

**期末项目设计报告**

|  |  |  |  |
| --- | --- | --- | --- |
| 题 目 | 基于Oracle的手机订单的数据库设计 | | |
| 课程 | Oracle数据库应用 | | |
| 学 院 | 信息科学与工程学院 | | |
| 专 业 | 软件工程 | 年级 | 2017级 |
| 学生姓名 | 张锐 | 学号 | 201710414227 |
| 指导教师 | 赵卫东 | 职称 | 副教授 |

|  |  |  |  |
| --- | --- | --- | --- |
| **评分项** | **评分标准** | **满分** | **得分** |
| 文档整体 | 文档内容详实、规范，美观大方 | 10 |  |
| 表设计 | 表，表空间设计合理，数据合理 | 20 |  |
| 用户管理 | 权限及用户分配方案设计正确 | 10 |  |
| PL/SQL设计 | 存储过程和函数设计正确 | 25 |  |
| 备份方案 | 备份方案设计正确 | 25 |  |
| 容灾方案 | DataGuard设计正确 | 10 |  |
| **得分合计** | | |  |

2019 年 11 月 18 日

**\*\*创建表空间\*\***

```

Create Tablespace U123

datafile

'/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf'

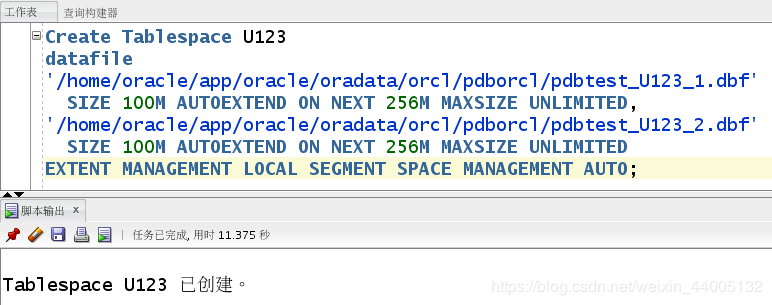
SIZE 100M AUTOEXTEND ON NEXT 256M MAXSIZE UNLIMITED,

'/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_2.dbf'

SIZE 100M AUTOEXTEND ON NEXT 256M MAXSIZE UNLIMITED

EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO;

```



```

Create Tablespace U1234

datafile

'/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_1.dbf'

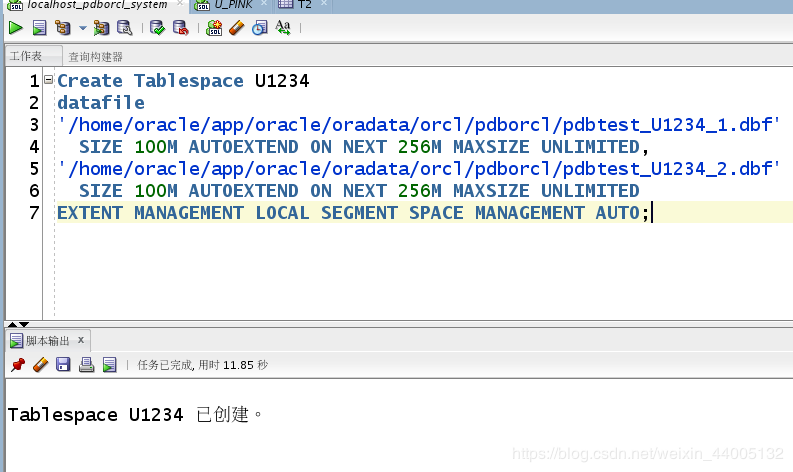
SIZE 100M AUTOEXTEND ON NEXT 256M MAXSIZE UNLIMITED,

'/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_2.dbf'

SIZE 100M AUTOEXTEND ON NEXT 256M MAXSIZE UNLIMITED

EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO;

```



**\*\*一用户及权限管理\*\***

**\*\*创建第一个角色\*\***

**第1步：以system登录到pdborcl，创建角色R\_PINK和用户U\_PINK ，并授权和分配空间：**

**```**

**CREATE ROLE R\_PINK;**

**GRANT connect,resource,CREATE VIEW TO R\_PINK;**

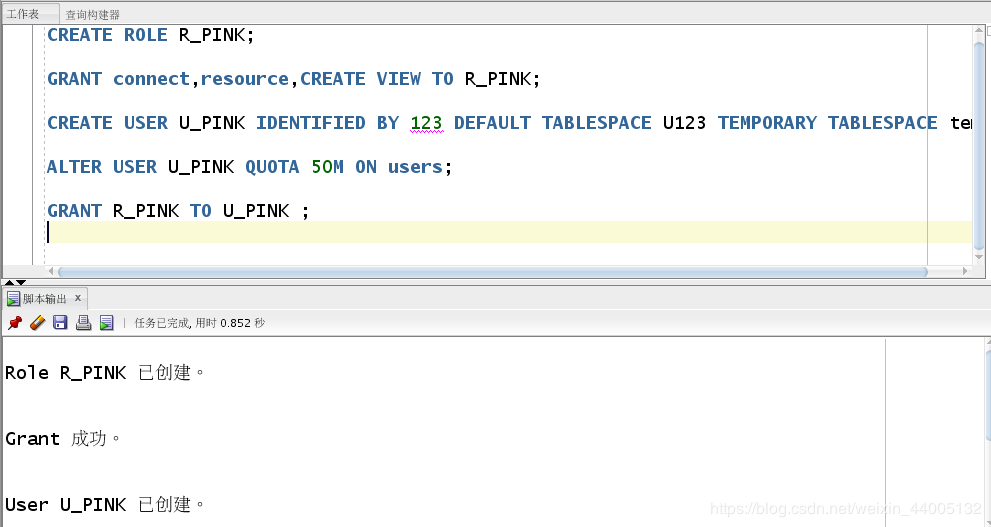
**CREATE USER U\_PINK IDENTIFIED BY 123 DEFAULT TABLESPACE U123 TEMPORARY TABLESPACE temp;**

**ALTER USER U\_PINK QUOTA 50M ON users;**

**GRANT R\_PINK TO U\_PINK ;**

**Exit**

```



**\*\*创建第二个角色\*\***

```

CREATE ROLE R\_PINK1;

GRANT connect,resource,CREATE VIEW TO R\_PINK1;

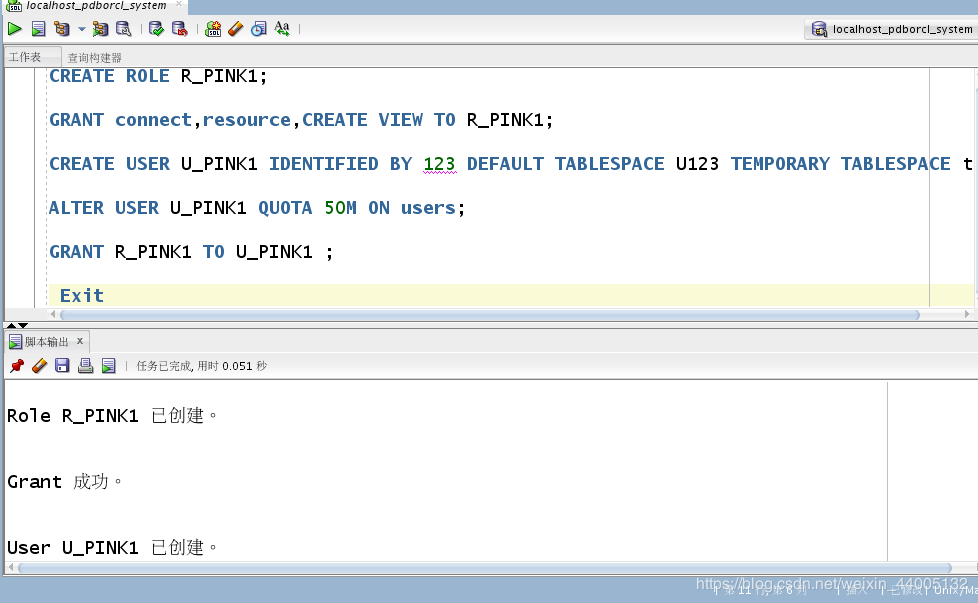
CREATE USER U\_PINK1 IDENTIFIED BY 123 DEFAULT TABLESPACE U123 TEMPORARY TABLESPACE temp;

