<http://www.xifenfei.com/2014/04/asm-disk-header-彻底损坏恢复.html>

asm disk header 彻底损坏恢复

发表于 2014 年 04 月 20 日 由 惜分飞

联系：手机(+86 13429648788) QQ(107644445)

标题：asm disk header 彻底损坏恢复

作者：惜分飞©版权所有[未经本人同意,不得以任何形式转载,否则有进一步追究法律责任的权利.]

在asm 磁盘组不能mount的情况下,如果是磁盘头的少数部分损坏,或者是asm disk header存在,可以通过kfed修复,或者使用备份的磁盘头信息去恢复从而实现磁盘组mount来恢复数据库.如果没有备份也无法修复可以尝试使用amdu,dul来实现对不能mount的磁盘组进行恢复.在极端情况下(比如磁盘组完全丢失),amdu/dul都无论为力的情况下,可以考虑使用扫描磁盘找出来datafile 的方法求救数据的最后稻草.本实验大概的模拟了asm disk 前10M完全损坏的情况下数据库恢复

测试准备

创建新表空间，创建T\_XIFENFEI测试表

SQL> create tablespace xifenfei datafile '+XIFENFEI' SIZE 50m;

Tablespace created.

SQL> CREATE TABLE T\_XIFENFEI TABLESPACE XIFENFEI

  2  AS SELECT \* FROM DBA\_OBJECTS;

Table created.

SQL> SELECT COUNT(\*) FROM T\_XIFENFEI;

  COUNT(\*)

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     50031

SQL> select ts#,rfile#,bytes/1024/1024,blocks,name from v$datafile;

       TS#     RFILE# BYTES/1024/1024     BLOCKS NAME

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         0          1             480      61440 +XIFENFEI/asm10g/datafile/system.256.845260203

         1          2              25       3200 +XIFENFEI/asm10g/datafile/undotbs1.258.845260205

         2          3             250      32000 +XIFENFEI/asm10g/datafile/sysaux.257.845260203

         4          4               5        640 +XIFENFEI/asm10g/datafile/users.259.845260205

         6          5              50       6400 +XIFENFEI/asm10g/datafile/xifenfei.266.845262139

SQL> select GROUP\_NUMBER,DISK\_NUMBER,STATE,TOTAL\_MB,FREE\_MB,NAME,path from  v$asm\_disk;

GROUP\_NUMBER DISK\_NUMBER STATE      TOTAL\_MB    FREE\_MB NAME                 PATH

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           1           0 NORMAL         2048          0 XIFENFEI\_0000        /dev/raw/raw1

           1           1 NORMAL          784          0 XIFENFEI\_0001        /dev/raw/raw2

           1           2 NORMAL         7059          0 XIFENFEI\_0002        /dev/raw/raw3

--关闭数据库

SQL> shutdown immediate;

Database closed.

Database dismounted.

ORACLE instance shut down.

--关闭ASM

SQL> shutdown immediate

ASM diskgroups dismounted

ASM instance shutdown

查看裸设备对应磁盘

[oracle@xifenfei dul]$ more /etc/sysconfig/rawdevices

/dev/raw/raw1   /dev/sdc

/dev/raw/raw2   /dev/sdd1

/dev/raw/raw3   /dev/sdd2

dd磁盘头

dd asm disk 前面10M，彻底破坏asm disk

[oracle@xifenfei ~]$ dd if=/dev/zero of=/dev/raw/raw1 bs=1M count=10 conv=notrunc

10+0 records in

10+0 records out

10485760 bytes (10 MB) copied, 0.175424 seconds, 59.8 MB/s

[oracle@xifenfei ~]$ dd if=/dev/zero of=/dev/raw/raw2 bs=1M count=10 conv=notrunc

10+0 records in

10+0 records out

10485760 bytes (10 MB) copied, 0.11584 seconds, 90.5 MB/s

[oracle@xifenfei ~]$ dd if=/dev/zero of=/dev/raw/raw3 bs=1M count=10 conv=notrunc

