Configuring Pass-through Disks in Hyper-V

A question the CORE Team gets asked frequently deals with configuring Hyper-V Guest with Pass-through 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.
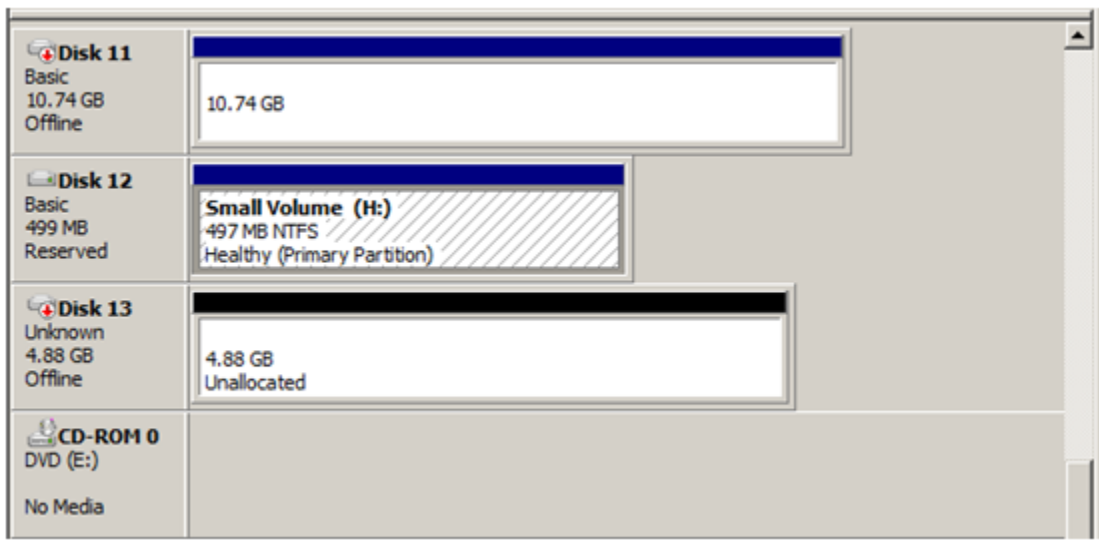