ALTER USER U\_PINK1 QUOTA 50M ON users;

GRANT R\_PINK1 TO U\_PINK1 ;

Exit

```



**\*二：设计项目涉及的表及表空间使用方案。至少5张表和5万条数据，两个表空间。\*\***

**\*\*创建表1DEPARTMENTS\*\***

```

CREATE TABLE DEPARTMENTS

(

DEPARTMENT\_ID NUMBER(6, 0) NOT NULL

, DEPARTMENT\_NAME VARCHAR2(40 BYTE) NOT NULL

, CONSTRAINT DEPARTMENTS\_PK PRIMARY KEY

(

DEPARTMENT\_ID

)

USING INDEX

(

CREATE UNIQUE INDEX DEPARTMENTS\_PK ON DEPARTMENTS (DEPARTMENT\_ID ASC)

NOLOGGING

TABLESPACE USERS

PCTFREE 10

INITRANS 2

STORAGE

(

INITIAL 65536

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOPARALLEL

)

ENABLE

)

NOLOGGING

TABLESPACE USERS

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 65536

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOCOMPRESS NO INMEMORY NOPARALLEL;

```

**\*\*创建表2EMPLOYEES\*\***

```

CREATE TABLE EMPLOYEES

(

EMPLOYEE\_ID NUMBER(6, 0) NOT NULL

, NAME VARCHAR2(40 BYTE) NOT NULL

, EMAIL VARCHAR2(40 BYTE)

, PHONE\_NUMBER VARCHAR2(40 BYTE)

, HIRE\_DATE DATE NOT NULL

, SALARY NUMBER(8, 2)

, MANAGER\_ID NUMBER(6, 0)

, DEPARTMENT\_ID NUMBER(6, 0)

, PHOTO BLOB

, CONSTRAINT EMPLOYEES\_PK PRIMARY KEY

(

EMPLOYEE\_ID

)

USING INDEX

(

CREATE UNIQUE INDEX EMPLOYEES\_PK ON EMPLOYEES (EMPLOYEE\_ID ASC)

NOLOGGING

TABLESPACE USERS

PCTFREE 10

INITRANS 2

STORAGE

(

INITIAL 65536

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOPARALLEL

)

ENABLE

)

NOLOGGING

TABLESPACE USERS

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 65536

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOCOMPRESS

NO INMEMORY

NOPARALLEL

LOB (PHOTO) STORE AS SYS\_LOB0000092017C00009$$

(

ENABLE STORAGE IN ROW

CHUNK 8192

NOCACHE

NOLOGGING

TABLESPACE USERS

STORAGE

(

INITIAL 106496

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

);

```

**\*\*创建表3PRODUCTS\*\***

```

CREATE TABLE PRODUCTS

(

PRODUCT\_NAME VARCHAR2(40 BYTE) NOT NULL

, PRODUCT\_TYPE VARCHAR2(40 BYTE) NOT NULL

, CONSTRAINT PRODUCTS\_PK PRIMARY KEY

(

PRODUCT\_NAME

)

ENABLE

)

LOGGING

TABLESPACE "USERS"

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 65536

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS 2147483645

BUFFER\_POOL DEFAULT

);

ALTER TABLE PRODUCTS

ADD CONSTRAINT PRODUCTS\_CHK1 CHECK

(PRODUCT\_TYPE IN ('耗材', '手机', '电脑'))

ENABLE;

```

**\*\*创建表4ORDER\_DETAILS\*\***

```

CREATE TABLE ORDER\_DETAILS

(

ID NUMBER(10, 0) NOT NULL

, ORDER\_ID NUMBER(10, 0) NOT NULL

, PRODUCT\_NAME VARCHAR2(40 BYTE) NOT NULL

, PRODUCT\_NUM NUMBER(8, 2) NOT NULL

, PRODUCT\_PRICE NUMBER(8, 2) NOT NULL

, CONSTRAINT ORDER\_DETAILS\_FK1 FOREIGN KEY

(

ORDER\_ID

)

REFERENCES ORDERS

(

ORDER\_ID

)

ENABLE

)

TABLESPACE USERS

PCTFREE 10

INITRANS 1

STORAGE

(

BUFFER\_POOL DEFAULT

)

NOCOMPRESS

NOPARALLEL

PARTITION BY REFERENCE (ORDER\_DETAILS\_FK1)

(

PARTITION PARTITION\_BEFORE\_2016

NOLOGGING

TABLESPACE USERS --必须指定表空间，否则会将分区存储在用户的默认表空间中

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 8388608

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOCOMPRESS NO INMEMORY,

PARTITION PARTITION\_BEFORE\_2017

NOLOGGING

TABLESPACE USERS02

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 8388608

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOCOMPRESS NO INMEMORY

)

;

```

**\*\*创建表5ORDER\_ID\_TEMP\*\***

```

CREATE GLOBAL TEMPORARY TABLE "ORDER\_ID\_TEMP"

( "ORDER\_ID" NUMBER(10,0) NOT NULL ENABLE,

CONSTRAINT "ORDER\_ID\_TEMP\_PK" PRIMARY KEY ("ORDER\_ID") ENABLE

) ON COMMIT DELETE ROWS ;

COMMENT ON TABLE "ORDER\_ID\_TEMP" IS '用于触发器存储临时ORDER\_ID';

```

**\*\*创建表6ORDERS\*\***

```

CREATE TABLE ORDERS

(

ORDER\_ID NUMBER(10, 0) NOT NULL

, CUSTOMER\_NAME VARCHAR2(40 BYTE) NOT NULL

, CUSTOMER\_TEL VARCHAR2(40 BYTE) NOT NULL

, ORDER\_DATE DATE NOT NULL

, EMPLOYEE\_ID NUMBER(6, 0) NOT NULL

, DISCOUNT NUMBER(8, 2) DEFAULT 0

, TRADE\_RECEIVABLE NUMBER(8, 2) DEFAULT 0

)

TABLESPACE USERS

PCTFREE 10

INITRANS 1

STORAGE

(

BUFFER\_POOL DEFAULT

)

NOCOMPRESS

NOPARALLEL

PARTITION BY RANGE (ORDER\_DATE)

(

PARTITION PARTITION\_BEFORE\_2016 VALUES LESS THAN (TO\_DATE(' 2016-01-01 00:00:00', 'SYYYY-MM-DD HH24:MI:SS', 'NLS\_CALENDAR=GREGORIAN'))

NOLOGGING

TABLESPACE USERS

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 8388608

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

BUFFER\_POOL DEFAULT

)

NOCOMPRESS NO INMEMORY

, PARTITION PARTITION\_BEFORE\_2017 VALUES LESS THAN (TO\_DATE(' 2017-01-01 00:00:00', 'SYYYY-MM-DD HH24:MI:SS', 'NLS\_CALENDAR=GREGORIAN'))

NOLOGGING

TABLESPACE USERS02

PCTFREE 10

INITRANS 1

STORAGE

(

INITIAL 8388608

NEXT 1048576

MINEXTENTS 1

MAXEXTENTS UNLIMITED

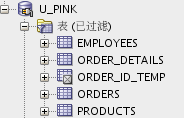
BUFFER\_POOL DEFAULT

)

NOCOMPRESS NO INMEMORY

);

```



**\*\*插入数据\*\***

```

declare

dt date;

m number(8,2);

V\_EMPLOYEE\_ID NUMBER(6);

v\_order\_id number(10);

v\_name varchar2(100);

v\_tel varchar2(100);

v number(10,2);

begin

for i in 1..10000

loop

if i mod 2 =0 then

dt:=to\_date('2015-3-2','yyyy-mm-dd')+(i mod 60);

else

dt:=to\_date('2016-3-2','yyyy-mm-dd')+(i mod 60);

end if;

V\_EMPLOYEE\_ID:=CASE I MOD 6 WHEN 0 THEN 11 WHEN 1 THEN 111 WHEN 2 THEN 112

WHEN 3 THEN 12 WHEN 4 THEN 121 ELSE 122 END;

--插入订单

v\_order\_id:=SEQ\_ORDER\_ID.nextval; --应该将SEQ\_ORDER\_ID.nextval保存到变量中。

v\_name := 'aa'|| 'aa';

v\_name := 'zhang' || i;

v\_tel := '139888883' || i;

insert /\*+append\*/ into ORDERS (ORDER\_ID,CUSTOMER\_NAME,CUSTOMER\_TEL,ORDER\_DATE,EMPLOYEE\_ID,DISCOUNT)

values (v\_order\_id,v\_name,v\_tel,dt,V\_EMPLOYEE\_ID,dbms\_random.value(100,0));

