**Database restoration from RAC to Standalone Database**

**IMBTEST (10.102.117.21)**

Restoring a database from a Real Application Clusters (RAC) environment to a standalone (single instance) environment requires a structured approach to ensure all necessary components are restored correctly. Here is a step-by-step guide to perform this restoration:

**Prerequisites**

1. **Access and Permissions**: Ensure you have administrative privileges on both RAC and standalone environments.
2. **Backups**: Ensure a valid backup of the RAC database is available (e.g., RMAN backup).
3. **Database Compatibility**: Ensure that both RAC and standalone environments are compatible in terms of Oracle versions, character sets, etc.

**Step-by-Step Guide :-**

1. **Prerequisites**
2. **Transfer Control File and Backup Pieces**
3. **Prepare the Standalone Environment**
4. **Startup Database in NOMOUNT Mode**
5. **Restore Control File**
6. **Mount the Database**
7. **Catalog Backup Pieces**
8. **Crosscheck Expired Backups and Archivelogs**
9. **Delete Expired Files if Necessary**
10. **Re-crosscheck Archivelogs**
11. **Set Archive Sequence Number**
12. **Rename Redo Log Files**
13. **Restore Database Files**
14. **Open Database in RESETLOGS Mode**
15. **Clear Thread 2 Log Members**
16. **Drop Extra Undo Tablespace**
17. **Change Database Name**
18. **Create SPFILE from PFILE**
19. **Disable RAC-specific Features**
20. **Run Post-Restoration Tasks**
21. **Update Listener and TNS Configuration**
22. **Take Final Backup**

**Step 1: Transfer Control File and Backup Pieces**

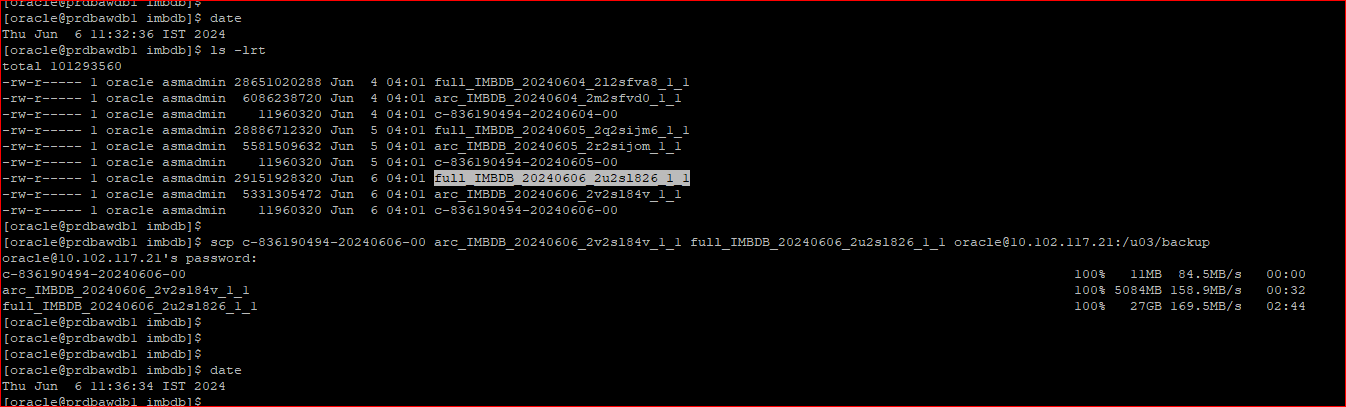
* Use scp to securely copy the control file and backup pieces from the RAC source environment to the target standalone server:

**scp /source\_path/controlfile.ctl /target\_path/**

**scp /source\_path/backup\_piece\* /target\_path/**

connect source database and scp the control file and backup pieces to the target database.

scp c-836190494-20241111-00 arc\_IMBDB\_20241111\_no39r44m\_1\_1 full\_IMBDB\_20241111\_nn39r428\_1\_1 [oracle@10.102.117.21:/u03/backup](mailto:oracle@10.102.117.21:/u03/backup)



**Step 2: Prepare the Standalone Environment, Create a New PFILE and Update /etc/oratab**

* **Install Oracle Database Software** on the standalone server.
* **Configure Necessary Parameters**: Set parameters in the initialization file (e.g., spfile or pfile) according to the standalone environment requirements.
* **Create PFILE:** Generate a new pfile for the standalone environment, adjusting for single-instance parameters and removing RAC-specific settings.

