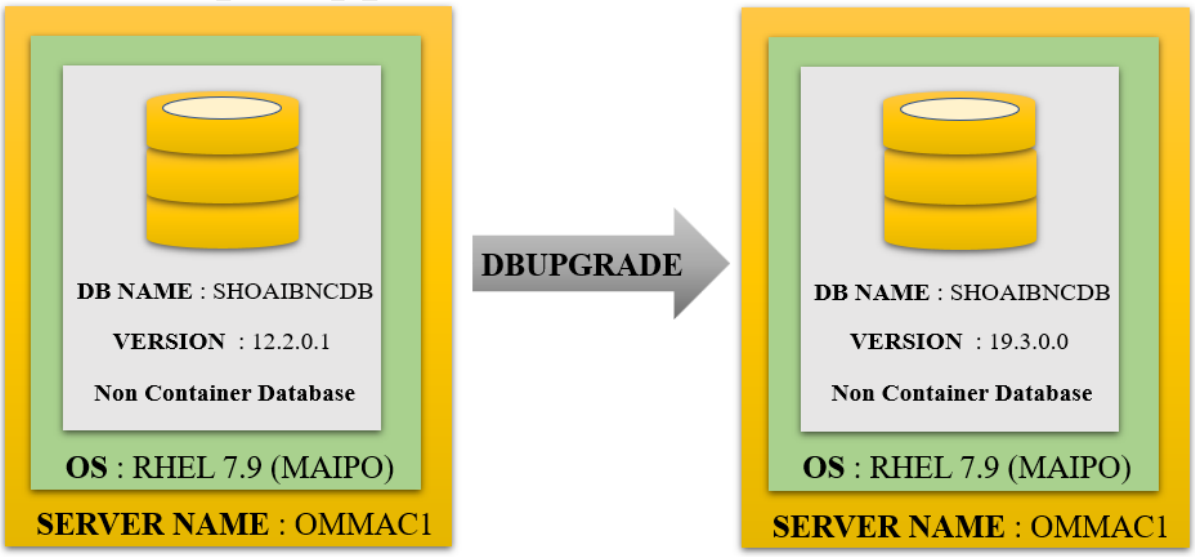
UPGRADE ORACLE DATABASE (12c TO 19c)

Manual Command-Line Upgrade (DBUPGRADE)

In this article I have followed the steps to directly upgrade non-Container database from 12c to 19c because direct upgrade to 19c is possible from database versions like 11.2.0.4/12.1.0.2/12.2.0.1/18c.

OUR TESTING ENVIRONMENT

For this upgrade I have prepared a virtual machine using (oracle virtual box) and Installed RedHat Enterprise Linux 7.9 on which Oracle 12cR2 non-container database is running.



Oracle database upgrade steps can be summarised as follows

1. **PRE-REQUISITES**
    a. Check Database Upgrade Certification Matrix
    b. Check OS Certification Matrix
    c. Oracle 19c Binaries Installation for Upgrade
    d. Oracle 12c Database RMAN Backup
    e. Check For Invalid Objects
    f. Create Directory to keep Upgrade Logs

2. **RUN PREUPGRADE.JAR UTILITY**
    a. Review Pre-Upgrade Logfiles

3. **PRE-UPGRADE STEPS**
    a. Verify Tablespace Size
    b. Gather Dictionary Stats
    c. Purge Recycle Bin
    d. Run Preupgrade Fixup Sql Script
    e. Verify Archive Destination Size
    f. Stop Database Listener
    g. Create Flashback Guaranteed Restore Point
    h. Shutdown 12cR2 Database
    i. Copy [Spfile/Password] Files From 12c To 19c Oracle Home
    j. Edit Oratab – Make 19c Oracle Home Active

4. **UPGRADE DATABASE STEPS**
    a. Start Database in Upgrade Mode From 19c Home
    b. Run Dbupgrade From 19c Home
    c. After Upgrade Simply Start the Database From 19c Home
    d. After Upgrade Check the Registry

