# RMAN备份恢复项目实践

## 数据库环境

**以下的所有案例都是通过测试经过，环境为：**

**VM：vmware 12**

  OS：Linux

  DB：Oracle 11.2

  DBNAME：oaec

**数据文件：**

SQL> select file#,status,enabled,name from v$datafile;

  FILE# STATUS ENABLED NAME

---------- ------- ---------- -----------------------------------------------------

1 SYSTEM READ WRITE /u02/app/oracle/oradata/DEMO2/datafile/system\_dlgb4kwk\_.dbf

2 ONLINE READ WRITE /u02/app/oracle/oradata/DEMO2/datafile/sysaux\_dlgb4kxm\_.dbf

3 ONLINE READ WRITE /u02/app/oracle/oradata/DEMO2/datafile/undotbs1\_dlgb4kxo\_.dbf

4 ONLINE READ WRITE /u02/app/oracle/oradata/DEMO2/datafile/users\_dll0dmy6\_.dbf

5 ONLINE READ WRITE /u02/app/oracle/oradata/DEMO2/datafile/example\_dlgb74jd\_.dbf

**控制文件：**

SQL> select \* from v$controlfile;

STATUS NAME IS\_RECOVERY\_DEST\_FILE BLOCK\_SIZE FILE\_SIZE\_BLKS

------- --------------------- ------------------------ ---------- --------------

/u02/app/oracle/oradata/DEMO2/controlfile/dlgb6kmn\_.ctl NO 16384 594

/u02/app/oracle/fast\_recovery\_area/DEMO2/controlfile/dlgb6kno\_.ctl YES 16384 594

**联机日志：**

SQL> select \* from v$logfile;

