

ParnassusData is a software company

PRM-DUL Testing for Oracle Database Recovery



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文档控制

变更记录

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30-Oct-14	Biot Wang	1.0	Initial

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简介

本文目的

Parnassusdata Recovery Management Tool's testing.

相关参考

1) PRM 技术白皮书

2)

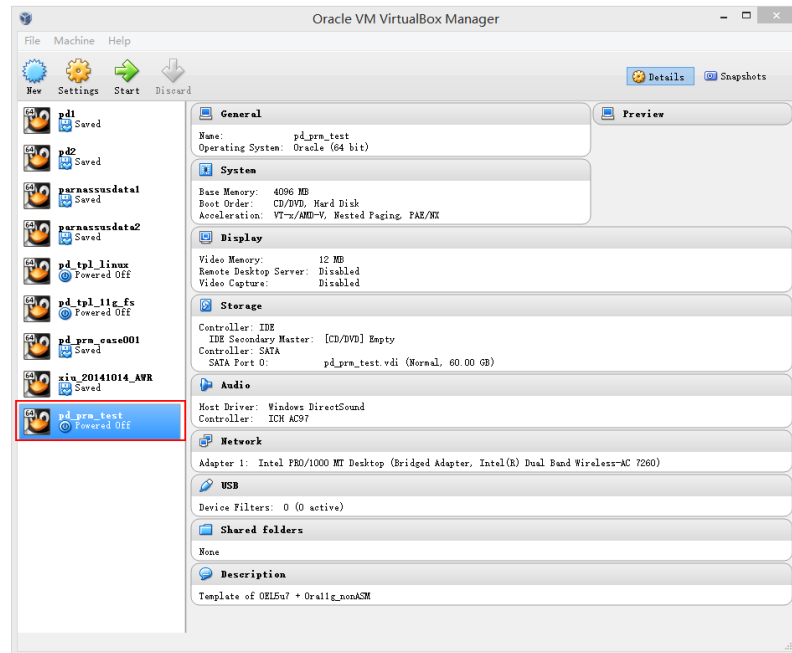
http://parnassusdata.com/sites/default/files/ParnassusData_PRMForOracle_3206.zip

测试准备

实验环境

Clone one Virtual Machine.

OEL5u7 + Oracle 11g non-ASM (Here is pd_prm_test)



Java openJDK 安装

使用 OEL5u7 安装光盘镜像中自带的 openJDK 安装:

Login with root.

\$ java -version

```
[root@pd ~]# java -version
java version "1.4.2"
gij (GNU libgcj) version 4.1.2 20080704 (Red Hat 4.1.2-51)

Copyright (C) 2006 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
[root@pd ~]#
```

**由于 PRM-DUL 推荐使用 Java 1.6 以上版本, 因此需要另行安装更高版本 JDK. 推荐安装 openJDK.

虚拟机 cdrom 倒入安装光盘 ISO 文件。

```
# cd /media
```

```
# mkdir disk
```

```
# mount /dev/cdrom /media/disk
```

```
# cd disk
```

```
# ls
```

```
[root@pd media]# cd disk
[root@pd disk]# ls
blafdoc.css      eula.py          README-en.html   Server
Cluster          GPL              RELEASE-NOTES-en supportinfo
ClusterStorage  images           RELEASE-NOTES-en.html TRANS.TBL
EULA             isolinux         RPM-GPG-KEY      VT
eula.en_US       README-en        RPM-GPG-KEY-oracle
```

```
# yum install java
```

```
root@pd:/media/disk
updated
--> Processing Dependency: tzdata-java for package: java-1.6.0-openjdk
--> Running transaction check
--> Package tzdata-java.x86_64 0:2011g-1.el5 set to be updated
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                Arch      Version                      Repository    Size
=====
Installing:
java-1.6.0-openjdk     x86_64    1:1.6.0.0-1.22.1.9.8.0.1.el5_6  oel5u7       37 M
Installing for dependencies:
tzdata-java            x86_64    2011g-1.el5                  oel5u7       180 k
=====

Transaction Summary
-----
Install      2 Package(s)
Upgrade      0 Package(s)

Total download size: 37 M
Is this ok [y/N]:
```

切换版本

```
# alternatives --config java
```

```
[root@pd disk]# alternatives --config java

There are 2 programs which provide 'java'.

   Selection    Command
-----
      1         /usr/lib/jvm/jre-1.4.2-gcj/bin/java
  *+  2         /usr/lib/jvm/jre-1.6.0-openjdk.x86_64/bin/java

Enter to keep the current selection[+], or type selection number: 2
```

安装设置完成

```
# java -version
```

```
[root@pd disk]# java -version
java version "1.6.0_20"
OpenJDK Runtime Environment (IcedTea6 1.9.8) (rhel-1.22.1.9.8.0.1.el5_6-x86_64)
OpenJDK 64-Bit Server VM (build 19.0-b09, mixed mode)
[root@pd disk]#
```

Oracle 数据库安装

由于被克隆的环境中已安装 Oracle 11g 数据库。

所以可直接使用，如果实验环境中未安装数据库，可参考：

- 1) PD_使用 VirtualBox 在 Oracle Linux 5.7 上安装 Oracle Database 11g Release 2 RAC 的最佳实践.pdf
- 2) PD_虚拟个人实验环境的模板搭建.pdf

PRM 安装

Login with oracle

\$ mkdir tmp

Upload file ParnassusData_PRMForOracle_3206.zip to
/home/oracle/tmp by using FTP.

