(053第7章)Rman recovery

注意：以下所有恢复和还原前都需要先进行备份！！！

1.丢失非关键数据文件

①离线表空间

alter tablespace users offline immediate;

②还原数据文件

restore datafile 4;

③恢复数据文件

recover datafile 4;

④在线表空间

alter tablespace users online;

2.丢失关键数据数据文件

①强制关闭数据库

shutdown abort

②启动数据库到mount

startup mount

③还原数据库

restore datafile 1;

④恢复数据库

recover datafile 1;

⑤打开数据库

alter database open;

3.使用Image Copy+增量备份方式进行备份和恢复

（使用这种方式要求你的备份空间要能存储你数据库中所有数据文件）

①备份

- recover copy of database with tag 'daily_inc'; --把增备备份恢复到Image Copy中去
- backup incremental level 1 for recover of copy with tag 'daily_inc' database; --生成基于Image Copy的增量备份

注意: 2条命令每次按顺序执行，这是EM中调度Oracle推荐备份的使用方法。

这种方式综合了Image copy与备份集的优势，效率非常高。

第一次执行：第一条命令什么也不做，第二条命令生成数据库的Image Copy备份。

第二次执行：第一条命令什么也不做，第二条命令生成从上次全库Image Copy以后改变部分的差异增量备份集。

第三次执行：第一条命令利用第二次执行时生成的增量备份集去去更新最初的Image Copy，

第二条命令生成继第二次执行之后的又一次差异增量备份集。

后续再次执行，与第三次执行效果相同！

②恢复：在RMAN中将数据文件快速切换到Image Copy的备份文件

- sql "alter tablespace users offline";
- switch datafile 4 to copy; --这一句无法在run块中执行，将切换原始数据文件到image copy的文件上
- recover datafile 4;
- sql "alter tablespace users online";

③恢复：在RMAN中还原数据文件的位置到原始的路径上

（backup as copy datafile 4 format '/u01/app/oracle/oradata/sztech1/users01.dbf' ;

或者 copy datafile 4 to '/u01/app/oracle/oradata/sztech1/users01.dbf';）--如果已存在image copy可以不需要执行copy备份

- sql "alter tablespace users offline";
- switch datafile 4 to copy;
- recover datafile 4;
- sql "alter tablespace users online";

4.使用set newname恢复并修改原数据文件的路径

```
RMAN> run {
sql "alter tablespace users offline immediate";
set newname for datafile 4 to '/home/oracle/users01.dbf';  --设置新数据文件的位置
restore datafile 4;
switch datafile 4;  --切换指定的数据文件
recover datafile 4;
sql "alter tablespace users online";
}
```

--甚至可以改变所有数据文件的位置（在mount下操作），需要有

```
RMAN> run {
set newname for datafile 1 to '/home/oracle/system01.dbf';
set newname for datafile 2 to '/home/oracle/sysaux.dbf';
set newname for datafile 3 to '/home/oracle/undotbs01.dbf';
set newname for datafile 4 to '/home/oracle/users01.dbf';
restore database;
switch database;  --切换所有的数据文件
recover database;
alter database open;
}
```

5.非归档模式下的数据库恢复

①关闭数库据

②还原整个数据库，包含数据文件、控制文件

③打开数据库

④手工处理丢失的数据

6.使用还原点执行不完整恢复

create restore point before_p1;

创建一个到当前状态的还原点。

create restore point end_p1 as of scn 100;

创建一个到过去某个时间的还原点。

注意：执行测试前需要对数据库执行过全库备份！

①基于还原点的恢复

```
SQL> select count(*) from hr.emp;
  COUNT(*)
----------
       100

SQL> create restore point rs_emp;   --创建一个还原点
Restore point created.

SQL> delete from hr.emp;    --删除hr的EMP表所有记录并提交
100 rows deleted.

SQL> commit;
Commit complete.

SQL> select * from v$restore_point;     --查询数据库的还原点信息
    SCN DATABASE_INCARNATION# GUA STORAGE_SIZE TIME        RESTORE_POINT_TIME                        PRE NAME
------- -------------------- --- ------------ ----------- ----------------------------------------- --- --------
2737951                    2 NO             0             03-AUG-17 09.48.13.0                      NO  RS_EMP

SQL> shutdown immediate    --正常关闭数据库
Database closed.
Database dismounted.
ORACLE instance shut down.

SQL> startup mount;              --启动数据到mount
ORACLE instance started.
Total System Global Area  368263168 bytes
Fixed Size                  1364704 bytes
Variable Size             322964768 bytes
Database Buffers           37748736 bytes
Redo Buffers                6184960 bytes
Database mounted.

--在RMAN中执行下面的脚本
RMAN>  run {
```

```
set until restore point rs_emp;
restore database;
recover database;
alter database open resetlogs;      --注意：不完整恢复只能以resetlogs方式打开数据。
}

executing command: SET until clause

Starting restore at 03-AUG-17
.....
Finished restore at 03-AUG-17

Starting recover at 03-AUG-17
.....
Finished recover at 03-AUG-17

database opened

SQL> select count(*) from hr.emp;     --再查询hr的EMP表，恢复到删除数据以前的状态
  COUNT(*)
----------
       100
```

