SnapManager for Hyper-V Documentation

SnapManager for Hyper-V

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Welcome to the SnapManager for Hyper-V Information Library.

Release notes

The SnapManager for Hyper-V Release Notes describe new features, upgrade notes, fixed issues, known limitations, and known issues.

For more information, see the SnapManager for Hyper-V 2.1.4 Release Notes.

What SnapManager for Hyper-V is

SnapManager for Hyper-V provides you with a solution for data protection and recovery for Microsoft Hyper-V virtual machines (VMs) residing on storage systems running ONTAP.

You can perform application-consistent and crash-consistent dataset backups according to dataset protection policies set by your backup administrator. You can also restore VMs from these backups. Reporting features enable you to monitor the status of the backups and get detailed information about your backup and restore jobs.

What you can do with SnapManager for Hyper-V

SnapManager for Hyper-V enables you to back up and restore multiple virtual machines across multiple hosts. You can create datasets and apply policies to them to automate backup tasks such as scheduling, retention, and replication.

You can perform the following tasks with SnapManager for Hyper-V:

- Group virtual machines into datasets that have the same protection requirements and apply policies to those datasets
- Back up and restore dedicated and clustered virtual machines residing on storage systems running ONTAP software
- Back up and restore virtual machines hosted on Cluster Shared Volumes (CSVs)
- Automate dataset backups using scheduling policies
- Perform on-demand backups of datasets
- Retain dataset backups for as long as you need them, using retention policies
- Update the SnapMirror destination location after a backup successfully finishes
- Specify custom scripts to run before or after a backup
- Restore virtual machines from backups
- Monitor the status of all scheduled and running jobs
- Manage hosts remotely from a management console
- Provide consolidated reports for dataset backup, restore, and configuration operations
- Perform a combination of crash-consistent and application-consistent backups
- Perform disaster recovery operations using PowerShell cmdlets
- Perform cluster operating system (OS) rolling upgrades

List of SnapManager for Hyper-V limitations

It is important that you understand that some features are not supported in SnapManager 2.1 and later for Hyper-V .

- Canceling, suspending, and resuming backup and restore jobs is not supported.

- Policies cannot be copied across datasets.
- Role-based access control (RBAC) is not supported.
- Excluding virtual hard disks (VHDs) from a SnapManager for Hyper-V Volume Shadow Copy Service (VSS) backup job is not supported.
- Single file restore from a backup copy is not natively supported.
- Cross-version management is not supported; for example, you cannot use Client Console 1.2 to manage SnapManager 2.0 for Hyper-V, and vice versa.
- If you start to restore a Hyper-V virtual machine (VM), and another backup or restoration of the same VM is in process, your attempt fails.
- Restoring a deleted VM from a crash-consistent backup copy is supported only for Windows Server 2012.
- Running different versions of SnapManager for Hyper-V on different nodes of a failover cluster is not supported.
- Reverting from SnapManager 2.1 for Hyper-V is not supported.
- Backup or restore jobs of virtual machines are not supported when users change the cluster ownership node while backing up or restoring.
- Mixed-mode backups (of virtual machines containing files on CSV 2.0 volumes and SMB shares) are not supported.
- After you migrate the storage of a VM to another location using Windows Server 2012, you cannot restore on that VM from backup copies made before the migration.
- For Windows Server 2012, you cannot perform a backup job where the backup set includes both a Cluster Shared Volume (CSV) and a shared disk.
- When configuring Manage Storage Connection Settings, you cannot use Remote Procedure Call (RPC) protocol; you can use only HTTP and HTTPS protocols.
- Creating an application-consistent backup of a virtual machine (VM) that is stored on NAS storage is not supported by the Windows Server 2012 Hyper-V operating system.

  This limitation does not apply to crash-consistent backups. It only applies to the free Hyper-V server, which does not include file share shadow copy services.

- The virtual switch name for a VM must be exactly the same for the primary and secondary Windows hosts.
- Backup and restore operations require a FlexClone license when Hyper-V VMs are deployed over SMB 3.0.
- The maximum supported LUN size for restore operations is 14 TB.
- The following Hyper-V Servers do not support application-consistent backups of VMs:
  - Microsoft Hyper-V Server 2016 (free edition)
  - Microsoft Hyper-V Server 2019 (free edition)

    Note that this limitation does not apply to crash-consistent backups or the following Windows platforms:

  - Microsoft Windows Server 2016 Standard and Datacenter Edition
  - Microsoft Windows Server 2019 Standard and Datacenter Edition

Data management concepts

SnapManager for Hyper-V uses datasets and policies, which enables you to group virtual machines and then apply rules to these groups to govern their behavior. This information is useful in scenarios in which you are using SnapManager for Hyper-V to schedule a backup and to specify a retention policy for the backup.

- **datasets**

  A dataset is a group of virtual machines (VMs) that enables you to protect data using retention, scheduling, and replication policies. You can use datasets to group virtual machines that have the same protection requirements. A VM can be part of multiple datasets.

- **Hyper-V parent hosts**

  Hyper-V parent hosts are physical servers on which the Hyper-V role is enabled. Hosts that contain virtual machines are added to SnapManager for Hyper-V for protection and recovery. SnapManager for Hyper-V must be installed and running on each Hyper-V parent host.

- **unprotected resources**

  Unprotected resources are virtual machines that are not part of any dataset. You can protect these resources by adding them to a dataset.

- **virtual machines**

  A virtual machine run on a Hyper-V parent host is a representation of a physical machine, with its own operating system, applications, and hardware.

  SnapManager for Hyper-V tracks the globally unique identifier, or GUID, of the virtual machine and not the virtual machine name. If you delete a virtual machine that is protected by SnapManager for Hyper-V, and then create a different virtual machine with the same name, the new virtual machine is not protected, because it has a different GUID.

- **management consoles**

  Management consoles are computers on which SnapManager for Hyper-V is installed and running as a client. You can use management consoles to remotely manage SnapManager for Hyper-V operations on a remote Hyper-V parent host.

- **scheduling policies**

  Scheduling policies assign backup jobs for particular times, enabling you to automate the scheduling process. You can add multiple scheduling policies, which apply to all virtual machines that are dataset members. SnapManager for Hyper-V uses Windows Scheduler to create scheduled tasks.

- **retention policies**

  A retention policy is the way you manage dataset backup retention in SnapManager for Hyper-V. Retention policies determine how long to keep a dataset backup, based on either time or number of backup copies.

  The limits that you set in a retention policy ensure that your data backup does not compromise future storage capacity.

You can set the following retention periods in SnapManager for Hyper-V:

- One hour
- One day
- One week
- One month
- Unlimited

You can specify a retention period once per dataset.

After choosing how often dataset backups are deleted, you can choose to delete either backups that are older than a specified period of time or backups that exceed a maximum total.

If your system appears to retain old backups, check your retention policies. All objects being backed up that share a Snapshot copy must meet the backup deletion criteria in order for the retention policy to trigger the removal of a Snapshot copy.

- **replication policies**

  A replication policy determines whether the SnapMirror destination is updated after a successful backup operation. SnapManager for Hyper-V supports volume-based SnapMirror only. You must configure a SnapMirror relationship on the two storage systems before you attempt to perform a SnapMirror update. This is required for both the source and destination.

Related information

Data ONTAP 8.2 Data Protection Online Backup and Recovery Guide for 7-Mode

NetApp Documentation: SnapDrive for Windows (current releases)

List of requirements for installing SnapManager for Hyper-V

Your environment must meet all hardware, software, ONTAP, and licensing requirements before you can install SnapManager for Hyper-V. The installer stops if the requirements for the minimum Windows operating system and .Net 4.5 are not met.

Hyper-V parent host requirements

You must have the Hyper-V parent hosts running Windows Server 2008 R2 or higher. You must have the Hyper-V roles enabled on the parent hosts. You must have SnapDrive 7.1 for Windows or later installed on the Hyper-V parent host.

SnapManager for Hyper-V download

You must have downloaded the SnapManager for Hyper-V software from the NetApp Support Site.

Storage system requirements

The storage system must run the appropriate version of the ONTAP software. You can use either host-based or storage system licensing to install SnapManager for Hyper-V.

Licenses

You must have the appropriate licenses to run SnapManager for Hyper-V.

Credentials

You must have the appropriate credentials to install and run SnapManager for Hyper-V.

Service account and authentication requirements

You must have a service account and must meet the authentication requirements. You must be able to log in to the host using the service account, and that account must have administrative rights.

Web service port number

You must have the Web service Net.Tcp port number available. The default port number is 808. When installing SnapManager for Hyper-V on a cluster, you must make sure that the same port number is used across all nodes.

SnapManager for Hyper-V licensing for ONTAP

SnapManager for Hyper-V licensing depends on the version of ONTAP that you use.

For host-based licensing and storage-based licensing, you must use Data ONTAP 8.0 or later.

You must use Data ONTAP 8.2 or later of MultiStore (vFiler unit) for use with SnapManager for Hyper-V.

If you are using a version of Data ONTAP prior to 8.2, there are some restrictions on certain operations.

Related information

NetApp Interoperability Matrix Tool

NetApp Documentation: SnapDrive for Windows (current releases)

Hyper-V parent host requirements

Hyper-V parent hosts are physical servers on which the Hyper-V role is enabled. Host servers that contain virtual machines are added to SnapManager for Hyper-V for protection and recovery. To install and run all of the SnapManager for Hyper-V software components, you must ensure that the Hyper-V parent hosts meet minimum operating system and Hyper-V requirements.

- **Supported operating systems**

  SnapManager for Hyper-V runs on the following operating systems:

  - Windows Server 2008 R2 SP1
  - Windows Server 2012 R2
  - Windows Server 2012
  - Windows Server 2016
  - Windows Server 2019

- **Supported management console operating systems**

  Management consoles must be running the following operating systems:

  - Windows Server 2008 R2 SP1
  - Windows Server 2012 R2
  - Windows Server 2012
  - Windows Server 2016
  - Windows Server 2019

- **Hyper-V requirements**

  For more information, see the Hyper-V getting started information in the Microsoft TechNet library.

- **Internationalization support**

  SnapManager for Hyper-V has been tested on German-language and Japanese-language operating systems.

Related information

Microsoft TechNet: Hyper-V

Hotfix requirements for Windows Server environments

You must manually install hotfixes to Microsoft Windows Server operating system environments.

For Windows Server 2016 and Windows Server 2019 requirements, refer to Hyper-V on Windows Server

For Windows Server 2012, the following hotfixes are required:

- KB2770917
- KB2779768

For Windows Server 2008 R2, the following hotfixes are required:

- KB974909
- KB975354
- KB2637197

For Windows Server 2008 R2 SP1, the following hotfixes are required:

- KB2263829
- KB2637197

These are the minimum patch levels.

License requirements

To run SnapManager for Hyper-V, you must select either host-based or storage system licenses during the installation of the licenses.

SnapManager suite license

A SnapManager suite license is required on the Windows host system. You can choose either host-based licensing or storage system licensing.

Per server license

This is also known as *host-based licensing*. If you select host-based licensing, you must provide a SnapManager suite license key during installation, which you can change later if you need to. You can change the license key after installation by clicking **License settings** in the SnapManager for Hyper-V Welcome window. Each parent host requires a SnapManager suite license.

Per storage system license

This is also known as *storage system licensing*. If you select storage system licensing, you must add the SnapManager suite license to all storage systems to run the SnapManager for Hyper-V operations.

Per client system license

You should use this licensing option when you are installing the management console.

Requirements for using the Remote Host Install wizard

Before using the Remote Host Install wizard to remotely install SnapManager for Hyper-V on a host or node, you must gather some required host details.

You can access the Remote Host Install wizard from the Actions pane in the Protection window. It enables you to remotely install or uninstall SnapManager for Hyper-V on standalone and cluster nodes or hosts.

If you add a host that does not have SnapManager for Hyper-V, the Add Host wizard prompts you to install it on the host.

- **Install or Uninstall**

  You must choose whether to use the wizard to remotely install or uninstall SnapManager for Hyper-V on hosts or nodes.

- **Per Server or Per Storage**

  You must choose whether to install SnapManager for Hyper-V on a per-server or a per-storage basis.

- **Host Name/IP**

  You must provide the name or IP address of the host on which you want to install SnapManager for Hyper-V. You can select **Browse…** to browse for the host or node.

- **Port**

  You must provide the port number to connect to the host or node.

- **SMHV License Key**

  You must provide the SnapManager for Hyper-V license key.

- **SDW License Key**

  You must provide the SnapDrive for Windows license key.

- **User Name**

  You must provide the host or node administrator-level user name using the format *domain\username*.

- **Password**

  You must enter the host or node password.

- **Confirm Password**

  You must reenter the host or node password for confirmation.

Install SnapManager for Hyper-V

Before you install SnapManager for Hyper-V, it is a good practice to decide how you want to configure your environment, which includes the installation of SnapDrive for Windows on all Hyper-V hosts prior to the installation of SnapManager for Hyper-V.

Download SnapManager for Hyper-V

Before installing SnapManager for Hyper-V, you must download the software package from the NetApp Support Site.

What you'll need

You must have login credentials for the NetApp Support Site.

Steps

1. Log in to the NetApp Support Site.
2. Go to the Download Software page.
3. From the drop-down list, select the operating system on which you are installing SnapManager for Hyper-V and click **Go!**
4. Click **View & Download** for the software version you want to install.
5. On the Description page, click **Continue**.
6. Review and accept the license agreement.
7. On the Download page, click the link for the installation file.
8. Save the SnapManager for Hyper-V file to a local or network directory.
9. Click **Save File**.
10. Verify the checksum to ensure that the software downloaded correctly.

Installation order for SnapDrive for Windows and SnapManager for Hyper-V

You must install SnapDrive for Windows on all hosts before installing SnapManager for Hyper-V. If the hosts are members of a cluster, all nodes in the cluster require the installation of SnapDrive for Windows.

When SnapManager for Hyper-V starts, it communicates with SnapDrive for Windows to get the list of all virtual machines running on a host. If SnapDrive for Windows is not installed on the host, this API fails and the SnapManager for Hyper-V internal cache does not update with the virtual machine information.

You might receive the following message: `Error :SnapManager for Hyper-V is not licensed on the host or in the Storage System, backup is aborted:.`

Install SnapManager for Hyper-V

You can install SnapManager for Hyper-V so that you are able to back up and restore

your data. You should install SnapDrive for Windows before installing SnapManager for Hyper-V.

What you'll need

Your existing data must be backed up, and you must have the following information ready:

- License key
- Login credentials
- Port number (default: 808; must match the SnapDrive for Windows installation port number)

Steps

1. Double-click the SnapManager for Hyper-V executable file to launch the SnapManager for Hyper-V installer.
2. Select the installation location and click **Next**.
3. Complete the steps in the SnapManager for Hyper-V **Install Shield** wizard.
4. Click **Install** on the **Ready to Install** page.
5. Review the summary of your selections and click **Finish**.

Related information

Hotfix requirements for Windows Server environments

Remotely install or uninstall SnapManager for Hyper-V on nodes or hosts

The Remote Host Install wizard enables you to remotely install or uninstall SnapManager for Hyper-V on standalone and cluster hosts or nodes. You can remotely install SnapManager for Hyper-V if you want to install the software on all nodes of a cluster at one time instead of installing it on each individual node.

What you'll need

You must already have SnapManager for Hyper-V installed on a host node to use the Remote Host Install wizard.

Steps

1. From the navigation pane, click **Protection**.
2. From the Actions pane, click **Remote Host Install**.
3. Run the **Remote Host Install** wizard.

Result

When you run the Remote Host Install wizard, the host node pushes SnapManager for Hyper-V installation or uninstallation to other nodes or hosts in the cluster.

List and description of command line switches for silent installation

You can use command line switches to perform a silent installation, which enables you to use an installation script to install SnapManager for Hyper-V.

The following table provides a list of values and describes each of the available command-line installation switches.

