Step-By-Step: Completing Storage Live Migration in Hyper-V 2012 R2



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With both Managing the Datacenter and Virtualizing the Datacenter #CANITPRO Camps coming to a close. Further details regarding the next upcoming will be made available soon. As you may be aware, Microsoft provides evaluation copies of Windows Server 2012R2 and Hyper-v Server 2012R2 to allow for testing from within your own private lab environments. Coupled with these Step-By-Step blog posts, we hope that you are empowered to further your endeavors as well as provide a reference for future activities asked of you within you production environment.

Storage Live Migration in Hyper-V

Storage Live Migration provides the ability to move your virtual machine storage while your VM is running. In comparison, Storage Live Migration is similar in offering to the VMware storage offering called vMotion. The virtual hard disks used by a virtual machine can be moved to different physical storage while the virtual machine remains running making it unnecessary to take a virtual machine offline to move the VMs files to different physical storage. Storage Live Migration supports both VHD and VHDX file types. VHDX file types are the new virtual hard drive format utilizing a 64k block size supporting virtual disks up to 64 TB in size and subsequently provide improved disk access speed in comparison to the old VHD file format. Older VHD disks utilize a 512 byte block size and have a maximum size of 2 TB.



During the Storage Live Migration process, the Virtual Machine disk is mirrored to either a local disk or shared storage allowing the server to continue to run the VM. Upon completion, Hyper-V switches the VM to run from destination virtual hard disk. Hyper-v can revert back to running the original source files should an error occur within the Storage Live Migration process and/or Hyper-V is unable to utilize the new destination virtual disk. An additional benefit of Storage Live Migration is that when deleting snapshots from a running VM, the snapshot / differencing disk will be merged in while the VM is running. Previously these changes were merged when the VM was restarted causing longer than expected reboot times as the VM had to wait to restart until changes were merged.

To add, the Shared Nothing Live Migration process provides storage migration mirroring the virtual hard disk to another server before completing the live migration. This process mirrors the memory to the new server then switches the running server to run on the new server and removes it from the original server thus moving a running VM from one Hyper-v host server without utilizing shared storage.

Fellow Microsoft Technical Evangelist, Brian Lewis, has created a detailed Storage Live Migration lab process which we at CANITPRO are happy to share.

Live Storage Migration via Hyper-v Manager

1. Within the Hyper-v MMC – you can see the settings of VM Server1 that the virtual hard disk is currently located under d:\Hyper-v\VHDs\Server1.vhdx

Server1	
 ★ Hardware ▲ Add Hardware ▲ BIOS Boot from CD ■ Boot from CD ■ Memory 1024 MB ■ Processor ■ IDE Controller 0 ▲ Hard Drive Server Lvhdx ■ IDE Controller 1 ④ DVD Drive None SCSI Controller ■ Network Adapter ExternalNetwork ♥ COM 1 None ♥ COM 2 None ♥ COM 2 None ★ Management I Name Server 1 	Hard Drive You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting. Controller: Location: IDE Controller 0 Media You can compact or convert a virtual hard disk by editing the associated file. Specify the full path to the file. If the physical hard disk: Physical hard disk: If the physical hard disk. To remove the virtual hard disk, olick Remove. This disconnects the disk but does not deter the associated file. To remove the virtual hard disk, dick Remove. This disconnects the disk but does not deter the associated file. Remove An operating a settings cannot be modified because the virtual machine was running when this window was opened. To modify a setting that is unavailable, shut down the virtual machine and then reopen this window.
Integration Services Al services offered Snapshot File Location D: Hyper-V(Whconfig) Smart Paging File Location D: Hyper-V(Whconfig)	
Integration Services All services offered Snapshot File Location D: (Hyper -V)(Mconfig) Smart Paging File Location D: (Hyper -V)(Wconfig) Replication Primary virtual machine	

Name 📩		State	CPU Usage	Assigned Memory	Uptime
DC1		Running	0 %	1024 MB	00:38:04
Server1 Server3 Server4 Server5	Connect Settings Turn Off Shut Down Save Pause Reset	D	0 % 0 % 0 % 0 %	1024 MB 1024 MB 514 MB 1024 MB 512 MB	00:38:07 00:38:05 00:38:03 00:38:05 00:38:03
	Snapshot		1		
inapsh	Rename Replication Help	•	d virtual machine has	no snapshots.	