5. **POST UPGRADE STEPS**
    a. Post Upgrade Run Utlrp.Sql
    b. Run Post Upgrade Fixup Sql Script
    c. Upgrade Timezone
    d. Run Utlusts.Sql
    e. Run Catuppst.Sql
    f. Rerun Post Upgrade Fixup Sql Script
    g. Check Invalid Counts
    h. Drop Restore Point
    i. Set 19c Compatible Parameter
    j. Verify Dbregistry – Final Check

UPGRADE ORACLE DATABASE (12c TO 19c)

Manual Command-Line Upgrade (DBUPGRADE)

DATABASE UPGRADE CERTIFICATION MATRIX

The upgrade path depends on the current database version. Some upgrades are easy and direct, while others require more time and effort. In direct upgrade we use the Database Upgrade Assistant (DBUA) or command-line upgrade script to upgrade the database to Oracle Database 19c. Direct upgrade is supported when the source database is running one of the releases shown in the following table.

Upgrade Path / Compatibility Matrix for 19.x Oracle Database

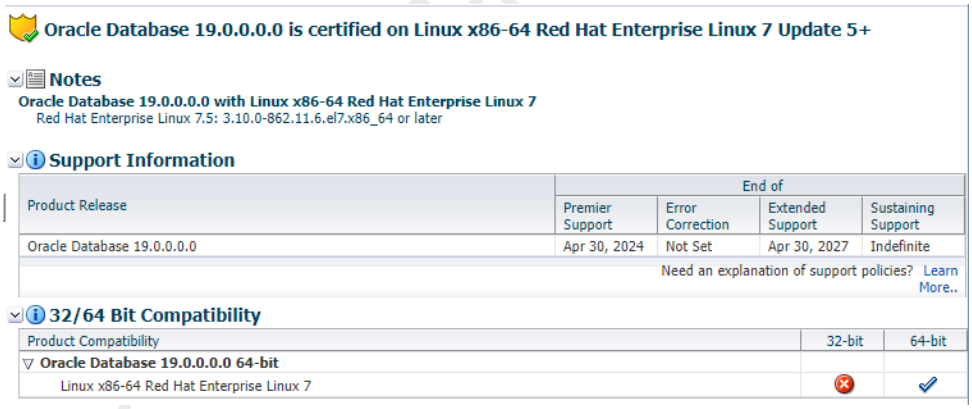
DBUA can upgrade only supported versions of direct upgrade.

Direct Upgrade to 19.x:

Source Database	Target Database
11.2.0.4 and Higher	19.x
12.1.0.2	19.x
12.2.0.1	19.x
18.1	19.x

OS CERTIFICATION MATRIX

In our testing environment we are running RHEL 7.9 Operating system, so we used the below certification matrix to confirm that oracle database 19c is supported on RHEL 7.5+ / RHEL 8



Oracle Database 19.0.0.0.0 is certified on Linux x86-64 Red Hat Enterprise Linux 7 Update 5+

Notes

Oracle Database 19.0.0.0.0 with Linux x86-64 Red Hat Enterprise Linux 7
Red Hat Enterprise Linux 7.5: 3.10.0-862.11.6.el7.x86_64 or later

Support Information

Product Release	End of			
	Premier Support	Error Correction	Extended Support	Sustaining Support
Oracle Database 19.0.0.0.0	Apr 30, 2024	Not Set	Apr 30, 2027	Indefinite

Need an explanation of support policies? Learn More..

32/64 Bit Compatibility

Product Compatibility	32-bit	64-bit
Oracle Database 19.0.0.0.0 64-bit		
Linux x86-64 Red Hat Enterprise Linux 7	✗	✓

Certification Results

Operating System Certification

Oracle Database 19.0.0.0.0 is certified on Linux x86-64 Red Hat Enterprise Linux 8

See Certification Details for Notes and Support information.