cd ~

unzip tmp/ParnassusData_PRMForOracle_3206.zip

cd ParnassusData_PRMForOracle_3206

chmod 750 prm.bat

chmod 750 prm.sh

chmod 750 prm_startup.sh

启动 Linux X window

startx

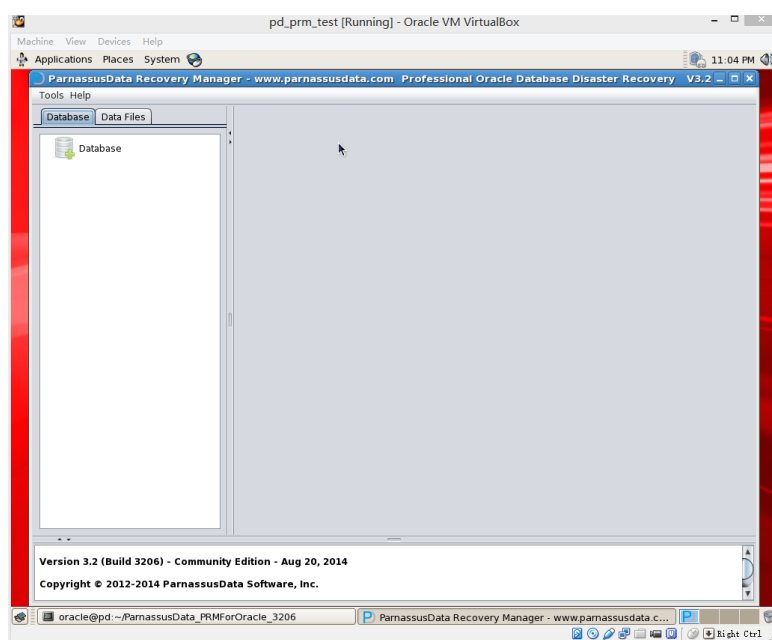
Open terminal 并启动 PRM-DUL

cd ParnassusData_PRMForOracle_3206

sh prm.sh

诗檀软件 专业 Oracle 数据库服务 www.parnassusdata.com

Oracle 紧急服务国内热线电话： **400-690-3643**



开启成功。

测试恢复场景

Sample 1: Table Truncate Recovery

Sample 2: Table Truncate Recovery (DataBridge)

Sample 3: 数据库字典受损导致数据库无法启动

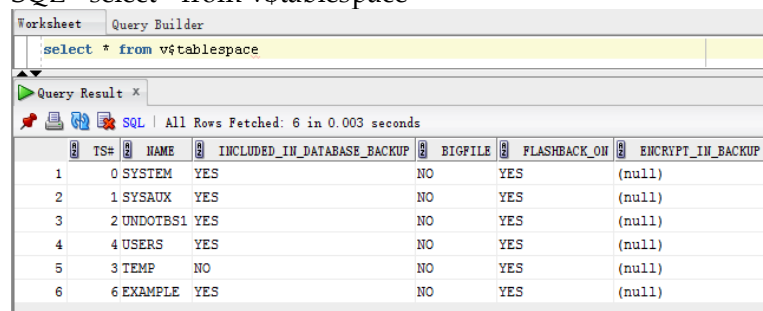
Sample 4 & Sample 5: 字典库受损严重或 SYSTEM 表空间已丢失

Sample 1

Table Truncate Recovery

1. 模拟重现场景:

SQL> select * from v\$tablespace



Worksheet Query Builder

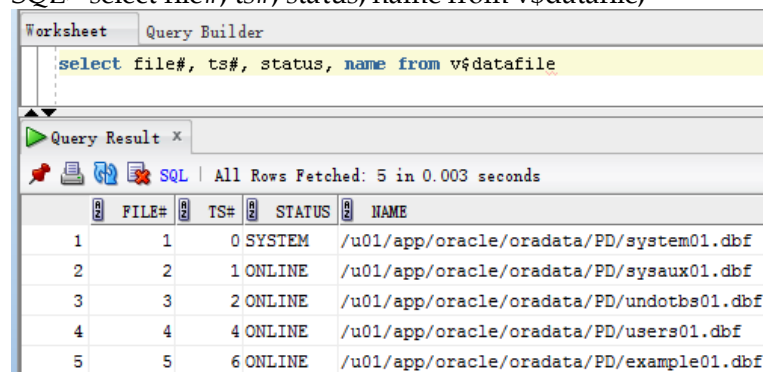
select * from v\$tablespace

Query Result x

SQL | All Rows Fetched: 6 in 0.003 seconds

	TS#	NAME	INCLUDED_IN_DATABASE_BACKUP	BIGFILE	FLASHBACK_ON	ENCRYPT_IN_BACKUP
1	0	SYSTEM	YES	NO	YES	(null)
2	1	SYS_AUX	YES	NO	YES	(null)
3	2	UNDOTBS1	YES	NO	YES	(null)
4	4	USERS	YES	NO	YES	(null)
5	3	TEMP	NO	NO	YES	(null)
6	6	EXAMPLE	YES	NO	YES	(null)

SQL> select file#, ts#, status, name from v\$datafile;



Worksheet Query Builder

select file#, ts#, status, name from v\$datafile

Query Result x

SQL | All Rows Fetched: 5 in 0.003 seconds

	FILE#	TS#	STATUS	NAME
1	1	0	SYSTEM	/u01/app/oracle/oradata/PD/system01.dbf
2	2	1	ONLINE	/u01/app/oracle/oradata/PD/sysaux01.dbf
3	3	2	ONLINE	/u01/app/oracle/oradata/PD/undotbs01.dbf
4	4	4	ONLINE	/u01/app/oracle/oradata/PD/users01.dbf
5	5	6	ONLINE	/u01/app/oracle/oradata/PD/example01.dbf

SQL> create user prmmuser identified by oracle;

SQL> grant dba to prmmuser;

SQL> create table prmmuser.test_tbl(empno number primary key, name varchar2(50), age number, role varchar2(30))

tablespace USERS;

```
SQL> create user prouser identified by oracle;
User created.
SQL> create table prouser.test_tbl(empno number primary key, name varchar2(50), age number, role varchar2(30)) tablespace USERS;
Table created.
SQL> []
```

以 prouser 登陆数据库并插入表数据：

sqlplus prouser/oracle@PD

```
SQL> insert into prouser.test_tbl values(1, 'HZY', 29,
'ROLE1');
```

```
SQL> insert into prouser.test_tbl values(2, 'LXB', 29,
'ROLE2');
```

```
SQL> insert into prouser.test_tbl values(3, 'WWH', 30,
'ROLE3');
```

```
SQL> commit;
```

```
[oracle@pd ~]$ sqlplus prouser/oracle@PD;

SQL*Plus: Release 11.2.0.4.0 Production on Mon Nov 3 04:26:48 2014

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> insert into prouser.test_tbl values(1, 'HZY', 29, 'ROLE1');

1 row created.

SQL> insert into prouser.test_tbl values(2, 'LXB', 29, 'ROLE2');

1 row created.

SQL> insert into prouser.test_tbl values(3, 'WWH', 30, 'ROLE3');

1 row created.

SQL> commit;

Commit complete.

SQL> []
```

```
SQL> col name for a20
```

```
SQL> col role for a20
```

```
SQL> select * from test_tbl;
```

```
SQL> select * from test_tbl;
```

