Practice Admin II

# Backup configuration… (4 bài đầu)

## Invoke and configure Recovery Manager (RMAN)

rman target/

CONFIGURE RETENTION POLICY TO REDUNDANCY 5; # default

CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 14 DAYS;

CONFIGURE BACKUP OPTIMIZATION OFF; # default

CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default

CONFIGURE CONTROLFILE AUTOBACKUP OFF; # default

CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; # default

CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default

CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE MAXSETSIZE TO UNLIMITED; # default

CONFIGURE ENCRYPTION FOR DATABASE OFF; # default

CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default

CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOAD TRUE ; # default

CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default

CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/opt/oracle/product/11.2.0/db\_1/dbs/snapcf\_testdb.f'; # default

## Configure multiple archive log file destinations to increase availability

Show parameter log\_archive\_dest;

ALTER SYSTEM SET log\_archive\_dest\_1='location=/opt/oracle/archive/orcl/';

ALTER SYSTEM SET log\_archive\_dest\_2='location=/opt/oracle/archive2/orcl/';

ALTER SYSTEM SET log\_archive\_dest\_state\_1 ='ENABLE';

ALTER SYSTEM SET log\_archive\_dest\_state\_2 ='ENABLE';

ALTER SYSTEM SET log\_archive\_format='arch\_%T\_%t\_%s\_%r.dbf' scope =spfile;

## Configure the Fast Recovery Area (FRA)

show parameter DB\_RECOVERY\_FILE \_DEST🡪

Show parameter DB\_RECOVERY\_FILE\_DEST\_SIZE 🡪

alter system set db\_recovery\_file\_dest\_size =5G;

## Specify a retention policy

CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default

CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 7 DAYS;

## Create and configure a recovery catalog

1)Create tablespace for RMAN repository

SQL> create tablespace rman\_tbs datafile '/opt/oracle/oradata/testdb/rman\_tbs01.dbf' size 100M autoextend off extent management local segment space management auto;

2)create RMAN owner user

SQL> create user rman identified by rman001 default tablespace rman\_tbs temporary tablespace temp;

3)Grant privileges to the RMAN Repository owner

SQL> grant connect,resource,recovery\_catalog\_owner to rman;

4)create catalog using RMAN catalog command tool

[oracle@rmanl001 bin]$ ./rman catalog rman/rman001

Recovery Manager: Release 11.2.0.2.0 – Production on Thu Jun 2 22:45:47 2011

Copyright (c) 1982, 2009, Oracle and/or its affiliates. All rights reserved.

connected to recovery catalog database

RMAN> create catalog;

Check to see if any objects were created in rman table space;

Now we will register 10g database with the rman repository.

SQL> connect rman@testdb

Enter password:

Connected.

SQL> select \* from rc\_database;

no rows selected

5)Register the database with RMAN repository

=======AT DB TARGET:

[oracle@rmanl001 bin]$ ./rman catalog rman/rman001@testdb target /

Recovery Manager: Release 10.2.0.5.0 – Production on Thu Jun 2 22:56:27 2011

Copyright (c) 1982, 2007, Oracle. All rights reserved.

connected to target database: RMANDV1 (DBID=701459141)

connected to recovery catalog database

RMAN> register database;

database registered in recovery catalog

starting full resync of recovery catalog

full resync complete

SQL> select \* from rc\_database;

DB\_KEY DBINC\_KEY DBID NAME RESETLOGS\_CHANGE# RESETLOGS

———- ———- ———- ——– —————– ———

2 701459141 RMANDV1 1 02-JUN-11

RMAN> show all;

==================== thử backup target.

RMAN> backup database;

================Với DB TARGET có version thấp hơn thì register bình thường.

================ Với DB TARGET có version cao hơn thì phải upgrade.

RMAN> upgrade catalog;

## Synchronize the recovery catalog

<http://www.dba-oracle.com/t_rman_97_syncronizing_catalog.htm>

$ export ORACLE\_SID=db1  
$ rman target / catalog [rcat\_owner/rcat@rc](mailto:rcat_owner/rcat@rc)  
   
connected to target database: DB1 (DBID=1302506781)  
connected to recovery catalog database  
   
RMAN> resync catalog;  
   
starting full resync of recovery catalog  
full resync complete  
RMAN>

<http://docs.oracle.com/cd/B28359_01/backup.111/b28273/rcmsynta038.htm>

## Use RMAN stored scripts

<http://www.oracle.com/technetwork/issue-archive/2009/09-sep/o59recovery-085185.html>

C:\> rman

RMAN> connect target /

RMAN> connect catalog rman/secretpass@rmancat

RMAN> create script backup\_ts\_users

comment 'Tablespace Users Backup'

{

allocate channel c1 type disk format 'c:\temp\%U';

backup tablespace users;

}

If global replace:

create script backup\_ts\_users

with

create global script backup\_ts\_users

Using parameter in script:

**Code Listing 4:**Parameter-driven stored script

RMAN> create script backup\_ts\_any

comment 'Any Tablespace Backup'

{

allocate channel c1 type disk format 'c:\temp\%U';

backup tablespace &1;

users

}

created script backup\_ts\_any

RMAN> list script names;

RMAN> list global script names;

* To display the contents of a specific stored script, such as backup\_ts\_any, use the following command:

RMAN> print global script backup\_ts\_level1\_any;

If the stored script you want to print is local, omit the keyword GLOBAL in the command.

* To drop a script, such as backup\_ts\_level1\_any, use the following command:

RMAN> delete global script

backup\_ts\_level1\_any;

What if you want to create a stored script from a script file in the file system? You can import the file into the catalog. Here is an example:

Tạo từ file thì không truyền được tham số.

RMAN> create script backup\_ts\_users from file 'backup\_ts\_users.rman';

Conversely, you can create a file from a stored script (or export a stored script to a file). Here is an example:

 RMAN> print script backup\_ts\_users to file 'backup\_ts\_users.rman';

Muốn thay đổi nội dung script thì hoặc drop đi tạo lại hoặc dùng lệnh REPLACE như với procedure.

REPLACE [GLOBAL] SCRIPT *script\_name* FROM FILE *'file\_name'*;

Thực thi một script:

RUN { EXECUTE SCRIPT

*script\_name*

; }

<http://www.di.unipi.it/~ghelli/didattica/bdldoc/B19306_01/backup.102/b14191/rcmcatdb005.htm>

Script tạo đều nằm trên catalog, lúc đăng nhập là có đăng nhập vào catalog và cả target.

## Back up the recovery catalog: backup hoặc export như DB thông thường.

## Create a virtual private catalog

Các bước trong bài này rất rõ ràng từng bước:  
http://www.dba-oracle.com/t\_rman\_105\_virtual\_private\_catalog.htm

VPC: là cách để gán quyền, giới hạn quyền, chia quyền cho từng target database bằng 1 user khác user catalog owner và tạo ra các virtual catalog trên máy target base trên catalog của server recovery catalog.

Làm ví dụ trên link bên trên.

Hoặc bài viết này:  
 <http://www.oraclemasters.in/?p=448>

## Configure backup destinations

run {

BACKUP BLOCKS ALL AS COMPRESSED BACKUPSET INCREMENTAL LEVEL 0 DATABASE FORMAT '/opt/oracle/backup/orcl/dbbk/db0\_%T\_%d\_%u\_%s' FILESPERSET 4 TAG FULLBKP;

}

## Allocate channels for tape destination

Run

{

ALLOCATE CHANNEL RMAN\_DISK01 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK02 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK03 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK04 TYPE DISK;

BACKUP BLOCKS ALL AS COMPRESSED BACKUPSET INCREMENTAL LEVEL 0 DATABASE FORMAT '/opt/oracle/backup/orcl/dbbk/db0\_%T\_%d\_%u\_%s' FILESPERSET 4 TAG FULLBKP;

RELEASE CHANNEL RMAN\_DISK01;

RELEASE CHANNEL RMAN\_DISK02;

RELEASE CHANNEL RMAN\_DISK03;

RELEASE CHANNEL RMAN\_DISK04;

}

## Configure backup optimization

CONFIGURE BACKUP OPTIMIZATION ON;

Optimization có tác dụng gì??? 🡪 skips backing up files when the identical file has already been backed up to the specified device type

<http://docs.oracle.com/cd/B28359_01/backup.111/b28270/rcmconfb.htm#i1015217>

# Create backup

## Create a compressed backup

BACKUP AS COMPRESSED BACKUPSET ARCHIVELOG ALL FORMAT '/opt/oracle/backup/orcl/arcbk/arc0\_%T\_%d\_%u\_%s\_%U' FILESPERSET 4 DELETE INPUT TAG ARCH;

## Create an encrypted backup

RMAN> CONFIGURE ENCRYPTION FOR DATABASE ON;

RMAN> CONFIGURE ENCRYPTION FOR DATABASE OFF;

## Create image file backups

Chính là backup as copy:

BACKUP AS COPY DATABASE FORMAT '/opt/oracle/backup/orcl/dbbk/ db0\_%T\_%d\_%u\_%s\_%U' ';

## Create a whole database backup

Là backup toàn bộ các file cần thiết để restore: datafile, controlfile, ….

