



NETAPP

HyperVIBE Installation and User Guide

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1 INTRODUCTION

This document describes how to install and use the HyperVIBE application, a command-line (CLI) tool for performing backup and restore operations on virtual machines hosted on the Microsoft Hyper-V hypervisor.

With exceptions noted herein, HyperVIBE is supported on configurations consistent with virtualization storage best practices as outlined in NetApp Technical Report TR-3702: NetApp and Microsoft Virtualization Storage Best Practices. This document is available at <http://media.netapp.com/documents/tr-3702.pdf>.

2 PREREQUISITES

This section lists the requirements for running the HyperVIBE application.

HYPER-V HOST

- Microsoft Windows 2008 Server, Full or Core version, x86_64 only
- Hot-fixes 950050, 950927, 954475, 956697 and 959962
- If using Windows Failover Clustering, hot-fixes 951308, 957967, 958065, and 958184
- NetApp SnapDrive for Windows (SDW 6.1P2, available on now.netapp.com)
- One or more NetApp LUNs (FC or iSCSI) for virtual machine files

VIRTUAL MACHINES

- One VM per LUN (multiple LUNs per VM are supported)
- VM disks on host-mounted VHD files. Passthrough and guest-mounted disks are not supported by HyperVIBE. NetApp recommends using fixed-size VHD files.
- VM definition files stored on same LUNs as VHD files
- Guest operating systems from the Microsoft-supported list. Hyper-V Integration Services must be installed on each guest VM. For application-consistent backups, the guest operating system must support Volume Shadow-copy Service (VSS).

STORAGE CONTROLLER

- NetApp storage system running Data ONTAP 7.3.1.1 or higher
- FCP or iSCSI license
- SnapRestore license

3 INSTALLATION

3.1 SET UP STORAGE CONTROLLER

1. Ensure NetApp storage system is running Data ONTAP 7.3.1.1 or higher.
2. Install iSCSI and/or FCP license.
3. Install SnapRestore license. This license is *not* optional.
4. Create an administrative user for use by SnapDrive for Windows.

3.2 INSTALL WINDOWS 2008 SERVER

1. Install Windows 2008 Server on the Hyper-V host machine along with required hot-fixes.
2. Enable Hyper-V role.

3. Log in with Administrator privilege and create a new user with root privileges and the same name as that defined on the storage controller.

3.3 INSTALL SNAPDRIVE FOR WINDOWS AND HYPERVIBE

1. Ensure your configuration meets the system requirements outlined in http://now.netapp.com/NOW/download/software/snapdrive_win/6.1/ with the following overrides:
 - Microsoft Windows 2008 Server, Full or Core version, x86_64 only
 - Data ONTAP 7.3.1.1 or higher
2. Install SnapDrive for Windows 6.1P2. You must have a valid SnapDrive for Windows license key to complete this step.
3. Unpack the HyperVIBE.zip file to a temporary location and copy the hypervibe.exe program file to any suitable location on the Hyper-V host.
4. Reboot.

3.4 SET UP VIRTUAL MACHINES

1. Using SnapDrive for Windows, create LUNs to contain virtual machine(s).
2. Create virtual machine(s). Place VHD files and VM definition files on the same LUN for each VM.
3. Start virtual machine(s).
4. Install Hyper-V Integration Services on each guest. Backups for any VM without Integration Services or VSS support will only be crash-consistent, and the VM may be restarted during the backup operation.
5. If using Windows Failover Clustering, configure your VMs for high availability.

4 USING HYPERVIBE

4.1 COMMANDS

HyperVIBE is a command-line utility that must be run on the Hyper-V host. The available commands are listed in Table 1.

Table 1) HyperVIBE commands

Command	Description
hypervibe --list vms [<vm> [<vm> ...]] [-t -x]	List virtual machines that reside on NetApp LUN storage. -t selects a tabular format. -x selects an XML format. VMs may be specified by name or GUID.
hypervibe --list backups [<vm> [<vm> ...]] [-t -x] [-m <path>]	List backup records for one, multiple, or all virtual machines that are available for a restore operation. -t selects a tabular format. -x selects an XML format. -m specifies an alternate path to the metadata store. VMs may be specified by name or GUID.
hypervibe --backup [-n] [-u] [-m <path>]	Back up all VMs individually. -n disables most confirmation prompts. -u updates SnapMirror destinations, if any exist. -m specifies an alternate path to the metadata store.

