Step By Step: How To Extend and Resize A Two-Way Mirrored Storage Tiered Space? #StorageSpaces

charbelnemnom.com/step-by-step-how-to-extend-and-resize-a-two-way-mirrored-storage-tiered-space-storagespaces-ws2012r2

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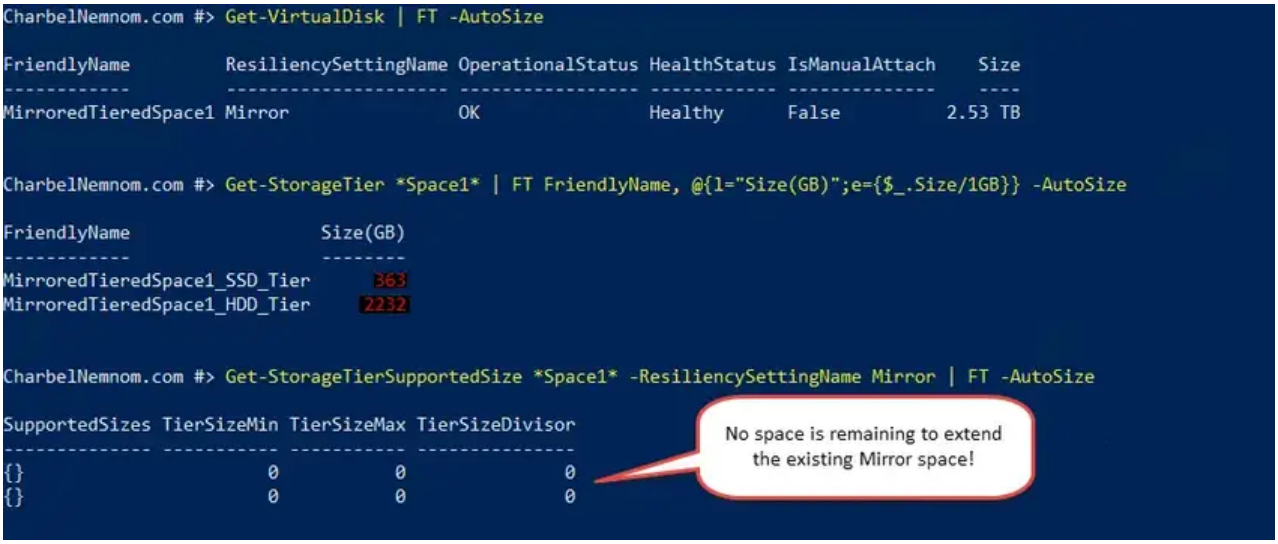
Hello folks,

In the previous articles, I showed you step by step how to create a Two-Way mirrored Storage Space, and how to replace a failed disk and repair the storage space.

In today's blog post, I will walk through how to extend and resize an existing Two-Way mirror Storage Space and volume.

First things first, we need to check the current status of the existing virtual disk before doing any changes.

Let's open PowerShell and get the existing virtual disk information:



As you can see, we have a mirror storage space with 363GB SSD Tier and 2.2TB HDD Tier, but we don't have any remaining space to extend the existing volume.

```
CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | FT -AutoSize

Number Friendly Name                 OperationalStatus Total Size Partition Style
------ -------------                 ----------------- ---------- ---------------
7      Microsoft Storage Space Device Online              2.53 TB GPT


CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Get-Partition | FT -AutoSize


   Disk Number: 7

PartitionNumber DriveLetter Offset       Size Type
--------------- ----------- ------       ---- ----
1                           17408      128 MB Reserved
2               D           135266304 2.53 TB Basic


CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Get-Partition | Get-Volume | FT -AutoSize

DriveLetter FileSystemLabel FileSystem DriveType HealthStatus SizeRemaining    Size
----------- --------------- ---------- --------- ------------ -------------    ----
D           Hyper-V         NTFS       Fixed     Healthy         1004.43 GB 2.53 TB
```

The current volume "**D**" has 2.53TB of disk space and 1TB of free size remaining.

In my demo, I will add 1TB to the HDD Tier, as a side note, the same will apply if you are resizing the SSD tier as well.

Now before we start increasing the pool capacity and resizing the virtual disk, you have to pay close attention to how many physical disks you can add to your existing storage space?

The answer to that question depends on **what options were chosen when the virtual disk was initially created**.

Let's consider the following example:

You have a storage pool that has a 2-column, two-way mirror space. The two-column, two-way mirror space suggests you expand the pool capacity in sets of four disks for mirror spaces, in other words, you have to multiple the number of columns by the number of copies, and since we have 2 columns, we need at least four physical disks.

Another thing to remember is, that after adding disks to the pool, there is no rebalancing mechanism. So the existing disks will be filled up first before data is written to the added disks. That's why the number of columns must be chosen carefully at the time you created a virtual disk because you can't change the number of columns once the virtual disk is created.