EMPNO	NAME	AGE	ROLE
1	HZY	29	ROLE1
2	LXB	29	ROLE2
3	WWH	30	ROLE3

```
SQL> []
```

```
SQL> select count(*) from test_tbl;
```

```
SQL> select count(*) from test_tbl;

COUNT (*)
-----
          3
```

```
SQL> select bytes/1024/1024 from dba_segments where
segment_name=upper('test_tbl') and
owner=upper('prouser');
```

```
BYTES/1024/1024
-----
          .0625
```

```
SQL> truncate table test_tbl;
```

```
SQL> truncate table test_tbl
2 ;

Table truncated.

SQL> select count(*) from test_tbl;

COUNT (*)
-----
          0
```

2. 使用 PRM-DUL 恢复

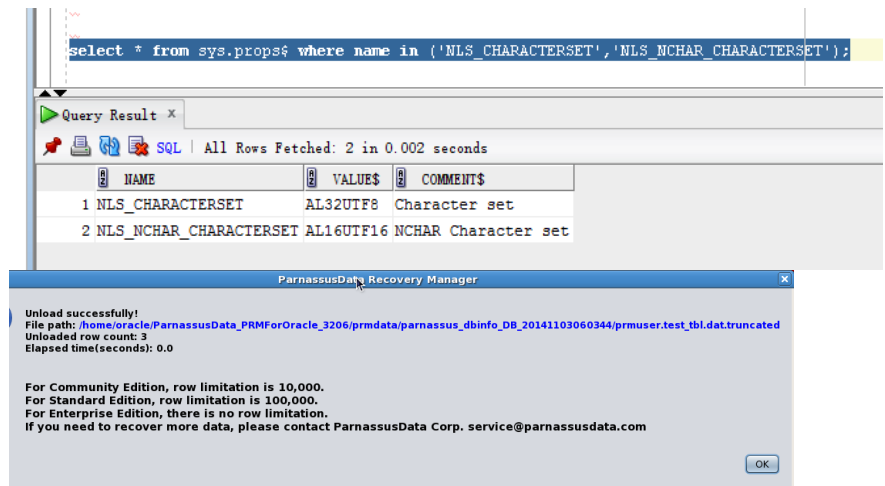
1) Login with oracle and start PRM

2)

Tools -> Recovery Wizard -> Next

Select 'Dictionary Mode' -> Next

```
SQL> select * from sys.props$ where name in
('NLS_CHARACTERSET','NLS_NCHAR_CHARACTERSET');
```



```

oracle@pd:~/ParnassusData_PRMForOracle_3206/prmdata/parnassus_d...
[oracle@pd parnassus_dbinfo_DB_20141103060344]$ ls
bootstrap$.dat          sys.indcompart$.ctl    sys.props$.dat
dict.ddl                sys.indcompart$.dat    sys.tabcompart$.ctl
EXT.dat                sys.ind$.ctl           sys.tabcompart$.dat
prmuser.test_tbl.ctl    sys.ind$.dat           sys.tab$.ctl
prmuser.test_tbl.dat.truncated sys.indpart$.ctl       sys.tab$.dat
scanTables_extentsMode.out sys.indpart$.dat       sys.tabpart$.ctl
SEG.dat                sys.indsubpart$.ctl    sys.tabpart$.dat
sys.attribute$.ctl      sys.indsubpart$.dat    sys.tabsubpart$.ctl
sys.attribute$.dat      sys.lobcompart$.ctl    sys.tabsubpart$.dat
sys.col$.ctl            sys.lobcompart$.dat    sys.ts$.ctl
sys.col$.dat            sys.lob$.ctl           sys.ts$.dat
sys.collection$.ctl     sys.lob$.dat           sys.type$.ctl
sys.collection$.dat     sys.lobfrag$.ctl       sys.type$.dat
sys.coltype$.ctl        sys.lobfrag$.dat       sys.undo$.ctl
sys.coltype$.dat        sys.obj$.ctl           sys.undo$.dat
sys.icol$.ctl           sys.obj$.dat           sys.user$.ctl
sys.icol$.dat           sys.props$.ctl         sys.user$.dat
[oracle@pd parnassus_dbinfo_DB_20141103060344]$ cat prmuser.test_tbl.dat.truncated
"1" "HZY" "29" "ROLE1"
"2" "LXB" "29" "ROLE2"
"3" "WWH" "30" "ROLE3"
[oracle@pd parnassus_dbinfo_DB_20141103060344]$
    
```

```

[oracle@pd parnassus_dbinfo_DB_20141103060344]$ cat prmuser.test_tbl.ctl
LOAD DATA
INFILE 'prmuser.test_tbl.dat.truncated'
APPEND
INTO TABLE prmuser.test_tbl
FIELDS TERMINATED BY ' '
OPTIONALLY ENCLOSED BY '"'
TRAILING NULLCOLS (
  "EMPNO" ,
  "NAME" ,
  "AGE" ,
  "ROLE"
)
[oracle@pd parnassus_dbinfo_DB_20141103060344]$
    
```

\$ sqlldr control=prmuser.test_tbl.ctl direct=true

```
[oracle@pd parnassus_dbinfo_DB_20141103060344]$ sqlldr control=prmuser.test_tbl.
ctl direct=true
Username:prmuser
Password:

SQL*Loader: Release 11.2.0.4.0 - Production on Mon Nov 3 10:25:46 2014

Copyright (c) 1982, 2011, Oracle and/or its affiliates. All rights reserved.

Load completed - logical record count 3.
[oracle@pd parnassus_dbinfo_DB_20141103060344]$
```

恢复成功

```
SQL> select * from prmuser.test_tbl;
```

EMPNO	NAME	AGE	ROLE
1	HZY	29	ROLE1
2	LXB	29	ROLE2
3	WWH	30	ROLE3

Sample 2

Table Truncate Recovery (DataBridge)

