

Using RMAN to restore a database to another server in an ASM environment

It is possible to restore an Oracle 11g database to another server easily in an ASM environment by following the steps below.

1. Perform a full database backup using RMAN. The backup pieces will reside in the Flash Recovery Area of the source database.

The example below uses the database control file for its catalog:

```
rman target /
run {
  allocate channel prmy1 type disk;
    allocate channel prmy2 type disk;
    allocate channel prmy3 type disk;
    allocate channel prmy4 type disk;
  BACKUP AS COMPRESSED BACKUPSET DATABASE PLUS ARCHIVELOG
DELETE ALL INPUT;
  release channel prmy1;
  release channel prmy2;
  release channel prmy3;
  release channel prmy4;
}
```

2. When the backup completes successfully, copy the entire backup to the remote database's Flash Recovery Area. (The assumption here being; the remote database is an empty "barebones" DB, having just default tablespaces and users created). We can use DBMS_FILE_TRANSFER.PUT_FILE procedure for this, but first we must create an Oracle Directory on source and target:

- a. logon to node A (source) as oracle
- b. set following environment variables for DB
E.g.

```
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/db_1
export ORACLE_SID=MYDB
```

- c. Create an Oracle Directory on top of
+FLASH/mydb/backupset/<today's_date>

```
sqlplus / as sysdba
```

```
SQL> create directory BACKUPSET_NODEA as
'+FLASH/mydb/backupset/2009_12_07';
```

Directory created.

- d. Create a temporary user for file transfer

```
SQL> create user filetrans identified by filetrans;
```

User created.

```
SQL> grant connect, resource, dba to filetrans;
```

Grant succeeded.

```
SQL> grant read, write on directory BACKUPSET_NODEA to filetrans;
```

Grant succeeded.

- e. logon to node B (target) as oracle
- f. set following environment variables for ASM
E.g.

```
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/asm  
export ORACLE_SID=+ASM
```

- g. Make an ASM directory under +FLASH/mydb/backupset

```
asmcmd
```

```
ASMCMD> cd +FLASH/mydb/backupset
```

```
ASMCMD mkdir 2009_12_07
```

- h. Create an Oracle Directory on top of ASM directory
(+FLASH/mydb/backupset/2009_12_07) as in step c above, but name it
BACKUPSET_NODEB
- i. Create a temporary user as in step d above and grant read, write privileges
on the Directory to user

- 3. Use DBMS_FILE_TRANSFER.PUT_FILE to transfer the backup files from
Node A to Node B.

- a. logon to node A (source) as oracle
- b. set following environment variables for ASM
E.g.

```
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/asm  
export ORACLE_SID=+ASM
```

- c. use ASM command line interpreter to list backup files

```
asmcmd ls +FLASH/mydb/backupset/<today's_date>
```

E.g.

```
annnf0_TAG20091126T021140_0.10954.703908705  
annnf0_TAG20091126T021140_0.2068.703909105  
annnf0_TAG20091126T021140_0.330.703908703  
annnf0_TAG20091126T031122_0.10989.703912285  
annnf0_TAG20091126T031122_0.14617.703912553  
annnf0_TAG20091126T031122_0.15436.703912285  
annnf0_TAG20091126T031122_0.2063.703912285  
annnf0_TAG20091126T031122_0.6825.703912285  
ncnnf0_TAG20091126T013849_0.14464.703906809  
nnndf0_TAG20091126T013849_0.11351.703906831
```

```
nnndf0_TAG20091126T013849_0.6933.703906751
nnndf0_TAG20091126T013849_0.6938.703906749
nnndf0_TAG20091126T013849_0.9652.703906829
nnsnf0_TAG20091126T013849_0.9043.703906813
```

- d. set following environment variables for DB
E.g.

```
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/db_1
export ORACLE_SID=MYDB
```

- e. logon as filetrans user and create a database link. (Assuming TNS Admin is configured)

```
sqlplus filetrans/ filetrans
```

```
SQL> create database link NODEB connect to filetrans
identified by filetrans using 'NODEB';
```

Database link created.

