【TTS】传输表空间 AIX asm -> linux asm 基于 rman

1.1 BLOG 文档结构图

1.2 前言部分

1.2.1 导读和注意事项

各位技术爱好者，看完本文后，你可以掌握如下的技能，也可以学到一些其它你所不知道的知识，~O(∩_∩)O~：

① 异构平台下传输表空间的实施

② 传输表空间基于表空间的 read only 和 rman2 种方式

③ 平台字节序、自包含概念

④ expdp/impdp 的应用

Tips：

① 若文章代码格式有错乱，推荐使用搜狗或 360 浏览器，也可以下载 pdf 格式的文档来查看，pdf 文档下载地址：http://yunpan.cn/cdEQedhCs2kFz （提取码：ed9b）

② 本篇 BLOG 中命令的输出部分需要特别关注的地方我都用灰色背景和粉红色字体来表示，比如下边的例子中，thread 1 的最大归档日志号为 33，thread 2 的最大归档日志号为 43 是需要特别关注的地方；而命令一般使用黄色背景和红色字体标注；对代码或代码输出部分的注释一般采用蓝色字体表示。

```
  List of Archived Logs in backup set 11
  Thrd Seq     Low SCN    Low Time            Next SCN   Next Time
  ---- ------- ---------- ------------------- ---------- ---------
  1    32      1621589    2015-05-29 11:09:52 1625242    2015-05-29 11:15:48
  1    33      1625242    2015-05-29 11:15:48 1625293    2015-05-29 11:15:58
  2    42      1613951    2015-05-29 10:41:18 1625245    2015-05-29 11:15:49
  2    43      1625245    2015-05-29 11:15:49 1625253    2015-05-29 11:15:53



[ZFXDESKDB1:root]:/>lsvg -o
T_XDESK_APP1_vg
rootvg
[ZFXDESKDB1:root]:/>
00:27:22 SQL> alter tablespace idxtbs read write;

====》2097152*512/1024/1024/1024=1G
```

本文如有错误或不完善的地方请大家多多指正，ITPUB 留言或 QQ 皆可，您的批评指正是我写作的最大动力。

1.2.2 相关参考文章链接

其他异构平台迁移的一些文章参考：

【推荐】 oracle 异构平台迁移之传输表空间一例 http://blog.itpub.net/26736162/viewspace-1391913/

【推荐】 oracle 传输表空间一例 http://blog.itpub.net/26736162/viewspace-1375260/

【推荐】 利用 rman 来实现 linux 平台数据库复制到 windows 平台数据库 http://blog.itpub.net/26736162/viewspace-1352436/

【推荐】 直接复制数据文件实现 linux 平台数据库复制到 windows 平台数据库 http://blog.itpub.net/26736162/viewspace-1352243/

【TTS】传输表空间 Linux asm -> AIX asm http://blog.itpub.net/26736162/viewspace-1987949/

【TTS】传输表空间 Linux asm -> AIX asm 基于 rman http://blog.itpub.net/26736162/viewspace-1987953/

【TTS】传输表空间 AIX asm -> linux http://blog.itpub.net/26736162/viewspace-1987957/

1.3 相关知识点扫盲

可传输表空间的特性主要用于进行库对库的表空间复制，要进行传输的表空间必须置于 read-only 模式。如果生产库不允许表空间置为只读模式，没关系，方法还是有的，通过 RMAN 备份也可以创建可传输表空间集。要使用可传输表空间的特性，oracle 至少是8i 企业版或更高版本。如果是相同操作系统平台相互导入，则8i 及以上版本均可支持，但如果是不同操作系统平台，数据库版本至少10g。被传输的表空间即可以是字典管理，也可以是本地管理。并且自 oracle9i 开始，被传输表空间的 block size 可以与目标数据库的 block size 不同。

可传输表空间(还有个集)最大的优势是其速度比 export/import 或 unload/load 要快的多。因为可传输表空间主要是复制数据文件到目标路径，然后再使用 export/import 或 Data Pump export/import 等应用仅导出/导入表空间对象的元数据到新数据库。

关于可传输表空间，还有个集(Transportable Tablespace Sets)的创建，其中都提到了很重要一点，就是被传输的表空间在传输过程中必须置为 read-only。而在实际操作过程中，对于某些生产数据库，将表空间置为 read-only 是件非常复杂的事情甚至完全不允许，有了 RMAN 的 Transportable Tablespace，这一切都得以避免。RMAN 通过备份创建可传输表空间集，它并不需要存取活动的数据文件，相应也就不需要将表空间置为 read-only。因此，数据库可用性得到提升，尤其对于超大的表空间，因为被传输的表空间在此期间仍可进行读写操作，而且把表空间置为 read-only 模式可能会花费较长时间，

使用 RMAN 创建可传输表空间集，允许你在传输过程中指定目标恢复时间点或 SCN，这样传输的数据可以更灵活，不必完全复制现有表空间，只要备份中存在，你就可以选择性的恢复数据。例如，你的备份策略为保留一周，你希望创建的可传输表空间中数据是截止本月底最后一天的数据，那么你在下个月第一周内任何时候都可以进行传输操作而不需要考虑这期间生产库是否会有写入操作。

1.3.1 注意事项

☞ 注意：

① source 和 target database 的数据库版本最好一致，否则会因为 db time zone 不一致导致报如下错误，但是如果 source 大于等于 target 的话是可以的，向下兼容的

```
ORA-39002: invalid operation
ORA-39322: Cannot use transportabletablespace with timestamp with timezone columns and different timezone version.
```

② source 和 target 端的字符集必须一致，例如如下情况报错：

```
source 为 ZHS16GBK, target 为 AL32UTF8
ORA-39123: Data Pump transportable tablespace job aborted
```

ORA-29345: cannot plug a tablespace into a database using an incompatible character set

Tartget db char set AL32UTF8 is not a superset of ZHS16GBK.
Failed to plug in a tablespace due to incompatible
  database character set"AL32UTF8" and
  transportable set database character set "ZHS16GBK"

③ source 和 target database 的 compatible 参数最好一致，但 source 如果小于等于 target 端的话是可以的，例如 source 为 11.2.0.4.0，target 为 11.2.0.0.0 就不行，impdp 的时候报错：

ORA-39123: Data Pump transportable tablespace job aborted
ORA-00721: changes by release 11.2.0.4.0 cannot be used by release 11.2.0.0.0

