# 1 控制文件数据字典视图

如图，展示了控制文件相关的数据字典视图信息：

| View | Description |
| --- | --- |
| V$DATABASE | Displays database information from the control file |
| V$CONTROLFILE | Lists the names of control files |
| V$CONTROLFILE_RECORD_SECTION | Displays information about control file record sections |
| V$PARAMETER | Displays the names of control files as specified in the CONTROL_FILES initialization parameter |

# 2 增加一个控制文件

## 2.1 查看现有控制文件位置

SQL> col name for a100
SQL> select name from v$controlfile;

NAME
--------------------------------------------------------------------------------------------------
/u01/app/oracle/oradata/orcl/control01.ctl
/u01/app/oracle/fast_recovery_area/orcl/control02.ctl

## 2.2 启动数据库至nomount状态

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

Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes

## 2.3 拷贝控制文件

SQL> host cp /u01/app/oracle/oradata/orcl/control01.ctl /home/oracle/control03.ctl

## 2.4 修改 control_files参数

SQL> alter system set
control_files='/u01/app/oracle/oradata/orcl/control01.ctl','/u01/app/oracle/fast_recovery_area/orcl/control02.ctl','/home/oracle/
 scope=spfile;

System altered.

## 2.5 重启数据库使参数生效

SQL> shutdown immediate
ORA-01507: database not mounted


ORACLE instance shut down.
SQL> startup
ORACLE instance started.


Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes
Database mounted.
Database opened.

## 2.6 查看控制文件

SQL> show parameter control_files;

```
NAME                           TYPE    VALUE
------------------------------------ ----------- ------------------------------
control_files                  string  /u01/app/oracle/oradata/orcl/c
                                       ontrol01.ctl, /u01/app/oracle/
                                       fast_recovery_area/orcl/contro
                                       l02.ctl, /home/oracle/control0
                                       3.ctl
```

# 3 删除一个控制文件

## 3.1 查看现有控制文件位置

SQL> select name from v$controlfile;

```
NAME
--------------------------------------------------------------------------------------------------
/u01/app/oracle/oradata/orcl/control01.ctl
/u01/app/oracle/fast_recovery_area/orcl/control02.ctl
/home/oracle/control03.ctl
```

## 3.2 重启数据库至nomount状态

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

```
Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes
```

### 3.3 修改 control_files参数

```
SQL> alter system set
control_files='/u01/app/oracle/oradata/orcl/control01.ctl','/u01/app/oracle/fast_recovery_area/orcl/control02.ctl' scope=spfile;

System altered.
```

### 3.4 重启数据库使参数生效

```
SQL> shutdown immediate
ORA-01507: database not mounted


ORACLE instance shut down.
SQL>
SQL> startup
ORACLE instance started.

Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes
Database mounted.
Database opened.
```

### 3.5 查看控制文件

```
SQL> show parameter control_files;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
control_files                        string      /u01/app/oracle/oradata/orcl/c
                                                 ontrol01.ctl, /u01/app/oracle/
                                                 fast_recovery_area/orcl/contro
                                                 l02.ctl
```

### 3.6 删除控制文件

```
SQL> host rm /home/oracle/control03.ctl
```

# 4 意外丢失一个控制文件

### 4.1 删除一个控制文件模拟丢失控制文件

SQL> host rm /u01/app/oracle/oradata/orcl/control01.ctl

## 4.2 关闭数据库，则出错，提示控制文件丢失

SQL> shutdown immediate
Database closed.
ORA-00210: cannot open the specified control file
ORA-00202: control file: '/u01/app/oracle/oradata/orcl/control01.ctl'
ORA-27041: unable to open file
Linux-x86_64 Error: 2: No such file or directory
Additional information: 3

## 4.3 查看数据字典视图，确认控制文件信息

SQL> select name from v$controlfile;

NAME
--------------------------------------------------------------------------------------------
/u01/app/oracle/oradata/orcl/control01.ctl
/u01/app/oracle/fast_recovery_area/orcl/control02.ctl

## 4.4 强制数据库关闭

SQL> shutdown abort
ORACLE instance shut down.