Switch	Value	Description
SILENT_MODE=	1	Enables SnapManager for Hyper-V to properly execute the unattended install feature. This switch is required for first-time installations, upgrades, and complete uninstallations.
REINSTALLMODE=		Specifies the reinstall mode to be used.
REINSTALLMODE=	v	Indicates that the installation is run from the source package and that the local package is cached. Do not use this option for first-time installations of SnapManager for Hyper-V. Reinstalls all files regardless of version, date, or checksum value.
REINSTALLMODE=	a	Reinstalls SnapManager for Hyper-V files if older versions are present or if files are missing.
REINSTALLMODE=	o	Indicates that all SnapManager for Hyper-V required registry entries from HKEY_LOCAL_MACHINE and HKEY_CLASSES_ROOT should be rewritten.
REINSTALLMODE=	m	Indicates that all SnapManager for Hyper-V required registry entries from HKEY_CURRENT_USER and HKEY_USERS should be rewritten.
REINSTALLMODE=	u	Reinstalls all shortcuts and recaches all icons, overwriting any existing shortcuts and icons.

Switch	Value	Description
REINSTALL=	ALL	Reinstalls all SnapManager for Hyper-V features.
/Li	filename	Specifies that a SnapDrive installation log should be generated.
SMHV_LICENSE=	license	Specifies the appropriate and valid SnapManager for Hyper-V license.
INSTALLDIR=	target installation directory	Specifies the target installation directory to which SnapManager for Hyper-V is installed. This switch is required only when installing SnapManager for Hyper-V for the first time.
SVCUSERNAME=	DOMAIN\username	Specifies the domain and user name that SnapManager for Hyper-V uses during the unattended installation.
SMHVSRV_PASSWORD=	password	Specifies the password for the SMHVSRV_PASSWORD user.
SMHVSRV_CONFIRMUSERPASSWORD=	password	Confirms the password for the SMHVSRV_CONFIRMUSERPASSWORD user.
SMHV_WEBSRV_TCP_PORT	port number	Specifies which port the SnapManager for Hyper-V web service uses for Net.Tcp. The default port is 808.

The following syntax shows a fresh installation:

```
setup.exe /s /v"/qn SILENT_MODE=1 /L*v SMHVInstall.log SVCUSERNAME=Domain\User
Name SMHVSRV_PASSWORD=password SMHVSRV_CONFIRMUSERPASSWORD=password"
```

The following syntax shows an upgrade:

```
setup.exe /s /v"/qn REINSTALLMODE=vamus REINSTALL=ALL SILENT_MODE=1 /L*v
SMHVUpgrade.log SVCUSERNAME=Domain\User Name SMHVSRV_PASSWORD=password
SMHVSRV_CONFIRMUSERPASSWORD=password"
```

The following syntax shows an uninstallation:

```
Setup.exe /s /x /v"/qn SILENT_MODE=1 /L*v SMHVuninstall.log"
```

Uninstall SnapManager for Hyper-V on Windows

You can uninstall SnapManager for Hyper-V from the Windows host when you no longer need the software. You must run the uninstallation program interactively.

Uninstall SnapManager for Hyper-V

You can uninstall SnapManager for Hyper-V from the Windows server using the Control Panel uninstall application for your operating system. You can remotely uninstall SnapManager for Hyper-V on standalone and cluster nodes or hosts using the Remote Host Install wizard from the Actions pane in the Protection window.

About this task

Uninstalling SnapManager for Hyper-V deletes all datasets and policies. You cannot recover that information after the uninstallation is complete. If you want to save your datasets and host configuration information, you can export them before you uninstall.

steps

1. On the Windows server where you installed SnapManager for Hyper-V, navigate to the Control Panel and select **Control Panel › Programs › Programs and Features**.
2. Scroll through the list of installed programs to find SnapManager for Hyper-V.
3. Click the name of the program and then click **Uninstall**.
4. When prompted to confirm uninstallation, click **Yes**.

Related information

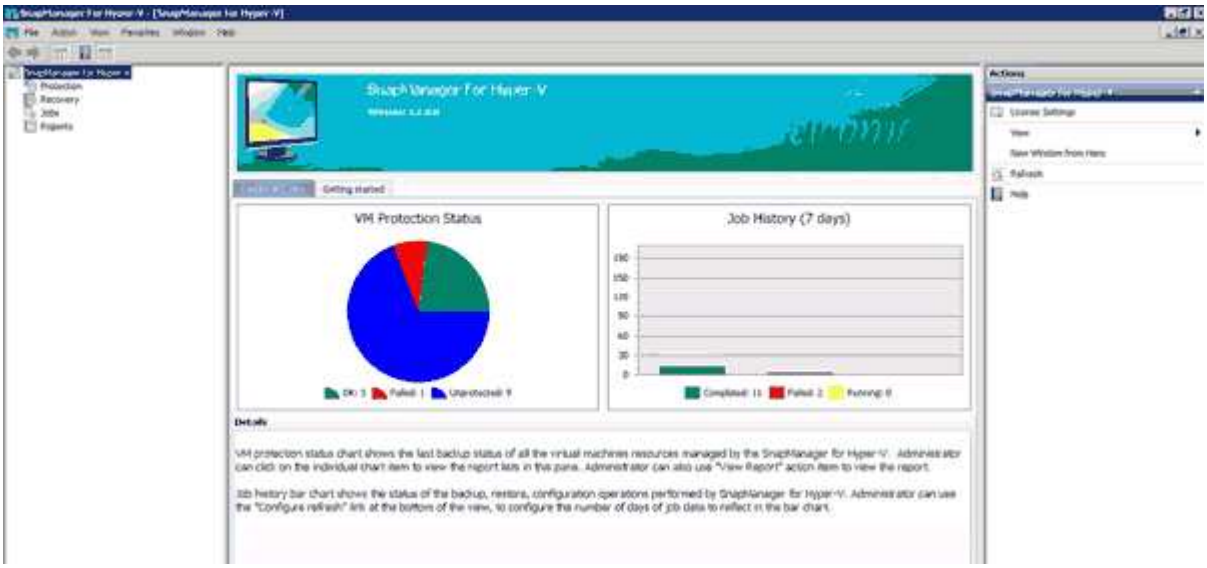
Importing or exporting host and dataset configuration information

Configure SnapManager for Hyper-V

After you install SnapManager for Hyper-V, you can configure and manage your hosts and virtual machines by adding policies to protect and restore your data.

Dashboard settings

The SnapManager for Hyper-V dashboard displays an overview of resources that are currently being protected, as well as those that are not protected. You can select different segments of either the VM Protection Status pie chart or the Job History bar graph to view general information about the status of your jobs, resources, and history.



- **VM protection status**

  When you select a segment in the VM Protection Status pie chart, you can view information about the protection status of the virtual machines in the Details pane. The descriptions for valid values are as follows:

  - **OK**

    Displays the most recent successful backup of all virtual machines.

  - **Failed**

    Displays the most recent failed backup of each virtual machine.

  - **Unprotected**

    Displays the virtual machines that do not belong to any datasets and are therefore unprotected.

- **Job history**

  When you select a segment in the Job History bar graph, you can view, in the Details pane, the history of completed, failed, and running jobs over a specified period of time. You can change the length of time that job details are displayed in the Job History bar graph. The default value is seven days.

- **Configure refresh**

  You can change how often the dashboard refreshes the displayed information by using the **Configure refresh** button. The default value is 10 minutes.

Configure hosts

You can add, view, and remove Hyper-V parent hosts or clusters by using SnapManager for Hyper-V.

Requirements for adding a Hyper-V parent host or host cluster

You must have all necessary configuration information available before adding a parent host or host cluster to SnapManager for Hyper-V.

SnapManager for Hyper-V installation

SnapManager for Hyper-V must be installed on the Hyper-V host that you want to add.

If you do not have SnapManager for Hyper-V installed, you are prompted to run the Remote Host Install wizard. The same SnapManager for Hyper-V version must be installed on each cluster node.

Configuration settings

The Hyper-V parent host that you want to add must be configured for SnapManager for Hyper-V.

If the SnapInfo settings, report directory settings, and notification settings are not configured for SnapManager for Hyper-V, you can configure them after you add the host, using the Configuration wizard.

Initially, the **Manage Storage Connections** tab is empty. You can add the storage connections from the **Manage Storage Connections** tab, but the newly added connections are visible from SnapDrive for Windows (SDW) Transport Protocol Settings (TPS).

You must configure the backup repository and report directory settings to add and manage virtual machines by using SnapManager for Hyper-V. Notification settings are optional.

Virtual machines and ONTAP LUNs

All of the files associated with the virtual machines, including configuration files, Snapshot copy file location, and VHDs, must reside on ONTAP LUNs.

This is necessary to perform a successful backup.

> If you change a virtual machine Snapshot file location to a different ONTAP LUN after creating the virtual machine, you should create at least one virtual machine Snapshot copy using Hyper-V Manager before making a backup by using SnapManager for Hyper-V. If you change the Snapshot copy file location and do not make a virtual machine Snapshot copy before making a backup, the backup operation could fail.

Dedicated and clustered virtual machines

Your virtual machines can be dedicated or part of a cluster.

If you add a single host, SnapManager for Hyper-V manages the dedicated virtual machines on that host. If you add a host cluster, SnapManager for Hyper-V manages the shared virtual machines on the host cluster. Virtual machines residing on SAN and NAS that belong to the same host cluster should not exist in the same dataset. Adding these types of resources to a single dataset can cause the dataset backup to fail.

For application-consistent backups, dataset backups of clustered virtual machines take longer to complete when the virtual machines run on different nodes of the cluster. When virtual machines run on different nodes, separate backup operations are required for each node in the cluster. If all virtual machines run on the same node, only one backup operation is required, resulting in a faster backup.

Number of virtual machines

If your Hyper-V host or host cluster has more than 1,000 virtual machines, you must increase the value of the maximum `Elements In Cache Before Scavenging` property in the `SnapMgrServiceHost.exe.config` file for Hyper-V Cache Manager. This value should be greater than or equal to the number of Hyper-V hosts running on a stand-alone host or cluster. The value should be changed on each node of the cluster, and the SnapManager for Hyper-V service must be restarted after changing this value. You must manually edit the `SnapMgrServiceHost.exe.config` file using a text editor.

```
<cacheManagers>
…
      <add name="HyperV Cache Manager"

type="Microsoft.Practices.EnterpriseLibrary.Caching.CacheManager,
                           Microsoft.Practices.EnterpriseLibrary.Caching"
                        expirationPollFrequencyInSeconds="60"
                        maximumElementsInCacheBeforeScavenging="1200"
                        numberToRemoveWhenScavenging="10"
                        backingStoreName="inMemory" />
…
</cacheManagers>
```

SnapManager for Hyper-V service account requirements

When using SnapManager for Hyper-V to manage a Hyper-V host cluster, the SnapManager for Hyper-V and SnapDrive for Windows service accounts must be domain user accounts with local administrator rights on the server.

SnapManager for Hyper-V application-consistent backups run on the cluster node where the virtual machine is running. If Cluster Shared Volumes (CSVs) used by the virtual machine are not owned by the same node, virtual machine backups can fail when the SnapManager for Hyper-V service is using a local system account (even though the account has administrator privileges). In this case, SnapManager for Hyper-V cannot detect that the virtual machine files are residing on a CSV, causing the backup to fail.

For remote Volume Shadow Copy Service (VSS) operations with virtual machines stored on clustered Data ONTAP SMB 3.0 continuous availability (CA) shares to work properly, you must grant full control rights to the share for the SnapDrive for Windows service accounts and a minimum read-level access to the SnapManager for Hyper-V web service account.

Related information

Microsoft TechNet: Hyper-V

Add a Hyper-V parent host or host cluster

You can add a Hyper-V parent host or host cluster to back up and restore your virtual machines.

Steps

1. From the navigation pane, click **Protection**.
2. From the Actions pane, click **Add host**.
3. Run the **Add host** wizard.

After you finish

When you add a host to a cluster, the information about the new host is not automatically displayed in the GUI. Manually add the host information to the xml file in the installation directory.

SnapManager for Hyper-V must be installed on each cluster node. If you do not have SnapManager for Hyper-V installed, you are prompted to run the Remote Host Install wizard.

Manage storage connection settings

After you have added a host, you should enter all of the storage connections (SnapDrive for Windows and SnapManager for Hyper-V) for using Manage Storage Connection Settings in **Protection › Dataset Management**.

What you'll need

You must have at least one host added to SnapManager for Hyper-V before you can manage your storage connection settings.

Steps

1. From **Protection › Dataset Management**, select the **Manage Storage Connection** Settings.
2. Add the storage connections.

   All storage connections can be viewed in SnapDrive for Windows TPS.

View a Hyper-V parent host or host cluster

You can view configuration information about a specific Hyper-V parent host or host cluster so that you can monitor its status.

Steps

1. From the navigation pane, click **Protection › Hosts**.
2. Select the host or host cluster that you want to view.

   The Details pane displays the host or host cluster name, domain, cluster members (if applicable), and configuration messages. If you select a host that is not configured, the Details pane displays information about what is not configured.

View a virtual machine

From the Virtual Machine tab and VHD tab of the Details pane for a virtual machine, you can view information about and monitor the status of that machine.

Steps

1. From the navigation pane, click **Protection › Hosts › Protection › Datasets**.
2. Select the dataset or host to which the virtual machine belongs.
3. Select the appropriate virtual machine.

Results

The Virtual Machine tab displays the name, GUID, and state of the selected virtual machine.

The VHD tab displays system disk, mountpoint, VHD full path, LUN path, storage system name, serial number, and volume name associated with the selected virtual machine.

Migrate a Hyper-V virtual machine for SnapManager for Hyper-V operations

SnapManager for Hyper-V does not contain a migration wizard to help you migrate virtual machines (VMs) from non-ONTAP storage to ONTAP storage so that you can use them with SnapManager for Hyper-V. Instead, you must manually export and import the VM by using Server Manager.

Import or export host and dataset configuration information

Although you should manage a host from only one management console, if you need to do so from multiple consoles, you can import and export host and dataset configuration information from one remote management console to another to ensure data consistency.

About this task

You should not import or export configuration information to the directory on which SnapManager for Hyper-V is installed. If you uninstall SnapManager for Hyper-V, this file is lost.

> ⓘ You can use the Import and Export wizard to change host and dataset configuration settings to a previously exported setting. If you perform this operation in a clustered environment, you must import the settings on all nodes in the cluster so that all host and dataset configurations are the same.

Steps

1. From the navigation pane, click **Protection**.
2. From the **Actions** pane, click **Import and export**.

The Import and Export wizard appears.

3. Complete the steps in the wizard to export host and dataset configuration information from one management console to another.

   The export file is static and current only at the time that export file was executed.

4. Complete the steps in the wizard to import host and dataset configuration information to the destination management console.

Remove a Hyper-V parent host or parent host cluster

You can remove a Hyper-V parent host or parent host cluster when you no longer want to manage it using SnapManager for Hyper-V.

Steps

1. From the navigation pane, click **Protection › Hosts**.
2. Select the host or host cluster you want to remove.
3. In the **Actions** pane, click **Remove**.

   You can select **Delete all VM backups** to delete any virtual machine backups associated with the host.

   The Hyper-V parent host or host cluster is removed from SnapManager for Hyper-V management but is not deleted permanently. The virtual machines belonging to that host or host cluster are also removed from any datasets to which they belonged.

Event notification settings

You can configure event notification settings to send e-mail, Syslog, and AutoSupport messages if an event occurs.

If event notification settings are not configured when a Hyper-V parent host is added to SnapManager for Hyper-V, you can configure those settings later, using the Configuration wizard.

You can change the event notification settings by using the Configuration wizard even after the host has been added to SnapManager for Hyper-V.

You can configure the event notification settings before you can add virtual machine resources to a dataset.

Configure email notifications

Multiple email recipients for notifications must be separated by commas.