②基于时间点的恢复

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup mount
ORACLE instance started.

Total System Global Area  368263168 bytes
Fixed Size                 1364704 bytes
Variable Size            322964768 bytes
Database Buffers          37748736 bytes
Redo Buffers               6184960 bytes
Database mounted.
```

在RMAN登录的用户环境中设置以下环境变量：

```
export NLS_DATE_FORMAT='yyyy-mm-dd hh24:mi:ss'
export NLS_LANG=american_america.zhs16gbk

RMAN> run {
```

```
2> set until time '2017-08-03 09:48:13';  --这里引用的是前次创建还原点的时间
3> restore database;
4> recover database;
5> }

executing command: SET until clause
Starting restore at 2017-08-03 10:15:12
using target database control file instead of recovery catalog
RMAN-00571:
===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571:
===========================================================
RMAN-03002: failure of restore command at 08/03/2017 10:15:13
RMAN-20207: UNTIL TIME or RECOVERY WINDOW is before RESETLOGS time
--由于前面我们已经执行过不完整恢复，且用resetlogs方式打开数据库。
--本次还原的时间点在resetlogs之前，因为无法正常执行还原，只能正常还原到上次resetlogs之后的时间点！

可以修改数据库原形的方式来还原，但还原的时间点之前必须存在数据库备份！
RMAN> list incarnation;  --列出数据库所有的resetlog原形
using target database control file instead of recovery catalog
List of Database Incarnations
DB Key  Inc Key DB Name  DB ID            STATUS  Reset SCN  Reset Time
------- ------- -------- ---------------- --- ---------- ----------
1       1       SZTECH1  3253410194       PARENT  635002     02-SEP-13
2       2       SZTECH1  3253410194       PARENT  2662911    02-AUG-17
3       3       SZTECH1  3253410194       CURRENT 2737953    03-AUG-17

RMAN> reset database to incarnation 2;    --重置数据库到过去的某个原型
database reset to incarnation 2

再执行恢复
RMAN> run {
2>  set until time '2017-08-03 09:48:13';
3>  restore database;
4>  recover database;
5>  }

executing command: SET until clause
```

```
Starting restore at 2017-08-03 10:20:12
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=11 device type=DISK

RMAN-00571:
===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571:
===========================================================
RMAN-03002: failure of restore command at 08/03/2017 10:20:13
RMAN-06026: some targets not found - aborting restore
RMAN-06023: no backup or copy of datafile 6 found to restore
RMAN-06023: no backup or copy of datafile 5 found to restore
RMAN-06023: no backup or copy of datafile 4 found to restore
RMAN-06023: no backup or copy of datafile 3 found to restore
RMAN-06023: no backup or copy of datafile 2 found to restore
RMAN-06023: no backup or copy of datafile 1 found to restore
```
--报错是因为改变到旧的数据库原形之前的时间里没有数据库的备份，因此备份大于一切！！！

7.还原参数文件和控制文件

注意：需要打开RMAN中的自动控制文件备份。

模拟参数文件和控制文件全部丢失的恢复：

①删除所有参数文件和控制文件

```
SQL> conn / as sysdba
Connected.
SQL> show parameter spfile

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string
/u01/app/oracle/product/11.2.0/db_1/dbs/spfilesztech1.ora

SQL> ! rm -rf /u01/app/oracle/product/11.2.0/db_1/dbs/spfilesztech1.ora
SQL> show parameter control_files;
NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
control_files                        string
/u01/app/oracle/oradata/sztech1/control01.ctl,