## 4.5 启动数据库至nomount状态，将现有的控制文件拷贝一份至丢失的控制文件目录

SQL> startup nomount
ORACLE instance started.

Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes
SQL>
SQL> host cp /u01/app/oracle/fast_recovery_area/orcl/control02.ctl /u01/app/oracle/oradata/orcl/control01.ctl

SQL> host ls /u01/app/oracle/oradata/orcl/control01.ctl
/u01/app/oracle/oradata/orcl/control01.ctl

## 4.6 装载、打开数据库

SQL> alter database mount;

Database altered.

SQL> alter database open;

Database altered.

# 5 备份控制文件

下面介绍几种备份控制文件的方法：

## 5.1 二进制备份到指定位置

SQL> alter database backup controlfile to '/home/oracle/ctl.bak';

Database altered.

SQL> host ls -l /home/oracle/ctl.bak
-rw-r-----. 1 oracle oinstall 10600448 Jul 17 21:36 /home/oracle/ctl.bak

## 5.2 备份到TRACE文件

### 5.2.1 定位到Alert文件

[oracle@strong trace]$ pwd
/u01/app/oracle/diag/rdbms/orcl/orcl/trace
[oracle@strong trace]$ tail -f -n 200 alert_orcl.log



### 5.2.2 备份到Trace文件

SQL> alter database backup controlfile to trace;

Database altered.

### 5.2.3 定位Trace文件

SQL> show parameter user_dump_dest;

```
NAME                            TYPE     VALUE
------------------------------- ---------- -----------------------------
user_dump_dest                  string   /u01/app/oracle/product/12.2.0
                                         /dbhome_1/rdbms/log
```
SQL> SELECT m.SPID
  FROM v$process m
 WHERE m.addr =
     (SELECT t.paddr
      FROM v$session t
      WHERE t.sid = (SELECT sid FROM v$mystat WHERE rownum = 1));

```
SPID
-----------------------
3947
```
[oracle@strong trace]$ ll |grep 3947
-rw-r-----. 1 oracle oinstall   7180 Jul 17 21:42 orcl_ora_3947.trc

-rw-r-----. 1 oracle oinstall   908 Jul 17 21:42 orcl_ora_3947.trm

## 5.3 使用RMAN备份控制文件

[oracle@strong ~]$ rman target /

Recovery Manager: Release 12.2.0.1.0 - Production on Tue Jul 17 21:55:19 2018

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connected to target database: ORCL (DBID=1509097982)

RMAN> backup current controlfile;

Starting backup at 17-JUL-18
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=70 device type=DISK
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 17-JUL-18
channel ORA_DISK_1: finished piece 1 at 17-JUL-18
piece
handle=/u01/app/oracle/fast_recovery_area/orcl/ORCL/backupset/2018_07_17/o1_mf_ncnnf_TAG20180717T215537_fnvxbyo7_.l
 tag=TAG20180717T215537 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:08
Finished backup at 17-JUL-18

Starting Control File and SPFILE Autobackup at 17-JUL-18
piece handle=/u01/app/oracle/fast_recovery_area/orcl/ORCL/autobackup/2018_07_17/o1_mf_s_981755751_fnvxc7tv_.bkp
comment=NONE
Finished Control File and SPFILE Autobackup at 17-JUL-18
注：可以设置RMAN配置为ON（CONFIGURE CONTROLFILE AUTOBACKUP ON;），实现控制文件的自动备份。

# 6 重建控制文件

## 6.1 列出数据库的数据文件和重做日志文件

SQL> col member for a50
SQL> col name for a50
SQL> select member from v$logfile;

MEMBER
--------------------------------------------------
/u01/app/oracle/oradata/orcl/redo03.log
/u01/app/oracle/oradata/orcl/redo02.log
/u01/app/oracle/oradata/orcl/redo01.log

