

【ONeStor】ONeStor+PMC460阵列卡+三星 SSD系统下查看使用寿命的方法

硬件相关 江淮 2023-12-31 发表

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。

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、使用sg_map -i指令查询阵列卡型号的sg编号, 如此图阵列卡为sg27

```
[root@node103 ~]# sg_map -i
/dev/sg0    UN          Smart Adapter      1.60
/dev/sg1    /dev/sda  UN          LOGICAL VOLUME      1.60
/dev/sg2    /dev/sdb  UN          LOGICAL VOLUME      1.60
/dev/sg3    /dev/sdc  UN          LOGICAL VOLUME      1.60
/dev/sg4    /dev/sdd  UN          LOGICAL VOLUME      1.60
/dev/sg5    /dev/sde  UN          LOGICAL VOLUME      1.60
/dev/sg6    /dev/sdf  UN          LOGICAL VOLUME      1.60
/dev/sg7    /dev/sdg  UN          LOGICAL VOLUME      1.60
/dev/sg8    /dev/sdh  UN          LOGICAL VOLUME      1.60
/dev/sg9    /dev/sdi  UN          LOGICAL VOLUME      1.60
/dev/sg10   /dev/sdj  UN          LOGICAL VOLUME      1.60
/dev/sg11   /dev/sdk  UN          LOGICAL VOLUME      1.60
/dev/sg12   /dev/sdl  UN          LOGICAL VOLUME      1.60
/dev/sg13   /dev/sdm  UN          LOGICAL VOLUME      1.60
/dev/sg14   /dev/sdn  UN          LOGICAL VOLUME      1.60
/dev/sg15   /dev/sdo  UN          LOGICAL VOLUME      1.60
/dev/sg16   /dev/sdp  UN          LOGICAL VOLUME      1.60
/dev/sg17   /dev/sdq  UN          LOGICAL VOLUME      1.60
/dev/sg18   /dev/sdr  UN          LOGICAL VOLUME      1.60
/dev/sg19   /dev/sds  UN          LOGICAL VOLUME      1.60
/dev/sg20   /dev/sdt  UN          LOGICAL VOLUME      1.60
/dev/sg21   /dev/sdu  UN          LOGICAL VOLUME      1.60
/dev/sg22   /dev/sdv  UN          LOGICAL VOLUME      1.60
/dev/sg23   /dev/sdw  UN          LOGICAL VOLUME      1.60
/dev/sg24   /dev/sdx  UN          LOGICAL VOLUME      1.60
/dev/sg25   /dev/sdy  UN          LOGICAL VOLUME      1.60
/dev/sg26   /dev/sdz  UN          LOGICAL VOLUME      1.60
/dev/sg27   UN          P460-M4      1.60
```