Displaying Oracle Database 19.0.0.0.0 Certifications (Filtered by Linux x86-64 Red Hat Enterprise Linux 8)

View | Share Link

Certified With	Number of Releases / Versions
Operating Systems (1 Item)	
Linux x86-64	1 Version (Red Hat Enterprise Linux 8)

ORACLE 19c BINARIES INSTALLATION FOR UPGRADE

We download the oracle database 19c software and uploaded zip file into our database server (OMMAC1).

Create Oracle Home Location for 19c database using following command

mkdir -p /u01/app/oracle/product/19.0.0/dbhome_1

unzip the 19c software file in 19c oracle home using following command

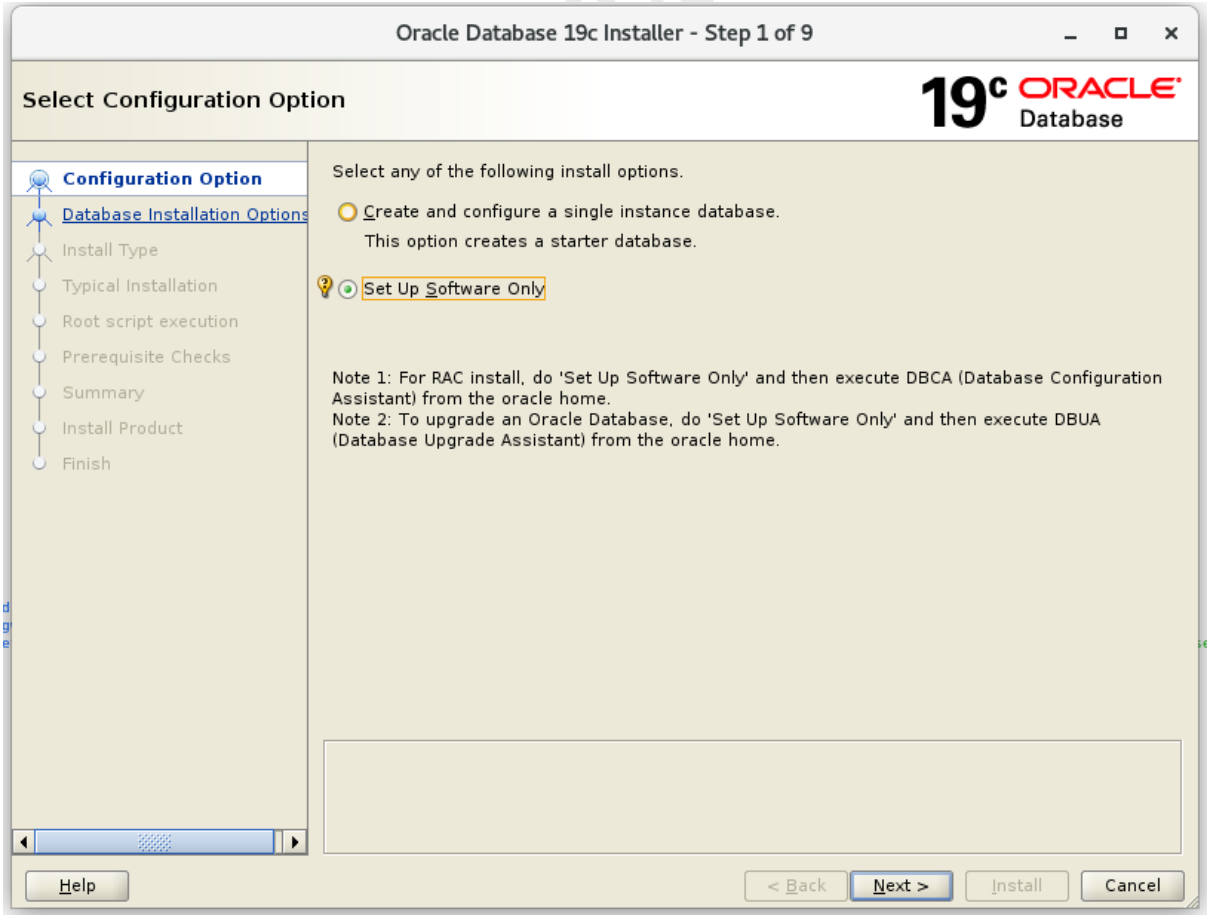
unzip LINUX.X64_193000_db_home.zip -d /u01/app/oracle/product/19.0.0/dbhome_1

