

1.手动指定备份模式

查看数据库数据文件信息：

```
report schema;
```

①备份集

```
backup as backupset database;
```

--备份数据库

```
backup as backupset database plus archivelog;
```

--备份数据库+归档

档日志

```
backup as backupset tablespace users;
```

--备份表空间

```
backup as backupset datafile 4;
```

--备份数据文件,指定数据文件号

文件,指定数据文件号

```
backup as backupset datafile
```

```
 '/u01/app/oracle/oradata/sztech1/users01.dbf'; --备份数据文件,指定待备份数据文件路径和名字
```

指定备份路径和文件命名方式，不指定路径时，使用RMAN默认的备份路径参数设置，如果也没有指定默认参数，则默认为快速恢复区。

```
backup as backupset database plus archivelog
```

```
format='/home/oracle/dbfull%D%s%p.bak';
```

```
backup as backupset tablespace users format '/home/oracle/users%U.bak';
```

②Image copy (副本)

```
backup as copy database archivelog all; --备份整个数据库+归档日志
```

```
backup as copy datafile 4 format '/home/oracle/user01%U.bak'; --
```

备份4号数据文件到指定位置

```
backup as copy archivelog all format '/home/oracle/%U.arc'; --
```

备份所有归档日志

```
backup as copy archivelog sequence 126; --
```

只备份126号归档日志

```
backup as copy archivelog until sequence 126; -
```

-备份归档日志序号小于等于126的所有日志文件

```
backup as copy archivelog until time 'sysdate-1'; -
```

-备份24小时（一天）之前产生的所有归档日志文件

2.采用Rman默认的备份模式

```
backup database;
```

--备份数据库

```
backup database plus archivelog;
```

--备份数据库+归档日志

```
backup tablespace users;
```

--备份表空间

```
backup datafile 4;
```

--备份数据文件,指定数据文

件号

backup datafile '/u01/app/oracle/oradata/sztech1/users01.dbf'; --备份数据文件,指定数据文件全路径名称

backup archivelog until sequence 126; --备份归档日志序号小于等于126的所有日志文件

3.整库备份 (Whole Database Backup)

整库备份不受 “CONFIGURE CONTROLFILE AUTOBACKUP OFF” 的影响，会自动备份控制文件，参数文件。

backup database plus archivelog;

整库备份步骤：

①切换日志，备份所有的归档日志

②备份数据文件

③备份控制文件、参数文件

④再次切换日志，备份所有的归档日志

实例如下：

```
Starting backup at 26-JUL-17
current log archived_ 切换日志
.....
input archived log thread=1 sequence=132 RECID=244 STAMP=950362774 备份所有归档日志
input archived log thread=1 sequence=133 RECID=245 STAMP=950363176
.....
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_annnn_TAG20170726T134616_dqjc599w_bkp tag=TAG20170726T134616 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

Starting backup at 26-JUL-17
using channel ORA_DISK_1
.....
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf 备份所有数据文件
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnndf_TAG20170726T134618_dqjc5brh_bkp tag=TAG20170726T134618 comment=NONE
.....
including current control file in backup set
including current SPFILE in backup set 备份控制文件和参数文件
.....
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsnf_TAG20170726T134618_dqjc737d_bkp tag=TAG20170726T134618 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

Starting backup at 26-JUL-17
current log archived_ 再次切换日志
.....
input archived log thread=1 sequence=134 RECID=246 STAMP=950363236 备份新的归档日志
.....
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_annnn_TAG20170726T134716_dqjc755y_bkp tag=TAG20170726T134716 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17
```

4.增量备份

①块改变跟踪介绍

注：启用块改变跟踪可以大大提高数据增备的速度！

--开启块改变跟踪

alter database enable block change tracking using
file'/u01/app/oracle/changed_block_tracking.log';

alter database enable block change tracking;--使用OMF管理时，可以省略块

改变跟踪文件名

alter database disable block change tracking;--关闭块改变跟踪

查看块改变跟踪的情况：v\$block_change_tracking

开启块改变跟踪后，服务器会自动运行一个后台进程：CTWR

```
SQL> ! ps -ef |grep ora_ctwr
oracle 4458      1   0 13:21 ?        00:00:00 ora_ctwr_sztech1
oracle 4811    4440   0 14:12 pts/3    00:00:00 /bin/bash -c ps -ef |grep ora_ctwr
oracle 4813    4811   0 14:12 pts/3    00:00:00 grep ora_ctwr
```