1. 模拟重现场景

```
oracle@pd:~
File Edit View Terminal Tabs Help
[oracle@pd ~]$ sqlplus prmuser/oracle@PD;

SQL*Plus: Release 11.2.0.4.0 Production on Mo

Copyright (c) 1982, 2013, Oracle. All rights

Connected to:
Oracle Database 11g Enterprise Edition Releas
With the Partitioning, OLAP, Data Mining and

SQL> truncate table test_tbl;

Table truncated.

SQL> select (1) from test_tbl;

no rows selected

SQL>
```

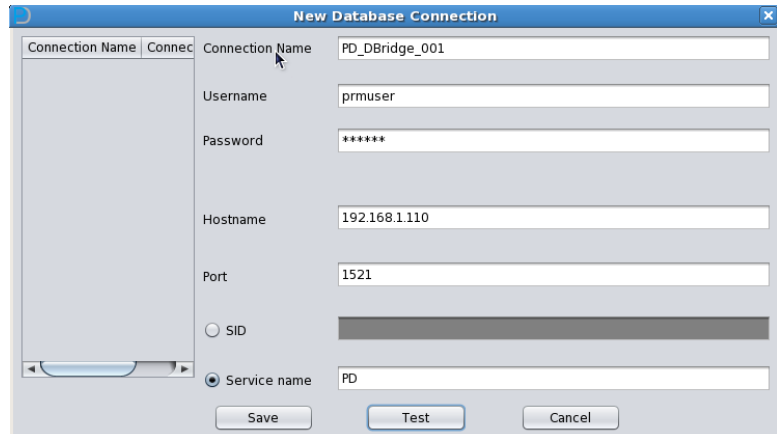
2. 使用 PRM-DUL (DataBridge)恢复

1) Login with oracle and start PRM

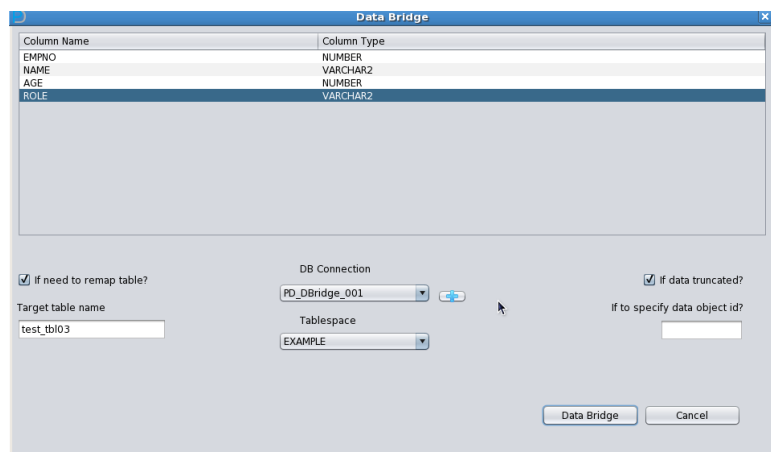
2)

Tools -> Recovery Wizard -> Next

Select 'Dictionary Mode' -> Next



The 'New Database Connection' dialog box is shown. It has a 'Connection Name' field with the value 'PD_DBridge_001'. The 'Username' field contains 'prmmuser' and the 'Password' field contains '*****'. The 'Hostname' field is '192.168.1.110' and the 'Port' field is '1521'. The 'Service name' radio button is selected, with the value 'PD' in the adjacent field. There are 'Save', 'Test', and 'Cancel' buttons at the bottom.



The 'Data Bridge' dialog box is shown. It features a table with columns 'Column Name' and 'Column Type'. The table contains the following data:

Column Name	Column Type
EMPNO	NUMBER
NAME	VARCHAR2
AGE	NUMBER
ROLE	VARCHAR2

Below the table, there are several options: a checked checkbox 'If need to remap table?', a 'Target table name' field with the value 'test_tbl03', a 'DB Connection' dropdown menu with 'PD_DBridge_001' selected, a 'Tablespace' dropdown menu with 'EXAMPLE' selected, a checked checkbox 'If data truncated?', and a field 'If to specify data object id?'. At the bottom right are 'Data Bridge' and 'Cancel' buttons.

```

oracle@pd:~
File Edit View Terminal Tabs Help
[oracle@pd ~]$ sqlplus prmsuser/oracle@PD;

SQL*Plus: Release 11.2.0.4.0 Production on Mon Nov 3 12:10:50 2014

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> create table test_tbl04 as select * from test_tbl where l=0;

Table created.

SQL> desc test_tbl04;
Name                                         Null?    Type
-----
EMPNO                                         NUMBER
NAME                                         VARCHAR2(50)
AGE                                           NUMBER
ROLE                                         VARCHAR2(30)

SQL> select count(*) from test_tbl04;

COUNT(*)
-----
0

SQL>
    
```

For prmsuser.test_tbl truncated table recovery testing results:

DateBridged Table	Tablespace	Created before DataBridged?	Results
test_tbl01	USERS	N	Recovered
test_tbl02	USERS	N	Recovered
test_tbl03	EXAMPLE	N	Recovered
test_tbl04	USERS	Y	Recovered

恢复成功

Sample 3

数据库字典受损导致数据库无法启动

此场景指数据库字典受损还不太严重但已无法启动数据库的情况下

1. 模拟重现场景
 - 1) Clone one virtual machine (pd_prm_test_1)
 Change the related server ip 192.168.1.120 (original is

192.168.1.110)

Start the virtual machine pd_prm_test, we will extract data from pd_prm_test_1 and databridged to pd_prm_test.