When you configure multiple email recipients for email notifications in SnapManager for Hyper-V, separate each recipient with a comma. This requirement differs from SnapManager for SQL in which each email notification recipient must be separated by semicolons.

Report path settings

You can configure report path settings so that you can store reports for SnapManager for

Hyper-V operations. You must configure the report path settings before you can add virtual machine resources to a dataset.

If the report settings are not configured when a Hyper-V parent host is added to SnapManager for Hyper-V, you can configure (and even change) those settings later, using the Configuration wizard.

If you configure the report path settings for a parent host cluster, you must manually create the report directory on each cluster node. The report path should not reside on a cluster shared volume (CSV) or a shared LUN.

Related information

Microsoft TechNet: Use Cluster Shared Volumes in a Failover Cluster

Configure SnapInfo directory settings

You must configure the SnapInfo settings for a host before you can add the virtual machine resources within that host to a dataset. If the SnapInfo settings are not configured when a Hyper-V host is added to SnapManager for Hyper-V, you can configure those settings later, using the Configuration wizard or the **SnapInfo settings** action.

You can also change the SnapInfo settings after the host has been added to SnapManager for Hyper-V. However, if you change the SnapInfo settings, you must manually move all files to the new location; SnapManager for Hyper-V does not update them automatically. If you do not move the files, you cannot restore from or manage the backup copy, and SnapManager for Hyper-V does not list the backup copy.

Starting with SnapManager for Hyper-V, the SnapInfo path can reside on Cluster Shared Volumes (CSV) and it can also reside on SMB shares for Windows Server 2012.

Related information

Microsoft TechNet: Use Cluster Shared Volumes in a Failover Cluster

Set up a SnapInfo LUN

You must add a SnapInfo LUN in SnapManager for Hyper-V to store the dataset backup metadata. The SnapInfo path must reside on a ONTAP LUN, because SnapManager for Hyper-V makes a backup of the SnapInfo copy after a regular backup occurs.

What you'll need

The SnapInfo path can reside on a Cluster Shared Volume (CSV) if you are running a Windows Server 2012 cluster. If you manage dedicated virtual machines, the SnapInfo location must be to a dedicated ONTAP LUN. If you manage shared virtual machines, the SnapInfo location must be to a shared ONTAP LUN.

Steps

1. Create a new shared disk by using SnapDrive for Windows.
   a. When given the option to choose a Microsoft Cluster Services Group, select the option **Create a new cluster group.**
   b. Name the group `smhv_snapinfo` and complete the process.
2. Open Windows Failover Clustering (WFC) and verify that the new group is online.

3. Install SnapManager for Hyper-V on each node in the cluster.
4. Run the **Configuration** wizard and apply the SnapInfo configuration settings to all nodes in the cluster.
   a. Select one of the hosts.
   b. From the **Navigation** pane, click **Protection › Hosts**.
   c. From the Actions pane, run the **Configuration** wizard.
   d. Apply the SnapInfo settings to the newly created LUN.

Results

When the Configuration wizard is run, the SnapInfo configuration settings are replicated to all nodes in the cluster. **Related information**

Error: Snapdrive SDDiscoveryFileSystemListInfo response is null

Change the SnapInfo directory path

You can control SnapInfo directory path settings by using the Configuration wizard or the **SnapInfo settings** action.

About this task

SnapInfo directory settings are specified on the host level in SnapManager for Hyper-V. SnapManager for Hyper-V supports NAS (SMB) hosts and SAN hosts. For SAN hosts, the SnapInfo settings are applied on the volume level; for NAS hosts, the SnapInfo settings are applied on the SMB share level.

If you have added the IP address of the storage system to SnapDrive for Windows TPS, the storage settings from SnapDrive for Windows are automatically populated when you run the configuration wizard in SnapManager for Hyper-V. If you do not have SnapDrive for Windows TPS configured, you must specify the IP address of the storage system in the Manage Storage Connections tab in SnapManager for Hyper-V.

Steps

1. From the navigation pane, click **Protection › Hosts**.
2. Select the host for which you want to change the SnapInfo directory path.
3. From the **Actions** pane, select **SnapInfo settings**.

   The **SnapInfo Settings** dialog box opens.

4. Select the storage type from the options shown:

Option	Description
SAN	This is the default storage type.
NAS	Use this option for SMB shares.

5. Click **Browse**.

   The Browse for Folder window opens.

6. Select your SnapInfo storage system (SAN) or volume (NAS) and click **OK**.

The hosts that display are NAS shares corresponding to the storage systems that have been registered using the `Manage Storage Connections` option at the host level. If you do not see the shares you are looking for, ensure that `Manage Storage Connections` has been configured correctly.

7. From the **SnapInfo Settings** window, click **OK**.

Configure datasets

You can create, modify, view, and delete datasets based on your protection needs.

Requirements for creating a dataset

You must meet specific requirements when you want to create datasets to protect your data. You must first add the host or host cluster to SnapManager for Hyper-V and then add virtual machines to the host or host cluster.

Dataset name and description

When naming the dataset, you should use a naming convention at your site to help administrators locate and identify datasets, limited to these characters:

- a to z
- A to Z
- 0 to 9
- _ (underscore)
- - (hyphen)

Dataset resources

You must add the host or host cluster to SnapManager for Hyper-V before adding resources such as virtual machines to the dataset.

You can add hosts, dedicated virtual machines, or shared virtual machines to a dataset. If you add a host, you add all of the virtual machines that belong to the host. You can also add virtual machines belonging to different hosts to the dataset. Virtual machines can belong to multiple datasets.

Dedicated and shared virtual machines that belong to the same host cluster should not exist in the same dataset. Adding these types of resources to a single dataset can cause the dataset backup to fail.

Virtual machines and ONTAP LUNs

All of the files associated with the virtual machines, including configuration files, Snapshot copies, and VHDs, must reside on ONTAP LUNs.

Dataset resource consumption

Only one application-consistent backup operation can occur on a host at any given time. If the same virtual machines belong to different datasets, you should not schedule an application-consistent backup of the datasets at the same time. If this occurs, one of the backup operations fails.

When creating a dataset, you should select all virtual machines that reside on a particular ONTAP LUN. This enables you to get all backups in one Snapshot copy and to reduce the space consumption on the storage system.

Create a dataset

You can create datasets for virtual machine resources that share the same protection requirements. You can add virtual machines to multiple datasets, as necessary.

What you'll need

You must have the following information available:

- Dataset name and description
- Virtual machine resources you plan to add to the dataset

About this task

Dedicated and shared disks that belong to the same host cluster should not be placed in the same dataset. Adding these types of resources to a single dataset can cause the dataset backup to fail. You can have only one type of VM per dataset: NAS or SAN. You cannot have mixed-mode datasets.

The Validate Dataset check box is selected by default. SnapManager for Hyper-V checks for any configuration errors in all VMs during the creation or modification of a dataset. You must ensure that the check box is not selected if you do not want to enable validation of the dataset.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. From the Actions pane, click **Create dataset**.
3. Complete the pages of the wizard.

After you finish

You should next add protection policies to the dataset that you created.

Modify a dataset

After you have created a dataset, you can modify the dataset description and the resources associated with the dataset.

About this task

The Validate Dataset check box is selected by default. SnapManager for Hyper-V checks for any configuration errors in all VMs during the creation or modification of a dataset. You must ensure that the check box is not selected if you do not want to enable validation of the dataset.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset that you want to modify.
3. From the Actions pane, click **Modify dataset**.
4. Complete the steps in the wizard.

View a dataset

You can view the virtual machines associated with a dataset.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Expand the tree view to look at the virtual machines that belong to the dataset.

Delete a dataset

You can delete a dataset as your protection needs change.

About this task

Deleting a dataset does not delete the virtual machines that belong to the dataset. After the dataset is deleted, the virtual machines that belonged to it become unprotected if they do not belong to another dataset.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset that you want to delete.
3. From the Actions pane, click **Delete** and click **OK** to delete the dataset.

   Deleting the dataset also deletes the scheduled jobs from all hosts that are members of the dataset. SnapManager for Hyper-V no longer manages the retention of backups when you delete the dataset, even if it is re-created with the same name.

Results

SnapManager for Hyper-V no longer protects the resources associated with the deleted dataset unless those resources belong to another dataset.

configure policies

You can add, modify, or delete policies associated with datasets so that you can protect your data.

Requirements for adding policies to a dataset

You must meet specific requirements when you want to apply policies to datasets for backup or restore functionality. You can add multiple retention, scheduling, and replication policies to the same dataset.

Policy name and description

A policy name and description, limited to these characters:

- a to z
- A to Z
- 0 to 9

- _ (underscore)
- - (hyphen)

Backup retention limits

You must decide the minimum length of time that you want to keep your hourly, daily, weekly, or monthly backup copies before they are deleted.

Backups with a retention type of “Unlimited” are not deleted.

You can keep backups based on either time or a specified number. For example, you can keep the 10 most current backups, or you can delete backups older than 15 days.

If your system appears to retain old backups, you should check your retention policies. All objects being backed up that share a Snapshot copy must meet the backup deletion criteria for the retention policy to trigger the removal of a Snapshot copy.

Scheduled backup job name

You must assign a name to the scheduled backup job.

Permission to schedule backups

You must have appropriate credentials to schedule dataset backups.

Number of possible datasets scheduled for backup simultaneously

If the same virtual machines belong to different datasets, you should not schedule a backup of more than one dataset containing the same VM at the same time. When this occurs, one of the backup operations fails. Only one backup operation can occur on a host at any given time.

Type of scheduled backup

You can perform either an application-consistent or a crash-consistent backup.

Backup options

You must choose if you want to update the SnapMirror destination location after the backup is complete.

The update succeeds only if you already have SnapMirror configured, and if the LUNs containing the virtual machines in the dataset belong to the source SnapMirror volume.

The default behavior of SnapManager for Hyper-V is to fail a backup if one or more virtual machines cannot be backed up online. If a virtual machine is in the saved state or shut down, you cannot perform an online backup. In some cases, virtual machines are in the saved state or shut down for maintenance, but backups still need to proceed, even if an online backup is not possible. To do this, you can move the virtual machines that are in the saved state or shut down to a different dataset with a policy that allows saved state backups.

You can also select the Allow saved state VM backup check box to enable SnapManager for Hyper-V to back up the virtual machine in the saved state. If you select this option, SnapManager for Hyper-V does not fail the backup when the Hyper-V VSS writer backs up the virtual machine in the saved state or performs an offline backup of the virtual machine. Performing a saved-state or offline backup can cause downtime.

The `distributed application-consistent backup` feature enables multiple VMs running on the partner cluster nodes to be consistent in a single hardware Snapshot copy made from the backup node. This feature is supported for all the VMs running on a CSV 2.0 Windows volume across multiple nodes in a Windows Failover Cluster. To use this feature, select the `Application-consistent` backup type and select the **Enable Distributed Backup** check box.

Secondary storage in a SnapMirror backup

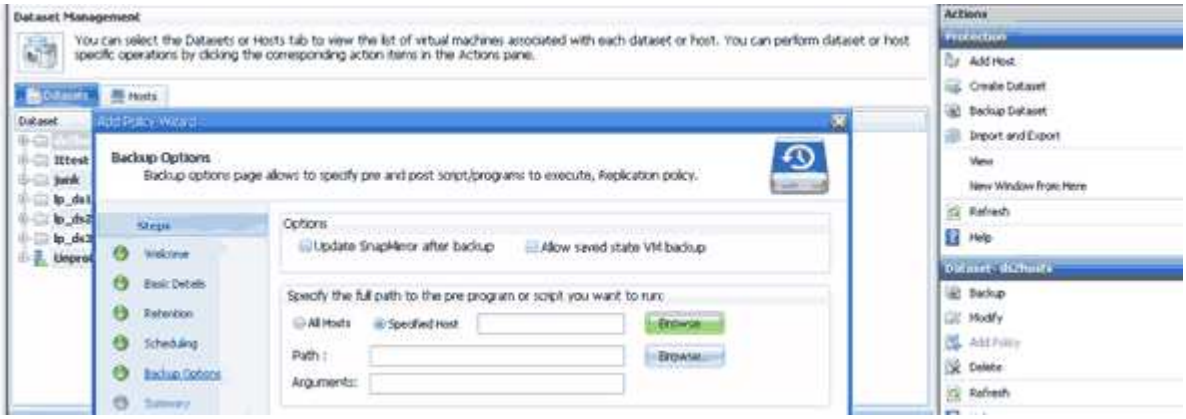
These options enable you to accept options applicable to a secondary storage defined in a SnapMirror relationship. Here, you can select **Update SnapMirror after backup**. Under the Vault label option pane, you can select **Update SnapVault after backup**. If you select **Update SnapVault after backup**, you must choose a vault label from the drop-down menu or enter a custom label.

Backup scripts

You must decide if you want the optional backup scripts to run either before or after the backup takes place.

These scripts run on all dataset member hosts unless you indicate a specific server.

Backup scripts run on each node in the dataset. You can set the dataset policy to specify the name of the host on which you want to run the scripts. The policy is processed on each node in the cluster where the VM to be backed up is running.



You can use the following environment variables in arguments for backup postscripts:

- **$VMSnapshot**: Specifies the name of the Snapshot copy that is created on the storage system as a result of this backup. When you are performing application-consistent backups in ONTAP environments running in 7-Mode, this is the name of the second (backup) Snapshot copy. The first name is same as the second name but without the _backup suffix.
- **$SnapInfoName**: Specifies the timestamp used in the SnapInfo directory name.
- **$SnapInfoSnapshot**: Specifies the name of the SnapInfo Snapshot copy created on the storage system. SnapManager for Hyper-V makes a Snapshot copy of the SnapInfo LUN at the end of the dataset backup operation.

> The **$SnapInfoSnapshot** variable is supported for dedicated virtual machines only.

Related information

Microsoft TechNet: Hyper-V

Add policies

You can add retention, scheduling, and replication policies, as well as scripts, to your datasets so that you can protect your data.

What you'll need

You must have the following information available:

- Policy names and descriptions
- Retention information
- Scheduling information
- Backup options information
- Backup script information

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset to which you want to add policies.
3. From the Actions pane, click **Add policy**.

   The Create Policy wizard appears.

4. Complete the steps in the wizard to create protection policies for your dataset.

Modify policies

You can modify the policies that protect your datasets by using the Modify Policy wizard.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset that contains the policies that you want to modify.
3. Select the policy that you want to modify.
4. From the Actions pane, click **Modify policy**.

   The Modify Policy wizard appears.

5. Complete the steps in the wizard to modify the protection policy for your dataset.

View policies

You can view policy details associated with a specific dataset.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset that contains the policies that you want to view.
3. From the Policies pane, select the specific policy for which you want to view details.

Information about the policy appears in the Details pane.

Delete policies

You can delete a policy from a dataset when it is no longer needed.

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset that contains the policy that you want to delete.
3. From the Policies pane, select the specific policy that you want to delete.
4. From the Actions pane, click **Remove** and click **OK** to delete the policy.

   Deleting the policy also deletes the scheduled jobs from all hosts that are members of the dataset.

Configure SVMs or CIFS servers for Hyper-V over SMB

Configuring a single storage virtual machine (SVM) or CIFS server for multiple applications can lead to resource sharing issues, which in turn impact the Hyper-V environment. You should configure dedicated SVMs or CIFS servers for Hyper-V over SMB, depending on your requirements.

Related information

NetApp KB Article 1015099: How to set up SVM/CIFS for Hyper-V over SMB

Manage reports

You can view and delete backup, restore, and configuration reports in SnapManager for Hyper-V. These reports contain important information about your datasets, virtual machines, and hosts. You can also export reports in several different formats.

- **Backup reports**

  Backup reports display all of the backup information for all hosts belonging to a particular dataset. You can view a backup report for either a dataset or a virtual machine. Reports displayed for a virtual machine use the virtual machine name instead of its GUID.

  When the backup report is displayed, you can export it into several different formats.

- **Restore reports**

  Restore reports display all of the information about the restore operation on a per-VM basis.