②增备

注：0级增备可作为1级增备的基础，跟全备的内容是一样的，但全备无法作为其它增量备份的基础；

0级增备也可以针对某一个数据文件。

1级累积增备是从上次0级备份以来变化的数据进行备份；

1级差异增备是从上次增备（包含所有的0级、1级增量备份）。

a.查看块改变跟踪的情况：v\$block_change_tracking

select * from v\$block_change_tracking;

SQL> select * from v\$block_change_tracking;

STATUS FILENAME BYTES

DISABLED

--表示当前已关闭块改变跟踪

b. backup incremental level 0 database --对数据库执行0级备份（用时1分45秒）

```
RMAN> backup incremental level 0 database;

Starting backup at 26-JUL-17
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=14 device type=DISK
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnnd0_TAG20170726T143721_dqjg51j8_.b
kp tag=TAG20170726T143721 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:01:45
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsn0_TAG20170726T143721_dqjg8d77_.b
kp tag=TAG20170726T143721 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17
```

c.backup incremental level 1 cumulative database --对数据库执行1级累积增备（用时25秒）

```

RMAN> backup incremental level 1 cumulative database;

Starting backup at 26-JUL-17
using channel ORA_DISK_1
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
skipping datafile 00004 because it has not changed
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnnd1_TAG20170726T144245_dqjgh6z0_.b
kp tag=TAG20170726T144245 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:25
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsn1_TAG20170726T144245_dqjgj12y_.b
kp tag=TAG20170726T144245 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

RMAN>

```

d.开启块改变跟踪：

```

SQL> alter database enable block change tracking using file'/u01/app/oracle/bctrace.log';
Database altered.

SQL> select * from v$block_change_tracking;

STATUS          FILENAME                                BYTES
-----
ENABLED         /u01/app/oracle/bctrace.log             11599872

```

e.再对数据库执行0级备份（用时45秒）：

```

RMAN> backup incremental level 0 database;

Starting backup at 26-JUL-17
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=14 device type=DISK
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnnd0_TAG20170726T144620_dqjgowxr_.b
kp tag=TAG20170726T144620 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:45
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsn0_TAG20170726T144620_dqjgqc52_.b
kp tag=TAG20170726T144620 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

```

f.再对数据库执行1级累积备份（用时7秒）：

```

RMAN> backup incremental level 1 cumulative database;

Starting backup at 26-JUL-17
using channel ORA_DISK_1
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
skipping datafile 00004 because it has not changed
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnnd1_TAG20170726T150155_dqjhm8m1_.b
kp tag=TAG20170726T150155 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsn1_TAG20170726T150155_dqjhmf36_.b
kp tag=TAG20170726T150155 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

```

g.对数据库执行1级差异增备（用时1秒）
 backup incremental level 1 database;

```

RMAN> backup incremental level 1 database;

Starting backup at 26-JUL-17
using channel ORA_DISK_1
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
skipping datafile 00004 because it has not changed
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnnd1_TAG20170726T150341_dqjhpftn_.b
kp tag=TAG20170726T150341 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting incremental level 1 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_ncsn1_TAG20170726T150341_dqjhphs4_.b
kp tag=TAG20170726T150341 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

```

可以看出，使用块改变跟踪可以大大提高增量备份的速度！
但是，当前备份前一定要有能做为基础的增量备份，才能提高速度！
比如做了0级增量后再做其它增量备份就可以提高备份速度。

5. oracle代理拷贝

- 一些介质管理产品可以完全管理Oracle数据文件和备份设备之间的所有数据移动。
- 一些在存储和介质子系统之间使用高速连接的产品可以减少主数据库服务器上的大部分备份负载。