## Create a full database backup

Là backup full toàn bộ database: tất cả các tablespace, datafile.

## Enable fast incremental backup

Backup incremental…

BACKUP BLOCKS ALL AS COMPRESSED BACKUPSET INCREMENTAL LEVEL 1 DATABASE FORMAT '/opt/oracle/backup/orcl/dbbk/db0\_%T\_%d\_%u\_%s' FILESPERSET 4 TAG FULLBKP;

## Create duplex backup sets

BACKUP DEVICE TYPE DISK COPIES 3 DATAFILE 7

FORMAT '/disk1/%U','?/oradata/%U','?/%U';

Hoặc:

BACKUP COPIES 2 DEVICE TYPE sbt BACKUPSET ALL;

## Back up a backup set

BACKUP AS COMPRESSED BACKUPSET ARCHIVELOG ALL FORMAT '/opt/oracle/backup/orcl/arcbk/arc0\_%T\_%d\_%u\_%s\_%U' FILESPERSET 4 DELETE INPUT TAG ARCH;

## Create RMAN multi-section backup

Dùng cho các DB quá lớn và giới hạn size cho bản backup.

**Multisection Backup**

An RMAN backup set in which each backup piece contains a file section, which is a contiguous range of blocks in a datafile. A multisection backup set contains multiple backup pieces, but a backup set never contains only a part of a datafile.You create a multisection backup by specifying the SECTION SIZE parameter on the BACKUP command. An RMAN channel can process each file section independently, either serially or in parallel. Thus, in a multisection backup, multiple channels can

back up a single file.

RMAN> BACKUP SECTION SIZE 300M TABLESPACE users;

<http://emrebaransel.blogspot.com/2011/07/rman-channels-parallelism-multisection.html>

## Create an archival backup for long-term retention

run {

backup database

format '/u01/app/oracle/oradata/odlin11g/archivalbkup/%U'

tag biannual\_01

keep until time 'sysdate+182'

restore point archbup;

}

## Report on and maintain backups

RMAN> List backup;

RMAN> DELETE NOPROMPT OBSOLETE;

RMAN> DELETE NOPROMPT EXPIRED BACKUP;

## Xem lung lượng fRA bằng lệnh command line.

SELECT

NAME,

TO\_CHAR(SPACE\_LIMIT, '999,999,999,999') AS SPACE\_LIMIT,

TO\_CHAR(SPACE\_LIMIT - SPACE\_USED + SPACE\_RECLAIMABLE, '999,999,999,999')

AS SPACE\_AVAILABLE,

ROUND((SPACE\_USED - SPACE\_RECLAIMABLE)/SPACE\_LIMIT \* 100, 1)

AS PERCENT\_FULL

FROM V$RECOVERY\_FILE\_DEST;

Query the **V$RECOVERY\_FILE\_DEST** view to find out the current location, disk quota, space in use, space reclaimable by deleting files, and total number of files in the Flash Recovery Area. For example :

SQL> SELECT \* FROM V$RECOVERY\_FILE\_DEST;

Query the **V$FLASH\_RECOVERY\_AREA\_USAGE** view to find out the percentage of the total disk quota used by different types of files. Also, you can determine how much space for each type of file can be reclaimed by deleting files that are obsolete, redundant, or already backed up to tape. For example :

SELECT \* FROM V$FLASH\_RECOVERY\_AREA\_USAGE;

## ENTRIES, disater, backup, recovery…

This argument specifies the number of entries that you require the password file to accept. This number corresponds to the number of distinct users allowed to connect to the database as SYSDBA or SYSOPER. The actual number of allowable entries can be higher than the number of users, because the ORAPWD utility continues to assign password entries until an operating system block is filled. For example, if your operating system block size is 512 bytes, it holds four password entries. The number of password entries allocated is always a multiple of four.

Entries can be reused as users are added to and removed from the password file. If you intend to specifyREMOTE\_LOGIN\_PASSWORDFILE=EXCLUSIVE, and to allow the granting of SYSDBA and SYSOPER privileges to users, this argument is required.

# Recovery

## Recovery index tablespace, password file,

Recreate index.

SQL> CREATE INDEX rname\_idx

ON hr.regions (region\_name)

PARALLEL 4;

To recover from the loss of a password file:

1, Re-create the password file by using orapwd.

$ orapwd file=$ORACLE\_HOME/dbs/orapworcl password=ora entries=5

2, Add users to the password file and assign appropriate privileges to each user.

Nologging object:

CREATE TABLE sales\_copy NOLOGGING;

SQL> INSERT /\*+ APPEND \*/ INTO sales\_copy SELECT \* FROM sales\_history;

Recovery controlfile:

% cp /backup/control01.dbf /disk1/oradata/trgt/control01.dbf

% cp /backup/control02.dbf /disk2/oradata/trgt/control02.dbf

Mount the database, and start the recovery process. You must specify that a backup control file is being used.

SQL> RECOVER DATABASE USING BACKUP CONTROLFILE UNTIL CANCEL;

## Recovery tablespace, datafile, database

RMAN> SQL 'ALTER TABLESPACE inv\_tbs OFFLINE IMMEDIATE';

RMAN> RESTORE TABLESPACE inv\_tbs;

RMAN> RECOVER TABLESPACE inv\_tbs;

RMAN> SQL 'ALTER TABLESPACE inv\_tbs ONLINE';

Recovery file hệ thống:

* + 1. If the instance is not already shut down, shut it down.
    2. Mount the database.
    3. Restore datafile #file;
    4. Determine whether you want to restore the files to the default location or (if a disk or controller is missing) to a new location. (set new name)
    5. Submit the RMAN job to restore and recover the missing files.
    6. Recovery datafile #file;
    7. Open the database. Users are not required to reenter data because the recovery is up to the time of the last commit.

Recovery image copy:

RMAN> RECOVER COPY OF DATAFILE {n|'file\_name'}

RMAN> recover copy of database with tag 'daily\_inc';

RMAN> backup incremental level 1 for recover of copy

with tag 'daily\_inc' database;

Switch image copy:

SQL> SWITCH DATAFILE *'filename'* TO COPY;

RECOVER DATAFILE 'FILENAME';

1. Take the data file offline.

2. Use the SWITCH TO ... COPY command to point to the image copy of the files.

3. Recover the data files.

4. Bring the data files online.

At this point, the database is usable, and the data files are recovered. But, if you want to put the data files back into their original location, proceed with the following steps:

5. Create an image copy of the data files in the original location using the BACKUP AS COPY command.

6. Take the data files offline.

7. Switch to the copy you made in step 5 using the SWITCH TO COPY command.

8. Recover the data files.

9. Bring the data files online.

Set new name: substitution variables: %b, %f, and %U. %I and %N are optional variables

1. SET NEWNAME FOR DATAFILE and SET NEWNAME FOR TEMPFILE

2. SET NEWNAME FOR TABLESPACE

3. SET NEWNAME FOR DATABASE

Script example:

RUN

{ ALLOCATE CHANNEL dev1 DEVICE TYPE DISK;

ALLOCATE CHANNEL dev2 DEVICE TYPE sbt;

SQL "ALTER TABLESPACE users OFFLINE IMMEDIATE";

SET NEWNAME FOR DATAFILE '/disk1/oradata/prod/users01.dbf'

TO '/disk2/users01.dbf';

RESTORE TABLESPACE users;

SWITCH DATAFILE ALL;

RECOVER TABLESPACE users;

SQL "ALTER TABLESPACE users ONLINE";

}

Or

RUN

{ SET NEWNAME FOR DATAFILE 1 TO '/oradata1/system01.dbf';

SET NEWNAME FOR DATAFILE 2 TO '/oradata2/sysaux01.dbf';

SET NEWNAME FOR DATAFILE 3 TO '/oradata3/undotbs01.dbf';

SET NEWNAME FOR DATAFILE 4 TO '/oradata4/users01.dbf';

SET NEWNAME FOR TABLESPACE example TO '/oradata5/%b';

DUPLICATE TARGET DATABASE TO dupldb; }

## Recovery in noarchivelog mode

* Shut down the instance if it is not already down.
* Restore the entire database, including all data and control files, from the backup.
* Open the database.