  When the restore report is displayed, you can export it into several different formats.

- **Configuration reports**

  Configuration reports display the notification settings, report path, and SnapInfo path for the selected host.

  When the configuration report is displayed, you can export it into several different formats.

View a dataset report

You can view a report about a dataset or virtual machine resource managed in SnapManager for Hyper-V.

Steps

1. From the navigation pane, click **Reports › Datasets**.
2. Select the dataset or virtual machine that contains the report you want to view.
3. From the Reports pane, click either the Backup tab or Recovery tab.
4. Select the report that you want to view and click **View report**.

If you want to view a…	Then…
dataset report	You can view a backup report.
virtual machine report	You can view either a backup or recovery report.

The report appears in a separate window.

View a host report

You can view a report about a host managed in SnapManager for Hyper-V.

Steps

1. From the navigation pane, click **Reports › Hosts**.
2. Select the host that contains the report you want to view.
3. From the Reports pane, select the report that you want to view and click **View report**.

   The configuration report appears in a separate window.

Delete a report

You can delete one or more reports when they are no longer necessary.

Steps

1. From the navigation pane, click **Reports › Datasets** or **Reports › Hosts**.
2. Select the dataset, virtual machine, or host that contains the report or reports you want to delete.
3. From the Reports pane, select the report or reports you want to delete.
4. From the Actions pane, click **Delete report** and click **OK** to delete.

VSS components

You can use Microsoft Windows Server Volume Shadow Copy Service (VSS) coordinate data servers, backup applications, and storage management software to support the creation and management of consistent backups.

VSS coordinates Snapshot copy-based backup and restore operations and includes these components:

- **VSS requestor**

  The VSS requestor is a backup application, such as SnapManager for Hyper-V or NTBackup. It initiates VSS backup and restore operations. The requestor also specifies Snapshot copy attributes for backups it initiates.

- **VSS writer**

  The VSS writer owns and manages the data to be captured in the Snapshot copy. Microsoft Hyper-V VSS Writer is an example of a VSS writer.

- **VSS provider**

  The VSS provider is responsible for creating and managing the Snapshot copy. A provider can be either a hardware provider or a software provider:

  - A hardware provider integrates storage array-specific Snapshot copy and cloning functionality into the VSS framework.

    The ONTAP VSS Hardware Provider integrates the SnapDrive service and storage systems running Data ONTAP into the VSS framework.

    The ONTAP VSS Hardware Provider is installed automatically as part of the SnapDrive software installation.

  - A software provider implements Snapshot copy or cloning functionality in software that is running on the Windows system.

    To ensure that the ONTAP VSS Hardware Provider works properly, do not use the VSS software provider on Data ONTAP LUNs. If you use the VSS software provider to create Snapshot copies on a Data ONTAP LUN, you cannot delete that LUN by using the VSS Hardware Provider.

CSV 2.0 in Windows Server 2012 and later

Windows Server 2012 and later provides new features for Cluster Shared Volume (CSV) 2.0 that include a new file system, changes to CSV writer, changes to CSV shadow copy, and enhancements to CSV backup.

Windows Server 2012 and later includes the following changes to CSV 2.0:

- The CSV File System (CSVFS) is available on all nodes in the cluster as a new distributed file system.

- CSV writer serves volume and component-level metadata from the nonrequesting node for CSV volumes and acts as a proxy by including the Hyper-V writers from the remote node for the backup session.
- The CSV shadow copy provider acts as the default software provider for CSV volumes and coordinates VSS freeze and VSS thaw across all cluster nodes to provide application and crash consistency.

  The CSV shadow copy provider ensures that a CSV Snapshot volume is writable on the requesting node.

- CSV now supports one application-consistent Snapshot volume across all CSVs for multiple virtual machines.

  The CSV volume from the Snapshot volume is exposed to all the virtual machine owner nodes, to perform autorecovery.

  CSV goes into redirected I/O mode only during Snapshot creation and not during backup.

SMB 3.0 support for Hyper-V VMs in Windows Server 2012

Microsoft enhanced the VSS infrastructure to support application-consistent backups of Hyper-V virtual machines (VMs) running on SMB 3.0 shares using the new Remote VSS Hardware Provider running on the SMB target.

A new provider named SMB File Share Provider is available in Windows 2012 Hypervisor to support and coordinate the Hyper-V VM backups running on SMB 3.0 shares.

When the VSS Requestor (SnapManager for Hyper-V) adds an SMB 3.0 share containing Hyper-V VMs to the VSS Snapshot set, VSS invokes the new SMB File Share Copy Provider to send the MSRPC commands to the SMB target to coordinate the VSS backups.

The new File Share Shadow Copy Agent (Remote VSS Provider) running on the SMB target is responsible for creating the actual hardware Snapshot copy.

Data ONTAP 8.2 implements the file share shadow copy agent (Remote VSS Hardware Provider) to perform the application-consistent backup copy of the SMB shares.

How SnapManager for Hyper-V uses VSS

SnapManager for Hyper-V provides integration with Microsoft Hyper-V Volume Shadow Copy Service (VSS) writer to quiesce a virtual machine (VM) before creating an application-consistent Snapshot copy of the VM.

SnapManager for Hyper-V is a VSS requestor and coordinates the backup operation to create a consistent Snapshot copy, using VSS Hardware Provider for Data ONTAP for Hyper-V VMs running on SAN and Remote VSS provider for Hyper-V VMs running on SMB 3.0 share.

SnapManager for Hyper-V enables you to make application-consistent backups of a VM, if you have Microsoft Exchange, Microsoft SQL, or any other VSS-aware application running on virtual hard disks (VHDs) in the VM. SnapManager for Hyper-V coordinates with the application writers inside the VM to ensure that application data is consistent when the backup occurs.

You can also restore a VM from an application-consistent backup. The applications that exist in the VM restore to the same state as at the time of the backup. SnapManager for Hyper-V restores the VM to its original

location.

VSS integration is available only with application-consistent backups. Crash-consistent backups do not use VSS.

ONTAP VSS Hardware Provider requirement

You must have the ONTAP VSS Hardware Provider installed for SnapManager to function properly. ONTAP VSS Hardware Provider integrates the SnapDrive service and storage systems running ONTAP into the VSS framework. This is required for VMs running on SAN storage.

The ONTAP VSS Hardware Provider, included with SnapDrive, does not need to be installed separately.

For Hyper-V VMs running on SMB 3.0 shares, remote VSS hardware provider running on Data ONTAP 8.2 will be invoked by the Windows Hypervisor.

View installed VSS providers

You can view the VSS providers installed on your host.

Steps

1. Select **Start › Run** and enter the following command to open a Windows command prompt:

   ```
   cmd
   ```

2. At the prompt, enter the following command:

   ```
   vssadmin list providers
   ```

   The output should be similar to the following:

   ```
   Provider name: 'Data ONTAP VSS Hardware Provider'
   Provider type: Hardware
   Provider ID: {ddd3d232-a96f-4ac5-8f7b-250fd91fd102}
   Version: 7.0.0.xxxx
   ```

Verify that the VSS Hardware Provider was used successfully

You can verify that the Data ONTAP VSS Hardware Provider was used successfully after a Snapshot copy was made.

Steps

1. Navigate to **System Tools › Event viewer › Application** in MMC and look for an event with the following values:

Source	Event ID	Description
Navssprv	4089	The VSS provider has successfully completed CommitSnapshots for SnapshotSetId id in n milliseconds.

VSS requires that the provider commit a Snapshot copy within 10 seconds. If this time limit is exceeded, the Data ONTAP VSS Hardware Provider logs Event ID 4364. This limit could be exceeded due to a transient problem. If this event is logged for a failed backup, retry the backup.

Create and manage backup jobs in SnapManager for Hyper-V

You can create and monitor on-demand backups or managed scheduled backups in SnapManager for Hyper-V. You can also perform two types of backup jobs with SnapManager for Hyper-V: application consistent and crash consistent.

About SnapManager for Hyper-V backups

You can create on-demand backup jobs and run them when you want or you can create scheduled backup jobs using policies attached to datasets. An on-demand backup job can include retention and replication policies as well as scripts to run before and after the backup takes place. You can create, modify, view, and delete the policies that make up scheduled backup jobs.

Types of backup jobs SnapManager for Hyper-V can perform

You can perform two types of backup jobs with SnapManager for Hyper-V: application consistent and crash consistent.

Application-consistent backup jobs

Application-consistent backup jobs are thorough, reliable, and resource intensive. They are performed in coordination with Microsoft Volume Shadow Copy Service (VSS) to ensure that each application running on the VM is quiesced before creating a Snapshot copy. This backup method guarantees application data consistency. You can use it to restore VMs and the applications running on them. However, application-consistent backup jobs are time consuming and can be complex.

Crash-consistent backup jobs

Crash-consistent backup jobs are quick Snapshot copies of all the LUNs used by VMs involved in a dataset. The resulting backup copies are similar to the data captures of VMs that crash or are otherwise abruptly powered off. Crash-consistent backup jobs provide a quick way to capture data, but the VMs must be present to be restored from a crash-consistent backup. Crash-consistent backup jobs are not intended to replace application-consistent backup jobs.

SnapManager for Hyper-V backup requirements and limitations

You should be aware of the requirements and limitations of a SnapManager for Hyper-V backup:

- Backup and restore operations are not supported if you are performing a switchover or switchback operation on a MetroCluster configuration. If a backup and restore operation and a switchover or switchback operation are running simultaneously, the `.vhd` file format of a VM might change to `.avhdx` in Windows Server 2012 R2 systems. The VM is not affected by this change.
- The `distributed application-consistent backup` option enables multiple VMs running on the partner cluster nodes to be consistent in one single hardware Snapshot copy created from the backup

node. This option is supported for all the VMs running on a CSV 2.0 Windows volume across multiple nodes in a Windows Failover Cluster.

- When operating in 7-Mode, application-consistent backup jobs use the VSS Hardware Provider to make two Snapshot copies. The Snapshot copies are called `snapshot_name` and `snapshot_name_backup`. The two Snapshot copies are made to facilitate automatic recovery during the VSS backup.
- In clustered environments, application-consistent backups require only one Snapshot copy for the automatic recovery process. SIS clones are leveraged to perform automatic recovery, and after automatic recovery is complete, the first Snapshot copy (`snapshot_name`) is deleted.
- Each Windows volume in the VM must have at least 300 MB of free disk space. This includes the Windows volumes corresponding to VHDs, iSCSI LUNs, and pass-through disks attached to the VM.
- A crash-consistent backup job always creates only one Snapshot copy. It does not provide VSS integration.
- Multiple crash-consistent backup jobs can execute in parallel. A crash-consistent backup job can run in parallel with an application-consistent backup job.
- `Allow Saved State Backup` is not applicable to crash-consistent backup jobs.

Requirements for manually backing up a dataset

To backup a dataset manually, you must first name and describe the dataset, choose a backup type and options, and set a retention policy.

Backup name and description

You must assign a name and description to the backup.

The default naming convention for backups is DatasetName_Timestamp. You can change everything in the backup name except the timestamp, which always appears as part of the backup name.

Backup names and descriptions are limited to these characters:

- a to z
- A to Z
- 0 to 9
- _ (underscore)
- - (hyphen)

Policy choice

You must decide which policy you want to use for the on-demand backup.

You can select a specific policy in the Backup wizard. You can override the retention or replication policy, as well as scripts associated with the policy, without changing the policy itself.

You can also choose None, which enables you to make an on-demand backup without creating any policies. This option uses the default values for retention policies, replication policies, and scripts.

Retention value

You can choose to override the retention policy specified in the policy that you selected. If you do this, you

must decide what the minimum length of time is that you want to keep your hourly, daily, weekly, monthly, or unlimited backup copies before they are deleted.

You can keep backups based on either time or a specified number of backups. For example, you can keep the 10 most current backups, or you can delete backups older than 15 days.

Type of backup

You can perform an application-consistent or crash-consistent backup.

Backup options

You can allow saved state backups.

The default behavior of SnapManager for Hyper-V is to fail a backup if one or more virtual machines cannot be backed up online. If a virtual machine is in the saved state or shut down, you cannot perform an online backup. In some cases, virtual machines are in the saved state or shut down for maintenance, but backups still must proceed, even if an online backup is not possible. To do this, you can move the virtual machines that are in the saved state or shut down to a different dataset, one with a policy that allows saved state backups.

You can also modify the existing policy by selecting the Allow saved state VM backup check box. This allows SnapManager for Hyper-V to back up the virtual machine in the saved state. If you select this option, SnapManager for Hyper-V does not fail the backup when the Hyper-V VSS writer backs up the virtual machine in the saved state or performs an offline backup of the virtual machine. Performing a saved state or offline backup can cause downtime.

The `distributed application-consistent backup` feature enables multiple VMs running on the partner cluster nodes to be consistent in one single hardware Snapshot copy made from the backup node. This feature is supported for all the VMs running on a CSV 2.0 Windows volume across multiple nodes in a Windows Failover Cluster.

Secondary storage in a SnapMirror backup

These options enable you to accept options applicable to a secondary storage defined in a SnapMirror relationship. You can select **Update SnapMirror after backup**. Under the Vault label option pane, you can select **Update SnapVault after backup**. If you select **Update SnapVault after backup**, you must choose a vault label from the drop-down menu or enter a custom label.

Backup scripts

You can override the script options specified in the policy that you selected.

These scripts run on all dataset member hosts, unless you indicate a specific host in the script.

Related information

Microsoft TechNet: Hyper-V

ONTAP 9 Volume Backup Using SnapVault Express Guide

How SnapManager for Hyper-V handles saved-state backups

Although the default behavior of SnapManager for Hyper-V is to cause backups containing virtual machines that are in the saved state to shut down or fail, you can perform a saved-state backup by moving the virtual machines to a dataset that has a policy that allows saved-state backups.

You can also create or edit your dataset policy to allow a saved-state virtual machine backup. If you choose this option, SnapManager for Hyper-V does not cause the backup to fail when the Hyper-V VSS writer backs up the virtual machine using the saved state or performs an offline backup of the virtual machine. However, performing a saved-state or offline backup can cause downtime.

Related information

Microsoft TechNet: Hyper-V

Manually backing up a dataset

You can create an on-demand backup of a dataset.

What you'll need

You must have the following information available:

- Backup name and description
- Policy name, if necessary
- Policy override information (if you plan to change any of the previously specified policy options)
- Backup type
- Backup options information

Steps

1. From the navigation pane, click **Protection › Datasets**.
2. Select the dataset for which you want to create a manual backup and click **Backup**.

   The **Backup wizard** appears.

3. Complete the steps in the wizard to create your on-demand backup.

   Closing the wizard does not cancel the on-demand backup.

Results

You can view the status of the on-demand backup in the Jobs Management window.

Monitor backup jobs

You can view the scheduled backup jobs for a particular dataset by using the Jobs Management windowScheduled tab. You can also view the backup and restore jobs that

are currently running by using the Jobs Management windowRunning tab.

Steps

1. From the navigation pane, click **Jobs**.
2. Click either the **Scheduled** tab or the **Running** tab.
3. Select the scheduled or running backup job, or the restore job, that you want to monitor.

   Information about the job appears in the Details pane.

4. Use the Running Job report in **Reports view**, if you want to view a live report of a running job.

> You can also monitor backup jobs with Microsoft's SCOM console. See the Microsoft web site for more information.

Delete a backup

You can delete one or more backups associated with either a dataset or a virtual machine.

Steps

1. From the navigation pane, click **Recovery**.
2. Select the virtual machine within the dataset that contains the backup you want to delete.

   If you delete a backup associated with a dataset, the backups associated with any virtual machines belonging to that dataset are also deleted. If you delete a backup associated with a virtual machine, only that backup is deleted.

3. In the Backups pane, select the backup that you want to delete.
4. Click **Delete**.

   The **Delete Backup** dialog displays. You have the option to delete backups for a selected VM or for an entire dataset.