- 文件复制发生在SAN而不是LAN中是有好处的。
- 在这一点上，RMAN不再参与操作，除了在LAN和MML之间通信状态。
- 1.使用backup命令的proxy选项时,需要使用MML来完成对文件的拷贝;
- 2.语法为BACKUP AS BACKUPSET ... PROXY [ONLY] DATABASE|TABLESPACE ...;
- 3.不能与AS COPY连用,否则会报错;
- 4.主要是用于把备份直接备份到磁带或者是存储上

6. 双工备份

双工备份表示同时备份文件数超过一份。

backup **copies 2** datafile 4 format '/home/oracle/df4_%U.bak';

```

RMAN> backup copies 2 datafile 4 format '/home/oracle/df4_%U.bak';

Starting backup at 26-JUL-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=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
channel ORA_DISK_1: finished piece 1 at 26-JUL-17 with 2 copies and tag TAG20170726T163757
piece handle=/home/oracle/df4_4tsab335_1_1.bak comment=NONE
piece handle=/home/oracle/df4_4tsab335_1_2.bak comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 26-JUL-17

```

快速恢复区不支持双工备份！


```

RMAN> backup copies 2 datafile 4;

Starting backup at 27-JUL-17
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=143 device type=DISK
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====
RMAN-03009: failure of backup command on ORA_DISK_1 channel at 07/27/2017 09:53:32
ORA-19806: cannot make duplex backups in recovery area

```

7.对备份集再进行备份

意义：①增强备份文件安全

②直接备份到磁带时速度比较慢(一般先将数据库备份到本地磁盘，再将备份集备份到磁带)

备份备份集到磁带:

backup device type sbt backupset all;

```

RMAN> backup device type sbt backupset all;

Starting backup at 26-JUL-17
released channel: ORA_DISK_1
allocated channel: ORA_SBT_TAPE_1
channel ORA_SBT_TAPE_1: SID=15 device type=SBT_TAPE
channel ORA_SBT_TAPE_1: Oracle Secure Backup
channel ORA_SBT_TAPE_1: input backup set: count=93, stamp=950374245, piece=1
channel ORA_SBT_TAPE_1: starting piece 1 at 26-JUL-17
channel ORA_SBT_TAPE_1: backup piece /u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_26/o1_mf_nnndf_
70726T165045_dqj0z6bc_.bkp
piece handle=2tsab3r5_1_2 comment=API Version 2.0,MMS Version 10.4.0.3
channel ORA_SBT_TAPE_1: finished piece 1 at 26-JUL-17
channel ORA_SBT_TAPE_1: backup piece complete, elapsed time: 00:00:35
channel ORA_SBT_TAPE_1: input backup set: count=94, stamp=950374247, piece=1
channel ORA_SBT_TAPE_1: starting piece 1 at 26-JUL-17
channel ORA_SBT_TAPE_1: backup piece /u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_26/o1_mf_s_950
_dqj0z7gm_.bkp
piece handle=c-3253410194-20170726-00 comment=API Version 2.0,MMS Version 10.4.0.3
channel ORA_SBT_TAPE_1: finished piece 1 at 26-JUL-17
channel ORA_SBT_TAPE_1: backup piece complete, elapsed time: 00:00:25
Finished backup at 26-JUL-17

Starting Control File and SPFILE Autobackup at 26-JUL-17
piece handle=c-3253410194-20170726-01 comment=API Version 2.0,MMS Version 10.4.0.3
Finished Control File and SPFILE Autobackup at 26-JUL-17

```

8.备份时处理只读表空间

①备份优化导致RMAN只有当不满足备份保留策略时才会备份只读表空间。

```
SQL> select tablespace_name,status from dba_tablespaces;
```

TABSPACE_NAME	STATUS
SYSTEM	ONLINE
SYSAUX	ONLINE
UNDOTBS1	ONLINE
TEMP	ONLINE
USERS	READ ONLY
EXAMPLE	ONLINE

6 rows selected.

```
RMAN> show RETENTION POLICY ;
```

RMAN configuration parameters for database with db_unique_name SZTECH1 are:
CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default

```
RMAN> backup database;
```

```

Starting backup at 26-JUL-17
using channel ORA_DISK_1
file 5 is excluded from whole database backup
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17

