某局点一台H3C UIS-Cell 3010 G3一体机硬盘故障的诊断分析

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组网及说明

无

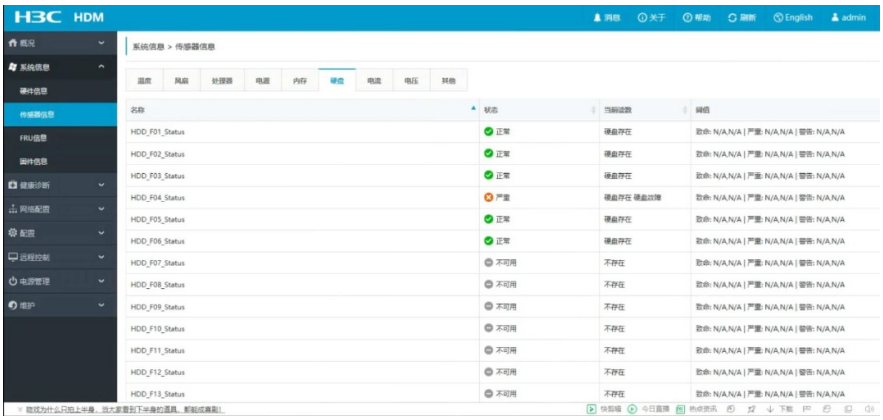
问题描述

某局点一台H3C UIS-Cell 3010 G3一体机用户反馈前面6块硬盘一起出现橙色和蓝色指示灯交替闪烁。业务未出现中断的情况。

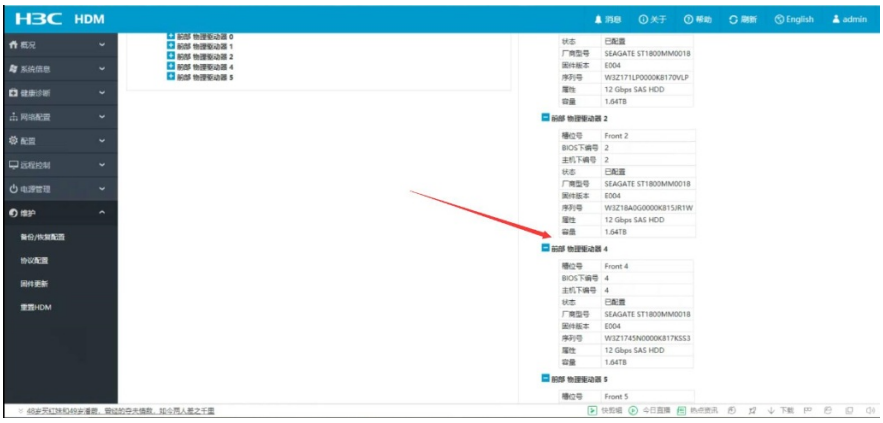
过程分析

H3C UIS-Cell 3010 G3底层的硬件是H3C UniServer R4900 G3服务器，具体分析过程如下：

1.登录HDM的Web界面，查看左侧“系统信息”下的“传感器信息”，在右侧主界面选中“硬盘”标签页，发现F04硬盘出现严重报错，如下图所示：



2.点击左侧“硬件信息”菜单，选择右侧主窗体的“存储”标签页，发现少了物理驱动器3，如下图所示：



3.收集SDS日志，分析发现动态监控日志里有如下掉盘(F04)和逻辑驱动器降级记录：

2019-05-03 05:38:30　　PD is offline ---Pos: Front Panel index: 3

2019-05-03 05:38:30　　LD 0 has changed from optimal to degraded.

2019-05-03 05:38:33　　SensorType: Drive Slot (Bay), SensorName: HDD_F04_Status, EventType: Discrete, Event: Drive Fault Drive fault

4. 从SDS也能看到配置的是PMC的P430-M2卡，故使用arcconf工具收集阵列卡日志，从controller_1_config.txt文件发现是6块硬盘配置成的RAID5，逻辑驱动器0当前是降级的状态，其中slot 3（或者叫bay 4）硬盘缺失，日志记录如下：