2、arconft list 1 |grep "Physical Device information" -A 60查看SSD盘的DID号 (从0依次往下编号)

```
[root@ZJRB-UISS ~]# arconft list 1 |grep "Physical Device information" -A 60
Physical Device information
-----
Physical ID      : State (Interface, BlockSize, SizeMB, Vendor, Model, Type) WnN, [Location]
Physical 0,8     : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7000, 0
[Enclosure 1, Slot 0(Connector 0:CNO)]
Physical 0,9     : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7001, 1
[Enclosure 1, Slot 1(Connector 0:CNO)]
Physical 0,10    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7002, 2
[Enclosure 1, Slot 2(Connector 0:CNO)]
Physical 0,11    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7003, 3
[Enclosure 1, Slot 3(Connector 0:CNO)]
Physical 0,12    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7004,
[Enclosure 1, Slot 4(Connector 0:CNO)]
Physical 0,13    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7005,
[Enclosure 1, Slot 5(Connector 0:CNO)]
Physical 0,14    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7006,
[Enclosure 1, Slot 6(Connector 0:CNO)]
Physical 0,15    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7007,
[Enclosure 1, Slot 7(Connector 0:CNO)]
Physical 0,16    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7008,
[Enclosure 1, Slot 8(Connector 0:CNO)]
Physical 0,17    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7009,
[Enclosure 1, Slot 9(Connector 0:CNO)]
Physical 0,18    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700A,
[Enclosure 1, Slot 10(Connector 0:CNO)]
Physical 0,19    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700B,
[Enclosure 1, Slot 11(Connector 0:CNO)]
Physical 0,20    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700C,
[Enclosure 1, Slot 12(Connector 0:CNO)]
Physical 0,21    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700D,
[Enclosure 1, Slot 13(Connector 0:CNO)]
Physical 0,22    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700E,
[Enclosure 1, Slot 14(Connector 0:CNO)]
Physical 0,23    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D700F,
[Enclosure 1, Slot 15(Connector 0:CNO)]
Physical 0,24    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7010,
[Enclosure 1, Slot 16(Connector 0:CNO)]
Physical 0,25    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7011,
[Enclosure 1, Slot 17(Connector 0:CNO)]
Physical 0,26    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7012,
[Enclosure 1, Slot 18(Connector 0:CNO)]
Physical 0,27    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7013,
[Enclosure 1, Slot 19(Connector 0:CNO)]
Physical 0,28    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7014,
[Enclosure 1, Slot 20(Connector 0:CNO)]
Physical 0,29    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7015,
[Enclosure 1, Slot 21(Connector 0:CNO)]
Physical 0,30    : Online (SATA, 512 Bytes, 1831420MB, ATA, , Solid State Drive) 5F010907821D7016,
```

3. smartctl -a -d cciss,7 /dev/sg27, 查看缓存盘寿命

注: 7为SSD盘对应的DID, sg27为阵列卡编号, 请根据现场实际情况填写

4. 三星SSD是从177 查看损耗均衡次数; VALUE显示剩余寿命百分比,获取硬盘的剩余寿命, 如图可知此块SSD剩余寿命为83%

```
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	0x0033	100	100	010	Pre-fail	Always	-	0
9	Power_On_Hours	0x0032	090	090	000	Old_age	Always	-	48090
12	Power_Cycle_Count	0x0032	099	099	000	Old_age	Always	-	29
177	Wear_Leveling_Count	0x0013	083	083	005	Pre-fail	Always	-	1264
179	Used_Rsvd_Blk_Cnt_Tot	0x0013	100	100	010	Pre-fail	Always	-	0
180	Unused_Rsvd_Blk_Cnt_Tot	0x0013	100	100	010	Pre-fail	Always	-	813
181	Program_Fail_Cnt_Total	0x0032	100	100	010	Old_age	Always	-	0
182	Erase_Fail_Count_Total	0x0032	100	100	010	Old_age	Always	-	0
183	Runtime_Bad_Block	0x0013	100	100	010	Pre-fail	Always	-	0
184	End-to-End_Error	0x0033	100	100	097	Pre-fail	Always	-	0
187	Reported_Uncorrect	0x0032	100	100	000	Old_age	Always	-	0
190	Airflow_Temperature_Cel	0x0032	067	055	000	Old_age	Always	-	33
194	Temperature_Celsius	0x0022	067	055	000	Old_age	Always	-	33 (Min/Max 22,
195	Hardware_ECC_Recovered	0x001a	200	200	000	Old_age	Always	-	0
197	Current_Pending_Sector	0x0032	100	100	000	Old_age	Always	-	0
199	UDMA_CRC_Error_Count	0x003e	100	100	000	Old_age	Always	-	0
202	Unknown_SSD_Attribute	0x0033	100	100	010	Pre-fail	Always	-	0
235	Unknown_Attribute	0x0012	099	099	000	Old_age	Always	-	19
241	Total_LBAs_Written	0x0032	099	099	000	Old_age	Always	-	668907095973
242	Total_LBAs_Read	0x0032	099	099	000	Old_age	Always	-	1488328605
243	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	0
244	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	0
245	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	65535
246	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	65535
247	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	65535
251	Unknown_Attribute	0x0032	100	100	000	Old_age	Always	-	676175268608

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