Migrate Databases to Exadata Using RMAN Duplicate

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Who Am I

• Oracle Certified Administrator from Oracle 7 – 12c
• Exadata Certified Implementation Specialist since 2011
• Oracle Database Performance Tuning Certified Expert
• Oracle Business Intelligence Foundation Suite 11g Certified Implementation Specialist
• Oracle Database Data Warehousing Certified Implementation Specialist
• Multiple Exadata Implementations / POC’s for large financial organizations
• Migrate / Upgrade databases between various versions of Oracle
• Capacity Planning for Oracle Engineered Systems
• Database Consolidation to Exadata / 12c Platform
• Architect Databases for OLTP and OLAP applications
• Not an Oracle Employee or Nor I represent Oracle in any way
Overview

I am sure many of you have already many migrated databases between different systems and migrating database to Exadata is not any different. There are many ways to migrate database to Exadata but for this blog I will like to use RMAN duplicate method to migrate single instance database running Linux operating system to Exadata two node RACK. I am planning to use RMAN duplicate from active database, if your database size is too large and you have access backups, you can use existing RMAN backup to avoid putting strain on source system and network resources.
Migration Steps

1. Create Static Local Listener on Target
2. Copy password file
3. Add TNS Names entries
4. Test Connections from Source & Target System
5. Create pfile & make required changes
6. Startup Instance on nomoumt mode
7. Create Required Directories
8. Run RMAN Duplicate from Active Database
9. Convert database to Cluster Database (Optional)
10. Register Database to CRS
11. Run Exachk report
Step 1: Create Static Local Listener on Target System

LISTENER_duplica =
  (DESCRIPTION_LIST =
   (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = EXADATA-HOST)(PORT = 1599))
   )
  )
SID_LIST_LISTENER_duplica =
  (SID_LIST =
   (SID_DESC =
    (SID_NAME = DB_NAME)
    (ORACLE_HOME =/u01/app/oracle/product/11.2.0.4/dbhome_1)
    (GLOBAL_=duplica_DGMGRL)
   )
  )

lsnrctl start LISTENER_duplica

lsnrctl status LISTENER_duplica
Step 2 : Copy Password file to Target System

scp orapwXXXX* oracle@exadatanode1:/u01/app/oracle/product/11.2.0.4/dbhome_1/dbs
Step 3: ADD TNSNAME Entries on Source & Target System

dbname_dup_source =
  (DESCRIPTION =
   (ADDRESS = (PROTOCOL = TCP)(HOST = SOURCE-HOST)(PORT = 1521))
   (CONNECT_DATA =
    (SERVER = DEDICATED)
    (SERVICE_NAME = source_db_service)
  )
)

dbname_dup_target =
  (DESCRIPTION =
   (ADDRESS = (PROTOCOL = TCP)(HOST = EXADATA-HOST)(PORT = 1599))
   (CONNECT_DATA =
    (SERVER = DEDICATED)
    (SERVICE_NAME = duplica_DGMGRL)(UR=A)
  )
)

TNSNAMES
Step 4: Test Connections from Source & Target System

\texttt{sqlplus sys/XXXX@dbname\_source as sysdba}

\texttt{sqlplus sys/XXXX@dbname\_dup\_target as sysdba}

\begin{center}
\begin{verbatim}
[oracle@admin]$ lsnrctl status LISTENER_duplica

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 05-OCT-2016 19:40:34
Copyright (c) 1991, 2014, Oracle. All rights reserved.
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=localhost)(PORT=1521)))

-------------------------  --------------------  ------------------------------
Alias                LISTENER_duplica
Version               TNSLSNR for Linux: Version 11.2.0.4.0 - Production
Start Date            05-OCT-2016 19:40:19
Uptime                0 days 0 hr. 0 min. 15 sec
Trace Level           off
Security               ON: Local OS Authentication
SNMP                   OFF
Listener Parameter File /u01/app/oracle/product/11.2.0.4/dbhome_1/network/admin/listener.ora
Listener Log File      /u01/app/oracle/product/11.2.0.4/dbhome_1/log/diag/tns1snr/listener_duplica/alert/log.xml
Listening Endpoints Summary...
   (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=localhost)(PORT=1521)))
Services Summary...
Service "duplica_DMGRL" has 1 instance(s).
   Instance "duplica_DMGRL", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully
\end{verbatim}
\end{center}
Step 5 : Create pfile from source database