hypervibe --backup [<vm> [<vm> ...]] [-n] [-u] [-m <path>]	Back up one or more VMs together. If multiple VMs are part of a single backup record, they will also be restored together. -n disables most confirmation prompts. -u updates SnapMirror destinations, if any exist. -m specifies an alternate path to the metadata store. VMs may be specified by name or GUID.
hypervibe --restore <record> [-n] [-m <path>]	Restore from a single backup record. All VMs that were part of this backup are restored. The backup record is specified using the numerical format returned by the --list command. -n disables most confirmation prompts. -m specifies an alternate path to the metadata store.
hypervibe --delete <record> [-p] [-n] [-m <path>]	Delete a single backup record. The filer snapshots that comprise this backup are deleted. -n disables most confirmation prompts. -p preserves the backup record. -m specifies an alternate path to the metadata store.
hypervibe --delete all [-p] [-n] [-m <path>]	Delete all backup records. The filer snapshots that comprise all backups are deleted. -n disables most confirmation prompts. -p preserves the backup record. -m specifies an alternate path to the metadata store.
hypervibe --delete keep <count> [-p] [-n] [-m <path>]	Delete all except the newest <count> backup records for each VM. The filer snapshots that comprise the non-retained backups are deleted. -n disables most confirmation prompts. -p preserves the backup record. -m specifies an alternate path to the metadata store.
hypervibe --script <filename> [<filename> ...]	Process one or more text files containing multiple HyperVIBE commands. The script files may also include --script commands, thereby enabling a hierarchical backup regimen that may be triggered by a single scheduled HyperVIBE invocation.

4.2 EXAMPLES

4.2.1 List virtual machines

```
C:\>hypervibe --list vms -t
```

Virtual machine	GUID	# of NetApp LUNs
VM1_Dunn_LUN10	45AA479E-B903-4F19-A883-B94AFDB4287A	1
VM2_Dunn_LUN11	FD06CA4D-A3E9-4290-B787-B0E64C84FED8	1
VM3_Dunn_LUN12	E4813353-E731-423D-B2AE-90E76A2D67E8	1
VM4_Dunn_LUN13	D7D9110B-14FE-4DC4-9CC4-EE9B6E6BC3EA	1

VM5_Dunn_LUN14	DF7F29F1-3D06-428B-A89A-24E4E5D64C72	1
VM6_Dunn_LUN14	F98885D1-2D8E-4D28-A384-18F1775BCC59	1
VM7_Dunn_LUN15	1052A316-A4E0-4A2C-9F38-69233543B68C	1
VM8_Dunn_LUN16	863142AF-7CDA-48EC-A5A5-5464B71B0040	1

4.2.2 List backup records

```
C:\>hypervibe --list backups -t
```

Backup record	Virtual machine	Backup date/time
1223058340	VM3_Dunn_LUN12	Fri, 03 Oct 2008, 14:25:40
1223058385	VM4_Dunn_LUN13	Fri, 03 Oct 2008, 14:26:25
1223058434	VM5_Dunn_LUN14	Fri, 03 Oct 2008, 14:27:14
1223058434	VM6_Dunn_LUN14	Fri, 03 Oct 2008, 14:27:14
1223058493	VM2_Dunn_LUN11	Fri, 03 Oct 2008, 14:28:13
1223064348	VM1_Dunn_LUN10	Fri, 03 Oct 2008, 16:05:48

4.2.3 Back up one virtual machine

```
C:\>hypervibe --backup VM1_Dunn_LUN10
Backup to record ID 1226331659 succeeded for the following VM(s):
45AA479E-B903-4F19-A883-B94AFDB4287A : VM1_Dunn_LUN10
```

4.2.4 Back up all virtual machines

```
C:\>hypervibe --backup
WARNING: You have chosen to separately backup ALL virtual machines.

Continue (y/n)? [y]
Backup to record ID 1226331860 succeeded for the following VM(s):
45AA479E-B903-4F19-A883-B94AFDB4287A : VM1_Dunn_LUN10
Backup to record ID 1226331915 succeeded for the following VM(s):
863142AF-7CDA-48EC-A5A5-5464B71B0040 : VM8_Dunn_LUN16
Backup to record ID 1226331971 succeeded for the following VM(s):
D7D9110B-14FE-4DC4-9CC4-EE9B6E6BC3EA : VM4_Dunn_LUN13
ERROR: The definition files for the following virtual machine:
1052A316-A4E0-4A2C-9F38-69233543B68C : VM7_Dunn_LUN15
were found to be here:
C:\ProgramData\Microsoft\Windows\Hyper-V
This path is not on any of the volumes that contain the
virtual machine VHD files. The definition files must be
```

```

        part of the backup and so must reside on a NetApp LUN.
        The VHD files for the virtual machine(s) in this backup
        operation are on the following NetApp-based volumes:
        \\?\Volume{6a694c44-816f-454b-a4d1-54479db6eb25}\ (I:\)
ERROR: The backup operation was aborted.
WARNING: The following virtual machines share common storage.
        These will be backed up together during this operation.
        DF7F29F1-3D06-428B-A89A-24E4E5D64C72 : VM5_Dunn_LUN14
        F98885D1-2D8E-4D28-A384-18F1775BCC59 : VM6_Dunn_LUN14
Backup to record ID 1226332027 succeeded for the following VM(s):
        DF7F29F1-3D06-428B-A89A-24E4E5D64C72 : VM5_Dunn_LUN14
        F98885D1-2D8E-4D28-A384-18F1775BCC59 : VM6_Dunn_LUN14
Backup to record ID 1226332096 succeeded for the following VM(s):
        E4813353-E731-423D-B2AE-90E76A2D67E8 : VM3_Dunn_LUN12
Backup to record ID 1226332150 succeeded for the following VM(s):
        FD06CA4D-A3E9-4290-B787-B0E64C84FED8 : VM2_Dunn_LUN11