--插入订单y一个订单包括3个产品

v:=dbms\_random.value(10000,4000);

v\_name:='computer'|| (i mod 3 + 1);

insert /\*+append\*/ into ORDER\_DETAILS(ID,ORDER\_ID,PRODUCT\_NAME,PRODUCT\_NUM,PRODUCT\_PRICE)

values (SEQ\_ORDER\_DETAILS\_ID.NEXTVAL,v\_order\_id,v\_name,2,v);

v:=dbms\_random.value(1000,50);

v\_name:='paper'|| (i mod 3 + 1);

insert /\*+append\*/ into ORDER\_DETAILS(ID,ORDER\_ID,PRODUCT\_NAME,PRODUCT\_NUM,PRODUCT\_PRICE)

values (SEQ\_ORDER\_DETAILS\_ID.NEXTVAL,v\_order\_id,v\_name,3,v);

v:=dbms\_random.value(9000,2000);

v\_name:='phone'|| (i mod 3 + 1);

insert /\*+append\*/ into ORDER\_DETAILS(ID,ORDER\_ID,PRODUCT\_NAME,PRODUCT\_NUM,PRODUCT\_PRICE)

values (SEQ\_ORDER\_DETAILS\_ID.NEXTVAL,v\_order\_id,v\_name,1,v);

--在触发器关闭的情况下，需要手工计算每个订单的应收金额：

select sum(PRODUCT\_NUM\*PRODUCT\_PRICE) into m from ORDER\_DETAILS where ORDER\_ID=v\_order\_id;

if m is null then

m:=0;

end if;

UPDATE ORDERS SET TRADE\_RECEIVABLE = m - discount WHERE ORDER\_ID=v\_order\_id;

IF I MOD 1000 =0 THEN

commit; --每次提交会加快插入数据的速度

END IF;

end loop;

--统计用户的所有表，所需时间很长：2千万行数据，需要1600秒，该语句可选

--dbms\_stats.gather\_schema\_stats(User,estimate\_percent=>100,cascade=> TRUE); --estimate\_percent采样行的百分比

end;

重复5次

```

**查询数据量**

```

SELECT count(\*) from ORDERS

```



**\*\*三：在数据库中建立一个程序包，在包中用PL/SQL语言设计一些存储过程和函数，实现比较复杂的业务逻辑，用模拟数据进行执行计划分析。\*\***

```

create or replace PACKAGE MyPack IS

/\*

包MyPack中有：

一个函数:Get\_SaleAmount(V\_DEPARTMENT\_ID NUMBER)，

一个过程:Get\_Employees(V\_EMPLOYEE\_ID NUMBER)

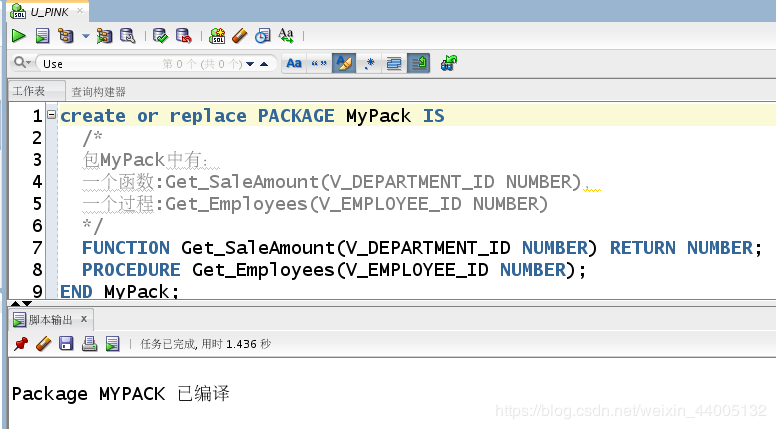
\*/

FUNCTION Get\_SaleAmount(V\_DEPARTMENT\_ID NUMBER) RETURN NUMBER;

PROCEDURE Get\_Employees(V\_EMPLOYEE\_ID NUMBER);

END MyPack;

```



```

create or replace PACKAGE BODY MyPack IS

FUNCTION Get\_SaleAmount(V\_DEPARTMENT\_ID NUMBER) RETURN NUMBER

AS

N NUMBER(20,2); --注意，订单ORDERS.TRADE\_RECEIVABLE的类型是NUMBER(8,2),汇总之后，数据要大得多。

BEGIN

SELECT SUM(O.TRADE\_RECEIVABLE) into N FROM ORDERS O,EMPLOYEES E

WHERE O.EMPLOYEE\_ID=E.EMPLOYEE\_ID AND E.DEPARTMENT\_ID =V\_DEPARTMENT\_ID;

RETURN N;

END;

PROCEDURE GET\_EMPLOYEES (V\_EMPLOYEE\_ID NUMBER)

AS

LEFTSPACE VARCHAR(2000);

begin

--通过LEVEL判断递归的级别

LEFTSPACE:=' ';

--使用游标

for v in

(SELECT LEVEL,EMPLOYEE\_ID,NAME,MANAGER\_ID FROM employees

START WITH EMPLOYEE\_ID = V\_EMPLOYEE\_ID

CONNECT BY PRIOR EMPLOYEE\_ID = MANAGER\_ID)

LOOP

DBMS\_OUTPUT.PUT\_LINE (LPAD (LEFTSPACE, (V.LEVEL-1)\*4,' ')||

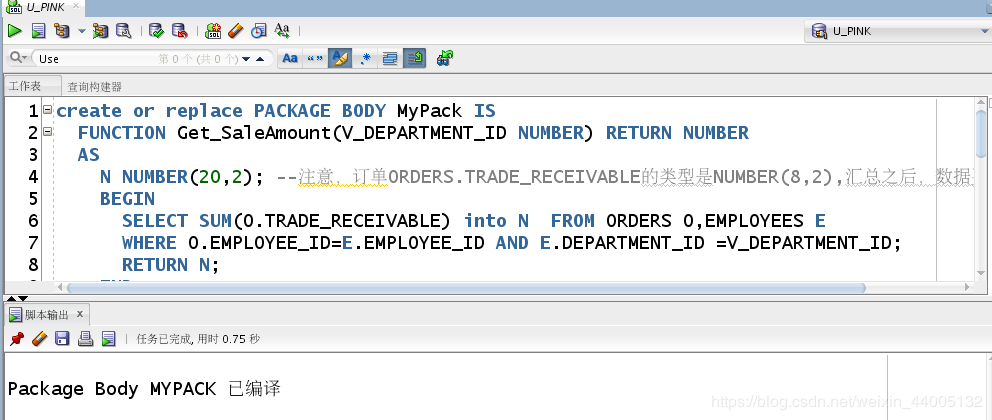
V.EMPLOYEE\_ID||' '||v.NAME);

END LOOP;

END;

END MyPack;

```



**\*\*用模拟数据进行执行计划分析。\*\***

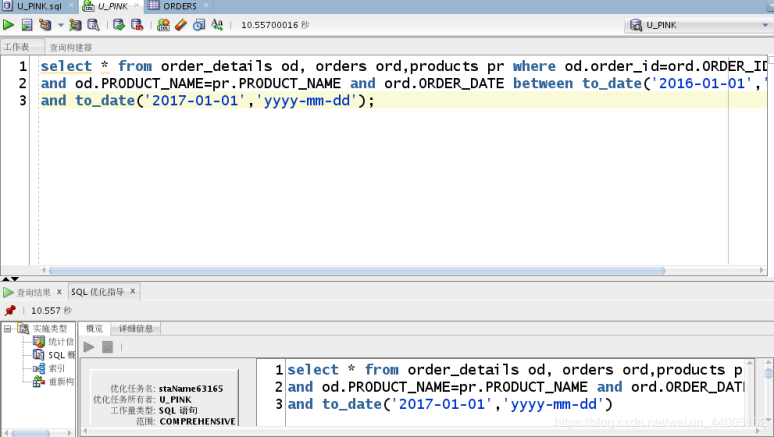
```

select \* from order\_details od, orders ord,products pr where od.order\_id=ord.ORDER\_ID

and od.PRODUCT\_NAME=pr.PRODUCT\_NAME and ord.ORDER\_DATE between to\_date('2016-01-01','yyyy-mm-dd')

and to\_date('2017-01-01','yyyy-mm-dd');

```



**\*\*Oracle 12c数据库全备份和全恢复实验\*\***

**\*\*1. 开始全备份\*\***