Create pfile ‘/tmp/initdbname.ora’ from spfile:

```plaintext
."control_files = '+DATA/TARGET_DB/CONTROLFILE/current.397.920902581'
."db_create_file_dest = '+DATA/'
."db_create_online_log_dest_1 = '+DATA/'
."db_file_name_convert = '+DATA/DATAFILE/SOURCE_DB/','+DATA/DATAFILE/TARGET_DB/
."log_file_name_convert = '+DATA/ONLINELOG/SOURCE_DB/','+DATA/ONLINELOG/TARGET_DB/
."db_recovery_file_dest = '+RECO'
."db_recovery_file_dest_size = 1932735283200

SQL> show parameter db_name
NAME                                      TYPE          VALUE
-------------------------------------- -------------- ---------------
db_name                               string         
SQL> create pfile="/tmp/initdbname.ora" from spfile;
File created.
SQL> exit
```
Step 6: Startup instance nomount mode on Target System (Exadata)

Place New create init.ora file to $ORACLE_HOME/dbs Directory

startup nomount
Step 7 : Create Required Directories on Target System (Exadata)

a) Create DATAFILE directory on ASM
b) Create ONLINELOG directory on ASM
c) Create CONTROLFILE directory on ASM
Step 8 : Run RMAN Duplicate Process

Connect to target and aux instances and start duplicate process

```
 rman target sys/XXX@dbname_source AUXILIARY sys/XXX@dbname_dup_target
 DUPLICATE TARGET DATABASE TO DBNAME FROM ACTIVE DATABASE NOFILENAMECHECK;
```

```
 RMAN> DUPLICATE TARGET DATABASE TO "" FROM ACTIVE DATABASE NOFILENAMECHECK;
 Starting Duplicate Db at 05-OCT-16
 using target database control file instead of recovery catalog
 allocated channel: ORA_AUX_DISK_1
 channel ORA_AUX_DISK_1: SID=175 device type=DISK
 allocated channel: ORA_AUX_DISK_2
 channel ORA_AUX_DISK_2: SID=17 device type=DISK
 allocated channel: ORA_AUX_DISK_3
 channel ORA_AUX_DISK_3: SID=176 device type=DISK
 allocated channel: ORA_AUX_DISK_4
 channel ORA_AUX_DISK_4: SID=18 device type=DISK
 allocated channel: ORA_AUX_DISK_5
 channel ORA_AUX_DISK_5: SID=177 device type=DISK
 allocated channel: ORA_AUX_DISK_6
 channel ORA_AUX_DISK_6: SID=19 device type=DISK
 current log archived
 contents of Memory Script:
 {   sql clone "create spfile from memory";
 } executing Memory Script
 sql statement: create spfile from memory
```
Step 9 : Move SPFILE to ASM

create spfile='+DATA' from pfile='/tmp/initdb.ora';

Add following entry to initdb.ora
Step 10 : Add Redo Logs Groups

alter database add logfile thread 2 group 5 '+DATA' size 4294967296;
alter database add logfile thread 2 group 6 '+DATA' size 4294967296;
alter database add logfile thread 2 group 7 '+DATA' size 4294967296;
alter database add logfile thread 2 group 8 '+DATA' size 4294967296;

Add Redo logs
Step 11: Convert Database to Cluster Database

alter system set instance_name='1' scope=spfile sid=' 1';
alter system set instance_name=' 2' scope=spfile sid=' 2';
alter database enable public thread 2;
alter system set cluster_database_instances=2 scope=spfile sid='*';
alter system set cluster_database=true scope=spfile sid='*';
alter system set remote_listener='EXA-SCAN:1521' scope=spfile sid='*';
alter system set instance_number=1 scope=spfile sid='1';
alter system set instance_number=2 scope=spfile sid=' 2';
alter system set thread=1 scope=spfile sid='1'; ---- Add Redo logs for Thread 2 first
alter system set thread=2 scope=spfile sid=' 2';
alter system set undo_tablespace='UNDOTBS1' scope=spfile sid='1';
alter system set undo_tablespace='UNDOTBS2' scope=spfile sid=' 2';
alter system set cluster_interconnects = 'X.X.X.X:X.X.X.X' scope = spfile sid='1';
alter system set cluster_interconnects = 'X.X.X.X:X.X.X.X' scope = spfile sid=' 2';
Step 12 : Register Database with CRS

```
srvctl add database -d dbname -o '/u01/app/oracle/product/11.2.0.4/dbhome_1' -p 'DATA/DBANAME/PARAMETERFILE/spfile.256.924518361'
srvctl add instance -d dbname -i dbname1 -n EXANODE1
srvctl add instance -d dbname -i dbname2 -n EXANODE2
```

Register Database
Step 13 : Changes & Enhancements

a) Index / Storage Indexes
b) Partitioning
c) Compression
d) Parallelism
e) Resource Management
Step 14: Run Exachk Report

- Primary database is NOT protected with Data Guard
- USE_LARGE_PAGES is NOT set to recommended value
- GLOBAL_NAMES is NOT set to recommended value
- Flashback on PRIMARY is not configured
- DB_UNIQUE_NAME on primary has not been modified

Oracle Exadata Assessment Report

System Health Score is 92 out of 100 (detail)
Thank You

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