Step By Step: How To Replace Faulty Disk In Two-Way Mirrored Storage Tiered Space? #StorageSpaces

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In this article, we will walk through the experience on how to replace faulty disks in Two-way Mirrored Storage Tiered Space, and show you how to replace the disk without interruption or data loss.

Introduction

As you know that Physical disks often experience errors of varying severity, from errors that the disk can transparently recover from, without interruption or data loss; to errors that are catastrophic and can cause data loss such as bad sectors…

My Hyper-V server was happily running until we received the status e-mail below!

Good morning Mr. Hyper-V, you have a Hard Disk failure!

Storage Health

Physical Disk Health:

Physical Disk Name	Device ID	Operational Status	Health Status	Size (GB)
PhysicalDisk0	0	OK	Healthy	279.37
PhysicalDisk 1		Lost Communication	Warning	1,117.00
PhysicalDisk2	2	OK	Healthy	1,117.00
PhysicalDisk3	3	OK	Healthy	1,117.00
PhysicalDisk4	4	OK	Healthy	1,117.00
PhysicalDisk5	5	OK	Healthy	185.50
PhysicalDisk6	6	OK	Healthy	185.50

Storage Pool Health:

Storage Pool Name	Operational Status	Health Status
StorageTieredPool1	Degraded	Warning

Virtual Disk Health:

Virtual Disk Name	Operational Status	Health Status
MirroredTieredSpace1	Degraded	Warning

Before we start with the procedure to replace the disk and repair my degraded Storage Space, I will give you an overview of the system.

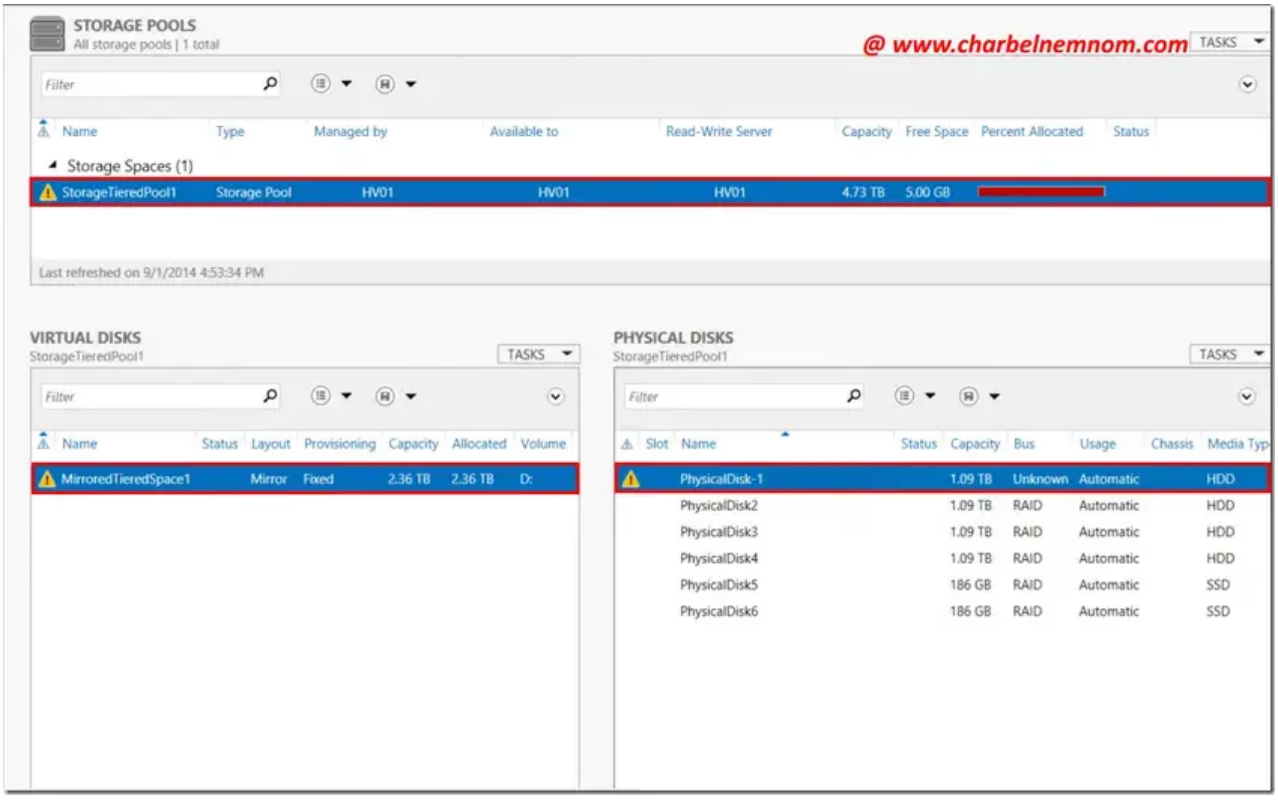
We are running Hyper-V server on **PhysicalDisk0** as Raid 1, and I am leveraging Two-way mirrored Storage Tiered Space for my Virtual Machines (4XHDD @ 1.2TB and 2XSSD @ 200GB).

