toolbar, and then do one of the following:

To view backups for…	Do the following…
VMs	Click the **Hosts and Clusters** menu option, then select a VM, then click the **Configure** tab, and then click **Backups** in the **SnapCenter Plug-in for VMware vSphere section**.
Datastores	Click the **Storage** menu option, then select a datastore, then click the **Configure** tab, and then click **Backups** in the **SnapCenter Plug-in for VMware vSphere** section.

2. In the left navigator pane, expand the datacenter that contains the VM or datastore.
3. Optional: Right-click a VM or datastore, then select **SnapCenter Plug-in for VMware vSphere** in the drop-down list, and then select **Restore** in the secondary drop-down list.
4. In the **Restore** wizard enter a search name and click **Search**.

   You can filter the backup list by selecting the filter icon and selecting a date and time range, selecting whether you want backups that contain VMware Snapshots, whether you want mounted backups, and the location. Click **OK**.

Restore VMs from backups

When you restore a VM, you can overwrite the existing content with the backup copy that

you select or you can make a copy of the VM.

You can restore VMs to the following locations:

- Restore to original location
  - To the original datastore mounted on the original ESXi host (this overwrites the original VM)
- Restore to alternate location
  - To a different datastore mounted on the original ESXi host
  - To the original datastore mounted on a different ESXi host that is managed by the same vCenter
  - To a different datastore mounted on a different ESXi host that is managed by the same vCenter
  - To a different datastore mounted on a different ESXi host that is managed by a different vCenter in linked mode

You cannot restore vVol VMs to an alternate host.

The following restore workflow is not supported: Add a storage VM, then perform a backup of that VM, then delete the storage VM and add a cluster that includes that same storage VM, and then attempt to restore the original backup.

For improved performance of restore operations in NFS environments, enable the VMware application vStorage API for Array Integration (VAAI).

Before you begin

- A backup must exist.

  You must have created a backup of the VM using the SnapCenter Plug-in for VMware vSphere before you can restore the VM.

  Restore operations cannot finish successfully if there are Snapshots of the VM that were performed by software other than the SnapCenter Plug-in for VMware vSphere.

- The destination datastore must be ready.
  - The destination datastore for the restore operation must have enough space to accommodate a copy of all the VM files (for example: vmdk, vmx, vmsd).
  - The destination datastore must not contain stale VM files from previous restore operation failures. Stale files have the name format `restore_xxx_xxxxxx_<filename>`.
- The VM must not be in transit.

  The VM that you want to restore must not be in a state of vMotion or Storage vMotion.

- HA configuration errors

  Ensure there are no HA configuration errors displayed on the vCenter ESXi Host Summary screen before restoring backups to a different location.

- Restoring to a different locations
  - When restoring to a different location, SnapCenter Plug-in for VMware vSphere must be running in the vCenter that is the destination for the restore operation. The destination datastore must have sufficient

space.

- The destination vCenter in the Restore To alternate Location field must be DNS resolvable.

About this task

- VM is unregistered and registered again

  The restore operation for VMs unregisters the original VM, restores the VM from a backup Snapshot, and registers the restored VM with the same name and configuration on the same ESXi server. You must manually add the VMs to resource groups after the restore.

- Restoring datastores

  You cannot restore a datastore, but you can restore any VM in the datastore.

- Restoring vVol VMs
  - vVol datastores that span VMs are not supported. Because attached VMDKs in a VM-spanning vVol datastore are not backed up, the restored VMs will contain only partial VMDKs.
  - You cannot restore a vVol to an alternate host.
  - vVol automatic rebalance is not supported.
- VMware consistency snapshot failures for a VM

  Even if a VMware consistency snapshot for a VM fails, the VM is nevertheless backed up. You can view the entities contained in the backup copy in the Restore wizard and use it for restore operations.

- A restore operation might fail if the storage tier of the FabricPool where the VM is located is unavailable.

Steps

1. In the VMware vSphere client GUI, click **Menu** in the toolbar, and then select **VMs and Templates** from the drop-down list.

   If you are restoring a deleted VM, the storage VM credentials that were added to the SnapCenter Plug-in for VMware vSphere must be `vsadmin` or a user account that has all the same privileges as `vsadmin`. The host must be on a storage system that is running ONTAP 8.2.2 or later.