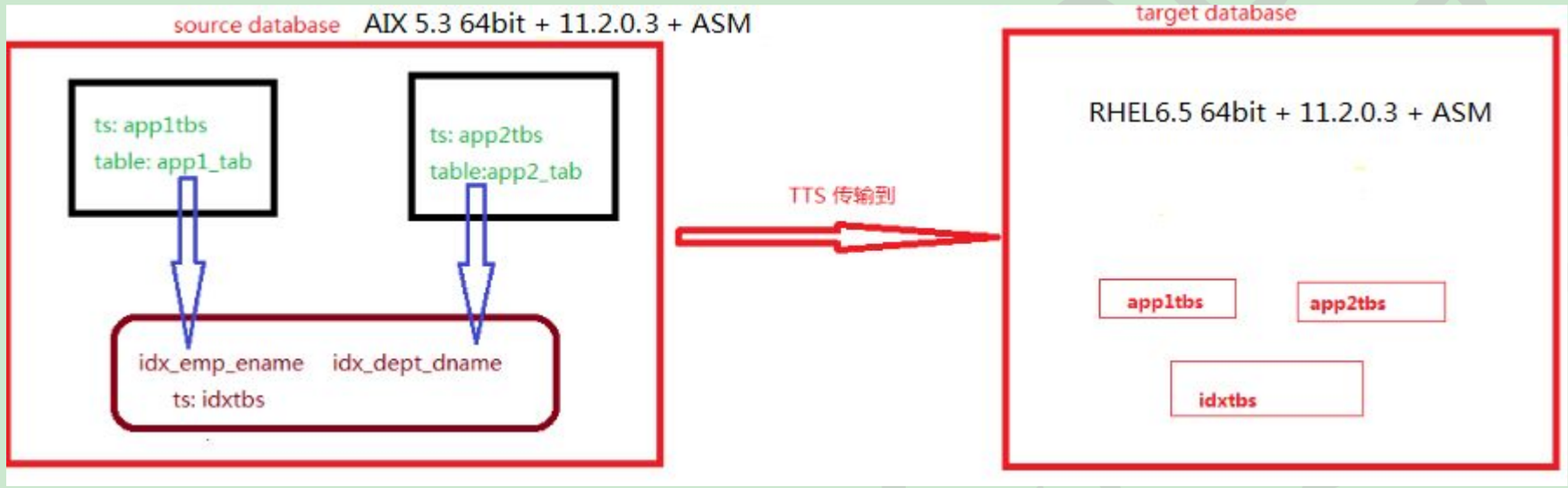
1.4 实验部分

1.4.1 实验环境介绍

项目	source db	target db
db 类型	单实例	单实例
db version	11.2.0.3	11.2.0.3
db 存储	ASM	ASM
ORACLE_SID	ora11g	orclasm
db_name	ora11g	orclasm
主机 IP 地址：	22.188.139.33	192.168.59.30
OS 版本及 kernel 版本	AIX 64 位 5.3.0.0	RHEL6.5 64 位，2.6.32-504.16.2.el6.x86_64
OS hostname	ZFXDESKDB2	rhel6_lhr
platform_name	AIX-Based Systems (64-bit)	Linux x86 64-bit
db time zone	14	14
字符集	ZHS16GBK	ZHS16GBK
compatible	11.2.0.0.0	11.2.0.0.0
归档模式	Archive Mode	Archive Mode

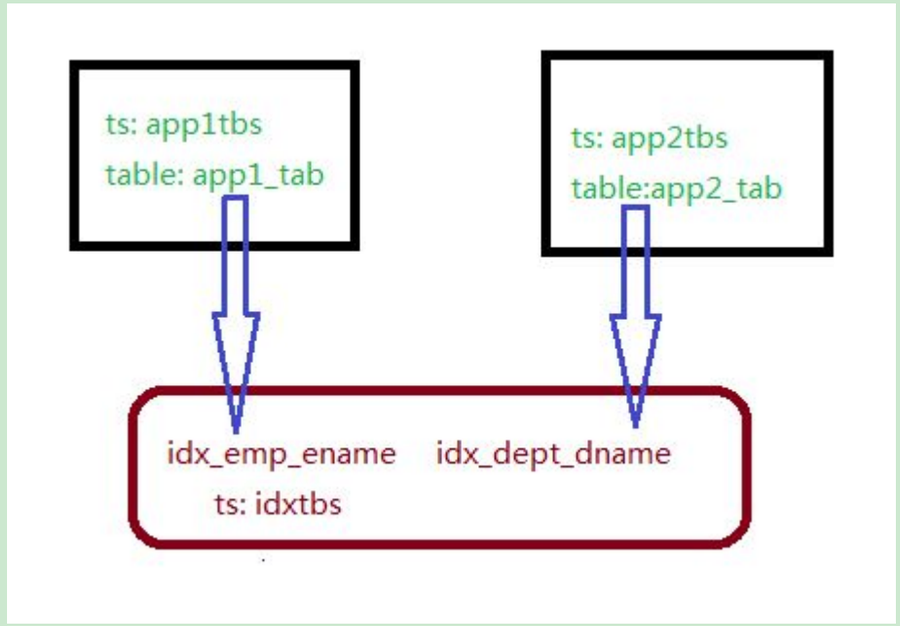
1.4.2 实验目标

要实现将自定义的应用程序表空间 app1tbs,app2tbs,idxtbs 从源平台传递到目标平台，而在实际的工作过程中，需要将 AIX 上的数据库迁移到 Linux，或者将 Linux 上的数据库迁移到 AIX 上，除了 exp/imp 和 expdp/impdp 外，最常用的就是传输表空间了，若是整个库迁移的话，我们需要做的就是把业务用户和业务表空间的数据迁移过来就行，Undo、temp、system 等等的就不用迁移了，整个处理过程和本文档的处理过程大同小异，需要关注的是业务对象的个数、大小、状态等。



1.4.3 实验过程

1.5 环境准备



1.5.1 在源库上创建 3 个用户应用的表空间，并在相应的表空间创建表和索引

```
oracle@ZDMTRAIN2:/oracle$ echo $ORACLE_SID
ora11g
oracle@ZDMTRAIN2:/oracle$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.3.0 Production on Sat Feb 18 10:51:00 2017

Copyright (c) 1982, 2011, Oracle.  All rights reserved.


Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Data Mining
and Real Application Testing options

SYS@ora11g> select name from v$datafile;

NAME
--------------------------------------------
+DATA1/ora11g/datafile/system.379.936264859
+DATA1/ora11g/datafile/sysaux.378.936264861
+DATA1/ora11g/datafile/undotbs1.380.936264861
+DATA1/ora11g/datafile/users.382.936264861
+DATA1/ora11g/datafile/example.391.936264979

SYS@ora11g> create tablespace app1tbs DATAFILE '+DATA1' size 10m;

Tablespace created.

SYS@ora11g> create tablespace app2tbs DATAFILE '+DATA1' size 10m;

Tablespace created.
```

```
SYS@orallg> CREATE TABLESPACE IDXTBS DATAFILE '+DATA1' SIZE 10M;

Tablespace created.

SYS@orallg> create user user_app1 identified by user_app1 default tablespace app1tbs;

User created.

SYS@orallg> create user user_app2 identified by user_app2 default tablespace app2tbs;

User created.

SYS@orallg> grant connect , resource to user_app1;

Grant succeeded.

SYS@orallg> grant connect , resource to user_app2;

Grant succeeded.

SYS@orallg> create table user_app1.app1_tab tablespace app1tbs as select * from scott.emp;

Table created.

SYS@orallg> create table user_app2.app2_tab tablespace app2tbs as select * from scott.dept;

Table created.

SYS@orallg> create index user_app1.idx_emp_ename on user_app1.app1_tab(ename) tablespace idxtbs;

Index created.

SYS@orallg> create index user_app2.idx_dept_dname on user_app2.app2_tab(dname) tablespace idxtbs;

Index created.

SYS@orallg> set line 9999 pagesize 9999
SYS@orallg> SELECT   a.NAME,  b.NAME FROM v$tablespace a , v$datafile b WHERE a.TS#=b.TS#  ;

NAME            NAME
--------------  ----------------------------------------------
SYSTEM          +DATA1/orallg/datafile/system.379.936264859
SYSAUX          +DATA1/orallg/datafile/sysaux.378.936264861
UNDOTBS1        +DATA1/orallg/datafile/undotbs1.380.936264861
USERS           +DATA1/orallg/datafile/users.382.936264861
EXAMPLE         +DATA1/orallg/datafile/example.391.936264979
APP1TBS         +DATA1/orallg/datafile/app1tbs.393.936269553
APP2TBS         +DATA1/orallg/datafile/app2tbs.394.936269559
IDXTBS          +DATA1/orallg/datafile/idxtbs.395.936269565

8 rows selected.

SYS@orallg>
```