If you want a quick overview on how to optimize Storage Tiered Spaces, make sure to check my previous blog post ***here***.

How does Storage Spaces respond to a Faulty Disk?

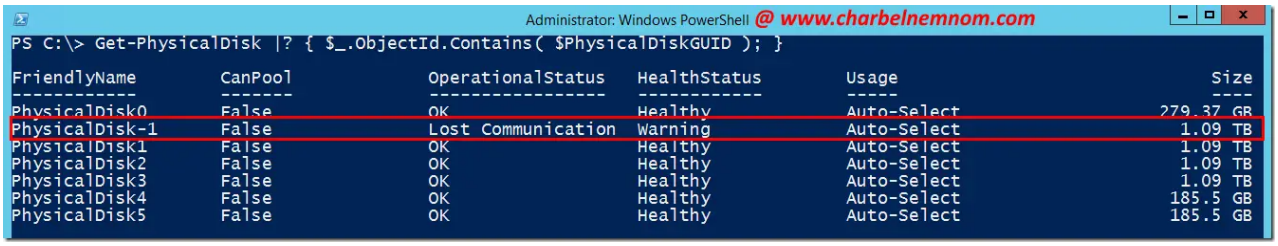
Let’s open Server Manager and have a look.

In the Storage Pools tile of the File and Storage Services role in Server Manager, health status that requires attention is identified as illustrated below, a **Yellow** triangle with an **exclamation** mark!

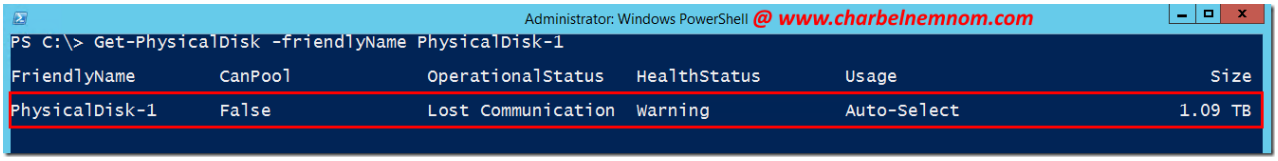


You can use the following PowerShell cmdlets to identify the physical disk associated with the I/O error:

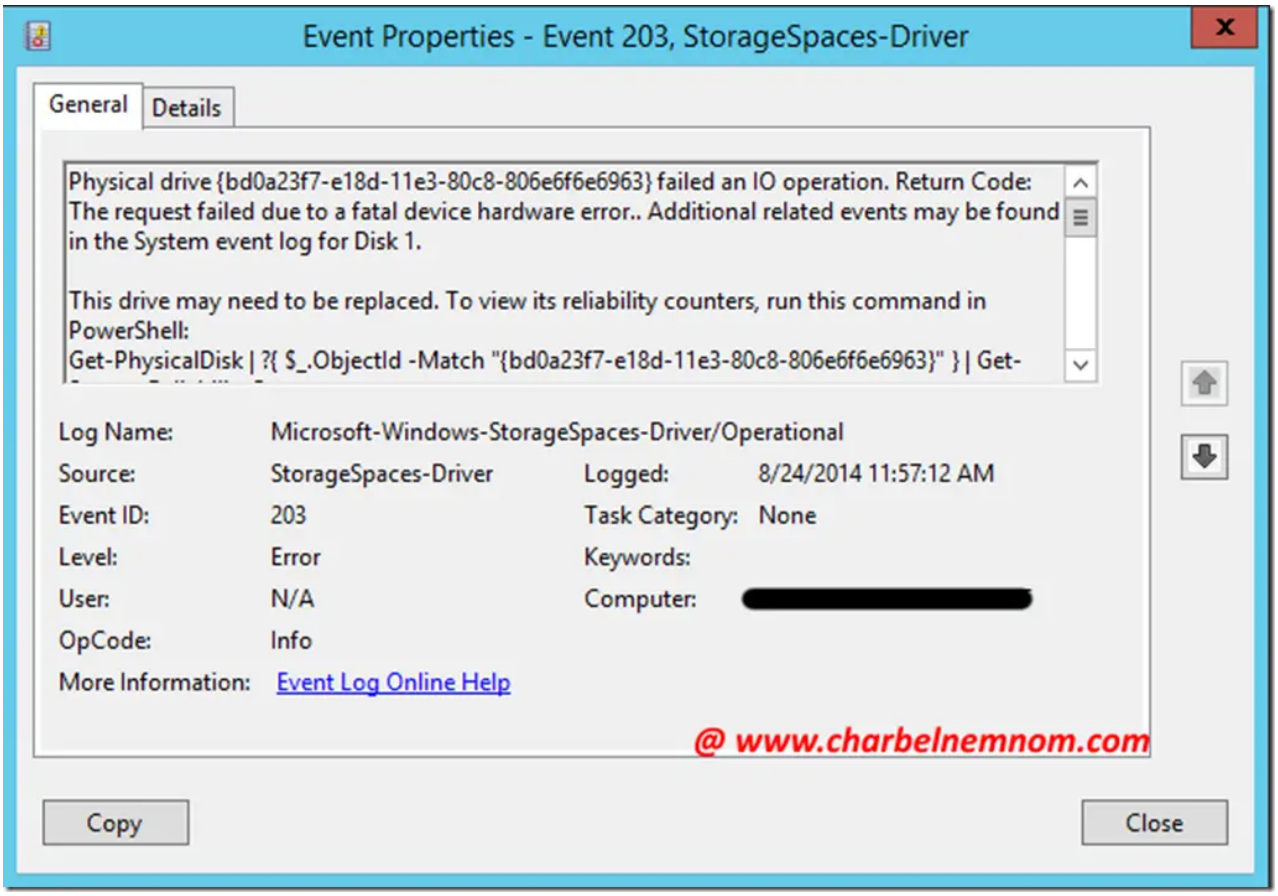
```
Get-PhysicalDisk |? { $_.ObjectId.Contains( $PhysicalDiskGUID ); }
```




```
Get-PhysicalDisk –friendlyName PhysicalDisk-1
```