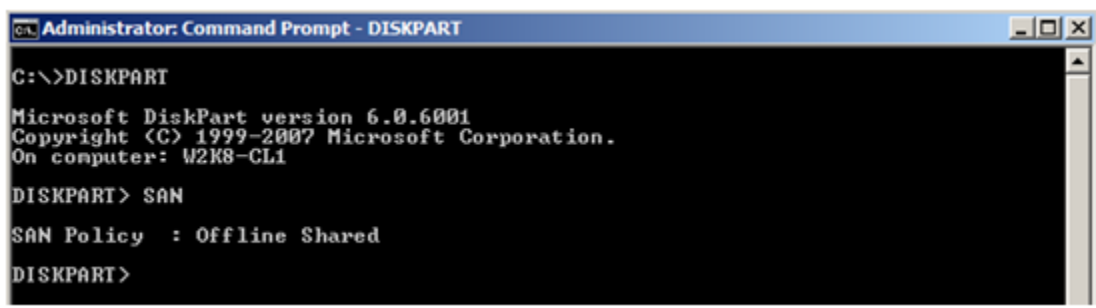Figure 1: Raw disk is Offline

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).
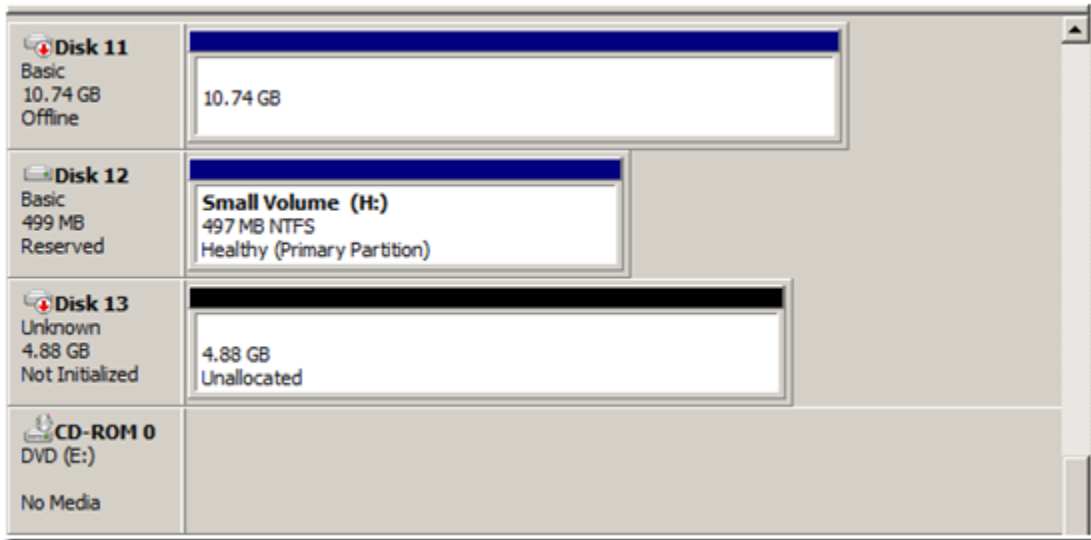

Figure 2: Disk is **Online** but **Not Initialized**

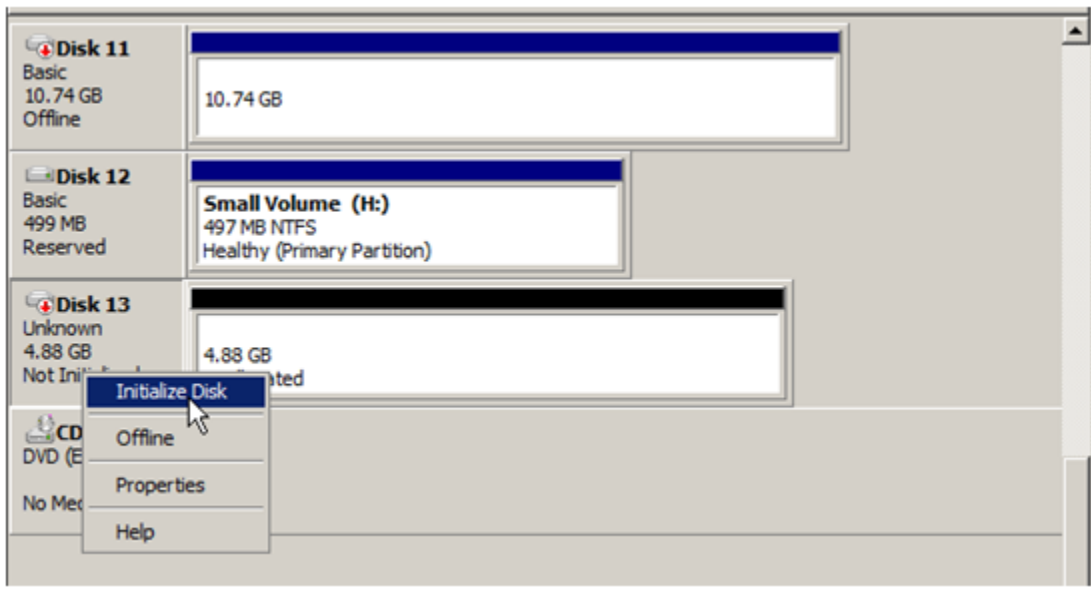**Right-click** on the disk and select **Initialize Disk** (Figure 3).