1.6 判断平台支持并确定字节序

如果传输表空间集到不同的平台，则要确定对于源和目标平台这种跨平台表空间被支持，也要确定每个平台的字节序，如果平台具有相同的字节序，则不需要进行转化，否则必须做一个表空间集转化，在源端或目标端都可以，在源端用 convert　tablespace，在目标端用 convert datafile。

```
SYS@ora11g> col platform_name for a40
SYS@ora11g> select tp.platform_name, tp.endian_format
          2   from v$transportable_platform tp
          3   where tp.platform_name in ('Linux x86 64-bit', 'AIX-Based Systems (64-bit)');

PLATFORM_NAME                            ENDIAN_FORMAT
---------------------------------------- --------------------------
AIX-Based Systems (64-bit)               Big
Linux x86 64-bit                         Little

SQL>
```

源平台和目标平台的 Endian_format 不同，source 端为 Big，target 端为 Little，所以需要进行表空间集转换，前边说过在源端或目标端都可以进行转换，这里我们选择在目标端来进行转换。

1.7 选择自包含的表空间集

1.7.1 进行检查

Indicates whether a full or partial dependency check is required. If TRUE, treats all IN and OUT pointers(dependencies) and captures them as violations if they are not self-contained in the transportable set.

先试试要传输 app1tbs 和 idxtbs 这 2 个表空间：

```
SYS@ora11g> execute sys.dbms_tts.transport_set_check('app1tbs,idxtbs',true);

PL/SQL procedure successfully completed.

SQL> col violations for a70
SYS@ora11g> select * from sys.transport_set_violations;

VIOLATIONS
----------------------------------------------------------------------
ORA-39907: Index USER_APP2.IDX_DEPT_DNAME in tablespace IDXTBS points
to table USER_APP2.APP2_TAB in tablespace APP2TBS.


SQL>
```

结论： 在 idxtbs 表空间中 IDX_DEPT_DNAME 索引指向了表空间集外的 user_app2.APP2_TAB 表，所以这里选择 app1tabs,app2tabs,idxtbs 作为新的表空间集再次进行检查

```
SYS@ora11g> execute sys.dbms_tts.transport_set_check('app1tbs,app2tbs,idxtbs',true);

PL/SQL procedure successfully completed.


SYS@ora11g>  select * from sys.transport_set_violations;

no rows selected

SYS@ora11g>
```

结论： 此时这个表空间集已经不再违背自包含的条件，可以确定为一个可传输表空间集。在实际生产环境中也是如此检查的，若是全库迁移，得把需要迁移的表空间修改为自包含的。