5. Select the appropriate option, and click **Confirm Delete**.

   You can view the status of the backup delete operation in the status window.

Restore a virtual machine from a backup copy

You can use SnapManager for Hyper-V to restore a virtual machine (VM) from a backup copy. You can also restore a VM that is part of a cluster. SnapManager for Hyper-V determines the appropriate node in the cluster to which to restore the VM.

To restore a VM, SnapManager for Hyper-V uses the file-level restore feature in SnapDrive for Windows. You can spread the associated files of a VM, including the configuration file, Snapshot copies, and any VHDs, across multiple ONTAP LUNs. A LUN can contain files belonging to multiple VMs.

If a LUN contains only files associated with the VM that you want to restore, SnapManager for Hyper-V restores the LUN by using LCSR (LUN clone split restore). If a LUN contains additional files not associated with the virtual machine that you want to restore, SnapManager for Hyper-V restores the virtual machine by using the file copy restore operation.

Related information

NetApp Documentation: SnapDrive for Windows (current releases)

Requirements for restoring a virtual machine

To restore a virtual machine from a backup copy, you must first determine how you want to restore the backup copy.

VM backup copy name

You must decide which backup copy you want to restore.

All backup copies are listed by name in the Backups pane of the Recovery Management window.

VM backup copy type

Restoring a VM from an application-consistent backup is done in coordination with VSS. Hyper-V VSS writer deletes the VM before restoring and registers the VM to Hyper-V Manager after the restore operation finishes.

Restoring a VM from a crash-consistent backup does not involve VSS. The VM is turned off prior to the restore operation. When you are restoring from a crash-consistent backup, the VM must exist; restoring a deleted VM from a crash-consistent backup fails.

VM backup copy status

You must determine if the virtual machine still exists.

If the virtual machine no longer exists, you can still restore it if the LUNs on which the virtual machine was created still exist. The LUNs must have the same drive letters and Windows volume GUIDs as at the time of backup.

If you delete a virtual machine in Windows Server 2008 R2, you can restore the virtual machine from an application-consistent backup, but in Windows Server 2012 and Windows Server 2012 R2, you can restore a deleted virtual machine from both a crash- and application-consistent backup.

If the virtual machine was removed from all datasets before it was deleted, you can still restore it by selecting

Unprotected Resources and selecting a backup to which it belonged.

VM backup copy configuration status

You must determine if the virtual machine configuration is the same as it was at the time of the backup.

If the current virtual machine configuration is different than at the time of backup, SnapManager for Hyper-V notifies you that the virtual machine layout has changed, and asks you if you would like to restore the virtual machine configuration and data as it existed in the backup.

> Because SnapManager for Hyper-V does not back up the cluster configuration of the virtual machine, it cannot restore the cluster configuration. If the virtual machine and cluster configuration are lost, you can restore the virtual machine from SnapManager for Hyper-V, but you have to manually make it highly available.

If the virtual machine is configured differently than the current configuration of the virtual machine in the backup, you might need to update the cluster configuration to reflect any newly added or removed virtual hard disks (VHDs).

Snapshot copy status

You can verify that the backup Snapshot copies exist on the storage system before attempting the restore operation.

VM restart

You can choose to start the virtual machine after it is restored.

Related information

Microsoft TechNet: Failover Clusters in Windows Server 2008 R2

Restore a virtual machine from a backup copy

You can use SnapManager for Hyper-V, which restores a single virtual machine (VM) at a time, to recover lost or damaged data from a backup copy.

What you'll need

You must have the following information available:

- Backup name
- Configuration information
- Script information

When restoring to an alternate host, the CPU type on the physical computer on which your original VM resided should be compatible with the physical computer onto which you want to restore the VM. Alternatively, you can use the Hyper-V Manager to specify that the machine is allowed to restore to a machine with a different CPU type.

About this task

After storage live migration, you cannot restore from the latest backup.

If you start a restore operation of a Hyper-V virtual machine, and another backup or restoration of the same virtual machine is in process, it fails.

Steps

1. From the navigation pane, click **Recovery**.
2. Select the virtual machine that you want to restore.
3. In the Backups pane, select the name of the backup copy that you want to restore and click **Restore**.

   The Restore wizard appears.

4. Complete the steps in the wizard to restore the virtual machine backup copy.

   Closing the wizard does not cancel the restore operation. SnapManager for Hyper-V validates the virtual machine configuration before beginning the restore operation. If there have been any changes in the virtual machine configuration, a warning appears, enabling you to choose to continue or to cancel the operation.

After you finish

You can view the status of the restore operation in the **Jobs Management** window or check the operation results by viewing the report in the **Reports Management** window.

Related information

Restore from a backup after failback

Perform a cluster operating system rolling upgrade

You can perform a cluster operating system (OS) rolling upgrade to upgrade the OS of the cluster nodes without stopping SnapManager for Hyper-V. This feature supports SLA compliance by reducing downtime.

Failover clusters running SnapManager for Hyper-V can be upgraded from Windows Server 2012 R2 to Windows Server 2016 and Windows Server 2019 with no downtime.

For information on cluster OS rolling upgrade benefits, installation process and limitations refer to the related information.

Related information

Microsoft TechNet: Cluster operating system rolling upgrade

Map LUNs in mixed operating system mode

When you perform a cluster OS rolling upgrade, you can use the following procedure to unmap the LUNs from the Windows 2012 R2 node and remap them to the Windows Server 2016 node after it is added to the cluster.

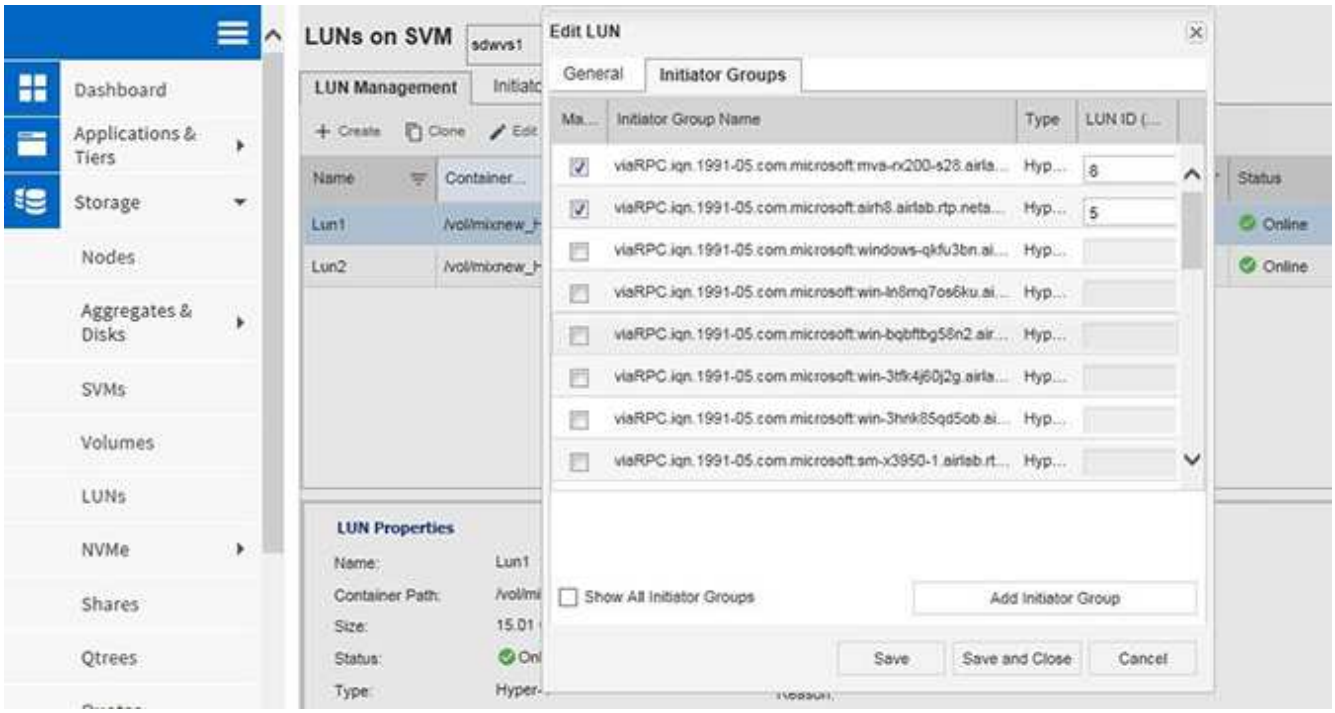
What you'll need

The Windows Server 2016 node must be added to the cluster.

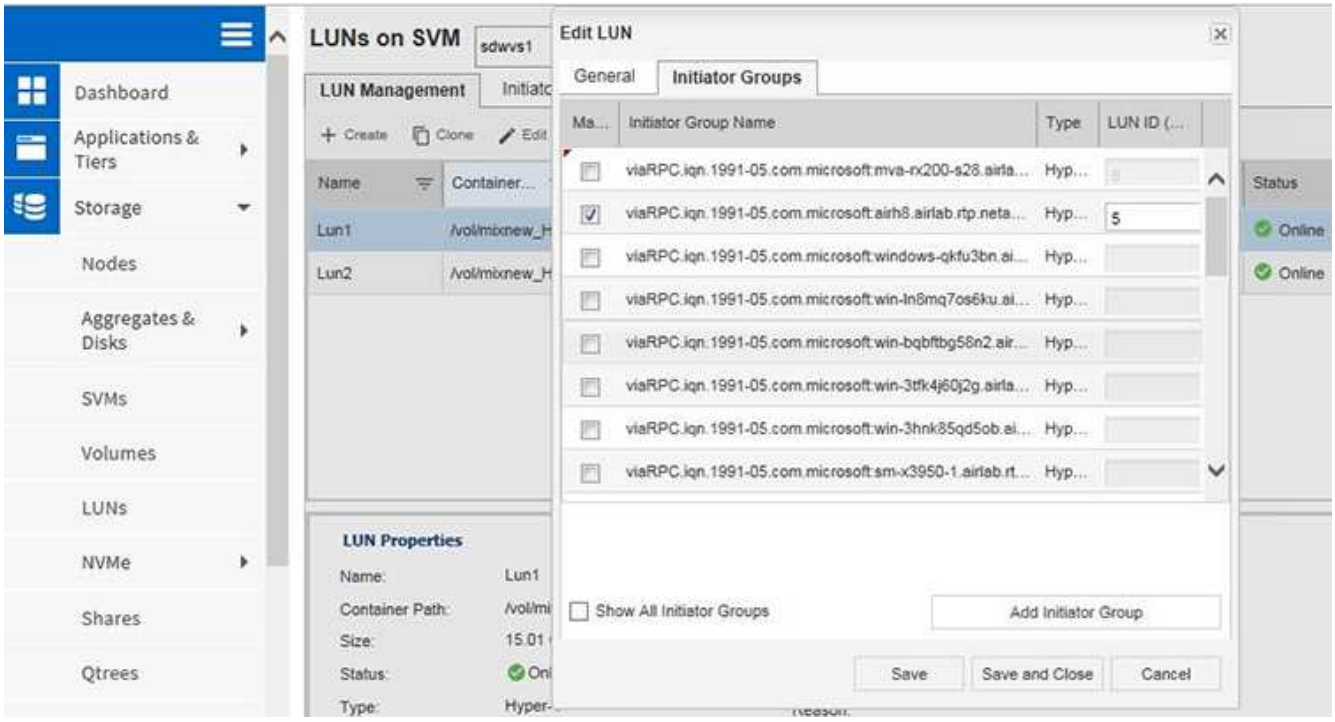
Cluster Rolling upgrade is supported from Windows Server 2016 to Windows Server 2019

Steps

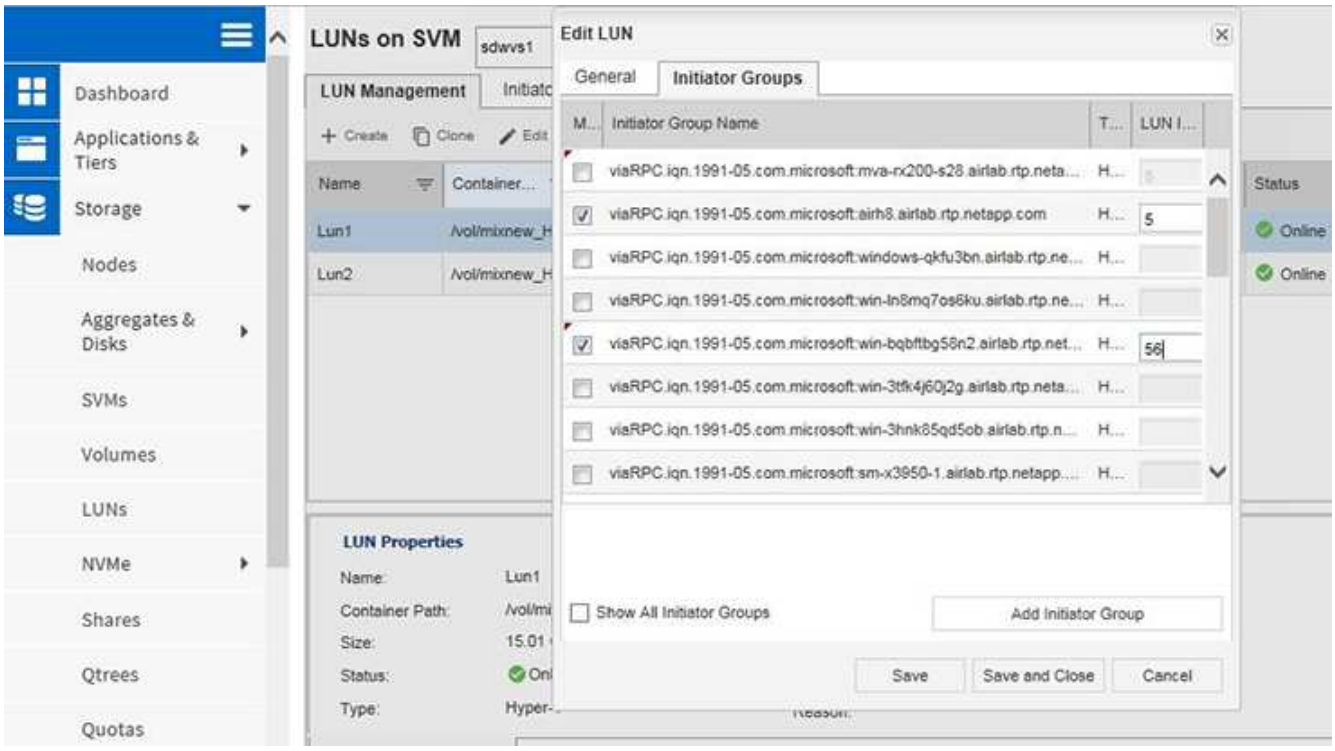
1. Log in to the ONTAP System Manager.
2. Select the LUN that was mapped to Windows 2012 R2.
3. Click **Edit** and select **Initiator Groups**.



4. Uncheck the igroup of the removed node from the cluster.
5. Add a new Initiator Group for all the newly added Windows 2016 nodes.