10+0 records in

10+0 records out

10485760 bytes (10 MB) copied, 0.353435 seconds, 29.7 MB/s

kfed查看磁盘

确定所有asm disk header完全被破坏

[oracle@xifenfei dul]$ kfed read /dev/raw/raw1

kfbh.endian:                          0 ; 0x000: 0x00

kfbh.hard:                            0 ; 0x001: 0x00

kfbh.type:                            0 ; 0x002: KFBTYP\_INVALID

kfbh.datfmt:                          0 ; 0x003: 0x00

kfbh.block.blk:                       0 ; 0x004: T=0 NUMB=0x0

kfbh.block.obj:                       0 ; 0x008: TYPE=0x0 NUMB=0x0

kfbh.check:                           0 ; 0x00c: 0x00000000

kfbh.fcn.base:                        0 ; 0x010: 0x00000000

kfbh.fcn.wrap:                        0 ; 0x014: 0x00000000

kfbh.spare1:                          0 ; 0x018: 0x00000000

kfbh.spare2:                          0 ; 0x01c: 0x00000000

[oracle@xifenfei dul]$ kfed read /dev/raw/raw2

kfbh.endian:                          0 ; 0x000: 0x00

kfbh.hard:                            0 ; 0x001: 0x00

kfbh.type:                            0 ; 0x002: KFBTYP\_INVALID

kfbh.datfmt:                          0 ; 0x003: 0x00

kfbh.block.blk:                       0 ; 0x004: T=0 NUMB=0x0

kfbh.block.obj:                       0 ; 0x008: TYPE=0x0 NUMB=0x0

kfbh.check:                           0 ; 0x00c: 0x00000000

kfbh.fcn.base:                        0 ; 0x010: 0x00000000

kfbh.fcn.wrap:                        0 ; 0x014: 0x00000000

kfbh.spare1:                          0 ; 0x018: 0x00000000

kfbh.spare2:                          0 ; 0x01c: 0x00000000

[oracle@xifenfei dul]$ kfed read /dev/raw/raw3

kfbh.endian:                          0 ; 0x000: 0x00

kfbh.hard:                            0 ; 0x001: 0x00

kfbh.type:                            0 ; 0x002: KFBTYP\_INVALID

kfbh.datfmt:                          0 ; 0x003: 0x00

kfbh.block.blk:                       0 ; 0x004: T=0 NUMB=0x0

kfbh.block.obj:                       0 ; 0x008: TYPE=0x0 NUMB=0x0

kfbh.check:                           0 ; 0x00c: 0x00000000

kfbh.fcn.base:                        0 ; 0x010: 0x00000000

kfbh.fcn.wrap:                        0 ; 0x014: 0x00000000

kfbh.spare1:                          0 ; 0x018: 0x00000000

kfbh.spare2:                          0 ; 0x01c: 0x00000000

amdu查看asm 磁盘

[oracle@xifenfei ~]$ amdu -diskstring '/dev/raw/raw\*'

amdu\_2014\_04\_18\_23\_17\_17/

[oracle@xifenfei ~]$ cd amdu\_2014\_04\_18\_23\_17\_17

[oracle@xifenfei amdu\_2014\_04\_18\_23\_17\_17]$ ls

report.txt

[oracle@xifenfei amdu\_2014\_04\_18\_23\_17\_17]$ more report.txt

-\*-amdu-\*-

…………

--------------------------------- Operations ---------------------------------

------------------------------- Disk Selection -------------------------------

 -diskstring '/dev/raw/raw\*'

------------------------------ Reading Control -------------------------------

------------------------------- Output Control -------------------------------

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* DISCOVERY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

----------------------------- DISK REPORT N0001 ------------------------------

                Disk Path: /dev/raw/raw1

           Unique Disk ID:

               Disk Label:

     Physical Sector Size: 512 bytes

                Disk Size: 65536 megabytes

\*\* NOT A VALID ASM DISK HEADER. BAD VALUE IN FIELD blksize\_kfdhdb \*\*

----------------------------- DISK REPORT N0002 ------------------------------

                Disk Path: /dev/raw/raw2

           Unique Disk ID:

               Disk Label:

     Physical Sector Size: 512 bytes

                Disk Size: 65536 megabytes

\*\* NOT A VALID ASM DISK HEADER. BAD VALUE IN FIELD blksize\_kfdhdb \*\*

----------------------------- DISK REPORT N0003 ------------------------------

                Disk Path: /dev/raw/raw3

           Unique Disk ID:

               Disk Label:

     Physical Sector Size: 512 bytes

                Disk Size: 65536 megabytes

\*\* NOT A VALID ASM DISK HEADER. BAD VALUE IN FIELD blksize\_kfdhdb \*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* END OF REPORT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

通过这里证明，当asm disk header 损坏严重之时,amdu无法识别，更加无法恢复相关数据库

dul查看完全损坏asm disk header

测试在asm disk header完全损坏情况下,dul是否还能够实现asm磁盘组中抽取数据,同理amdu也无法正常工作.