1. **From the RAC environment, create a PFILE from the SPFILE:**

SQL> CREATE PFILE='/path/to/pfile.ora' FROM SPFILE;

1. **Edit the PFILE to adjust RAC-specific parameters:**
   * Remove or update parameters such as cluster\_database, instance\_number, thread, and any other RAC-specific entries.
   * Adjust control\_files, db\_unique\_name, and db\_name as needed for the standalone environment.
2. **Update /etc/oratab:** Modify the database entry in /etc/oratab to reflect the new database name and path.

* Insert the database name and Oracle Home path in /etc/oratab

vi /etc/oratab

[oracle@cdc1dbrestore dbs]$ vi initIMBTEST.ora

[oracle@cdc1dbrestore dbs]$ cat initIMBTEST.ora

IMBTEST.\_\_data\_transfer\_cache\_size=0

IMBTEST.\_\_db\_cache\_size=10536091648

IMBTEST.\_\_inmemory\_ext\_roarea=0

IMBTEST.\_\_inmemory\_ext\_rwarea=0

IMBTEST.\_\_java\_pool\_size=134217728

IMBTEST.\_\_large\_pool\_size=67108864

IMBTEST.\_\_oracle\_base='/u01/app/oracle'#ORACLE\_BASE set from environment

IMBTEST.\_\_pga\_aggregate\_target=4227858432

IMBTEST.\_\_sga\_target=12616466432

IMBTEST.\_\_shared\_io\_pool\_size=134217728

IMBTEST.\_\_shared\_pool\_size=1711276032

IMBTEST.\_\_streams\_pool\_size=0

IMBTEST.\_\_unified\_pga\_pool\_size=0

\*.audit\_file\_dest='/u01/app/oracle/admin/IMBTEST/adump'

\*.audit\_trail='db'

\*.compatible='19.0.0'

\*.control\_files='/u03/IMBTEST/controlfiles/controlfile\_01.ctl','/u03/IMBTEST/controlfiles/controlfile\_02.ctl'

\*.db\_block\_size=8192

\*.db\_create\_file\_dest='/u01/app/oracle/oradata'

\*.db\_name='IMBTEST'

\*.db\_recovery\_file\_dest\_size=8256m

\*.diagnostic\_dest='/u01/app/oracle'

\*.dispatchers='(PROTOCOL=TCP) (SERVICE=IMBTESTXDB)'

\*.open\_cursors=300

\*.pga\_aggregate\_target=4006m

\*.processes=640

\*.remote\_login\_passwordfile='EXCLUSIVE'

\*.sga\_target=12016m

\*.undo\_tablespace='UNDOTBS1'

\*.diagnostic\_dest='/oracle/app/oracle'

\*.log\_file\_name\_convert='+REDO/IMBTESTDB/onlinelogs/','/u03/IMBTEST/onlinelogs/'

\*.log\_archive\_dest\_1='LOCATION=/u03/IMBTEST/archivelogs'

\*.log\_archive\_format='%t\_%s\_%r.arc'

* Set the Oracle Environments.

. oraenv

IMBTEST

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* Now, create the new pfile and startup database with nomount state.
* [oracle@cdc1dbrestore backup]$ cd $ORACLE\_HOME/dbs
* [oracle@cdc1dbrestore dbs]$
* [oracle@cdc1dbrestore dbs]$ pwd
* /u01/app/oracle/product/19.3.0/dbhome\_1/dbs
* vi initIMBTEST.ora

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**Step 3: Startup the database nomount with pfile**

Here, we have create new pfile. Now startup the database nomount by using pfile.

startup nomount pfile=’/u01/app/oracle/product/19.3.0/dbhome\_1/dbs/initIMBTEST.ora’;