2) Login with oracle in pd_prm_test_1

```
$ sqlplus / as sysdba
```

```
SQL> create user prouser identified by oracle;
```

```
SQL> grant dba to prouser;
```

```
SQL> exit
```

```
$ sqlplus prouser/oracle@PD
```

```
SQL> create table test_sys_tbl(empno number, name  
varchar2(30)) tablespace USERS;
```

```
SQL> insert into test_sys_tbl values(1, 'TEST1');
```

```
SQL> insert into test_sys_tbl values(1, 'TEST2');
```

```
SQL> commit;
```

```
SQL> select * from test_sys_tbl;
```

```
SQL> select * from test_sys_tbl;
```

EMPNO	NAME
1	TEST1
2	TEST2

3) Drop table sys.ts\$

```
SQL> delete from ts$;
```

```
7 rows deleted.
```

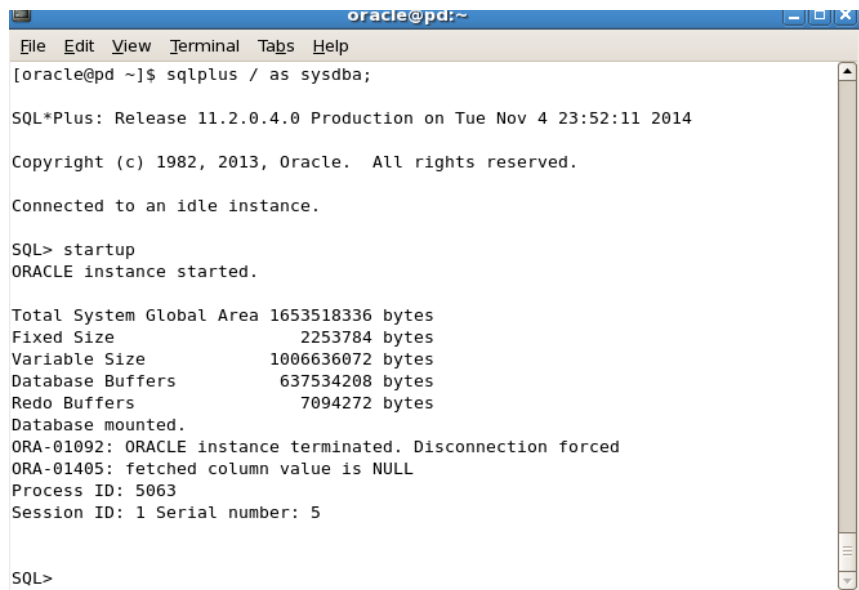
```
SQL> commit;
```

```
Commit complete.
```

```
SQL> alter system checkpoint;
```

```
System altered.
```

Shutdown 后，启动不能：



```
oracle@pd:~  
File Edit View Terminal Tabs Help  
[oracle@pd ~]$ sqlplus / as sysdba;  
  
SQL*Plus: Release 11.2.0.4.0 Production on Tue Nov 4 23:52:11 2014  
  
Copyright (c) 1982, 2013, Oracle. All rights reserved.  
  
Connected to an idle instance.  
  
SQL> startup  
ORACLE instance started.  
  
Total System Global Area 1653518336 bytes  
Fixed Size 2253784 bytes  
Variable Size 1006636072 bytes  
Database Buffers 637534208 bytes  
Redo Buffers 7094272 bytes  
Database mounted.  
ORA-01092: ORACLE instance terminated. Disconnection forced  
ORA-01405: fetched column value is NULL  
Process ID: 5063  
Session ID: 1 Serial number: 5  
  
SQL>
```

