Change Disk Type_Disk Mgmt

Last updated by | Kevin Gregoire | Mar 29, 2022 at 11:47 AM PDT

Tags

cw.Disk-Mgmt	cw.TSG

Contents

Scenario

VMs are all running the same size D4_v3 and the same disk configuration - Standard HDD. The type of OS disk and Data disks for some VMs are 512N which “Bytes Per Sector” and “Bytes Per Physical Sector” are all 512, we can use fsutil to query.

```
C:\>fsutil fsinfo ntfsinfo E:\
NTFS Volume Serial Number :        0xacde349d********
NTFS Version   :                   3.1
LFS Version    :                   2.0
Number Sectors :                   0x00000000********
Total Clusters :                   0x00000000********
Free Clusters  :                   0x00000000********
Total Reserved :                   0x00000000********
Bytes Per Sector  :                512                  <<<--------------------
Bytes Per Physical Sector :        512                  <<<--------------------
Bytes Per Cluster :                65535
Bytes Per FileRecord Segment    :  1024
Clusters Per FileRecord Segment :  0
```

Some other VMs have 512E disks which the “Bytes Per Sector” is 512 and “Bytes Per Physical Sector” is 4k.

```
C:\>fsutil fsinfo ntfsinfo E:\
NTFS Volume Serial Number :       0xacde349d********
NTFS Version   :                  3.1
LFS Version    :                  2.0
Number Sectors :                  0x00000000********
Total Clusters :                  0x00000000********
Free Clusters  :                  0x00000000********
Total Reserved :                  0x00000000********
Bytes Per Sector  :               512                 <<<--------------------
Bytes Per Physical Sector :       4096                <<<--------------------
Bytes Per Cluster :               65535
Bytes Per FileRecord Segment    :  1024
Clusters Per FileRecord Segment :  0
```

If “Bytes Per Physical Sector” are different between 2 VMs, it could impact the some sync jobs like: e.g. SQL server VMs that are a part of AG, the synchronization between 2 SQL VMs could be slow. - KB3009974

Information

What is 512E and 512N?

> Support policy for 4k sector hard drives

Common Names	Bytes Per Sector	Bytes Per Physical Sector
512-byte Native, 512N	512 bytes	512 bytes
Advanced Format, AF, 512-byte Emulation, 512E	512 bytes	4 KB
Advanced Format, AF, 4K Native, 4KN	4 KB	4 KB

Cause

There are 2 types of configuration with regarding to storage stack clusters:

- rdssd clusters or stripe clusters – support only VMs with standard disk.
- newer cluster aka ABC nodes – mixed mode clusters that support both premium disk & standard disks

The VMs in tripe clusters have 512N disks and the VMs in ABC nodes have 512E disks. A standard SKU could be landed on either stripe nodes and ABC nodes, so the “Bytes Per Physical Sector” could be vary. S series SKU that supports premium storage always land on ABC nodes, so storage stack could be always the same.

Another ultradisk case is not mentioned here, ultradisk is a 4k native disk where “Bytes Per Sector” and “Bytes Per Physical Sector” are all 4k.

It’s all standard SKU D_v3 and the disks are all standard HDD in this case, one is landed to stripe node and another is on ABC and this caused the type of disks are different. Basically, this issue suppose not to happen if we follow the best practice mentioned in: Performance guidelines for SQL Server in Azure - SQL Server on Azure VM | Microsoft Docs, the doc suggested using premium/ultra disks for SQL VMs.

How to validate the prepare mode

```
#### Use FcShell
PS C:\fcshell> $f = Get-Fabric DB3Prd***06
PS C:\fcshell> $n = $f | Get-Node 7af42c1b-6d87-b2cb-****-********
PS C:\fcshell> $n.Internals.MachineProperties

CPUInfo              : {Intel(R) Xeon(R) Platinum 8171M CPU @ 2.60GHz, Intel(R) Xeon(R) Platinum 8171M CPU @
                       Intel(R) Xeon(R) Platinum 8171M CPU @ 2.60GHz...}
Memory               : 589824
HasDdaDisks          : False
NetworkAdapters      : {Hyper-V Virtual Ethernet Adapter}
DrivesInformation    : {}
PreparedMode         : ABC                  <<<--------------------
```

```
####
PS C:\fcshell> $f = Get-Fabric DB3Prd***02
PS C:\fcshell> $n = $f | Get-Node 7af42c1b-6d87-b2cb-****-********
PS C:\fcshell> $n.Internals.MachineProperties

CPUInfo              : {Intel(R) Xeon(R) CPU E5-2660 0 @ 2.20GHz, Intel(R) Xeon(R) CPU E5-2660 0 @ 2.20GHz, I
                       CPU E5-2660 0 @ 2.20GHz...}
Memory               : 131072
HasDdaDisks          : False
NetworkAdapters      : {Intel(R) I350 Gigabit Network Connection, Intel(R) I350 Gigabit Network Connection #2
DrivesInformation    : {}
PreparedMode         : Stripe                   <<<--------------------
```

Workaround

Resizing the VM to Ds_v3 that supports premium storage, then the OS/Data disks changed to 512E. In case cx concerns, the performance and pricing for Ds_v3 VMs are the same as D_v3.

I didn't find a way to move VM back to Stripe node, it is not necessary as most applications are compatible with 4k sector size, and the data storage industry is transitioning the physical format of hard disk drives from 512-byte sectors to 4096-byte sectors (also known as 4K or 4KB sectors), this transition is driven by several factors like increases in storage density and reliability.

Reference

ICM# 147427610, 218505405

Known issue

There's a known scenario that when we switch the disk configuration from Stripe to ABC, the start/resize operation may take long time: Azure Virtual Machine Start-Stop VM TSG Host Node Switched to Disk configuration

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