With Get-VirtualDisk you can find many things about a virtual disk that you've created within a storage pool.

```
CharbelNemnom.com #> Get-VirtualDisk | ft FriendlyName, HealthStatus, NumberOfColumns, NumberOfDataCopies, Interleave, R
esiliencySettingName -AutoSize

FriendlyName         HealthStatus NumberOfColumns NumberOfDataCopies Interleave ResiliencySettingName
------------         ------------ --------------- ------------------ ---------- --------------------
MirroredTieredSpace1 Healthy                   1                  2     262144 Mirror
```

Since I am running a two-way mirror space with one column, I will add a 2 X 1TB HDD into my JBOD.

```
CharbelNemnom.com #> Get-PhysicalDisk |  Where Size -gt 300GB | Sort Size | FT FriendlyName, Size, MediaType, HealthStat
us, OperationalStatus -AutoSize

FriendlyName            Size MediaType   HealthStatus OperationalStatus
------------            ---- ---------   ------------ -----------------
PhysicalDisk6   399163523072 SSD         Healthy      OK
PhysicalDisk5   399163523072 SSD         Healthy      OK
PhysicalDisk3  1199369617408 HDD         Healthy      OK
PhysicalDisk1  1199369617408 HDD         Healthy      OK
PhysicalDisk2  1199369617408 HDD         Healthy      OK
PhysicalDisk4  1199369617408 HDD         Healthy      OK
PhysicalDisk10 1200210141184 UnSpecified Healthy      OK
PhysicalDisk9  1200210141184 UnSpecified Healthy      OK
```

Next, we will add the newly added disks to the existing Storage Pool and then set the media type to HDD.

```
CharbelNemnom.com #> Get-PhysicalDisk -CanPool $True | ft FriendlyName,OperationalStatus,Size,MediaType

FriendlyName                OperationalStatus                                Size MediaType
------------                -----------------                                ---- ---------
PhysicalDisk9               OK                                 1200210141184 UnSpecified
PhysicalDisk10              OK                                 1200210141184 UnSpecified


CharbelNemnom.com #> $pooldisks = Get-PhysicalDisk | ? {$_.CanPool –eq $true }
CharbelNemnom.com #> Add-PhysicalDisk -PhysicalDisks $pooldisks -StoragePoolFriendlyName StorageTieredPool1
CharbelNemnom.com #> Get-StoragePool StorageTieredPool1 | Get-PhysicalDisk | Sort Size | FT FriendlyName, Size, MediaTyp
e, HealthStatus, OperationalStatus -AutoSize

FriendlyName            Size MediaType   HealthStatus OperationalStatus
------------            ---- ---------   ------------ -----------------
PhysicalDisk6   399163523072 SSD         Healthy      OK
PhysicalDisk5   399163523072 SSD         Healthy      OK
PhysicalDisk10 1199369617408 UnSpecified Healthy      OK
PhysicalDisk9  1199369617408 UnSpecified Healthy      OK
PhysicalDisk3  1199369617408 HDD         Healthy      OK
PhysicalDisk2  1199369617408 HDD         Healthy      OK
PhysicalDisk4  1199369617408 HDD         Healthy      OK
PhysicalDisk1  1199369617408 HDD         Healthy      OK
```

```
CharbelNemnom.com #> Get-StoragePool StorageTieredPool1 | Get-PhysicalDisk | ? Size -gt 1TB | Set-PhysicalDisk –MediaTyp
e HDD
CharbelNemnom.com #> Get-StoragePool StorageTieredPool1 | Get-PhysicalDisk | Sort MediaType | FT FriendlyName, MediaType
,@{l="Size(GB)";e={$_.Size/1GB}} -AutoSize

FriendlyName   MediaType Size(GB)
------------   --------- --------
PhysicalDisk3  HDD            1117
PhysicalDisk9  HDD            1117
PhysicalDisk10 HDD            1117
PhysicalDisk1  HDD            1117
PhysicalDisk4  HDD            1117
PhysicalDisk2  HDD            1117
PhysicalDisk6  SSD          371.75
PhysicalDisk5  SSD          371.75
```

Newly two disks added to the pool!

Let’s see the maximum capacity that we can add to the storage tier and extend the existing volume.

```
CharbelNemnom.com #> Get-StorageTierSupportedSize MirroredTieredSpace1_HDD_Tier -ResiliencySettingName Mirror | FT @{l="
TierSizeMin(GB)";e={$_.TierSizeMin/1GB}},@{l="TierSizeMax(GB)";e={$_.TierSizeMax/1GB}},@{l="TierSizeDivisor(GB)";e={$_.T
ierSizeDivisor/1GB}} -AutoSize

TierSizeMin(GB) TierSizeMax(GB) TierSizeDivisor(GB)
--------------- --------------- -------------------
              1            1116                   1
```

As you can see, we can add roughly 1.1TB.