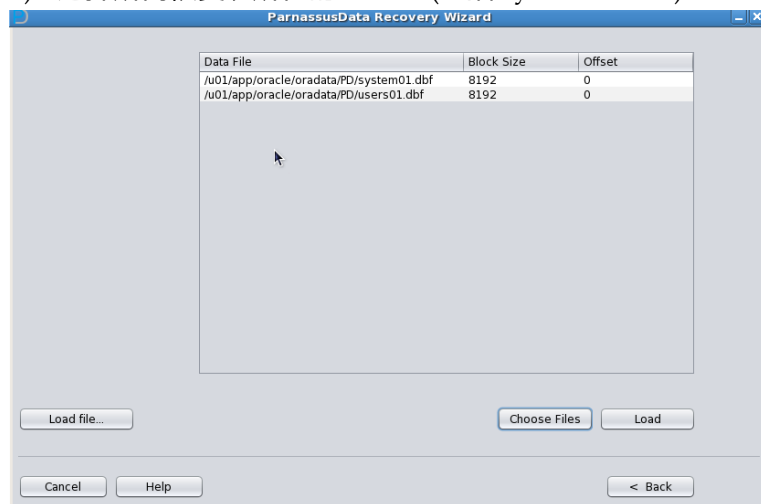
2. 使用 PRM-DUL (DataBridge)恢复

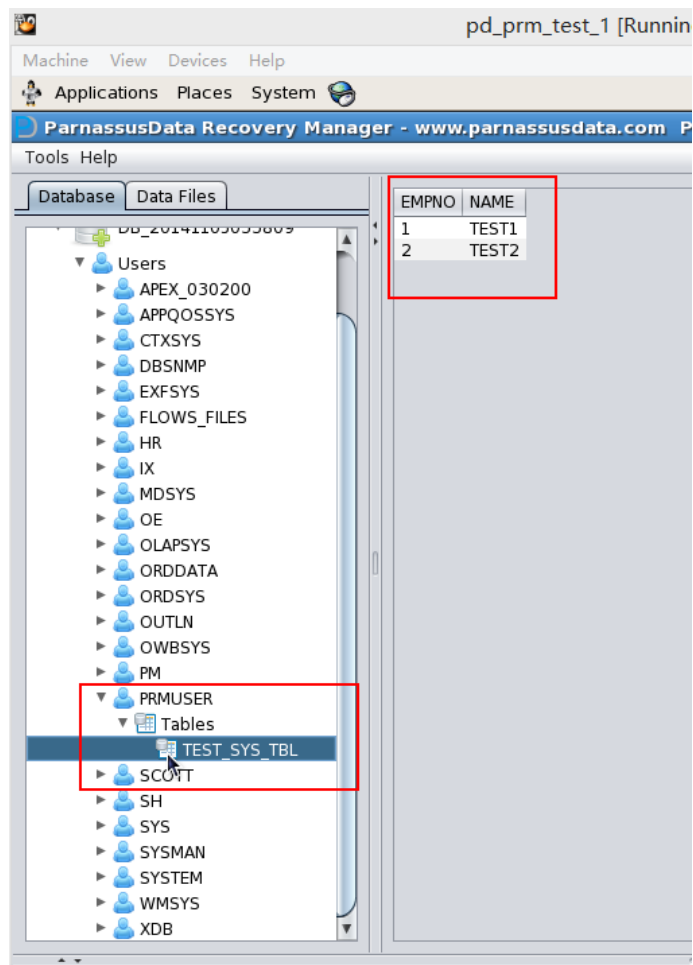
1) Login with oracle and start PRM

2) Tools -> Recovery Wizard -> Next

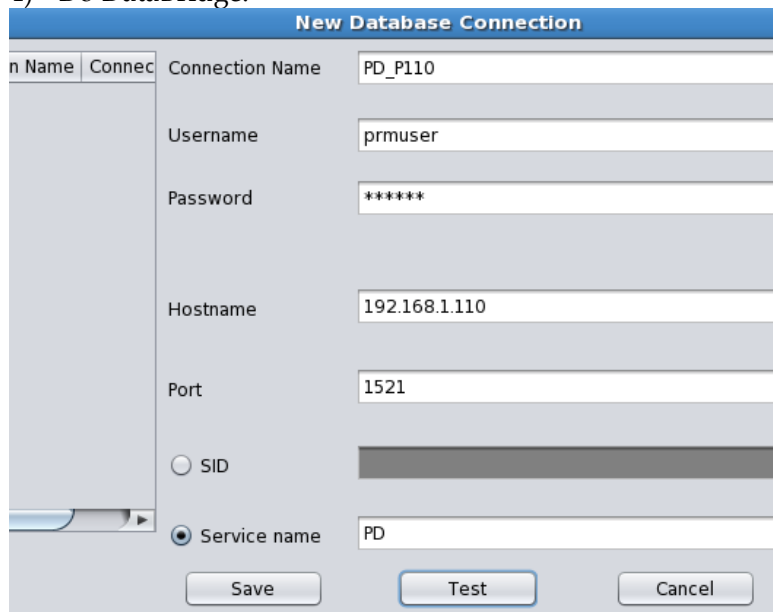
Select 'Dictionary Mode' -> Next

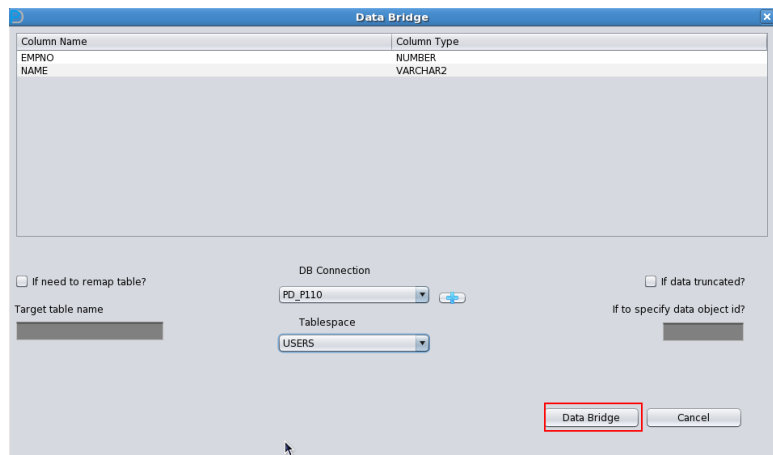
3) 选择所需恢复表所在的 db file (包括 system db file)





4) Do DataBridge:





Go to pd_prm_test server and login with oracle:

```
$ sqlplus prmuser/oracle@PD
```

```
SQL> col name form a25
SQL> select * from test_sys_tbl;

  EMPNO NAME
-----
      1 TEST1
      2 TEST2

SQL> _
```

数据被成功抽出。

Sample 4 & Sample 5

字典库受损严重或 SYSTEM 表空间已丢失。

1. 模拟重现场景

1) Clone one virtual machine (pd_prm_test_2)

Change the related server ip 192.168.1.130 (original is 192.168.1.110)

Start the virtual machine pd_prm_test, we will extract data from pd_prm_test_2 and databridged to pd_prm_test.

2) Login with oracle in pd_prm_test_2

\$ sqlplus / as sysdba

SQL> create user prouser identified by oracle;

SQL> grant dba to prouser;

SQL> exit

\$ sqlplus prouser/oracle@PD

SQL> create table test_null_tbl(empno number, name
varchar2(30), blb blob, chk varchar2(5)) tablespace USERS

SQL> insert into test_null_tbl values(1, 'TEST1',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(2, 'TEST2',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(3, 'TEST3',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(4, 'TEST4',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(5, 'TEST5',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(6, 'TEST6',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(7, 'TEST7',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(8, 'TEST8',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(9, 'TEST9',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(10, 'TEST10',
to_blob('110010000110011'), NULL);

SQL> insert into test_null_tbl values(11, 'TEST11', NULL,
NULL);

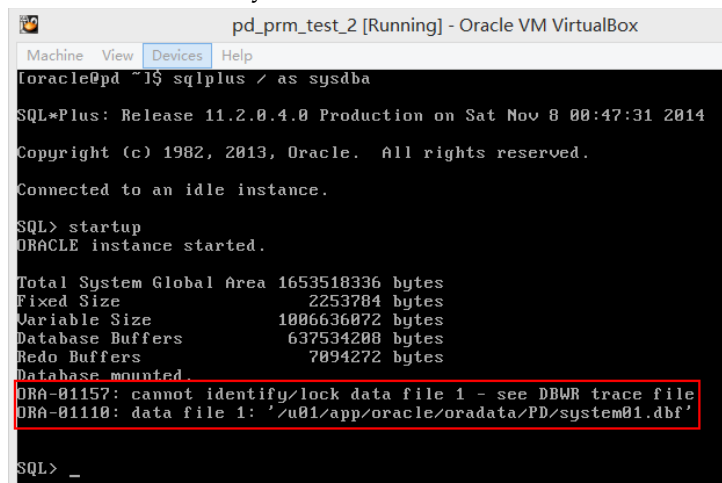
SQL> insert into test_null_tbl values(12, 'TEST12', NULL,
NULL);