## Create restore point

Now:

SQL> CREATE RESTORE POINT before\_mods;

In the past:

SQL> CREATE RESTORE POINT end\_q1 AS OF SCN 100;

Lấy SCN hiện tại:

SELECT TO\_CHAR(CURRENT\_SCN) FROM V$DATABASE;

select dbms\_flashback.get\_system\_change\_number from dual;

Khôi phục DB về restore point:

Restore như quy trình thông thường.

 recover database until restore point xxx;

## Incomplete recovery

* 1. Determine the restore target. This can be in terms of a date and time, an SCN, restore point, or log sequence number. For example, if you know that some bad transactions were submitted at 3:00 PM yesterday, then you can choose 2:59 PM yesterday as the target restore point time.
* 2. Set the National Language Support (NLS) OS environment variables, so that the time constants you provide to RMAN are formatted correctly. These are some example settings:

$ export NLS\_LANG = american\_america.us7ascii

$ export NLS\_DATE\_FORMAT = "yyyy-mm-dd:hh24:mi:ss"

* 3. Mount the database. If it is open, you have to shut it down first, as in this example:

RMAN> shutdown immediate

RMAN> startup mount

* 4. Create a RUN block and run it. The RECOVER and RESTORE commands should be in the same RUN block so that the UNTIL setting applies to both. For example, if you choose to recover to a particular SCN, the RESTORE command needs to know that value so it restores files from backups that are sufficiently old—that is, backups that are from before that SCN. Here is an example of a RUN block:

RUN

{

SET UNTIL TIME/SCN/SEQUENCE '2007-08-14:21:59:00';

RESTORE DATABASE;

RECOVER DATABASE;

}

* 5. As soon as you open the database for read/write, you have committed to the restore you just performed. So, first, open the database READ ONLY, and view some data, to check whether the recovery did what you expected.

RMAN> SQL 'ALTER DATABASE OPEN READ ONLY';

* 6. If satisfied with the results of the recovery, open the database with the RESETLOGS option, as shown:

RMAN> ALTER DATABASE OPEN RESETLOGS;

## Restore parameter file, controlfile, and incremental

SQL> CREATE PFILE [= 'pfile\_name' ]

FROM { { SPFILE [= 'spfile\_name'] } | MEMORY } ;

Or

SQL> CREATE SPFILE [= 'spfile\_name' ]

FROM { { PFILE [= 'pfile\_name' ] } | MEMORY } ;

Restore pfile or spfile From auto backup:

RMAN> STARTUP FORCE NOMOUNT;

RMAN> RESTORE SPFILE FROM AUTOBACKUP;

RMAN> STARTUP FORCE;

Restore control file from auto backup:

RMAN> STARTUP NOMOUNT;

RMAN> RESTORE CONTROLFILE FROM AUTOBACKUP;

RMAN> ALTER DATABASE MOUNT;

RMAN> RECOVER DATABASE;

RMAN> ALTER DATABASE OPEN RESETLOGS;

Recover using incremental:

STARTUP FORCE NOMOUNT;

RESTORE CONTROLFILE;

ALTER DATABASE MOUNT;

RESTORE DATABASE;

RECOVER DATABASE NOREDO;

ALTER DATABASE OPEN RESETLOGS;

## Restore to new host

1. Configure the ORACLE\_SID environment variable as shown in the following example:

$ setenv ORACLE\_SID orcl

2. Start RMAN and connect to the target instance. Do not connect to the recovery catalog as shown in the following example:

$ rman TARGET /

3. Set the database identifier (DBID). You can find the DBID of your source database by querying the DBID column in V$DATABASE.

RMAN> SET DBID 1090770270;

4. Start the instance in NOMOUNT mode:

RMAN> STARTUP NOMOUNT

You will receive an error similar to the following because the server parameter file has not been restored. RMAN uses a “dummy” parameter file to start the instance.

startup failed: ORA-01078: failure in processing system parameters

5. Restore the server parameter file from the backup sets and shut down the instance as shown in the example:

RESTORE SPFILE TO PFILE '?/oradata/test/initorcl.ora' FROM AUTOBACKUP;

6. Shut down the instance:

SHUTDOWN IMMEDIATE;

7. Edit the restored initialization parameter file to change any location-specific parameters, such as those ending in \_DEST, to reflect the new directory structure.

8. Start the instance in NOMOUNT mode using your edited text initialization parameter file.

RMAN> STARTUP NOMOUNT

> PFILE='?/oradata/test/initorcl.ora';

9. Create a RUN block to restore the control file from an autobackup and mount the database as shown in the example:

RUN

{

RESTORE CONTROLFILE FROM AUTOBACKUP;

ALTER DATABASE MOUNT;

}

10. Query V$DATAFILE on your new host to determine the database file names as recorded in the control file. Create the RMAN recovery script to restore and recover the database, including the following steps as appropriate:

* + - 1. Use the SET NEWNAME command to specify the path on your new host for each of the data files that is restored to a different destination than on the original host.
      2. Use the SQL ALTER DATABASE RENAME FILE command to specify the path for the online redo log files.
      3. Include the SET UNTIL command to limit recovery to the end of the archived redo log files.

Include the SWITCH command so that the control file recognizes the new path names as the correct names for the data files.

An example of a recovery script follows:

RUN

{

SET NEWNAME FOR DATAFILE 1 TO '?/oradata/test/system01.dbf';

SET NEWNAME FOR DATAFILE 2 TO '?/oradata/test/undotbs01.dbf';

SET NEWNAME FOR DATAFILE 3 TO '?/oradata/test/sysaux.dbf';

SET NEWNAME FOR DATAFILE 4 TO '?/oradata/test/users01.dbf';

SET NEWNAME FOR DATAFILE 5 TO '?/oradata/test/example01.dbf';

SQL "ALTER DATABASE RENAME FILE ''/u01/app/oracle/oradata/orcl/redo01.log''

TO ''?/oradata/test/redo01.log'' ";

SQL "ALTER DATABASE RENAME FILE ''/u01/app/oracle/oradata/orcl/redo02.log''

TO ''?/oradata/test/redo02.log'' ";

SQL "ALTER DATABASE RENAME FILE ''/u01/app/oracle/oradata/orcl/redo03.log''

TO ''?/oradata/test/redo03.log'' ";

SET UNTIL SCN 4545727;

RESTORE DATABASE;

SWITCH DATAFILE ALL;

RECOVER DATABASE;

}

11. Execute the recovery script.

12. Open the database with the RESETLOGS option:

RMAN> ALTER DATABASE OPEN RESETLOGS;

After you have completed your test, you can shut down the test database instance and delete the test database with all its files.

# Tuning, monitor RMAN

## Monitor:

SQL> COLUMN CLIENT\_INFO FORMAT a30

SQL> COLUMN SID FORMAT 999

SQL> COLUMN SPID FORMAT 9999

SQL> SELECT s.sid, p.spid, s.client\_info

FROM v$process p, v$session s

WHERE p.addr = s.paddr

AND CLIENT\_INFO LIKE 'rman%';

SQL> SELECT OPNAME, CONTEXT, SOFAR, TOTALWORK,

ROUND(SOFAR/TOTALWORK\*100,2) "%\_COMPLETE"

FROM V$SESSION\_LONGOPS

WHERE OPNAME LIKE 'RMAN%'

AND OPNAME NOT LIKE '%aggregate%'

AND TOTALWORK != 0

AND SOFAR <> TOTALWORK;

Example:

1. In each session, set the command ID to a different value and then back up the desired object. For example, enter the following in session 1:

RUN  
{  
SET COMMAND ID TO 'sess1';  
BACKUP DATABASE;  
}

Set the command ID to a string such as sess2 in the job running in session 2:

RUN  
{  
SET COMMAND ID TO 'sess2';  
BACKUP DATABASE;  
}

2. Start a SQL\*Plus session and then query the joined V$SESSION and V$PROCESS views while the RMAN job is being executed. For example, enter:

SELECT SID, SPID, CLIENT\_INFO  
FROM V$PROCESS p, V$SESSION s  
WHERE p.ADDR = s.PADDR  
AND CLIENT\_INFO LIKE '%id=sess%';

If you run the SET COMMAND ID command in the RMAN job, then the CLIENT\_INFO column is displayed in the following format:  
id=command\_id,rman channel=channel\_id  
For example, the following shows a sample output:

SID SPID CLIENT\_INFO  
---- ------------ ------------------------------  
11 8358 id=sess1  
15 8638 id=sess2  
14 8374 id=sess1,rman channel=c1  
9 8642 id=sess2,rman channel=c1

## Debug

Sử dụng debug:

* + - View the PL/SQL that is generated
    - Determine precisely where an RMAN command is hanging or faulting

rman target / catalog rman/rman debug trace trace.log

RMAN> backup database;

RMAN> host "ls –l trace.log";

$ rman target / catalog rman/rman debug trace sample.log

RMAN> backup database;

RMAN> host "ls –l sample.log";

-rw-r--r-- 1 user02 dba 576270 Apr 6 10:38 sample.log

host command complete

Một số dòng lỗi khi sử dụng RMAN.

RMAN-00571: ===========================================

RMAN-00569: ======= ERROR MESSAGE STACK FOLLOWS =======

RMAN-00571: ===========================================

RMAN-03009: failure of backup command on c1 channel at  
 09/04/2001 13:18:19

ORA-19506: failed to create sequential file,  
 name="07d36ecp\_1\_1", parms=""

ORA-27007: failed to open file

SVR4 Error: 2: No such file or directory

Additional information: 7005

Additional information: 1

ORA-19511: Error from media manager layer,error text:

## Tuning

Nhắc lại backup parallel.

Multiplexing RMAN: phụ thuộc vào FILESPERSET của lệnh BACKUP và MAXOPENFILES trong cấu hình kênh CONFIGURE CHANNEL hoặc ALLOCATE CHANNEL và số file backup.