```

[oracle@oracle-pc ~]$ cat rman\_level0.sh

#rman\_level0.sh

#!/bin/sh

export NLS\_LANG='SIMPLIFIED CHINESE\_CHINA.AL32UTF8'

export ORACLE\_HOME=/home/oracle/app/oracle/product/12.1.0/dbhome\_1

export ORACLE\_SID=orcl

export PATH=$ORACLE\_HOME/bin:$PATH

rman target / nocatalog msglog=/home/oracle/rman\_backup/lv0\_`date +%Y%m%d-%H%M%S`\_L0.log << EOF

run{

configure retention policy to redundancy 1;

configure controlfile autobackup on;

configure controlfile autobackup format for device type disk to '/home/oracle/rman\_backup/%F';

configure default device type to disk;

crosscheck backup;

crosscheck archivelog all;

allocate channel c1 device type disk;

backup as compressed backupset incremental level 0 database format '/home/oracle/rman\_backup/dblv0\_%d\_%T\_%U.bak'

plus archivelog format '/home/oracle/rman\_backup/arclv0\_%d\_%T\_%U.bak';

report obsolete;

delete noprompt obsolete;

delete noprompt expired backup;

delete noprompt expired archivelog all;

release channel c1;

}

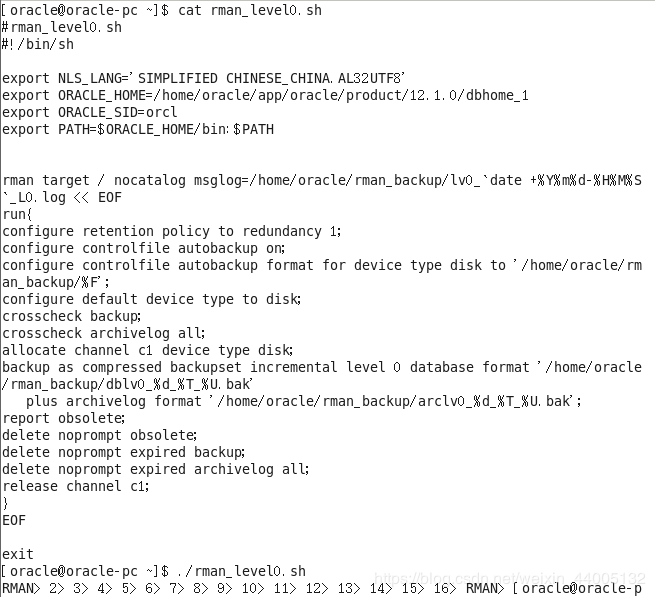
EOF

exit

[oracle@oracle-pc ~]$ ./rman\_level0.sh

RMAN> 2> 3> 4> 5> 6> 7> 8> 9> 10> 11> 12> 13> 14> 15> 16> RMAN> [oracle@oracle-p

```



**查看备份文件**

\*.log是日志文件

dblv0\*.bak是数据库的备份文件

arclv0\*.bak是归档日期的备份文件

c-1392946895-20191124-02是控制文件和参数的备份

```

[oracle@oracle-pc rman\_backup]$ ls

arclv0\_ORCL\_20191124\_9guhmtu3\_1\_1.bak dblv0\_ORCL\_20191124\_9euhmtod\_1\_1.bak lv0\_20191124-203053\_L0.log

c-1392946895-20191124-02 dblv0\_ORCL\_20191124\_9fuhmtsv\_1\_1.bak lv0\_20191124-203217\_L0.log

dblv0\_ORCL\_20191124\_9duhmtl3\_1\_1.bak lv0\_20191111-003303\_L0.log lv1\_20191111-003650\_L0.log

[oracle@oracle-pc rman\_backup]$ arclv0\_ORCL\_20191120\_dauhb2fm\_1\_1.bak

```

**\*\*查看备份文件的内容\*\***

```

[oracle@oracle-pc ~]$ rman target /

Recovery Manager: Release 12.1.0.2.0 - Production on 星期一 11月 25 13:07:05 2019

Copyright (c) 1982, 2014, Oracle and/or its affiliates. All rights reserved.

connected to target database: ORCL (DBID=1392946895)

RMAN> list backup;

using target database control file instead of recovery catalog

List of Backup Sets

===================

BS Key Type LV Size Device Type Elapsed Time Completion Time

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

251 Incr 0 219.63M DISK 00:03:01 25-11月-19

BP Key: 251 Status: AVAILABLE Compressed: YES Tag: TAG20191125T124528

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9buhomj9\_1\_1.bak

List of Datafiles in backup set 251

Container ID: 3, PDB Name: PDBORCL

File LV Type Ckp SCN Ckp Time Name

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

8 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/system01.dbf

9 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/sysaux01.dbf

10 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/SAMPLE\_SCHEMA\_users01.dbf

11 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/example01.dbf

12 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_1.dbf

13 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_2.dbf

16 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_3.dbf

17 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_4.dbf

77 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users03\_1.dbf

78 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users03\_2.dbf

79 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf

80 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_2.dbf

81 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_1.dbf

82 0 Incr 47526430 25-11月-19 /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_2.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

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

252 Incr 0 369.98M DISK 00:02:13 25-11月-19

BP Key: 252 Status: AVAILABLE Compressed: YES Tag: TAG20191125T124528

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9cuhomp6\_1\_1.bak

List of Datafiles in backup set 252

File LV Type Ckp SCN Ckp Time Name

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

1 0 Incr 47526499 25-11月-19 /home/oracle/app/oracle/oradata/orcl/system01.dbf

3 0 Incr 47526499 25-11月-19 /home/oracle/app/oracle/oradata/orcl/sysaux01.dbf

4 0 Incr 47526499 25-11月-19 /home/oracle/app/oracle/oradata/orcl/undotbs01.dbf

6 0 Incr 47526499 25-11月-19 /home/oracle/app/oracle/oradata/orcl/users01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

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

253 Incr 0 157.08M DISK 00:00:45 25-11月-19

BP Key: 253 Status: AVAILABLE Compressed: YES Tag: TAG20191125T124528

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9duhomti\_1\_1.bak

List of Datafiles in backup set 253

Container ID: 2, PDB Name: PDB$SEED

File LV Type Ckp SCN Ckp Time Name

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

5 0 Incr 1819408 01-12月-14 /home/oracle/app/oracle/oradata/orcl/pdbseed/system01.dbf

7 0 Incr 1819408 01-12月-14 /home/oracle/app/oracle/oradata/orcl/pdbseed/sysaux01.dbf

BS Key Size Device Type Elapsed Time Completion Time

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

254 66.50K DISK 00:00:00 25-11月-19

BP Key: 254 Status: AVAILABLE Compressed: YES Tag: TAG20191125T125147

Piece Name: /home/oracle/rman\_backup/arclv0\_ORCL\_20191125\_9euhomv4\_1\_1.bak

List of Archived Logs in backup set 254

Thrd Seq Low SCN Low Time Next SCN Next Time

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

1 1616 47526388 25-11月-19 47526592 25-11月-19

BS Key Type LV Size Device Type Elapsed Time Completion Time

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

255 Full 17.77M DISK 00:00:04 25-11月-19

BP Key: 255 Status: AVAILABLE Compressed: NO Tag: TAG20191125T125149

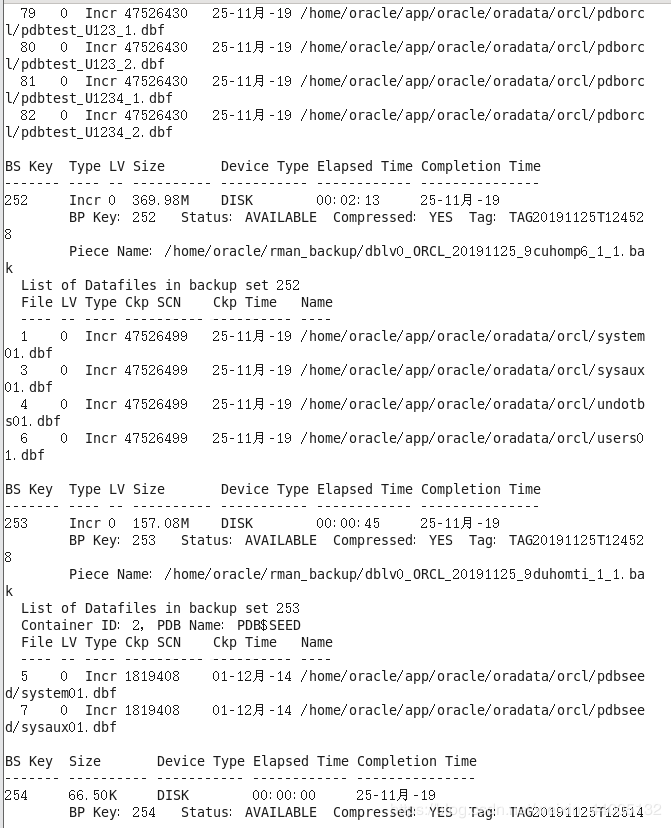
Piece Name: /home/oracle/rman\_backup/c-1392946895-20191125-00