  GROUP# STATUS TYPE MEMBER IS\_RECOVERY\_DEST\_FILE

---------- ------- ------- ------------------------------------------------- ---

3 ONLINE /u02/app/oracle/oradata/DEMO2/onlinelog/3\_dlgb6t04\_.log NO

3 ONLINE /u02/app/oracle/fast\_recovery\_area/DEMO2/onlinelog/3\_dlgb6vrj\_.log YES

2 ONLINE /u02/app/oracle/oradata/DEMO2/onlinelog/2\_dlgb6nvj\_.log NO

2 ONLINE /u02/app/oracle/fast\_recovery\_area/DEMO2/onlinelog/2\_dlgb6pcp\_.log YES

1 ONLINE /u02/app/oracle/oradata/DEMO2/onlinelog/1\_dlgb6kr9\_.log NO

1 ONLINE /u02/app/oracle/fast\_recovery\_area/DEMO2/onlinelog/1\_dlgb6llo\_.log YES

打开归档模式

SQL> archive log list

Database log mode Archive Mode

Automatic archival Enabled

Archive destination USE\_DB\_RECOVERY\_FILE\_DEST

Oldest online log sequence 3

Next log sequence to archive 5

Current log sequence 5

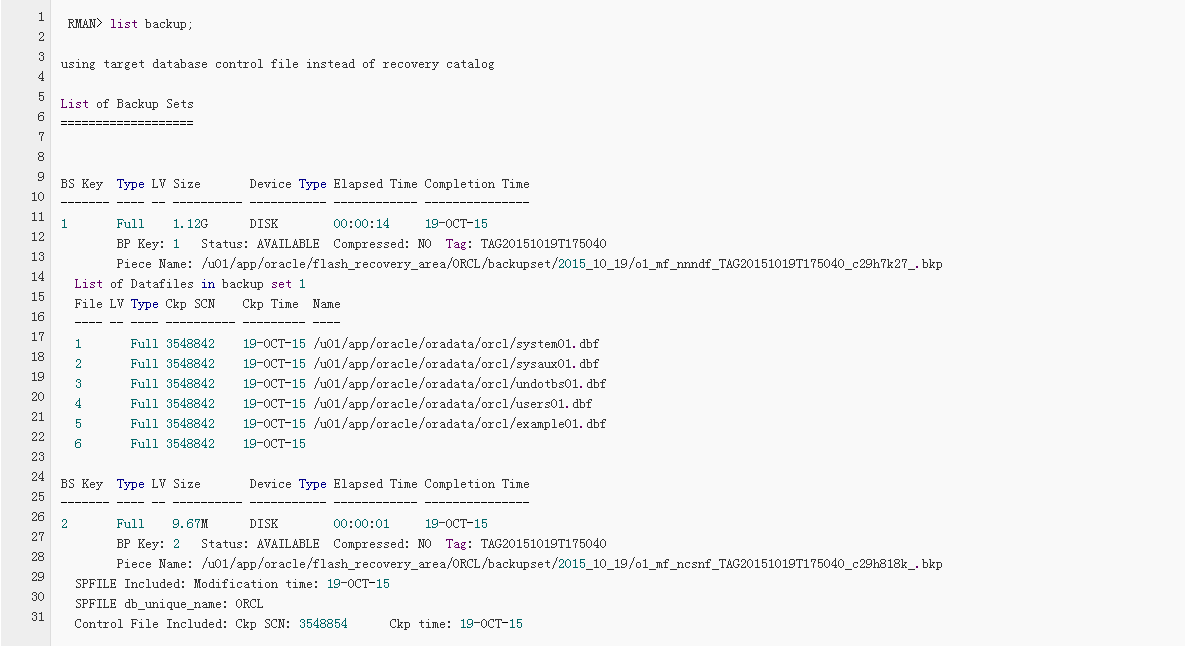
## 备份和恢复演练

一 、RMAN全库备份和恢复

1. 进入rman



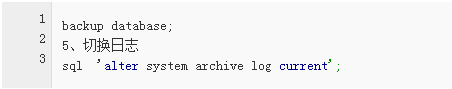
2、查看原来的备份



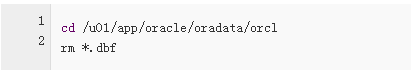
1. 为了实验干净，删除原来备份，重新建立备份



1. 重新备份[**数据库**](http://lib.csdn.net/base/mysql)



1. 模拟事故 、删除所有数据文件



6、恢复

$ rman target /

RMAN> startup mount;

RMAN> restore database;

RMAN> recover database;

RMAN> alter database open;

## 丢失所有控制文件

**1.启用控制文件的自动备份**

[oracle@standby oracle]$ rman target /

Recovery Manager: Release 9.2.0.4.0 - Production

Copyright (c) 1995, 2002, Oracle Corporation. All rights reserved.

connected to target database: PRIMARY (DBID=1367687269)

RMAN> configure controlfile autobackup on;

using target database controlfile instead of recovery catalog

new RMAN configuration parameters:

CONFIGURE CONTROLFILE AUTOBACKUP ON;

new RMAN configuration parameters are successfully stored

RMAN> exit

Recovery Manager complete.

**2.执行RMAN全备份**

[oracle@standby oracle]$ ls

10g admin dictionary.ora initprimary.ora jre oradata oraInventory oui

[oracle@standby oracle]$ mkdir orabak

[oracle@standby oracle]$ rman target /

Recovery Manager: Release 9.2.0.4.0 - Production

Copyright (c) 1995, 2002, Oracle Corporation. All rights reserved.

connected to target database: PRIMARY (DBID=1367687269)

RMAN> run {

backup database

format '/opt/oracle/orabak/full\_%d\_%T\_%s'

plus archivelog

format '/opt/oracle/orabak/arch\_%d\_%T\_%s'

delete all input; }

Starting backup at 09-MAR-05

current log archived

using target database controlfile instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: sid=14 devtype=DISK

channel ORA\_DISK\_1: starting archive log backupset

channel ORA\_DISK\_1: specifying archive log(s) in backup set

…………………………………………

channel ORA\_DISK\_1: starting piece 1 at 09-MAR-05

channel ORA\_DISK\_1: finished piece 1 at 09-MAR-05

piece handle=/opt/oracle/orabak/arch\_PRIMARY\_20050309\_1 comment=NONE

channel ORA\_DISK\_1: backup set complete, elapsed time: 00:00:08

channel ORA\_DISK\_1: deleting archive log(s)

archive log filename=/opt/oracle/oradata/primary/archive/1\_109.dbf recid=1 stamp=539688042

………………………………………………………………

archive log filename=/opt/oracle/oradata/primary/archive/1\_124.dbf recid=16 stamp=552478112

Finished backup at 09-MAR-05

…………………………………………

Starting Control File and SPFILE Autobackup at 09-MAR-05

piece handle=/opt/oracle/product/9.2.0/dbs/c-1367687269-20050309-00 comment=NONE

Finished Control File and SPFILE Autobackup at 09-MAR-05

RMAN> exit

Recovery Manager complete.

**3.移除所有控制文件及数据文件**

[oracle@standby oracle]$ sqlplus "/ as sysdba"

Connected to:

**4.从自动备份中恢复控制文件**

|  |
| --- |
|  |

[oracle@standby oradata]$ rman target /

RMAN> startup nomount;

RMAN> restore controlfile to '/home/oracle/control01.ctl' from autobackup;

Starting restore at 09-MAR-05

using target database controlfile instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: sid=11 devtype=DISK

RMAN-00571: ===========================================================

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

RMAN-00571: ===========================================================

RMAN-03002: failure of restore command at 03/09/2005 10:15:05

RMAN-06495: must explicitly specify DBID with SET DBID command

如果报错说明没有DBID设置

RMAN> set DBID=1367687269

executing command: SET DBID

RMAN> restore controlfile to '/opt/oracle/oradata/control01.ctl' from autobackup;

using channel ORA\_DISK\_1

channel ORA\_DISK\_1: looking for autobackup on day: 20050309

channel ORA\_DISK\_1: autobackup found: c-1367687269-20050309-00

channel ORA\_DISK\_1: controlfile restore from autobackup complete

Finished restore at 09-MAR-05

RMAN> exit

**5.你可能需要修改spfile文件**  
当然如果文件位置等信息没有变化就无需修改

[oracle@standby oradata]$ sqlplus '/ as sysdba'

SQL> create pfile from spfile;

File created.