2. In the left navigator pane, right-click a VM, then select **SnapCenter Plug-in for VMware vSphere** in the drop-down list, and then select **Restore** in the secondary drop-down list to start the wizard.
3. In the **Restore** wizard, on the **Select Backup** page, select the backup Snapshot that you want to restore.

   You can search for a specific backup name or a partial backup name, or you can filter the backup list by clicking the filter icon and selecting a date and time range, selecting whether you want backups that contain VMware Snapshots, whether you want mounted backups, and the location. Click **OK** to return to the wizard.

4. On the **Select Scope** page, select **Entire virtual machine** in the **Restore scope** field, then select the restore location, and then enter the destination information where the backup should be mounted.

   In the **VM name** field, if the same VM name exists, then the new VM name format is `<vm_name>_<timestamp>`.

   When restoring partial backups, the restore operation skips the **Select Scope** page.

5. On the **Select Location** page, select the location for the restored datastore.

   In SnapCenter Plug-in for VMware vSphere 4.5 and later, you can select secondary storage for FlexGroup volumes.

6. Review the Summary page and then click **Finish**.
7. Optional: Monitor the operation progress by clicking **Recent Tasks** at the bottom of the screen.

   Refresh the screen to display updated information.

After you finish

- Change IP address

  If you restored to a different location, then you must change the IP address of the newly created VM to avoid an IP address conflict when static IP addresses are configured.

- Add restored VMs to resource groups

  Although the VMs are restored, they are not automatically added to their former resource groups. Therefore, you must manually add the restored VMs to the appropriate resource groups.

Restore deleted VMs from backups

You can restore a deleted VM from a datastore primary or secondary backup to an ESXi host that you select.

You can restore VMs to the following locations:

- Restore to original location
  - To the original datastore mounted on the original ESXi host (this makes a copy of the VM)
- Restore to alternate location
  - To a different datastore mounted on the original ESXi host
  - To the original datastore mounted on a different ESXi host that is managed by the same vCenter
  - To a different datastore mounted on a different ESXi host that is managed by the same vCenter
  - To a different datastore mounted on a different ESXi host that is managed by a different vCenter in linked mode

When restoring to a different location, SnapCenter Plug-in for VMware vSphere must be running in the linked vCenter that is the destination for the restore operation. The destination datastore must have sufficient space.

You cannot restore vVol VMs to an alternate location.

When restoring a deleted VM, any tags or folders that were originally assigned to the VM are not restored.

Before you begin

- The user account for the storage system, on the Storage Systems page in the VMware vSphere client, must have the Minimum ONTAP privileges required for ONTAP.
- The user account in vCenter must have the Minimum vCenter privileges required for SnapCenter Plug-in for VMware vSphere.
- A backup must exist.

  You must have created a backup of the VM using the SnapCenter Plug-in for VMware vSphere before you can restore the VMDKs on that VM.

For improved performance of restore operations in NFS environments, enable the VMware application vStorage API for Array Integration (VAAI).

About this task

You cannot restore a datastore, but you can restore any VM in the datastore.

A restore operation might fail if the storage tier of the FabricPool where the VM is located is unavailable.

Steps

1. Click **Menu** and select the **Storage** menu option, then select a datastore, then select the **Configure** tab, and then click **Backups** in the **SnapCenter Plug-in for VMware vSphere** section.
2. Double-click on a backup to see a list of all VMs that are included in the backup.
3. Select the deleted VM from the backup list and click **Restore**.
4. In the **Restore** wizard, on the **Select Backup** page, select the backup copy that you want to restore from.

   You can search for a specific backup name or a partial backup name, or you can filter the backup list by clicking the filter icon and selecting a date and time range, selecting whether you want backups that contain VMware Snapshots, whether you want mounted backups, and the location. Click **OK** to return to the wizard.

5. On the **Select Scope** page, select **Entire virtual machine** in the **Restore scope** field, then select the restore location, and then enter the Destination ESXi host information where the backup should be mounted.