```

②修改只读表空间为可读写时，请立即手动备份数据库。

③使用SKIP READONLY强制跳过只读表空间

```
RMAN> backup database skip readonly;

Starting backup at 26-JUL-17
using channel ORA_DISK_1
skipping read-only file 5
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002 name=/u01/app/oracle/oradata/sztech1/sysaux01.dbf
input datafile file number=00001 name=/u01/app/oracle/oradata/sztech1/system01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztech1/undotbs01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
channel ORA_DISK_1: starting piece 1 at 26-JUL-17
```

9.大文件分段备份（提高备份性能）

backup datafile 5 section size=100M;

注意：使用分段备份时，不能设置限制备份片大小的参数！

```
RMAN> show CHANNEL ;

RMAN configuration parameters for database with db_unique_name SZTECH1 are:
CONFIGURE CHANNEL DEVICE TYPE DISK MAXPIECESIZE 2 G;

RMAN> backup datafile 5 section size 100m;

Starting backup at 27-JUL-17
using channel ORA_DISK_1
RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====
RMAN-03002: failure of backup command at 07/27/2017 10:24:03
RMAN-06808: SECTION SIZE cannot be used when piece limit is in effect
```

取消备份片大小限制设置后，可以成功执行分段备份！

```
RMAN> show channel;

RMAN configuration parameters for database with db_unique_name SZTECH1 are:
RMAN configuration has no stored or default parameters

RMAN> backup datafile 5 section size 100m;
Starting backup at 27-JUL-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
.....
Finished backup at 27-JUL-17
Starting Control File and SPFILE Autobackup at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950437596_dqlmbc2y_bkp commet
Finished Control File and SPFILE Autobackup at 27-JUL-17
```

评估数据文件或者表空间分段数量

validate datafile 4 section size 300m;

validate tablespace users section size 500m;

```

RMAN> validate datafile 4 section size 300m; 分段大小为300M

Starting validate at 01-AUG-17
using channel ORA_DISK_1
channel ORA_DISK_1: starting validation of datafile
channel ORA_DISK_1: specifying datafile(s) for validation
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
validating blocks 1 through 38400
channel ORA_DISK_1: validation complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting validation of datafile
channel ORA_DISK_1: specifying datafile(s) for validation
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
validating blocks 38401 through 76800
channel ORA_DISK_1: validation complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting validation of datafile
channel ORA_DISK_1: specifying datafile(s) for validation
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
validating blocks 76801 through 115200
channel ORA_DISK_1: validation complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting validation of datafile
channel ORA_DISK_1: specifying datafile(s) for validation
input datafile file number=00004 name=/u01/app/oracle/oradata/sztech1/users01.dbf
validating blocks 115201 through 131072
channel ORA_DISK_1: validation complete, elapsed time: 00:00:01
List of Datafiles
=====
File Status Marked Corrupt Empty Blocks Blocks Examined High SCN
-----
4 OK 0 66 131099 2325644
File Name: /u01/app/oracle/oradata/sztech1/users01.dbf
Block Type Blocks Failing Blocks Processed
-----
Data 0 30402
Index 0 95
Other 0 100506

Finished validate at 01-AUG-17