SQL> !

[oracle@standby oradata]$ cd $ORACLE\_HOME/dbs

[oracle@standby dbs]$ vi initprimary.ora

\*.aq\_tm\_processes=0

\*.background\_dump\_dest='/opt/oracle/admin/primary/bdump'

\*.compatible='9.2.0.0.0'

\*.control\_files='/opt/oracle/oradata/control01.ctl' ----修改为恢复后的目录和文件

~

"initprimary.ora" 34L, 1044C written

[oracle@standby dbs]$ exit

exit

SQL> shutdown immediate;

ORA-01507: database not mounted

ORACLE instance shut down.

SQL> create spfile from pfile;

File created.

SQL> startup mount;

ORACLE instance started.

Total System Global Area 135337420 bytes

Fixed Size 452044 bytes

Variable Size 109051904 bytes

Database Buffers 25165824 bytes

Redo Buffers 667648 bytes

Database mounted.

SQL> exit

**6.使用rman进行恢复**

[oracle@standby oradata]$ rman target /

connected to target database: PRIMARY (DBID=1367687269)

RMAN> restore database;

Starting restore at 09-MAR-05

using target database controlfile instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: sid=11 devtype=DISK

channel ORA\_DISK\_1: starting datafile backupset restore

channel ORA\_DISK\_1: specifying datafile(s) to restore from backup set

restoring datafile 00001 to /opt/oracle/oradata/primary/system01.dbf

restoring datafile 00002 to /opt/oracle/oradata/primary/undotbs01.dbf

restoring datafile 00003 to /opt/oracle/oradata/primary/users01.dbf

channel ORA\_DISK\_1: restored backup piece 1

piece handle=/opt/oracle/orabak/full\_PRIMARY\_20050309\_2 tag=TAG20050309T100844 params=NULL

channel ORA\_DISK\_1: restore complete

Finished restore at 09-MAR-05

RMAN> recover database;

Starting recover at 09-MAR-05

using channel ORA\_DISK\_1

starting media recovery

channel ORA\_DISK\_1: starting archive log restore to default destination

channel ORA\_DISK\_1: restoring archive log

archive log thread=1 sequence=125

channel ORA\_DISK\_1: restored backup piece 1

piece handle=/opt/oracle/orabak/arch\_PRIMARY\_20050309\_3 tag=TAG20050309T100910 params=NULL

channel ORA\_DISK\_1: restore complete

archive log filename=/opt/oracle/oradata/primary/archive1\_125.dbf thread=1 sequence=125

unable to find archive log

archive log thread=1 sequence=126

RMAN-00571: ===========================================================

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

RMAN-00571: ===========================================================

RMAN-03002: failure of recover command at 03/09/2005 10:44:02

RMAN-06054: media recovery requesting unknown log: thread 1 scn 6691197

RMAN> alter database open resetlogs;

database opened

### 丢失日志文件恢复

### 1、丢失非当前的联机redolog

**（1）查看哪些redolog是非当前文件**

SQL> select GROUP#, ARCHIVED,STATUS, FIRST\_TIME from V$log;  
    GROUP#  ARC STATUS           FIRST\_TIME  
---------- --- ---------------- --------------  
         1   YES INACTIVE         18-7月 -12  
         2   NO  CURRENT          19-7月 -12  
         3   YES UNUSED  
SQL> select group#,member from V$logfile;  
    GROUP#                       MEMBER  
--------------------------------------------------------------------------  
         3                      D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO03.LOG  
         2                      D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG  
         1                      D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO01.LOG  
SQL>

可以看出来一个文件是当前联机redolog，一个是非当前，一个还没有使用，我们删除这个INACTIVE状态的，也就是

D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO01.LOG

**（2）删除非联机的redolog**

SQL> shutdown immediate;  
[数据库](http://lib.csdn.net/base/mysql)已经关闭。  
已经卸载数据库。  
[Oracle](http://lib.csdn.net/base/oracle) 例程已经关闭。  
SQL> host del D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO01.LOG  
SQL> startup mount;  
ORACLE 例程已经启动。