Giả sử: backup 2 file, filesperset =3, maxopenfiles=8 🡺 trường hợp này số file trong mỗi bakup set là 2 < FILESPERSET, nên Multiplex là 2.

Note: For best recovery performance, do not set FILESPERSET to a value greater than 8.

Tham số BACKUP\_TAPE\_IO\_SLAVES:

show parameter BACKUP\_TAPE\_IO\_SLAVES

True: Kênh cấp phát từ SGA

False: Kênh cấp phát PGA

Buffer của disk thường lớn lơn tape, thông thường tape là 256 KB buffer, nên nếu backup ra tape mà để cấu hình backup thông thường thì sẽ chậm hơn.

* Cơ chế đọc ghi I/O đồng bộ và bất đồng bộ trường hợp backup ra tape:
  + Đồng bộ: đọc ghi lần lượt, xong tiến trình trước rồi mới đến tiến trình sau
  + Bất đồng bộ: đọc ghi đồng thời nhiều process lên buffer, sau đó có 1 tiến trình ghi từ buffer xuống Disk.
* Nếu BACKUP\_TAPE\_IO\_SLAVES là TRUE, thì tape I/O là bất đồng bộ, nếu không thì là đồng bộ
* Theo dõi performance từ 2 view:
  + V$BACKUP\_SYNC\_IO
  + V$BACKUP\_ASYNC\_IO
* Phát hiện bottleneck:
  + Dùng view V$BACKUP\_ASYNC\_IO để theo dõi I/O bất đồng bộ:
  + Nếu tỉ số LONG\_WAITS /IO\_COUNT lớn thì có khả năng bị bottleneck.

Select status, to\_char(open\_time, ‘dd/mm/yyyy hh24:mi:ss’), device\_type, LONG\_WAITS /IO\_COUNT, SHORT\_WAIT\_TIME\_TOTAL, LONG\_WAIT\_TIME\_TOTAL;

* + - IO\_COUNT: Number of I/Os performed on the file
    - LONG\_WAITS: Number of times the backup/restore process told the OS to wait until I/O was complete
  + Wait times should be zero to avoid bottlenecks.
    - SHORT\_WAIT\_TIME\_TOTAL
    - LONG\_WAIT\_TIME\_TOTAL
* Bottleneck với trường hợp đồng bộ
  + Query the DISCRETE\_BYTES\_PER\_SECOND column from V$BACKUP\_SYNC\_IO to view the I/O rate.
  + Compare this rate with the device’s maximum rate.
  + If the rate is lower than what the device specifies, this is a tuning opportunity.
* Tuning bằng kênh RMAN
  + Parallel, multiplex file
  + Giới hạn kích cỡ của file
* Tuning câu lệnh BACKUP
  + MAXPIECESIZE giới hạn kích cỡ của mỗi một file backup
  + FILESPERSET tránh cho việc RMAN đọc từ nhiều disk tại 1 thời điểm.
  + MAXOPENFILES số file lớn nhất đc ghi ra tape
  + BACKUP DURATION giảm tải của hệ thống trong quá trình backup.
    - **MINIMIZE TIME:** The backup runs as fast as possible.
    - **MINIMIZE LOAD:** The backup attempts to use the full amount of time available in the window. This reduces load on the system
* **4 bước tuning performance**

To tune RMAN backup performance, follow these steps :

* + Remove RATE settings from configured and allocated channels.
  + Set DBWR\_IO\_SLAVES if you use synchronous disk I/O. Nếu hệ thống không hỗ trợ bất đồng bộ IO thì nên đặt tham số này bằng 0.
  + Set LARGE\_POOL\_SIZE.
  + Tune RMAN tape streaming performance bottlenecks.
  + Query V$ views to identify bottlenecks.

# Diagnostic DB

Cách xem alert log:

SELECT \* FROM V$DIAG\_INFO;

🡪

NAME VALUE

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

Diag Enabled TRUE

ADR Base /u01/app/oracle

ADR Home /u01/app/oracle/diag/rdbms/orcl/orcl

Diag Trace /u01/app/oracle/diag/rdbms/orcl/orcl/trace

Diag Alert /u01/app/oracle/diag/rdbms/orcl/orcl/alert

Diag Incident /u01/app/oracle/diag/rdbms/orcl/orcl/incident

Diag Cdump /u01/app/oracle/diag/rdbms/orcl/orcl/cdump

Health Monitor /u01/app/oracle/diag/rdbms/orcl/orcl/hm

Default Trace File /u01/app/oracle/diag/.../trace/orcl\_ora\_11424.trc

Active Problem Count 3

Active Incident Count 8

Cách sinh ra trace file:

<http://www.toadworld.com/platforms/oracle/w/wiki/376.tracing-sql-statement-execution.aspx>

ALTER SESSION SET SQL\_TRACE TRUE;

select \* from hr.employees;

SELECT s.sql\_trace, s.sql\_trace\_waits, s.sql\_trace\_binds,

traceid, tracefile

FROM v$session s JOIN v$process p ON (p.addr = s.paddr)

WHERE audsid = USERENV ('SESSIONID')

/

/opt/oracle/diag/rdbms/testdb/testdb/trace/testdb\_ora\_19032.trc

[oracle@db01 ~]$ tkprof /opt/oracle/diag/rdbms/testdb/testdb/trace/testdb\_ora\_19032.trc /home/oracle/output\_trace.log explain=connection waits =yes

TKPROF: Release 11.2.0.1.0 - Development on Sat Nov 30 10:31:42 2013

Copyright (c) 1982, 2009, Oracle and/or its affiliates. All rights reserved.

password = oracle

#

tail -1000f output\_trace.log

Kết quả:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SQL ID: 7jk33n4f4mpy9

Plan Hash: 1445457117

select \*

from

hr.employees

call count cpu elapsed disk query current rows

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

Parse 1 0.01 0.11 0 0 0 0

Execute 1 0.00 0.00 0 0 0 0

Fetch 9 0.00 0.04 6 15 0 107

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

total 11 0.02 0.16 6 15 0 107

Misses in library cache during parse: 1

Optimizer mode: ALL\_ROWS

Parsing user id: SYS

Rows Row Source Operation

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

107 TABLE ACCESS FULL EMPLOYEES (cr=15 pr=6 pw=0 time=0 us cost=3 size=7383 card=107)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Block recovery:

RECOVER DATAFILE 6 BLOCK 3; *Recover a single block*

RECOVER *Recover multiple blocks*

DATAFILE 2 BLOCK 43 i*n multiple data files*

DATAFILE 2 BLOCK 79

DATAFILE 6 BLOCK 183;

RECOVER CORRUPTION LIST; *Recover all blocks logged in*

# Memory

SQL> show parameter target

NAME TYPE VALUE

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

archive\_lag\_target integer 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

memory\_max\_target big integer 752M

memory\_target big integer 752M

parallel\_servers\_target integer 4

pga\_aggregate\_target big integer 0

sga\_target big integer 0

Cách lấy file awr để xem advisor của sga\_target va PGA

SQL> BEGIN

2 DBMS\_WORKLOAD\_REPOSITORY.CREATE\_SNAPSHOT ();

3 END;

4 /

PL/SQL procedure successfully completed.

SQL> desc chien.testdata;

Name Null? Type

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

ID NUMBER

GROUP\_ID NOT NULL NUMBER

CREATED\_AT NOT NULL DATE

TEXT NOT NULL VARCHAR2(50)

NUM NUMBER(2)

SQL> insert into chien.testdata values (29, 19, sysdate, 'tttest awr', 1);

1 row created.

SQL> commit;

Commit complete.

SQL> BEGIN

2 DBMS\_WORKLOAD\_REPOSITORY.CREATE\_SNAPSHOT ();

3 END;

4 /

PL/SQL procedure successfully completed.

SQL> @$ORACLE\_HOME/rdbms/admin/awrrpt.sql

Current Instance

~~~~~~~~~~~~~~~~

DB Id DB Name Inst Num Instance

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

2582268585 TESTDB 1 testdb

Specify the Report Type

~~~~~~~~~~~~~~~~~~~~~~~

Would you like an HTML report, or a plain text report?

Enter 'html' for an HTML report, or 'text' for plain text

Defaults to 'html'

Enter value for report\_type:

Type Specified: html

Instances in this Workload Repository schema

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

DB Id Inst Num DB Name Instance Host

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

\* 2582268585 1 TESTDB testdb db01.perform

ancetest

Using 2582268585 for database Id

Using 1 for instance number

Specify the number of days of snapshots to choose from

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Entering the number of days (n) will result in the most recent

(n) days of snapshots being listed. Pressing <return> without

specifying a number lists all completed snapshots.