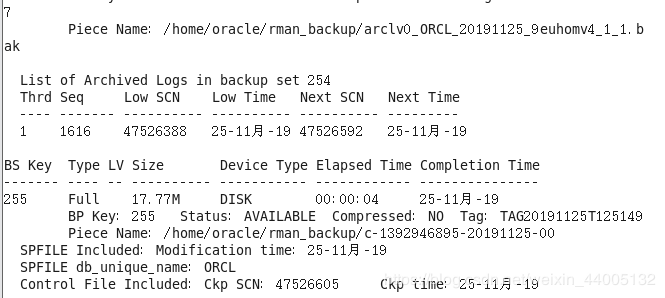
SPFILE Included: Modification time: 25-11月-19

SPFILE db\_unique\_name: ORCL

Control File Included: Ckp SCN: 47526605 Ckp time: 25-11月-19







由上面的"list backup;" 输出可以看出，备份集中的文件内容是：

/home/oracle/rman\_backup/dblv0\_ORCL\_20191120\_d7uhb2ap\_1\_1.bak 是插接数据库PDBORCL的备份集

/home/oracle/rman\_backup/dblv0\_ORCL\_20191120\_d8uhb2c6\_1\_1.bak 是ORCL的备份集

/home/oracle/rman\_backup/dblv0\_ORCL\_20191120\_d9uhb2ei\_1\_1.bak是PDB$SEED的备份集

/home/oracle/rman\_backup/arclv0\_ORCL\_20191120\_dauhb2fm\_1\_1.bak是归档文件的备份集

/home/oracle/rman\_backup/c-1392946895-20191120-01是参数文件(SPFILE)和控制文件(Control File)的备份集

**\*\*备份后修改数据\*\***

```

[oracle@oracle-pc ~]$ sqlplus U\_PINK/123@pdborcl

SQL\*Plus: Release 12.1.0.2.0 Production on 星期一 11月 25 13:12:49 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Last Successful login time: 星期日 11月 24 2019 19:01:47 +08:00

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

SQL> create table t1 (id number,name varchar2(50);

create table t6 (id number,name varchar2(50)

\*

ERROR at line 1:

ORA-00907: 缺失右括号

SQL> create table t1 (id number,name varchar2(50));

Table created.

SQL> insert into t1 values(1,'zhang');

1 row created.

SQL> commit;

Commit complete.

SQL> select \* from t1;

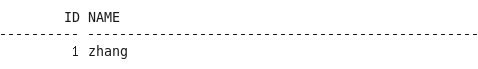
ID NAME

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

1 zhang

SQL> exit

```



**\*\*3. 删除数据库文件，模拟数据库文件损坏\*\***

```

rm /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf

```

IMG_256

\*\*删除数据库文件后修改数据\*\*

删除数据文件后，仍然可以增加一条数据。这是因为增加的数据并没有写入数据文件，而是写到了日志文件中。如果增加的数据较多的时候，就会出问题了。

```

[oracle@oracle-pc ~]$ sqlplus U\_PINK/123@pdborcl

SQL\*Plus: Release 12.1.0.2.0 Production on 星期一 11月 25 21:05:20 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Last Successful login time: 星期一 11月 25 2019 20:59:47 +08:00

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

SQL> insert into t1 values(2,'wang');

1 row created.

SQL> commit;

Commit complete.

SQL> select \* from t1;

ID NAME

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

2 wang

1 zhang

SQL> declare

2 n number;

3 begin

4 for n in 1..10000 loop

5 insert into t1 values(n,'name'||n);

6 end loop;

7 end;

8 /

declare

\*

ERROR at line 1:

ORA-01116: 打开数据库文件 79 时出错 ORA-01110:

数据文件 79: '/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf'

ORA-27041: 无法打开文件

Linux-x86\_64 Error: 2: No such file or directory

Additional information: 3

ORA-06512: 在 line 5

SQL> select \* from t1;

ID NAME

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

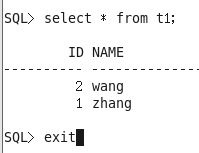
2 wang

1 zhang

SQL> exit

```





**\*\*4数据库完全恢复\*\***

**\*\*4.1 重启损坏的数据库到mount状态\*\***

**通过shutdown immediate无法正常关闭数据库，只能通过shutdown abort强制关闭。然后将数据库启动到mount状态。**

```

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on 星期一 11月 25 21:12:15 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

SQL> shutdown immediate

ORA-01116: 打开数据库文件 79 时出错

ORA-01110: 数据文件 79: '/home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf'

ORA-27041: 无法打开文件

Linux-x86\_64 Error: 2: No such file or directory

Additional information: 3

SQL> shutdown abort

ORACLE instance shut down.

SQL> startup mount

ORACLE instance started.

Total System Global Area 1577058304 bytes

Fixed Size 2924832 bytes

Variable Size 738201312 bytes

Database Buffers 654311424 bytes

Redo Buffers 13848576 bytes

In-Memory Area 167772160 bytes

Database mounted.

SQL> exit