1.8 产生可传输表空间集

1.8.1 rman 备份 source 库

当然，如果已经有全库备份了就可以省略这个步骤。

```
oracle@ZDMTRAIN2:/oracle$ mkdir -p /lxm/oracle_bk/ora11g
oracle@ZDMTRAIN2:/oracle$ rman target /

Recovery Manager: Release 11.2.0.3.0 - Production on Sat Feb 18 11:27:16 2017

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connected to target database: ORA11G (DBID=37497795)


RMAN> list backupset;

using target database control file instead of recovery catalog
specification does not match any backup in the repository

RMAN> backup  as compressed backupset  format  '/lxm/oracle_bk/ora11g/full_%n_%T_%t_%s.bak' database include current controlfile plus archivelog delete input ;


Starting backup at 2017-02-18 11:27:32
current log archived
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=196 device type=DISK
channel ORA_DISK_1: starting compressed archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=6 RECID=1 STAMP=936271653
channel ORA_DISK_1: starting piece 1 at 2017-02-18 11:27:34
channel ORA_DISK_1: finished piece 1 at 2017-02-18 11:27:37
piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271654_3.bak tag=TAG20170218T112734 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:03
channel ORA_DISK_1: deleting archived log(s)
archived log file name=+DATA1/ora11g/archivelog/2017_02_18/thread_1_seq_6.396.936271653 RECID=1 STAMP=936271653
Finished backup at 2017-02-18 11:27:38

Starting backup at 2017-02-18 11:27:38
using channel ORA_DISK_1
channel ORA_DISK_1: starting compressed full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00001 name=+DATA1/ora11g/datafile/system.379.936264859
input datafile file number=00002 name=+DATA1/ora11g/datafile/sysaux.378.936264861
input datafile file number=00005 name=+DATA1/ora11g/datafile/example.391.936264979
input datafile file number=00003 name=+DATA1/ora11g/datafile/undotbs1.380.936264861
input datafile file number=00006 name=+DATA1/ora11g/datafile/app1tbs.393.936269553
input datafile file number=00007 name=+DATA1/ora11g/datafile/app2tbs.394.936269559
input datafile file number=00008 name=+DATA1/ora11g/datafile/idxtbs.395.936269565
input datafile file number=00004 name=+DATA1/ora11g/datafile/users.382.936264861
channel ORA_DISK_1: starting piece 1 at 2017-02-18 11:27:38
channel ORA_DISK_1: finished piece 1 at 2017-02-18 11:28:53
piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271658_4.bak tag=TAG20170218T112738 comment=NONE
```

```
channel ORA_DISK_1: backup set complete, elapsed time: 00:01:15
channel ORA_DISK_1: starting compressed full 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 2017-02-18 11:28:55
channel ORA_DISK_1: finished piece 1 at 2017-02-18 11:28:56
piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271734_5.bak tag=TAG20170218T112738 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 2017-02-18 11:28:56

Starting backup at 2017-02-18 11:28:56
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting compressed archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=7 RECID=2 STAMP=936271736
channel ORA_DISK_1: starting piece 1 at 2017-02-18 11:28:57
channel ORA_DISK_1: finished piece 1 at 2017-02-18 11:28:58
piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271737_6.bak tag=TAG20170218T112856 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
channel ORA_DISK_1: deleting archived log(s)
archived log file name=+DATA1/ora11g/archivelog/2017_02_18/thread_1_seq_7.396.936271737 RECID=2 STAMP=936271736
Finished backup at 2017-02-18 11:28:58

RMAN> list backupset;


List of Backup Sets
===================


BS Key  Size       Device Type Elapsed Time Completion Time
------- ---------- ----------- ------------ -------------------
2       8.32M      DISK        00:00:03     2017-02-18 11:27:37
        BP Key: 2   Status: AVAILABLE  Compressed: YES  Tag: TAG20170218T112734
        Piece Name: /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271654_3.bak

  List of Archived Logs in backup set 2
  Thrd Seq     Low SCN    Low Time            Next SCN   Next Time
  ---- ------- ---------- ------------------- ---------- ---------
  1    6       1116417    2017-02-18 09:43:58 1131262    2017-02-18 11:27:32

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ -------------------
3       Full    284.70M    DISK        00:01:15     2017-02-18 11:28:53
        BP Key: 3   Status: AVAILABLE  Compressed: YES  Tag: TAG20170218T112738
        Piece Name: /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271658_4.bak
  List of Datafiles in backup set 3
  File LV Type Ckp SCN    Ckp Time            Name
  ---- -- ---- ---------- ------------------- ----
  1       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/system.379.936264859
  2       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/sysaux.378.936264861
  3       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/undotbs1.380.936264861
  4       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/users.382.936264861
  5       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/example.391.936264979
  6       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/app1tbs.393.936269553
  7       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/app2tbs.394.936269559
  8       Full 1131273    2017-02-18 11:27:38 +DATA1/ora11g/datafile/idxtbs.395.936269565

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ -------------------
4       Full    1.03M      DISK        00:00:01     2017-02-18 11:28:55
        BP Key: 4   Status: AVAILABLE  Compressed: YES  Tag: TAG20170218T112738
        Piece Name: /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271734_5.bak
  SPFILE Included: Modification time: 2017-02-18 11:25:43
  SPFILE db_unique_name: ORA11G
  Control File Included: Ckp SCN: 1131300      Ckp time: 2017-02-18 11:28:53
```

```
BS Key  Size       Device Type Elapsed Time Completion Time
------- ---------- ----------- ------------ -------------------
5       4.00K      DISK        00:00:00     2017-02-18 11:28:57
        BP Key: 5   Status: AVAILABLE  Compressed: YES  Tag: TAG20170218T112856
        Piece Name: /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271737_6.bak

  List of Archived Logs in backup set 5
  Thrd Seq     Low SCN    Low Time            Next SCN   Next Time
  ---- ------- ---------- ------------------- ---------- ---------
  1    7       1131262    2017-02-18 11:27:32 1131306    2017-02-18 11:28:56

RMAN>
RMAN>
```