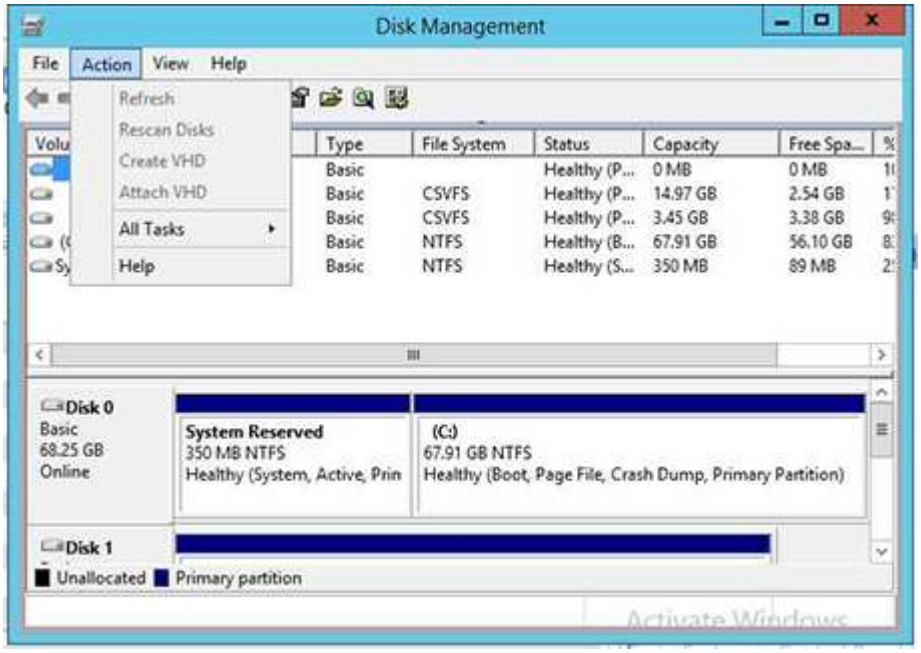
6. Select the checkbox beside the newly created initiator group to map the LUN to the Windows 2016 host that was added to the cluster.



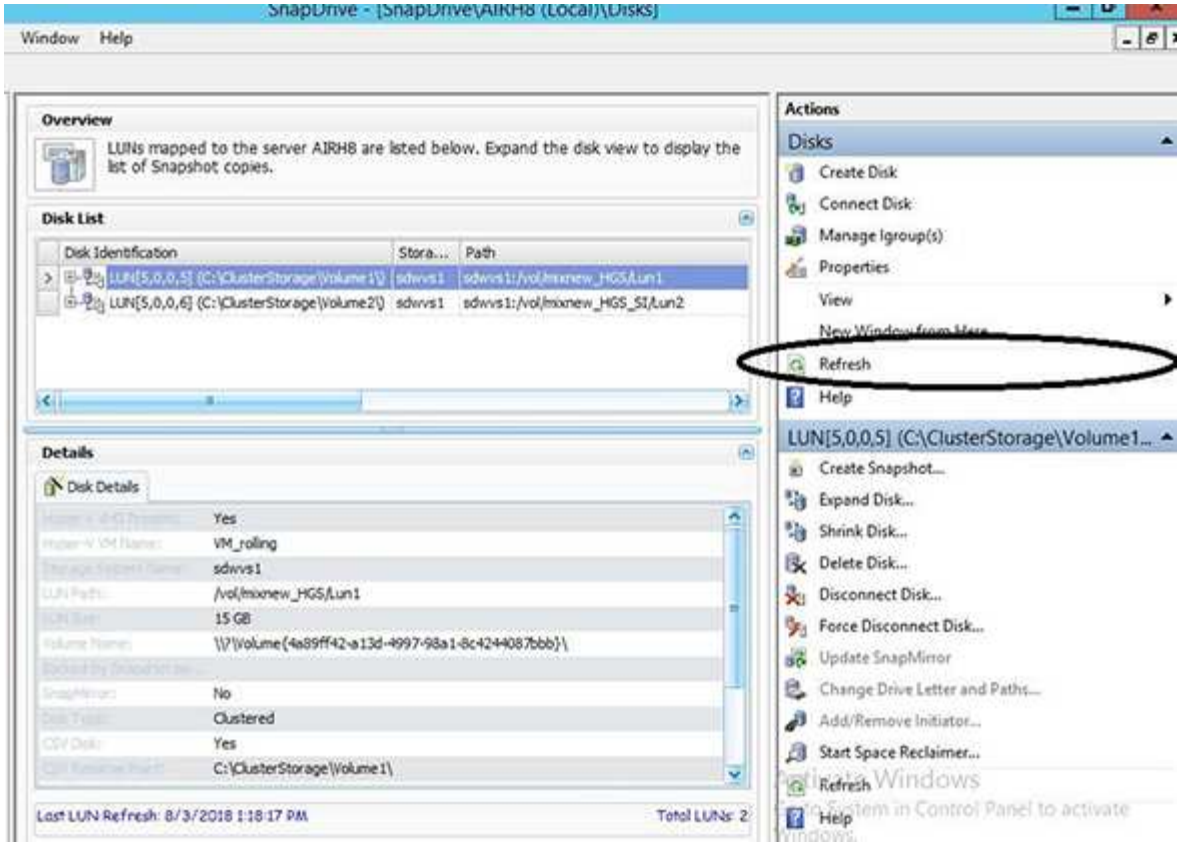
7. Repeat Steps 4 and 6 to map every LUN to Windows 2016 nodes.

   All LUNs should be visible in the Windows 2016 node.

8. Rescan the disks from the disk management tool in the Windows 2016 nodes.



9. Add the storage management LIF in the new Windows 2016 SnapDrive transport protocol settings (TPS) and then refresh the disks.



Update the dataset and SnapInfo across all nodes

After you perform a cluster OS rolling upgrade, you must update the dataset and SnapInfo across all nodes.

What you'll need

Cluster Rolling upgrade is supported from Windows Server 2016 to Windows Server 2019; shared disk backup is not supported in mixed-mode operating systems.

Steps

1. Edit all the datasets on the Windows 2012 R2 node.
2. Verify that all available datasets are visible on the Windows 2016 node.
3. Set the SnapInfo path on the Windows 2012 R2 node.
4. Verify that the correct SnapInfo path is displayed on the Windows 2016 node.

Perform disaster recovery

The disaster recovery feature ensures that if a disaster or other circumstance makes critical protected data at your primary storage sites unavailable, that you can provide access to the backed up copy of that data through your secondary storage sites. Disaster recovery can only be performed using the PowerShell interface.

Configure SnapManager for Hyper-V for failover

To fully enable your SnapManager for Hyper-V implementation for disaster recovery, you must ensure that the primary and secondary hosts have the same configuration and know that you can perform disaster recovery using only PowerShell.

The following types of setups support disaster recovery:

- Stand-alone primary host and stand-alone secondary Hyper-V host
- Clustered primary and secondary Hyper-V hosts
- Cluster shared volumes (CSV) on the primary and secondary Hyper-V hosts

For example, a cluster virtual machine (VM) on a primary host must be recovered as a cluster VM, a dedicated (stand-alone) VM must be recovered as a dedicated VM, and a CSV VM must be recovered as a CSV VM.

LUNs on a secondary host should be connected in the same way as their counterparts on the primary host. That is, the LUN type (dedicated, shared, or CSV) and the drive letter, mount point, or CSV reparse point should be the same on primary and secondary hosts. With SAN restore operations to an alternate path location, a different drive letter can be specified for the LUN restore operation on a secondary location.

Drive letters or CSVs and volume mount points are supported.

The following example shows a basic disaster recovery setup:

- Site A (primary) contains storage systems and a stand-alone Hyper-V host system or Hyper-V host cluster.

  VMs running on these hosts reside on Data ONTAP storage.

- Site B (secondary) contains storage systems and a Hyper-V host or cluster (same as that of primary).
- SnapDrive for Windows and SnapManager for Hyper-V are installed on both sites A and B.
- The SnapMirror relationship is initialized from site A to site B.
- On site A, a Hyper-V host or cluster added to SnapManager for Hyper-V and the VMs is backed up using SnapManager for Hyper-V.

  The policy to update SnapMirror after the backup is checked. After each backup, the secondary site is updated with new Snapshot copies of the VMs and SnapInfo copies.

Recover and restore from a disaster recovery failover

To recover from a disaster, SnapManager for Hyper-V must first fail over to a secondary storage system. Failing over involves a series of manual steps in PowerShell.

About this task

Most backups can be restored to an alternate host for both NAS and SAN; however, Windows Server 2008 R2 crash-consistent backups cannot be restored to an alternate host.

Steps

1. If you are running Data ONTAP 8.1.x, on the secondary site, enter the storage virtual machine (SVM) information to the Transport Protocol Setting (TPS) in the SnapDrive for Windows MMC.
2. From the secondary storage system, connect to all of the LUNs.

   If the secondary storage system is clustered, go to the node where the cluster group, which is the available storage group owner node in the destination cluster, is online and then connect to all of the LUNs from that node in the cluster. Refer to the SnapDrive for Windows documentation for information about mapping LUNs.

3. Depending on your configuration, take one of the following actions:

If the primary storage system is…	Then…
A stand-alone host (SAN)	Connect to all of the mount points and LUNs of the same type on the primary storage system.
A clustered host (SAN)	From the node where the cluster group is online, connect to all of the mount points and LUNs in the cluster.
Data ONTAP 8.1.x configured with a single LUN hosting VMs on a source FlexVol volume (SAN)	For SnapMirror updates to succeed, you must create a second, smaller LUN (10 MB to 100 MB) on the source FlexVol volume before initiating a backup. From the node where the cluster group is online, connect to all of the mount points and LUNs in the cluster.
A stand-alone or clustered host (NAS)	Unmount the Data Protection (DP) volume, mount the DP volume as rewriteable, verify that the volume has RWX permissions, and then create CIFS shares for the different volumes.

4. Reconfigure SnapInfo based on your environment:

If your configuration is…	Then…
SAN	Restore the SnapInfo LUN from its last Snapshot copy.
NAS	Mount the SnapInfo directory.

   For NAS, if an access is denied error occurs, or if you cannot browse to the exposed SMB share location, you might need to reset the access control list on the share.

This is typical when using the System Center Virtual Machine Manager (SCVMM) Console and Data ONTAP SMI-S Agent.

5. Add the secondary storage system or cluster in the SnapManager for Hyper-V MMC, and then configure it with the SnapInfo path.
6. Enter the following cmdlets:
   a. Enter `Get-VMsFromBackup` to retrieve the list of VMs present in the backup metadata.
   b. Enter `Get-Backup` to get the backup copies for each VM.
7. To restore, use `Restore-Backup` with the VM GUID and the backup copy with the following parameters:

To restore from…	Enter this command…
An alternate host	`Restore-Backup -Server Secondary_host_system_or_cluster_name -DisableVerifySnapshot -RestoreToAlternateHost`
A listed backup	`Restore-Backup -Server -VirtualMachinePath -SnapShotFilePath @VHD`

   For `@VHD`, a VM might have multiple VHDs; make sure that you enter both a source and a destination path pair specified for each VHD.

8. If the secondary host system is a cluster, complete the following steps:
   a. Ensure that the LUNs on which the VMs reside are online on the cluster node that owns the cluster group.
   b. Use the failover PowerShell cmdlets to make the VMs highly available.

Failover examples

The following example shows a two-cluster setup in which smhv-cluster-01 is the primary site and hv-19-cluster is the secondary site:

```
PS C:\> Get-VMsFromBackup -Server hv-19-cluster

winxp-x64c-135                593ABA72-B323-4AF7-9AC6-9514F64C0178
csv1-xp-3                     59B85C68-BAFA-4A49-8E85-A201045843F7
vm-w2k8r2sp1                  5A248757-872B-4FE7-8282-91C8E9D45CF9
um10_11_dr                    5AC1B2A8-6603-4F90-98F5-4F2F435AB0C2
winxp-x64c-30                 5B47D3CF-5D96-495D-9BAB-FB394392CF31
winxp-x64c-126                5B57EED1-B4F1-45A3-A649-24C6947CB79C
winxp-x64c-118                5B5D417B-70DC-427C-94BB-97FF81C5B92B
winxp-x64c-122                5BEE26B8-BE57-4879-A28E-9250A6A5EEFC
csv4-w2k3-19                  5D0613E5-B193-4293-8AAD-F8B94A5D851F

PS C:\> Get-Backup -Server hv-19-cluster -ResourceName um10_11_dr

BackupName    : smhv-ccb-ds_04-10-2012_10.37.58
RetentionType : hourly
DatasetName   : smhv-ccb-ds
BackupId      : smhv-ccb-ds_04-10-2012_10.37.58
BackupTime    : 4/10/2012 10:37:58 AM
BackupType    : Application consistent
BackedupVMs   : {um10_11_dr}

PS C:\> Restore-Backup -Server hv-19-cluster -ResourceName
um10_11_dr -BackupName smhv-ccb-ds_04-10-2012_10.37.58
-DisableVerifySnapshot -RestoreToAlternateHost
```

The following example shows a SAN restore operation to an alternate path for which N:\ is the destination and I:\ is the source LUN path:

```
PS C:\> Restore-Backup -Resourcename dr-san-ded1
-RestoreToAlternateHost -DisableVerifySnapshot -BackupName san_dr_09-11-
2013_10.57.31 -Verbose
-VirtualMachinePath "N:\dr-san-ded1" -SnapshotFilePath "N:\dr-san-ded1"
-VHDs @(@{"SourceFilePath" = "I:\dr-san-ded1\Virtual Hard Disks\dr-san-
ded1.vhdx"; "DestinationFilePath" = "N:\dr-san-ded1\Virtual Hard Disks\dr-
san-ded1"})
```

The following example shows a NAS restore operation to an alternate path for which \\172.17.162.174\ is the source SMB share path and \\172.17.175.82\ is the destination SMB share path:

```
PS C:\> Restore-Backup -Resourcename vm_claba87_cifs1
-RestoreToAlternateHost -DisableVerifySnapshot -BackupName ag-DR_09-09-
2013_16.59.16 -Verbose
-VirtualMachinePath "\\172.17.175.82\vol_new_dest_share\ag-vm1"
-SnapshotFilePath "\\172.17.175.82\vol_new_dest_share\ag-vm1" -VHDs
@(@{"SourceFilePath" = "\\172.17.162.174\vol_test_src_share\ag-vm1\Virtual
Hard Disks\ag-vm1.vhdx"; "DestinationFilePath" =
"\\172.17.175.82\vol_new_dest_share\ag-vm1\Virtual Hard Disks\ag-
vm1.vhdx"})
```

Related information

Data ONTAP 8.2 Data Protection Online Backup and Recovery Guide for 7-Mode

NetApp Documentation: SnapDrive for Windows (current releases)

SMB/CIFS Reference

Reconfigure storage systems after a disaster recovery failback

After failing over to a secondary storage system, SnapManager for Hyper-V completes disaster recovery by failing back to the original primary storage system. Failing back restores primary storage function to the original primary storage site after its storage systems are reenabled or replaced.

Steps

1. Depending on the condition of the primary storage system, take one of the following actions:

If the primary storage system is…	Then…
Recoverable	Move the data from the secondary host back to the primary storage system.
Completely destroyed	Provision a new storage system.

2. Manage the SnapMirror relationship:
   a. Initialize the SnapMirror relationship from the secondary storage system to the primary storage system to recover the data.
   b. Resynchronize the existing SnapMirror relationship from the secondary storage system to the primary storage system.
   c. Using SnapDrive on the secondary storage system, initiate a SnapMirror update for each of the LUNs or SMB shares on the secondary storage system.
3. Depending on your configuration, take one of the following actions:

If the primary storage system is…	Then…
A stand-alone host (SAN)	Connect to all the mount points and LUNs on the primary storage system of the same type.
A clustered host (SAN)	From the node where the cluster group is online, connect to all the mount points and LUNs in the cluster.
Data ONTAP 8.1.x configured with a single LUN hosting VMs on a source FlexVol volume (SAN)	For SnapMirror updates to succeed, you must create a second, smaller LUN (10 MB to 100 MB) on the source FlexVol volume before initiating a backup job. From the node where the cluster group is online, connect to all the mount points and LUNs in the cluster.
A stand-alone or clustered host (NAS)	Unmount the Data Protection (DP) volume, mount the DP volume as rewriteable, verify that the volume has RWX permissions, and then create CIFS shares for the different volumes.

4. Reconfigure SnapInfo based on your environment:

If your configuration is…	Then…
SAN	Restore the SnapInfo LUN from its last Snapshot copy.
NAS	Mount the SnapInfo directory.

   For NAS, if an access is denied error occurs, or if you cannot browse to the exposed SMB share location, you might need to reset the ACL on the share.

