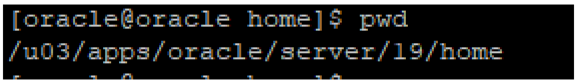
ORACLE DATABASE UPGRADE FROM 12C TO 19C

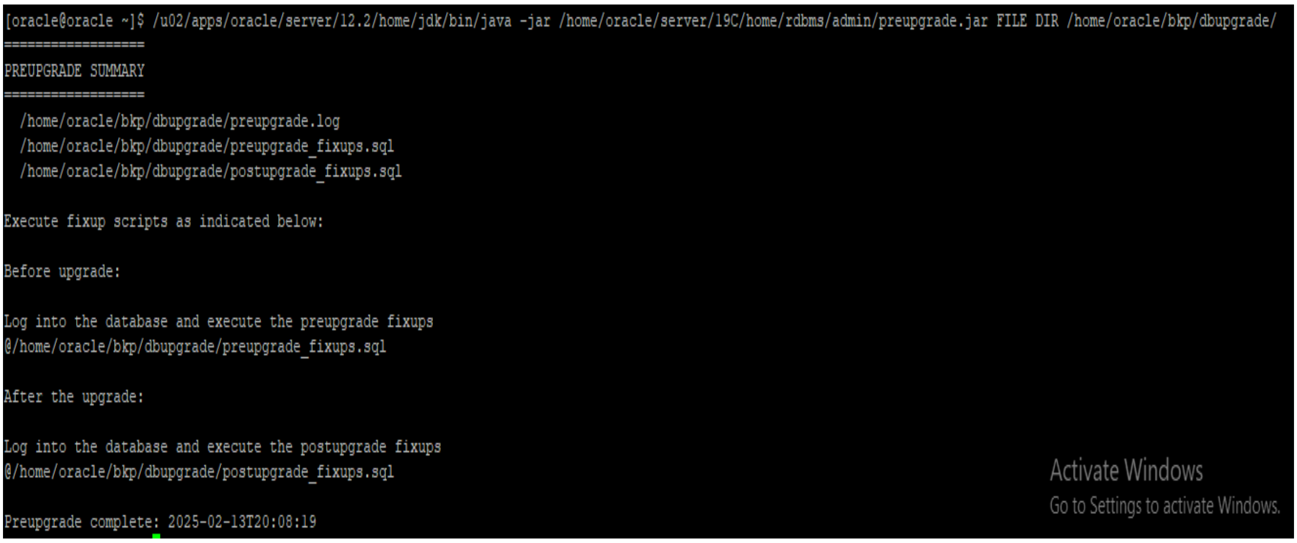
- Create a directory for 19C Database -



```
[oracle@oracle home]$ pwd
/u03/apps/oracle/server/19/home
```

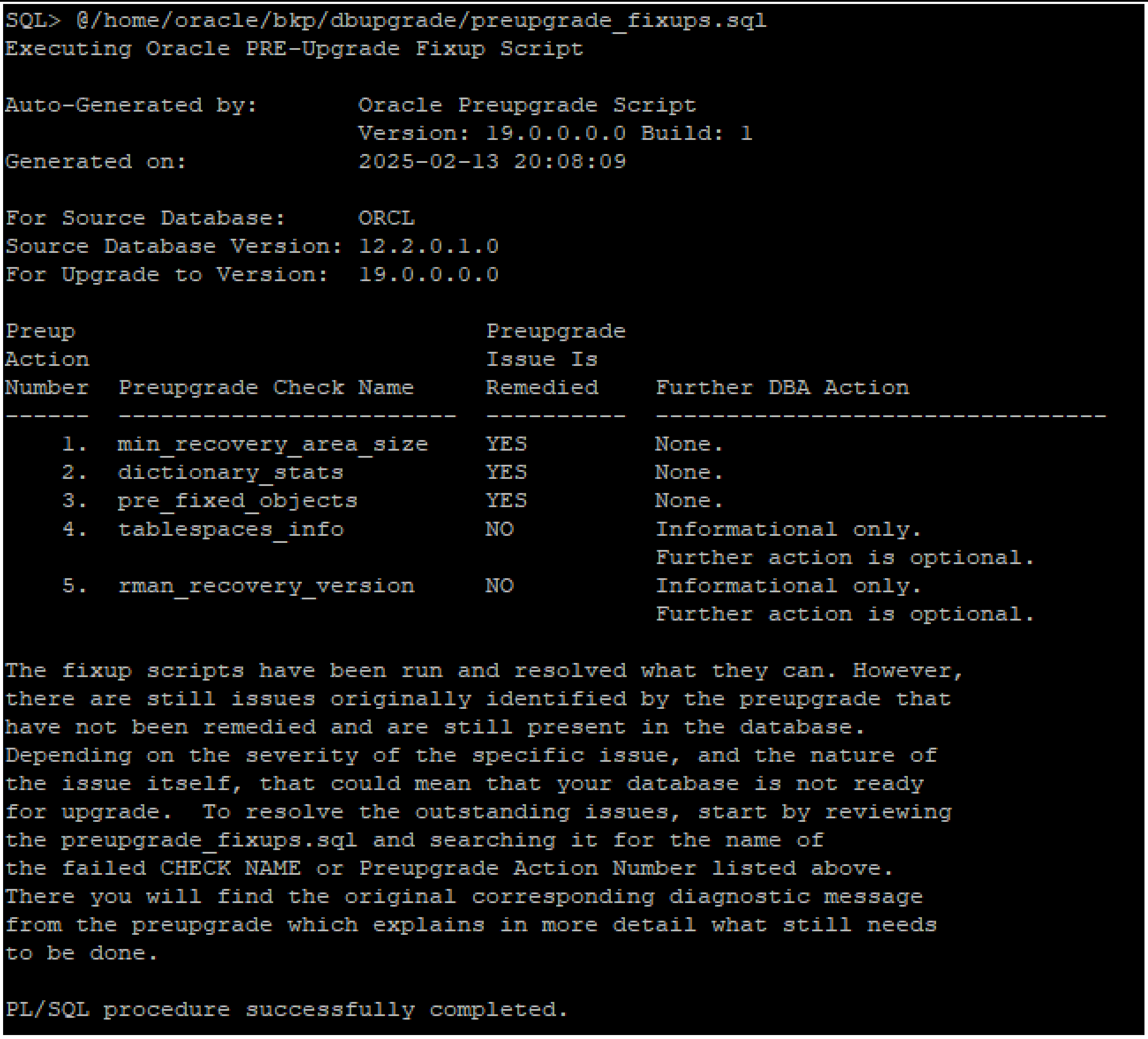
- Unzip the 19C zipfile into the home folder, then run the installer script.
- Installer Script - **runInstaller**
- Install only the software.