SQL> select name from v$datafile;

NAME
--------------------------------------------------
/u01/app/oracle/oradata/orcl/system01.dbf
/u01/app/oracle/oradata/orcl/sysaux01.dbf
/u01/app/oracle/oradata/orcl/undotbs01.dbf
/u01/app/oracle/oradata/orcl/users01.dbf

SQL> select name from v$controlfile;

NAME
--------------------------------------------------
/u01/app/oracle/oradata/orcl/control01.ctl
/u01/app/oracle/fast_recovery_area/orcl/control02.ctl

## 6.2 关闭数据库

SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.

## 6.3 备份数据库所有数据文件和日志文件

[oracle@strong ~]$ mkdir backup
[oracle@strong ~]$ cd /u01/app/oracle/oradata/orcl/
[oracle@strong orcl]$ ll
total 2045388
-rw-r-----. 1 oracle oinstall  10600448 Jul 17 22:06 control01.ctl
-rw-r-----. 1 oracle oinstall 209715712 Jul 17 21:35 redo01.log
-rw-r-----. 1 oracle oinstall 209715712 Jul 17 21:35 redo02.log
-rw-r-----. 1 oracle oinstall 209715712 Jul 17 22:06 redo03.log
-rw-r-----. 1 oracle oinstall 524296192 Jul 17 22:06 sysaux01.dbf
-rw-r-----. 1 oracle oinstall 849354752 Jul 17 22:06 system01.dbf
-rw-r-----. 1 oracle oinstall  33562624 Jul 17 22:03 temp01.dbf
-rw-r-----. 1 oracle oinstall  73408512 Jul 17 22:06 undotbs01.dbf
-rw-r-----. 1 oracle oinstall   5251072 Jul 17 22:06 users01.dbf
[oracle@strong orcl]$ cp * /home/oracle/backup/

## 6.4 启动数据库至nomount状态

SQL> startup nomount
ORACLE instance started.

Total System Global Area  843055104 bytes
Fixed Size                  8626288 bytes
Variable Size             587206544 bytes
Database Buffers          243269632 bytes
Redo Buffers                3952640 bytes

## 6.5 使用create control语句创建控制文件

```
CREATE CONTROLFILE REUSE DATABASE "ORCL" RESETLOGS  ARCHIVELOG
    MAXLOGFILES 16
    MAXLOGMEMBERS 3
    MAXDATAFILES 100
    MAXINSTANCES 8
    MAXLOGHISTORY 292
LOGFILE
  GROUP 1 '/u01/app/oracle/oradata/orcl/redo01.log'  SIZE 200M BLOCKSIZE 512,
  GROUP 2 '/u01/app/oracle/oradata/orcl/redo02.log'  SIZE 200M BLOCKSIZE 512,
  GROUP 3 '/u01/app/oracle/oradata/orcl/redo03.log'  SIZE 200M BLOCKSIZE 512
-- STANDBY LOGFILE
DATAFILE
  '/u01/app/oracle/oradata/orcl/system01.dbf',
  '/u01/app/oracle/oradata/orcl/sysaux01.dbf',
  '/u01/app/oracle/oradata/orcl/undotbs01.dbf',
  '/u01/app/oracle/oradata/orcl/users01.dbf'
CHARACTER SET AL32UTF8
```

## 6.6 打开数据库

```
SQL> select status from v$instance;

STATUS
------------
MOUNTED

SQL> alter database open;
alter database open
*
ERROR at line 1:
ORA-01589: must use RESETLOGS or NORESETLOGS option for database open



SQL> alter database open resetlogs;

Database altered.
SQL> select name,open_mode from v$database;

NAME                                               OPEN_MODE
-------------------------------------------------- --------------------
ORCL                                               READ WRITE
```

> 由于控制文件是重建，所以数据库必须以RESETLOGS方式打开。