Figure 3: Initialize the disk

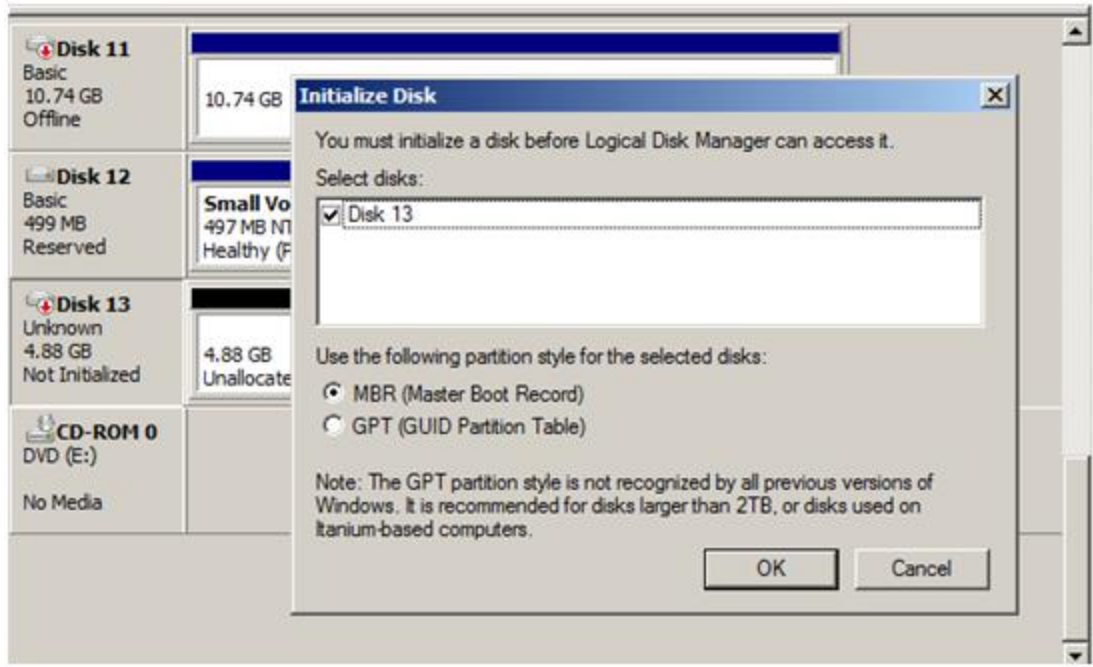Select either an **MBR** or **GPT** partition type (Figure 4).

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).
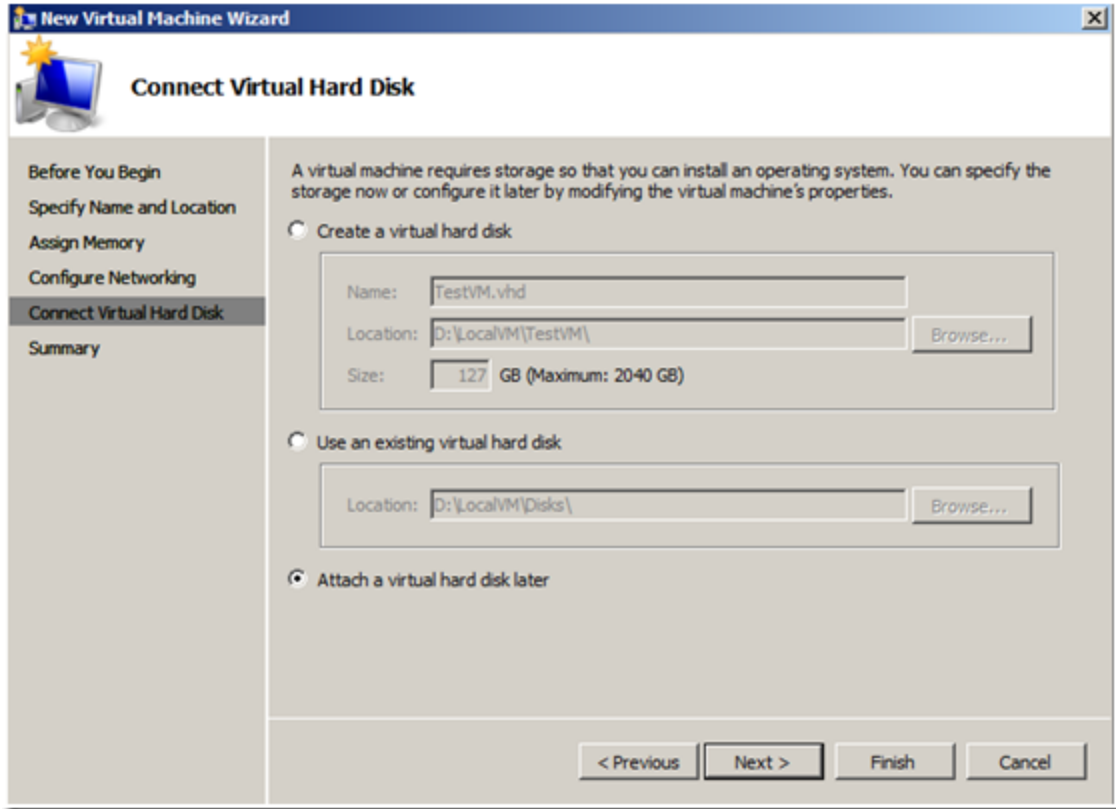
Figure 5: Choosing to attach a virtual disk later