Total System Global Area  535662592 bytes  
Fixed Size                  1334380 bytes  
Variable Size             209716116 bytes  
Database Buffers          318767104 bytes  
Redo Buffers                5844992 bytes  
数据库装载完毕。

SQL> alter database open;  
alter database open  
\*  
第 1 行出现错误:  
ORA-00313: 无法打开日志组 1 (用于线程 1) 的成员  
ORA-00312: 联机日志 1 线程 1: 'D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO01.LOG'  
SQL>

**（3）恢复redolog**

SQL> alter database clear logfile group 1;  
数据库已更改。  
SQL> alter database open;  
数据库已更改。  
SQL>

由于丢失的并不是当前的联机redolog，不会造成数据丢失，只需要重建改组redolog就可以了。

### 2、丢失当前的联机redolog

这种情况一般会丢失数据，即使有备份，恢复的时候也是只能不完全恢复。有时候运气好，这段时间没有数据改变，估计不会丢失数据

**（1）查找当前的联机redolog**

SQL>  select GROUP#, ARCHIVED,STATUS, FIRST\_TIME from V$log;  
    GROUP# ARC STATUS           FIRST\_TIME  
---------- --- ---------------- --------------  
         1 YES UNUSED           18-7月 -12  
         2 NO  CURRENT          19-7月 -12  
         3 YES UNUSED  
SQL>  select group#,member from V$logfile;  
    GROUP#           MEMBER  
-----------------------------------------------------------------------  
         3             D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO03.LOG  
         2             D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG  
         1             D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO01.LOG  
SQL>

**（2）删除当前联机redolog**

SQL> shutdown immediate;  
数据库已经关闭。  
已经卸载数据库。  
ORACLE 例程已经关闭。  
SQL> host del D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG  
SQL> startup mount;  
ORACLE 例程已经启动。  
Total System Global Area  535662592 bytes  
Fixed Size                  1334380 bytes  
Variable Size             209716116 bytes  
Database Buffers          318767104 bytes  
Redo Buffers                5844992 bytes  
数据库装载完毕。  
SQL> alter database open;  
alter database open  
\*  
第 1 行出现错误:  
ORA-00313: 无法打开日志组 2 (用于线程 1) 的成员  
ORA-00312: 联机日志 2 线程 1: 'D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG'  
SQL>

**（3）尝试修复联机重做日志**

SQL> alter database clear logfile group 2;  
alter database clear logfile group 2  
\*  
第 1 行出现错误:  
ORA-00350: 日志 2 (实例 orcl 的日志, 线程 1) 需要归档  
ORA-00312: 联机日志 2 线程 1: 'D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG'  
SQL>

用恢复非当前联机redolog那一招不管用

**（4）执行不完全恢复**

如果有备份并且是归档模式，可以尝试用过备份进行不完全恢复

RMAN> restore database;  
启动 restore 于 19-7月 -12  
分配的通道: ORA\_DISK\_1  
通道 ORA\_DISK\_1: SID=148 设备类型=DISK  
  
通道 ORA\_DISK\_1: 正在开始还原数据文件备份集  
通道 ORA\_DISK\_1: 正在指定从备份集还原的数据文件  
通道 ORA\_DISK\_1: 将数据文件 00001 还原到 D:\APP\ADMINISTRATOR\ORADATA\ORCL\SYSTE  
M01.DBF  
通道 ORA\_DISK\_1: 将数据文件 00002 还原到 D:\APP\ADMINISTRATOR\ORADATA\ORCL\SYSAU  
X01.DBF  
通道 ORA\_DISK\_1: 将数据文件 00003 还原到 D:\APP\ADMINISTRATOR\ORADATA\ORCL\UNDOT  
BS01.DBF  
通道 ORA\_DISK\_1: 将数据文件 00004 还原到 D:\APP\ADMINISTRATOR\ORADATA\ORCL\USERS  
01.DBF  
通道 ORA\_DISK\_1: 将数据文件 00005 还原到 D:\APP\ADMINISTRATOR\ORADATA\ORCL\PRODU  
CT.DBF  
通道 ORA\_DISK\_1: 正在读取备份片段 D:\APP\ADMINISTRATOR\FLASH\_RECOVERY\_AREA\ORCL\  
BACKUPSET\2012\_07\_19\O1\_MF\_NNNDF\_TAG20120719T155846\_80HHKQDP\_.BKP  
通道 ORA\_DISK\_1: 段句柄 = D:\APP\ADMINISTRATOR\FLASH\_RECOVERY\_AREA\ORCL\BACKUPSE  
T\2012\_07\_19\O1\_MF\_NNNDF\_TAG20120719T155846\_80HHKQDP\_.BKP 标记 = TAG20120719T155  
846  
通道 ORA\_DISK\_1: 已还原备份片段 1  
通道 ORA\_DISK\_1: 还原完成, 用时: 00:00:45  
完成 restore 于 19-7月 -12  
  