- f. Put backup files (1 at a time) from NodeA DB and to NodeB DB
E.g.

```
SQL> exec
dbms_file_transfer.put_file('BACKUPSET_NODEA','annnf0_TAG
20091126T021140_0.10954.
703908705','BACKUPSET_NODEB','annnf0_TAG20091126T021140_0
.10954','NODEB');
```

PL/SQL procedure successfully completed.

```
[ dbms_file_transfer.put_file( SOURCE_DIRECTORY_OBJECT,
SOURCE_FILE_NAME, DESTINATION_DIRECTORY_OBJECT,
DESTINATION_FILE_NAME, DESTINATION_DATABASE ) ]
```

- g. Repeat step f for each file in source database backup directory until all files are transferred.

N.B. The unique incarnation number attached to the filename by ASM must be removed on the destination filename else the file transfer will fail to the following error:

```
ORA-15046: ASM file name "string" is not in single-file
creation form
```

4. Restore the database on target server using RMAN. The first step is to restore the database control file that contains the backup information, then catalog the backup files.

- a. logon to Node B as oracle
b. set following environment variables for DB
E.g.

```
export ORACLE_HOME=/u01/app/oracle/product/11.1.0/db_1
```

```
export ORACLE_SID=MYDB
```

- c. logon to target database as sysdba

```
sqlplus / as sysdba
```

- d. shutdown and startup (nomount) database and exit

```
SQL> shutdown immediate
```

```
SQL> startup nomount
```

```
SQL> exit
```

- e. connect to database using RMAN

```
rman target /
```

- f. restore original database control file from backuppeice (get filename from RMAN backup log file)

```
RMAN> restore controlfile from  
'+FLASH/mydb/backupset/2009_12_07/ncnnf0_tag20091126t0138  
49_0.14464.703906809';
```

- g. mount database from RMAN prompt

```
RMAN> alter database mount;
```

```
Database mounted.
```

- h. restore database using RMAN

```
RMAN> restore database;
```

```
Starting restore at 07-DEC-09  
Starting implicit crosscheck backup at 07-DEC-09  
allocated channel: ORA_DISK_1  
Crosschecked 45 objects  
Finished implicit crosscheck backup at 07-DEC-09
```

```
Starting implicit crosscheck copy at 07-DEC-09  
using channel ORA_DISK_1  
Finished implicit crosscheck copy at 07-DEC-09
```

```
searching for all files in the recovery area  
cataloging files...  
cataloging done
```

```
List of Cataloged Files
```

```
=====
```

```
File Name:
```

```
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.268.704548253
```

```
File Name:
```

```
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.269.704548299
```

```
File Name:
```

```
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.270.704548339
```

```
File Name:
```

```
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.271.704548411
```

```

File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.272.704548447
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.273.704548517
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.274.704548645
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.275.704548683
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.276.704548711
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.277.704548739
File Name:
+flash/MYDB/BACKUPSET/FILE_TRANSFER_0.278.704549283
using channel ORA_DISK_1

channel ORA_DISK_1: starting datafile backup set restore
. . .

channel ORA_DISK_1: restore complete, elapsed time:
00:43:56
Finished restore at 07-DEC-09

```

N.B. When the files are transferred to target DB ASM directory, ASM will rename the files to +flash/MYDB/BACKUPSET/FILE_TRANSFER_Aliases (with original filename) are automatically created in +flash/MYDB/BACKUPSET/2009_12_07 pointing to respective files in +flash/MYDB/BACKUPSET/ directory.

5. Recover the target database using RMAN.

a. logon to target database using RMAN

```
rman target /
```

b. Get the highest sequence number from RMAN catalog

```
RMAN> list archivelog all;
```

```
List of Archived Log Copies for database with
db_unique_name MYDB
=====
```

Key	Thrd	Seq	S	Low	Time
197651	1	51537	A	07-DEC-09	
Name:					
+FLASH/mydb/archivelog/2009_12_07/thread_1_seq_51537.4384.703902883					
197655	1	51538	A	07-DEC-09	
Name:					
+FLASH/mydb/archivelog/2009_12_07/thread_1_seq_51538.6894.703903155					
. . .					
197730	2	53401	A	07-DEC-09	
Name:					
+FLASH/mydb/archivelog/2009_12_07/thread_2_seq_53401.316.704565073					

- c. Recover database to last sequence number in backup

```
RMAN> recover database until sequence 53401;
```

- d. When recovery complete, open database from RMAN prompt

```
RMAN> alter database open resetlogs;
```

```
Database opened.
```

6. Finally drop the filetrans temporary user and BACKUPSET_NODEA Oracle Directory from the source database.