

## 知 ONEStor+LSI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SD，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intel 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:Sl't 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 ██████████ 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 ██████████ U -
8:27 10 Onln 0 446.625 GB SATA SSD N N 512B ██████████ 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 :
=====
EID:Sl't 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 MZ7L3480HCQ-00B7C U -
8:39 10 Onln 0 446.625 GB SATA SSD N N 512B SAMSUNG MZ7L3480HCQ-00B7C U -
```

```
EID=Enclosure Device ID|Sl't=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
Encryption = None
Data Protection = Disabled
Active Operations = None
Exposed to OS = Yes
OS Drive Name = /dev/sda
```

物理盘DID号

物理盘当前缓存状态信息

操作系统下盘符信息

- 3、Intel是通过对比Smart233 :Media Wareout 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
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

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