- Then run the preupgrade script from the active database(12C) - **SINGLE LINE COMMAND - /u02/apps/oracle/server/12.2/home/jdk/bin/java -jar /home/oracle/server/19C/home/rdbms/admin/preupgrade.jar FILE DIR /home/oracle/bkp/dbupgrade/**



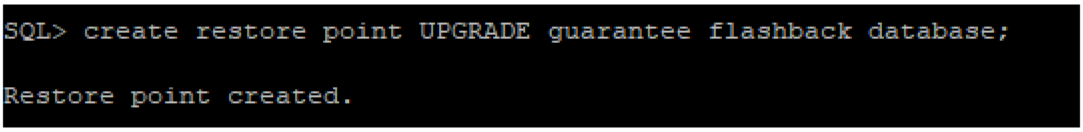
```
[oracle@oracle ~]$ /u02/apps/oracle/server/12.2/home/jdk/bin/java -jar /home/oracle/server/19C/home/rdbms/admin/preupgrade.jar FILE DIR /home/oracle/bkp/dbupgrade/
==================
PREUPGRADE SUMMARY
==================
  /home/oracle/bkp/dbupgrade/preupgrade.log
  /home/oracle/bkp/dbupgrade/preupgrade_fixups.sql
  /home/oracle/bkp/dbupgrade/postupgrade_fixups.sql

Execute fixup scripts as indicated below:

Before upgrade:

Log into the database and execute the preupgrade fixups
@/home/oracle/bkp/dbupgrade/preupgrade_fixups.sql

After the upgrade:

Log into the database and execute the postupgrade fixups
@/home/oracle/bkp/dbupgrade/postupgrade_fixups.sql

Preupgrade complete: 2025-02-13T20:08:19
```

- Run the preupgrade.sql script from the active database(12C) which will resides in the folder **/home/oracle/bkp/dbupgrade/preupgrade_fixups.sql.**
- After executing, it brings the issues and necessary actions that can be taken to do the upgrade.



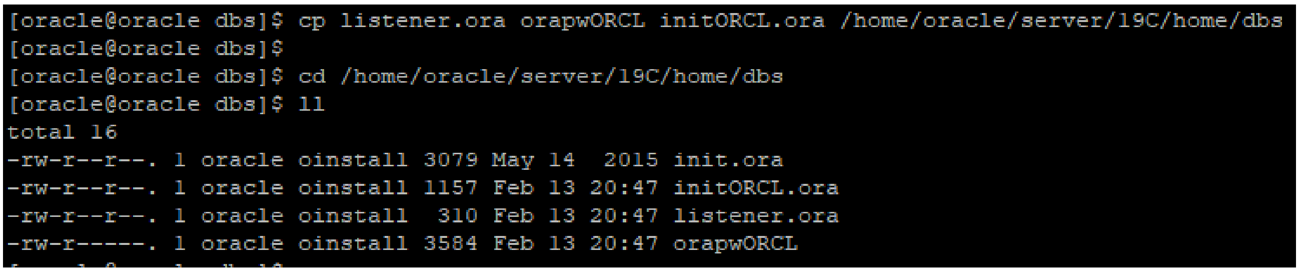
```
SQL> @/home/oracle/bkp/dbupgrade/preupgrade_fixups.sql
Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by:       Oracle Preupgrade Script
                         Version: 19.0.0.0.0 Build: 1
Generated on:            2025-02-13 20:08:09

For Source Database:     ORCL
Source Database Version: 12.2.0.1.0
For Upgrade to Version:  19.0.0.0.0

Preup                             Preupgrade
Action                            Issue Is
Number  Preupgrade Check Name     Remedied    Further DBA Action
------  ------------------------  ----------  --------------------------------
    1.  min_recovery_area_size    YES         None.
    2.  dictionary_stats          YES         None.
    3.  pre_fixed_objects         YES         None.
    4.  tablespaces_info          NO          Informational only.
                                              Further action is optional.
    5.  rman_recovery_version     NO          Informational only.
                                              Further action is optional.

The fixup scripts have been run and resolved what they can. However,
there are still issues originally identified by the preupgrade that
have not been remedied and are still present in the database.
Depending on the severity of the specific issue, and the nature of
the issue itself, that could mean that your database is not ready
for upgrade.  To resolve the outstanding issues, start by reviewing
the preupgrade_fixups.sql and searching it for the name of
the failed CHECK NAME or Preupgrade Action Number listed above.
There you will find the original corresponding diagnostic message
from the preupgrade which explains in more detail what still needs
to be done.

PL/SQL procedure successfully completed.
```

- ➢ Enable the active database should be in archivelog mode, create a guaranteed restore point.



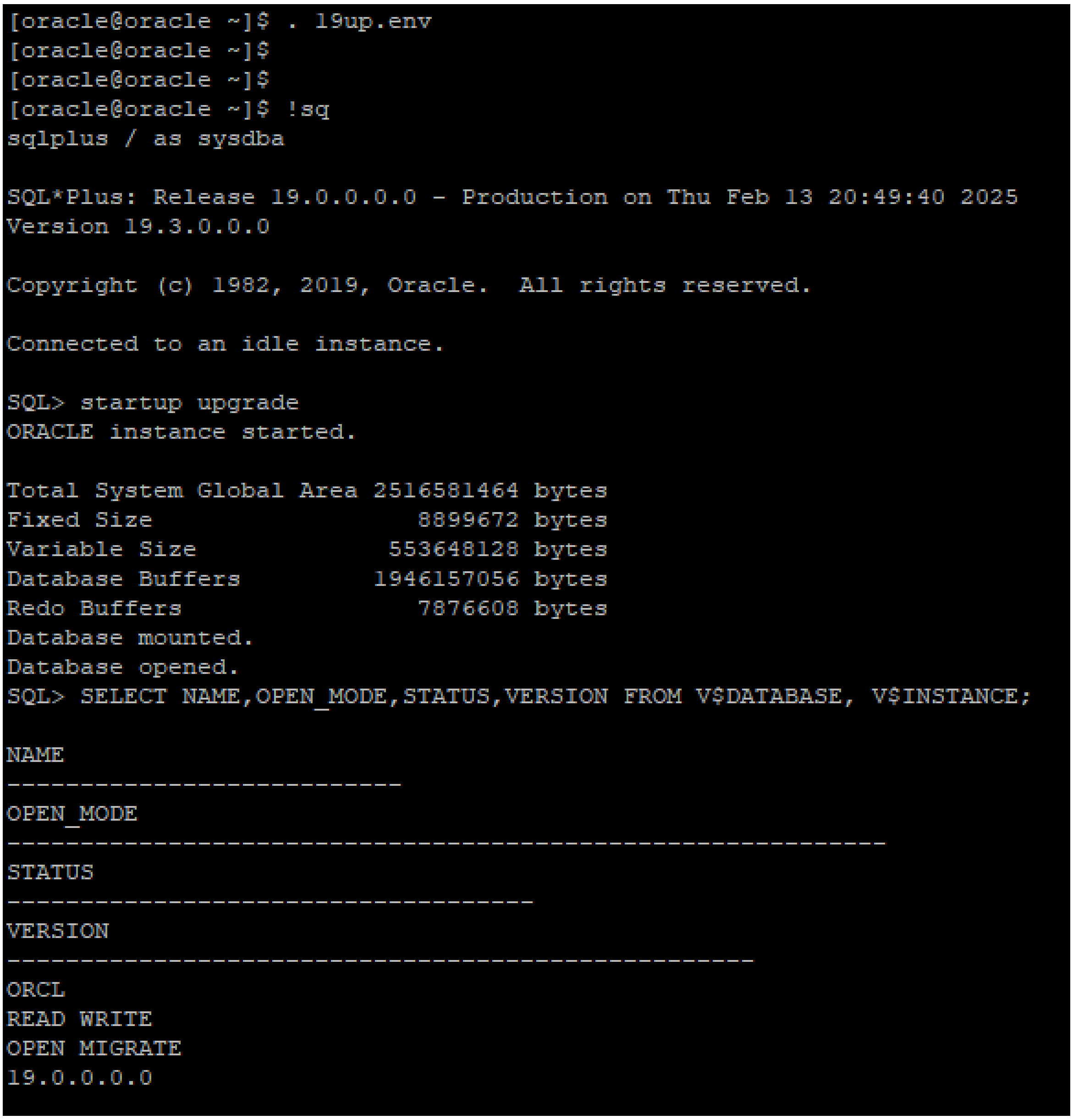
```
SQL> create restore point UPGRADE guarantee flashback database;

Restore point created.
```