Install the Oracle 19c Database software

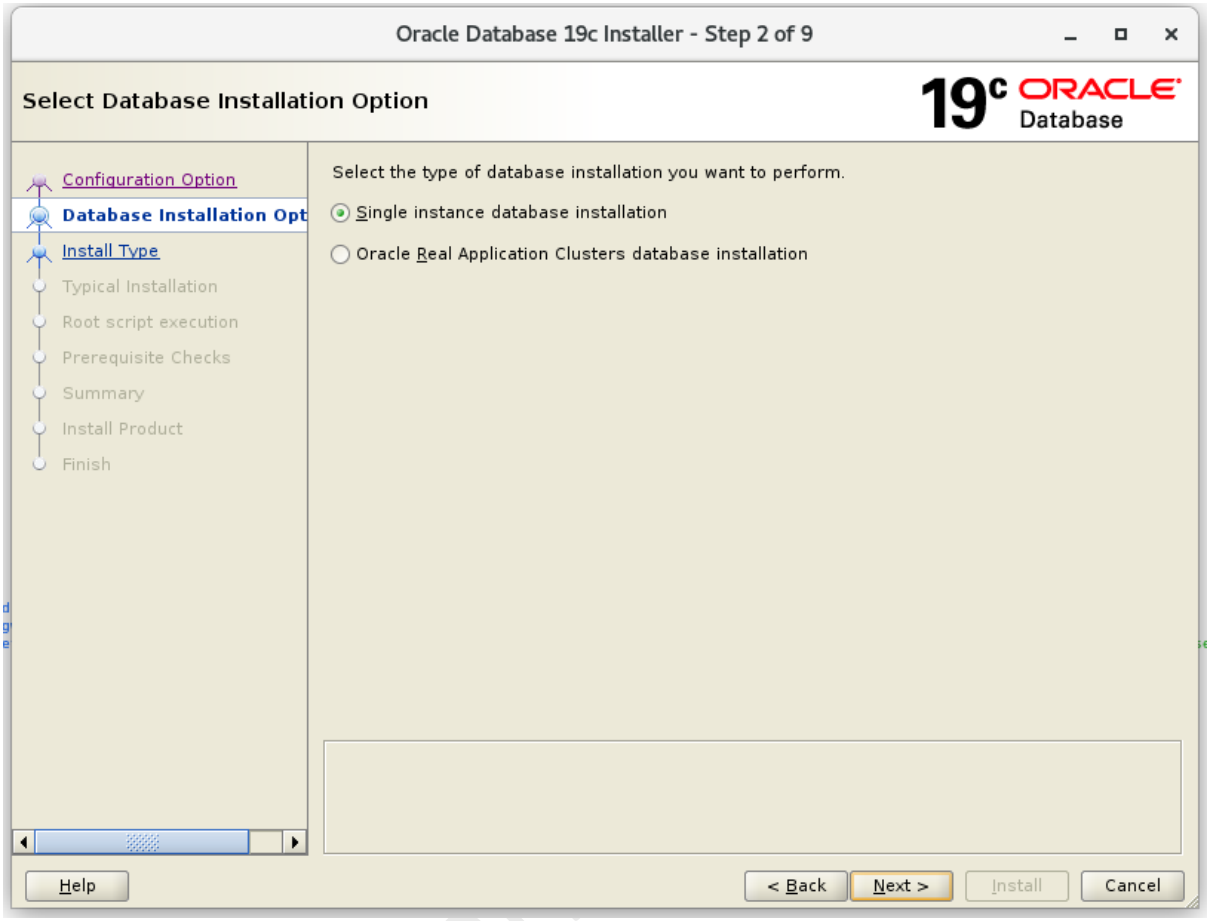
$ **./runInstaller**

(We can install 19c before upgrade to save downtime and we will use different Oracle Home location from existing Oracle 12c Home.)