RMAN> recover database;  
启动 recover 于 19-7月 -12  
使用通道 ORA\_DISK\_1  
  
  
正在开始介质的恢复  
无法恢复介质  
DBGANY:     Mismatched message length! [16:29:15.562] (krmiduem)  
DBGANY:     Mismatched message length! [16:29:15.562] (krmiduem)

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============  
RMAN-00571: ===========================================================  
RMAN-00600: internal error, arguments [3045] [] [] [] []  
RMAN-00571: ===========================================================  
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============  
RMAN-00571: ===========================================================  
RMAN-03002: recover 命令 (在 07/19/2012 16:29:15 上) 失败  
ORA-00283: recovery session canceled due to errors  
RMAN-11003: 在分析/执行 SQL 语句期间失败: alter database recover if needed  
 start  
ORA-00283: 恢复会话因错误而取消  
ORA-00313: 无法打开日志组 2 (用于线程 1) 的成员  
ORA-00312: 联机日志 2 线程 1: 'D:\APP\ADMINISTRATOR\ORADATA\ORCL\REDO02.LOG'  
ORA-27041: 无法打开文件  
OSD-04002: 无法打开文件  
O/S-Error: (OS 2) 系统找不到指定的文件。

修复失败了，只能强制恢复了。

SQL> alter system set "\_allow\_resetlogs\_corruption"=true scope=spfile;  
系统已更改。  
SQL>

**《这个隐藏的初始化参数是oracle在open的时候会跳过一些一致性检查》**

SQL> recover database until cancel;  
ORA-00279: 更改 1475265 (在 07/19/2012 15:58:47 生成) 对于线程 1 是必需的  
ORA-00289: 建议:  
D:\APP\ADMINISTRATOR\FLASH\_RECOVERY\_AREA\ORCL\ARCHIVELOG\2012\_07\_19\O1\_MF\_1\_2\_%U\_.ARC  
ORA-00280: 更改 1475265 (用于线程 1) 在序列 #2 中  
指定日志: {<RET>=suggested | filename | AUTO | CANCEL}  
cancel  
介质恢复已取消。  
SQL> alter database open resetlogs;  
数据库已更改。  
SQL> select count(1) from scott.dept;  
  COUNT(1)  
----------  
         6  
SQL>

由于执行了强制恢复，导致可能有些数据丢失，需要手动录入一些数据

## 丢失数据文件恢复

**实验一**

查看时间select to\_char(sysdate,'yyyy-mm-dd hh24:mi:ss') from dual;

1. 创建表空间test，用户test，数据文件test01.dbf，建表school，插入3条数据

SQL>create tablespace test datafile ‘/u01/app/oracle/oradata/orcl/test101.dbf’ size 10m;

SQL>create user test identified by oracle default tablespace test;

SQL>create table school (id number(10),name varchar2(10));

SQL>insert into school (id,name) values (01,’haidian’);

SQL>insert into school (id,name) values (02,’chaoyang’);

SQL>insert into school (id,name) values (03,’dongcheng’);

2.rman全(热)备份，时间：2013-10-04 10:30:00以前：

   RMAN> backup database include current controlfile;

1. 创建表空间test2，用户test2，数据文件test201.dbf，建表school

SQL>create tablespace test2 datafile ‘/u01/app/oracle/oradata/orcl/test201.dbf’ size 10m;

SQL>create user test2 identified by oracle default tablespace test2;

SQL>create table school (id number(10),name varchar2(10));

SQL>insert into school (id,name) values (01,’haidian’);

SQL>insert into school (id,name) values (02,’chaoyang’);

SQL>insert into school (id,name) values (03,’xicheng’);

1. 删除用户test（cascade），结果是表空间test还在，但表已丢失，查不到数据，如何恢复？？

drop user test cascade;

5.恢复步骤：

5.1.加上用户test，仍然查不到数据（说明数据或结构已经破坏，在步骤2之前加上用户，也可不加，均可恢复出来）

5.2.  RMAN>shutdown immediate

     RMAN>startup mount

     RMAN>restore database until time "to\_date('2013-10-04 10:30:00','yy-mm-dd hh24:mi:ss')";

    RMAN>recover database until time "to\_date('2013-10-04 10:30:00','yy-mm-dd hh24:mi:ss')";

    RMAN>alter database open resetlogs;

5.3.执行结果是test用户的数据完全恢复，但是10:30以后的操作全丢失，用户test2不再存在

**实验二**

1. 创建表空间test2，用户test2，数据文件test201.dbf，建表school，插入2条数据

SQL>create tablespace test2 datafile ‘/u01/app/oracle/oradata/orcl/test201.dbf’ size 10m;

