RMAN BACKUP AND RECOVERY PRACTICE DUPLICATE DATABASE

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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	***On the target Oracle Home, create password file:*** orapwd file=orapwrmdupl password=oracle entries=10
2. Create a new init.ora for the database	***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:*** Used an existing spfile to create the new pfile and then edited it: 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'

	*.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)

4. Create required directories as defined on init.ora	***Get Directory names from init.ora and create all required files:*** {oracle} > grep /vmasmtest/ initrmdupl.ora *.log_archive_dest='/vmasmtest/od01/rmdupl/archives' *.control_files='/vmasmtest/od01/rmdupl/controlfile/o1_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
5. Startup nomount the auxiliary instance on target node	***Set environment variables to point to the auxiliary instance:*** ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=rmdupl ***Startup nomount force the auxiliary instance:*** {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

	Redo Buffers 2973696 bytes
6.Check that source database is mounted or open	***With environment pointing to source database check status:*** ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=racdbtst2 {oracle} /home/oracle [vmractest2.partnergsm.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
7. Check that a backup of all required datafiles and archived logs exist on the target server	***Add all archived logs from the existing database to backup destination using rman:*** backup as copy archivelog all format '/vmasmtest/BACKUP/rman_backups/%d_AL_%T_%u_s%s_p%p' ;
8. Start Rman and allocate auxiliary channels to the new database	***Set the environment on the source node to the source database:*** ORACLE_BASE=/oradisk/app01/oracle ORACLE_HOME=/oradisk/app01/oracle/product/10gDB ORACLE_SID=racdbtst2 ***Invoke rman on the source database and target auxiliary instance:*** {oracle} /home/oracle [vmractest2.partnergsm.co.il] > rman TARGET / nocatalog AUXILIARY sys/oracle@rmdupl

	Recovery Manager: Release 10.2.0.1.0 - Production on Sun Feb 4 16:33:44 2007 Copyright (c) 1982, 2005, Oracle. All rights reserved. connected to target database: RACDBTST (DBID=519338572) using target database control file instead of recovery catalog connected to auxiliary database: RMDUPL (not mounted)

9. Execute the duplicate database command	RMAN> run {
	2> ALLOCATE AUXILIARY CHANNEL aux1 DEVICE TYPE DISK;
	3> DUPLICATE TARGET DATABASE TO rmdupl;
	4> }
	
	allocated channel: aux1
	channel aux1: sid=153 devtype=DISK
	
	Starting Duplicate Db at 04/02/2007 17:04:14
	
	contents of Memory Script:
	{
	   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
	   ;
	}
	executing Memory Script
	
	executing command: SET until clause
	
	executing command: SET NEWNAME
	
	executing command: SET NEWNAME
	
	executing command: SET NEWNAME
	
	executing command: SET NEWNAME

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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/o1_mf_system_%u_.dbf
channel aux1: copied datafile copy of datafile 00001
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_undotbs1_%u_.dbf
channel aux1: copied datafile copy of datafile 00002
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_sysaux_%u_.dbf
channel aux1: copied datafile copy of datafile 00003
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_undotbs2_%u_.dbf
channel aux1: copied datafile copy of datafile 00004
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_users_%u_.dbf
channel aux1: copied datafile copy of datafile 00005
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf
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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/o1_mf_recop1_%u_.dbf
channel aux1: copied datafile copy of datafile 00006
output filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_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/o1_mf_undotbs1_2wcxoq56_.dbf
datafile 3 switched to datafile copy
input datafile copy recid=2 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_sysaux_2wcxq00y_.dbf
datafile 4 switched to datafile copy
input datafile copy recid=3 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs2_2wcxv3ck_.dbf
datafile 5 switched to datafile copy
input datafile copy recid=4 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf
datafile 6 switched to datafile copy
input datafile copy recid=5 stamp=613674696
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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
/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_a0i97p6d_s320_p1
archive log thread 2 sequence 14 is already on disk as file
/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_9vi97p65_s319_p1
archive log thread 2 sequence 15 is already on disk as file
/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_a1i97p6d_s321_p1
archive log filename=/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_a0i97p6d_s320_p1
thread=1 sequence=16
archive log filename=/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_9vi97p65_s319_p1
thread=2 sequence=0
archive log filename=/vmasmtest/BACKUP/rman_backups/RACDBTST_AL_20070204_a1i97p6d_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/o1_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/o1_mf_undotbs1_2wcxoq56_.dbf";
   catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_sysaux_2wcxq00y_.dbf";
   catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs2_2wcxv3ck_.dbf";
   catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf";
   catalog clone datafilecopy
"/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_temp_%u_.tmp in
```

```
control file
renamed temporary file 2 to /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_temp_%u_.tmp in
control file

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs1_2wcxoq56_.dbf
recid=1 stamp=613674808

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_sysaux_2wcxq00y_.dbf
recid=2 stamp=613674808

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs2_2wcxv3ck_.dbf
recid=3 stamp=613674809

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf
recid=4 stamp=613674809

cataloged datafile copy
datafile copy filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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/o1_mf_undotbs1_2wcxoq56_.dbf
datafile 3 switched to datafile copy
input datafile copy recid=2 stamp=613674808
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_sysaux_2wcxq00y_.dbf
datafile 4 switched to datafile copy
input datafile copy recid=3 stamp=613674809
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs2_2wcxv3ck_.dbf
datafile 5 switched to datafile copy
input datafile copy recid=4 stamp=613674809
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf
datafile 6 switched to datafile copy
input datafile copy recid=5 stamp=613674810
filename=/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_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 performa a general checkup:*** 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 ---------- /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_system_2wcxm819_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs1_2wcxoq56_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_sysaux_2wcxq00y_.dbf

	/vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_undotbs2_2wcxv3ck_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_users_2wcxvwt9_.dbf /vmasmtest/od01/rmdupl/RMDUPL/datafile/o1_mf_recop1_2wcxwdmv_.dbf 6 rows selected.
References	***How Recovery Manager Duplicates a Database*** ***Prepare the Rman Duplicate Auxiliary Instance***