1.8.2 transport tablespace 生成文件

该步骤需要注意的是磁盘剩余空间 :如下的目录/lxm/ora11g/transportdest 剩余空间必须大于 source 库整个表空间的大小+需要传输的表空间的大小 ,否则会因为磁盘空间不够而报错。

```
oracle@ZDMTRAIN2:/oracle$ mkdir -p /lxm/ora11g/transportdest
oracle@ZDMTRAIN2:/oracle$ rman target /

Recovery Manager: Release 11.2.0.3.0 - Production on Sat Feb 18 11:30:34 2017

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connected to target database: ORA11G (DBID=37497795)

RMAN> transport tablespace APP1TBS,APP2TBS,IDXTBS tablespace destination '/lxm/ora11g/transportdest' auxiliary destination '/lxm/ora11g/transportdest';

using target database control file instead of recovery catalog
RMAN-05026: WARNING: presuming following set of tablespaces applies to specified point-in-time

List of tablespaces expected to have UNDO segments
Tablespace SYSTEM
Tablespace UNDOTBS1

Creating automatic instance, with SID='wBBm'

initialization parameters used for automatic instance:
db_name=ORA11G
db_unique_name=wBBm_tspitr_ORA11G
compatible=11.2.0.0.0
db_block_size=8192
db_files=200
sga_target=280M
processes=50
db_create_file_dest=/lxm/ora11g/transportdest
log_archive_dest_1='location=/lxm/ora11g/transportdest'
#No auxiliary parameter file used


starting up automatic instance ORA11G

Oracle instance started

Total System Global Area     292278272 bytes

Fixed Size                     2220880 bytes
Variable Size                100666544 bytes
Database Buffers             184549376 bytes
Redo Buffers                   4841472 bytes
Automatic instance created
Running TRANSPORT_SET_CHECK on recovery set tablespaces
```

```
TRANSPORT_SET_CHECK completed successfully

contents of Memory Script:
{
# set requested point in time
set until  scn 1131306;
# restore the controlfile
restore clone controlfile;
# mount the controlfile
sql clone 'alter database mount clone database';
# archive current online log
sql 'alter system archive log current';
}
executing Memory Script

executing command: SET until clause

Starting restore at 2017-02-18 11:31:02
allocated channel: ORA_AUX_DISK_1
channel ORA_AUX_DISK_1: SID=80 device type=DISK

channel ORA_AUX_DISK_1: starting datafile backup set restore
channel ORA_AUX_DISK_1: restoring control file
channel ORA_AUX_DISK_1: reading from backup piece /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271734_5.bak
channel ORA_AUX_DISK_1: piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271734_5.bak tag=TAG20170218T112738
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:00:01
output file name=/lxm/ora11g/transportdest/ORA11G/controlfile/o1_mf_dbhhzqsd_.ctl
Finished restore at 2017-02-18 11:31:04

sql statement: alter database mount clone database

sql statement: alter system archive log current

contents of Memory Script:
{
# set requested point in time
set until  scn 1131306;
# set destinations for recovery set and auxiliary set datafiles
set newname for clone datafile  1 to new;
set newname for clone datafile  3 to new;
set newname for clone datafile  2 to new;
set newname for clone tempfile  1 to new;
set newname for datafile  6 to
 "/lxm/ora11g/transportdest/o1_mf_app1tbs_%u_.dbf";
set newname for datafile  7 to
 "/lxm/ora11g/transportdest/o1_mf_app2tbs_%u_.dbf";
set newname for datafile  8 to
 "/lxm/ora11g/transportdest/o1_mf_idxtbs_%u_.dbf";
# switch all tempfiles
switch clone tempfile all;
# restore the tablespaces in the recovery set and the auxiliary set
restore clone datafile  1, 3, 2, 6, 7, 8;
switch clone datafile all;
}
executing Memory Script

executing command: SET until clause

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME
```

```
executing command: SET NEWNAME

executing command: SET NEWNAME

renamed tempfile 1 to /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_temp_%u_.tmp in control file

Starting restore at 2017-02-18 11:31:10
using channel ORA_AUX_DISK_1

channel ORA_AUX_DISK_1: starting datafile backup set restore
channel ORA_AUX_DISK_1: specifying datafile(s) to restore from backup set
channel ORA_AUX_DISK_1: restoring datafile 00001 to /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_system_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00003 to /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_undotbs1_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00002 to /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_sysaux_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00006 to /lxm/ora11g/transportdest/o1_mf_app1tbs_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00007 to /lxm/ora11g/transportdest/o1_mf_app2tbs_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00008 to /lxm/ora11g/transportdest/o1_mf_idxtbs_%u_.dbf
channel ORA_AUX_DISK_1: reading from backup piece /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271658_4.bak
channel ORA_AUX_DISK_1: piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271658_4.bak tag=TAG20170218T112738
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:01:25
Finished restore at 2017-02-18 11:32:42

datafile 1 switched to datafile copy
input datafile copy RECID=8 STAMP=936271962 file name=/lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_system_dbhj055o_.dbf
datafile 3 switched to datafile copy
input datafile copy RECID=9 STAMP=936271962 file name=/lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_undotbs1_dbhj058d_.dbf
datafile 2 switched to datafile copy
input datafile copy RECID=10 STAMP=936271962 file name=/lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_sysaux_dbhj055q_.dbf
datafile 6 switched to datafile copy
input datafile copy RECID=11 STAMP=936271962 file name=/lxm/ora11g/transportdest/o1_mf_app1tbs_dbhj05ll_.dbf
datafile 7 switched to datafile copy
input datafile copy RECID=12 STAMP=936271962 file name=/lxm/ora11g/transportdest/o1_mf_app2tbs_dbhj05nz_.dbf
datafile 8 switched to datafile copy
input datafile copy RECID=13 STAMP=936271962 file name=/lxm/ora11g/transportdest/o1_mf_idxtbs_dbhj05o8_.dbf

contents of Memory Script:
{
# set requested point in time
set until  scn 1131306;
# online the datafiles restored or switched
sql clone "alter database datafile  1 online";
sql clone "alter database datafile  3 online";
sql clone "alter database datafile  2 online";
sql clone "alter database datafile  6 online";
sql clone "alter database datafile  7 online";
sql clone "alter database datafile  8 online";
# recover and open resetlogs
recover clone database tablespace  "APP1TBS", "APP2TBS", "IDXTBS", "SYSTEM", "UNDOTBS1", "SYSAUX" delete archivelog;
alter clone database open resetlogs;
}
executing Memory Script

executing command: SET until clause

sql statement: alter database datafile  1 online

sql statement: alter database datafile  3 online

sql statement: alter database datafile  2 online

sql statement: alter database datafile  6 online

sql statement: alter database datafile  7 online

sql statement: alter database datafile  8 online
```

```
Starting recover at 2017-02-18 11:32:43
using channel ORA_AUX_DISK_1

starting media recovery

channel ORA_AUX_DISK_1: starting archived log restore to default destination
channel ORA_AUX_DISK_1: restoring archived log
archived log thread=1 sequence=7
channel ORA_AUX_DISK_1: reading from backup piece /lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271737_6.bak
channel ORA_AUX_DISK_1: piece handle=/lxm/oracle_bk/ora11g/full_ORA11Gxx_20170218_936271737_6.bak tag=TAG20170218T112856
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:00:01
archived log file name=/lxm/ora11g/transportdest/1_7_936264966.dbf thread=1 sequence=7
channel clone_default: deleting archived log(s)
archived log file name=/lxm/ora11g/transportdest/1_7_936264966.dbf RECID=2 STAMP=936271966
media recovery complete, elapsed time: 00:00:01
Finished recover at 2017-02-18 11:32:48

database opened

contents of Memory Script:
{
# make read only the tablespace that will be exported
sql clone 'alter tablespace  APP1TBS read only';
sql clone 'alter tablespace  APP2TBS read only';
sql clone 'alter tablespace  IDXTBS read only';
# create directory for datapump export
sql clone "create or replace directory STREAMS_DIROBJ_DPDIR as ''
/lxm/ora11g/transportdest''";
}
executing Memory Script

sql statement: alter tablespace  APP1TBS read only

sql statement: alter tablespace  APP2TBS read only

sql statement: alter tablespace  IDXTBS read only

sql statement: create or replace directory STREAMS_DIROBJ_DPDIR as ''/lxm/ora11g/transportdest''

Performing export of metadata...
   EXPDP> Starting "SYS"."TSPITR_EXP_wBBm":
   EXPDP> Processing object type TRANSPORTABLE_EXPORT/PLUGTS_BLK
   EXPDP> Processing object type TRANSPORTABLE_EXPORT/TABLE
   EXPDP> Processing object type TRANSPORTABLE_EXPORT/INDEX/INDEX
   EXPDP> Processing object type TRANSPORTABLE_EXPORT/INDEX_STATISTICS
   EXPDP> Processing object type TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
   EXPDP> Master table "SYS"."TSPITR_EXP_wBBm" successfully loaded/unloaded
   EXPDP> ******************************************************************************
   EXPDP> Dump file set for SYS.TSPITR_EXP_wBBm is:
   EXPDP>   /lxm/ora11g/transportdest/dmpfile.dmp
   EXPDP> ******************************************************************************
   EXPDP> Datafiles required for transportable tablespace APP1TBS:
   EXPDP>   /lxm/ora11g/transportdest/o1_mf_app1tbs_dbhj051l_.dbf
   EXPDP> Datafiles required for transportable tablespace APP2TBS:
   EXPDP>   /lxm/ora11g/transportdest/o1_mf_app2tbs_dbhj05nz_.dbf
   EXPDP> Datafiles required for transportable tablespace IDXTBS:
   EXPDP>   /lxm/ora11g/transportdest/o1_mf_idxtbs_dbhj05o8_.dbf
   EXPDP> Job "SYS"."TSPITR_EXP_wBBm" successfully completed at 11:34:58
Export completed

/*
   The following command may be used to import the tablespaces.
   Substitute values for <logon> and <directory>.
   impdp <logon> directory=<directory> dumpfile= 'dmpfile.dmp' transport_datafiles= /lxm/ora11g/transportdest/o1_mf_app1tbs_dbhj051l_.dbf, /lxm/ora11g/transportdest/o1_mf_app2tbs_dbhj05nz_.dbf,
/lxm/ora11g/transportdest/o1_mf_idxtbs_dbhj05o8_.dbf
*/
-----------------------------------------------------------
```

```
-- Start of sample PL/SQL script for importing the tablespaces
-------------------------------------------------------------
-- creating directory objects
CREATE DIRECTORY STREAMS$DIROBJ$1 AS  '/lxm/ora11g/transportdest/';
CREATE DIRECTORY STREAMS$DIROBJ$DPDIR AS  '/lxm/ora11g/transportdest';
/* PL/SQL Script to import the exported tablespaces */
DECLARE
  -- the datafiles
  tbs_files     dbms_streams_tablespace_adm.file_set;
  cvt_files     dbms_streams_tablespace_adm.file_set;
  -- the dumpfile to import
  dump_file     dbms_streams_tablespace_adm.file;
  dp_job_name   VARCHAR2(30) := NULL;
  -- names of tablespaces that were imported
  ts_names       dbms_streams_tablespace_adm.tablespace_set;
BEGIN
  -- dump file name and location
  dump_file.file_name :=  'dmpfile.dmp';
  dump_file.directory_object := 'STREAMS$DIROBJ$DPDIR';
  -- forming list of datafiles for import
  tbs_files( 1).file_name :=  'o1_mf_appltbs_dbhj05ll_.dbf';
  tbs_files( 1).directory_object :=  'STREAMS$DIROBJ$1';
  tbs_files( 2).file_name :=  'o1_mf_app2tbs_dbhj05nz_.dbf';
  tbs_files( 2).directory_object :=  'STREAMS$DIROBJ$1';
  tbs_files( 3).file_name :=  'o1_mf_idxtbs_dbhj05o8_.dbf';
  tbs_files( 3).directory_object :=  'STREAMS$DIROBJ$1';
  -- import tablespaces
  dbms_streams_tablespace_adm.attach_tablespaces(
    datapump_job_name      => dp_job_name,
    dump_file              => dump_file,
    tablespace_files       => tbs_files,
    converted_files        => cvt_files,
    tablespace_names       => ts_names);
  -- output names of imported tablespaces
  IF ts_names IS NOT NULL AND ts_names.first IS NOT NULL THEN
    FOR i IN ts_names.first .. ts_names.last LOOP
      dbms_output.put_line('imported tablespace '|| ts_names(i));
    END LOOP;
  END IF;
END;
/
-- dropping directory objects
DROP DIRECTORY STREAMS$DIROBJ$1;
DROP DIRECTORY STREAMS$DIROBJ$DPDIR;
-------------------------------------------------------------
-- End of sample PL/SQL script
-------------------------------------------------------------

Removing automatic instance
shutting down automatic instance
database closed
database dismounted
Oracle instance shut down
Automatic instance removed
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_temp_dbhj31y7_.tmp deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/onlinelog/o1_mf_3_dbhj30z7_.log deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/onlinelog/o1_mf_2_dbhj30m3_.log deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/onlinelog/o1_mf_1_dbhj3090_.log deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_sysaux_dbhj055q_.dbf deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_undotbs1_dbhj058d_.dbf deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/datafile/o1_mf_system_dbhj055o_.dbf deleted
auxiliary instance file /lxm/ora11g/transportdest/ORA11G/controlfile/o1_mf_dbhhzqsd_.ctl deleted

RMAN>
```