```

最终划分为4段！

分段备份时可以配置多通道，进一步提升备份速度！

```

RMAN> run {
2> allocate channel c1 device type disk;
3> allocate channel c2 device type disk;
4> allocate channel c3 device type disk;
5> backup datafile 5 section size 100m;
6> }

allocated channel: c1
channel c1: SID=27 device type=DISK

allocated channel: c2
channel c2: SID=150 device type=DISK

allocated channel: c3
channel c3: SID=28 device type=DISK

Starting backup at 27-JUL-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=00005 name=/u01/app/oracle/oradata/sztech1/example01.dbf
backing up blocks 1 through 12800
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_27/o1_mf_nnndf_TAG20170727T103937_d
qlnm9r3_.bkp tag=TAG20170727T103937 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:03
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00005 name=/u01/app/oracle/oradata/sztech1/example01.dbf
backing up blocks 12801 through 25600
channel ORA_DISK_1: starting piece 2 at 27-JUL-17
channel ORA_DISK_1: finished piece 2 at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_27/o1_mf_nnndf_TAG20170727T103937_d
qlnmf6s_.bkp tag=TAG20170727T103937 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00005 name=/u01/app/oracle/oradata/sztech1/example01.dbf
backing up blocks 25601 through 38400
channel ORA_DISK_1: starting piece 3 at 27-JUL-17
channel ORA_DISK_1: finished piece 3 at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_27/o1_mf_nnndf_TAG20170727T103937_d
qlnmglv_.bkp tag=TAG20170727T103937 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00005 name=/u01/app/oracle/oradata/sztech1/example01.dbf
backing up blocks 38401 through 44320
channel ORA_DISK_1: starting piece 4 at 27-JUL-17
channel ORA_DISK_1: finished piece 4 at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_27/o1_mf_nnndf_TAG20170727T103937_d
qlnmj0s_.bkp tag=TAG20170727T103937 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:02
Finished backup at 27-JUL-17

Starting Control File and SPFILE Autobackup at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950438385_dqlnmkg1_.bkp
comment=NONE
Finished Control File and SPFILE Autobackup at 27-JUL-17

```

10.归档备份

归档备份可以跳过恢复窗口保留策略的检查，使备份保留更久。

使用方式：在备份时加上KEEP{FOREVER| UNTIL TIME [=] 'DATA_STING'}

RESTORE POINT rname [FORMAT = ' '];

注意：要使用参数Forever,需要使用恢复目录！


```

RMAN> backup database keep until time='sysdate+90' restore point rs90 format '/home/oracle/rs90_%U.bak';

Starting backup at 27-JUL-17
current log archived 日志切换

using channel ORA_DISK_1
backup will be obsolete on date 25-OCT-17 备份90天后过期
archived logs required to recover from this backup will be backed up
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/sztechl/system01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztechl/users01.dbf
input datafile file number=00002 name=/u01/app/oracle/oradata/sztechl/sysaux01.dbf
input datafile file number=00005 name=/u01/app/oracle/oradata/sztechl/example01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztechl/undotbs01.dbf
input datafile file number=00006 name=/u01/app/oracle/oradata/sztechl/ts_inventory01.dbf
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/home/oracle/rs90_4msad3de_1_1.bak tag=TAG20170727T105542 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:01:36

using channel ORA_DISK_1
backup will be obsolete on date 25-OCT-17
archived logs required to recover from this backup will be backed up
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current SPFILE in backup set
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/home/oracle/rs90_4nsad3ge_1_1.bak tag=TAG20170727T105542 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01

current log archived
using channel ORA_DISK_1 再次日志切换
backup will be obsolete on date 25-OCT-17
archived logs required to recover from this backup will be backed up
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=103 RECID=96 STAMP=950439439
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/home/oracle/rs90_4osad3gg_1_1.bak tag=TAG20170727T105542 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01

using channel ORA_DISK_1
backup will be obsolete on date 25-OCT-17
archived logs required to recover from this backup will be backed up
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
including current control file in backup set
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/home/oracle/rs90_4psad3gh_1_1.bak tag=TAG20170727T105542 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:02
Finished backup at 27-JUL-17

```

归档备份无法使用快速恢复区！

```

RMAN> backup database keep until time='sysdate+90' ;

Starting backup at 27-JUL-17
current log archived

using channel ORA_DISK_1
backup will be obsolete on date 25-OCT-17
archived logs required to recover from this backup will be backed up
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/sztechl/system01.dbf
input datafile file number=00004 name=/u01/app/oracle/oradata/sztechl/users01.dbf
input datafile file number=00002 name=/u01/app/oracle/oradata/sztechl/sysaux01.dbf
input datafile file number=00005 name=/u01/app/oracle/oradata/sztechl/example01.dbf
input datafile file number=00003 name=/u01/app/oracle/oradata/sztechl/undotbs01.dbf
input datafile file number=00006 name=/u01/app/oracle/oradata/sztechl/ts_inventory01.dbf
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====
RMAN-03002: failure of backup command at 07/27/2017 11:06:15
ORA-19811: cannot have files in DB_RECOVERY_FILE_DEST with keep attributes