```



**\*\*4.2 开始恢复数据库\*\***

```

[oracle@oracle-pc ~]$ rman target /

Recovery Manager: Release 12.1.0.2.0 - Production on 星期一 11月 25 21:13:56 2019

Copyright (c) 1982, 2014, Oracle and/or its affiliates. All rights reserved.

connected to target database: ORCL (DBID=1392946895, not open)

RMAN> restore database ;

Starting restore at 25-11月-19

using target database control file instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=243 device type=DISK

skipping datafile 5; already restored to file /home/oracle/app/oracle/oradata/orcl/pdbseed/system01.dbf

skipping datafile 7; already restored to file /home/oracle/app/oracle/oradata/orcl/pdbseed/sysaux01.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 00008 to /home/oracle/app/oracle/oradata/orcl/pdborcl/system01.dbf

channel ORA\_DISK\_1: restoring datafile 00009 to /home/oracle/app/oracle/oradata/orcl/pdborcl/sysaux01.dbf

channel ORA\_DISK\_1: restoring datafile 00010 to /home/oracle/app/oracle/oradata/orcl/pdborcl/SAMPLE\_SCHEMA\_users01.dbf

channel ORA\_DISK\_1: restoring datafile 00011 to /home/oracle/app/oracle/oradata/orcl/pdborcl/example01.dbf

channel ORA\_DISK\_1: restoring datafile 00012 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00013 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_2.dbf

channel ORA\_DISK\_1: restoring datafile 00016 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_3.dbf

channel ORA\_DISK\_1: restoring datafile 00017 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users02\_4.dbf

channel ORA\_DISK\_1: restoring datafile 00077 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users03\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00078 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_users03\_2.dbf

channel ORA\_DISK\_1: restoring datafile 00079 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00080 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U123\_2.dbf

channel ORA\_DISK\_1: restoring datafile 00081 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00082 to /home/oracle/app/oracle/oradata/orcl/pdborcl/pdbtest\_U1234\_2.dbf

channel ORA\_DISK\_1: reading from backup piece /home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9buhpj44\_1\_1.bak

channel ORA\_DISK\_1: piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9buhpj44\_1\_1.bak tag=TAG20191125T205219

channel ORA\_DISK\_1: restored backup piece 1

channel ORA\_DISK\_1: restore complete, elapsed time: 00:03:09

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 /home/oracle/app/oracle/oradata/orcl/system01.dbf

channel ORA\_DISK\_1: restoring datafile 00003 to /home/oracle/app/oracle/oradata/orcl/sysaux01.dbf

channel ORA\_DISK\_1: restoring datafile 00004 to /home/oracle/app/oracle/oradata/orcl/undotbs01.dbf

channel ORA\_DISK\_1: restoring datafile 00006 to /home/oracle/app/oracle/oradata/orcl/users01.dbf

channel ORA\_DISK\_1: reading from backup piece /home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9cuhpj7i\_1\_1.bak

channel ORA\_DISK\_1: piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20191125\_9cuhpj7i\_1\_1.bak tag=TAG20191125T205219

channel ORA\_DISK\_1: restored backup piece 1

channel ORA\_DISK\_1: restore complete, elapsed time: 00:05:01

Finished restore at 25-11月-19

RMAN> recover database;

Starting recover at 25-11月-19

using channel ORA\_DISK\_1

starting media recovery

media recovery complete, elapsed time: 00:00:06

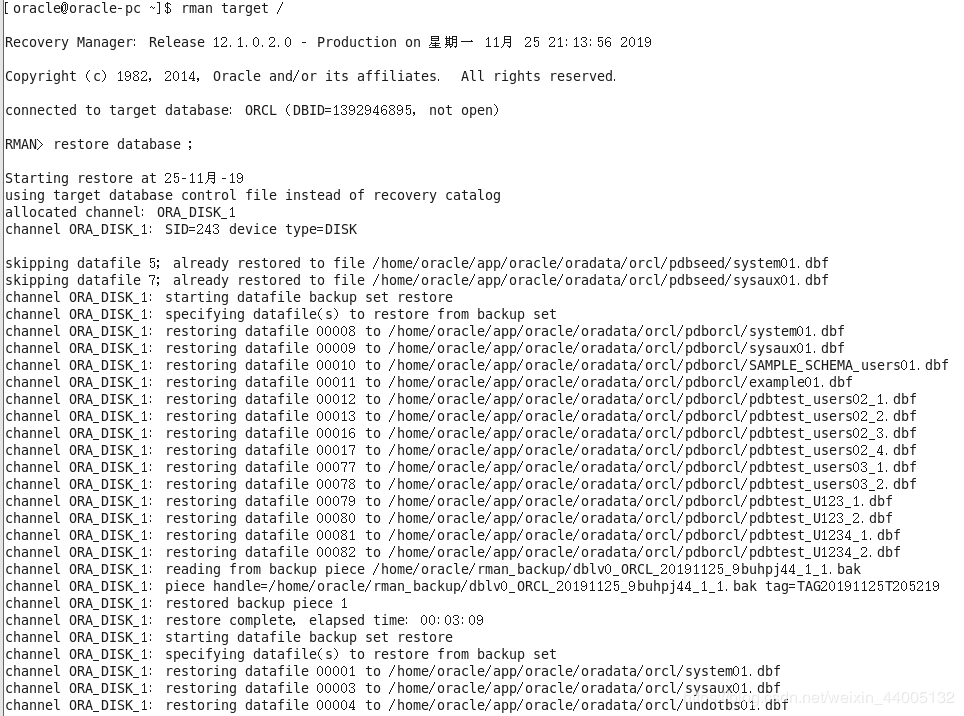
Finished recover at 25-11月-19

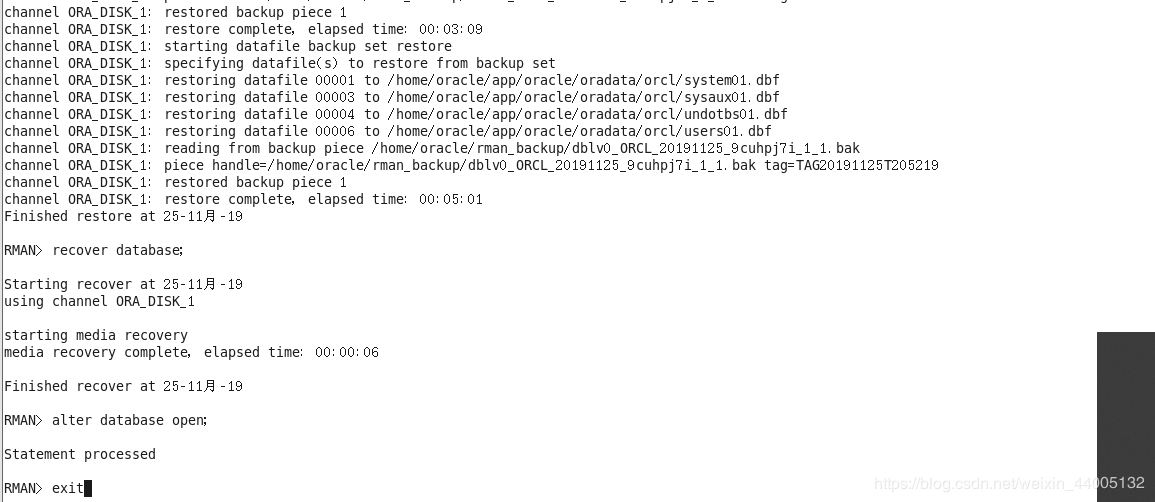
RMAN> alter database open;

Statement processed

RMAN> exit

```





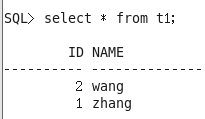
**\*\*5 查询数据是否恢复\*\***

```

[oracle@oracle-pc ~]$ sqlplus U\_PINK/123@pdborcl

SQL> select \* from t1;

```



**\*\*设计容灾方案。使用两台主机，通过DataGuard实现数据库整体的异地备份\*\***

**\*\*第一步：备库\*\***

```

mkdir -p /home/oracle/app/oracle/diag/orcl

mkdir -p /home/oracle/app/oracle/oradata/stdorcl/

mkdir -p /home/oracle/app/oracle/oradata/stdorcl/pdborcl

mkdir -p /home/oracle/arch

mkdir -p /home/oracle/rman

mkdir -p /home/oracle/app/oracle/oradata/stdorcl/pdbseed/

mkdir -p /home/oracle/app/oracle/oradata/stdorcl/pdb/

```



**\*\*删除原有数据库:\*\***

**```**

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on 星期二 11月 26 12:30:46 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

SQL> shutdown immediate;

Database closed.

Database dismounted.

ORACLE instance shut down.

SQL> startup mount exclusive restrict;

ORACLE instance started.

Total System Global Area 1577058304 bytes

Fixed Size 2924832 bytes

Variable Size 738201312 bytes

Database Buffers 654311424 bytes

Redo Buffers 13848576 bytes

In-Memory Area 167772160 bytes

Database mounted.

SQL> drop database;

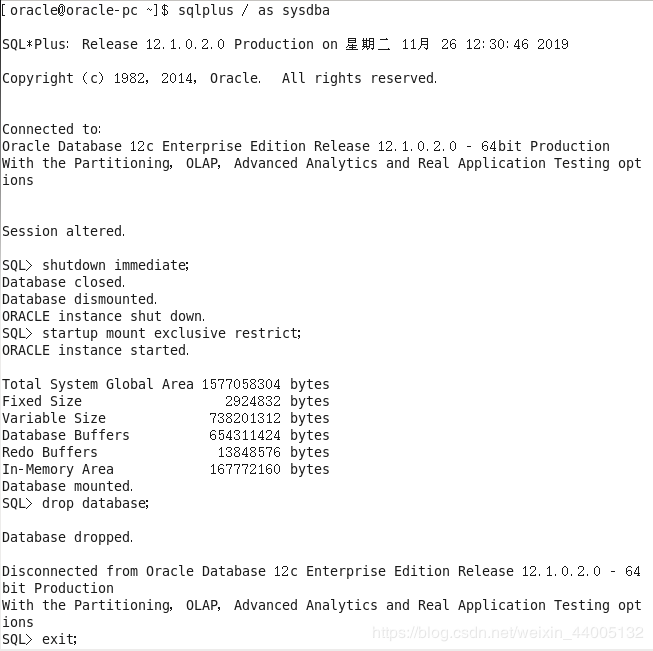
Database dropped.

Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

SQL> exit;

```



\*\*启动到nomount7\*\*

```

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on 星期二 11月 26 12:33:33 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Connected to an idle instance.

alter session set NLS\_DATE\_FORMAT='YYYY-MM-DD HH24:MI:SS'

\*

ERROR at line 1:

ORA-01034: ORACLE not available

进程 ID: 0

会话 ID: 0 序列号: 0

SQL> startup nomount

ORACLE instance started.

Total System Global Area 1577058304 bytes

Fixed Size 2924832 bytes

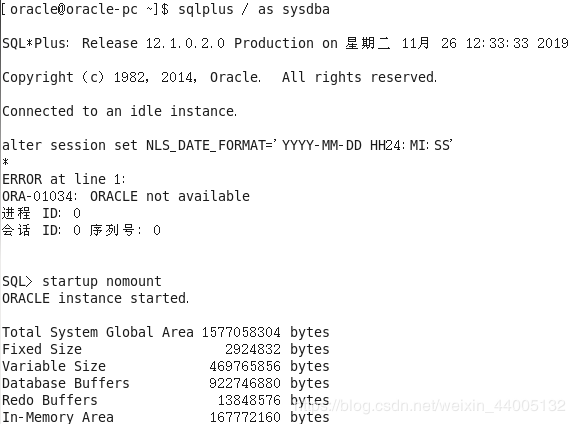
Variable Size 469765856 bytes

Database Buffers 922746880 bytes

Redo Buffers 13848576 bytes

In-Memory Area 167772160 bytes

```



\*\*第二步：主库:\*\*

```

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on 星期二 11月 26 12:36:00 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

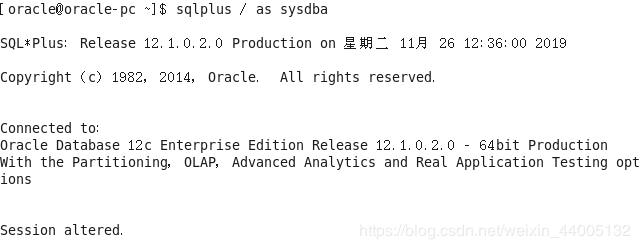
Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

```



```

SQL> select group#,thread#,members,status from v$log;

GROUP# THREAD# MEMBERS STATUS

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

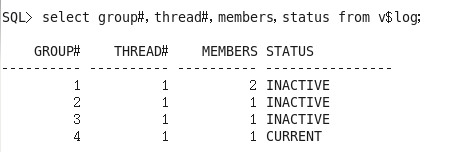
1 1 2 INACTIVE

2 1 1 INACTIVE

3 1 1 INACTIVE

4 1 1 CURRENT

```



```

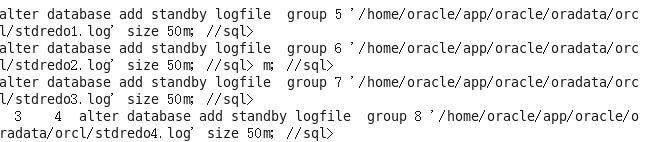
alter database add standby logfile group 5 '/home/oracle/app/oracle/oradata/orcl/stdredo1.log' size 50m;

alter database add standby logfile group 6 '/home/oracle/app/oracle/oradata/orcl/stdredo2.log' size 50m;

alter database add standby logfile group 7 '/home/oracle/app/oracle/oradata/orcl/stdredo3.log' size 50m;

alter database add standby logfile group 8 '/home/oracle/app/oracle/oradata/orcl/stdredo4.log' size 50m;

```



\*\*主库环境开启强制归档\*\*

```

ALTER DATABASE FORCE LOGGING;

```

IMG_256

```

alter system set LOG\_ARCHIVE\_CONFIG='DG\_CONFIG=(orcl,stdorcl)' scope=both sid='\*';

alter system set log\_archive\_dest\_1='LOCATION=/home/oracle/arch VALID\_FOR=(ALL\_LOGFILES,ALL\_ROLES) DB\_UNIQUE\_NAME=orcl' scope=spfile;

alter system set LOG\_ARCHIVE\_DEST\_2='SERVICE=stdorcl LGWR ASYNC VALID\_FOR=(ONLINE\_LOGFILES,PRIMARY\_ROLE) DB\_UNIQUE\_NAME=stdorcl' scope=both sid='\*';h sid='\*';

alter system set fal\_client='orcl' scope=both sid='\*';

alter system set FAL\_SERVER='stdorcl' scope=both sid='\*';

alter system set standby\_file\_management=AUTO scope=both sid='\*';

alter system set DB\_FILE\_NAME\_CONVERT='/home/oracle/app/oracle/oradata/stdorcl/','/home/oracle/app/oracle/oradata/orcl/' scope=spfile sid='\*';

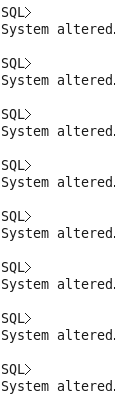
alter system set LOG\_FILE\_NAME\_CONVERT='/home/oracle/app/oracle/oradata/stdorcl/','/home/oracle/app/oracle/oradata/orcl/' scope=spfile sid='\*';

alter system set log\_archive\_format='%t\_%s\_%r.arc' scope=spfile sid='\*';

alter system set remote\_login\_passwordfile='EXCLUSIVE' scope=spfile;

alter system set LOG\_ARCHIVE\_CONFIG='DG\_CONFIG=(orcl,stdorcl)' scope=both sid='\*';

```



**\*\*编辑主库以及备库的/home/oracle/app/oracle/product/12.1.0/dbhome\_1/network/admin/tnsnames.ora文件\*\***

```

gedit /home/oracle/app/oracle/product/12.1.0/dbhome\_1/network/admin/tnsnames.ora

```

添加代码

```

ORCL =

(DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.199.231)(PORT = 1521)) //\*\*

)

(CONNECT\_DATA =

(SERVER = DEDICATED)

(SERVICE\_NAME = orcl)

)

)

stdorcl =

(DESCRIPTION =

(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.199.159)(PORT = 1521)) //\*\*

(CONNECT\_DATA =

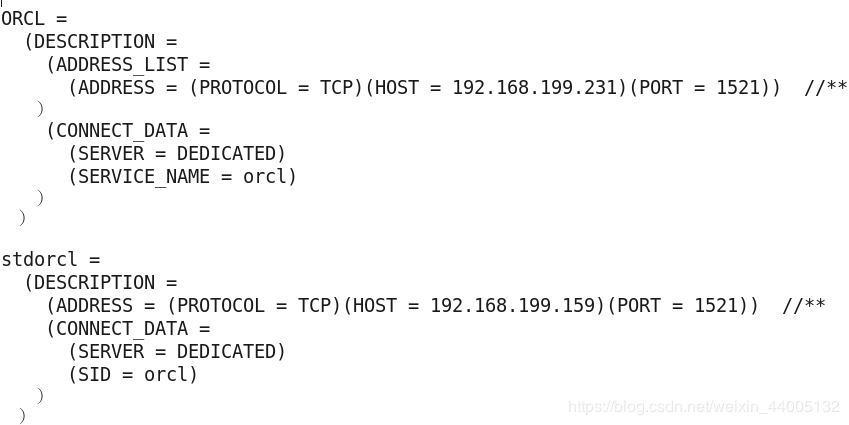
(SERVER = DEDICATED)

(SID = orcl)

)

)

```



**生成/home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/initorcl.ora**

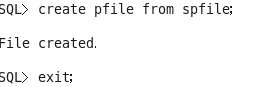
```

SQL> create pfile from spfile;

File created.