2. To initiate a Live Storage Migration – right click on the server then select Move

3. In the Wizard select if you want to move the Virtual Machine or the Storage of the Virtual Machine. In this example moving the storage to the VM is chosen



4. Choice is provided to move just the virtual disks or to also include the configuration files. In this example, the disks, snapshots, and configuration file are selected to be moved

Before You Begin Choose Move Type	How do you want to move the storage? Owner was all of the virtual machine's data to a single location
Choose Move Options Virtual Machine Summary	This option allows you to specify one location to store all the virtual machine's items. Move the virtual machine's data to different locations This option allows you to specify individual locations for each of the virtual machine's items. Move only the virtual machine's virtual hard disks This option allows you to specify locations to move the virtual machine's virtual hard disks.

P	Move "Server1" Wizard			
Choose a r	new location for virtual machine			
Before You Begin Choose Move Type Choose Move Options	Specify a location for the virtual machine's items. New location Folder: Whyperv1WHDs\Virtual Machines\ Browse Browse			
Virtual Machine Summary	Available space: 43.26 GB Current location Size: 8.63 GB			
	R			
	< Previous Next > Finish Cancel			

6. In this example the files are being moved from the local hard drive (d:\Hyperv\VHDs\Server1.vhdx) to a file share (\\hyperv1\VHDS\VirtualMachines\)

P	Move "Server1" Wiza	ard 🗾 💌
Completin	g Move Wizard	
Before You Begin Choose Move Type Choose Move Options Virtual Machine Summary	You are about to perform the following operate Description: Virtual machine: Move type: Item to move: Attached virtual hard disk IDE Controller 0 Current configuration Snapshots Smart Paging To complete the move and close this wizard, cl	ion. Server 1 Virtual Machine Storage New location \hypperv1\VHDs\Virtual Machines\ \hypperv1\VHDs\Virtual Machines\ \hypperv1\VHDs\Virtual Machines\ \hypperv1\VHDs\Virtual Machines\ \hypperv1\VHDs\Virtual Machines\
	< Prev	ious Next > Finish Cancel

7. The process is now completed. The location of the virtual hard disk has now been moved to the file share which occurred without shutting down any VMs

Server1 v	410
Add Hardware Add Hardware Image: State of the state	You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting. Controller: Location: IDE Controller 0 V Media Media
IDE Controller 0 Ide Controller 0 Ide Controller 0	You can compact or convert a virtual hard disk by editing the associated file. Specify the full path to the file.
IDE Controller 1 DVD Drive None	Virtual hard disic Virtual Machines/Virtual Hard Disks/Server1.vhdx New Edit Inspect Browse
Vetwork Adapter ExternalNetwork ExternalNetwork OM 1 None OM 2 None Diskette Drive None	Physical hard disk: Physical hard disk: Physical hard disk you want to use is not listed, make sure that the disk is offline. Use Disk Management on the physical computer to manage physical hard disks. To remove the virtual hard disk, dick Remove. This disconnects the disk but does not delete the associated file.
Management Name Server1 Integration Services Al services offered Snapshot File Location (hyperv 1\WHDs\Wirbual Machines	Some settings cannot be modified because the virtual machine was running when this window was opened. To modify a setting that is unavailable, shut down the virtual machine and then reopen this window.
Smart Paging File Location (hyperv 1\HDs\Virtual Machines Replication Primary virtual machine	

Live Storage Migration via PowerShell

1. Open the PowerShell console



 Type - Move-VMStorage "Server1" "\\Hyperv1\VHDs\Virtual Hard Disks\"