Enter value for num\_days: 3

Listing the last 3 days of Completed Snapshots

Snap

Instance DB Name Snap Id Snap Started Level

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

testdb TESTDB 8070 30 Nov 2013 08:00 1

8071 30 Nov 2013 09:00 1

8072 30 Nov 2013 10:00 1

8073 30 Nov 2013 11:00 1

8074 30 Nov 2013 11:15 1

8075 30 Nov 2013 11:17 1

Specify the Begin and End Snapshot Ids

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Enter value for begin\_snap: 8074

Begin Snapshot Id specified: 8074

Enter value for end\_snap: 8075

End Snapshot Id specified: 8075

Specify the Report Name

~~~~~~~~~~~~~~~~~~~~~~~

The default report file name is awrrpt\_1\_8074\_8075.html. To use this name,

press <return> to continue, otherwise enter an alternative.

Enter value for report\_name: awr\_test.html

Using the report name awr\_test.html

Lấy file trên đường dẫn hiện session vừa connect.

# Flashback I

* Phân biệt giữa:
  + flashback query: xem dữ liệu tại 1 thời điểm trong quá khứ
  + Xem DL gốc (nhớ set time on)
  + Cập nhật lần 1 salary=1000 và Commit;
  + Cập nhật lần 2: salary=2000 và Commit;

SELECT \* FROM employees

AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '60' MINUTE)where employee\_id=100;

SELECT \* FROM employees

AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '10' MINUTE)where employee\_id=100;

SELECT \* FROM employees

AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '5' MINUTE)where employee\_id=100;

Kết quả:

15:33:59 SQL> SELECT \* FROM employees

15:34:32 2 AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '60' MINUTE)where employee\_id=100;

EMPLOYEE\_ID FIRST\_NAME LAST\_NAME EMAIL PHONE\_NUMBER HIRE\_DATE JOB\_ID SALARY

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

COMMISSION\_PCT MANAGER\_ID DEPARTMENT\_ID

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

100 Steven King SKING 515.123.4567 17-JUN-03 AD\_PRES 24000

90

15:34:32 SQL> SELECT \* FROM employees

15:34:53 2 AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '10' MINUTE)where employee\_id=100;

EMPLOYEE\_ID FIRST\_NAME LAST\_NAME EMAIL PHONE\_NUMBER HIRE\_DATE JOB\_ID SALARY

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

COMMISSION\_PCT MANAGER\_ID DEPARTMENT\_ID

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

100 Steven King SKING 515.123.4567 17-JUN-03 AD\_PRES 1000

90

15:34:53 SQL> SELECT \* FROM employees

15:35:07 2 AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '5' MINUTE)where employee\_id=100;

EMPLOYEE\_ID FIRST\_NAME LAST\_NAME EMAIL PHONE\_NUMBER HIRE\_DATE JOB\_ID SALARY

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

COMMISSION\_PCT MANAGER\_ID DEPARTMENT\_ID

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

100 Steven King SKING 515.123.4567 17-JUN-03 AD\_PRES 2000

* + flashback version query: Xem sự khác biệt giữa 2 thời điểm.

select EMPLOYEE\_ID, salary from employees where EMPLOYEE\_ID =100;

update employees set salary= 1000 where EMPLOYEE\_ID=100;

SQL> set line 150

SELECT versions\_startscn, versions\_starttime,

versions\_endscn, versions\_endtime,

versions\_xid, versions\_operation,

last\_name, salary

FROM employees

VERSIONS BETWEEN TIMESTAMP

TO\_TIMESTAMP('2013-11-29 15:00:00', 'YYYY-MM-DD HH24:MI:SS')

AND TO\_TIMESTAMP('2013-11-29 15:21:00', 'YYYY-MM-DD HH24:MI:SS')

WHERE employee\_id = 100;

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

VERSIONS\_STARTSCN VERSIONS\_STARTTIME VERSIONS\_ENDSCN

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

VERSIONS\_ENDTIME VERSIONS\_XID V LAST\_NAME SALARY

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

King 24000

SQL> select employee\_id, salary from employees where employee\_id=100;

EMPLOYEE\_ID SALARY

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

100 1000

15:26:36 SQL>

update employees set salary= 5000 where EMPLOYEE\_ID=100;

SELECT versions\_startscn, versions\_starttime,

versions\_endscn, versions\_endtime,

versions\_xid, versions\_operation,

last\_name, salary

FROM employees

VERSIONS BETWEEN TIMESTAMP

TO\_TIMESTAMP('2013-11-29 15:00:00', 'YYYY-MM-DD HH24:MI:SS')

AND TO\_TIMESTAMP('2013-11-29 15:27:00', 'YYYY-MM-DD HH24:MI:SS')

WHERE employee\_id = 100;

VERSIONS\_STARTSCN VERSIONS\_STARTTIME VERSIONS\_ENDSCN

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

VERSIONS\_ENDTIME VERSIONS\_XID V LAST\_NAME SALARY

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

84656383 29-NOV-13 03.26.51 PM

010006006DDA0000 U King 2000

84650209 29-NOV-13 03.21.42 PM 84656383

29-NOV-13 03.26.51 PM 070021009EDA0000 U King 1000

84650209

29-NOV-13 03.21.42 PM King 24000

* + Flashback table: restore lại dữ liệu của bảng tại 1 thời điểm

ALTER TABLE employees ENABLE ROW MOVEMENT;

FLASHBACK TABLE hr.employees TO TIMESTAMP

TO\_TIMESTAMP('2013-11-29 15:00:00',

'YYYY-MM-DD HH24:MI:SS');

* + Flashback transaction version:

Xem lại những câu lệnh sql đã làm thay đổi dữ liệu

NOTE: trước khi thực hiện các câu lệnh DML thì database phải được enable tính năng supplemental log data:

Alter database add supplemental log data;

**SELECT xid, operation, start\_scn, commit\_scn, logon\_user, undo\_sql**

**FROM flashback\_transaction\_query**

**WHERE xid = HEXTORAW('**010006006DDA0000**');**

Kết quả:

15:44:24 SQL> conn / as sysdba

Connected.

15:44:37 SQL> SELECT xid, operation, start\_scn, commit\_scn, logon\_user, undo\_sql

15:44:38 2 FROM flashback\_transaction\_query

15:44:38 3 WHERE xid = HEXTORAW('010006006DDA0000');

XID OPERATION START\_SCN COMMIT\_SCN LOGON\_USER

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

UNDO\_SQL

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

010006006DDA0000 UPDATE 84656318 84656383 HR

update "HR"."EMPLOYEES" set "SALARY" = '1000' where ROWID = 'AAAR5pAAFAAAADPAAA';

010006006DDA0000 BEGIN 84656318 84656383 HR

Hoặc: run as sysdba

**SELECT xid, logon\_user**

**FROM flashback\_transaction\_query**

**WHERE xid IN (**

**SELECT versions\_xid FROM hr.employees VERSIONS BETWEEN TIMESTAMP**

TO\_TIMESTAMP('2013-11-29 15:21:00', 'YYYY-MM-DD HH24:MI:SS')

AND TO\_TIMESTAMP('2013-11-29 15:27:00', 'YYYY-MM-DD HH24:MI:SS')

**);**

Flashback transaction backout:

<http://mewithoracle.wordpress.com/2012/10/18/oracle11g-flashback-transaction-backout/>

DEV>

DECLARE

v\_xid   SYS.xid\_array;

BEGIN

v\_xid := sys.xid\_array ('010006006DDA0000');

DBMS\_FLASHBACK.transaction\_backout (numtxns => 1, xids => v\_xid, options => DBMS\_FLASHBACK.cascade);

END;

/  2    3    4    5    6    7

PL/SQL procedure successfully completed.

NOTE:

Database phải ở chế độ archive log mode thì mới thực hiện được lệnh này

<http://www.dba-oracle.com/t_11g_new_flashback_interface.htm>

TRANSACTION BACKOUT requires the database to be in ***ARCHIVELOG  mode***

\*

ERROR at line 1:

ORA-55510: Mining could not start

ORA-06512: at "SYS.DBMS\_FLASHBACK", line 37

ORA-06512: at "SYS.DBMS\_FLASHBACK", line 70

ORA-06512: at line 3

