

Hyper-V 2012 CSV Support Considerations

v2 updated 7/26/2013 to add additional resources and antivirus concerns

Purpose

This article is intended to discuss known software defects in Microsoft Hyper-V 2012 related to Cluster Shared Volumes (CSV), and Microsoft's supported/recommended configurations and patches required to allow successful 3rd party backups of Hyper-V 2012 systems that utilize CSV. Additionally, this article includes information necessary to ensure the default "system" writer is used when backing up Hyper-V guests using the Unitrends Agent.

Description

Symptoms of an improperly patched Hyper-V 2012 server with CSV can include but are not limited to:

- CSV completely going offline when a backup is attempted using VSS
- Windows System events 5120 or 5142 are logged during heavy disk activity cycles or when taking a backup
- Hyper-V nodes are removed from active cluster membership, System Event ID 1135 is logged
- You have Event ID 4 Kerberos KRB_AP_ERR_MODIFIED errors appearing on 2003 Server and XP workstations when attempting to access file shares hosted on Server 2012 systems using CSV.
- The Windows Systems Log on Server 2012 system has event IDs 1228 or 1196 when attempting to bring a cluster resource online.
- Live migration of VMs between hyper-V nodes fails with event ID 21502.
- An attempt to back up a Hyper-V guest is interrupted or fails and a VSS_E_SNAPSHOT_SET_IN_PROGRESS error is generated in the event logs.
- Memory usage on a Hyper-V node increases dramatically during snapshot corresponding to read requests from other non-owning nodes
- When under heavy load a Hyper-V node may crash and provide the following Stop error message: STOP: 0x000000C2 (parameter1, parameter2, parameter3, parameter4)
- When using thin provisioned guest disks, I/O delays or I/O stalls occur frequently during volume unmounting
- Agent backups attempt to use a VSS provider other than the Microsoft System Writer

- Unitrends Agent backups of Hyper-V 2012 servers configured with remote storage fail.

Cause

The production release of Hyper-V 2012 Server was released with numerous bugs related to a new implementation of CSV. These bugs do have current known hotfixes, however most of these hotfixes are NOT part of any current patch available through Windows Update Services. Many of these bugs can cause a CSV to go *offline completely* causing *data loss* in most scenarios, when snapshots are being taken of the volume or when high load is applied to the storage system.

Additionally, Hyper-V 2012 has known configuration requirements Microsoft has conveyed concerning network topology when iSCSI storage is in use that could lead to further complications and unreliability.

Finally, Hyper-V guests by default are not snapshotted in all cases by the default system provider, but by the SAN storage provider. Such configurations are not always compatible with the Unitrends Agent for Hyper-V guest backup and recovery.

An initial issue with the CSV implementation in Hyper-V 2012, which is a new architecture from previous CSV implementations, was first discovered with Microsoft's own DPM backup solution. This issue impacts all backup solutions, 1st and 3rd party for hyper-V 2012.

Resolution

This article pulls together all resources current as of July 22, 2013. Updates to this article will be posted as more information is made available. As this has been an ongoing saga including more than 10 total KBs to resolve a single issue, neither Unitrends nor Microsoft can confirm this solution will work for all parties in all scenarios and cannot guarantee unresolved issues still remain unreported that may impact CSV stability. However, at this time numerous Unitrends clients have confirmed successful backups of Hyper-V 2012 using CSV without incident after following the patch process provided by Microsoft detailed in this article.

By following the information below, Hyper-V 2012 systems using remote or CSV storage should be able to be backed up successfully using the Unitrends Agent vs the Microsoft System Provider via VSS.

- 1) Install the following hotfix by clicking the "Hotfix Download Available" image at the top of this KB on every Hyper-V 2012 node. The link will direct you to a download link for a fix for Windows 8 RTM (this is correct for Server 2012 64bit systems although not intuitive). You must reboot after installing this hotfix. <http://support.microsoft.com/kb/2870270>

This hotfix includes all hotfixes from KBs 2870270, 2848344, 2796995, 279728, 2801054, 2813630, and 2848727.

- 2) Install the following hotfix by clicking the "Hotfix Download Available" image at the top of this KB on every Hyper-V 2012 node. A reboot is required after installing this hotfix. <http://support.microsoft.com/kb/2838043>

Further, if you have experienced any of the symptoms noted in the KB's symptoms section previously then you *must* change the password on the named cluster resources following the procedures in the KB article.

- 3) Ensure the patch rollup for 2012 servers from March 2013 via KB 2811660 is installed. You must restart each node in the cluster after installing this update rollup. The download link is included here:
<http://www.microsoft.com/en-us/download/details.aspx?id=36916>
- 4) Ensure your SAN architecture is running current firmware and storage drivers (and if necessary fiber hardware drivers and switch firmware). Preferably drivers and firmware which have been released after May 10 2013 as those are likely to include or be in reflection of Microsoft's own hotfix efforts themselves to tolerate I/O latency issues caused by CSV under load. Ensure your SAN hardware is openly supported and *certified* by Microsoft for use with 2012 CSV.
- 5) Ensure the mainboards in your server are running the latest BIOS or EFI firmware, and that all hardware drivers have been updated, specifically noting tcpip.sys, netio.sys, mrxsmb.sys, mrxsmb20.sey, mrxsmb10.sys and srv.sys. Ensure your server hardware is Certified for Windows 2012 systems by Microsoft.
- 6) Ensure the networking requirements for number of NICs and required dedicated subnets for Storage, Heartbeat, and public data access have been reviewed and are correct.
- 7) Run the Microsoft "Validate a Configuration Wizard" or the PowerShell equivalent scripts following the information in the following article for 2012 clusters ensuring to include the full storage tests. This test can only be run during a maintenance window as it requires guests to be powered down during some tests. <http://technet.microsoft.com/en-us/library/jj134244.aspx> If any deficiencies are reported, resolve them before attempting backups using any VSS aware tools.
- 8) Ensure the 7.1 Unitrends agent or higher is deployed to all Hyper-V 2012 nodes and on the backup appliance.