至此，已和源库没有任何关系。

1.9 传输文件到 target 端

这里需要传输转储元文件和数据文件到目标库

1.9.1 查看目标库数据文件位置和导入目录

```
[oracle@rhel6 ~]$ export ORACLE_SID=orclasm

[oracle@rhel6_lhr dpdump]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.3.0 Production on 星期三 2月 3 20:17:58 2016

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连接到:
Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Data Mining
and Real Application Testing options

SQL> select name from v$datafile;

NAME
--------------------------------------------------------------------------------
+DATA/orclasm/datafile/system.256.868235071
+DATA/orclasm/datafile/sysaux.257.868235073
+DATA/orclasm/datafile/undotbs1.258.868235073
+DATA/orclasm/datafile/users.259.868235073
13 rows selected.

SQL> set line 9999
SQL> col directory_name for a28
SQL> col directory_path for a100
SQL> select directory_name,directory_path from dba_directories;

DIRECTORY_NAME               DIRECTORY_PATH
---------------------------- ----------------------------------------------------------------------------------------------------
XMLDIR                       /ade/b/2125410156/oracle/rdbms/xml
DATA_PUMP_DIR                /u01/app/oracle/admin/orclasm/dpdump/
ORACLE_OCM_CONFIG_DIR        /u01/app/oracle/product/11.2.0/dbhome_1/ccr/state
3 rows selected.

SQL>
```
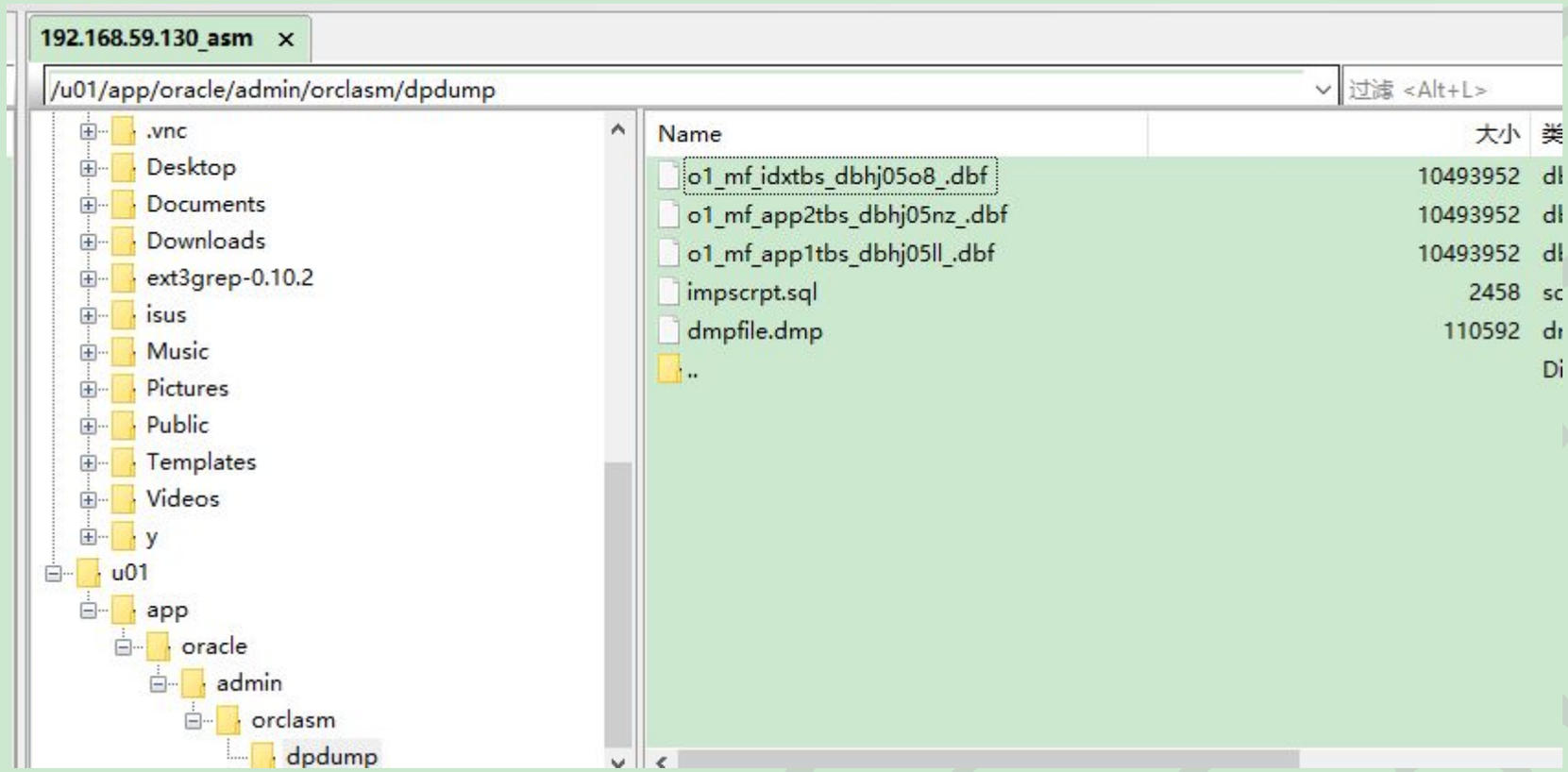

