Configuring Pass-through Disks in Hyper-V

A question the CORE Team gets asked frequently deals with configuring Hyper-V Guest with Passthrough disks. In this blog I will cover this topic.

Pass -through Disk Configuration

Hyper-V allows virtual machines to access storage mapped directly to the Hyper-V server without requiring the volume be configured. The storage can either be a physical disk internal to the Hyper-V server or it can be a Storage Area Network (SAN) Logical Unit (LUN) mapped to the Hyper-V server. To ensure the Guest has exclusive access to the storage, it must be placed in an **Offline** state from the Hyper-V server perspective. Additionally, this raw piece of storage is not limited in size so, hypothetically, it can be a multi-terabyte LUN.

After storage is mapped to the Hyper-V server, it will appear as a raw volume and will be in an **Offline** state (depending on the SAN Policy (Figure 1-1)) as seen in Figure 1.

Generation Contract C	10.74 GB
Basic 499 MB Reserved	Small Volume (H:) 497 MB NTFS Healthy (Primary Partition)
Cipisk 13 Unknown 4.88 GB Offline	4.88 GB Unallocated
DVD (E:)	

Figure 1: Raw disk is Offline



Figure 1-1 SAN Mode determination using diskpart.exe

I stated earlier that a disk must be **Offline** from the Hyper-V servers' perspective in order for the Guest to have exclusive access. However, a raw volume must first be initialized before it can be used. To

accomplish this in the Disk Management interface, the disk must first be brought **Online**. Once **Online**, the disk will show as being **Not Initialized** (Figure 2).

Disk 11 Basic 10.74 GB	10.74 GB
Offline Disk 12 Basic 499 MB Reserved	Small Volume (H:) 497 MB NTFS Healthy (Primary Partition)
Disk 13 Unknown 4.88 GB Not Initialized	4.88 GB Unallocated
CD-ROM 0 DVD (E:) No Media	

Figure 2: Disk is Online but Not Initialized

Right-click on the disk and select Initialize Disk (Figure 3).

Generation Disk 11 Basic 10.74 GB Offline	10.74 GB
Disk 12 Basic 499 MB Reserved	Small Volume (H:) 497 MB NTFS Healthy (Primary Partition)
CD DVD (E No Med Help	

Figure 3: Initialize the disk

Select either an **MBR** or **GPT** partition type (Figure 4).

Gibisk 11 Basic 10.74 GB Offline	10.74 GB	Initialize Disk	×
Basic 499 MB Reserved	Small Vo 497 MB MI Healthy (F	Select disks:	
Disk 13 Unknown 4.88 GB Not Initialized	4.88 GB Unallocate	Use the following partition style for the selected disks:	
CD-ROM 0 DVD (E:) No Media		C GPT (GUID Partition Table) Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.	
		Itanium-based computers.	

Figure 4: Selecting a partition type

Once a disk is initialized, it can once again be placed in an **Offline** state. If the disk is not in an **Offline** state, it will not be available for selection when configuring the Guest's storage.

In order to configure a Pass-through disk in a Guest, you must select **Attach a virtual disk later** in the **New Virtual Machine Wizard** (Figure 5).

Connect Virt	tual Hard Disk	X
Before You Begin Specify Name and Location Assign Memory Configure Networking Connect Virtual Hard Disk Summary	A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties. C Create a virtual hard disk Name: TestVM.vhd Location: D: \LocalVM\TestVM\ Size: 127 GB (Maximum: 2040 GB) C Use an existing virtual hard disk Location: D: \LocalVM\Disks\ Browse @ Attach a virtual hard disk later Previous Nature Finish	

Figure 5: Choosing to attach a virtual disk later

If the Pass-through disk will be used to boot the operating system, it must be attached to an IDE Controller. Data disks can take advantage of SCSI controllers. In Figure 6, a Pass-through disk is attached to IDE Controller 0.

t Hardware	Hard Drive		
Madd Hardware			
BIOS		irtual hard disk is attached to the virtual ma d on this disk, changing the attachment mig	
Boot from CD	virtual machine from starti		proprotone une
1024 MB	Controller:	Location:	
Processor	IDE Controller 0	0 (in use)	
1 Virtual processor	Media		
IDE Controller 0		vert a virtual hard disk by editing the .vhd f	ile. Specify the
🕞 Hard Drive	full path to the file.		
Physical drive Disk 2	C Virtual hard disk (.vh	d) file:	
DVD Drive			
None		New Edit Inspect	Browse
Network Adapter		aca nobere	DIONSCIII
CORP	Physical hard disk:		
None	Disk 2 💌		
TO COM 2	Disk 2	ard disk you want to use is not listed, make	ours that the
None		e Disk Management on the physical comput	
Diskette Drive	Disk 5 hard dis	ks.	
None	Disk 6 To reDisk 7 pual hard	I disk, click Remove. This disconnects the di	sk but does not
A Management	delet Disk 8 t.		an our does not
I Name TestVM	Disk 9 Disk 10		Remove
Integration Services	Disk 11		
All services offered	Disk 12 Disk 13		
😹 Snapshot File Location	14		

Figure 6: Attaching a pass-through disk to an IDE Controller

Note: If the disk does not appear in the drop down list, ensure the disk is **Offline** in the Disk Management interface (In Server CORE, use the *diskpart.exe* CLI).

Once the Pass-through disk is configured, the Guest can be started and data can placed on the drive. If an operating system will be installed, the installation process will properly prepare the disk. If the disk will be used for data storage, it must be prepared in the Guest operating system before data can be placed on it.

If a Pass-through disk, being used to support an operating system installation, is brought **Online** before the Guest is started, the Guest will fail to start. When using Pass-through disks to support an operating system installation, provisions must be made for storing the Guest configuration file in an alternate location. This is because the entire Pass-through disk is consumed by the operating system installation. An example would be to locate the configuration file on another internal drive in the Hyper-V server itself. Or, if it is a cluster, the configuration file can be hosted on a separate cluster providing highly available file services. Be aware that Pass-through disks cannot be dynamically expanded. Additionally, when using Pass-through disks, you lose the capability to take snapshots, and finally, you cannot use differencing disks with Pass-through disks.

Note: When using Pass-through disks in a Windows Server 2008 Failover Cluster, you must have the update documented in <u>KB951308</u>: Increased functionality and virtual machine control in the Windows <u>Server 2008 Failover Cluster Management console for the Hyper-V role</u> installed on all nodes in the cluster.