- ➢ Now, Shutdown the database and stop the listener.
- ➢ Then, copy the password file, pfile and listener file from active database directory to the target database directory



```
[oracle@oracle dbs]$ cp listener.ora orapwORCL initORCL.ora /home/oracle/server/19C/home/dbs
[oracle@oracle dbs]$
[oracle@oracle dbs]$ cd /home/oracle/server/19C/home/dbs
[oracle@oracle dbs]$ ll
total 16
-rw-r--r--. 1 oracle oinstall 3079 May 14  2015 init.ora
-rw-r--r--. 1 oracle oinstall 1157 Feb 13 20:47 initORCL.ora
-rw-r--r--. 1 oracle oinstall  310 Feb 13 20:47 listener.ora
-rw-r-----. 1 oracle oinstall 3584 Feb 13 20:47 orapwORCL
```

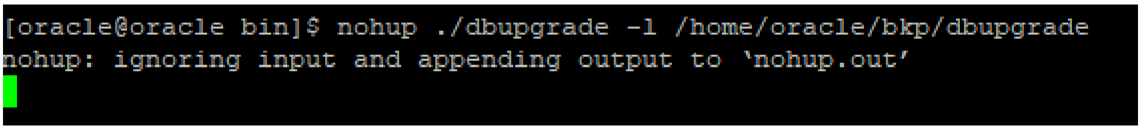
- Now, From the 19C oracle home, Source the ENV file and startup the database in upgrade mode.



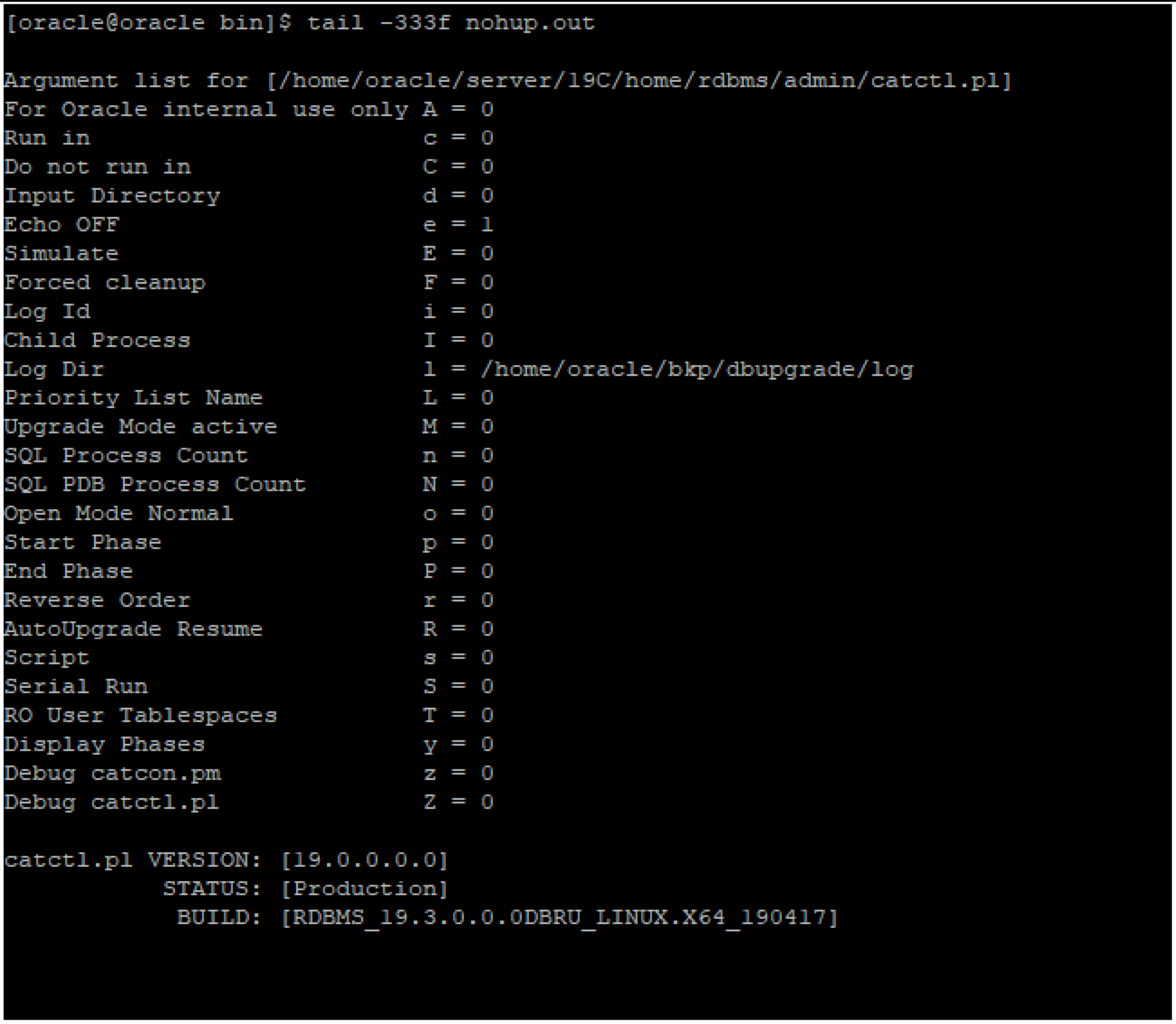
```
[oracle@oracle ~]$ . 19up.env
[oracle@oracle ~]$
[oracle@oracle ~]$
[oracle@oracle ~]$ !sq
sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Feb 13 20:49:40 2025
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle.  All rights reserved.

Connected to an idle instance.

SQL> startup upgrade
ORACLE instance started.

Total System Global Area 2516581464 bytes
Fixed Size                  8899672 bytes
Variable Size             553648128 bytes
Database Buffers         1946157056 bytes
Redo Buffers                7876608 bytes
Database mounted.
Database opened.
SQL> SELECT NAME,OPEN_MODE,STATUS,VERSION FROM V$DATABASE, V$INSTANCE;

NAME
---------------------------
OPEN_MODE
------------------------------------------------------------
STATUS
------------------------------------
VERSION
---------------------------------------------------
ORCL
READ WRITE
OPEN MIGRATE
19.0.0.0.0
```

- Then, from the 19C database's bin folder run the dbupgrade utility using -
  nohup ./dbupgrade -l /home/oracle/bkp/dbupgrade