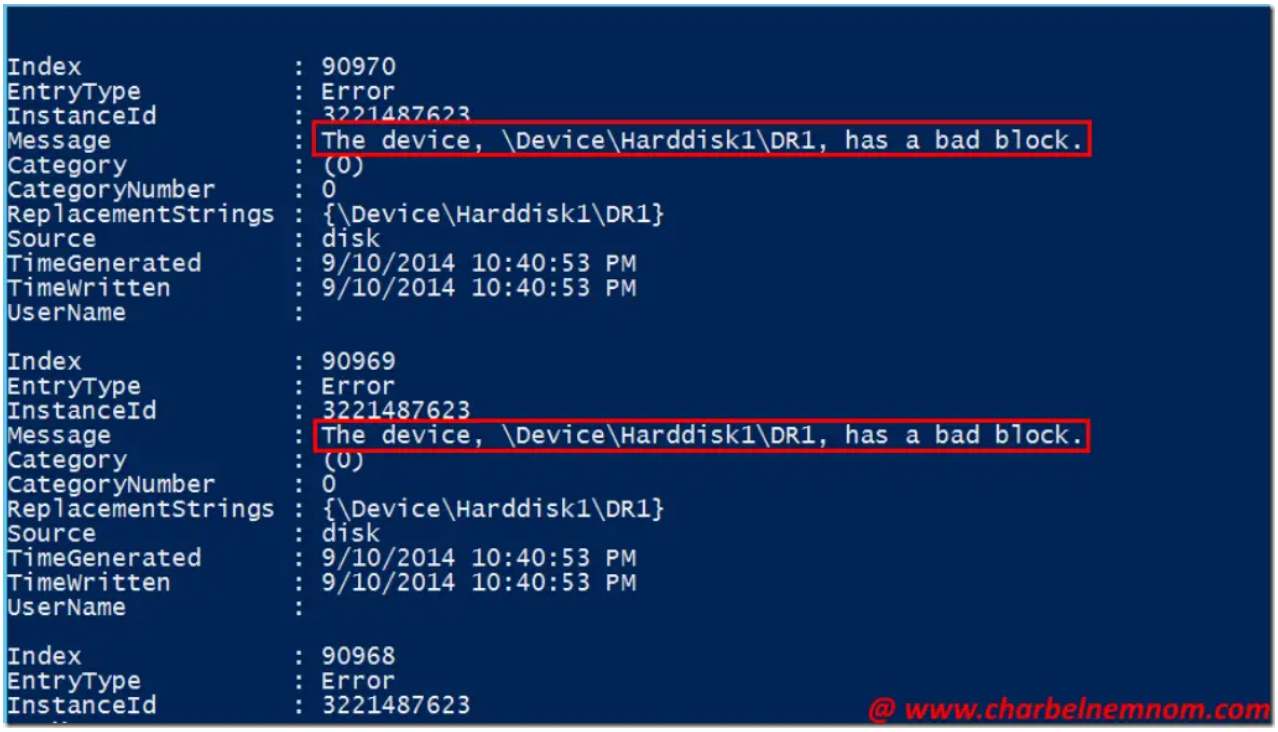


Event Viewer is showing an error with Physical Disk 1.

