

# Migrate Databases to Exadata Using RMAN Duplicate

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# Who Am I

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- 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

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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

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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 nomount 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
```



```
scp [redacted] :/u01/app/oracle/product/11.2.0.4/dbhome_1/dbs
password:
[redacted] 100% 1536 1.5KB/s 00:00
```

## 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)  
)  
)
```



## Step 4 : Test Connections from Source & Target System

sqlplus sys/**XXXX@dbname\_source** as sysdba

sqlplus sys/**XXXX@dbname\_dup\_target** as sysdba

```
[oracle@redhat 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=██████████) (PORT=1599)))
STATUS of the LISTENER
-----
Alias                LISTENER_duplica
Version              TNSLSNR for Linux: Version 11.2.0.4.0 - Production
Start Date           05-OCT-2016 19:40:18
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/tnslsnr/██████████/listener_duplica/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=██████████) (PORT=1599)))
Services Summary...
Service "duplica_DGMGRL" has 1 instance(s).
  Instance "██████████", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully
```



Connection

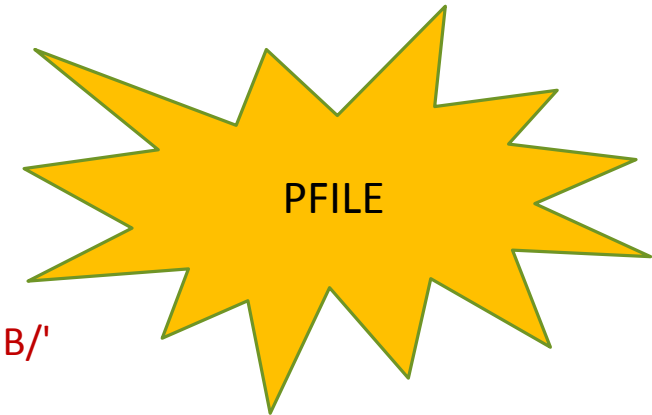


## Step 5 : Create pfile from source database

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Create pfile '/tmp/initdbaname.ora' from spfile ;

```
*.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/init_____.ora' from spfile;  
  
File created.  
  
SQL> exit
```

## Step 6 : Startup instance nomount mode on Target System ( Exadata )

---

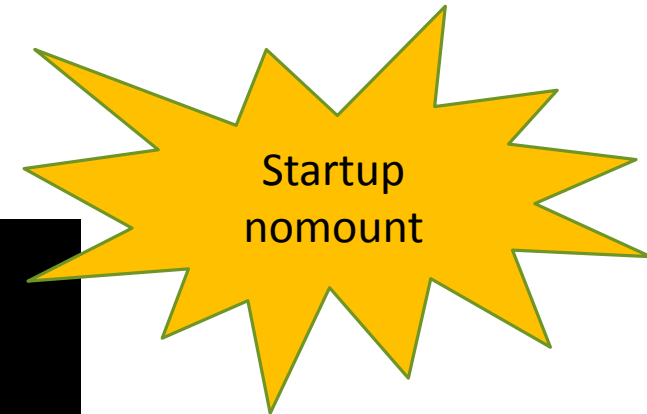
Place New create init.ora file to \$ORACLE\_HOME/dbs Directory

startup nomount

```
[oracle@ ~]$ sqlplus / as sysdba
SQL*Plus: Release 11.2.0.4.0 Production on Wed Oct 5 22:28:38 2016
Copyright (c) 1982, 2013, Oracle. All rights reserved.
Connected to an idle instance.

SQL> startup nomount
ORACLE instance started.

Total System Global Area 2137886720 bytes
Fixed Size 2254952 bytes
Variable Size 570427288 bytes
Database Buffers 1543503872 bytes
Redo Buffers 21700608 bytes
SQL> exit
```



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

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- a) Create DATAFILE directory on ASM
- b) Create ONLINELOG directory on ASM
- c) Create CONTROLFILE directory on ASM

```
ASMCMD> ls  
CONTROLFILE/  
DATAFILE/  
ONLINELOG/
```



Directories

## Step 8 : Run RMAN Duplicate Process

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Connect to target and aux instances and start duplicate process

```
rman target sys/XXX@dbname_source AUXILIARY sys/XXX@dbname_dup_target
```

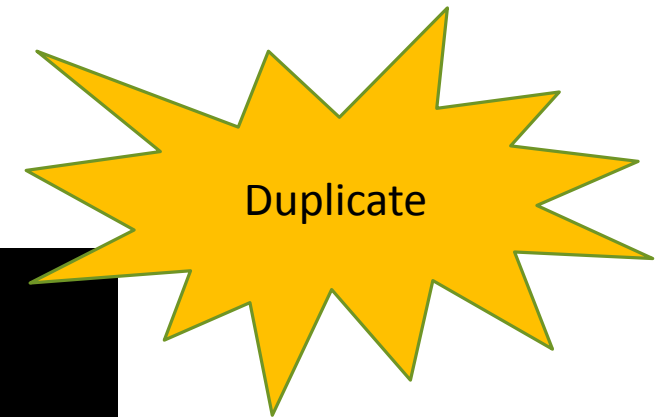
```
DUPLICATE TARGET DATABASE TO DBNAME FROM ACTIVE DATABASE NOFILENAMECHECK;
```

```
RMAN> DUPLICATE TARGET DATABASE TO [REDACTED] 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 SPILE to ASM

---

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

Add following entry to initdb.ora

```
SQL> show parameter spfile
```

NAME	TYPE	VALUE
spfile	string	+DATA [REDACTED]/parameterfile /spfile.256.924518361



Spfile to ASM

## 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

```
SQL> select GROUP#,THREAD#,BYTES,STATUS from v$log;
```

GROUP#	THREAD#	BYTES	STATUS
1	1	4294967296	CURRENT
2	1	4294967296	UNUSED
3	2	4294967296	CURRENT
4	2	4294967296	INACTIVE
5	1	4294967296	INACTIVE
6	1	4294967296	INACTIVE
7	2	4294967296	ACTIVE
8	2	4294967296	UNUSED

```
8 rows selected.
```

## 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
```





## Step 13 : Changes & Enhancements

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- a) Index / Storage Indexes
- b) Partitioning
- c) Compression
- d) Parallelism
- e) Resource Management



## Step 14 : Run Exachk Report

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- 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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