

RMAN BACKUP AND RECOVERY PRACTICE DUPLICATE DATABASE

Alejandro Vargas
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Practice Objectives:

Build skills to create a clone of a Database based on ASM using RMAN.

Practice Description:

Duplicate Instance from Node 2 of a RAC on ASM as a new Database in Node 1

Steps:

Task	Action
1. Create an Oracle Password File for the Auxiliary Instance	<p><i>On the target Oracle Home, create password file:</i></p> <pre>orapwd file=orapwrmdupl password=oracle entries=10</pre>
2. Create a new init.ora for the database	<p><i>Use the db_create_file_dest init.ora parameter to setup all new database file names using Oracle Managed Files, this simplify cloning because all names are automatically changed to match database name and assigned location:</i></p> <p>Used an existing spfile to create the new pfile and then edited it:</p> <pre>strings spfilewhiteowl.ora >initrmdupl.ora rmdupl.__db_cache_size=92274688 rmdupl.__java_pool_size=4194304 rmdupl.__large_pool_size=4194304 rmdupl.__shared_pool_size=62914560 rmdupl.__streams_pool_size=0 *.compatible='10.2.0.1.0' *.audit_file_dest ='/oradisk/app01/oracle/admin/rmdupl/adump' *.background_dump_dest ='/oradisk/app01/oracle/admin/rmdupl/bdump' *.user_dump_dest ='/oradisk/app01/oracle/admin/rmdupl/udump' *.core_dump_dest ='/oradisk/app01/oracle/admin/rmdupl/cdump' *.log_archive_dest ='/vmasmtest/od01/rmdupl/archives' *.db_create_file_dest ='/vmasmtest/od01/rmdupl' *.control_files ='/vmasmtest/od01/rmdupl/controlfile/rmdupl_01.ctl' *.db_block_size=8192 *.db_domain='' *.db_file_multiblock_read_count=16 *.db_name='rmdupl'</pre>

```
*.dispatchers='(PROTOCOL=TCP) (SERVICE=rmduplXDB)'  
*.job_queue_processes=10  
*.open_cursors=300  
*.pga_aggregate_target=16777216  
*.processes=150  
*.remote_login_passwordfile='EXCLUSIVE'  
*.sga_target=167772160  
*.undo_management='AUTO'  
*.undo_tablespace='UNDOTBS1'
```

3. Configure SQL Net for the new database

On Source Node add to tnsnames an entry to get to the database:

```
rmdupl =  
  (DESCRIPTION =  
    (ADDRESS = (PROTOCOL = TCP)(HOST = vmractest1)(PORT = 1521))  
    (CONNECT_DATA =  
      (SERVER = DEDICATED)  
      (SERVICE_NAME = rmdupl)  
    )  
  )  
)
```

On Target Node add an entry to the Listener.ora:

```
SID_LIST_LISTENER.VMRACTEST1 =  
  (SID_LIST =  
    (SID_DESC =  
      (GLOBAL_DBNAME = rmdupl)  
      (ORACLE_HOME = /oradisk/app01/oracle/product/10gDB)  
      (SID_NAME = rmdupl)  
    )  
  )  
)
```

Check from source node SqlNet connectivity:

```
> tnsping rmdupl  
TNS Ping Utility for Linux: Version 10.2.0.1.0 - Production on 04-FEB-2007 15:58:52  
Copyright (c) 1997, 2005, Oracle. All rights reserved.  
Used parameter files:  
/oradisk/app01/oracle/product/10gDB/network/admin/sqlnet.ora  
  
Used TNSNAMES adapter to resolve the alias  
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = vmractest1)(PORT =  
1521)) (CONNECT_DATA = (SERVER = DEDICATED) (SERVICE_NAME = rmdupl)))  
OK (0 msec)
```