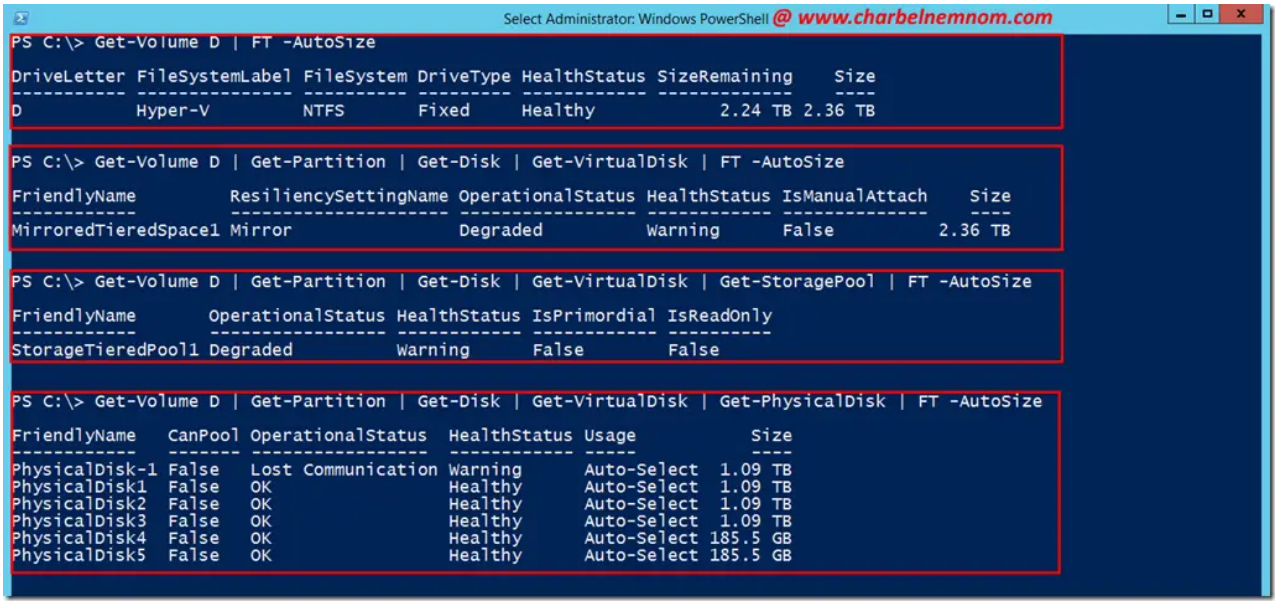


You can use the following PowerShell cmdlet to get the physical disk Event Log:

```
Get-EventLog -LogName System -Source Disk
```



```
Get-Volume D | FT -AutoSize
Get-Volume D | Get-Partition | Get-Disk | Get-VirtualDisk | FT -AutoSize
Get-Volume D | Get-Partition | Get-Disk | Get-VirtualDisk | Get-StoragePool | FT -
AutoSize
Get-Volume D | Get-Partition | Get-Disk | Get-VirtualDisk | Get-PhysicalDisk | FT
–AutoSize
```