1.9.2 拷贝文件到目标库相应位置并修改文件权限




```
[root@rhel6_lhr dpdump]# ll
total 30856
-rw-r--r-- 1 root root   110592 Feb 18  2017 dmpfile.dmp
-rw-r--r-- 1 root root     2458 Feb 18  2017 impscrpt.sql
-rw-r--r-- 1 root root 10493952 Feb 18  2017 o1_mf_app1tbs_dbhj05ll_.dbf
-rw-r--r-- 1 root root 10493952 Feb 18  2017 o1_mf_app2tbs_dbhj05nz_.dbf
-rw-r--r-- 1 root root 10493952 Feb 18  2017 o1_mf_idxtbs_dbhj05o8_.dbf
[root@rhel6_lhr dpdump]# chown oracle:dba *
[root@rhel6_lhr dpdump]# ll
total 30856
-rw-r--r-- 1 oracle dba   110592 Feb 18  2017 dmpfile.dmp
-rw-r--r-- 1 oracle dba     2458 Feb 18  2017 impscrpt.sql
-rw-r--r-- 1 oracle dba 10493952 Feb 18  2017 o1_mf_app1tbs_dbhj05ll_.dbf
-rw-r--r-- 1 oracle dba 10493952 Feb 18  2017 o1_mf_app2tbs_dbhj05nz_.dbf
-rw-r--r-- 1 oracle dba 10493952 Feb 18  2017 o1_mf_idxtbs_dbhj05o8_.dbf
[root@rhel6_lhr dpdump]#
```

1.10 target 端转换字节序

```
[oracle@rhel6_lhr dpdump]$ rman target /
```

```
恢复管理器: Release 11.2.0.3.0 - Production on 星期三 2月 3 20:39:19 2016

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已连接到目标数据库: ORCLASM (DBID=3424884828)

RMAN> CONVERT DATAFILE
2> "/u01/app/oracle/admin/orclasm/dpdump/o1_mf_app1tbs_dbhj05ll_.dbf",
3> "/u01/app/oracle/admin/orclasm/dpdump/o1_mf_app2tbs_dbhj05nz_.dbf",
4> "/u01/app/oracle/admin/orclasm/dpdump/o1_mf_idxtbs_dbhj05o8_.dbf"
5> TO PLATFORM="Linux x86 64-bit"
6> FROM PLATFORM="AIX-Based Systems (64-bit)"
7> FORMAT '+DATA';

启动 conversion at target 于 2016-02-03 20:39:22
使用目标数据库控制文件替代恢复目录
分配的通道: ORA_DISK_1
通道 ORA_DISK_1: SID=30 设备类型=DISK
分配的通道: ORA_DISK_2
通道 ORA_DISK_2: SID=415 设备类型=DISK
通道 ORA_DISK_1: 启动数据文件转换
输入文件名=/u01/app/oracle/admin/orclasm/dpdump/o1_mf_app1tbs_dbhj05ll_.dbf
通道 ORA_DISK_2: 启动数据文件转换
输入文件名=/u01/app/oracle/admin/orclasm/dpdump/o1_mf_app2tbs_dbhj05nz_.dbf
已转换的数据文件 = +DATA/orclasm/datafile/app1tbs.301.902867963
通道 ORA_DISK_1: 数据文件转换完毕, 经过时间: 00:00:03
通道 ORA_DISK_1: 启动数据文件转换
输入文件名=/u01/app/oracle/admin/orclasm/dpdump/o1_mf_idxtbs_dbhj05o8_.dbf
已转换的数据文件 = +DATA/orclasm/datafile/app2tbs.300.902867963
通道 ORA_DISK_2: 数据文件转换完毕, 经过时间: 00:00:03
已转换的数据文件 = +DATA/orclasm/datafile/idxtbs.299.902867967
通道 ORA_DISK_1: 数据文件转换完毕, 经过时间: 00:00:01
完成 conversion at target 于 2016-02-03 20:39:27

RMAN>
```

1.11 开始导入

1.11.1 创建 source 库的 2 个用户并赋权限

如果不创建用户会报如下的错误：

ORA-39123: Data Pump transportable tablespace job aborted
ORA-29342: user USER_APP1 does not exist in the database

create user user_app1 identified by user_app1;

```
SYS@orclasm> create user user_app1 identified by user_app1;

User created.

SYS@orclasm> create user user_app2 identified by user_app2;

User created.

SYS@orclasm>  grant connect , resource to user_app1;
```

```
Grant succeeded.

SYS@orclasm>  grant connect , resource to user_app2;

Grant succeeded.

SYS@orclasm>  exit
```

1.11.2 开始导入

文件内容如下：

```
[oracle@rhel6_lhr dpdump]$ impdp \'/ as sysdba \' DUMPFILE=dmpfile.dmp DIRECTORY=DATA_PUMP_DIR
TRANSPORT_DATAFILES='+DATA/orclasm/datafile/app1tbs.301.902867963','+DATA/orclasm/datafile/app2tbs.300.902867963','+DATA/orclasm/datafile/idxtbs.299.902867967'
LOGFILE=impdp_tts_rman_20160203.log

Import: Release 11.2.0.3.0 - Production on 星期三 2月 3 20:41:47 2016

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连接到: Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Data Mining
and Real Application Testing options
已成功加载/卸载了主表 "SYS"."SYS_IMPORT_TRANSPORTABLE_01"
启动 "SYS"."SYS_IMPORT_TRANSPORTABLE_01":  "/******** AS SYSDBA" DUMPFILE=dmpfile.dmp DIRECTORY=DATA_PUMP_DIR
TRANSPORT_DATAFILES=+DATA/orclasm/datafile/app1tbs.301.902867963,+DATA/orclasm/datafile/app2tbs.300.902867963,+DATA/orclasm/datafile/idxtbs.299.902867967 LOGFILE=impdp_tts_rman_20160203.log
处理对象类型 TRANSPORTABLE_EXPORT/PLUGTS_BLK
处理对象类型 TRANSPORTABLE_EXPORT/TABLE
处理对象类型 TRANSPORTABLE_EXPORT/INDEX/INDEX
处理对象类型 TRANSPORTABLE_EXPORT/INDEX_STATISTICS
处理对象类型 TRANSPORTABLE_EXPORT/POST_INSTANCE/PLUGTS_BLK
作业 "SYS"."SYS_IMPORT_TRANSPORTABLE_01" 已于 20:41:59 成功完成

[oracle@rhel6_lhr dpdump]$
```

