1.数据文件丢失的恢复处理

```
SQL> create table t01(id int) tablespace users;
SQL> insert into t01 values(1);
SQL> insert into t01 values(2);
SQL> insert into t01 values(3);
SQL> commit;
SQL> ho mkdir /u01/app/oracle/rmanback/
```

对数据库做全备

```
RMAN> backup as backupset format  '/u01/app/oracle/rmanback/wb_%U' tag=Whole_bak
database;
RMAN> sql  'alter system archive log current';
```

对数据库做 0 级增量备份

```
RMAN> run{
    allocate channel ch1 type disk;
    backup incremental level 0 database
    format '/u01/app/oracle/rmanback/Inc_0_%U'
    tag=Inc_0;
    release channel ch1;}
```

对表插入新记录并切换日志

```
SQL> select * from t01;
SQL> insert into t01 select 4 from dual;
SQL> commit;
SQL> alter system checkpoint;
SQL> alter system switch logfile;
```

对数据库做 1 级增量备份

```
RMAN> run{
    allocate channel ch1 type disk;
    backup incremental level 1 database
    format '/u01/app/oracle/rmanback/Inc_1%U'
    tag=Inc_1;
    release channel ch1;}
SQL> shutdown immediate;
```

删除所有的数据文件

```
SQL> ho rm $ORACLE_BASE/oradata/orcl/*.dbf
SQL> startup mount
```

使用 RMAN 连接到数据库

```
RMAN> connect target /
```

执行数据库还原，注意当存在完整备份也同时存在 0 级增量备份时，Oracle 会自动使用 0 级增量备份来还原数据库

```
RMAN> restore database;
```

通过提示可知还原的数据来自 0 级增量备份

```
piece handle=/u01/app/oracle/rmanback/Inc_0_0alqu132_1_1 tag=INC_0
```

执行数据库恢复

```
RMAN> recover database;
```

通过提示可知数据来自 1 级增量备份

```
piece handle=/u01/app/oracle/rmanback/Inc_10clqu1fe_1_1 tag=INC_1
```

打开数据库验证恢复

```
RMAN> alter database open;
SQL> select * from t01;
```

2.磁盘损坏导致数据文件无法恢复到原始位置或不想恢复到原始位置的处理，使用 set newname 命令将数据文件还原到新路径。

```
set newname for datafile 1 to '<newdir>/system01.dbf';
```

使用 switch 命令将变更更新到控制文件,等同于 alter database rename file 命令，该命令将恢复的数据文件重命名更新到控制文件

```
switch datafile n | all ;
```

首先删除 users.dbf，接下来将其恢复到 oradata 目录中

```
SQL> ho rm $ORACLE_BASE/oradata/orcl/users01.dbf
SQL> startup mount force;
RMAN> connect target /
RMAN> run{
    set newname for datafile 4 to '/u01/app/oracle/oradata/users.dbf';
    restore database;
    switch datafile all;
    recover database;
    alter database open;}
SQL> select file#,name,status from v$datafile where file#=4;
```

表 t01 位于 users.dbf 内

```
SQL> select count(1) from t01;
```

3.恢复表空间

删除表空间内的数据文件，删除后,在表（删除的表空间内的表）中插入记录以及实施检查点进程

```
SQL> ho rm $ORACLE_BASE/oradata/users.dbf
SQL> insert into t01 select 5 from dual;
SQL> commit;
SQL> alter system checkpoint;
```

强制检查点后，告警日志出现错误提示，视图 v$recover_file 给出了故障数据文件

```
[oracle@oradb ~]$ tail -n 50 $ORACLE_BASE/admin/orcl/bdump/alert_orcl.log
SQL> select * from v$recover_file;
SQL> select name,status from v$datafile where file#=4;
SQL> select count(1) from t01;
```

使用 RMAN 命令恢复数据文件，此时数据库处于 OPEN 状态，因此首先需要将表空间脱机，恢复完成之后再将其联机

```
RMAN> run{
    sql 'alter tablespace users offline immediate';
    set newname for datafile 4 to '/u01/app/oracle/oradata/orcl/users01.dbf';
    restore tablespace users;
    switch datafile all;
    recover tablespace users;
    sql 'alter tablespace users online';}
```

位置变动到 orcl 子目录下，状态变为 online

```
SQL> select name,status from v$datafile where file#=4;
SQL> select count(1) from t01;
```

4. SPFILE 文件丢失的恢复

SPFILE 参数文件可以在 RMAN 中进行备份，因此可以使用 RMAN 来恢复 SPFILE 文件。可以自动备份 SPFILE。SPFILE 的自动备份是随着控制文件的备份一起被完成的，因此可以通过自动备份控制文件来实现自动备份 SPFILE 文件的目的,其次,在备份系统表空间时将引发控制文件的自动备份，而不论是否设置自动备份参数为 ON，此时同样也备份 SPFILE 文件

SPFILE 文件恢复步骤

a. startup nomount [force];
b. set dbid=dbid_no;
c. restore spfile from autobackup | '<dir>'
d. startup force; 如果 d 执行失败则转到 e，f，否则不用执行 e，f。
e. set dbid=dbid_no;
f. startup;