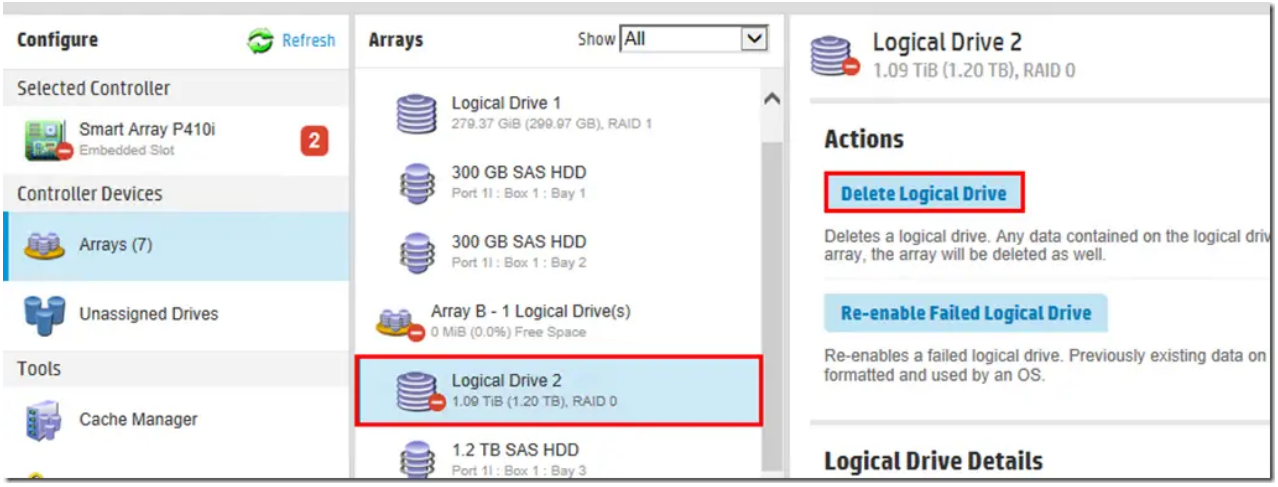


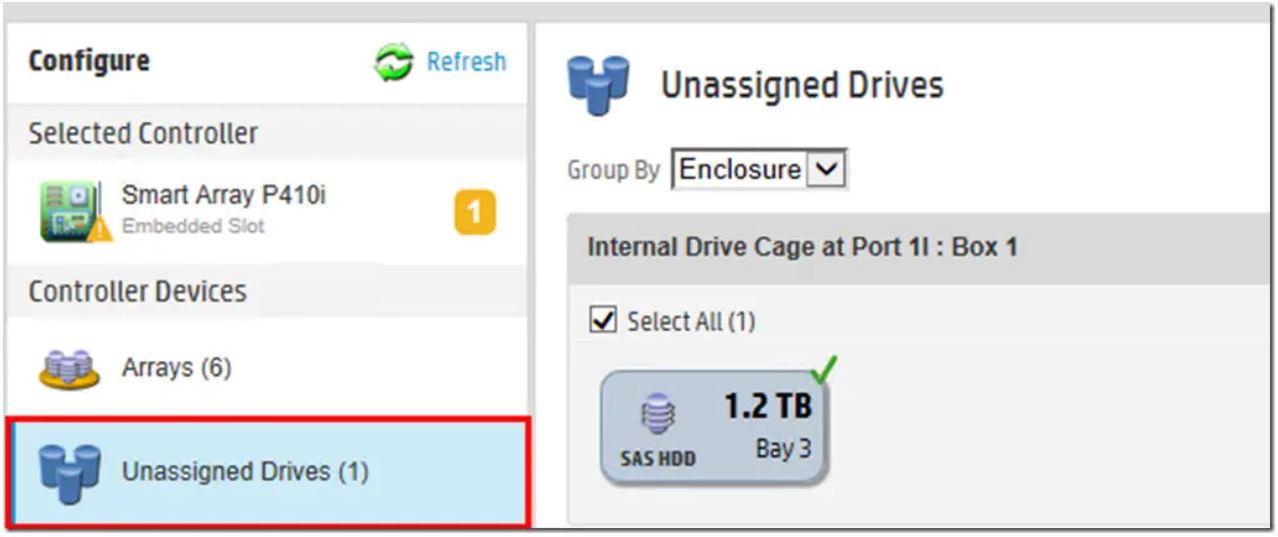
As you can see, the Storage Spaces sustained the failure of a **single** disk in a two-way mirrored space. The Volume is healthy, but the virtual disk and pool are in a degraded state. (A two-way mirror will allow you to suffer the loss of a single disk with no problems while a three-way mirror will allow you to lose two disks).

Replace Faulty Disks without Interruption

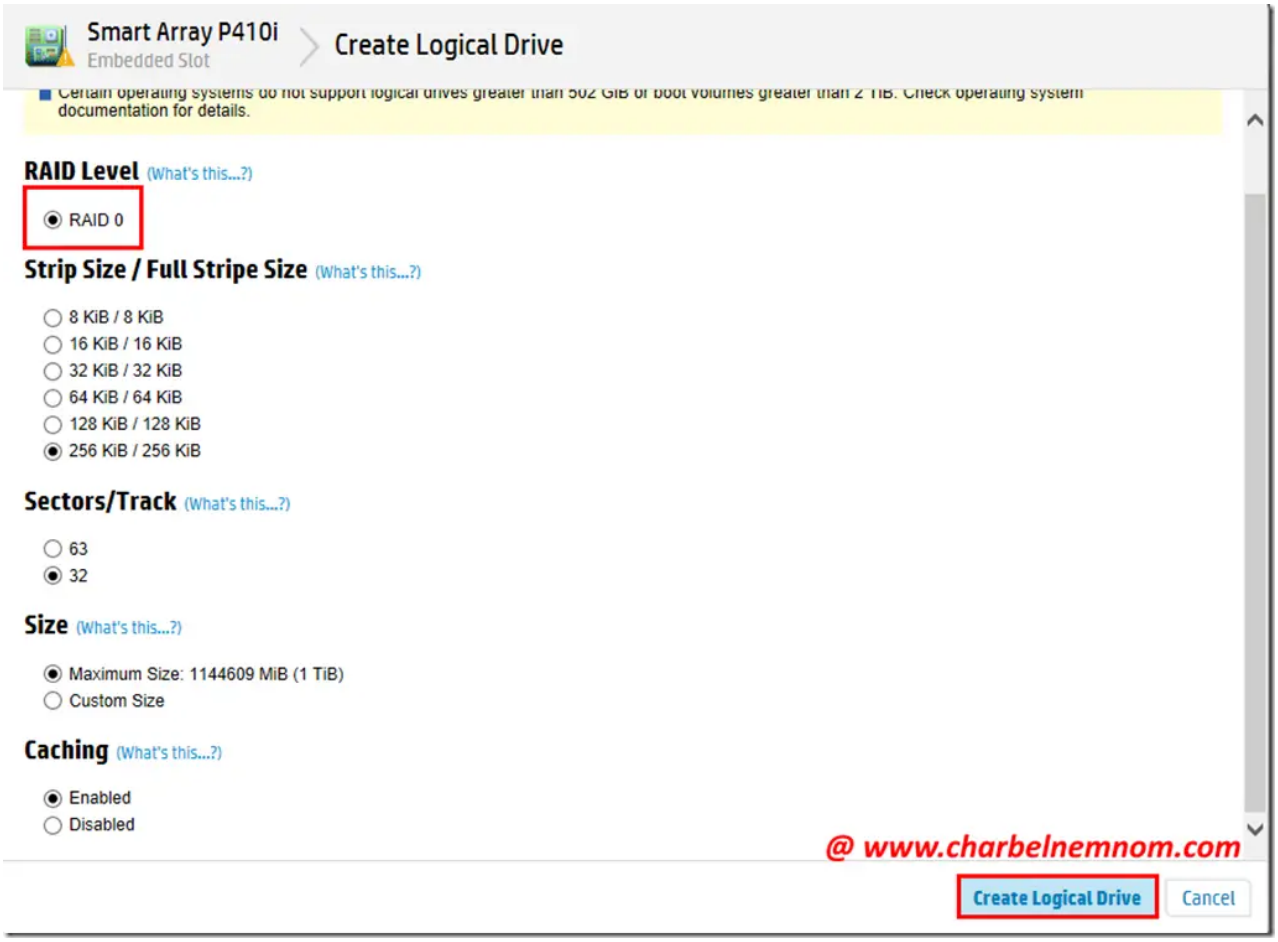
Now before we start with the replacement, we want to mention that we are using an old HPE server that is not fully supported by Microsoft Storage Spaces. You may want to skip this step if you are using a certified Hardware/JBOD that is listed under ***Storage Spaces in the Windows Server Catalog***.