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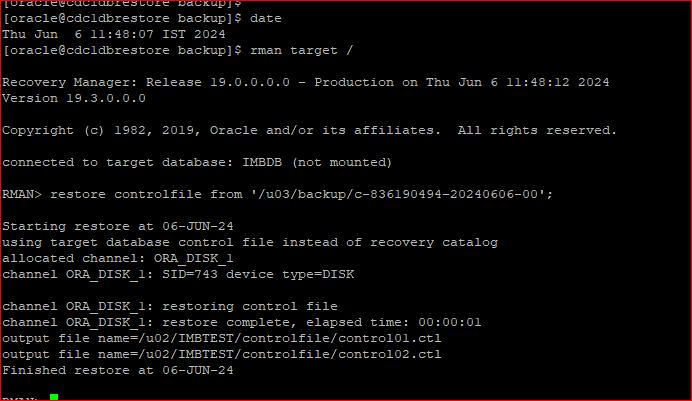
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**Step 4: Connect RMAN (rman target /) and restore the control file.**

* Now, database is nomount state here we shoulb be restore the control file first.

rman target /

restore controlfile from ‘/u03/backup/ c-836190494-20240606-00’;



**Step 5: Go to the mount state.**

alter database mount;

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**Step 6: Catalog the database backup pieces**

catalog start with ‘/u03/backup’;

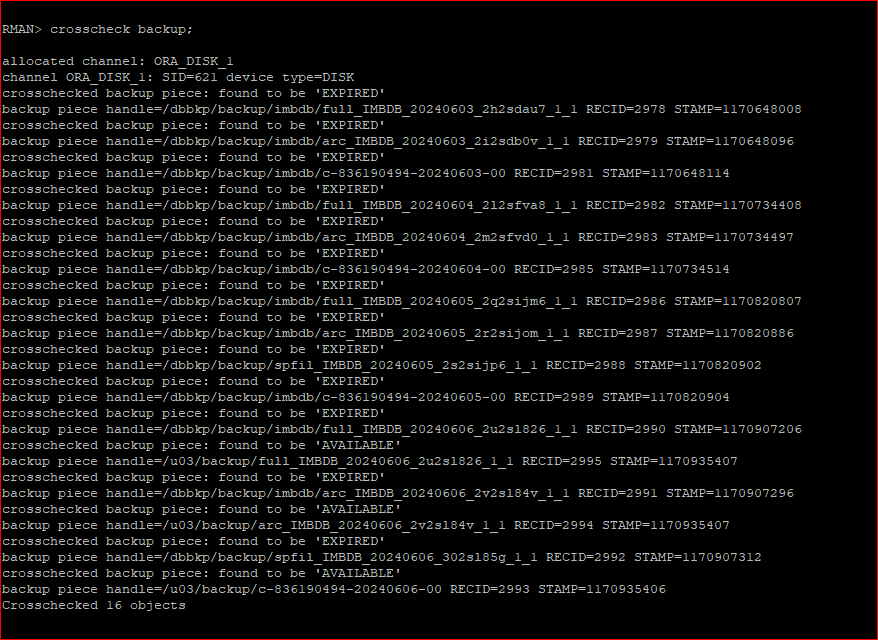
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**Step 7: Crosscheck the expired backup and archivelogs**.

* Check the backup pieces and archivelogs validation by using below command.

crosscheck backup;



crosscheck archivelog all;

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**Step 8: If any expired backup and archivelogs available, then delete those files**.

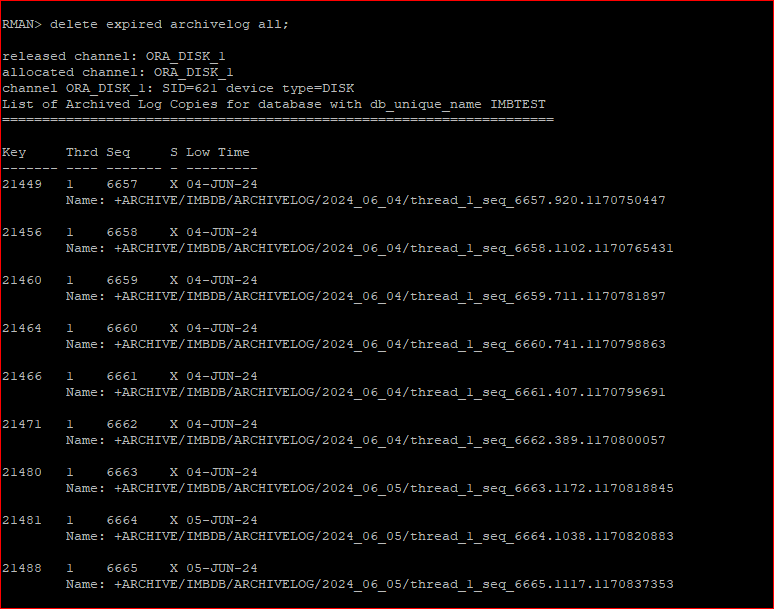
* If any expired backup and archivelogs available are available delete those files by using the below commands.