[oracle@xifenfei dul]$ ./dul

Data UnLoader: 10.2.0.5.28 - Internal Only - on Sat Apr 19 04:02:02 2014

with 64-bit io functions

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DUL: Warning: block 0 is not a disk header block

DUL: Error: Block is not in use

DUL: Error: Block type mismatch ( seen 0 expect 1) when parsing block 0 of disk /dev/raw/raw1

DUL: Warning: block 0 is not a disk header block

DUL: Error: Block is not in use

DUL: Error: Block type mismatch ( seen 0 expect 1) when parsing block 0 of disk /dev/raw/raw2

DUL: Warning: block 0 is not a disk header block

DUL: Error: Block is not in use

DUL: Error: Block type mismatch ( seen 0 expect 1) when parsing block 0 of disk /dev/raw/raw3

这里可以看出来,当asm disk header完全异常,dul也无法识别出来asm磁盘组(该情况下dul无法正常操作)

通过工具扫描磁盘抽取数据块

CPFL> scan disk  /dev/raw/raw1

Scanning  disk /dev/raw/raw1, at 2014-04-19 04:05:11

Completed  disk /dev/raw/raw1, at 2014-04-19 04:05:56

CPFL> scan  disk  /dev/raw/raw2

Scanning  disk /dev/raw/raw2, at 2014-04-19 04:05:56

Completed  disk /dev/raw/raw2, at 2014-04-19 04:06:15

CPFL> scan  disk  /dev/raw/raw3

Scanning  disk /dev/raw/raw3, at 2014-04-19 04:06:15

Completed  disk /dev/raw/raw3, at 2014-04-19 04:07:44

CPFL> list datafiles

 Tablespace: SYSTEM    File:    1  Blocks:      61440

 Tablespace: UNDOTBS1  File:    2  Blocks:       3200

 Tablespace: SYSAUX    File:    3  Blocks:      32000

 Tablespace: USERS     File:    4  Blocks:        640

 Tablespace: XIFENFEI  File:    5  Blocks:       6400

CPFL> copy datafile 1 to /u01/oracle/oradata/datafile/1.dbf

copy datafile start: 2014-04-19 04:10:35

copy datafile 1 have blocks 61440

copy datafile completed: 2014-04-19 04:11:18

CPFL> copy datafile 2  to /u01/oracle/oradata/datafile/2.dbf

copy datafile start: 2014-04-19 04:11:52

copy datafile 2 have blocks 3200

copy datafile completed: 2014-04-19 04:11:54

CPFL>  copy datafile 3  to /u01/oracle/oradata/datafile/3.dbf

copy datafile start: 2014-04-19 04:12:03

copy datafile 3 have blocks 32000

copy datafile completed: 2014-04-19 04:12:27

CPFL>  copy datafile 4  to /u01/oracle/oradata/datafile/4.dbf

copy datafile start: 2014-04-19 04:13:07

copy datafile 4 have blocks 640

copy datafile completed: 2014-04-19 04:13:08

CPFL> copy datafile 5 to /u01/oracle/oradata/datafile/5.dbf

copy datafile start: 2014-04-19 04:13:18

copy datafile 5 have blocks 6400

copy datafile completed: 2014-04-19 04:13:19

查看使用工具抽取数据文件

[oracle@xifenfei datafile]$ ls -l

total 830320

-rw-r--r-- 1 oracle oinstall 503324672 Apr 19 04:34 1.dbf

-rw-r--r-- 1 oracle oinstall  26222592 Apr 19 04:34 2.dbf

-rw-r--r-- 1 oracle oinstall 262152192 Apr 19 04:34 3.dbf

-rw-r--r-- 1 oracle oinstall   5251072 Apr 19 04:34 4.dbf

-rw-r--r-- 1 oracle oinstall  52436992 Apr 19 04:34 5.dbf

dul验证抽取文件

[oracle@xifenfei dul]$ ./dul

Data UnLoader: 10.2.0.5.28 - Internal Only - on Sat Apr 19 06:56:09 2014

with 64-bit io functions

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DUL: Warning: Recreating file "dul.log"