For this reason, we need to open the Smart Array controller and delete the faulty logical disk drive and then add a new one.





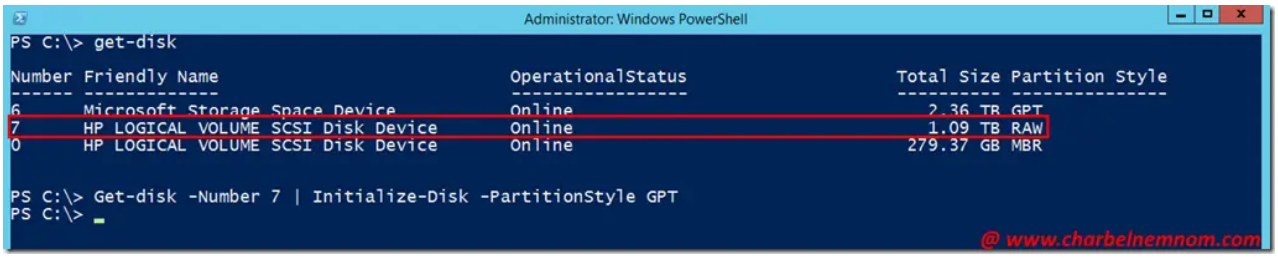
Here is an important step, you need to create the new logical drive as **RAID0** since Storage Spaces will not automatically detect the new drive.



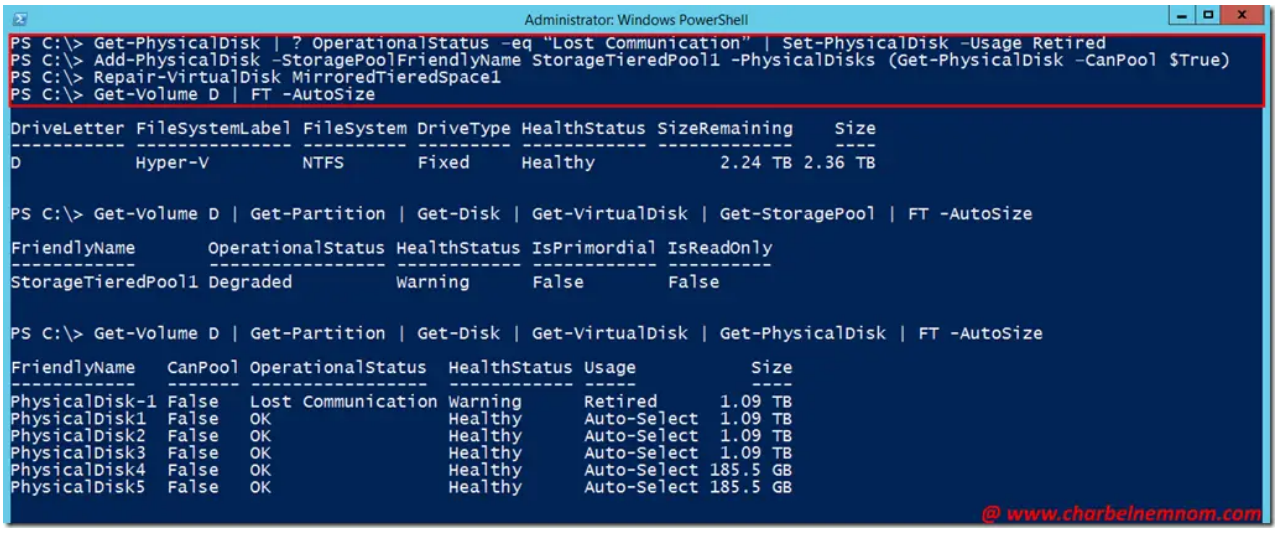
Next, we need to initialize the disk and add it to the **Storage Pool**.