SQL> insert into test_null_tbl values(13, 'TEST13', NULL,
NULL);

```
SQL> insert into test_null_tbl values(14, 'TEST14', NULL,
NULL);
SQL> insert into test_null_tbl values(15, 'TEST15', NULL,
NULL);
SQL> insert into test_null_tbl values(16, 'TEST16', NULL,
NULL);
SQL> insert into test_null_tbl values(17, 'TEST17', NULL,
NULL);
SQL> insert into test_null_tbl values(18, 'TEST18', NULL,
NULL);
SQL> insert into test_null_tbl values(19, 'TEST19', NULL,
NULL);
SQL> insert into test_null_tbl values(20, 'TEST20', NULL,
NULL);
SQL> insert into test_null_tbl values(21, 'TEST21', NULL,
NULL);
SQL> insert into test_null_tbl values(22, 'TEST22', NULL,
NULL);
SQL> insert into test_null_tbl values(23, 'TEST23', NULL,
NULL);
SQL> insert into test_null_tbl values(24, 'TEST24', NULL,
NULL);
SQL> insert into test_null_tbl values(25, 'TEST25', NULL,
NULL);
SQL> insert into test_null_tbl values(26, 'TEST26', NULL,
NULL);
SQL> insert into test_null_tbl values(27, 'TEST27', NULL,
NULL);
SQL> insert into test_null_tbl values(28, 'TEST28', NULL,
NULL);
SQL> insert into test_null_tbl values(29, 'TEST29', NULL,
NULL);
SQL> insert into test_null_tbl values(30, 'TEST30', NULL,
NULL);
SQL> insert into test_null_tbl values(31, 'TEST31', NULL,
'Y31');
```

```
SQL> insert into test_null_tbl values(32, 'TEST32', NULL,
'Y32');
SQL> insert into test_null_tbl values(33, 'TEST33', NULL,
NULL);
SQL> insert into test_null_tbl values(34, 'TEST34', NULL,
NULL);
SQL> insert into test_null_tbl values(35, 'TEST35', NULL,
NULL);
SQL> commit;
SQL> alter system checkpoint;
```

关闭数据库后删除 system01.dbf , 启动数据库报错。



```
pd_prm_test_2 [Running] - Oracle VM VirtualBox
Machine View Devices Help
oracle@pd ~1$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Sat Nov 8 00:47:31 2014
Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to an idle instance.

SQL> startup
ORACLE instance started.

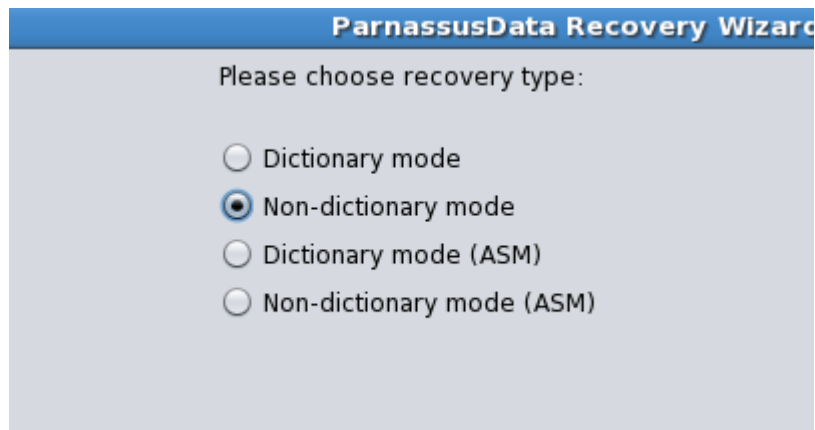
Total System Global Area 1653518336 bytes
Fixed Size 2253784 bytes
Variable Size 1006636072 bytes
Database Buffers 637534208 bytes
Redo Buffers 7094272 bytes
Database mounted.
ORA-01157: cannot identify/lock data file 1 - see DBWR trace file
ORA-01110: data file 1: '/u01/app/oracle/oradata/PD/system01.dbf'

SQL> _
```

2. 使用 PRM-DUL 进行恢复

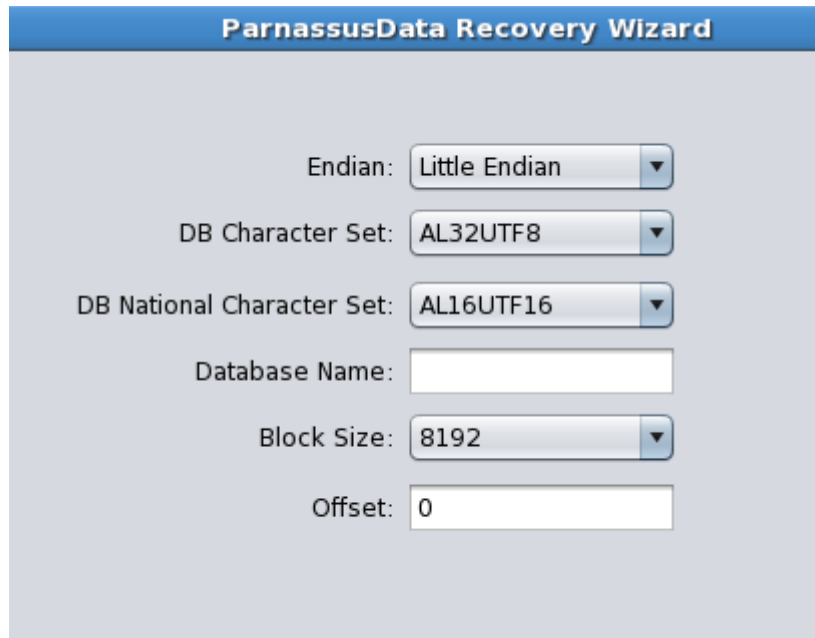
- 1) Login with oracle and start PRM
- 2) Tools -> Recovery Wizard -> Next

Use 'Non-dictionary mode'.



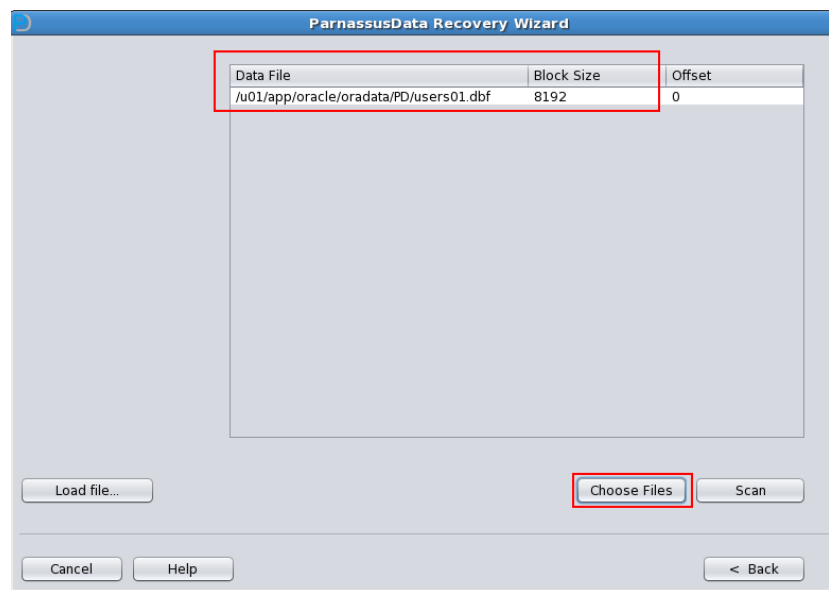
The screenshot shows the 'ParnassusData Recovery Wizard' window. The title bar is blue with the text 'ParnassusData Recovery Wizard'. Below the title bar, the text 'Please choose recovery type:' is displayed. There are four radio button options: 'Dictionary mode', 'Non-dictionary mode' (which is selected), 'Dictionary mode (ASM)', and 'Non-dictionary mode (ASM)'.