Found db\_id = 181793355

Found db\_name = ASM10G

DUL> show datafiles;

ts# rf# start   blocks offs open  err file name

  0   1     0    61440    0    1    0 /u01/oracle/oradata/datafile/1.dbf

  1   2     0     3200    0    1    0 /u01/oracle/oradata/datafile/2.dbf

  2   3     0    32000    0    1    0 /u01/oracle/oradata/datafile/3.dbf

  4   4     0      640    0    1    0 /u01/oracle/oradata/datafile/4.dbf

  6   5     0     6400    0    1    0 /u01/oracle/oradata/datafile/5.dbf

DUL> bootstrap;

Probing file = 1, block = 377

. unloading table                BOOTSTRAP$

DUL: Warning: block number is non zero but marked deferred trying to process it anyhow

      57 rows unloaded

DUL: Warning: Dictionary cache DC\_BOOTSTRAP is empty

Reading BOOTSTRAP.dat 57 entries loaded

Parsing Bootstrap$ contents

DUL: Warning: Recreating file "dict.ddl"

Generating dict.ddl for version 10

 OBJ$: segobjno 18, file 1 block 121

 TAB$: segobjno 2, tabno 1, file 1  block 25

 COL$: segobjno 2, tabno 5, file 1  block 25

 USER$: segobjno 10, tabno 1, file 1  block 89

Running generated file "[@dict.ddl](mailto:@dict.ddl)" to unload the dictionary tables

. unloading table                      OBJ$   51171 rows unloaded

. unloading table                      TAB$    1576 rows unloaded

. unloading table                      COL$   55264 rows unloaded

. unloading table                     USER$      59 rows unloaded

Reading USER.dat 59 entries loaded

Reading OBJ.dat 51171 entries loaded and sorted 51171 entries

Reading TAB.dat 1576 entries loaded

Reading COL.dat 55264 entries loaded and sorted 55264 entries

Reading BOOTSTRAP.dat 57 entries loaded

DUL: Warning: Recreating file "dict.ddl"

Generating dict.ddl for version 10

 OBJ$: segobjno 18, file 1 block 121

 TAB$: segobjno 2, tabno 1, file 1  block 25

 COL$: segobjno 2, tabno 5, file 1  block 25

 USER$: segobjno 10, tabno 1, file 1  block 89

 TABPART$: segobjno 266, file 1 block 2121

 INDPART$: segobjno 271, file 1 block 2161

 TABCOMPART$: segobjno 288, file 1 block 2297

 INDCOMPART$: segobjno 293, file 1 block 2345

 TABSUBPART$: segobjno 278, file 1 block 2217

 INDSUBPART$: segobjno 283, file 1 block 2257

 IND$: segobjno 2, tabno 3, file 1  block 25

 ICOL$: segobjno 2, tabno 4, file 1  block 25

 LOB$: segobjno 2, tabno 6, file 1  block 25

 COLTYPE$: segobjno 2, tabno 7, file 1  block 25

 TYPE$: segobjno 181, tabno 1, file 1  block 1297

 COLLECTION$: segobjno 181, tabno 2, file 1  block 1297

 ATTRIBUTE$: segobjno 181, tabno 3, file 1  block 1297

 LOBFRAG$: segobjno 299, file 1 block 2393

 LOBCOMPPART$: segobjno 302, file 1 block 2425

 UNDO$: segobjno 15, file 1 block 105

 TS$: segobjno 6, tabno 2, file 1  block 57

 PROPS$: segobjno 96, file 1 block 721

Running generated file "[@dict.ddl](mailto:@dict.ddl)" to unload the dictionary tables

. unloading table                      OBJ$

DUL: Warning: Recreating file "OBJ.ctl"

   51171 rows unloaded

. unloading table                      TAB$

DUL: Warning: Recreating file "TAB.ctl"