Logical Device number 0

Logical Device name　　: DefaultValue0

Block Size of member drives　　: 512 Bytes

RAID level : 5

Unique Identifier : E1FB32B3

Status of Logical Device : Degraded

Additional details : Initialized with Build/Clear

Size : 8575985 MB

Parity space : 1715199 MB

Stripe-unit size : 256 KB

Interface Type : Serial Attached SCSI

Device Type : HDD

Read-cache setting : Enabled

Read-cache status : On

Write-cache setting : Enabled

Write-cache status : On

Partitioned : Yes

Protected by Hot-Spare : No

Bootable : Yes

Failed stripes : No

Power settings : Disabled

Logical Device segment information

Segment 0 : Present (1716957MB, SAS, HDD, Enclosure:0, Slot:0) W3Z17NQV
0000K817KUPS

Segment 1 : Present (1716957MB, SAS, HDD, Enclosure:0, Slot:1) W3Z171LP0
000K8170VLP

Segment 2 : Present (1716957MB, SAS, HDD, Enclosure:0, Slot:2) W3Z18A0G
0000K815JR1W

Segment 3 : Missing (0MB, SAS, HDD, Connector:0, Device:3)

Segment 4 : Present (1716957MB, SAS, HDD, Enclosure:0, Slot:4) W3Z1745N0
000K817KSS3

Segment 5 : Present (1716957MB, SAS, HDD, Enclosure:0, Slot:5) W3Z1740D0
000K817KU3K

5. 检查对应时间点的Controller_1_Logs.txt发现，dev03（也就是bay4）硬盘有hardware error，具体原因是磁头的随机定位错误，KCQ值是04/15/01，未发现阵列卡及固件的IOP reset或者hung等错误，如下：

[14098]: 05:41:42 ProcessSRB_Errors: Service Response 0, Scsi Status 2

[14099]: Fri - May 3 05:41:42 2019.587360 ScsiStatus=2 ServResp=0devt=0x3 Cdb[0:15]=0x2800ccef:e5200000:08000000:00000000
[14100]: Fri - May 3 05:41:42 2019.587477 RS: Check Condition hhmmss=0x00054149 incident=0x00003aaf nexus=0x01020002 devt=0x00000003
[14101]: 05:41:42 expevent 0001000C - 00:03:00 SCSI Sense codekey=04 asc=15 ascq=01
[14102]: 05:41:42 ID(0:03:0); Error Event [Cmd:0x28]
[14103]: Fri - May 3 05:41:42 2019.587777 DC_DecodeSenseInfo: ID(0:03:0);[k:0x4;c:0x15;q:0x1]
[14104]: 05:41:42 Hardware Error
[14105]: Fri - May 3 05:41:42 2019.587908 DC_DecodeSenseInfo: ID(0:03:0)
[14106]: 05:41:42 Random Positioning Error
[14107]: Fri - May 3 05:41:42 2019.588045 SP_CloseNexus: Setting ID(0:03:0) offline.failure Reason Code=4
[14108]: 05:41:42 IsContainerPartition: Container device 0x3
[14109]: 05:41:42 Vendor ID: SEAGATE Product ID: ST1800MM0018 Serial Number: W3Z189X00000K816NVFV
[14110]: 05:41:42 SAS WWN: 50 00 C5 00 A0 DA 44 44
[14111]: 05:41:42 DDLog for devt: 3 with reason: 4