  Nohup - Silent installation
  To view installation - tail -333f nohup.out

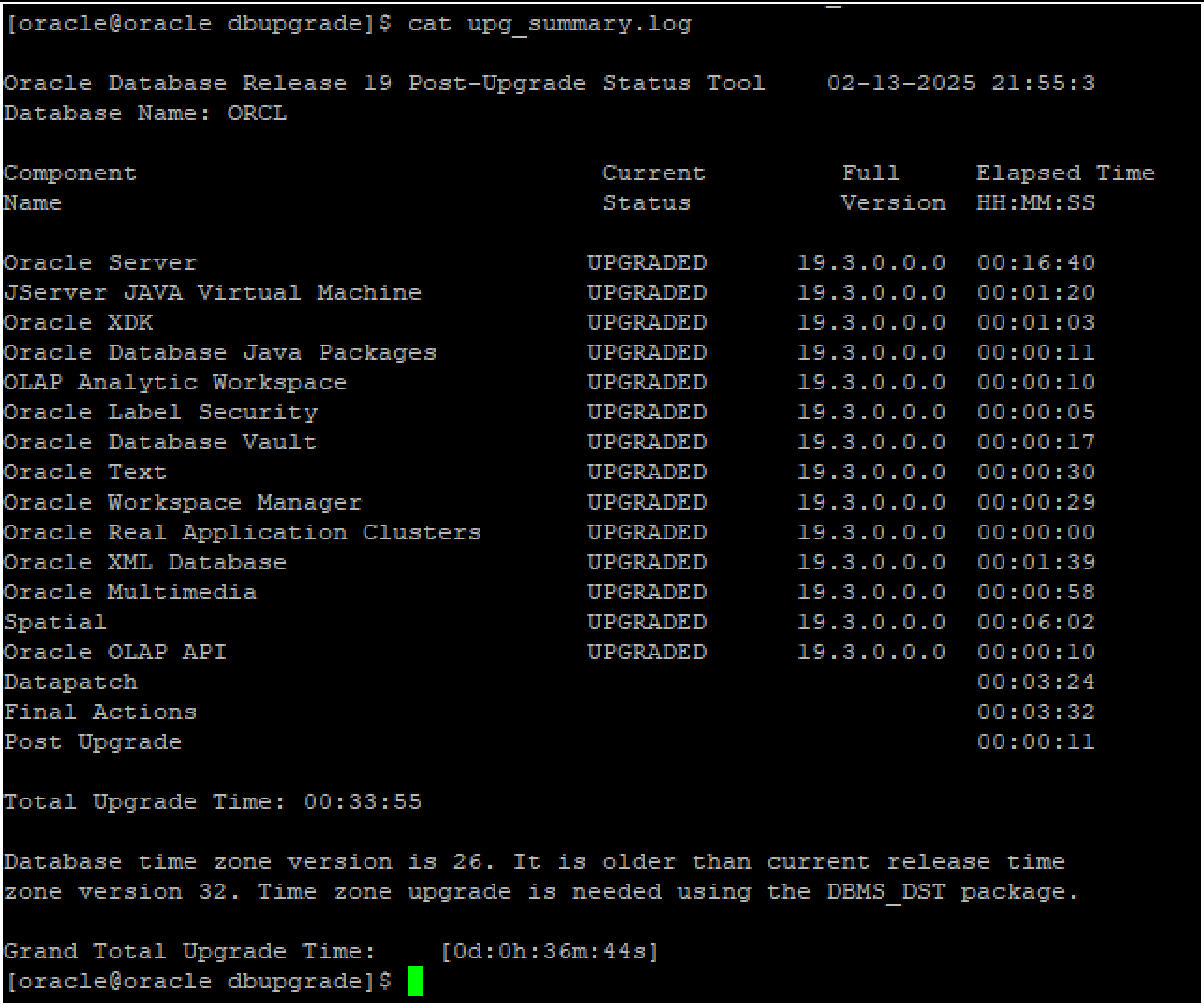


```
[oracle@oracle bin]$ nohup ./dbupgrade -l /home/oracle/bkp/dbupgrade
nohup: ignoring input and appending output to 'nohup.out'
```



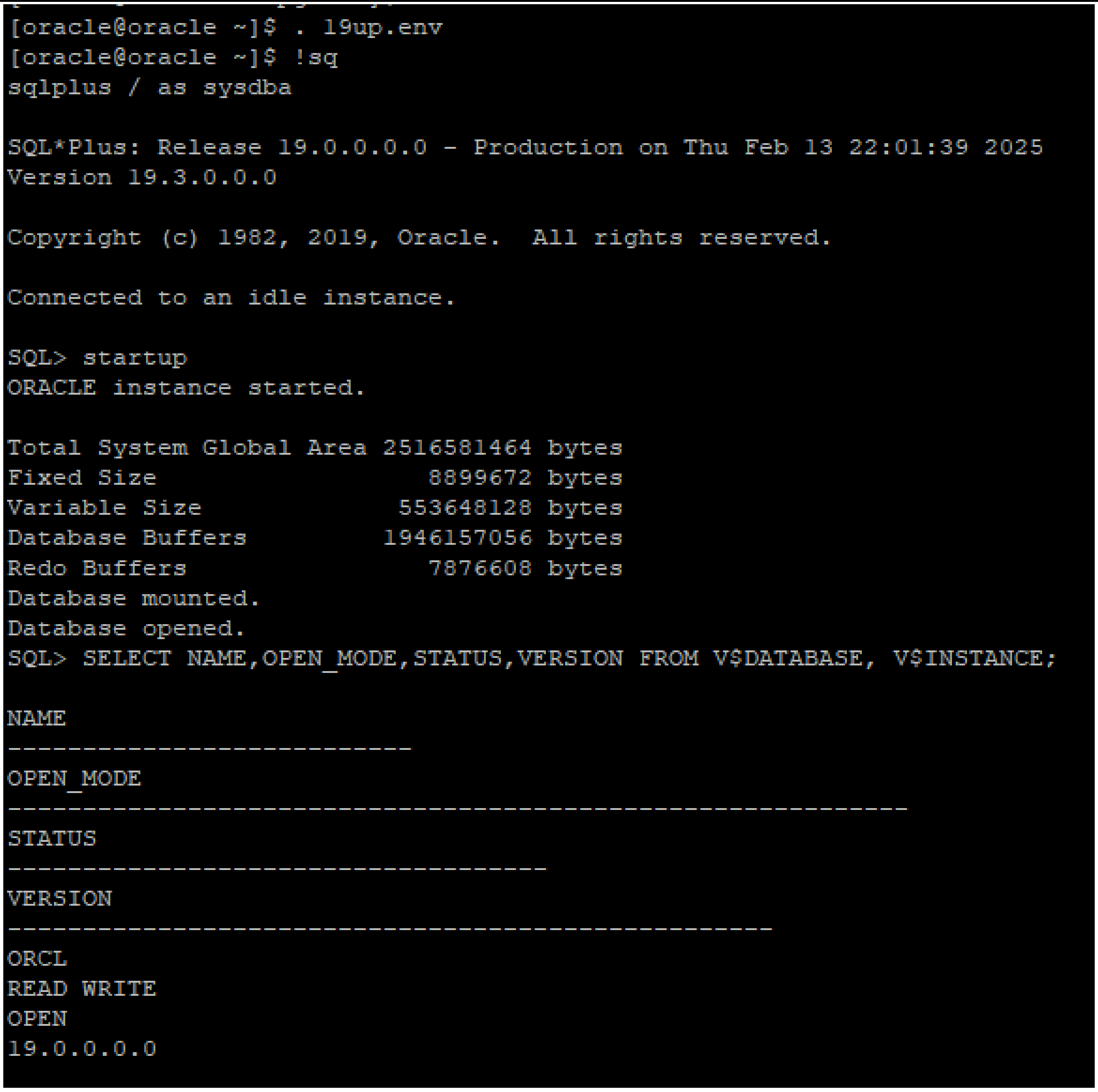
```
[oracle@oracle bin]$ tail -333f nohup.out

Argument list for [/home/oracle/server/19C/home/rdbms/admin/catctl.pl]
For Oracle internal use only A = 0
Run in                       c = 0
Do not run in                C = 0
Input Directory              d = 0
Echo OFF                     e = 1
Simulate                     E = 0
Forced cleanup               F = 0
Log Id                       i = 0
Child Process                I = 0
Log Dir                      l = /home/oracle/bkp/dbupgrade/log
Priority List Name           L = 0
Upgrade Mode active          M = 0
SQL Process Count            n = 0
SQL PDB Process Count        N = 0
Open Mode Normal             o = 0
Start Phase                  p = 0
End Phase                    P = 0
Reverse Order                r = 0
AutoUpgrade Resume           R = 0
Script                       s = 0
Serial Run                   S = 0
RO User Tablespaces          T = 0
Display Phases               y = 0
Debug catcon.pm              z = 0
Debug catctl.pl              Z = 0

catctl.pl VERSION: [19.0.0.0.0]
           STATUS: [Production]
            BUILD: [RDBMS_19.3.0.0.0DBRU_LINUX.X64_190417]
```

