ONEStor+LSI阵列卡+镁光 SSD系统下查看使用寿命的方法

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问题描述

固态硬盘（SSD、NVME、M.2）存在固定的擦写次数，在使用过程中寿命会随着擦写次数增加寿命逐渐减少，损耗的频率受多种因素影响，如硬盘类型、容量大小、业务读写模式等。分布式存储由于其实现原理，数据IO相对均衡的落在不同硬盘上，因此集群内硬盘剩余寿命会存在几乎同时耗尽的可能。当多个节点的多块硬盘剩余寿命同时濒临耗尽时，若继续使用会存在性能数据下降和跨节点多块硬盘批量故障的风险，造成用户数据丢失。因此在日常运维过程中需要密切关注SSD磨损度。

注：阵列卡型号会决定查询使用的指令，硬盘型号会决定查询的字段，因此不同阵列卡下不同类型的SSD，查询方法均不相同

1、确认节点使用的阵列卡型号和SSD型号，如果是LSI阵列卡且镁光SSD可以使用本案例

2、使用指令/opt/MegaRAID/storcli/storcli64 /call show|grep -A 30 "PD LIST :"查询SSD的DID号

```
[root@node87 ~]# /opt/MegaRAID/storcli/storcli64 /call show|grep -A 30 'PD LIST :'
PD LIST :
=======

----------------------------------------------------------------------------------
EID:Slt DID State DG      Size Intf Med SED PI SeSz Model                    Sp Type
----------------------------------------------------------------------------------
8:0      23 Onln  13 446.625 GB SATA SSD N   N  512B Micron_5200_MTFDDAK480TDC U  -
8:4      13 Onln   1   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:5      15 Onln   2   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:6      11 Onln   3   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:7      14 Onln   4   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:8      17 Onln   5   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:9      12 Onln   6   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:10     18 Onln   7   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:11     19 Onln   8   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:12     16 Onln   9   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:13     22 Onln  10   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:14     20 Onln  11   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:15     21 Onln  12   7.276 TB SATA HDD N   N  512B ST8000NM000A-2KE101       U  -
8:26      9 Onln   0 446.625 GB SATA SSD N   N  512B Micron_5300_MTFDDAK480TDS U  -
8:27     10 Onln   0 446.625 GB SATA SSD N   N  512B Micron_5300_MTFDDAK480TDS U  -
```

2、使用指令smartctl -a -d megaraid,DID /dev/sdx，查询SSD盘寿命

注：盘符信息可以随便填写，对指令查询情况无影响，DID务必保证填写正确。即本例中可以使用smartctl -a -d megaraid,23 /dev/sdn查询，如果需要查询准确的盘符，可以使用/opt/MegaRAID/storcli/storcli64 /c0/vall show all，根据DID编号查询盘符，如图：

```
PDs for VD 0 :
============
                                             物理盘DID号
----------------------------------------------------------------------------------
EID:Slt DID State DG      Size Intf Med SED PI SeSz Model                    Sp Type
----------------------------------------------------------------------------------
8:0       9 Onln   0 446.625 GB SATA SSD N   N  512B SAMSUNG MZ7L3480HCHQ-00B7C U  -
8:39     10 Onln   0 446.625 GB SATA SSD N   N  512B SAMSUNG MZ7L3480HCHQ-00B7C U  -
----------------------------------------------------------------------------------

EID=Enclosure Device ID|Slt=Slot No.|DID=Device ID|DG=DriveGroup
DHS=Dedicated Hot Spare|UGood=Unconfigured Good|GHS=Global Hotspare
UBad=Unconfigured Bad|Sntze=Sanitize|Onln=Online|Offln=Offline|Intf=Interface
Med=Media Type|SED=Self Encryptive Drive|PI=Protection Info
SeSz=Sector Size|Sp=Spun|U=Up|D=Down|T=Transition|F=Foreign
UGUnsp=UGood Unsupported|UGShld=UGood shielded|HSPShld=Hotspare shielded
CFShld=Configured shielded|Cpybck=CopyBack|CBShld=Copyback Shielded
UBUnsp=UBad Unsupported|Rbld=Rebuild


VD0 Properties :
==============
Strip Size = 256 KB
Number of Blocks = 936640512
VD has Emulated PD = Yes
Span Depth = 1
Number of Drives Per Span = 2
Write Cache(initial setting) = WriteBack
Disk Cache Policy = Disk's Default              物理盘当前缓存状态信息
Encryption = None
Data Protection = Disabled
Active Operations = None
Exposed to OS = Yes                             操作系统下盘符信息
OS Drive Name = /dev/sda
```

3、Mircon SSD磨损率是从Smart202：Percentage Of The Rated Lifetime Used查看剩余寿命，如图可知此块SSD剩余寿命为20%

```
SMART Attributes Data Structure revision number: 16
Vendor Specific SMART Attributes with Thresholds:
ID# ATTRIBUTE_NAME          FLAG    VALUE WORST THRESH TYPE     UPDATED  WHEN_FAILED RAW_VALUE
  1 Raw_Read_Error_Rate     0x002f  100   100   050    Pre-fail Always       -       0
  5 Reallocated_Sector_Ct   0x0032  100   100   001    Old_age  Always       -       0
  9 Power_On_Hours          0x0032  100   100   000    Old_age  Always       -       15270
 12 Power_Cycle_Count       0x0032  100   100   001    Old_age  Always       -       18
170 Unknown_Attribute       0x0033  100   100   010    Pre-fail Always       -       0
171 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       0
172 Unknown_Attribute       0x0032  100   100   001    Old_age  Always       -       0
173 Unknown_Attribute       0x0032  020   020   000    Old_age  Always       -       3745
174 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       16
183 Runtime_Bad_Block       0x0032  100   100   000    Old_age  Always       -       0
184 End-to-End_Error        0x0032  100   100   000    Old_age  Always       -       0
187 Reported_Uncorrect      0x0032  100   100   000    Old_age  Always       -       0
188 Command_Timeout         0x0032  100   100   000    Old_age  Always       -       17
194 Temperature_Celsius     0x0022  077   065   000    Old_age  Always       -       23 (Min/Max 18/35)
195 Hardware_ECC_Recovered  0x0032  100   100   000    Old_age  Always       -       0
196 Reallocated_Event_Count 0x0032  100   100   000    Old_age  Always       -       0
197 Current_Pending_Sector  0x0032  100   100   000    Old_age  Always       -       0
198 Offline_Uncorrectable   0x0030  100   100   000    Old_age  Offline      -       0
199 UDMA_CRC_Error_Count    0x0032  100   100   000    Old_age  Always       -       0
202 Unknown_SSD_Attribute   0x0030  020   020   001    Old_age  Offline      -       80
206 Unknown_SSD_Attribute   0x000e  100   100   000    Old_age  Always       -       0
246 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       2494069379729
247 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       77940494239
248 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       84369582579
180 Unused_Rsvd_Blk_Cnt_Tot 0x0033  100   100   000    Pre-fail Always       -       2161
210 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       0
211 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       108
212 Unknown_Attribute       0x0032  100   100   000    Old_age  Always       -       0
```

解决方法

由于固态硬盘的寿命有限，建议在硬盘寿命减少到1%时，就应当进行硬盘更换的准备工作