[14163]: 05:41:42 FSAPRINT: @Drive 0:3:0 returning error
[14164]: 05:41:42 FSAPRINT: Drive 0:3:0 offline on container 0:
[14165]: 05:41:42 Turning alarm ON for RaidDriveFailEvent from CtPupCodeAlarmOn()..
[14166]: 05:41:42 CtPupCodeAlarmOn() call AlarmOnOff()OnBit=1
[14167]: 05:41:42 AlarmOnOff() Alarm already on...
[14168]: 05:41:42 UpdateFailOnDisk: Enter
[14169]: 05:41:42 UpdateFailOnDisk: container 0x0
[14170]: 05:41:42 UpdateFailOnDisk: REDUNDANT container
[14171]: 05:41:42 Turning alarm ON for RaidDriveFailEvent from CtPupCodeAlarmOn()..
[14172]: 05:41:42 CtPupCodeAlarmOn() call AlarmOnOff()OnBit=1
[14173]: 05:41:42 AlarmOnOff() Alarm already on...
[14174]: 05:41:42 FSAPRINT: !RAID5 Container 0 Drive 0:3:0 Failure
[14175]: 05:41:42 Turning alarm ON for RaidDriveFailEvent from CtPupCodeAlarmOn()..
[14176]: 05:41:42 CtPupCodeAlarmOn() call AlarmOnOff()OnBit=1
[14177]: 05:41:42 AlarmOnOff() Alarm already on...
[14178]: 05:41:42 ReadSliceMBR: can"t read mbr dev_t:1
[14179]: 05:41:42 UpdateFailOnDisk: Skipping, no container
[14180]: 05:41:42 UpdateFailOnDisk: Skipping, no container
[14181]: 05:41:42 UpdateFailOnDisk: Skipping, no container
[14182]: 05:41:43 ReadSliceMBR: can"t read mbr dev_t:1
[14183]: 05:41:43 can"t read config from slice #[1]
[14184]: 05:41:43 GetFailoverSlice: GetContainerFailoverSlice returns ffffffff
[14185]: 05:41:43 ReadSliceMBR: can"t read mbr dev_t:1
[14186]: 05:41:43 can"t read config from slice #[1]
[14187]: 05:41:43 GetFailoverSlice: no_failover_device:1
[14188]: 05:41:43 CheckRAID5:GetFailoverSlice returned:ffffffff
[14189]: 05:41:43 ReadSliceMBR: can"t read mbr dev_t:1
[14190]: 05:41:43 CT_GetHotSpareType: can"t read config from slice #[1]
[14191]: 05:41:43 FSAPRINT: RAID5 Failover Container 0 No Failover Assigned

6. Controller_1_Monitor_Log.txt中也发现指向devt03的错误code是4，KCQ是04/15/01的报错记录，未发现与阵列卡及固件相关的报错，记录如下：
05/03/19 05:41:42.587360: ScsiStatus=2 ServResp=0 devt=0x3 Cdb[0:15]=0x2800ccef:e5200000:08000000:00000000
05/03/19 05:41:42.587477: RS: Check Condition hhmmss=0x00054149 incident=0x00003aaf nexus=0x01020002 devt=0x00000003
05/03/19 05:41:42.587777: DC_DecodeSenseInfo: ID(0:03:0); [k:0x4;c:0x15;q:0x1]
05/03/19 05:41:42.587908: DC_DecodeSenseInfo: ID(0:03:0)
05/03/19 05:41:42.588045: SP_CloseNexus: Setting ID(0:03:0) offline. failure Reason Code=4
05/03/19 05:41:42.588937: ID_AIC_DEV_TASK: rmw_nexus=0x01020002 state=0x01000100:01000201:02020f00:0f090f0a:0f090f0a:02050203:02040600
05/03/19 05:41:42.591771: ScsiStatus=109 ServResp=1 devt=0x3 Cdb[0:15]=0x2a00ccef:fe000002:00000000:00000000
05/03/19 05:41:42.591875: SRV_DLVRY_TGT_FAILURE Abort handling for STATUS: 0x6d on devt=0x00000003 !
05/03/19 05:41:42.592174: ScsiStatus=109 ServResp=1 devt=0x3

Cdb[0:15]=0x2800ccef:e6880000:08000000:00000000
05/03/19 05:41:42.592277: SRV_DLVRY_TGT_FAILURE Abort handling for STATUS: 0x6d on devt=0x00000003 !
05/03/19 05:41:42.592573: ScsiStatus=109 ServResp=1 devt=0x3
Cdb[0:15]=0x2800ccef:e1c80000:08000000:00000000
05/03/19 05:41:42.592676: SRV_DLVRY_TGT_FAILURE Abort handling for STATUS: 0x6d on devt=0x00000003 !

7. Controller_1_SmartStats.xml日志未发现bay4硬盘，同时其他硬盘未发现有错误记录；

8. 配置的阵列卡是RAID-P430-M2，固件和驱动都不是最新版本，日志记录如下：

Controller Type	: RAID-P430-M2
Firmware Version	: 33270

Controller Version Information

BIOS : 7.13-0 (33270)

Firmware : 7.13-0 (33270)

Driver : 1.2-1 (50792)

Boot Flash : 7.13-0 (33270)

CPLD (Load version/ Flash version) : 8/ 8

SEEPROM (Load version/ Flash version) : 1/ 1

FCT Custom Init String Version : 0x3

从上述可以定位问题的根因就是bay 4硬盘损坏，该硬盘截留分析也发现无法识别到，问题指向硬盘的磁头。

解决方法

1.做好数据备份，更换故障硬盘；
2.更新阵列卡固件及驱动到最新版本（FW：33303，Drv：57013）。