SQL>create user test2 identified by oracle default tablespace test2;

SQL>create table school (id number(10),name varchar2(10));

SQL>insert into school (id,name) values (01,’haidian’);

SQL>insert into school (id,name) values (02,’chaoyang’);

SQL>insert into school (id,name) values (03,’xicheng’);

1. rman全(热)备份，时间：2013-10-04 16:06:00以前

RMAN> backup database include current controlfile;

1. 创建表空间test，用户test，数据文件test01.dbf，建表school

SQL>create tablespace test datafile ‘/u01/app/oracle/oradata/orcl/test101.dbf’ size 10m;

SQL>create user test identified by oracle default tablespace test;

SQL>create table school (id number(10),name varchar2(10));

SQL>insert into school (id,name) values (01,’haidian’);

SQL>insert into school (id,name) values (02,’chaoyang’);

SQL>insert into school (id,name) values (03,’dongcheng’);

4.删除用户test2（cascade），结果是表空间test2还在，但表已丢失，查不到数据，如何恢复？？

5.恢复步骤：

5.1.加上用户test2，仍然查不到数据

5.2. RMAN>restore datafile 'path' until time "to\_date('2013-10-04 16:06:00','yy-mm-dd hh24:mi:ss')";

    RMAN>recover datafile 'path' until time "to\_date('2013-10-04 16:06','yy-mm-dd hh24:mi')";

   运行成功，但仍然没有恢复出表

5.3. RMAN>restore tablespace 'name' until time "to\_date('2013-10-04 16:06','yy-mm-dd hh24:mi:')";

   RMAN>recover tablespace 'name' until time "to\_date('2013-10-04 16:06','yy-mm-dd hh24:mi')";

   restore成功，recover失败。

6.删除表空间，再执行3，报从恢复目录中找不到该表空间的名字。料想到可能存在误删表空间的情况存在，因此先测试如何恢复表空间(此方法同样适合表空间和用户同时误删的情况下恢复)：

6.1 RMAN> startup nomount;

    RMAN> restore controlfile from 'G:\oracledb\flash\_recovery\_area\testdb\BACKUPSET\2013\_10\_04\O1\_MF\_NCSNF\_TAG20131004T160420\_94WXQ598\_.BKP'; //恢复控制文件

    RMAN> alter database mount;

    RMAN> restore database until time "to\_date('2013-10-04 16:06:00','yy-mm-dd hh24:mi:ss')";

    RMAN> recover database until time "to\_date('2013-10-04 16:06:00','yy-mm-dd hh24:mi:ss')";

    RMAN> alter database open resetlogs;

ps：恢复控制文件一步必不可少，否则将报错：

   ERROR at line 1:

     ORA-00376: file 11 cannot be read at this time

     ORA-01111: name for data file 11 is unknown - rename to correct file

     ORA-01110: data file 11: '/opt/oracle/product/9.2.0/dbs/MISSING00011'

6.2 以上步骤执行成功后，登录查询数据，test2用户的表空间、数据全部恢复，但是16:06:00以后的操作全丢失

**实验三**

1.创建表空间test2，用户test2，数据文件test201.dbf，建表school，插入2条数据

2.rman全(热)备份，时间：2013-10-04 21:11:00以前

3.关闭数据库，重命名test201.dbf为test2001.dbf，模拟数据文件丢失

4.启动数据库，会报如下**错误**：

  RMAN> startup

  已连接到目标数据库 (未启动)

  Oracle 实例已启动

  数据库已装载

  RMAN-00571: ===========================================================

  RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

  RMAN-00571: ===========================================================

  RMAN-03002: startup 命令 (在 10/04/2013 21:40:50 上) 失败

  ORA-01157: 无法标识/锁定数据文件 6 - 请参阅 DBWR 跟踪文件

  ORA-01110: 数据文件 6: 'G:\ORACLEDB\DBDATA\TESTDB\TEST201.DBF'

5. 因此检查出错的数据文件：

   RMAN> startup mount

   SQL> select file#,error from v$recover\_file; //查找有问题的数据文件，file#是文件号

     FILE# ERROR

     ---------- -------------------------------------

       6 FILE NOT FOUND

6.恢复数据文件：

   RMAN> sql 'alter database datafile 6 offline';

  RMAN> restore datafile 6;

  RMAN> recover datafile 6;

  RMAN> sql 'alter database datafile 6 online';

  RMAN> sql 'alter database open';

7.成功启动，数据不丢失

**实验四**

1.创建表空间test2，用户test2，数据文件test201.dbf，建表school，插入2条数据，建表student，插入2条数据

2.rman全(热)备份，时间：2013-10-04 22:00:00以前

3.drop掉表student，如何使用备份来恢复表student？

drop table student;

