VSS components

SnapManager for Hyper-V

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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.

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