delete expired backup;

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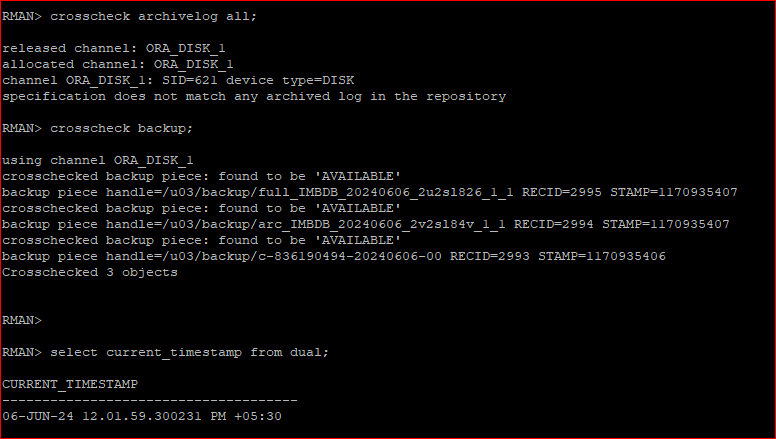
delete expired archivelog all;



**Step 9: Again crosscheck the archivelogs**.

crosscheck archivelog all;

crosscheck backup;



**STEP 10: List of archivelogs to set the sequence number of thread 1 and 2.**

list backup of archivelog all;

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**Step 11: Rename the redlog file name from ‘+DATA’ (asm disk) to ‘/u03’ (mount space):**

* Check the redologs location. If it is showing “+REDO” location then change to mount space.

select member from v$logfile;

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**Step 12: set until sequence <least sequence next number>; (compare to thread 1 and 2)**

**Step 13: Restore Database Files Using RMAN**

**Command:**

run {

SET NEWNAME FOR DATABASE TO '/u03/IMBTEST/datafile/%b';

SET NEWNAME FOR tempfile 1 TO '/u03/IMBTEST/datafile/%b';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_1.291.1111760697' to '/u03/IMBTEST/ONLINELOG/group\_1.291.1111760697';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_10.296.1111760827' to '/u03/IMBTEST/ONLINELOG/group\_10.296.1111760827';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_11.297.1111760847' to '/u03/IMBTEST/ONLINELOG/group\_11.297.1111760847';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_12.298.1111760867' to '/u03/IMBTEST/ONLINELOG/group\_12.298.1111760867';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_13.299.1111760889' to '/u03/IMBTEST/ONLINELOG/group\_13.299.1111760889';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_14.300.1111760905' to '/u03/IMBTEST/ONLINELOG/group\_14.300.1111760905';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_15.301.1111760923' to '/u03/IMBTEST/ONLINELOG/group\_15.301.1111760923';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_16.302.1111760939' to '/u03/IMBTEST/ONLINELOG/group\_16.302.1111760939';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_17.303.1111760959' to '/u03/IMBTEST/ONLINELOG/group\_17.303.1111760959';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_18.304.1111761025' to '/u03/IMBTEST/ONLINELOG/group\_18.304.1111761025';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_2.292.1111760707' to '/u03/IMBTEST/ONLINELOG/group\_2.292.1111760707';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_3.293.1111760731' to '/u03/IMBTEST/ONLINELOG/group\_3.293.1111760731';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_4.294.1111760753' to '/u03/IMBTEST/ONLINELOG/group\_4.294.1111760753';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_5.287.1111759627' to '/u03/IMBTEST/ONLINELOG/group\_5.287.1111759627';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_6.288.1111759649' to '/u03/IMBTEST/ONLINELOG/group\_6.288.1111759649';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_7.289.1111760393' to '/u03/IMBTEST/ONLINELOG/group\_7.289.1111760393';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_8.290.1111760409' to '/u03/IMBTEST/ONLINELOG/group\_8.290.1111760409';