   The restore destination can be any ESXi host that has been added to SnapCenter. This option restores the contents of the selected backup in which the VM resided from a Snapshot with the specified time and date. The **Restart VM** check box is checked if you select this option and the VM will be powered on.

   If you are restoring a VM in an NFS datastore onto an alternate ESXi host that is in an ESXi cluster, then after the VM is restored, it is registered on the alternate host.

6. On the **Select Location** page, select the location of the backup that you want to restore from (primary or secondary).
7. Review the Summary page and then click **Finish**.

Restore VMDKs from backups

You can restore existing VMDKs, or deleted or detached VMDKs, from either a primary or secondary backup of traditional VMs or vVol VMs.

You can restore one or more virtual machine disks (VMDKs) on a VM to the same datastore.

For improved performance of restore operations in NFS environments, enable the VMware application vStorage API for Array Integration (VAAI).

Before you begin

- A backup must exist.

  You must have created a backup of the VM using the SnapCenter Plug-in for VMware vSphere.

- The VM must not be in transit.

  The VM that you want to restore must not be in a state of vMotion or Storage vMotion.

About this task

- If the VMDK is deleted or detached from the VM, then the restore operation attaches the VMDK to the VM.
- A restore operation might fail if the storage tier of the FabricPool where the VM is located is unavailable.
- Attach and restore operations connect VMDKs using the default SCSi controller.
  However, when VMDKs that are attached to a VM with a NVMe disk are backed up, the attach and restore operations use NVMe controller if available.

Steps

1. In the VMware vSphere client GUI, click **Menu** in the toolbar, and then select **VMs and Templates** from the drop-down list.
2. In the left navigator pane, right-click a VM, then select **SnapCenter Plug-in for VMware vSphere** in the drop-down list, and then select **Restore** in the secondary drop-down list.
3. In the **Restore** wizard, on the Select Backup page, select the backup copy that you want to restore from.

   You can search for a specific backup name or a partial backup name, or you can filter the backup list by clicking the filter icon and selecting a date and time range, selecting whether you want backups that contain VMware Snapshots, whether you want mounted backups, and primary or secondary location. Click **OK** to return to the wizard.

4. On the **Select Scope** page, select the restore destination.

To restore to…	Specify the restore destination…
The original datastore	Select **Particular disk** from the drop-down list and then click **Next**. In the Datastore selection table, you can select or unselect any VMDKs.
An alternate datastore in an alternate location	Click the destination datastore and select a different datastore from the list.

5. On the **Select Location** page, select the Snapshot that you want to restore (primary or secondary).
6. Review the Summary page and then click **Finish**.
7. Optional: Monitor the operation progress by clicking **Recent Tasks** at the bottom of the screen.
8. Refresh the screen to display updated information.

Restore the most recent backup of the MySQL database

You can use the maintenance console to restore the most recent backup of the MySQL database (also called an NSM database) for the SnapCenter Plug-in for VMware vSphere.

Steps

1. Open a maintenance console window.

   Access the Maintenance Console.

2. From the Main Menu, enter option **1) Application Configuration**.
3. From the Application Configuration Menu, enter option **6) MySQL backup and restore**.
4. From the MySQL Backup and Restore Configuration Menu, enter option **4) Restore MySQL backup**.
5. At the prompt “Restore using the most recent backup,” enter **y**, and then press **Enter**.

   The backup MySQL database is restored to its original location.

Restore a specific backup of the MySQL database

You can use the maintenance console to restore a specific backup of the MySQL database (also called an NSM database) for the SnapCenter Plug-in for VMware vSphere virtual appliance.

Steps

1. Open a maintenance console window.

   Access the Maintenance Console.

2. From the Main Menu, enter option **1) Application Configuration**.
3. From the Application Configuration Menu, enter option **6) MySQL backup and restore**.
4. From the MySQL Backup and Restore Configuration Menu, enter option **2) List MySQL backups**, and then make a note of the backup you want to restore.
5. From the MySQL Backup and Restore Configuration Menu, enter option **4) Restore MySQL backup**.
6. At the prompt “Restore using the most recent backup,” enter **n**.
7. At the prompt “Backup to restore from,” enter the backup name, and then press **Enter**.

   The selected backup MySQL database is restored to its original location.

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