- Check the upgrade log in the directory where we created to store those three files,



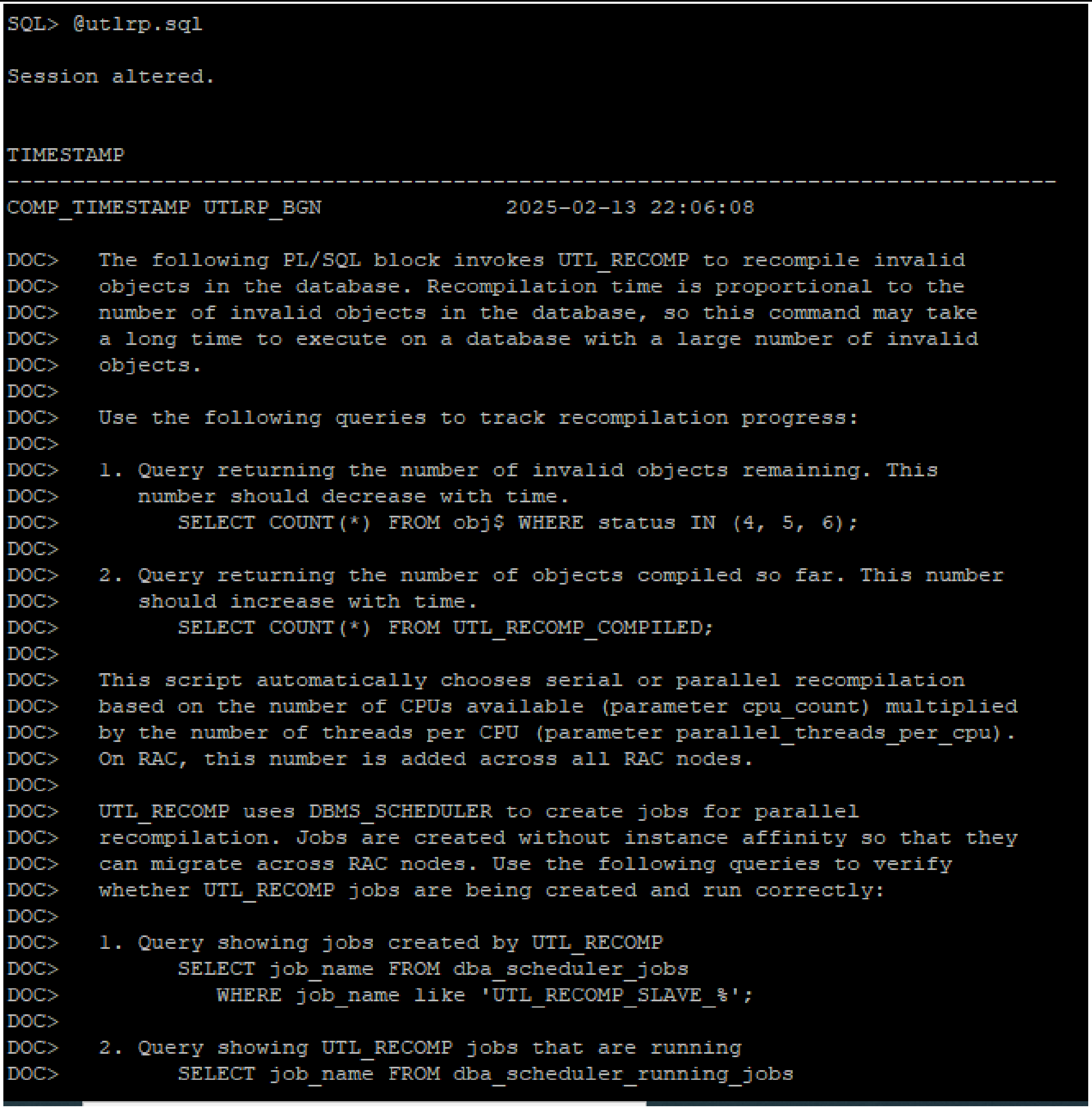
```
[oracle@oracle dbupgrade]$ cat upg_summary.log

Oracle Database Release 19 Post-Upgrade Status Tool    02-13-2025 21:55:3
Database Name: ORCL

Component                                       Current          Full     Elapsed Time
Name                                            Status           Version  HH:MM:SS

Oracle Server                                  UPGRADED      19.3.0.0.0  00:16:40
JServer JAVA Virtual Machine                   UPGRADED      19.3.0.0.0  00:01:20
Oracle XDK                                     UPGRADED      19.3.0.0.0  00:01:03
Oracle Database Java Packages                  UPGRADED      19.3.0.0.0  00:00:11
OLAP Analytic Workspace                        UPGRADED      19.3.0.0.0  00:00:10
Oracle Label Security                          UPGRADED      19.3.0.0.0  00:00:05
Oracle Database Vault                          UPGRADED      19.3.0.0.0  00:00:17
Oracle Text                                    UPGRADED      19.3.0.0.0  00:00:30
Oracle Workspace Manager                       UPGRADED      19.3.0.0.0  00:00:29
Oracle Real Application Clusters               UPGRADED      19.3.0.0.0  00:00:00
Oracle XML Database                            UPGRADED      19.3.0.0.0  00:01:39
Oracle Multimedia                              UPGRADED      19.3.0.0.0  00:00:58
Spatial                                        UPGRADED      19.3.0.0.0  00:06:02
Oracle OLAP API                                UPGRADED      19.3.0.0.0  00:00:10
Datapatch                                                                00:03:24
Final Actions                                                            00:03:32
Post Upgrade                                                             00:00:11

Total Upgrade Time: 00:33:55

Database time zone version is 26. It is older than current release time
zone version 32. Time zone upgrade is needed using the DBMS_DST package.

Grand Total Upgrade Time:    [0d:0h:36m:44s]
[oracle@oracle dbupgrade]$
```

- Now update the oratab for the new database.(In root, vi /etc/oratab).
- Now source the env for 19c and startup the database,



```
[oracle@oracle ~]$ . 19up.env
[oracle@oracle ~]$ !sq
sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Feb 13 22:01:39 2025
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle.  All rights reserved.

Connected to an idle instance.

SQL> startup
ORACLE instance started.

Total System Global Area 2516581464 bytes
Fixed Size                  8899672 bytes
Variable Size             553648128 bytes
Database Buffers         1946157056 bytes
Redo Buffers                7876608 bytes
Database mounted.
Database opened.
SQL> SELECT NAME,OPEN_MODE,STATUS,VERSION FROM V$DATABASE, V$INSTANCE;

NAME
---------------------------
OPEN_MODE
------------------------------------------------------------
STATUS
------------------------------------
VERSION
---------------------------------------------------
ORCL
READ WRITE
OPEN
19.0.0.0.0
```

