

## 知 ONEStor+PMC430阵列卡+intel 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。

## 过程分析

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、使用lsscsi -g指令查询阵列卡型号和SSD对应的sg编号。如图PMC430阵列卡回显为PMC8060，此系统下两块intel SSD，sg编号分别为sg16和sg17。（若系统下有多种型号硬盘，可以先在HDM中获取SSD具体型号）

```
oot@L1GZW1-CVK20:~# lsscsi -g
[0:0:0:0] disk PM8060-R DefaultValue0 V1.0 /dev/sda /dev/sg0
[0:0:1:0] disk PM8060-R DefaultValue1 V1.0 /dev/sdb /dev/sg1
[0:0:2:0] disk PM8060-R DefaultValue2 V1.0 /dev/sdc /dev/sg2
[0:0:3:0] disk PM8060-R DefaultValue3 V1.0 /dev/sdd /dev/sg3
[0:0:4:0] disk PM8060-R DefaultValue4 V1.0 /dev/sde /dev/sg4
[0:0:5:0] disk PM8060-R DefaultValue5 V1.0 /dev/sdf /dev/sg5
[0:0:6:0] disk PM8060-R LogicalDrv 6 V1.0 /dev/sdg /dev/sg6
[0:0:7:0] disk PM8060-R LogicalDrv 7 V1.0 /dev/sdh /dev/sg7
[0:0:8:0] disk PM8060-R LogicalDrv 8 V1.0 /dev/sdi /dev/sg8
[0:0:9:0] disk PM8060-R LogicalDrv 9 V1.0 /dev/sdj /dev/sg9
[0:0:10:0] disk PM8060-R LogicalDrv 10 V1.0 /dev/sdk /dev/sg10
[0:1:8:0] disk SEAGATE ST600MM0208 N001 - /dev/sg11
[0:1:9:0] disk SEAGATE ST600MM0208 N001 - /dev/sg12
[0:1:10:0] disk HGST HUS726040ALS210 A907 - /dev/sg13
[0:1:11:0] disk HGST HUS726040ALS210 A907 - /dev/sg14
[0:1:12:0] disk HGST HUS726040ALS210 A907 - /dev/sg15
[0:1:13:0] disk ATA INTEL SSDSC2BB24 0112 - /dev/sg16
[0:1:14:0] disk ATA INTEL SSDSC2BB24 0112 - /dev/sg17
[0:1:15:0] disk ATA HGST HUS726T4TAL W41G - /dev/sg18
[0:1:16:0] disk ATA HGST HUS726T4TAL W41G - /dev/sg19
[0:1:17:0] disk ATA HGST HUS726T4TAL W41G - /dev/sg20
[0:1:18:0] disk ATA INTEL SSDSC2KB24 0110 - /dev/sg21
[0:1:19:0] disk ATA INTEL SSDSC2KB24 0110 - /dev/sg22
```

2、使用smartctl -a /dev/sdx指令，查看缓存盘寿命

```
oot@L1GZW1-CVK20:~# smartctl -a /dev/sg16
smartctl 6.6 2016-05-31 r4324 [x86_64-linux-4.14.131-generic] (local build)
copyright (C) 2002-16, Bruce Allen, Christian Franke, www.smartmontools.org

== START OF INFORMATION SECTION ==
Device Model: INTEL SSDSC2BB240G7
Serial Number: PHDV722505RM240AGN
LU WWN Device Id: 5 5cd2e4 14e080d6d
Firmware Version: N2010112
```

3、Intel是通过对比Smart233 :Media Wearout Indicator来确认硬盘使用寿命，如图所示本块SSD剩余寿命为99%

```
SMART Attributes Data Structure revision number: 1
Vendor Specific SMART Attributes with Thresholds:
ID# ATTRIBUTE_NAME          FLAG     VALUE WORST THRESH TYPE      UPDATED  WHEN_FAILED RAW_VALUE
  5 Reallocated_Sector_Ct     0x0032   100    100    000    Old_age Always      -          0
  9 Power_On_Hours             0x0032   100    100    000    Old_age Always      -         4520
 12 Power_Cycle_Count         0x0032   100    100    000    Old_age Always      -        14329
 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    000    Old_age Always      -          0
 174 Unknown_Attribute        0x0032   100    100    000    Old_age Always      -        13897
 175 Program_Fail_Count_Chip  0x0033   100    100    010    Pre-fail Always      -        61565305815065
 183 Runtime_Bad_Block        0x0032   100    100    000    Old_age Always      -          0
 184 End-to-End_Error         0x0033   001    001    090    Pre-fail Always      FAILING_NOW 350
 187 Reported_Uncorrect       0x0032   100    100    000    Old_age Always      -          0
 190 AirFlow_Temperature_Cel  0x0022   068    067    000    Old_age Always      -          32 (Min/Max 21/33)
 192 Power-Off_Retract_Count  0x0032   100    100    000    Old_age Always      -        13897
 194 Temperature_Celsius      0x0022   100    100    000    Old_age Always      -          32
 197 Current_Pending_Sector   0x0012   100    100    000    Old_age Always      -          0
 199 UDMA_CRC_Error_Count     0x003e   100    100    000    Old_age Always      -         277
 225 Unknown_SSD_Attribute    0x0032   100    100    000    Old_age Always      -        55554
 226 Unknown_SSD_Attribute    0x0032   100    100    000    Old_age Always      -         142
 227 Unknown_SSD_Attribute    0x0032   100    100    000    Old_age Always      -          64
 228 Power-off_Retract_Count  0x0032   100    100    000    Old_age Always      -       257025
 232 Available_Reservd_Space  0x0033   100    100    010    Pre-fail Always      -          0
 233 Media_Wearout_Indicator   0x0032   099    099    000    Old_age Always      -          0
 234 Unknown_Attribute        0x0032   100    100    000    Old_age Always      -          0
 241 Total_LBAs_Written       0x0032   100    100    000    Old_age Always      -        55554
 242 Total_LBAs_Read          0x0032   100    100    000    Old_age Always      -       150244
 243 Unknown_Attribute        0x0032   100    100    000    Old_age Always      -       202171
```

## 解决方法

建议定期查看SSD剩余寿命，建议在硬盘寿命减少到10%前，就开始进行硬盘更换的准备工作