5. Add the primary host or cluster in SnapManager for Hyper-V MMC and configure it with the SnapInfo path.
6. Enter the following cmdlets:
   a. Retrieve the list of VMs present in the backup metadata by using the Get-VMsFromBackup cmdlet.
   b. Get the backup copies for each VM by using the Get-Backup cmdlet to get the backup copies for each VM.
7. To restore, use `Restore-Backup` with the VM GUID and the backup copy with the following parameters:

To restore from…	Enter this command…
An alternate host	`Restore-Backup -Server Secondary_host_system_or_cluster_name -DisableVerifySnapshot -RestoreToAlternateHost`

To restore from…	Enter this command…
A listed backup copy	`Restore-Backup -Server -VirtualMachinePath -SnapShotFilePath @VHD`

For `@VHD`, a VM might have multiple VHDs; you must enter both a source and a destination path pair specified for each VHD.

8. If the secondary host system is a cluster, complete the following steps:

   a. Ensure that the LUNs on which the VMs reside are online on the cluster node that owns the cluster group.

   b. Use the failover PowerShell cmdlets to make the VMs highly available.

   For NAS, after the VMs are exposed as SMB shares from one cluster node, the VMs are accessible to all hosts configured to use the storage system cluster.

Failback examples

The following example shows a two-cluster setup in which smhv-cluster-01 is the primary site and hv-19-cluster is the secondary site:

```
PS C:\> Get-VMsFromBackup -Server smhv-cluster-01

winxp-x64c-135                593ABA72-B323-4AF7-9AC6-9514F64C0178
csv1-xp-3                     59B85C68-BAFA-4A49-8E85-A201045843F7
vm-w2k8r2sp1                  5A248757-872B-4FE7-8282-91C8E9D45CF9
um10_11_dr                    5AC1B2A8-6603-4F90-98F5-4F2F435AB0C2
winxp-x64c-30                 5B47D3CF-5D96-495D-9BAB-FB394392CF31
winxp-x64c-126                5B57EED1-B4F1-45A3-A649-24C6947CB79C
winxp-x64c-118                5B5D417B-70DC-427C-94BB-97FF81C5B92B
winxp-x64c-122                5BEE26B8-BE57-4879-A28E-9250A6A5EEFC
csv4-w2k3-19                  5D0613E5-B193-4293-8AAD-F8B94A5D851F

PS C:\> Get-Backup -Server smhv-cluster-01 -ResourceName
um10_11_dr

BackupName    : smhv-ccb-ds_04-10-2012_10.37.58
RetentionType : hourly
DatasetName   : smhv-ccb-ds
BackupId      : smhv-ccb-ds_04-10-2012_10.37.58
BackupTime    : 4/10/2012 10:37:58 AM
BackupType    : Application consistent
BackedupVMs   : {um10_11_dr}

PS C:\> Restore-Backup -Server smhv-cluster-01 -ResourceName
um10_11_dr -BackupName smhv-ccb-ds_04-10-2012_10.37.58
-DisableVerifySnapshot -RestoreToAlternateHost
```

The following example shows a SAN restore operation to an alternate path for which N:\ is the destination and I:\ is the source LUN path:

```
PS C:\> Restore-Backup -Resourcename dr-san-ded1
-RestoreToAlternateHost -DisableVerifySnapshot -BackupName san_dr_09-11-
2013_10.57.31 -Verbose
-VirtualMachinePath "N:\dr-san-ded1" -SnapshotFilePath "N:\dr-san-ded1"
-VHDs @(@{"SourceFilePath" = "I:\dr-san-ded1\Virtual Hard Disks\dr-san-
ded1.vhdx"; "DestinationFilePath" = "N:\dr-san-ded1\Virtual Hard Disks\dr-
san-ded1"})
```

The following example shows a NAS restore operation to an alternate path for which \\172.17.162.174\ is the source SMB share path and \\172.17.175.82\ is the destination SMB share path:

```
PS C:\> Restore-Backup -Resourcename vm_claba87_cifs1
-RestoreToAlternateHost -DisableVerifySnapshot -BackupName ag-DR_09-09-
2013_16.59.16 -Verbose
-VirtualMachinePath "\\172.17.175.82\vol_new_dest_share\ag-vm1"
-SnapshotFilePath "\\172.17.175.82\vol_new_dest_share\ag-vm1" -VHDs
@(@{"SourceFilePath" = "\\172.17.162.174\vol_test_src_share\ag-vm1\Virtual
Hard Disks\ag-vm1.vhdx"; "DestinationFilePath" =
"\\172.17.175.82\vol_new_dest_share\ag-vm1\Virtual Hard Disks\ag-
vm1.vhdx"})
```

Related information

Data ONTAP 8.2 Data Protection Online Backup and Recovery Guide for 7-Mode

SMB/CIFS Reference

Restore the original configuration for standalone hosts

After the VMs are backed up on the primary storage system, you can return to the original configuration using a SnapMirror relationship that is established from the primary storage system to the secondary storage system.

Steps

1. Shut down the VMs running on the secondary storage system.
2. Delete the VMs running on the secondary storage system.
3. Disconnect the SnapInfo disk and the disks containing VMs using SnapDrive.
4. Resynchronize the SnapMirror relationship from the primary storage system to the secondary storage system.

Restore the original configuration for clustered hosts

After the VMs are backed up on the primary storage system, you can return to the original configuration using a SnapMirror relationship which is established from the primary storage system to the secondary storage system.

Steps

1. Offline the virtual machine resource and virtual machine configuration resource for all the VMs.
2. Delete these resources from the cluster.
3. Delete all the VMs from Hyper-V Manager.
4. Disconnect all the disks by using SnapDrive.
5. Resynchronize the SnapMirror relationship from the primary storage system to the secondary storage system.

Troubleshoot SnapManager for Hyper-V

If you encounter unexpected behavior during the installation or configuration of SnapManager for Hyper-V, you can follow specific troubleshooting procedures to identify and resolve the cause of such issues.

Backup Failed for the following VM(s) since it cannot be backed up online or No VM to be found for backup

- **Message**

  ```
  Backup Failed for the following VM(s) since it cannot be backed up online or
  NO VM to be found for backup
  ```

- **Description**

  This message occurs when backing up a Windows 2012 VM in a Windows 2008 R2 SP1 Hyper-V parent without the Allow saved state VM backup option enabled fails.

- **Corrective action**

  For Windows 2012 backups, run the backup with the `Allow saved state` VM backup option enabled.

Unexpected error querying for the IVssWriterCallback interface. hr = 0x80070005, Access is denied.

- **Message**

  ```
  Unexpected error querying for the IVssWriterCallback interface. hr =
  0x80070005, Access is denied.
  ```

- **Description**

  If a CSV is owned by the cluster group owner and the VM is owned by the partner node, backup of the VM completes successfully with the VSS error in the application event log. This is often caused by incorrect security settings in either the writer or requestor process.

- **Corrective action**

  None: this error message can be ignored.

Backup reports use management console time zone information in report name

- **Issue**

  When you generate a backup report using a client host that resides in a different time zone than the parent host, the report name uses the client host time zone information and the report contents use the parent host time zone.

- **Cause**

  The timestamp in the backup report name appears with the client host time zone information.

- **Corrective action**

  No corrective action is necessary.

Backup and restore notifications not sent in IPv6-only environments

- **Issue**

  When you run an IPv6-only host, you do not receive any backup or restore operation notifications.

- **Cause**

  Your SMTP server does not support IPv6, or it does not have IPv6 enabled on it.

- **Corrective action**

  Enable IPv6 on your SMTP server.

Failover clustering event ID 5121

- **Message**

  `Failover clustering event ID 5121` from the application event logs, or the host message `NO_DIRECT_IO_DUE_TO_FAILURE`.

- **Description**

  This error message occurs when the cluster shared volume (CSV) is no longer directly accessible from the cluster node, and I/O access redirects to the storage device that owns the volume. This occurs because only the coordination node can perform actions using VSS backups. During backup operations, the coordination node locks the CSV and requires all non-coordination nodes to redirect I/O.

- **Corrective action**

  After the operation has been completed, the coordination node releases the lock on the CSV and I/O is no longer be redirected. If the error message occurs only during VSS backups, there is no failure and this is expected behavior.

Virtual machine backups made while a restore operation is in progress might be invalid

- **Issue**

  An application-consistent backup created while a restore operation is in progress might be invalid. Restoring a virtual machine from this incomplete backup results in data loss and the virtual machine is deleted.

- **Cause**

  The SnapManager for Hyper-V configuration information is missing in the backup copy. The backup operation is successful, but the backup copy is invalid because the virtual machine configuration information is not included. The SnapManager for Hyper-V restore operations delete the virtual machine configuration information from the Hyper-V host before performing a restore operation. This behavior is by design in the Microsoft Hyper-V Writer.

- **Corrective action**

  Ensure that the backup schedule does not coincide with the restore operation, or that the on-demand backup you want to perform does not overlap with a restore operation on the same data.

Virtual machine managing itself

- **Issue**

  If a virtual machine (VM) belongs to a host that has SnapManager for Hyper-V installed, and you install SnapManager for Hyper-V on that VM to use as a management console, you should not use SnapManager for Hyper-V to manage the host to which the VM belongs.

- **Cause**

  SnapManager for Hyper-V on a virtual machine cannot manage itself.

- **Corrective action**

  No corrective action necessary.

- **Example**

  If VM1 belongs to Host1 (with SnapManager for Hyper-V installed), and you install SnapManager for Hyper-V on VM1, you should not use SnapManager for Hyper-V to manage Host1 from VM1.

  If you do this, and try to restore the VM from itself, the VM will be deleted or restarted from Hyper-V Manager.

Connection time is longer with IPv6-only host

- **Issue**

  If you are working in a mixed IPv4 and IPv6 environment and you add an IPv6-only host to SnapManager for Hyper-V, the connection might take longer than normal.

- **Cause**

  This delay occurs because SnapManager for Hyper-V tries IPv4 protocol first.

- **Corrective action**

  To work around this delay, add the host in the `\windows\system32\drivers\etc\hosts` file.

Volume Shadow Copy Service error: An internal inconsistency was detected

- **Message**

  ```
  Volume Shadow Copy Service error: An internal inconsistency was detected in
  trying to contact shadow copy service writers. Please check to see that the
  Event Service and Volume Shadow Copy Service are operating properly.
  ```

- **Description**

  When you perform a backup of a virtual machine that uses Windows Server 2003, it repeatedly fails due to a retry error.

- **Corrective action**

  Check the Windows Application event log inside the virtual machine for any VSS errors.

Related information

Microsoft Support Article 940184: Error message when you run the "vssadmin list writers" command on a Windows Server 2003-based computer: "Error: 0x8000FFFF"

Web Service Client channel was unable to connect to the ConfigurationManagementService instance on machine smhv51_81clus

- **Message**

  ```
  Web Service Client channel was unable to connect to the
  ConfigurationManagementService instance on machine smhv51_81clus.

  There was no endpoint listening at
  net.tcp://smhv51_81clus/SnapManager/HyperV/ConfigMgmtService/v_10 that could
  accept the message. This is often caused by an incorrect address or SOAP
  action. See InnerException, if present, for more details.
  ```

- **Description**

  If you export configuration information, the local Web service port settings of the managed hosts are stored in the exported configuration file. If you later have to reinstall SnapManager for Hyper-V using a different Web service port, and import the former configuration information, you experience connection issues.

- **Corrective action**

  To prevent this issue, use the same Web service port settings contained in the exported configuration file when reinstalling SnapManager for Hyper-V.

MSI custom property used in silent installation

- **Issue**

  Systems running Windows Server 2008 or Vista with Windows Installer version 4.5 do not recognize the built-in properties of SnapManager for Hyper-V installation.

- **Corrective action**

  Use the `MSIRESTARTMANAGERCONTROL=Disable` command switch parameter with installation.

Related information

Microsoft Developer Network (MSDN) Library

SnapManager for Hyper-V is not licensed on the host or in the Storage System

- **Message**

  ```
  SnapManager for Hyper-V is not licensed on the host or in the Storage System,
  backup is aborted
  ```

- **Description**

  This message occurs either when your system is not licensed or when there are issues with enumeration, virtual machine caching, or master boot record (MBR) disk use.

- **Corrective action**

  a. Ensure that your system is licensed.

  b. Migrate any MBR disks, which SnapManager for Hyper-V does not support, to GUID Partition Table (GPT) disks.

  c. Restart SnapManager for Hyper-V. If this does not resolve the issue, you most likely have an enumeration problem and should contact technical support.

Delete backups after failover

- **Message**

  ```
  The specified backup does not exist for some of the objects in the dataset.
  ```

- **Description**

  After failover to a secondary site (site B), you may be unable to delete backups created at the primary site (site A). If you are at a disaster recovery site (site B), and attempt to delete backups made at the primary site (site A), you will be deleting backups from the primary (site A) rather than the disaster recovery site (site B).

- **Corrective action**

  After performing disaster recovery operations, only delete backups that were made at your current site of

operation.

Storage performance degrades after failed backup

- **Issue**

  Storage performance may degrade following a failed backup job.

- **Cause**

  If the Microsoft Hyper-V VSS components experience an exception during a backup, the cluster shared volumes (CSVs) might remain in redirected I/O mode, causing I/O overhead and potential bottlenecks within the Windows Failover Cluster. This can lead to overall performance degradation, with the greatest impact to VMs residing on the CSV in redirected I/O mode.

- **Corrective action**

  Contact Microsoft Support for assistance with this issue.

Deleted SnapInfo Snapshot copies

- **Issue**

  SnapManager for Hyper-V is not maintaining or deleting SnapInfo Snapshot copies.

- **Cause**

  After creating a dataset backup, SnapManager for Hyper-V creates a Snapshot copy of the SnapInfo LUN. SnapInfo Snapshot copies are not deleted if the backup is deleted. By default, SnapManager for Hyper-V retains 30 SnapInfo LUN Snapshot copies, replacing the oldest copy with the newest copy each time the newest copy exceeds the 30-copy threshold.

- **Corrective action**

  You can configure the number of SnapInfo Snapshot copies you want to retain for each Hyper-V host by using one of the following registry keys:

  For stand-alone Hyper-V hosts: key:

  ```
  HKLM\SOFTWARE\NetApp\SnapManager for Hyper-V\Server\<hostname> DWORD value:
  snapinfo_snaps_count (number of SnapInfo Snapshot copies to be retained)
  ```

  For clustered Hyper-V hosts (to be configured on each node in the cluster): key:

  ```
  HKLM\Cluster\SOFTWARE\NetApp\SnapManager for Hyper-V\Server\<clustername>
  DWORD value: snapinfo_snaps_count (number of SnapInfo Snapshot copies to be
  retained)
  ```

High memory consumption caused by antivirus solution

- **Issue**

File-level antivirus solutions can cause high memory consumption, which might appear to be a memory leak.

- **Cause**

  Under certain conditions, SnapManager for Hyper-V might consume large and steadily increasing amounts of memory due to an incorrectly configured antivirus solution that scans the VM configuration files. When an antivirus solution scans the VM configuration files, an _InstanceModificationEvent event displays, which describes the changes. When SnapManager for Hyper-V receives this notification, it triggers an enumeration of storage and VMs with SnapDrive for Windows. In some cases, these events might occur with such rapidity that SnapDrive for Windows is unable to process them, causing SnapManager for Hyper-V to queue them.

- **Corrective action**

  Exclude the SnapManager for Hyper-V VM files from being scanned by the antivirus solution.

Space consumption when making two Snapshot copies for each backup

- **Issue**

  For every backup containing Hyper-V objects, two Snapshot copies are created, which can lead to concerns over space consumption.

  This only applies to application-consistent backups.

- **Cause**

  Microsoft Hyper-V VSS Writer creates both VM and application-consistent backup copies within the VMs, with the applications residing on VHDs. To create both software-consistent and VM-consistent backup copies, VSS employs the native autorecovery process, which sets the VM to a state consistent with the software Snapshot copy. Hyper-V VSS writer contacts each VM in the backup, and creates a software-consistent Snapshot copy.