```

查询所有的还原点：

```

RMAN> list restore point all;

SCN            RSP Time  Type          Time          Name
-----
2456419        27-JUL-17  RS90

```

还原数据到指定的还原点（在mount状态下进行还原操作）：
restore database until restore point RS90;

```

RMAN> restore database until restore point rs90;

Starting restore at 27-JUL-17
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=24 device type=DISK

skipping datafile 5; already restored to file /u01/app/oracle/oradata/sztech1/example01.dbf
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 00006 to /u01/app/oracle/oradata/sztech1/ts_inventory01.dbf
channel ORA_DISK_1: reading from backup piece /home/oracle/rs90_4msad3de_1_1.bak
RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====
RMAN-03002: failure of restore command at 07/27/2017 11:12:24
ORA-19870: error while restoring backup piece /home/oracle/rs90_4msad3de_1_1.bak
ORA-19573: cannot obtain exclusive enqueue for datafile 1

```

当前数据是在OPEN状态，无法还原！

改变当前归档备份的保留期限，如果这些备份超出了恢复窗口保留时间的话将立即变为过期的备份！

①查看归档备份

```

RMAN> list backup of database tag 'TAG20170727T105542';

List of Backup Sets
=====

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
-----
111      Full  1.18G          DISK            00:01:33      27-JUL-17
BP Key: 143 Status: AVAILABLE Compressed: NO Tag: TAG20170727T105542
Piece Name: /home/oracle/rs90_4msad3de_1_1.bak
Keep: BACKUP LOGS Until: 25-OCT-17
List of Datafiles in backup set 111
File LV Type Ckp SCN      Ckp Time  Name
-----
1      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/system01.dbf
2      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/sysaux01.dbf
3      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/undotbs01.dbf
4      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/users01.dbf
5      Full  2454012      27-JUL-17 /u01/app/oracle/oradata/sztech1/example01.dbf
6      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/ts_inventory01.dbf

```

当前备份KEEP到90天后

②修改归档备份为NOKEEP

```

RMAN> change backup tag 'TAG20170727T105542' nokeep;

using channel ORA_DISK_1
keep attributes for the backup are deleted
backup set key=111 RECID=111 STAMP=950439435
keep attributes for the backup are deleted
backup set key=112 RECID=112 STAMP=950439438
keep attributes for the backup are deleted
backup set key=113 RECID=113 STAMP=950439440
keep attributes for the backup are deleted
backup set key=114 RECID=114 STAMP=950439443

```

③再次查询该归档备份，已经没有KEEP UNTIL属性了！

```

RMAN> list backup of database tag 'TAG20170727T105542';

List of Backup Sets
=====

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
-----
111      Full  1.18G          DISK            00:01:33      27-JUL-17
BP Key: 143 Status: AVAILABLE Compressed: NO Tag: TAG20170727T105542
Piece Name: /home/oracle/rs90_4msad3de_1_1.bak
List of Datafiles in backup set 111
File LV Type Ckp SCN      Ckp Time  Name
-----
1      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/system01.dbf
2      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/sysaux01.dbf
3      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/undotbs01.dbf
4      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/users01.dbf
5      Full  2454012      27-JUL-17 /u01/app/oracle/oradata/sztech1/example01.dbf
6      Full  2456377      27-JUL-17 /u01/app/oracle/oradata/sztech1/ts_inventory01.dbf