4.在数据库open的情况下：

RMAN> sql 'alter tablespace test2 offline';

  RMAN> restore tablespace test2 until time "to\_date('2013-10-04 22:00','yy-mm-dd hh24:mi')";//成功

 RMAN> recover tablespace test2 until time "to\_date('2013-10-04 22:00','yy-mm-dd hh24:mi')";//报错

RMAN-00571: ===========================================================

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

RMAN-00571: ===========================================================

RMAN-03002: recover 命令 (在 10/04/2013 23:07:24 上) 失败

RMAN-05002: 中止表空间时间点恢复

RMAN-05073: 表空间 TEST2 创建 SCN 1051551 位于时间点 SCN 1036110 之前

RMAN-05517: 临时文件 G:\ORACLEDB\DBDATA\TESTDB\TEMP01.DBF 与目标数据库使用的文件冲突

RMAN-05001: 辅助文件名G:\ORACLEDB\DBDATA\TESTDB\SYSAUX01.DBF 与目标数据库使用的文件冲突

RMAN-05001: 辅助文件名G:\ORACLEDB\DBDATA\TESTDB\UNDOTBS01.DBF 与目标数据库使用的文件冲突

RMAN-05001: 辅助文件名G:\ORACLEDB\DBDATA\TESTDB\SYSTEM01.DBF 与目标数据库使用的文件冲突

原因：出现该问题的原因是没有指定auxiliary destination，默认为数据库表空间所在目录，因此冲突报错，将恢复的命令行做修改

  RMAN> recover tablespace test2 until time "to\_date('2013-10-04 22:00','yy-mm-dd hh24:mi')" auxiliary destination 'G:\oracledb\auxdes';

//成功执行

  RMAN> sql 'alter tablespace test2 online';

5.成功恢复表空间test2，得到了drop掉的student表

ps：步骤4中恢复失败报的错与实验二中步骤3报的错是一样的，因此重复实验二，尝试部分恢复数据

**实验五**

1.创建表空间test2，用户test2，数据文件test201.dbf，建表school，插入2条数据，建表student，插入2条数据

2.rman全(热)备份，时间：2013-10-05 11:40:00以前

3.创建表空间test1，用户test1，数据文件test101.dbf，建表school，插入2条数据

4.删除用户test2（cascade），结果是表空间test2还在，但表已丢失，查不到数据，如何恢复？？

5恢复步骤：

5.1.在数据库open的情况下执行：

    RMAN> sql "alter tablespace test2 offline";

   RMAN> restore tablespace test2 until time "to\_date('2013-10-05 11:40','yy-mm-dd hh24:mi')";

   RMAN> recover tablespace test2 until time "to\_date('2013-10-05 11:40','yy-mm-dd hh24:mi')" auxiliary destination 'G:\oracledb\auxdes';//直接执行此步会报错

RMAN-00571: ===========================================================

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

RMAN-00571: ===========================================================

RMAN-03002: recover 命令 (在10/05/2013 00:38:04 上) 失败

RMAN-06963: 导入元数据时收到错误

RMAN-06961:    IMPDP> ORA-39123: 数据泵可传输的表空间作业中止

ORA-29342: 数据库中不存在用户 TEST

    SQL> create user test2  identified by oracle;

    RMAN> recover tablespace test2 until time "to\_date('2013-10-05 11:40','yy-mm-dd hh24:mi')" auxiliary destination 'G:\oracledb\auxdes';

    SQL> grant connect,resource to test2;

    SQL> conn test2/oracle

    SQL> select \* from school;

select \* from school

              \*

第 1 行出现错误:

ORA-00376: 此时无法读取文件 5

ORA-01110: 数据文件 5: 'G:\ORACLEDB\DBDATA\TESTDB\TEST201.DBF' //忘了将表空间online

    RMAN> sql "alter tablespace test2 online";

    SQL> select \* from school;//成功返回结果

    SQL> conn test1/oracle

    SQL> select \* from school;//成功返回结果

至此，恢复成功，且不丢失时间点之后的操作。

## RMAN备份策略实践

总体策略为 可以恢复到10天内的数据， 周三和周六 为0级备份， 归档日志每天备份

#### 下面为一些备份策略配置：

CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 10 DAYS;--恢复10天内数据的备份  
CONFIGURE CONTROLFILE AUTOBACKUP ON;          --控制文件自动备份  
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '/datarman/rmanbak/controlfile/%F';      --控制文件自动目录  
CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/datarman/rmanbak/controlfile/snapcf\_emoss2.f';       --控制文件快照

#### 备份的路径如下：

--归档文件备份路径：  /datarman/rmanbak/arch/  
--控制文件备份路径：  /datarman/rmanbak/controlfile/  
--数据库文件备份路径：/datarman/rmanbak/dbfile/  
--数据库文件备份日志路径：/datarman/rmanbak/dbfile\_log/