<p>4. Create required directories as defined on init.ora</p>	<p>Get Directory names from init.ora and create all required files:</p> <pre>{oracle} > grep /vmasmtest/ initrmdupl.ora *.log_archive_dest='/vmasmtest/od01/rmdupl/archives' *.control_files='/vmasmtest/od01/rmdupl/controlfile/ol_mf_2p06qqh8_.ctl' *.db_create_file_dest='/vmasmtest/od01/rmdupl' {oracle} > grep oradisk initrmdupl.ora *.audit_file_dest='/oradisk/app01/oracle/admin/rmdupl/adump' *.background_dump_dest='/oradisk/app01/oracle/admin/rmdupl/bdump' *.user_dump_dest='/oradisk/app01/oracle/admin/rmdupl/udump' *.core_dump_dest='/oradisk/app01/oracle/admin/rmdupl/cdump' {oracle}> mkdir -p /vmasmtest/od01/rmdupl/archives {oracle}> mkdir -p /vmasmtest/od01/rmdupl/controlfile {oracle}> mkdir -p /oradisk/app01/oracle/admin/rmdupl/adump {oracle}> mkdir -p /oradisk/app01/oracle/admin/rmdupl/bdump {oracle}> mkdir -p /oradisk/app01/oracle/admin/rmdupl/udump {oracle}> mkdir -p /oradisk/app01/oracle/admin/rmdupl/cdump {oracle}> mkdir -p /vmasmtest/od01/rmdupl</pre>
<p>5. Startup nomount the auxiliary instance on target node</p>	<p>Set environment variables to point to the auxiliary instance:</p> <pre>ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=rmdupl</pre> <p>Startup nomount force the auxiliary instance:</p> <pre>{oracle} /oradisk/app01/oracle/product/10gDB/dbs [vmractest1.partnergsm.co.il] > sqlplus / as sysdba SQL*Plus: Release 10.2.0.1.0 - Production on Sun Feb 4 16:17:16 2007 Copyright (c) 1982, 2005, Oracle. All rights reserved. Connected to an idle instance. SQL> startup nomount; ORACLE instance started. Total System Global Area 167772160 bytes Fixed Size 1218316 bytes Variable Size 71305460 bytes Database Buffers 92274688 bytes</pre>

	Redo Buffers 2973696 bytes
6. Check that source database is mounted or open	<p><i>With environment pointing to source database check status:</i></p> <pre>ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=racdbtst2 {oracle} /home/oracle [vmractest2.partneregsm.co.il] > sqlplus / SQL*Plus: Release 10.2.0.1.0 - Production on Sun Feb 4 17:51:40 2007 Copyright (c) 1982, 2005, Oracle. All rights reserved. Connected to: Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production With the Partitioning, Real Application Clusters, OLAP and Data Mining options SQL> select status from v\$instance 2 / STATUS ----- OPEN</pre>
7. Check that a backup of all required datafiles and archived logs exist on the target server	<p><i>Add all archived logs from the existing database to backup destination using rman:</i></p> <pre>backup as copy archivelog all format '/vmasmtest/BACKUP/rman_backups/%d_AL_%T_%u_s%s_p%p' ;</pre>
8. Start Rman and allocate auxiliary channels to the new database	<p><i>Set the environment on the source node to the source database:</i></p> <pre>ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=racdbtst2</pre> <p><i>Invoke rman on the source database and target auxiliary instance:</i></p> <pre>{oracle} /home/oracle [vmractest2.partneregsm.co.il] > rman TARGET / nocatalog AUXILIARY sys/oracle@rmdupl</pre>

	<p>Recovery Manager: Release 10.2.0.1.0 - Production on Sun Feb 4 16:33:44 2007</p> <p>Copyright (c) 1982, 2005, Oracle. All rights reserved.</p> <p>connected to target database: RACDBTST (DBID=519338572) using target database control file instead of recovery catalog connected to auxiliary database: RMDUPL (not mounted)</p>
<p>9. Execute the duplicate database command</p>	<pre>RMAN> run { 2> ALLOCATE AUXILIARY CHANNEL aux1 DEVICE TYPE DISK; 3> DUPLICATE TARGET DATABASE TO rmdupl; 4> }</pre> <p>allocated channel: aux1 channel aux1: sid=153 devtype=DISK</p> <p>Starting Duplicate Db at 04/02/2007 17:04:14</p> <p>contents of Memory Script:</p> <pre>{ set until scn 18923772; set newname for clone datafile 1 to new; set newname for clone datafile 2 to new; set newname for clone datafile 3 to new; set newname for clone datafile 4 to new; set newname for clone datafile 5 to new; set newname for clone datafile 6 to new; restore check readonly clone database ; }</pre> <p>executing Memory Script</p> <p>executing command: SET until clause</p> <p>executing command: SET NEWNAME</p> <p>executing command: SET NEWNAME</p> <p>executing command: SET NEWNAME</p> <p>executing command: SET NEWNAME</p>