- Then execute the utlrp.sql tovalidate the invalid objects.
- Navigate to oracle_home/rdbms/admin and connect to database.
- Then execute the @utlrp.sql script.



```
SQL> @utlrp.sql

Session altered.


TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP UTLRP_BGN              2025-02-13 22:06:08

DOC>   The following PL/SQL block invokes UTL_RECOMP to recompile invalid
DOC>   objects in the database. Recompilation time is proportional to the
DOC>   number of invalid objects in the database, so this command may take
DOC>   a long time to execute on a database with a large number of invalid
DOC>   objects.
DOC>
DOC>   Use the following queries to track recompilation progress:
DOC>
DOC>   1. Query returning the number of invalid objects remaining. This
DOC>      number should decrease with time.
DOC>         SELECT COUNT(*) FROM obj$ WHERE status IN (4, 5, 6);
DOC>
DOC>   2. Query returning the number of objects compiled so far. This number
DOC>      should increase with time.
DOC>         SELECT COUNT(*) FROM UTL_RECOMP_COMPILED;
DOC>
DOC>   This script automatically chooses serial or parallel recompilation
DOC>   based on the number of CPUs available (parameter cpu_count) multiplied
DOC>   by the number of threads per CPU (parameter parallel_threads_per_cpu).
DOC>   On RAC, this number is added across all RAC nodes.
DOC>
DOC>   UTL_RECOMP uses DBMS_SCHEDULER to create jobs for parallel
DOC>   recompilation. Jobs are created without instance affinity so that they
DOC>   can migrate across RAC nodes. Use the following queries to verify
DOC>   whether UTL_RECOMP jobs are being created and run correctly:
DOC>
DOC>   1. Query showing jobs created by UTL_RECOMP
DOC>         SELECT job_name FROM dba_scheduler_jobs
DOC>            WHERE job_name like 'UTL_RECOMP_SLAVE_%';
DOC>
DOC>   2. Query showing UTL_RECOMP jobs that are running
DOC>         SELECT job_name FROM dba_scheduler_running_jobs
```

- Use the following queries to track recompilation progress:

  1. Query returning the number of invalid objects remaining. This number should decrease with time.

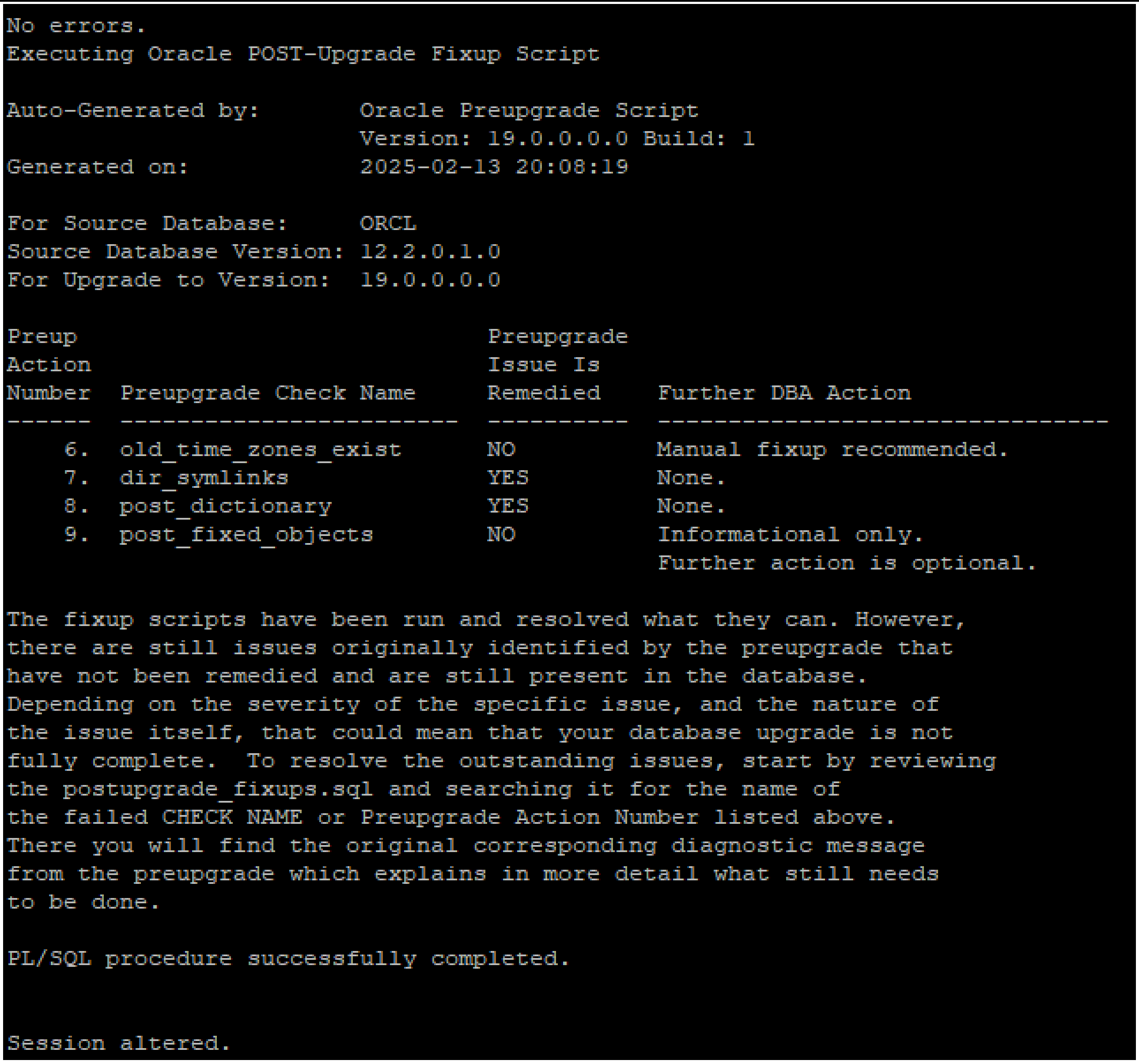
     SELECT COUNT(*) FROM obj$ WHERE status IN (4, 5, 6);

  2. Query returning the number of objects compiled so far. This number should increase with time.

     SELECT COUNT(*) FROM UTL_RECOMP_COMPILED;