You do not need to create a partition or format the new disk, leave it unallocated.

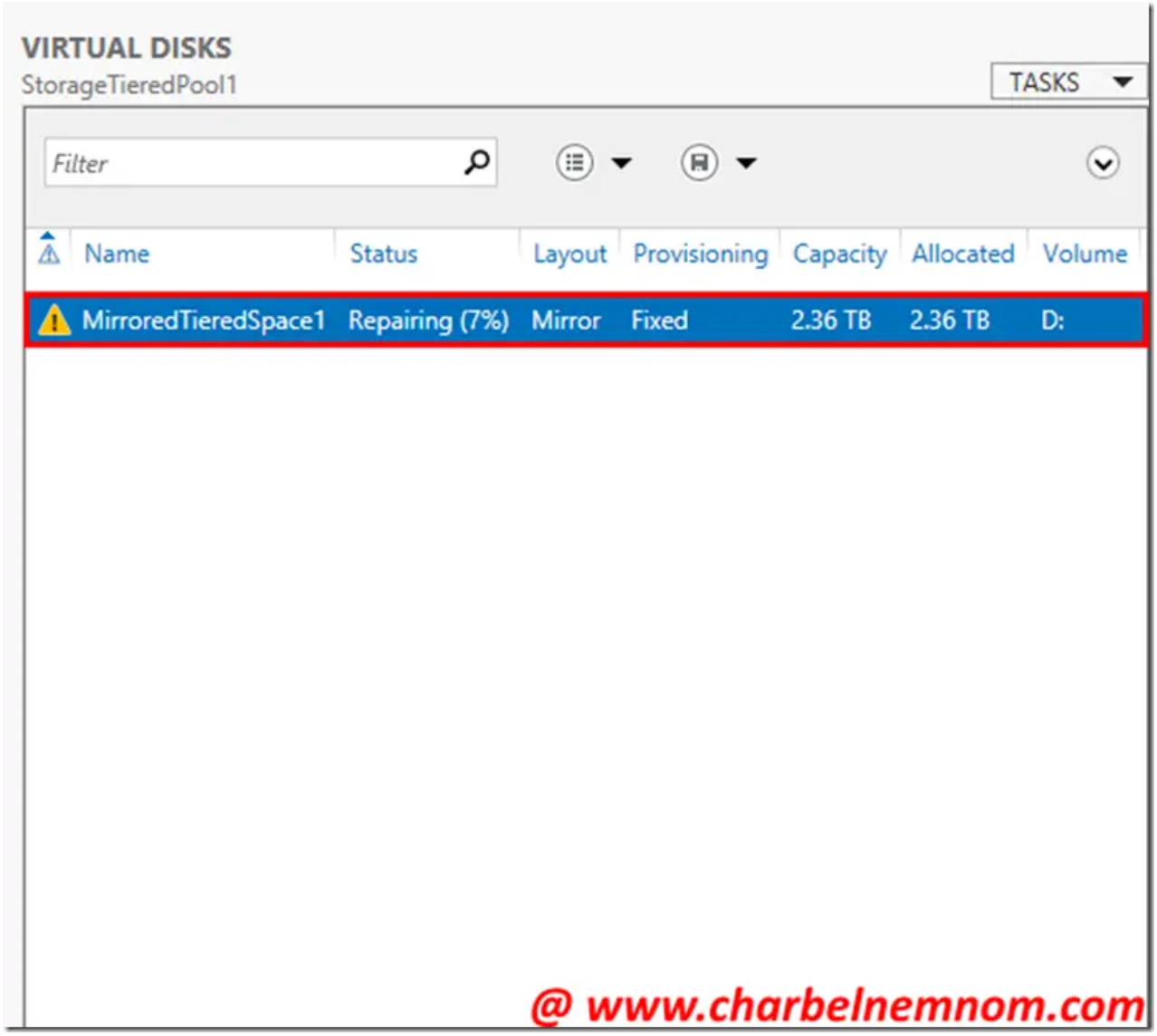
```
Get-Disk
Get-Disk -Number 7 | Initialize-Disk -PartitionStyle GPT
```




```
Add-PhysicalDisk –StoragePoolFriendlyName StorageTieredPool1 -PhysicalDisks (Get-PhysicalDisk –CanPool $True)
Repair-VirtualDisk MirroredTieredSpace1
```