SQL> exit;

```



**\*\*将主库的参数文件，密码文件拷贝到备库:\*\***

```

[oracle@oracle-pc ~]$ scp /home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/initorcl.ora 192.168.199.159:/home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/

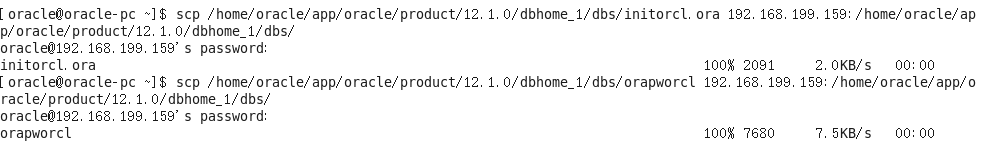
oracle@192.168.199.159's password:

initorcl.ora 100% 2091 2.0KB/s 00:00

[oracle@oracle-pc ~]$ scp /home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/orapworcl 192.168.199.159:/home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/

oracle@192.168.199.159's password:

orapworcl 100% 7680 7.5KB/s 00:00

```

**\*\*将主库复制到备库\*\***

```

$rman target sys/123@orcl auxiliary sys/123@stdorcl

```

**\*\*执行duplicate:\*\***

```

run{

allocate channel c1 type disk;

allocate channel c2 type disk;

allocate channel c3 type disk;

allocate AUXILIARY channel c4 type disk;

allocate AUXILIARY channel c5 type disk;

allocate AUXILIARY channel c6 type disk;

DUPLICATE TARGET DATABASE

FOR STANDBY

FROM ACTIVE DATABASE

DORECOVER

NOFILENAMECHECK;

release channel c1;

release channel c2;

release channel c3;

release channel c4;

release channel c5;

release channel c6;

}

```

**\*\*第三步：备库\*\***

**\*\*在备库上更改参数文件\*\***

```

[oracle@oracle-pc ~]$ gedit /home/oracle/app/oracle/product/12.1.0/dbhome\_1/dbs/initorcl.ora

```

IMG_256

**替换文件内容**

```

orcl.\_\_data\_transfer\_cache\_size=0

orcl.\_\_db\_cache\_size=671088640

orcl.\_\_java\_pool\_size=16777216

orcl.\_\_large\_pool\_size=33554432

orcl.\_\_oracle\_base='/home/oracle/app/oracle'#ORACLE\_BASE set from environment

orcl.\_\_pga\_aggregate\_target=536870912

orcl.\_\_sga\_target=1258291200

orcl.\_\_shared\_io\_pool\_size=50331648

orcl.\_\_shared\_pool\_size=301989888

orcl.\_\_streams\_pool\_size=0

\*.\_allow\_resetlogs\_corruption=TRUE

\*.\_catalog\_foreign\_restore=FALSE

\*.audit\_file\_dest='/home/oracle/app/oracle/admin/orcl/adump'

\*.audit\_trail='db'

\*.compatible='12.1.0.2.0'

\*.control\_files='/home/oracle/app/oracle/oradata/orcl/control01.ctl','/home/oracle/app/oracle/fast\_recovery\_area/orcl/control02.ctl','/home/oracle/app/oracle/fast\_recovery\_area/orcl/control03.ctl'

\*.db\_block\_size=8192

\*.db\_domain=''

\*.db\_file\_name\_convert='/home/oracle/app/oracle/oradata/orcl/','/home/oracle/app/oracle/oradata/stdorcl/'

\*.db\_name='orcl'

\*.db\_unique\_name='stdorcl'

\*.db\_recovery\_file\_dest='/home/oracle/app/oracle/fast\_recovery\_area'

\*.db\_recovery\_file\_dest\_size=4823449600

\*.diagnostic\_dest='/home/oracle/app/oracle'

\*.dispatchers='(PROTOCOL=TCP)(dispatchers=1)(pool=on)(ticks=1)(connections=500)(sessions=1000)'

\*.enable\_pluggable\_database=true

\*.fal\_client='stdorcl'

\*.fal\_server='orcl'

\*.inmemory\_max\_populate\_servers=2

\*.inmemory\_size=157286400

\*.local\_listener=''

\*.log\_archive\_config='DG\_CONFIG=(stdorcl,orcl)'

\*.log\_archive\_dest\_1='LOCATION=/home/oracle/arch VALID\_FOR=(ALL\_LOGFILES,ALL\_ROLES) DB\_UNIQUE\_NAME=stdorcl'

\*.log\_archive\_dest\_2='SERVICE=orcl LGWR ASYNC VALID\_FOR=(ONLINE\_LOGFILES,PRIMARY\_ROLE) DB\_UNIQUE\_NAME=orcl'

\*.log\_archive\_format='%t\_%s\_%r.arc'

\*.log\_file\_name\_convert='/home/oracle/app/oracle/oradata/orcl/','/home/oracle/app/oracle/oradata/stdorcl/'

\*.max\_dispatchers=5

\*.max\_shared\_servers=20

\*.open\_cursors=400

\*.parallel\_execution\_message\_size=8192

\*.pga\_aggregate\_target=511m

\*.processes=300

\*.recovery\_parallelism=0

\*.remote\_login\_passwordfile='EXCLUSIVE'

\*.service\_names='ORCL'

\*.sga\_max\_size=1572864000

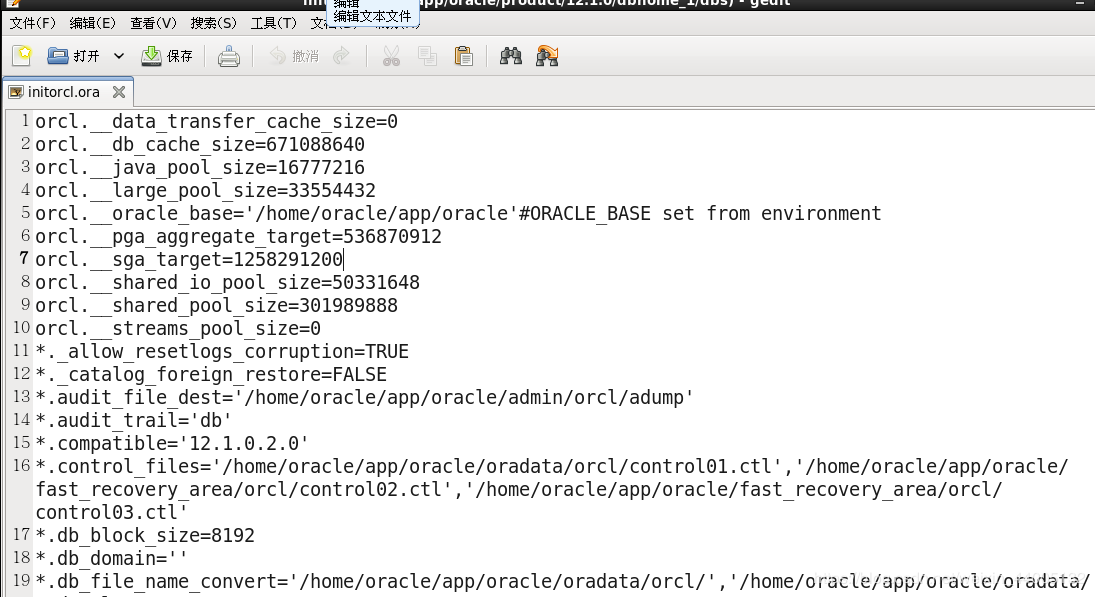
\*.sga\_target=1258291200

\*.shared\_server\_sessions=200

\*.standby\_file\_management='AUTO'

\*.undo\_tablespace='UNDOTBS1'

```



**\*\*在备库增加静态监听\*\***

```

gedit /home/oracle/app/oracle/product/12.1.0/dbhome\_1/network/admin/listener.ora

```

IMG_256

```

SID\_LIST\_LISTENER =

(SID\_LIST =

(SID\_DESC =

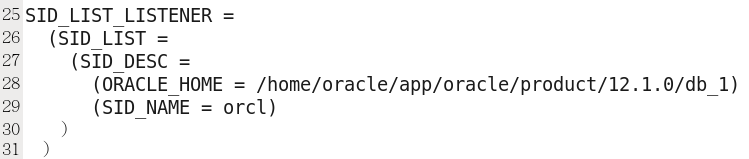
(ORACLE\_HOME = /home/oracle/app/oracle/product/12.1.0/db\_1)

(SID\_NAME = orcl)

)

)

```



**\*\*重新启动,备库开启实时应用模式:：\*\***

```

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL\*Plus: Release 12.1.0.2.0 Production on 星期二 11月 26 20:44:33 2019

Copyright (c) 1982, 2014, Oracle. All rights reserved.

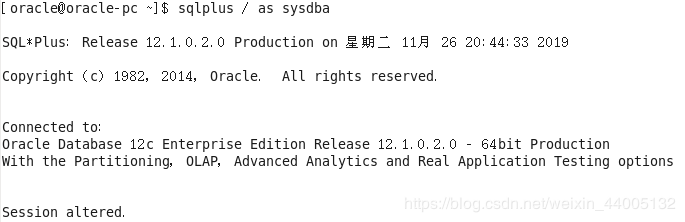
Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

Session altered.

```



```

shutdown immediate /

startup

alter database recover managed standby database disconnect;

```