ALTER DATABASE RENAME FILE '+REDO/IMBDB/ONLINELOG/group\_9.295.1111760807' to '/u03/IMBTEST/ONLINELOG/group\_9.295.1111760807';

run {

set until sequence 7856;

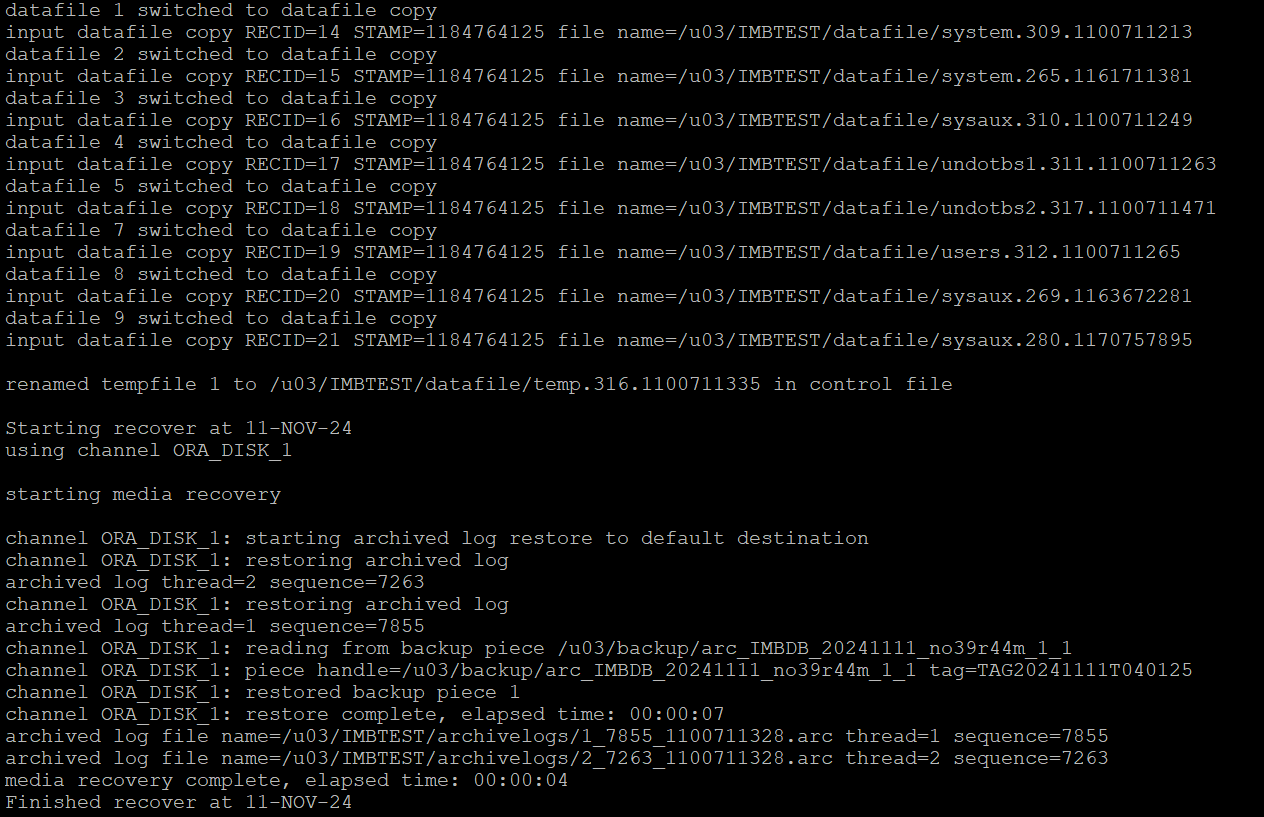
restore database;

switch datafile all;

switch tempfile all;

recover database;