1.11.3 查看目标平台信息

```
[oracle@rhel6_lhr dpdump]$ sqlplus / as sysdba

SQL*Plus: Release 11.2.0.3.0 Production on 星期三 2月 3 20:27:41 2016

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连接到:
Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Data Mining
and Real Application Testing options

SYS@orclasm >  select tablespace_name,status from dba_tablespaces;

TABLESPACE_NAME                STATUS
------------------------------ ---------
SYSTEM                         ONLINE
SYSAUX                         ONLINE
```

```
UNDOTBS1                       ONLINE
TEMP                           ONLINE
USERS                          ONLINE
EXAMPLE                        ONLINE
TS_LHR                         ONLINE
ENCRYPTED_TS                   ONLINE
GOLDENGATE                     ONLINE
APP1TBS                        READ ONLY
APP2TBS                        READ ONLY
IDXTBS                         READ ONLY

已选择 12 行。

SYS@orclasm >

SYS@orclasm > alter tablespace APP1TBS read write;

表空间已更改。

SYS@orclasm > alter tablespace APP2TBS read write;

表空间已更改。

SYS@orclasm > alter tablespace IDXTBS read write;

表空间已更改。

SYS@orclasm > select tablespace_name,status from dba_tablespaces;

TABLESPACE_NAME                STATUS
------------------------------ ---------
SYSTEM                         ONLINE
SYSAUX                         ONLINE
UNDOTBS1                       ONLINE
TEMP                           ONLINE
USERS                          ONLINE
EXAMPLE                        ONLINE
TS_LHR                         ONLINE
ENCRYPTED_TS                   ONLINE
GOLDENGATE                     ONLINE
APP1TBS                        ONLINE
APP2TBS                        ONLINE
IDXTBS                         ONLINE

已选择 12 行。

SYS@orclasm >

SYS@orclasm> set line 9999 pagesize 9999
SYS@orclasm> select * from scott.appl_tab;

     EMPNO ENAME      JOB              MGR HIREDATE              SAL       COMM     DEPTNO
---------- ---------- --------- ---------- -------------- ---------- ---------- ----------
      9000 lastwiner
      9001 lastwiner
      7369 SMITH      CLERK           7902 17-12 月-80           800                    20
      7499 ALLEN      SALESMAN        7698 20-2 月 -81           1600        300         30
      7521 WARD       SALESMAN        7698 22-2 月 -81           1250        500         30
      7566 JONES      MANAGER         7839 02-4 月 -81           2975                    20
      7654 MARTIN     SALESMAN        7698 28-9 月 -81           1250       1400         30
      7698 BLAKE      MANAGER         7839 01-5 月 -81           2850                    30
      7782 CLARK      MANAGER         7839 09-6 月 -81           2450                    10
      7788 SCOTT      ANALYST         7566 19-4 月 -87           3000                    20
      7839 KING       PRESIDENT            17-11 月-81           5000                    10
      7844 TURNER     SALESMAN        7698 08-9 月 -81           1500          0         30
      7876 ADAMS      CLERK           7788 23-5 月 -87           1100                    20
      7900 JAMES      CLERK           7698 03-12 月-81            950                    30
      7902 FORD       ANALYST         7566 03-12 月-81           3000                    20
```

```
      7934 MILLER     CLERK           7782 23-1月 -82           1300                    10

已选择 16 行。

SYS@orclasm> select * from scott.app2_tab;

    DEPTNO DNAME          LOC
---------- -------------- -------------
        10 ACCOUNTING     NEW YORK
        20 RESEARCH       DALLAS
        30 SALES          CHICAGO
        40 OPERATIONS     BOSTON

SYS@orclasm > select D.owner,D.index_name,D.table_name,D.tablespace_name from dba_indexes d WHERE d.table_name in ('APP1_TAB','APP2_TAB');

OWNER                          INDEX_NAME                     TABLE_NAME                     TABLESPACE_NAME
------------------------------ ------------------------------ ------------------------------ ------------------------------
USER_APP1                      IDX_EMP_ENAME                  APP1_TAB                       IDXTBS
USER_APP2                      IDX_DEPT_DNAME                 APP2_TAB                       IDXTBS

SYS@orclasm >
SYS@orclasm > set line 9999
SYS@orclasm > SELECT   a.NAME,   b.NAME FROM v$tablespace a ,  v$datafile b WHERE a.TS#=b.TS#  ;

NAME                           NAME
------------------------------ ----------------------------------------------------------------------------------------
SYSTEM                         +DATA/orclasm/datafile/system.256.850260145
SYSAUX                         +DATA/orclasm/datafile/sysaux.257.850260145
UNDOTBS1                       +DATA/orclasm/datafile/undotbs1.258.851526539
USERS                          +DATA/orclasm/datafile/users.259.850260147
EXAMPLE                        +DATA/orclasm/datafile/example.265.850260295
APP1TBS                        +DATA/orclasm/datafile/app1tbs.301.902867963
APP2TBS                        +DATA/orclasm/datafile/app2tbs.300.902867963
TS_LHR                         +DATA/orclasm/datafile/ts_lhr.269.852632495
ENCRYPTED_TS                   +DATA/orclasm/datafile/encrypted_ts.272.854650889
GOLDENGATE                     +DATA/orclasm/datafile/goldengate.273.862829891
IDXTBS                         +DATA/orclasm/datafile/idxtbs.299.902867967
TS_LHR                         +FRA/orclasm/datafile/ts_lhr.284.869738273
USERS                          +FRA/orclasm/datafile/users.449.880121199
SYSTEM                         +FRA/orclasm/datafile/system.349.880121287

已选择 14 行。

SYS@orclasm >
```

至此说明 3 个表空间已经完全由 AIX 平台迁移到 Linux 平台上。

1.12 总结

到此所有的处理算是基本完毕，过程很简单，但是不同的场景处理方式有很多种，我们应该学会灵活变通。

1.13 About Me

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本文作者：小麦苗，只专注于数据库的技术，更注重技术的运用

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于 2016-01-26 10:00~ 2016-02-06 19:00 在中行完成

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