# Flashback II

Note: drop column trong FDA có được phép không??? 🡪 chỉ được phép với version từ 11gR2 trở đi.

<http://www.oracledistilled.com/oracle-database/flashback-data-archive-oracle-total-recall/>

<http://dbaora.com/flashback-data-archive-11g/>

**Transparent Schema Evolution:**

<http://web.eecs.umich.edu/techreports/cse/94/CSE-TR-211-94.pdf>

DBA\_FREE\_SPACE??? Với recycle bin Lab.

**Flashback Data Archive (FDA) hay Total Recall**

1. Create a new tablespace to hold the FDA.

CREATE TABLESPACE fda DATAFILE

'/opt/app/oracle/oradata/devrnd/fda01.dbf' SIZE 8192M AUTOEXTEND ON NEXT 1280K MAXSIZE 8192M LOGGING

ONLINE

PERMANENT

EXTENT MANAGEMENT LOCAL AUTOALLOCATE

BLOCKSIZE 8K

SEGMENT SPACE MANAGEMENT AUTO

FLASHBACK ON;

Nếu tạo sai thì xóa ts:

 DROP TABLESPACE users INCLUDING CONTENTS AND DATAFILES;.

2. With the FLASHBACK ARCHIVE ADMINISTER system privilege: Create a Flashback Data Archive, assign it to the tablespace, and specify its retention period.

CREATE FLASHBACK ARCHIVE fda1

TABLESPACE fda QUOTA 10M RETENTION 1 YEAR;

3. With the FLASHBACK ARCHIVE object privilege: Alter the base tables to enable archiving and assign it to a flashback archive.

ALTER TABLE HR.EMPLOYEES FLASHBACK ARCHIVE fda1;

Some DDL statements cause error ORA-55610 when used on a table enabled for Flashback Data Archive. For example:

ALTER TABLE statement that includes an UPGRADE TABLE clause, with or without an INCLUDING DATA clause

ALTER TABLE statement that moves or exchanges a partition or subpartition operation

DROP TABLE statement

**Flashback drop**

FLASHBACK TABLE <table\_name> TO BEFORE DROP   
[RENAME TO <*new\_name*>];

Note: When you flash back a dropped table, the recovered indexes, triggers, and constraints keep their recycle bin names. Therefore, it is advisable to query the recycle bin and DBA\_CONSTRAINTS before flashing back a dropped table. In this way, you can rename the recovered indexes, triggers, and constraints to more usable names.

# Flashback III – flashback database

* Cấu hình enable flashback database.

SQL> SHUTDOWN IMMEDIATE

SQL> STARTUP MOUNT

SQL> ALTER DATABASE ARCHIVELOG;

SQL> ALTER SYSTEM SET

2 DB\_FLASHBACK\_RETENTION\_TARGET=2880 SCOPE=BOTH;

SQL> ALTER DATABASE FLASHBACK ON;

SQL> ALTER DATABASE OPEN;

NOTE: 2880: số phút

* Thực hiện flashback database

NOTE:

* Trước khi thực hiện flashaback database thì db phải ở chế độ MOUNT
* Sau khi thực hiện thì phải open resetlogs.

BY RMAN:

RMAN> FLASHBACK DATABASE TO TIME =

2> "TO\_DATE('2009-05-27 16:00:00',

3> 'YYYY-MM-DD HH24:MI:SS')";

RMAN> FLASHBACK DATABASE TO SCN=23565;

RMAN> FLASHBACK DATABASE

2> TO SEQUENCE=223 THREAD=1;

BY Sqlplus:

SQL> FLASHBACK DATABASE

2 TO TIMESTAMP(SYSDATE-1/24);

SQL> FLASHBACK DATABASE TO SCN 53943;

SQL> FLASHBACK DATABASE TO RESTORE POINT b4\_load;

* + To review changes: Read-only opened database
  + To finalize: Read/write opened database with RESETLOGS

Rollback:

TO BEFORE RESETLOGS clause in the FLASHBACK DATABASE command.

RMAN> FLASHBACK DATABASE TO BEFORE RESETLOGS;

* Monitor.
  + View the Fast Recovery Area disk quota:

SELECT estimated\_flashback\_size,

flashback\_size  
 FROM V$FLASHBACK\_DATABASE\_LOG;

* + Determine the current flashback window:

SQL> SELECT oldest\_flashback\_scn,

oldest\_flashback\_time

FROM V$FLASHBACK\_DATABASE\_LOG;

* + Monitor logging in the Flashback Database logs:

SQL> SELECT \*  
 FROM V$FLASHBACK\_DATABASE\_STAT;

Kết hợp với restore point

SQL> CREATE RESTORE POINT before\_upgrade

GUARANTEE FLASHBACK DATABASE;

FLASHBACK DATABASE TO RESTORE POINT 'before\_upgrade';

FLASHBACK DATABASE TO SCN 202381;

The following example shows how to create a normal restore point in SQL\*Plus:

SQL> CREATE RESTORE POINT before\_upgrade;

This example shows how to create a guaranteed restore point:

SQL> CREATE RESTORE POINT before\_upgrade GUARANTEE FLASHBACK DATABASE;

LIST RESTORE POINT *restore\_point\_name*;

LIST RESTORE POINT ALL;

SQL> DROP RESTORE POINT before\_app\_upgrade;

Restore point dropped.

For detail:

<http://docs.oracle.com/cd/E11882_01/backup.112/e10642/flashdb.htm#BRADV593>

# Managing Database Performance

Monitor performance

Một số lệnh theo dõi:

Lock, wait, số processes, số session, long\_ops session, Đặt tham số statistic.

🡪 Admin I nhắc lại

Các bước điều tra để tuning.

* Xem arlert log, nguồn thông tin về thao tác bị chậm.
* Trạng thái Listener: lsnrctl status
* Resource: process, session 🡪 select \* from v$resource\_limit;
* Xem lock, wait.
* Long\_ops\_session
* Tham số statistic: show parameter level

Hoặc show parameter target 🡪 Cấu hình hiện tại đã phù hợp chưa

Lấy thông tin Awr.

* Trace lệnh gây chậm, xem plan của câu lệnh đó.
* Kết luận nguyên nhân gây chậm.

Một số lệnh select các objects:

Từ view: V$DATAFILE, V$database, dba\_users, dba\_tables…

Database Replay

<http://www.orafaq.com/wiki/Real_Application_Testing#Monitoring>

Quy trình chuẩn:

<http://allthingsoracle.com/oracle-database-replay-for-your-workload-test/>

# Tuning SQL

Sử dụng sql advisor, access advisor để xem các lệnh sql cần tuning (EM)

Phân biệt tác dụng của hai công cụ này.

Sử dụng AWR để xem top các câu lệnh tải cao. 🡪 thực hành lại bài tạo Awr

# Manageing Resource

Phân biệt consumer group, resource plan, resource plan directive

Tạo consumer group:

DBMS\_RESOURCE\_MANAGER.CREATE\_CONSUMER\_GROUP(

CONSUMER\_GROUP => 'APPUSER',

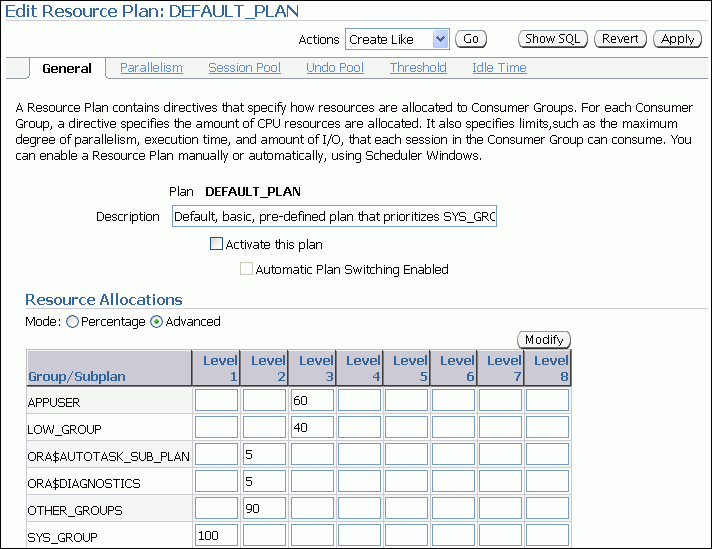
MGMT\_MTH => 'ROUND-ROBIN',

COMMENT => '');

Gán user vào consumer group:

DBMS\_RESOURCE\_MANAGER\_PRIVS.GRANT\_SWITCH\_CONSUMER\_GROUP (  
grantee\_name => 'PM',   
consumer\_group => 'APPUSER',   
grant\_option => FALSE );

Chỉ ra resource plan directive:



|  |  |
| --- | --- |
| **Parameter**  **(Comments)** | **Possible Values** |
| MGMT\_MTH | EMPHASIS, RATIO  EMPHASIS là phương pháp mặc định cho single-level plans. Nó cũng được sử dụng cho multilevel plans nhưng phải chia **phần trăm** sử dụng bao nhiêu CPU giữa các consumer groups  RATIO cũng là cho single-level plans nhưng sử dụng tỉ lệ phân chia CPU. |
| Allocating CPU usage | |
| PARALLEL\_DEGREE\_LIMIT\_MTH  PARALLEL\_DEGREE\_LIMIT\_MTH limits the **maximum** degree of parallelism of any operation. This method can be specified only for resource consumer groups, not subplans. | PARALLEL\_DEGREE\_LIMIT\_ABSOLUTE  The PARALLEL\_DEGREE\_LIMIT\_ABSOLUTE chỉ ra giá trị có thể sử dụng gán cho thao tác là bao nhiêu. Nếu có multiple plan directives thì nó tham chiếu đến cùng subplan hoặc consumer group, là **minimum** of all the possible values is used as the parallel degree limit for that subplan or consumer group. |
| Limiting degree of parallelism of any operation | |
| ACTIVE\_SESS\_POOL\_MTH  Giới hạn số lượng active session. | PARALLEL\_DEGREE\_LIMIT\_ABSOLUTE  All other sessions are inactive and wait in a queue to be activated. The only value (that is, the only available method) for this parameter is PARALLEL\_DEGREE\_LIMIT\_ABSOLUTE, which is its default value. |