```

④再次修改归档备份的保留期限并查看修改结果

```

RMAN> change backup tag 'tag20170727T105542' keep until time 'sysdate+90';
using channel ORA_DISK_1
keep attributes for the backup are changed
backup will be obsolete on date 25-OCT-17
backup set key=111 RECID=111 STAMP=950439435
keep attributes for the backup are changed
backup will be obsolete on date 25-OCT-17
backup set key=112 RECID=112 STAMP=950439438
keep attributes for the backup are changed
backup will be obsolete on date 25-OCT-17
backup set key=113 RECID=113 STAMP=950439440
keep attributes for the backup are changed
backup will be obsolete on date 25-OCT-17
backup set key=114 RECID=114 STAMP=950439443

RMAN> list backup of database tag 'tag20170727T105542';

List of Backup Sets
=====

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
-----
111      Full  1.18G          DISK        00:01:33      27-JUL-17
BP Key: 143  Status: AVAILABLE Compressed: NO  Tag: TAG20170727T105542
Piece Name: /home/oracle/rs90_4msad3de_1_1.bak
Keep: BACKUP_LOGS          Until: 25-OCT-17

List of Datafiles in backup set 111
File LV Type Ckp SCN      Ckp Time    Name
---
1      Full 2456377 27-JUL-17 /u01/app/oracle/oradata/sztech1/system01.dbf
2      Full 2456377 27-JUL-17 /u01/app/oracle/oradata/sztech1/sysaux01.dbf
3      Full 2456377 27-JUL-17 /u01/app/oracle/oradata/sztech1/undotbs01.dbf
4      Full 2456377 27-JUL-17 /u01/app/oracle/oradata/sztech1/users01.dbf
5      Full 2454012 27-JUL-17 /u01/app/oracle/oradata/sztech1/example01.dbf
6      Full 2456377 27-JUL-17 /u01/app/oracle/oradata/sztech1/ts_inventory01.dbf

```

11.备份恢复文件和快速恢复区

- ①备份快速恢复区中的所有文件
backup recovery area;

```

RMAN> backup recovery area to destination '/u01/app/oracle'; 目标路径不能为快速恢复区！

Starting backup at 27-JUL-17
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=154 device type=DISK
specification does not match any datafile copy in the repository
specification does not match any backup set in the repository
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=103 RECID=96 STAMP=950439439
input archived log thread=1 sequence=104 RECID=97 STAMP=950439974
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
piece handle=/u01/app/oracle/SZTECH1/backupset/2017_07_27/o1_mf_anno TAG20170727T132759_dqlyh01f_.bkp tag=TAG20170727T132759
ent=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 27-JUL-17

Starting Control File and SPFILE Autobackup at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950448481_dqlyh1kf_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 27-JUL-17

```

- ②备份所有恢复文件（包含非快速恢复区中的备份文件）
backup recovery files;

```

RMAN> backup recovery files to destination '/u01/app/oracle'; 目标路径不能为快速恢复区！

Starting backup at 27-JUL-17
using channel ORA_DISK_1
specification does not match any archived log in the repository
specification does not match any datafile copy in the repository
skipping backup set key 117; already backed up 1 time(s)
skipping backup set key 118; already backed up 1 time(s)
skipping backup set key 120; already backed up 1 time(s)
channel ORA_DISK_1: input backup set: count=159, stamp=950448677, piece=1
channel ORA_DISK_1: starting piece 1 at 27-JUL-17
channel ORA_DISK_1: backup piece /home/oracle/df4_4vsadch5_1_1.bak
piece handle=/u01/app/oracle/SZTECH1/backupset/2017_07_27/o1_mf_nnndf_TAG20170727T133117_dqlyp1ss_.bkp comment=NONE
channel ORA_DISK_1: finished piece 1 at 27-JUL-17
channel ORA_DISK_1: backup piece complete, elapsed time: 00:00:01
Finished backup at 27-JUL-17

Starting Control File and SPFILE Autobackup at 27-JUL-17
piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950448707_dqlyp38d_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 27-JUL-17

```

12.查看备份报告

- ①list

list backup; --查看所有备份信息，，包含所有备份集和Image Copy的备份信息。

list backupset; --查看所有备份集信息
list copy; --查看所有Image Copy的备份信息
list datafilecopy all; --查看所有imagecopy的数据文件信息
list backup of controlfile; --查看控制文件的备份信息
list backup of spfile; --查看参数文件的备份信息
list backup of datafile 5; --查看5号数据文件的备份信息
list backup of database; --查看备份的数据库信息
list backup of archivelog all; --查看备份的归档日志信息