```

4.2.5 Restore a virtual machine

```

C:\>hypervibe --restore 1226331860
WARNING: You MUST have licensed SnapRestore on your filer(s) before
        performing a virtual machine restore operation. Failure
        to do so may require you to recover your VM(s) manually.
WARNING: The VM(s) being restored will be shut down during this operation,
        and all data on the active LUN filesystem(s) will be overwritten.

The following VMs will be restored.

        45AA479E-B903-4F19-A883-B94AFDB4287A : VM1_Dunn_LUN10

Continue (y/n)? [y]
Restore from record 1226331860 succeeded.

```

4.2.6 Delete older backups

```

C:\>hypervibe --delete keep 3
WARNING: You have chosen to delete 9 backup records. This operation
        will delete the filer snapshots associated with these backups.

Continue (y/n)? [y]
Snapshots deleted for record 1226088092.
Snapshots deleted for record 1226088786.

```

```

Snapshots deleted for record 1226090504.
Snapshots deleted for record 1226076170.
Snapshots deleted for record 1226076760.
Snapshots deleted for record 1226088147.
Snapshots deleted for record 1226076815.
Snapshots deleted for record 1226087372.
Snapshots deleted for record 1226088210.

```

4.2.7 Run a script

Create a text file containing one or more commands, i.e.:

```

hypervibe --backup VM1_Dunn_LUN10
hypervibe --backup VM2_Dunn_LUN11
hypervibe --delete keep 3 -n

```

Then issue or schedule the HyperVIBE command:

```

C:\>hypervibe --script backup.txt
*** Executing script file backup.txt
--> hypervibe --backup VM1_Dunn_LUN10
Backup to record ID 1226332982 succeeded for the following VM(s):
    45AA479E-B903-4F19-A883-B94AFDB4287A : VM1_Dunn_LUN10
--> hypervibe --backup VM2_Dunn_LUN11
Backup to record ID 1226333042 succeeded for the following VM(s):
    FD06CA4D-A3E9-4290-B787-B0E64C84FED8 : VM2_Dunn_LUN11
--> hypervibe --delete keep 3 -n
Snapshots deleted for record 1226090749.
Snapshots deleted for record 1226331054.
Snapshots deleted for record 1226331659.

```

4.3 SCHEDULING

HyperVIBE may be used together with the Windows scheduler to create a regular backup regimen.

Create a Windows CMD file containing one or more HyperVIBE commands, such as C:\script.cmd:

```

time /T >>C:\HyperVBackupLog.txt
date /T >>C:\HyperVBackupLog.txt
C:\hypervibe.exe --backup -n >>C:\HyperVBackupLog.txt
C:\hypervibe.exe --delete keep 5 -n >>C:\HyperVBackupLog.txt
echo _____ >>C:\HyperVBackupLog.txt

```

Then add the task to the scheduler:

```

C:\>schtasks /create /ru Administrator /rp password /sc daily /tn
"Hyper-V Backup" /tr "C:\script.cmd" /st 02:00

```

4.4 LIMITATIONS

- SnapDrive for Windows 6.1P2 cannot create VSS backups simultaneously from different nodes of a Windows 2008 failover cluster. When scheduling HyperVIBE backups for multiple cluster nodes, ensure the backup windows do not overlap.
- HyperVIBE 2.0 is only supported for Windows 2008 failover clusters with iSCSI LUNs.
- A Windows host doing VSS backup operations may only have FC LUNs mapped to one filer head in an ONTAP single-image (SSI) cluster.
- While backing up many VMs in rapid succession on a Hyper-V host, a VSS backup may fail with VSS_E_WRITER_STATUS_NOT_AVAILABLE written to the Windows application event log. To prevent this issue, NetApp recommends inserting a short wait between HyperVIBE invocations.