| Limiting number of active sessions, queuing inactive ones | |
| QUEUING\_MTH  controls the order in which queued inactive sessions execute | FIFO\_TIMEOUT  is the default and only method available. |
| Controlling queues, how inactive sessions enter active session pool | |

­­­­­

Đọc lại bài phân biệt **EMPHASIS and RATIO**

**EMPHASIS : Chia nhiều level, tổng các level =100%. 1 level chỉ có thể <=100. Phương pháp này tránh được starvation problem (bị bỏ rơi không được cấp resource để chạy) với những consumer có độ ưu tiên thấp.**

**RATIO: Chỉ 1 level, tổng các group =100, hoặc 10 hoặc 1000. Tùy cách chia con số, miễn là chia đủ.**

**Ví dụ:**

* + - OLTP\_USERS: 4
    - DSS\_USERS: 3
    - BATCH\_USERS: 2
    - OTHER: 1
* This is similar to saying that OLTP users should get 40% of the resources, DSS users should get 30% of the resources, BATCH users should get 20% of the resources, and all other consumer groups should get 10% of the available resources.

**Active sesion pool:**

BEGIN  
dbms\_resource\_manager.clear\_pending\_area();  
dbms\_resource\_manager.create\_pending\_area();  
dbms\_resource\_manager.update\_plan\_directive(  
    plan => 'DEFAULT\_PLAN',  
    group\_or\_subplan => 'APPUSER',  
    new\_comment => '',  
    new\_active\_sess\_pool\_p1 => 50,  
    new\_queueing\_p1 => NULL,

    new\_parallel\_degree\_limit\_p1 => NULL,  
    new\_switch\_group => '',  
    new\_switch\_time => NULL,  
    new\_switch\_estimate => false,

new\_max\_est\_exec\_time => NULL,  
new\_undo\_pool => NULL,  
new\_max\_idle\_time => NULL,  
new\_max\_idle\_blocker\_time => NULL,  
mgmt\_p1 => NULL,

mgmt\_p2 => NULL,

mgmt\_p3 => 60,

mgmt\_p4 => NULL,

mgmt\_p5 => NULL,

mgmt\_p6 => NULL,

mgmt\_p7 => NULL,

mgmt\_p8 => NULL,

switch\_io\_megabytes => NULL,

switch\_io\_reqs => NULL,  
switch\_for call);  
dbms\_resource\_manager.submit\_pending\_area();  
END;

Idle timeout:

DBMS\_RESOURCE\_MANAGER.UPDATE\_PLAN\_DIRECTIVE

(PLAN => 'DAY\_PLAN',

GROUP\_OR\_SUBPLAN => 'APPUSER',

COMMENT => 'Limit Idle Time Example',

NEW\_MAX\_IDLE\_TIME => 600,

NEW\_MAX\_IDLE\_BLOCKER\_TIME => 300);

Limit CPU database level

EXEC DBMS\_RESOURCE\_MANAGER.CREATE\_PLAN\_DIRECTIVE( -  
 plan => 'db\_consolidation\_plan',  
 group\_or\_subplan => 'App\_1',  
 mgmt\_p1 => 50,  
 max\_utilization\_limit => 60);

Limit cpu Server Level

Chuyển về default resource plan:

alter system set resource\_manager\_plan = 'default\_plan';

Sửa số cpu

alter system set cpu\_count=4;

Xem lại ví dụ Instance Caging Examples.

Monitor:

Xem giá trị của CPU\_COUNT parameter

SELECT value FROM v$parameter WHERE name = 'cpu\_count' AND (isdefault = 'FALSE' OR ismodified != 'FALSE');

Xác định trạng thái của Resource Manager

SELECT name FROM v$rsrc\_plan

WHERE is\_top\_plan = 'TRUE' AND cpu\_managed = 'ON';

Quản lý điều tiết (throttling):

SELECT begin\_time, consumer\_group\_name, cpu\_consumed\_time, cpu\_wait\_time

FROM v$rsrcmgrmetric\_history

ORDER BY begin\_time;

SELECT name, consumed\_cpu\_time, cpu\_wait\_time

FROM v$rsrc\_consumer\_group;

Resource Consumer Group Mapping

Example to give the Client OS User a higher priority than the Client Program:

BEGIN  
dbms\_resource\_manager.clear\_pending\_area();  
dbms\_resource\_manager.create\_pending\_area();  
dbms\_resource\_manager.set\_consumer\_group\_mapping(  
    dbms\_resource\_manager.oracle\_user,  
    'SCOTT',  
    'LOW\_GROUP'  
);  
dbms\_resource\_manager.set\_consumer\_group\_mapping\_pri(  
    EXPLICIT => 1,  SERVICE\_MODULE\_ACTION => 2,  
    SERVICE\_MODULE => 3,  
    MODULE\_NAME\_ACTION => 4,  
    MODULE\_NAME => 5,  
    SERVICE\_NAME => 6,  
    ORACLE\_USER => 7,  
    CLIENT\_OS\_USER => 8,  
    CLIENT\_PROGRAM => 9,  
    CLIENT\_MACHINE => 10  
);  
dbms\_resource\_manager.submit\_pending\_area();  
END;

Active a plan

ALTER SYSTEM SET RESOURCE\_MANAGER\_PLAN = 'mydb\_plan';

To deactivate the Database Resource Manager, issue the following statement:

ALTER SYSTEM SET RESOURCE\_MANAGER\_PLAN = '';

With option force:

ALTER SYSTEM SET RESOURCE\_MANAGER\_PLAN = 'FORCE:mydb\_plan';

* + - * Bắt buộc phải chuyển plan, có thể phải thực thi lại 1 số lệnh đang thực hiện.

<http://docs.oracle.com/cd/B19306_01/server.102/b14231/dbrm.htm>

Quản lý thông tin resource:

SELECT plan, num\_plan\_directives, status, mandatory FROM dba\_rsrc\_plans;

Sử dụng các view:

* + V$SESSION: Contains the resource\_consumer\_group column that shows the current group for a session
  + V$RSRC\_PLAN: A view that shows the active resource plan
  + V$RSRC\_CONSUMER\_GROUP: A view that contains statistics for all active groups

# Scheduler

Tạo job, đặt job cho lệnh, procedure bằng sql developer

B1. Tạo procedureecho

B2. Gán quyền

GRANT SCHEDULER\_ADMIN TO hr;

B3. Tạo job: với các tùy chọn: chạy ngay, chạy 1lần, nhiều lần, theo lịch…

Phân biệt job thông thường và lightweight job.

BEGIN

DBMS\_SCHEDULER.CREATE\_JOB (

job\_name => 'my\_lightweight\_job2',

program\_name => 'MY\_PROG',

schedule\_name => 'MY\_SCHED',

job\_style => 'LIGHTWEIGHT');

END;

/

Lightweight: Thay vì tạo hàng ngàn job chạy trong 1 giây, thì tạo một job, chạy nhiều công việc, nhưng là các công việc đơn giản, tốn ít resource. Làm như vậy để giảm tải start các job nhỏ.

Được tạo từ 1 job template

**In the example, MY\_PROG is the job template and the schedule is applied from a named schedule.**

Phân biệt Time-Based or Event-Based Schedule

Khi nào thì sử dụng:

Time-Based: dựa vào thời gian để đặt lịch

Event-based: Dựa vào một sự kiện xảy ra. Thường có xảy ra tự động ở oracle Stream.

* Tạo job phức
  + - **INCLUDE:** Adds a list of dates to the calendaring expression results
    - **EXCLUDE:** Removes a list of dates from the calendaring expression results
    - **INTERSECT:** Uses only the dates that are common to two or more schedules

Kích hoạt tính năng gửi mail cảnh báo:

Using Scheduler Email Notification:

1.Specify the address of the SMTP server you will use to send email messages:

DBMS\_SCHEDULER.SET\_SCHEDULER\_ATTRIBUTE

('email\_server','*host[:port]*');

2.Optionally, set a default sender email address:

DBMS\_SCHEDULER.SET\_SCHEDULER\_ATTRIBUTE

('email\_sender','*valid email address*');

3.Add email notifications for a specified job.

DBMS\_SCHEDULER.ADD\_JOB\_EMAIL\_NOTIFICATION (

job\_name IN VARCHAR2,

recipients IN VARCHAR2,

sender IN VARCHAR2 DEFAULT NULL,

subject IN VARCHAR2

DEFAULT dbms\_scheduler.default\_notification\_subject,

body IN VARCHAR2

DEFAULT dbms\_scheduler.default\_notification\_body,

events IN VARCHAR2

DEFAULT 'JOB\_FAILED,JOB\_BROKEN,JOB\_SCH\_LIM\_REACHED,

JOB\_CHAIN\_STALLED,JOB\_OVER\_MAX\_DUR',

filter\_condition IN VARCHAR2 DEFAULT NULL);

Remove:

DBMS\_SCHEDULER.REMOVE\_JOB\_EMAIL\_NOTIFICATION (

job\_name IN VARCHAR2,

recipients IN VARCHAR2 DEFAULT NULL,

events IN VARCHAR2 DEFAULT NULL);

## Job trong hệ điều hành:

#Set biến