下面设定控制文件的自动备份以及设置其备份路径(注意要预先知道目标数据库的 DBID，此次演示的 DBID 为 1358299580)

RMAN> configure controlfile autobackup on;

RMAN> configure controlfile autobackup format for device type disk to '/u01/app/oracle/rmanback/auto_ctl_%d_%F';

RMAN> exit

sys@ORCL> alter tablespace users add datafile '$ORACLE_BASE/oradata/orcl/users02.dbf' size 5m;

执行上一条 alter tablespace users add datafile 语句将引发控制文件的自动备份,可以查询备份目录查看：/u01/app/oracle/rmanback/auto_ctl_ORCL_c-1358299580-20131205-00

sys@ORCL> shutdown immediate;

将原来的 spfile 文件重命名

[oracle@wl dbs]$ pwd

/u01/app/oracle/product/10.2.0/db_1/dbs

[oracle@wl dbs]$ mv spfileorcl.ora spfileorcl.ora.bak

[oracle@wl ~]$ rman target /

RMAN> startup nomount force;

RMAN> set dbid=1358299580;

此处并没有找到文件路径，按 Oracle 联机文档，在 nomount 状态应该可以找到

RMAN> restore spfile from autobackup;

RMAN-06172: no autobackup found or specified handle is not a valid copy or piece

手动指定路径

RMAN> restore spfile from '/u01/app/oracle/rmanback/auto_ctl_ORCL_c-1358299580-20131205-00';

RMAN> startup force;

5、控制文件丢失的恢复

RMAN> list backup;

[oracle@opc dbs]$ rm -rf /u01/app/oracle/oradata/orcl/control0*

RMAN> shutdown immediate

RMAN> startup nomount;

RMAN> restore controlfile from '/u01/app/oracle/flash_recovery_area/ORCL/backupset/2013_12_06/o1_mf_ncsnf_TAG20131206T152425_9b2yxtgv_.bkp';

RMAN> startup;

RMAN> alter database open resetlogs;

RMAN> recover database;

RMAN> alter database open resetlogs;

6、归档重做日志的还原

[oracle@opc ~]$ rman target /

RMAN> BACKUP ARCHIVELOG ALL;

[root@opc ~]# rm /u01/app/oracle/flash_recovery_area/ORCL/archivelog/* -rf

RMAN> RESTORE ARCHIVELOG ALL;

RMAN> list backup;

RMAN> RESTORE ARCHIVELOG FROM LOGSEQ=3;

7、数据文件恢复

RMAN> backup datafile 4;

rm -rf /u01/app/oracle/oradata/orcl/users01.dbf

RMAN> shutdown immediate

RMAN> startup mount;

RMAN> restore datafile 4;

RMAN> recover datafile 4;

RMAN> alter database open;

或

backup as copy datafile 4;

rm -rf /u01/app/oracle/oradata/orcl/users01.dbf

RMAN> shutdown immediate

RMAN> startup mount;

RMAN> restore (datafile 4) from datafilecopy;

RMAN> recover datafile 4;

RMAN> alter database open;

8、还原检查与恢复测试

RMAN> backup database;

rm -rf /u01/app/oracle/oradata/orcl/users01.dbf

RMAN> RESTORE DATABASE VALIDATE;

RMAN> shutdown immediate

RMAN> startup mount;

RMAN> RESTORE DATABASE;

RMAN> recover database;

RMAN> alter database open;

9、从指定的 tag 恢复

```
RMAN> backup database;
rm -rf /u01/app/oracle/oradata/orcl/users01.dbf
RMAN> RESTORE DATABASE VALIDATE;
RMAN> shutdown immediate
RMAN> startup mount;
RMAN> RESTORE database FROM tag='TAG20131206T161150';
RMAN> recover database FROM tag='TAG20131206T161150';
RMAN> alter database open;
```

10、块级别的恢复

```
create tablespace block datafile '/u01/app/oracle/oradata/orcl/block.dbf'  size 1M extent management local;
CREATE USER wl IDENTIFIED BY wl;
GRANT CONNECT,RESOURCE TO wl;
alter user wl default tablespace block;
alter user wl quota unlimited on block;
connect wl/wl
create table wl.t as select * from dba_users;
insert into wl.t select * from wl.t;
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SQL> /
SYS@orcl> /
insert into wl.t select * from wl.t
*
ERROR at line 1:
ORA-01653: unable to extend table WL.T by 8 in tablespace BLOCK
RMAN> backup validate datafile 6;
commit;
alter system checkpoint;
select count(*) from wl.t;
connect / as sysdba
RMAN> backup datafile 6;
shutdown immediate
dd of=/u01/app/oracle/oradata/orcl/block.dbf bs=8192 conv=notrunc seek=15
SQL> startup
```

```
select count(*) from wl.t;

RMAN> backup validate datafile 6;

SYS@orcl> select * from  v$database_block_corruption;

RMAN> blockrecover datafile 6 block 15;

select count(*) from wl.t;
```