}

****

**Step 14: Open the database in resetlogs mode:**

**RMAN> alter database open resetlogs;**

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

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

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

RMAN-03002: failure of sql statement command at 01/25/2017 16:05:27

ORA-00392: log 7 of thread 1 is being cleared, operation not allowed

ORA-00312: online log 7 thread 1: '/archive/NID/redo7a.log'

ORA-00312: online log 7 thread 1: '/archive/NID/redo7b.log'

RMAN> select group#,thread#,status from v$log;

GROUP# THREAD# STATUS

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

5 1 CLEARING

6 1 CLEARING

7 1 CLEARING\_CURRENT

8 1 CLEARING

9 2 CLEARING\_CURRENT

10 2 CLEARING

11 2 CLEARING

12 2 CLEARING

We can see the status of group 7 **and** grup 9 are in clearing\_current MODE. So we clear them manually.

**RMAN> alter database clear logfile group 7;**

**RMAN> alter database clear logfile group 9;**

**RMAN> select group#,thread#,status from v$log;**

GROUP# THREAD# STATUS

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

5 1 CLEARING

6 1 CLEARING

7 1 CURRENT

8 1 CLEARING

9 2 CURRENT

10 2 CLEARING

11 2 CLEARING

12 2 CLEARING

8 rows selected

**RMAN> alter database open resetlogs;**

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**Step 15: Clear the thread 2 log members.**

As we have clone from a 2 node RAC, so it has also 2 threads. Drop the thread 2 log.

SQL> select name,open\_mode,database\_role,instance\_name from v$instance,v$database;

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**SQL> select THREAD#, STATUS, ENABLED from v$thread;**

**SQL> alter database disable thread 2;**

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**Step 16: drop the undo tablespace of other instance:**

SQL> select tablespace\_name from dba\_tablespaces where contents='UNDO';

SQL> drop tablespace UNDOTBS2 including contents and datafiles;

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**Step 17: Change the database name**.

Down the database and startup the mount with pfile.

shut immediate;

startup mount pfile=’$ORACLE\_HOME/dbs/initIMBTEST.ora’;

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* By using “nid” utility we can change the database name.

nid target=sys dbname=IMBTEST

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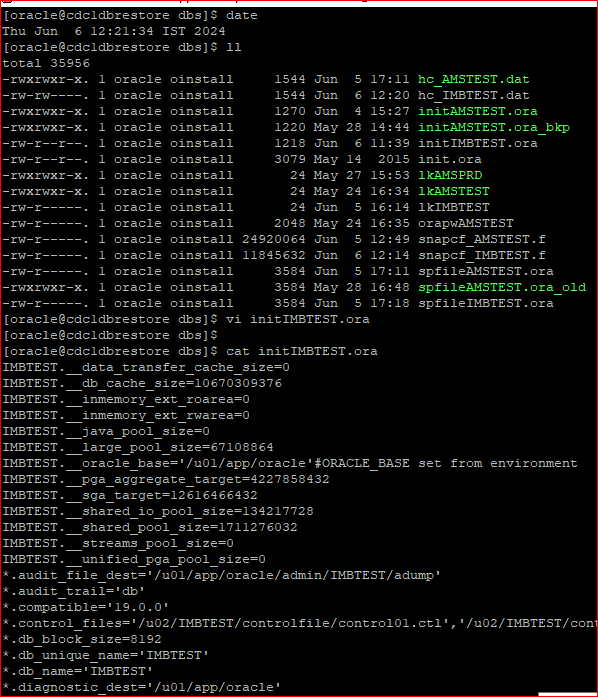
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* Then after we should be change the database name in parameter file.

vi initIMBTEST.ora

\*.db\_unique\_name='IMBDB' -----------🡪 Old db name

\*.db\_unique\_name='IMBTEST' -----------🡪 New db name



* Database was automatically down after changing the db name by using “nid” utility. Connect sqlplus and create spfile from pfile.

create spfile from pfile; (then startup the database in mount state).

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* Once again check the status of database and name.