#Set biến môi trường

rman target / nocatalog cmdfile /home/oracle/script\_bk/orcl/backup\_level0.rman log /home/oracle/script\_bk/orcl/log\_backup/$logfile

Exit

* Linux:
  + Viết script rman

(NOTE: Cấu hình autobackup control file và cấu hình retention policy)

run {

ALLOCATE CHANNEL RMAN\_DISK01 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK02 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK03 TYPE DISK;

ALLOCATE CHANNEL RMAN\_DISK04 TYPE DISK;

BACKUP AS COMPRESSED BACKUPSET ARCHIVELOG ALL FORMAT '/opt/oracle/backup/orcl/arcbk/arc0\_%T\_%d\_%u\_%s\_%U' FILESPERSET 4 DELETE INPUT TAG ARCH;

BACKUP BLOCKS ALL AS COMPRESSED BACKUPSET INCREMENTAL LEVEL 0 DATABASE FORMAT '/opt/oracle/backup/orcl/dbbk/db0\_%T\_%d\_%u\_%s' FILESPERSET 4 TAG FULLBKP;

BACKUP AS COMPRESSED BACKUPSET CURRENT CONTROLFILE FORMAT '/opt/oracle/backup/orcl/bkcontrolfile0\_%T\_%d\_%u\_%s' TAG CTLFILE;

CROSSCHECK BACKUP;

DELETE NOPROMPT OBSOLETE;

DELETE NOPROMPT EXPIRED BACKUP;

RELEASE CHANNEL RMAN\_DISK01;

RELEASE CHANNEL RMAN\_DISK02;

RELEASE CHANNEL RMAN\_DISK03;

RELEASE CHANNEL RMAN\_DISK04;

}

EXIT;

* + Script sh

#!/bin/bash

logfile=`date +%Y%m%d`\_level0.log

export ORACLE\_SID=orcl

export NLS\_DATE\_FORMAT="yyyy-mm-dd hh24:mi:ss"

export ORACLE\_BASE=/opt/oracle

export ORACLE\_HOME=/opt/oracle/112

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

rman target / nocatalog cmdfile /home/oracle/script\_bk/orcl/backup\_level0.rman log /home/oracle/script\_bk/orcl/log\_backup/$logfile

exit

* + Đặt crontab

#crontab –e

00 01 \* \* 6,3 /home/oracle/script\_bk/mmoney/backup\_level0.sh

00 01 \* \* 1,2,4,5,0 /home/oracle/script\_bk/mmoney/backup\_level.sh

\* \* \* \* \* command to be executed

- - - - -

| | | | |

| | | | +----- day of week (0 - 6) (Sunday=0)

| | | +------- month (1 - 12)

| | +--------- day of month (1 - 31)

| +----------- hour (0 - 23)

+------------- min (0 - 59)

Crontab -l

* Window
  + Viết script rman tương tự linux
  + Script bat

logfile=`date +%Y%m%d`\_level0.log

set ORACLE\_SID=

set ORACLE\_HOME=

set PATH=%ORACLE\_HOME%\bin:%PATH%

rman target / nocatalog cmdfile C:\backup\_level0.rman log C:\%logfile%

exit

Log file

<http://stackoverflow.com/questions/1192476/windows-batch-script-format-date-and-time>

<http://stackoverflow.com/questions/11083366/format-file-date-yyyymmdd-in-batch>

It's not portable between machines with different date formats but the simplest way is to use a substring:%var:~STARTPOS,LENGTH%

set filedatetime=14/06/2012 12:26

set filedatetime=%filedatetime:~6,4%%filedatetime:~3,2%%filedatetime:~0,2%

echo "%filedatetime%"

"20120614"

Set timedate = %date

C:\Users\chienxinh>set filename=%date:~10,4%%date:~4,2%%date:~7,2%%time:~0,2%%time:~3,2%.log

C:\Users\chienxinh>echo %filename%

201312212258.log

* + Đặt schedule trong window.

# Manage space

* Shrinking segment space is a nonresumable operation
* Đặt thresholds.
* Các segment
* Tạo bảng chưa tạo segment

SQL> SHOW PARAMETERS deferred\_segment\_creation

NAME TYPE VALUE

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

deferred\_segment\_creation boolean TRUE

SQL> CREATE TABLE seg\_test(c number, d varchar2(500));

Table created.

SQL> SELECT segment\_name FROM user\_segments;

no rows selected

Inserting rows and creating segments:

SQL> INSERT INTO seg\_test VALUES(1, 'aaaaaaa');

1 row created.

SQL> SELECT segment\_name FROM user\_segments;

SEGMENT\_NAME

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

SEG\_TEST

Tạo bảng tạo luôn segment:

CREATE TABLE SEG\_TAB3(C1 number, C2 number)

SEGMENT CREATION IMMEDIATE TABLESPACE SEG\_TBS;

CREATE TABLE SEG\_TAB4(C1 number, C2 number)

SEGMENT CREATION DEFERRED;

Thông tin segment với index, partition.

Without user intervention:

* + No segments for unusable indexes and index partitions
  + Creating an index without a segment:

CREATE INDEX test\_i1 ON seg\_test(c) UNUSABLE;

* + Removing any allocated space for an index:

ALTER INDEX test\_i UNUSABLE;

* + Creating the segment for an index:

ALTER INDEX test\_i REBUILD;

Select tên của objects, tìm objects:

SELECT segment\_name, partition\_name, segment\_type

FROM user\_segments

WHERE segment\_name like '%DEMO';

Tìm các unused object index

http://adminoracle10g.blogspot.de/2012/06/how-to-find-unused-index-in-dataabse.html

Hoặc select object\_name from user\_indexes where status = ‘UNUSABLE’;

Compress table:

Ít thực hiện với OLTP, với OLTP có nhiều hạn chế khi sử dụng compress

Đặt ngưỡng cho alert(EM)

Shrink table:

(NOTE: các bảng đặt chế độ FDA thì không thể shrink được.

Các bảng trước khi shrink thì phải được enable row movement)

ALTER TABLE employees SHRINK SPACE COMPACT;

Resume session, có một số nguyên nhân gây ra treo session, khi giải quyết đc vấn đề thì sử dụng resume để enable lại:

* + - Out of space
    - Maximum extents reached
    - Space quota exceeded

ALTER SESSION ENABLE RESUMABLE;

INSERT INTO sales\_new SELECT \* FROM sh.sales;

ALTER SESSION DISABLE RESUMABLE;

ALTER SESSION ENABLE RESUMABLE TIMEOUT 3600

NAME 'multitab insert';

SELECT name, sql\_text FROM user\_resumable;

Những lệnh có thể resumable

The following operations are resumable:

Queries: SELECT statements that run out of temporary space (for sort areas)

DML: INSERT, UPDATE, and DELETE statements

The following DDL statements:

CREATE TABLE ... AS SELECT

CREATE INDEX

ALTER INDEX ... REBUILD

ALTER TABLE ... MOVE PARTITION

ALTER TABLE ... SPLIT PARTITION

ALTER INDEX ... REBUILD PARTITION

ALTER INDEX ... SPLIT PARTITION

CREATE MATERIALIZED VIEW

# Manage space for database

**4-KB sector disks in emulation mode have eight logical sectors per one physical sector**

**4-KB sector disks in native mode have one logical sector per physical sector**

**Chỉ ra block size**

CREATE DATABASE sample NORESETLOGS FORCE LOGGING ARCHIVELOG  
LOGFILE  
  GROUP 1 '$ORACLE\_BASE/oradata/sample/redo01.log'

SIZE 100M BLOCKSIZE 4096,  
  GROUP 2 '$ORACLE\_BASE/oradata/sample/redo02.log‘

SIZE 100M BLOCKSIZE 4096  
DATAFILE

Xác định endian format

SELECT tp.endian\_format

FROM v$transportable\_platform tp, v$database d

WHERE tp.platform\_name = d.platform\_name;

Convert:

CONNECT TARGET SYS@orcl

RMAN>

SQL 'ALTER TABLESPACE hr READ ONLY';

CONVERT TABLESPACE hr

TO PLATFORM 'Solaris[tm] OE (64-bit)'

FORMAT '/tmp/transport\_to\_solaris/%U';;

Using EM to transport.

With RMAN: <http://www.dba-oracle.com/t_rman_88_transport_tablespace.htm>

<http://luhartma.blogspot.com/2006/04/transportable-tablespaces-from-backup.html>

<http://dbaharrison.blogspot.com/2012/08/transportable-tablespace-with-rman-no.html>

ALTER TABLESPACE USERS ADD DATAFILE '+DATA' SIZE 1M AUTOEXTEND ON NEXT 1280M MAXSIZE 8192M

ALTER TABLESPACE USERS ADD DATAFILE '/opt/app/oracle/oradata/user08.dbf' SIZE 1M AUTOEXTEND ON NEXT 1280M MAXSIZE 8192M

# Duplicate

<http://www.oracle-base.com/articles/11g/duplicate-database-using-rman-11gr2.php>