/u01/app/oracle/fast_recovery_area/sztech1/control02.ctl
```

SQL> ! rm -rf /u01/app/oracle/oradata/sztech1/control01.ctl
SQL> ! rm -rf /u01/app/oracle/fast_recovery_area/sztech1/control02.ctl

SQL> shutdown abort
ORACLE instance shut down.

②RMAN中执行恢复
[oracle@dbserver ~]$ rman target
Recovery Manager: Release 11.2.0.4.0 - Production on Thu Aug 3 11:36:42 2017
Copyright (c) 1982, 2011, Oracle and/or its affiliates. All rights reserved.
connected to target database (not started)
RMAN> set dbid=3253410194
executing command: SET DBID

RMAN> startup nomount
startup failed: ORA-01078: failure in processing system parameters
LRM-00109: could not open parameter file '/u01/app/oracle/product/11.2.0/db_1/dbs/initsztech1.ora'
starting Oracle instance without parameter file for retrieval of spfile
Oracle instance started
Total System Global Area   1071333376 bytes
Fixed Size   1369420 bytes
Variable Size   281021108 bytes
Database Buffers   784334848 bytes
Redo Buffers   4608000 bytes

 --无法找到自动备份的参数文件
RMAN> restore spfile from autobackup;
Starting restore at 2017-08-03 11:37:55
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=171 device type=DISK
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170803
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170802
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170801
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170731
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170730
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170729
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170728
channel ORA_DISK_1: no AUTOBACKUP in 7 days found
RMAN-00571: ===
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS

```
===============
RMAN-00571:
===========================================================
=========
RMAN-03002: failure of restore command at 08/03/2017 11:38:00
RMAN-06172: no AUTOBACKUP found or specified handle is not a valid
copy or piece

--指定从之前的备份文件中进行恢复
RMAN> restore spfile from
'/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_03/o1_
mf_s_951046029_dr560fqw_.bkp';
Starting restore at 2017-08-03 11:38:17
using channel ORA_DISK_1
channel ORA_DISK_1: restoring spfile from AUTOBACKUP
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_03/o1_
mf_s_951046029_dr560fqw_.bkp
channel ORA_DISK_1: SPFILE restore from AUTOBACKUP complete
Finished restore at 2017-08-03 11:38:18

--重新应用参数文件启动到nomount
RMAN> startup force nomount
Oracle instance started
Total System Global Area     368263168 bytes
Fixed Size                     1364704 bytes
Variable Size                322964768 bytes
Database Buffers              37748736 bytes
Redo Buffers                   6184960 bytes