    1576 rows unloaded

. unloading table                      COL$

DUL: Warning: Recreating file "COL.ctl"

   55264 rows unloaded

. unloading table                     USER$

DUL: Warning: Recreating file "USER.ctl"

      59 rows unloaded

. unloading table                  TABPART$      72 rows unloaded

. unloading table                  INDPART$      80 rows unloaded

. unloading table               TABCOMPART$       0 rows unloaded

. unloading table               INDCOMPART$       0 rows unloaded

. unloading table               TABSUBPART$       0 rows unloaded

. unloading table               INDSUBPART$       0 rows unloaded

. unloading table                      IND$    2231 rows unloaded

. unloading table                     ICOL$    3650 rows unloaded

. unloading table                      LOB$     530 rows unloaded

. unloading table                  COLTYPE$    1701 rows unloaded

. unloading table                     TYPE$    1945 rows unloaded

. unloading table               COLLECTION$     555 rows unloaded

. unloading table                ATTRIBUTE$    7275 rows unloaded

. unloading table                  LOBFRAG$       1 row  unloaded

. unloading table              LOBCOMPPART$       0 rows unloaded

. unloading table                     UNDO$      21 rows unloaded

. unloading table                       TS$       7 rows unloaded

. unloading table                    PROPS$      28 rows unloaded

Reading USER.dat 59 entries loaded

Reading OBJ.dat 51171 entries loaded and sorted 51171 entries

Reading TAB.dat 1576 entries loaded

Reading COL.dat 55264 entries loaded and sorted 55264 entries

Reading TABPART.dat 72 entries loaded and sorted 72 entries

Reading TABCOMPART.dat 0 entries loaded and sorted 0 entries

Reading TABSUBPART.dat 0 entries loaded and sorted 0 entries

Reading INDPART.dat 80 entries loaded and sorted 80 entries

Reading INDCOMPART.dat 0 entries loaded and sorted 0 entries

Reading INDSUBPART.dat 0 entries loaded and sorted 0 entries

Reading IND.dat 2231 entries loaded

Reading LOB.dat 530 entries loaded

Reading ICOL.dat 3650 entries loaded

Reading COLTYPE.dat 1701 entries loaded

Reading TYPE.dat 1945 entries loaded

Reading ATTRIBUTE.dat 7275 entries loaded

Reading COLLECTION.dat 555 entries loaded

Reading BOOTSTRAP.dat 57 entries loaded

Reading LOBFRAG.dat 1 entries loaded and sorted 1 entries

Reading LOBCOMPPART.dat 0 entries loaded and sorted 0 entries

Reading UNDO.dat 21 entries loaded

Reading TS.dat 7 entries loaded

Reading PROPS.dat 28 entries loaded

Database character set is ZHS16GBK

Database national character set is AL16UTF16

DUL> unload table sys.t\_xifenfei;

. unloading table                T\_XIFENFEI   50031 rows unloaded

通过这里可以发现,我们创建测试数据为50031条,dul读取抽取出来数据文件中对应表数据条数也为50031条;证明:在asm disk header完全损坏情况下,amdu,dul无法直接恢复asm里面数据库，但是可以通过工具扫描数据文件，找出来磁盘中的datafile block实现完整恢复数据[只要你的asm中的数据没有覆盖,都可以通过该方法恢复]

如果你在使用这些思路进行恢复遇到突发情况不能自行解决,请联系我们(ORACLE数据库恢复技术支持),将为您提供专业数据库技术支持：

Phone:13429648788    Q Q:107644445    [E-Mail:dba@xifenfei.com](mailto:E-Mail:dba@xifenfei.com)

使用 dul 挖数据文件初试

dul 10支持oracle 11g r2

密码保护：dul扫描磁盘抢救数据

密码保护：使用dul恢复asm中数据

DUL10直接支持ORACLE 8.0

最新版Oracle dul支持Oracle 7.2.3

Oracle dul支持Oracle 12.2(12c)

dul支持ORACLE 12C CDB数据库恢复

ORA-01157: cannot identify/lock data file导致表空间无法online

dul恢复truncate表测试

dul无法加载bootstrap实现unload table/user恢复

oracle dul 11 正式发布