executing command: SET NEWNAME

executing command: SET NEWNAME

Starting restore at 04/02/2007 17:04:22

channel aux1: restoring datafile 00001
input datafile copy recid=125 stamp=613670153
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-SYSTEM_FNO-1_9ei97n6h
destination for restore of datafile 00001:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_system_%u_.dbf
channel aux1: copied datafile copy of datafile 00001
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_system_2wcxm819_.dbf
channel aux1: restoring datafile 00002
input datafile copy recid=127 stamp=613670173
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-UNDOTBS1_FNO-2_9fi97n89
destination for restore of datafile 00002:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_%u_.dbf
channel aux1: copied datafile copy of datafile 00002
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf
channel aux1: restoring datafile 00003
input datafile copy recid=126 stamp=613670170
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-SYSAUX_FNO-3_9di97n6h
destination for restore of datafile 00003:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_%u_.dbf
channel aux1: copied datafile copy of datafile 00003
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf
channel aux1: restoring datafile 00004
input datafile copy recid=129 stamp=613670196
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-UNDOTBS2_FNO-4_9gi97n93
destination for restore of datafile 00004:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_%u_.dbf
channel aux1: copied datafile copy of datafile 00004
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf
channel aux1: restoring datafile 00005
input datafile copy recid=131 stamp=613670200
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-USERS_FNO-5_9ii97n9j
destination for restore of datafile 00005:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_%u_.dbf
channel aux1: copied datafile copy of datafile 00005
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf

```
channel aux1: restoring datafile 00006
input datafile copy recid=128 stamp=613670192
filename=/vmasmtest/BACKUP/rman_backups/data_D-RACDBTST_I-519338572_TS-RECOP1_FNO-6_9hi97n93
destination for restore of datafile 00006:
/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_%u_.dbf
channel aux1: copied datafile copy of datafile 00006
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_2wcxwdmv_.dbf
Finished restore at 04/02/2007 17:09:35
sql statement: CREATE CONTROLFILE REUSE SET DATABASE "RMDUPL" RESETLOGS ARCHIVELOG
MAXLOGFILES      192
MAXLOGMEMBERS    3
MAXDATAFILES     1024
MAXINSTANCES     32
MAXLOGHISTORY    292
LOGFILE
GROUP 3 SIZE 50 M ,
GROUP 4 SIZE 50 M
DATAFILE
'/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_system_2wcxm819_.dbf'
CHARACTER SET AL32UTF8
```