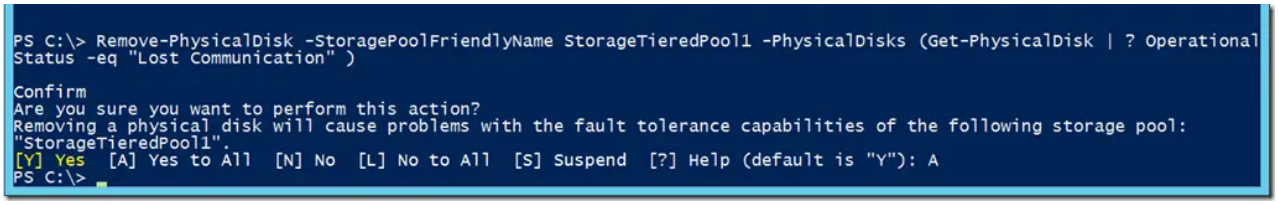


So after we added the new disk to the pool and we ran ***Repair-VirtualDisk*** cmdlet. The data will be rebalanced to the new disk (takes a while, in my case, it took 2 hours to repair the 1.2TB disk).

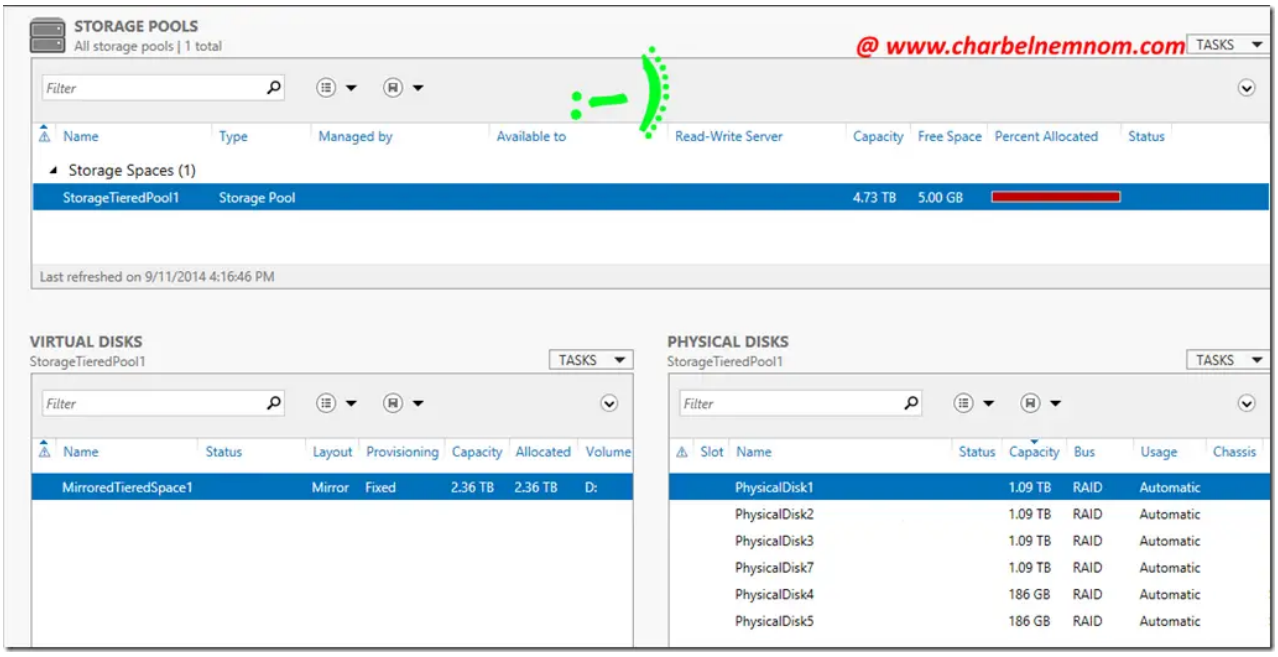


The old disk can either be retired or it can be completely removed from the pool.

```
Get-PhysicalDisk | ? OperationalStatus –eq “Lost Communication” | Set-PhysicalDisk
–Usage Retired
Remove-PhysicalDisk -StoragePoolFriendlyName StorageTieredPool1 -PhysicalDisks
(Get-PhysicalDisk | ? OperationalStatus -eq "Lost Communication" )
```



And here you go… Healthy Storage Space without interruption or data loss 😊



My wish list for the next release of Windows Server is to have auto-repair for the Virtual Disks as soon as you add a new disk to the Storage Pool.

Did you experience any issue with Storage Spaces after a single HDD/SSD failure? please add a comment to this blog post and share your experiences.

Hope this helps,

Until then… Enjoy!
/Charbel