--从自动备份中恢复控制文件
RMAN> restore controlfile from autobackup;
Starting restore at 2017-08-03 11:39:22
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=125 device type=DISK
recovery area destination: /u01/app/oracle/fast_recovery_area
database name (or database unique name) used for search: SZTECH1
channel ORA_DISK_1: AUTOBACKUP
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_03/o1_
mf_s_951046029_dr560fqw_.bkp found in the recovery area
channel ORA_DISK_1: looking for AUTOBACKUP on day: 20170803
channel ORA_DISK_1: restoring control file from AUTOBACKUP
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_03/o1_
mf_s_951046029_dr560fqw_.bkp
channel ORA_DISK_1: control file restore from AUTOBACKUP complete
output file name=/u01/app/oracle/oradata/sztech1/control01.ctl
```

output file name=/u01/app/oracle/fast_recovery_area/sztech1/control02.ctl
Finished restore at 2017-08-03 11:39:26

--改变数据库到mount
RMAN> alter database mount;
database mounted
released channel: ORA_DISK_1

--恢复数据库
RMAN> recover database;
Starting recover at 2017-08-03 11:40:10
Starting implicit crosscheck backup at 2017-08-03 11:40:10
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=125 device type=DISK
Crosschecked 3 objects
Finished implicit crosscheck backup at 2017-08-03 11:40:12
Starting implicit crosscheck copy at 2017-08-03 11:40:12
using channel ORA_DISK_1
Finished implicit crosscheck copy at 2017-08-03 11:40:12
searching for all files in the recovery area
cataloging files...
cataloging done

List of Cataloged Files
=======================
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_02/o1_mf_s_950979021_dr34lfvl_.bkp
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_02/o1_mf_s_950954223_dr2dcj46_.bkp
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_02/o1_mf_s_950977338_dr32xv46_.bkp
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_01/o1_mf_s_950872438_dqzwhpb3_.bkp
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_01/o1_mf_s_950872318_dqzwcybo_.bkp
File Name:
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_03/o1_mf_s_951046029_dr560fqw_.bkp
using channel ORA_DISK_1
starting media recovery

archived log for thread 1 with sequence 3 is already on disk as file /u01/app/oracle/oradata/sztech1/redo03.log
archived log file name=/u01/app/oracle/oradata/sztech1/redo03.log thread=1 sequence=3
media recovery complete, elapsed time: 00:00:00
Finished recover at 2017-08-03 11:40:15

--以resetlogs方式打开数据库
RMAN> alter database open resetlogs;
database opened

8.利用备份执行同构异机恢复

注意：本实例是在同构环境，将一台服务器的备份恢复到另一台服务器中。

大致步骤：源库中执行全库备份；

拷贝数据备份、归档备份、控制文件自动备份、以及参数文件、口令文件到目标库的**相同目录**中；

在目标库中执行恢复步骤。

①在源库中执行全备份
RMAN> backup database format '/home/oracle/dbfull_%U.bak' plus archivelog format '/home/oracle/arch_%U.bak';
Starting backup at 04-AUG-17
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=2 RECID=61 STAMP=951126151
channel ORA_DISK_1: starting piece 1 at 04-AUG-17
channel ORA_DISK_1: finished piece 1 at 04-AUG-17
piece handle=/home/oracle/arch_1bsb2248_1_1.bak tag=TAG20170804T094232 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 04-AUG-17
Starting backup at 04-AUG-17
using channel ORA_DISK_1
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf

input datafile file number=00005
name=/u01/app/oracle/oradata/sztech1/example01.dbf
input datafile file number=00003
name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00006
name=/u01/app/oracle/oradata/sztech1/ts_inventory01.dbf
channel ORA_DISK_1: starting piece 1 at 04-AUG-17
channel ORA_DISK_1: finished piece 1 at 04-AUG-17
piece handle=/home/oracle/dbfull_1csb224a_1_1.bak
tag=TAG20170804T094233 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:02:06
Finished backup at 04-AUG-17
Starting backup at 04-AUG-17
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=3 RECID=62 STAMP=951126280
channel ORA_DISK_1: starting piece 1 at 04-AUG-17
channel ORA_DISK_1: finished piece 1 at 04-AUG-17
piece handle=/home/oracle/arch_1dsb2289_1_1.bak
tag=TAG20170804T094441 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 04-AUG-17
Starting Control File and SPFILE Autobackup at 04-AUG-17
piece
handle=**/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_04/**o1_mf_s_951126283_dr7ndclt_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 04-AUG-17

②在目标服务器中创建相同的目录
mkdir -p
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_04

③从源库拷贝数据备份、归档备份、控制文件备份、参数文件、口令文件到目标库中
[oracle@dbserver ~]$ scp dbfull_1csb224a_1_1.bak
192.168.132.121:/home/oracle/
The authenticity of host '192.168.132.121 (192.168.132.121)' can't be established.
RSA key fingerprint is ba:da:31:63:54:e0:0e:7c:bb:7f:06:76:4a:1c:45:b3.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.132.121' (RSA) to the list of known hosts.
oracle@192.168.132.121's password:

```
dbfull_1csb224a_1_1.bak
100% 1235MB  33.4MB/s   00:37
[oracle@dbserver ~]$ scp arch*.bak 192.168.132.121:/home/oracle/
oracle@192.168.132.121's password:
arch_1bsb2248_1_1.bak
100%  417KB 417.0KB/s   00:00
arch_1dsb2289_1_1.bak
100%   18KB  17.5KB/s   00:00
[oracle@dbserver ~]$ scp
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_04/o1_
mf_s_951126283_dr7ndclt_.bkp
192.168.132.121:/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/
2017_08_04/
oracle@192.168.132.121's password:
o1_mf_s_951126283_dr7ndclt_.bkp
100%   10MB   9.9MB/s   00:01
[oracle@dbserver ~]$ scp
/u01/app/oracle/product/11.2.0/db_1/dbs/spfilesztech1.ora
192.168.132.121://u01/app/oracle/product/11.2.0/db_1/dbs/
oracle@192.168.132.121's password:
spfilesztech1.ora
100% 3584     3.5KB/s   00:00
[oracle@dbserver ~]$ scp
/u01/app/oracle/product/11.2.0/db_1/dbs/orapwsztech1
192.168.132.121://u01/app/oracle/product/11.2.0/db_1/dbs/
oracle@192.168.132.121's password:
orapwsztech1
100% 2048     2.0KB/s   00:00
```

④在目标服务器中执行恢复
--启动目标服务器到nomount

```
SQL> startup nomount
ORACLE instance started.
Total System Global Area  368263168 bytes
Fixed Size                  1364704 bytes
Variable Size             322964768 bytes
Database Buffers           37748736 bytes
Redo Buffers                6184960 bytes