contents of Memory Script:

```
{
  switch clone datafile all;
}
```

executing Memory Script

```
datafile 2 switched to datafile copy
input datafile copy recid=1 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf
datafile 3 switched to datafile copy
input datafile copy recid=2 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf
datafile 4 switched to datafile copy
input datafile copy recid=3 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf
datafile 5 switched to datafile copy
input datafile copy recid=4 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf
datafile 6 switched to datafile copy
input datafile copy recid=5 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_2wcxwdmv_.dbf
```



```
contents of Memory Script:
{
  set until scn 18923772;
  recover
  clone database
  delete archivelog
  ;
}
executing Memory Script

executing command: SET until clause

Starting recover at 04/02/2007 17:09:48

starting media recovery

archive log thread 1 sequence 16 is already on disk as file
/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_a0i97p6d_s320_p1
archive log thread 2 sequence 14 is already on disk as file
/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_9vi97p65_s319_p1
archive log thread 2 sequence 15 is already on disk as file
/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_al197p6d_s321_p1
archive log filename=/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_a0i97p6d_s320_p1
thread=1 sequence=16
archive log filename=/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_9vi97p65_s319_p1
thread=2 sequence=0
archive log filename=/vmasmttest/BACKUP/rman_backups/RACDBTST_AL_20070204_al197p6d_s321_p1
thread=2 sequence=15
media recovery complete, elapsed time: 00:00:23
Finished recover at 04/02/2007 17:10:18

contents of Memory Script:
{
  shutdown clone;
  startup clone nomount ;
}
executing Memory Script

database dismounted
Oracle instance shut down

connected to auxiliary database (not started)
Oracle instance started
```

```
Total System Global Area      167772160 bytes

Fixed Size                      1218316 bytes
Variable Size                   71305460 bytes
Database Buffers               92274688 bytes
Redo Buffers                    2973696 bytes
sql statement: CREATE CONTROLFILE REUSE SET DATABASE "RMDUPL" RESETLOGS ARCHIVELOG
  MAXLOGFILES      192
  MAXLOGMEMBERS    3
  MAXDATAFILES     1024
  MAXINSTANCES     32
  MAXLOGHISTORY    292
LOGFILE
  GROUP 3 SIZE 50 M ,
  GROUP 4 SIZE 50 M
DATAFILE
  '/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_system_2wcxm819_.dbf'
CHARACTER SET AL32UTF8

contents of Memory Script:
{
  set newname for clone tempfile 1 to new;
  set newname for clone tempfile 2 to new;
  switch clone tempfile all;
  catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf";
  catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf";
  catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf";
  catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf";
  catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_2wcxwdmv_.dbf";
  switch clone datafile all;
}
executing Memory Script

executing command: SET NEWNAME

executing command: SET NEWNAME

renamed temporary file 1 to /vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_temp_%u_.tmp in
```

```
control file
renamed temporary file 2 to /vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_temp_%u_.tmp in
control file

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf
recid=1 stamp=613674808

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf
recid=2 stamp=613674808

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf
recid=3 stamp=613674809

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf
recid=4 stamp=613674809

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_2wcxwdmv_.dbf
recid=5 stamp=613674810

datafile 2 switched to datafile copy
input datafile copy recid=1 stamp=613674808
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf
datafile 3 switched to datafile copy
input datafile copy recid=2 stamp=613674808
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf
datafile 4 switched to datafile copy
input datafile copy recid=3 stamp=613674809
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf
datafile 5 switched to datafile copy
input datafile copy recid=4 stamp=613674809
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf
datafile 6 switched to datafile copy
input datafile copy recid=5 stamp=613674810
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recop1_2wcxwdmv_.dbf

contents of Memory Script:
{
  Alter clone database open resetlogs;
}
```

```
executing Memory Script

database opened
Finished Duplicate Db at 04/02/2007 17:12:21

RMAN>exit
```

10. Check the new database

Set the environment variables to point to the new database and perform a general backup:

```
ORACLE_BASE=/oradisk/app01/oracle
ORACLE_HOME=/oradisk/app01/oracle/product/10gDB
ORACLE_SID=rmdupl
```

```
{oracle} > sqlplus '/ as sysdba'
```

```
SQL*Plus: Release 10.2.0.1.0 - Production on Sun Feb 4 17:16:07 2007
```

```
Copyright (c) 1982, 2005, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, Real Application Clusters, OLAP and Data Mining options
```

```
SQL> select INSTANCE_NAME,HOST_NAME,STARTUP_TIME,STATUS from v$instance
SQL> /
```

INSTANCE_NAME	HOST_NAME	STARTUP_TIME	STATUS
rmdupl	vmractest1.partnergsm.co.il	04-feb-07 17:12	OPEN

```
SQL> select DBID,NAME,CREATED,RESETLOGS_TIME,LOG_MODE,CONTROLFILE_CREATED
from v$database
SQL> /
```

DBID	NAME	CREATED	RESETLOGS_TIME	LOG_MODE	CONTROLFILE_CRE
2966418732	RMDUPL	04-feb-07 17:13	04-feb-07 17:13	ARCHIVELOG	04-feb-07 17:13

```
SQL> select file_name from dba_data_files;
```

```
FILE_NAME
```

```
-----
/vmasmttest/od01/rmdupl/RMDUPL/datafile/ol_mf_system_2wcxm819_.dbf
/vmasmttest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs1_2wcxoq56_.dbf
/vmasmttest/od01/rmdupl/RMDUPL/datafile/ol_mf_sysaux_2wcxq00y_.dbf
```

	<pre>/vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_undotbs2_2wcxv3ck_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_users_2wcxvwt9_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/ol_mf_recopl_2wcxwdmv_.dbf 6 rows selected.</pre>
References	<p><u>How Recovery Manager Duplicates a Database</u> <u>Prepare the Rman Duplicate Auxiliary Instance</u></p>