Here is another important point to remember: When you are resizing the storage space, you have to specify the new total size, and not the amount you want to increase, so in my example above, the existing Storage Space for the HDD tier is 2,232GB, I need to add 1,116GB (new) + 2,232GB (existing) = 3,348GB total HDD tier, this of course if I need to add the whole capacity otherwise. The same concept will apply if you are resizing the SSD tier.

Let's proceed and add the whole capacity.

```
CharbelNemnom.com #> # Before Resizing the Virtual Disk
CharbelNemnom.com #> Get-StorageTier MirroredTieredSpace1_HDD_Tier | FT FriendlyName, @{l="Size(GB)";e={$_.Size/1GB}} -A


FriendlyName                Size(GB)
------------                --------
MirroredTieredSpace1_HDD_Tier     2232


CharbelNemnom.com #> # Resize the Existing Virtual Disk
CharbelNemnom.com #> Resize-StorageTier MirroredTieredSpace1_HDD_Tier -Size 3348GB
CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Update-Disk
CharbelNemnom.com #> # After Resizing the Virtual Disk
CharbelNemnom.com #> Get-VirtualDisk *Space1  | FT -AutoSize

FriendlyName         ResiliencySettingName OperationalStatus HealthStatus IsManualAttach    Size
------------         --------------------- ----------------- ------------ --------------    ----
MirroredTieredSpace1 Mirror                OK                Healthy      False          3.62 TB


CharbelNemnom.com #> Get-StorageTier *Space1* | FT FriendlyName, @{l="Size(GB)";e={$_.Size/1GB}} -A

FriendlyName                Size(GB)
------------                --------
MirroredTieredSpace1_SSD_Tier      363
MirroredTieredSpace1_HDD_Tier     3348
```

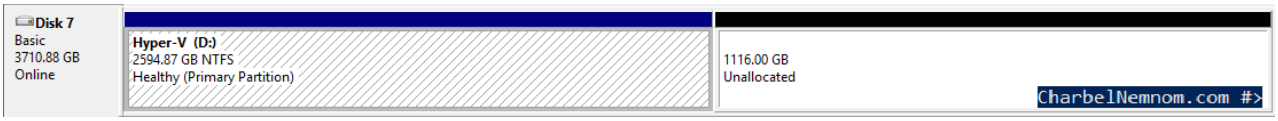
```
CharbelNemnom.com #> Get-StorageTierSupportedSize MirroredTieredSpace1_HDD_Tier -ResiliencySettingName Mirror | FT -A

SupportedSizes TierSizeMin TierSizeMax TierSizeDivisor
-------------- ----------- ----------- ---------------
{}                       0           0               0


CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | FT -AutoSize

Number Friendly Name                  OperationalStatus Total Size Partition Style
------ -------------                  ----------------- ---------- ---------------
7      Microsoft Storage Space Device Online              3.62 TB GPT


CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Get-Partition | Get-Volume | FT -AutoSize

DriveLetter FileSystemLabel FileSystem DriveType HealthStatus SizeRemaining    Size
----------- --------------- ---------- --------- ------------ -------------    ----
D           Hyper-V         NTFS       Fixed     Healthy         1004.58 GB 2.53 TB
```

No free space is remaining to be added anymore

The total partition size is 3.62 TB

The current volume size is 2.53 TB (To be extended)

Last but not least, we need to extend the existing partition which extends the volume "**D**" as well, and finally confirm the changes.



```
CharbelNemnom.com #> # Extend partition
CharbelNemnom.com #> $Size = (Get-PartitionSupportedSize -DiskNumber 7 -PartitionNumber 2)
CharbelNemnom.com #> Resize-Partition -DiskNumber 7 -PartitionNumber 2 -Size $size.SizeMax
CharbelNemnom.com #>
CharbelNemnom.com #> # Check after Partition/Volume change
CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Get-Partition | FT -AutoSize


   Disk Number: 7

PartitionNumber DriveLetter Offset       Size Type
--------------- ----------- ------       ---- ----
1                           17408      128 MB Reserved
2               D           135266304 3.62 TB Basic


CharbelNemnom.com #> Get-VirtualDisk *Space1 | Get-Disk | Get-Partition | Get-Volume | FT -AutoSize

DriveLetter FileSystemLabel FileSystem DriveType HealthStatus SizeRemaining    Size
----------- --------------- ---------- --------- ------------ -------------    ----
D           Hyper-V         NTFS       Fixed     Healthy            2.07 TB 3.62 TB
```

Microsoft has a great Storage Spaces Overview which goes into more detail and is well worth a read.

Hopefully, the above notes and screenshots illustrate how you can extend and resize a storage pool when you have a need to do so.

Until next time… Enjoy your day!

/Charbel