Use Default here.



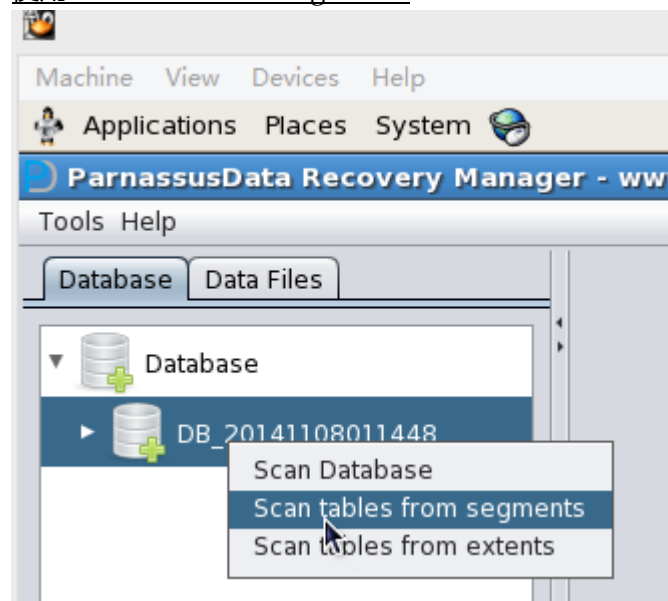
The screenshot shows the 'ParnassusData Recovery Wizard' window with various configuration settings. The title bar is blue with the text 'ParnassusData Recovery Wizard'. The settings are as follows: 'Endian' is set to 'Little Endian' (dropdown menu); 'DB Character Set' is set to 'AL32UTF8' (dropdown menu); 'DB National Character Set' is set to 'AL16UTF16' (dropdown menu); 'Database Name' is an empty text field; 'Block Size' is set to '8192' (dropdown menu); and 'Offset' is set to '0' (text field).

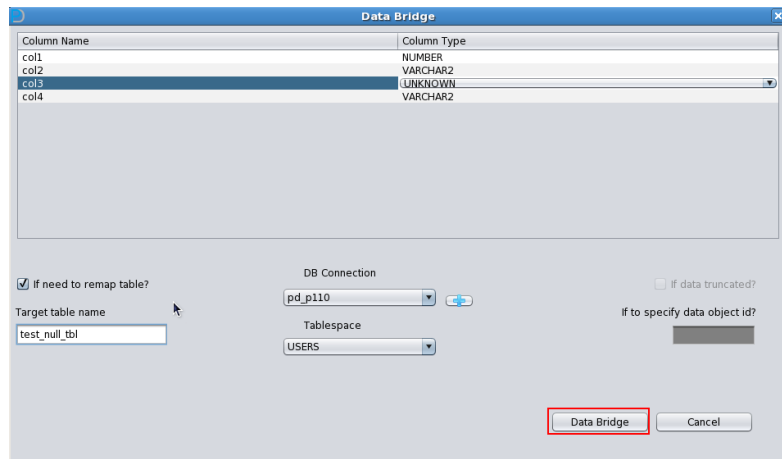
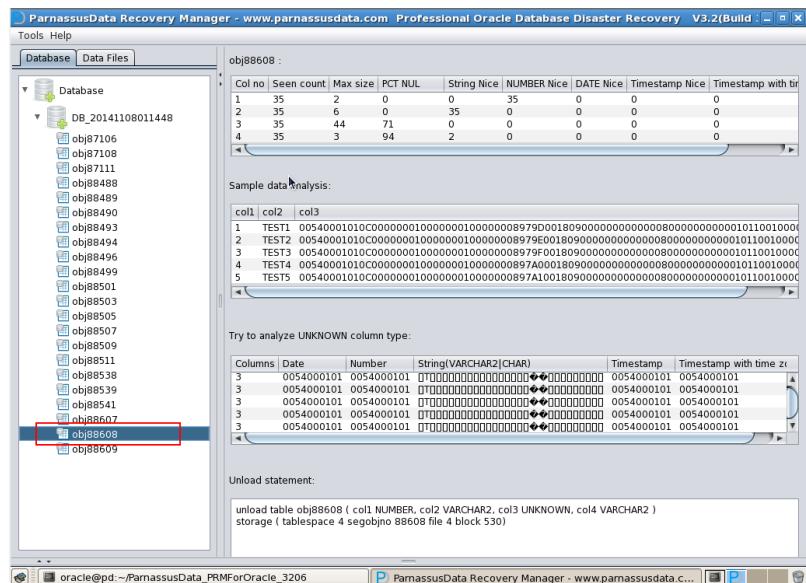
由于 System 表空间对应文件丢失，因此使用非字典模式恢复。
Choose File 选择需要抽取数据的文件。



Click Scan:

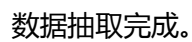
使用 Scan tables from segments:





在 192.168.1.110 中查询：

Oracle 紧急服务国内热线电话: **400-690-3643**



如果使用 Scan tables from extents (针对 Sample 5):



诗檀软件 专业 Oracle 数据库服务 www.parnassusdata.com

Oracle 紧急服务国内热线电话： **400-690-3643**

之后的抽取步骤一致。

其他问题

未解决的问题

问题号	问题描述	解决方案	日期
1	ASM copy & Recovery		8-Nov-2014

已解决的问题

问题号	问题描述	解决方案	解决日期

更多资源

技术资源: <http://www.parnassusdata.com/resources/>
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最后



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