②report

report schema; --查看数据库数据文件信息，可以在open或mount状态查看
report need backup; --查看所有需要备份的数据文件信息，会自动应用保留策略进行判断
rereport need backup days 20; --查看需要能还原20天内所有需要备份的数据文件。
report obsolete; --查看检查满足备份策略后已过时的备份

13.删除备份

delete backup; --删除所有的备份文件，只删除所有备份集，不删除Image Copy的备份，跟delete backupset效果一样！
delete backupset; ---删除所有的备份集文件
delete copy; --删除所有的Image Copy的备份文件,包含数据文件、控制文件、参数文件、归档日志文件等。
delete obsolete; --删除过时的备份。

14.备份相关的视图

v\$backup_set :备份集的统计信息，等同于rman看的命令list backupset;
v\$backup_piece :备份片的统计信息
v\$datafile_copy :Image copy的统计信息，等同于rman的命令list datafilecopy;
v\$backup_files : 查看所有的备份文件信息，包含image copy和backupset

15.校验备份

检查控制文件中或者catalog中的备份信息与物理备份文件是否一致和有效。
crosscheck backup; --校验所有备份文件

```

RMAN> crosscheck backup;
using channel ORA_DISK_1
crosschecked backup piece: found to be "EXPIRED"  校验为已经过期或者无效的备份。
backup piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950450921_dqm0v9dv_.bkp RECID=157 STAMP=950450921
crosschecked backup piece: found to be 'AVAILABLE'
backup piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/backupset/2017_07_27/o1_mf_rnndf_TAG20170727T141535_dqm187gn_.bkp RECID=158 STAMP=950451335
crosschecked backup piece: found to be 'AVAILABLE'
backup piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950451336_dqm188rz_.bkp RECID=159 STAMP=950451336
Crosschecked 3 objects

```

crosscheck archivelog all; --校验所有的归档日志备份


```

RMAN> crosscheck archivelog all;

released channel: ORA_DISK_1
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=125 device type=DISK
validation failed for archived log 校验失败!
archived log file name=/u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_108_dqm1fb5s_.arc RECID=103 STAMP=
950451498
validation succeeded for archived log
archived log file name=/u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_109_dqm1fgtg_.arc RECID=104 STAMP=
950451502
Crosschecked 2 objects

```

delete expired backup;

```

RMAN> delete expired backup; 删除无效的备份!
using channel ORA_DISK_1

List of Backup Pieces
BP Key   BS Key   Pc# Cp# Status      Device Type Piece Name
-----
157      124      1   1   EXPIRED     DISK        /u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950450921_dqm0v9dv_.bkp

Do you really want to delete the above objects (enter YES or NO)? yes
deleted backup piece
backup piece handle=/u01/app/oracle/fast_recovery_area/SZTECH1/autobackup/2017_07_27/o1_mf_s_950450921_dqm0v9dv_.bkp RECID=157 S
MP=950450921
Deleted 1 EXPIRED objects

```

delete expired archivelog all; --删除所有无效的归档备份。

```

RMAN> list archivelog all;

List of Archived Log Copies for database with db_unique_name SZTECH1
=====
Key       Thrd Seq      S Low Time
-----
103       1    108      X 27-JUL-17
Name: /u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_108_dqm1fb5s_.arc

104       1    109      A 27-JUL-17
Name: /u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_109_dqm1fgtg_.arc

RMAN> delete expired archivelog all; 删除无效归档备份!

released channel: ORA_DISK_1
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=125 device type=DISK
List of Archived Log Copies for database with db_unique_name SZTECH1
=====
Key       Thrd Seq      S Low Time
-----
103       1    108      X 27-JUL-17
Name: /u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_108_dqm1fb5s_.arc

Do you really want to delete the above objects (enter YES or NO)? yes
deleted archived log
archived log file name=/u01/app/oracle/fast_recovery_area/SZTECH1/archivelog/2017_07_27/o1_mf_1_108_dqm1fb5s_.arc RECID=103
950451498
Deleted 1 EXPIRED objects

```