#### 以下为备份脚本 (脚本路径：/datarman/rmanbak/dbrman\_scripts)

--删除多余和无效备份脚本(每天删除)

1. [oracle@localhost dbrman\_scripts]$ chmod u+x delobsolete
2. [oracle@localhost dbrman\_scripts]$ vi  delobsolete
3. run {
4. crosscheck backup;
5. delete noprompt obsolete;
6. delete noprompt expired backup;
7. }

--备份归档日志脚本(每天备份)

1. [oracle@localhost dbrman\_scripts]$ chmod u+x arch
2. [oracle@localhost dbrman\_scripts]$ vi  arch
3. sql 'alter system archive log current' ;
4. run {
5. allocate channel a1 type disk  FORMAT   '/datarman/rmanbak/arch/' ;
6. backup filesperset 10 format '/datarman/rmanbak/arch/arch\_%T\_%d\_%t\_%s\_%p' archivelog all delete input;
7. release channel a1;
8. }

--数据库0级备份脚本(每周三和周六备份)

1. [oracle@localhost dbrman\_scripts]$ chmod u+x level0
2. [oracle@localhost dbrman\_scripts]$ vi  level0
3. sql 'alter system archive log current' ;
4. run {
5. allocate channel a2 type disk  ;
6. backup as compressed backupset incremental level 0 DATABASE filesperset 5  format '/datarman/rmanbak/dbfile/db\_%T\_%d\_%t\_%s\_%p' ;
7. release channel a2;
8. }

#### 相应的shell执行脚本

--删除多余和无效备份脚本(每天1点删除)

1. [oracle@localhost dbrman\_scripts]$ chmod u+x emoss2dbdel.sh
2. [oracle@localhost dbrman\_scripts]$ vi emoss2dbdel.sh
3. export ORACLE\_SID=orcl
4. export ORACLE\_BASE=/u01/app/oracle
5. export ORACLE\_HOME=$ORACLE\_BASE/product/11.2.0/db\_1
6. export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib
7. export PATH=$PATH:$ORACLE\_HOME/bin
8. export NAME=`date -d now +%F`
9. $ORACLE\_HOME/bin/rman target /  nocatalog  log=/datarman/rmanbak/dbfile\_log/emoss2dbrmandel\_$NAME.log<<EOF
10. @/datarman/rmanbak/dbrman\_scripts/delobsolete
11. exit
12. EOF

----备份归档日志脚本(每天2点备份)

1. [oracle@localhost dbrman\_scripts]$ chmod u+x emoss2dbarch.sh
2. [oracle@localhost dbrman\_scripts]$ vi emoss2dbarch.sh
3. export ORACLE\_SID=orcl
4. export ORACLE\_BASE=/u01/app/oracle
5. export ORACLE\_HOME=$ORACLE\_BASE/product/11.2.0/db\_1
6. export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib
7. export PATH=$PATH:$ORACLE\_HOME/bin
8. export NAME=`date -d now +%F`
9. $ORACLE\_HOME/bin/rman target /  nocatalog  log=/datarman/rmanbak/dbfile\_log/emoss2dbrmanarchback\_$NAME.log<<EOF
10. @/datarman/rmanbak/dbrman\_scripts/arch
11. exit
12. EOF

--数据库0级备份脚本(每周三和周六 3点备份  )

1. [oracle@localhost dbrman\_scripts]$ chmod u+x emoss2dblev0.sh
2. [oracle@localhost dbrman\_scripts]$ vi emoss2dblev0.sh
3. export ORACLE\_SID=orcl
4. export ORACLE\_BASE=/u01/app/oracle
5. export ORACLE\_HOME=$ORACLE\_BASE/product/11.2.0/db\_1
6. export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib
7. export PATH=$PATH:$ORACLE\_HOME/bin
8. export NAME=`date -d now +%F`
9. $ORACLE\_HOME/bin/rman target /  nocatalog  log=/datarman/rmanbak/dbfile\_log/emoss2dbrmanlevel0\_$NAME.log<<EOF
10. @/datarman/rmanbak/dbrman\_scripts/arch
11. @/datarman/rmanbak/dbrman\_scripts/level0
12. exit
13. EOF

#### 计划任务

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1. [oracle@localhost dbrman\_scripts]$ crontab -e
2. 0  1  \* \* \*    /datarman/rmanbak/dbrman\_scripts/emoss2dbdel.sh
3. 0  2  \* \* \*    /datarman/rmanbak/dbrman\_scripts/emoss2dbarch.sh
4. 0  3  \* \* 3,6  /datarman/rmanbak/dbrman\_scripts/emoss2dblev0.sh