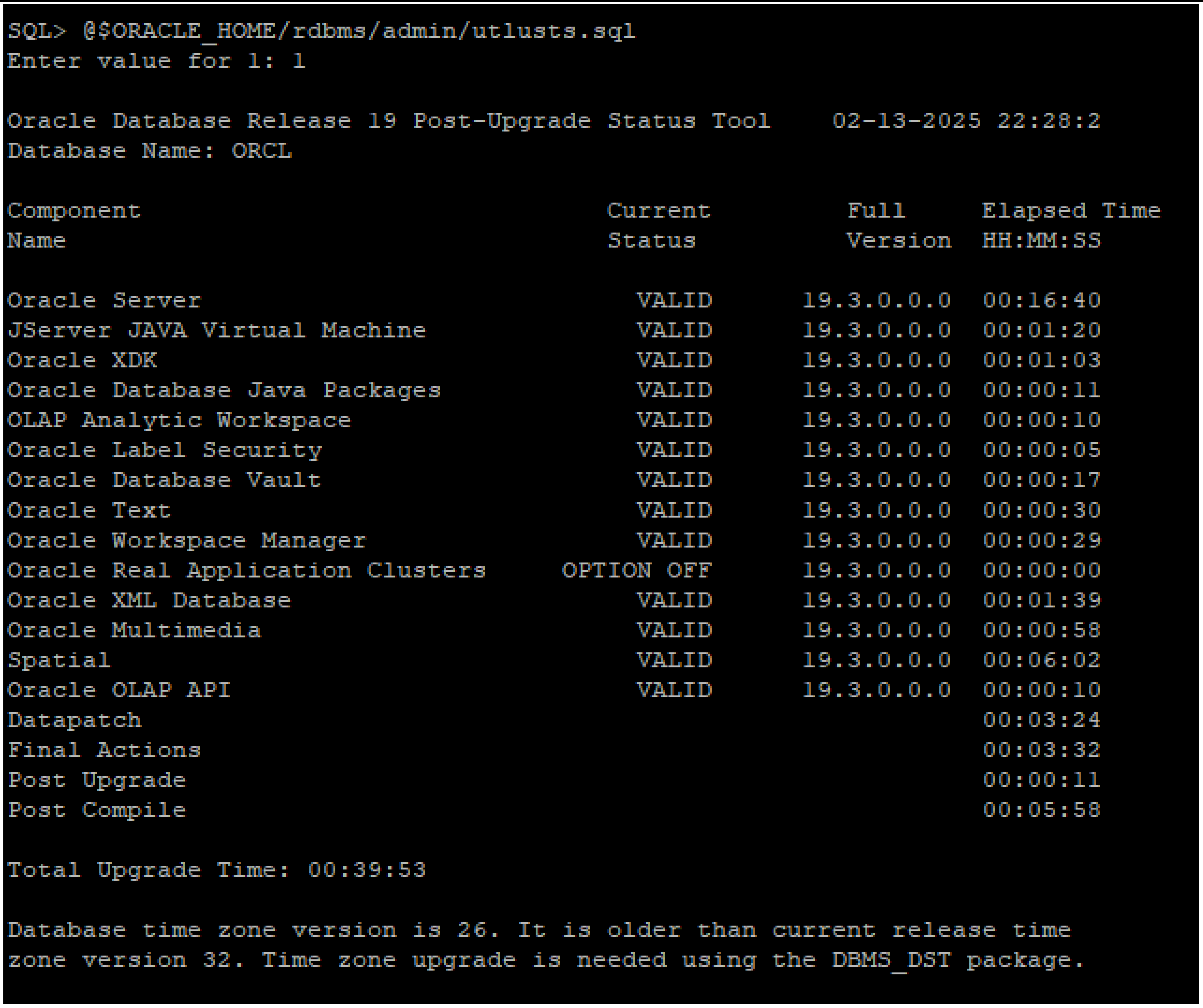
- Then execute postupgrade_fixups.sql script created when the first step is executed.

  @/home/oracle/bkp/dbupgrade/postupgrade_fixups.sql



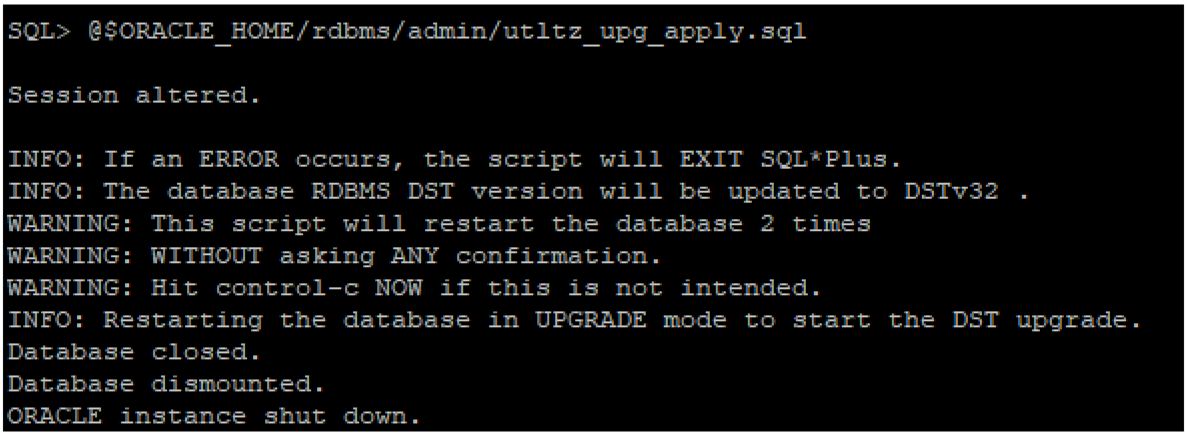
```
No errors.
Executing Oracle POST-Upgrade Fixup Script

Auto-Generated by:       Oracle Preupgrade Script
                         Version: 19.0.0.0.0 Build: 1
Generated on:            2025-02-13 20:08:19

For Source Database:     ORCL
Source Database Version: 12.2.0.1.0
For Upgrade to Version:  19.0.0.0.0

Preup                             Preupgrade
Action                            Issue Is
Number  Preupgrade Check Name     Remedied    Further DBA Action
------  ------------------------  ----------  --------------------------------
    6.  old_time_zones_exist      NO          Manual fixup recommended.
    7.  dir_symlinks              YES         None.
    8.  post_dictionary           YES         None.
    9.  post_fixed_objects        NO          Informational only.
                                              Further action is optional.

The fixup scripts have been run and resolved what they can. However,
there are still issues originally identified by the preupgrade that
have not been remedied and are still present in the database.
Depending on the severity of the specific issue, and the nature of
the issue itself, that could mean that your database upgrade is not
fully complete.  To resolve the outstanding issues, start by reviewing
the postupgrade_fixups.sql and searching it for the name of
the failed CHECK NAME or Preupgrade Action Number listed above.
There you will find the original corresponding diagnostic message
from the preupgrade which explains in more detail what still needs
to be done.

PL/SQL procedure successfully completed.


Session altered.
```

- Resolve the timezone error by runing the script from
  @$ORACLE_HOME/rdbms/admin/utltz_upg_check.sql
- Run the post upgrade validation tool to validate the upgrade process.
  @$ORACLE_HOME/rdbms/admin/utlusts.sql