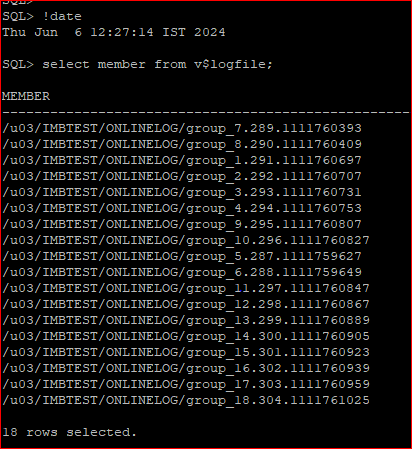
select name,open\_mode,database\_role,instance\_name from v$instance,v$database;

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Now, cross verify the redologs locations.

select member from v$logfile;



* And check datafiles status by using below command:

select file#,status,name from v$datafile;

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* Check the archivelogs status

archive log list

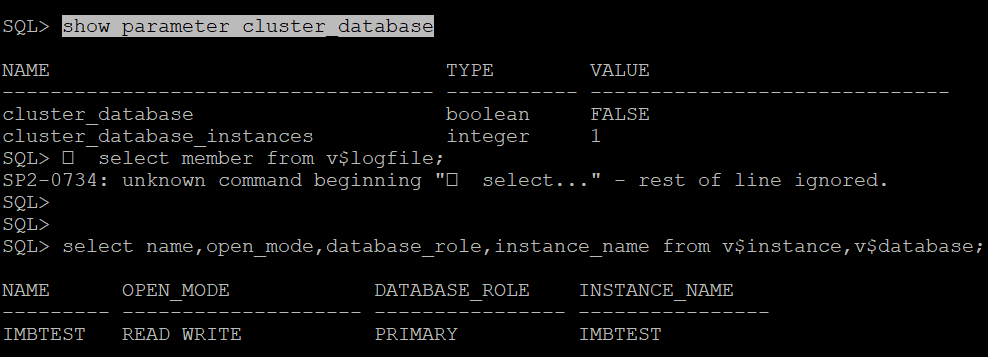
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**Step 18: Disable RAC-specific Features**:

SQL> ALTER SYSTEM SET cluster\_database=FALSE SCOPE=SPFILE;

SQL>show parameter cluster\_database

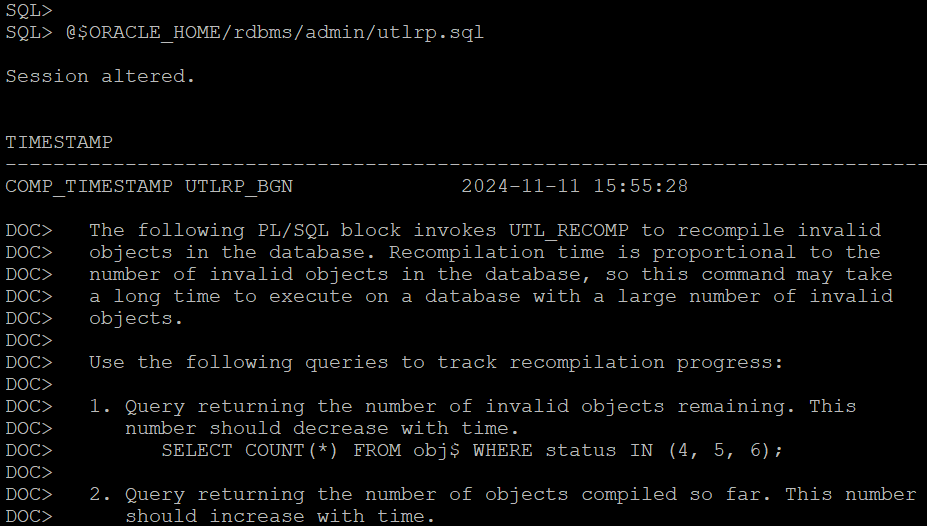
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**Step 19: Perform Post-Restoration Tasks**

* **Run SQL Scripts** to recompile invalid objects:

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

* **Verify** the restored database by running health checks, data integrity checks, and validating connectivity.



**Step 20: Update Listener and TNS Configuration**

* Update the listener.ora and tnsnames.ora files to reflect the standalone environment settings.
* **Check Performance**: Run performance tests to ensure the database functions as expected.
* **Backup**: Take a fresh backup of the standalone database.

By following these steps, you should be able to restore a RAC database to a standalone environment successfully.