[oracle@dbserver dbs]$ rman target /
Recovery Manager: Release 11.2.0.4.0 - Production on Fri Aug 4 10:16:49
2017
Copyright (c) 1982, 2011, Oracle and/or its affiliates.  All rights reserved.
connected to target database: SZTECH1 (not mounted)
```

--在目标服务器的rman中恢复控制文件
RMAN> restore controlfile from autobackup;
Starting restore at 04-AUG-17
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=134 device type=DISK
recovery area destination: /u01/app/oracle/fast_recovery_area
database name (or database unique name) used for search: SZTECH1
channel ORA_DISK_1: AUTOBACKUP
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_04/o1_
mf_s_951126283_dr7ndclt_.bkp found in the recovery area
AUTOBACKUP search with format "%F" not attempted because DBID was
not set
channel ORA_DISK_1: restoring control file from AUTOBACKUP
/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_08_04/o1_
mf_s_951126283_dr7ndclt_.bkp
channel ORA_DISK_1: control file restore from AUTOBACKUP complete
output file name=/u01/app/oracle/oradata/sztech1/control01.ctl
output file name=/u01/app/oracle/fast_recovery_area/sztech1/control02.ctl
Finished restore at 04-AUG-17

--修改数据库到mount状态
RMAN> alter database mount;
database mounted
released channel: ORA_DISK_1

--要源库中查询联机日志序列号
SQL> select group#,sequence#,status from v$log;
    GROUP# SEQUENCE# STATUS
---------- ---------- ----------------
         1   4 CURRENT
         2   2 INACTIVE
         3   3 INACTIVE

--在目标服务器中执行rman脚本，进行不完整恢复（无法实现完整恢复，因为源库的当前状态的联机日志无法处理）
RMAN> run{
set until sequence 4;
restore database;
recover database;
}

executing command: SET until clause
Starting restore at 04-AUG-17
using channel ORA_DISK_1

channel ORA_DISK_1: starting datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup set
channel ORA_DISK_1: restoring datafile 00001 to
/u01/app/oracle/oradata/sztech1/system01.dbf
channel ORA_DISK_1: restoring datafile 00002 to
/u01/app/oracle/oradata/sztech1/sysaux01.dbf
channel ORA_DISK_1: restoring datafile 00003 to
/u01/app/oracle/oradata/sztech1/undotbs01.dbf
channel ORA_DISK_1: restoring datafile 00004 to
/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: restoring datafile 00005 to
/u01/app/oracle/oradata/sztech1/example01.dbf
channel ORA_DISK_1: restoring datafile 00006 to
/u01/app/oracle/oradata/sztech1/ts_inventory01.dbf
channel ORA_DISK_1: reading from backup piece
/home/oracle/dbfull_1csb224a_1_1.bak
channel ORA_DISK_1: piece handle=/home/oracle/dbfull_1csb224a_1_1.bak
tag=TAG20170804T094233
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:02:05
Finished restore at 04-AUG-17

Starting recover at 04-AUG-17
using channel ORA_DISK_1
starting media recovery
channel ORA_DISK_1: starting archived log restore to default destination
channel ORA_DISK_1: restoring archived log
archived log thread=1 sequence=3
channel ORA_DISK_1: reading from backup piece
/home/oracle/arch_1dsb2289_1_1.bak
channel ORA_DISK_1: piece handle=/home/oracle/arch_1dsb2289_1_1.bak
tag=TAG20170804T094441
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
archived log file
name=/u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_08_04
/o1_mf_1_3_dr7pllvp_.arc thread=1 **sequence=3** **--只能恢复到当前日志的前一个序号**
channel default: deleting archived log(s)
archived log file
name=/u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_08_04
/o1_mf_1_3_dr7pllvp_.arc RECID=67 STAMP=951128530
media recovery complete, elapsed time: 00:00:00
Finished recover at 04-AUG-17

--以resetlogs方式打开数据库
RMAN> alter database open resetlogs;
database opened

--查看恢复后日志状态正常
SQL> select group#,sequence#,status from v$log;

GROUP#	SEQUENCE#	STATUS
1	1	CURRENT
2	0	UNUSED
3	0	UNUSED

至此，完成恢复！

9.灾难恢复

灾难恢复的前提：　①要有数据文件的备份！
②要有归档文件或归档文件的备份
③要有控制文件的自动备份

灾难恢复的步骤：（跟异机恢复非常相似）
- Restore an autobackup of the server parameter file.
- Start the target database instance.
- Restore the control file from autobackup.
- Mount the database.
- Restore the data files.
- Recover the data files.
- Open the database with the `RESETLOGS` option.