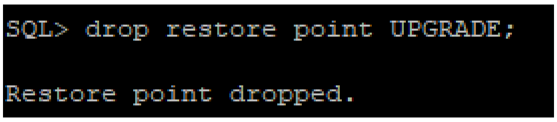
```
SQL> @$ORACLE_HOME/rdbms/admin/utlusts.sql
Enter value for 1: 1

Oracle Database Release 19 Post-Upgrade Status Tool    02-13-2025 22:28:2
Database Name: ORCL

Component                                  Current         Full     Elapsed Time
Name                                       Status          Version  HH:MM:SS

Oracle Server                                VALID      19.3.0.0.0  00:16:40
JServer JAVA Virtual Machine                 VALID      19.3.0.0.0  00:01:20
Oracle XDK                                   VALID      19.3.0.0.0  00:01:03
Oracle Database Java Packages                VALID      19.3.0.0.0  00:00:11
OLAP Analytic Workspace                      VALID      19.3.0.0.0  00:00:10
Oracle Label Security                        VALID      19.3.0.0.0  00:00:05
Oracle Database Vault                        VALID      19.3.0.0.0  00:00:17
Oracle Text                                  VALID      19.3.0.0.0  00:00:30
Oracle Workspace Manager                     VALID      19.3.0.0.0  00:00:29
Oracle Real Application Clusters        OPTION OFF      19.3.0.0.0  00:00:00
Oracle XML Database                          VALID      19.3.0.0.0  00:01:39
Oracle Multimedia                            VALID      19.3.0.0.0  00:00:58
Spatial                                      VALID      19.3.0.0.0  00:06:02
Oracle OLAP API                              VALID      19.3.0.0.0  00:00:10
Datapatch                                                           00:03:24
Final Actions                                                       00:03:32
Post Upgrade                                                        00:00:11
Post Compile                                                        00:05:58

Total Upgrade Time: 00:39:53

Database time zone version is 26. It is older than current release time
zone version 32. Time zone upgrade is needed using the DBMS_DST package.
```

- Upgrade the timezone by running,
  @$ORACLE_HOME/rdbms/admin/utltz_upg_apply.sql



```
SQL> @$ORACLE_HOME/rdbms/admin/utltz_upg_apply.sql

Session altered.

INFO: If an ERROR occurs, the script will EXIT SQL*Plus.
INFO: The database RDBMS DST version will be updated to DSTv32 .
WARNING: This script will restart the database 2 times
WARNING: WITHOUT asking ANY confirmation.
WARNING: Hit control-c NOW if this is not intended.
INFO: Restarting the database in UPGRADE mode to start the DST upgrade.
Database closed.
Database dismounted.
ORACLE instance shut down.
```

- Drop the restore point previously created .



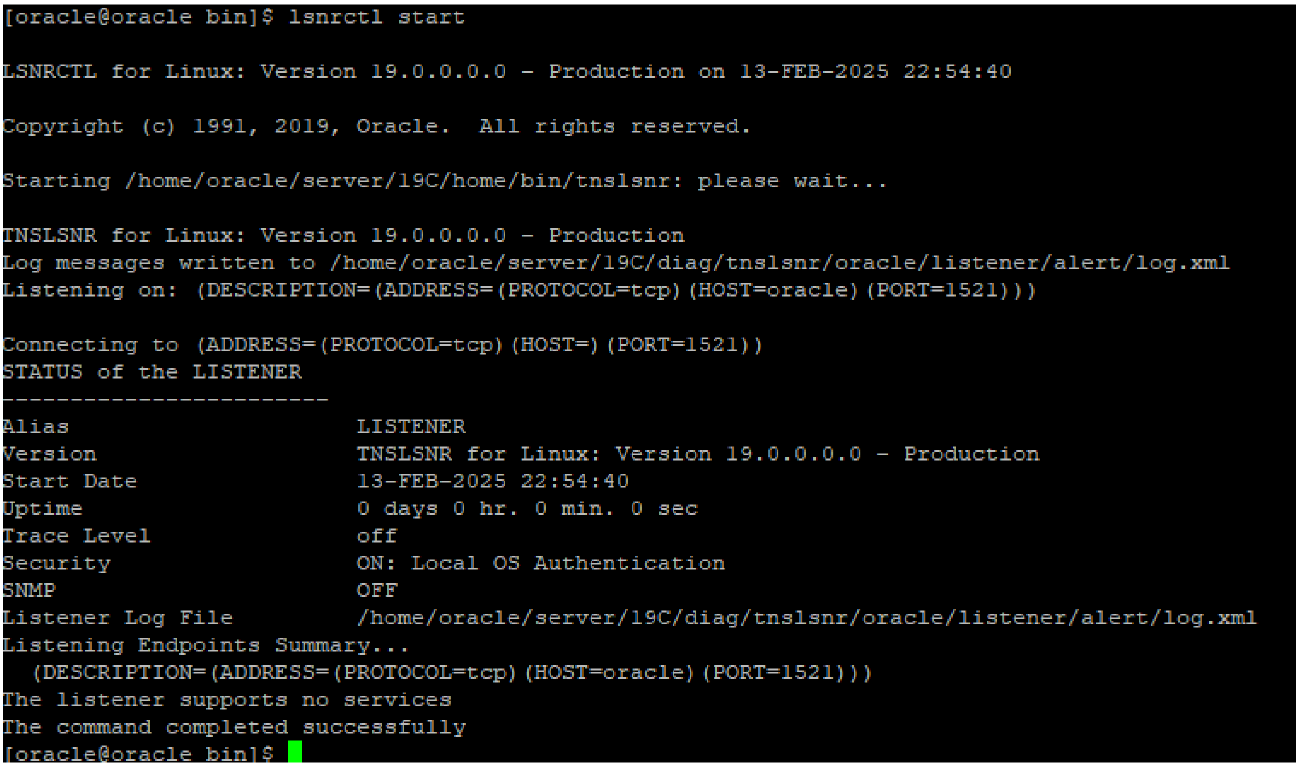
```
SQL> drop restore point UPGRADE;

Restore point dropped.
```

- Set the parameters to be compatible,execute:

  alter system set compatible='19.0.0' scope=spfile;

- Ensure the database is running on spfile.

- Start the listener to ensure the proper connection is established.



```
[oracle@oracle bin]$ lsnrctl start

LSNRCTL for Linux: Version 19.0.0.0.0 - Production on 13-FEB-2025 22:54:40

Copyright (c) 1991, 2019, Oracle.  All rights reserved.

Starting /home/oracle/server/19C/home/bin/tnslsnr: please wait...

TNSLSNR for Linux: Version 19.0.0.0.0 - Production
Log messages written to /home/oracle/server/19C/diag/tnslsnr/oracle/listener/alert/log.xml
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=oracle)(PORT=1521)))

Connecting to (ADDRESS=(PROTOCOL=tcp)(HOST=)(PORT=1521))
STATUS of the LISTENER
------------------------
Alias                     LISTENER
Version                   TNSLSNR for Linux: Version 19.0.0.0.0 - Production
Start Date                13-FEB-2025 22:54:40
Uptime                    0 days 0 hr. 0 min. 0 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Log File         /home/oracle/server/19C/diag/tnslsnr/oracle/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=oracle)(PORT=1521)))
The listener supports no services
The command completed successfully
[oracle@oracle bin]$
```

ERROR FACED:

- Ensure the restore point is dropped before changing the compatibility to 19.0.0 or else the db cannot be started or even mounted

Manual steps to follow:

Manual upgrade Steps to follow
1.12c database installed
2.19c software alone install
3.run preupgrade.jar -->From 12c home run the jarfile in 19c home --> create a new dir /u04/preupgrade
4.After runnig preupdrade.jar it will give 3 new files, preupgrade_fixups.sql,postupgrade_fixups.sql,preupgrade.log
5.Now run preupgrade_fixups.sql --> it will list the fix to apply
6.Create restore point on 12c , DB should be in archive log mode.
7.Shutdown 12c DB , down the listener, cp passwd,pfile,lisnter from old home to new home 19c
8.start up 19c DB --> startup upgrade
9.run db upgrade utility on the 19c home/bin
10.run utlusts.sql
11. run utlrp.sql to make all the invalide object are become valide

12.Run postupgrade_fixups.sql
13.Update the timezone
14.exec object stats dictinory stats
15.Drop the restore point
16.Update compatibility
17.Bounce the DB and check the status