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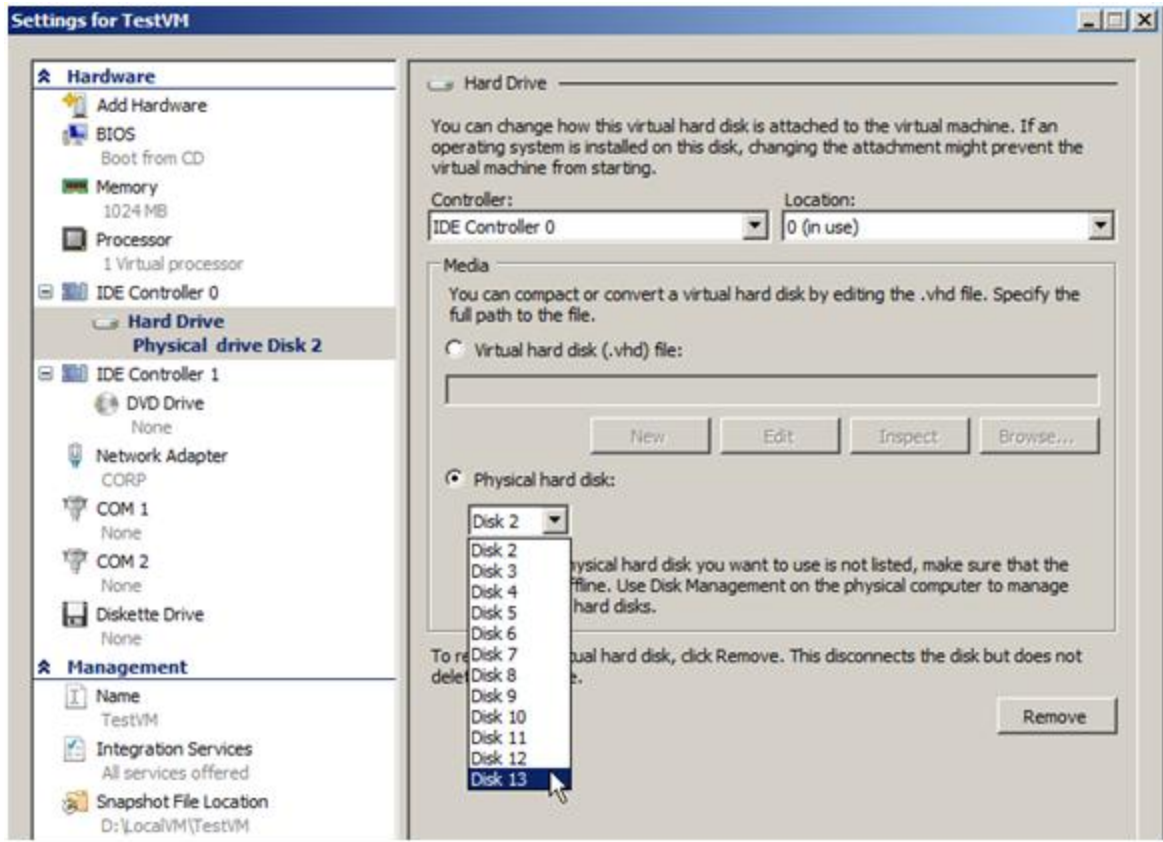
Figure 6: Attaching a pass-through disk to an IDE Controller

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 KB951308: Increased functionality and virtual machine control in the Windows Server 2008 Failover Cluster Management console for the Hyper-V role installed on all nodes in the cluster.