- 9) Edit the file C:/PCBP/master.ini on all nodes. Locate the section [Usnap] near the bottom of the file and add the line: "UsnapProvider=System" (note this is CASE SENSITIVE but does not include the quotes). Save the Master.ini file. Agents do *not* need to be restarted after this change. If backups previously ran using a provider other than system a new full backup of each Hyper-V guest is required.
- 10) Ensure any antivirus engine excludes all scans of C:\Windows\cluster directory
- 11)

After patching your system, confirming proper network routing and number of network cards are used, and if running on certified platform for Hyper-V 2012 clusters, your cluster validation should be successful. With the change to step 9, Unitrends backups should also be successful using our agent.

Note: some limitations of Windows and Hyper-V 2012 prevent certain types of guest configurations being supported for backup and recovery through VSS. Please review the links below and ensure your host and guest architecture is compliant with Microsoft's backup requirements. Some guest configurations are possible that are not supported under VSS for backup and will require the deployment of an agent inside the guest for protection by Unitrends.

Third-Party Sources

Links of particular value in diagnosing and configuring your Hyper-V 2012 CSV environment are highlighted in **red** below.

A technet forum post containing a detailed and routinely updated history of the problems with Hyper-V 2012 CSV backups can be found here:

<http://social.technet.microsoft.com/Forums/en-US/604409df-ada1-47d1-bdfb-3f938cde0b59/dpm-2012-sp1-beta-causing-server-2012-hyperv-cluster-hang-iscsi-problems>

PowerShell Script to check for all related Hyper-V 2012 hotfixes!

<http://blogs.technet.com/b/cedward/archive/2013/05/24/validating-hyper-v-2012-and-failover-clustering-2012-hotfixes-and-updates-with-powershell.aspx>

List of Failover Cluster hotfixes for 2012 server from the MS cluster team Wiki:

<http://social.technet.microsoft.com/wiki/contents/articles/15577.list-of-failover-cluster-hotfixes-for-windows-server-2012.aspx>

Official Microsoft KB for failover cluster hotfixes: (this is expanded upon greatly by the link above and is included for reference only)

<http://support.microsoft.com/?id=2784261>

Windows Server 2012 Hyper-V Best Practices (EASY CHECKLIST)

<http://blogs.technet.com/b/askpfplat/archive/2013/03/10/windows-server-2012-hyper-v-best-practices-in-easy-checklist-form.aspx>

Network configuration requirements for Hyper-V 2012 (Very Important)

<http://blogs.technet.com/b/gavinmcshera/archive/2011/03/27/3416313.aspx>

<http://blogs.msdn.com/b/clustering/archive/2011/06/17/10176338.aspx>

<http://blogs.technet.com/b/askcore/archive/2010/02/12/windows-server-2008-failover-clusters-networking-part-1.aspx>

<http://blogs.technet.com/b/schadinio/archive/2010/11/06/virtualization-network-card-settings-for-hyper-v-cluster.aspx>

<http://social.technet.microsoft.com/wiki/contents/articles/9711.hyper-v-network-design-configuration-and-prioritization-guidance.aspx>

Antivirus software and clustering

<http://support.microsoft.com/kb/250355>

<http://support.microsoft.com/kb/309422>

Information about the changes to Failover Clustering in 2012 for Hyper-V:

<http://blogs.technet.com/b/askcore/archive/2012/07/23/windows-server-2012-failover-cluster-sessions-at-teched.aspx>

More info about 2012 failover clustering:

<http://technet.microsoft.com/en-in/library/hh831414.aspx>

Best practices for Live-Migration and its configuration

<http://blogs.technet.com/b/askcore/archive/2009/12/10/windows-server-2008-r2-live-migration-the-devil-may-be-in-the-networking-details.aspx>

Known limitations of Hyper-V 2012 with Passthru Disks in use:

<http://blogs.technet.com/b/askcore/archive/2013/01/24/behavior-change-when-working-with-pass-through-disks-in-windows-server-2012-failover-clusters.aspx>

Windows 2012 clustering news group:

<http://social.technet.microsoft.com/Forums/windowsserver/en-US/home?forum=winserverClustering>

Microsoft support policy for 4k sector hard disks

<http://support.microsoft.com/kb/2510009#Application>

windows server 2012 Backup features (Supported/Not Supported)

<http://technet.microsoft.com/en-us/library/jj614621.aspx>

Windows Backup of Hyper-V Supported in 2012 (unlike 2008 R2)

http://blogs.msdn.com/b/virtual_pc_guy/archive/2013/02/18/windows-backup-and-hyper-v-in-server-2012.aspx

Backup of Hyper-v VMs using CMD

http://blogs.msdn.com/b/virtual_pc_guy/archive/2013/02/25/backing-up-hyper-v-virtual-machines-from-the-command-line.aspx

Features added/Updated in Hyper-V

<http://technet.microsoft.com/en-us/library/hh831531.aspx>

Features added/Updated in Failover Clustering 2012

<http://technet.microsoft.com/en-us/library/hh831414.aspx>

Features added/Updated in Failover Clustering 2012 R2 (Preview)

<http://technet.microsoft.com/en-us/library/dn265972.aspx>

2012 Failover Clustering

<http://technet.microsoft.com/en-us/library/hh831579.aspx>

List of Supported OS on Hyper-v 2012

<http://blogs.technet.com/b/schadinio/archive/2012/06/26/windows-server-2012-hyper-v-list-of-supported-client-os.aspx>

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