  After the Snapshot copies are created, the parent partition creates a VSS Snapshot copy of the entire disk (LUN) that houses these VMs. After the parent partition Snapshot copy is created, VSS requires mounting of the previously created parent partition, to roll each of the VMs back to the software-consistent state and to remove any changes that were made to the VMs after the software Snapshot copy was created. These modifications to the VHDs must be made persistent. Because these Snapshot copies are read-only by default, a new Snapshot copy must be made to retain the updated copies of the VHDs. For this reason, a second Snapshot copy of the volume is created. This Snapshot copy is labeled with the suffix **_backup** and is the backup copy used in restore operations.

- **Corrective action**

  The two Snapshot copies are considered a pair. When the retention period ends for the backup, both of the Snapshot copies are deleted. You should not manually delete the first Snapshot copy, because it is necessary for restore operations.

  Microsoft VSS supports backing up VMs only on the host that owns the Cluster Shared Volume (CSV), so CSV ownership moves between the nodes to create backups of the VMs on each host in the cluster.

When backing up a CSV, SnapManager for Hyper-V creates two Snapshot copies per host in the cluster that runs a VM from that CSV. This means that if you back up 15 VMs on a single CSV, and those VMs are evenly split across three Hyper-V Servers, there is a total of six Snapshot copies per backup.

SnapDrive SDDiscoveryFileSystemListInfo response is null while backing up

- **Issue**

  You receive the error `SnapDrive SDDiscoveryFileSystemListInfo response is null while backing up`.

- **Cause**

  This message occurs when the SnapInfo location to which you are backing up is not available.

- **Corrective action**

  Verify that the SnapInfo location exists and is available. If it has changed, re-run the configuration manager to specify the new location. Attempt the backup again.

Related information

Set up a SnapInfo LUN

Error: Vss Requestor - Backup components failed

- **Message**

  The following error message is displayed in the SnapManager for Hyper-V report and the Windows Event log: `Error: Vss Requestor - Backup Components failed. Writer Microsoft Hyper-V VSS Writer involved in backup or restore encountered a retryable error. Writer returned failure code 0x800423f3. Writer state is XXX. For more information, see the Hyper-V-VMMS event log in the Windows Event Viewer.`

- **Description**

  If you receive a VSS retry error that causes your application-consistent backup to fail, SnapManager for Hyper-V retries the backup three times with a wait of one minute between each attempt.

- **Corrective action**

  You can configure the number of retries (retry count) and the duration of wait time between the retries (retry interval) using the following registry keys:

  ```
  Key: HKLM\System\CurrentControlSet\Services\OnCommandHyperV\Parameters DWORD value in seconds: vss_retry_sleep (The time duration to wait between retries) DWORD value: vss_retry (Number of retries)
  ```

  These settings are at the Hyper-V host level and the keys and values should be set on the Hyper-V host for each virtual machine. If the virtual machine is clustered, the keys should be set on each node in the cluster.

You must restart SnapManager for Hyper-V after making changes to or adding these registry keys.

Vss Requestor - Backup Components failed. An expected disk did not arrive in the system

- **Cause**

  This message occurs when you back up a dataset using SnapManager for Hyper-V and the following error appears in the Windows Application event log on the Hyper-V host.

```
A Shadow Copy LUN was not detected in the system and did not
arrive.

     LUN ID     guid

     Version      0x0000000000000001
     Device Type    0x0000000000000000
     Device TypeModifier  0x0000000000000000
     Command Queueing 0x0000000000000001
     Bus Type   0x0000000000000006
     Vendor Id    vendor
     Product Id   LUN
     Product Revision   number
     Serial Number    serial_number

     Storage Identifiers
     Version    0
     Identifier Count 0



    Operation:
       Exposing Disks
       Locating shadow-copy LUNs
       PostSnapshot Event
       Executing Asynchronous Operation

    Context:
       Execution Context: Provider
       Provider Name: Data ONTAP VSS Hardware Provider
       Provider Version: 6. 1. 0. 4289
       Provider ID: {ddd3d232-a96f-4ac5-8f7b-250fd91fd102}
   Current State: DoSnapshotSet
```

- **Corrective action**

Retry the dataset backup.

Vss Requestor - Backup Components failed with partial writer error

- **Message**

```
Error: Vss Requestor - Backup Components failed with partial
writer error.
Writer Microsoft Hyper-V VSS Writer involved in backup or restore
operation reported partial failure. Writer returned failure code
0x80042336. Writer state is 5.
Application specific error information:
Application error code: 0x1
Application error message: -
Failed component information:
Failed component: VM GUID XXX
    Writer error code: 0x800423f3
    Application error code: 0x8004230f
    Application error message: Failed to revert to VSS snapshot on the
    virtual hard disk 'volume_guid' of the virtual machine 'vm_name'.
   (Virtual machine ID XXX)
```

The following errors appear in the Windows Application event log on the Hyper-V host:

```
Volume Shadow Copy Service error: Unexpected error calling routine
GetOverlappedResult.  hr = 0x80070057, The parameter is incorrect.

Operation:
   Revert a Shadow Copy

Context:
   Execution Context: System Provider

Volume Shadow Copy Service error: Error calling a routine on a Shadow
Copy Provider
{b5946137-7b9f-4925-af80-51abd60b20d5}. Routine details
RevertToSnapshot
[hr = 0x80042302, A Volume Shadow Copy Service component encountered
an unexpected
error.
Check the Application event log for more information.].

Operation:
   Revert a Shadow Copy

Context:
   Execution Context: Coordinator
```

- **Description**

  This message appears when performing an application-consistent backup of a dataset. This error causes the backup to fail for some of the virtual machines in the dataset.

- **Corrective action**
  - Retry the dataset backup.
  - If the retry attempt fails again, split the dataset into two datasets so that all the VMs whose backup failed will be placed into a single dataset and all other VMs will be put into another dataset. Then run the backup again.

VSS returns errors against Microsoft iSCSI Target VSS Hardware Provider during NAS backup

- **Issue**

  While performing a NAS backup, the following errors might occur:

  ```
  Vss Requestor - Backup Components failed. Failed to add volume [example] to
  snapshot set. The shadow copy provider had an unexpected error while trying to
  process the specified operation.`

  Volume Shadow Copy Service error: Error creating the Shadow Copy Provider COM
  ```

`class with CLSID [example]. Access is denied.`

- **Cause**

  These errors occur during a NAS application-consistent backup. NAS backup does not fail, but VSS logs some errors related to Microsoft iSCSI Target VSS Hardware Provider.

- **Corrective action**

  The backup has not failed; you can safely ignore these errors.

Vss Requestor - Backup Components failed. Failed to call keep snapshot set.

- **Error**

  `Vss Requestor - Backup Components failed. Failed to call keep snapshot set. Reason Index and count must refer to a location within the string.`

- **Description**

  This error occurs when VMs in a backup job reside on a Storage Virtual Machine and CIFS server with the same name.

- **Corrective action**

  None available for this release.

- **Failure example**

  1. Create a Storage Virtual Machine and CIFS server with the same name: for example, “test1”.
  2. Add the test1 name to the DNS with both IP addresses.
  3. On a Windows Server 2012 host, install SnapManager for Hyper-V and create some VMs using the CIFS shares from test1.
  4. Create a backup copy that includes those VMs.
  5. Note that the backup job fails with the error: `Backup Components failed. Failed to call keep snapshot set. Reason Index and count must refer to a location within the string.`

MBR LUNs unsupported in SnapManager for Hyper-V

- **Issue**

  SnapManager for Hyper-V does not support MBR LUNs for virtual machines running on shared volumes or cluster shared volumes.

- **Cause**

  A Microsoft API issue returns different volume GUIDs when the cluster shared volume disk ownership changes. The volume GUID is not the same as the GUID in the cluster disk resource property. This issue also applies to virtual machines made highly available using Microsoft Failover clustering.

- **Corrective action**

  See the Microsoft Knowledge Base.

Backup fails after you remove a virtual machine from Hyper-V Manager

- **Issue**

  After you remove a Hyper-V virtual machine (VM) from Hyper-V Manager, backup operations fail if you do not update the dataset associated with the VM.

- **Cause**

  This issue occurs when you remove a Hyper-V VM from Hyper-V Manager and attempt a backup without modifying the dataset. Additionally, if you re-created a VM, you must modify the dataset. SnapManager for Hyper-V creates datasets based on the VM ID (GUID). The backup fails when a VM is deleted, removed, or re-created, which creates a new GUID. Although this does not trigger the failure of the entire backup process, if a VM is deleted, and then re-created with the same name, it is not automatically protected by SnapManager for Hyper-V.

- **Corrective action**

  Remove the VM from the dataset list of VMs, and add any re-created VMs to the dataset.

Related information

Configure datasets

Modify a dataset

Some types of backup failures do not result in partial backup failure

- **Issue**

  If one virtual machine in a dataset has an error, SnapManager for Hyper-V does not successfully complete the dataset backup, and in some scenarios, does not generate a partial failure. In these situations, the entire dataset backup fails.

- **Example**

  In a scenario where one storage system volume exceeds the 255 Snapshot copy limit, SnapManager for Hyper-V generates a partial failure even though the problem is associated with a subset of virtual machines in the dataset.

- **Corrective action**

  To successfully complete the backup operation, you need to fix the virtual machine that has the issue. If that is not possible, you can temporarily move the virtual machine out of the dataset, or create a dataset that only contains virtual machines known not to have a problem.

Restore failure after storage system volume renaming

- **Message**

  `Some of the storage system snapshots required to restore the VM are missing or inconsistent.`

- **Description**

  If storage system volumes are renamed, you cannot restore a virtual machine (VM) from its backup that was created prior to renaming volumes.

- **Corrective Action**

  If storage system volumes are renamed and you need to restore a VM from a backup created prior to renaming volumes, then complete the following:

  - While restoring a VM from MMC, make sure that "Enable Snapshot Verification" option is unchecked in the **Restore Options** page of the Restore wizard.
  - While restoring a VM by using PowerShell, make sure that -`DisableVerifySnapshot` parameter is specified.

Restore from a backup after failback

- **Issue**

  If you perform a failover and failback, you may not be able to restore VMs on your primary site from a backup created on the same primary site, before the failover.

- **Cause**

  Snapshot copy verification uses volume GUIDs. GUIDs changes after disaster recovery.

- **Corrective Action**

  You can disable the Verify Snapshots option through the PowerShell or the Restore wizard:

  - Uncheck the "Enable Snapshot Verification" option in the **Restore Options** page of the Restore wizard.
  - Using PowerShell, make sure that - `DisableVerifySnapshot` parameter is specified.

Related information

Restore a virtual machine from a backup copy

Web Service Client channel unable to connect while updating the dataset to the new node

- **Issue**

  If a Web Services Client is not explicitly started, it will fail to connect to SnapManager for Hyper-V.

- **Cause**

SnapManager for Hyper-V no longer automatically starts a Web Services Client channel. If the Web Service Client channel is unable to connect while updating a dataset to a new node, it may be for one of the following reasons:

  - Web Services has not been started.
  - SnapManager for Hyper-V is not installed.
  - The Web Services host is down.

- **Corrective action**

  To correct this behavior, be sure you have performed the following tasks:

  - Start Web Services.
  - Install SnapManager for Hyper-V.
  - Restart the Web Services host.

Datasets are not automatically replicated to new nodes in a Windows Failover Cluster

- **Issue**

  After adding new nodes to a Windows Failover Cluster, datasets are not automatically transferred to the new node.

- **Cause**

  When adding new nodes to a Windows Failover Cluster, SnapManager for Hyper-V does not automatically replicate the existing datasets to the new nodes in the cluster.

- **Corrective action**

  Run the Modify Dataset wizard and click **Update Schedule Policies to all the Dataset member nodes** on the Basic Details page.

  This wizard must be run for each dataset that has virtual machines.

Related information

Modify a dataset

Error 1935. An error occurred during the installation of assembly component

- **Message**

  ```
  Error 1935. An error occurred during the installation of assembly component
  {2A030FEB-29B5-314B-97B5-ED38673CC885}. HRESULT: 0x80070BC9.
  ```

- **Description**

  This message occurs when the SnapManager for Hyper-V installer fails as a result of the Hyper-V system

not being restarted after you install or uninstall Microsoft hotfixes.

- **Corrective action**

  Restart your computer and run the SnapManager for Hyper-V installer again.

Backup jobs that involve more than 15 CSVs from the same storage system might fail

- **Issue**

  SnapManager for Hyper-V backup jobs that involve more than 15 Cluster Shared Volumes (CSVs) from the same storage system fail with the following error:

  ```
  Failed to rename the Snapshot copy of the LUN to the new Snapshot copy
  name.
  Error code: The attempt to get the named attribute for the LUN on the
  storage system failed.
  Error code: 13057.
  Error description: An error occurred in the reception and processing of
  the API reply from the appliance.
  ```

- **Cause**

  This is a limitation caused by Data ONTAP to prevent a hold of system resources. The limitation of 15 LUNs is applicable only when all of the LUNs belong to the same storage system. If a backup dataset is created so that no more than 15 CSVs are involved from one storage system, then this issue does not occur.

- **Corrective action**

  If you want to make a backup that includes more than 15 LUNs from the same storage system, create multiple datasets to avoid this failure.

Either the specified VM(s) are not present or they cannot be backed up online

- **Message**

  ```
  Either the specified VM(s) are not present or they cannot be backed up online
  ```

- **Description**

  One reason this message occurs is when application-consistent backups fail if the pass-through disk size on the VM is less than 300 MB. Your error log will resemble the following example:

```
Log Name:      Application
Source:        SnapMgrServiceHost
Date:          11/12/2012 12:24:28 PM
Event ID:      106
Task Category: Backup Event
Level:         Error
Keywords:      Classic
User:          N/A
Computer:      defiant16.wak-qa.com
Description:
SnapManager for Hyper-V backup failed to complete

Backup Failed for the following VM(s) since it cannot be backedup online
or No VM to be found for backup
               VM Name: demovm-0
```

There are no other application or system error messages to indicate the failure.

- **Corrective action**

  You can either resize the pass-through disk to be larger than 300 MB or run the backup with the Allow saved state VM backup option enabled.

  This corrective action is applicable in both SAN and NAS environments.

- **Message**

  `Either the specified VM(s) are not present or they cannot be backed up online`

- **Description**

  A second reason this message occurs is because Windows cannot perform an online backup of this system because the scoped snapshots option for Hyper-V VMs is enabled. Scoped snapshots are mainly used by Windows critical updates.

- **Corrective action**

  You must disable the `scoped snapshots` option by creating a DWORD `ScopeSnapshots` parameter with value 0 in:

  `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WindowsNT\CurrentVersion\SystemRestore\`

  This corrective action is applicable in both SAN and NAS environments.

Required hotfix KB2263829 cannot be installed on some platforms

- **Issue**

  While installing SnapManager for Hyper-V, attempting to install hotfix KB2263829 might fail for Windows Server 2008 R2 SP1. The installer states that the hotfix is not applicable for this server.

- **Cause**

  The hotfix is not supported for your platform.

- **Corrective action**

  Open a support case with Microsoft and resolve the issue with Microsoft.

Backup failure with the error “Shadow copy creation is already in progress”

- **Message**

```
SnapManager for Hyper-V backup failed to complete
Backup of the Dataset Name: example
Backup id: c1bb4b28-c76c-4001-85fd-ffdfdb5737c9 failed to execute
Error: Vss Requestor - Backup Components failed. Failed to add volume
\\CIFS_USER_SER\USER_SHARE2\ to snapshot set. Another shadow copy
creation is already in progress. Wait a few moments and try again.
```

- **Description**

  This issue occurs because a previous backup is not aborted and is still active. Use the following command to check for any entries listed: `cifs share show -shadowcopy`

- **Corrective action**

  Abort the previous backup job and retry the operation.

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