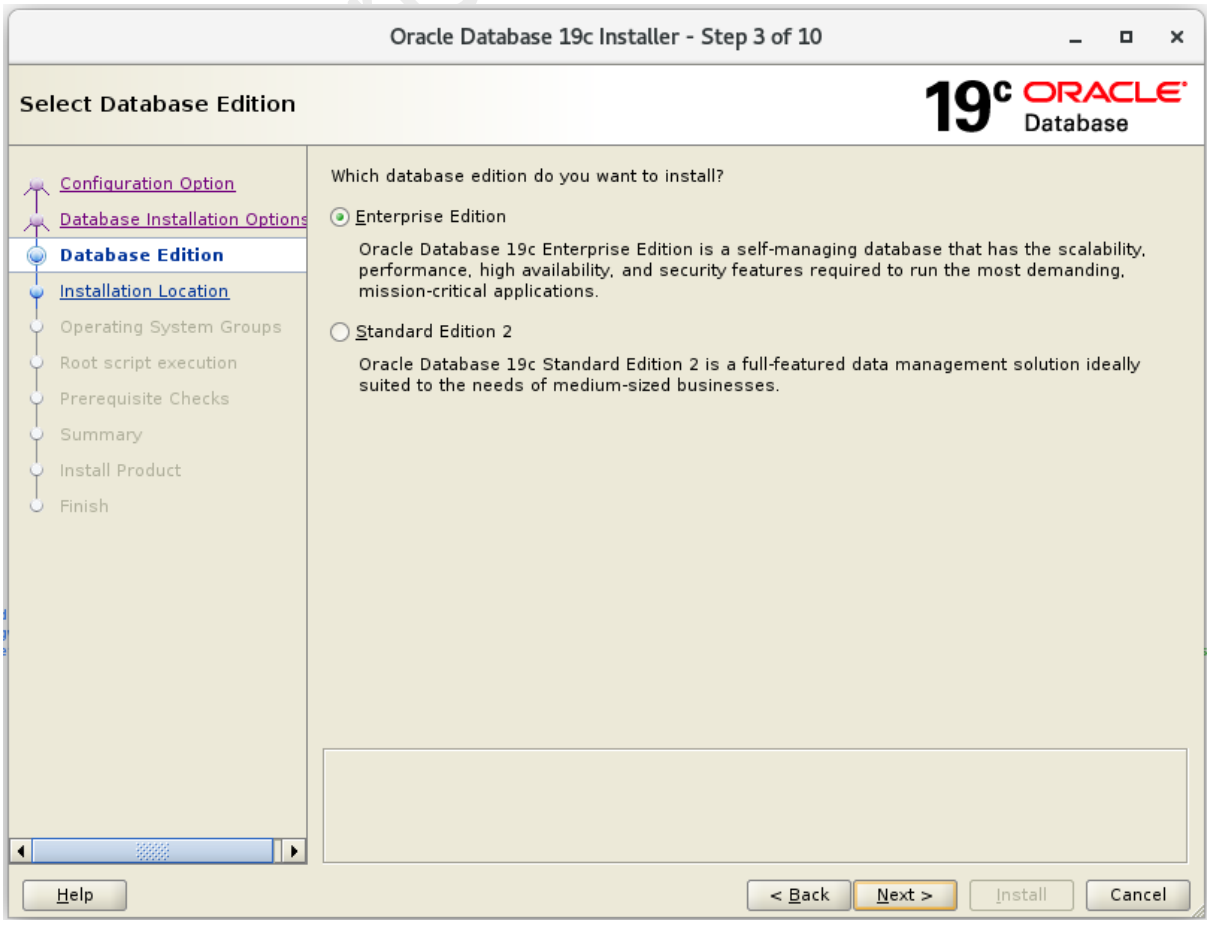
In install step 1 we will choose the second option as it will just install the s/w and not create any DB



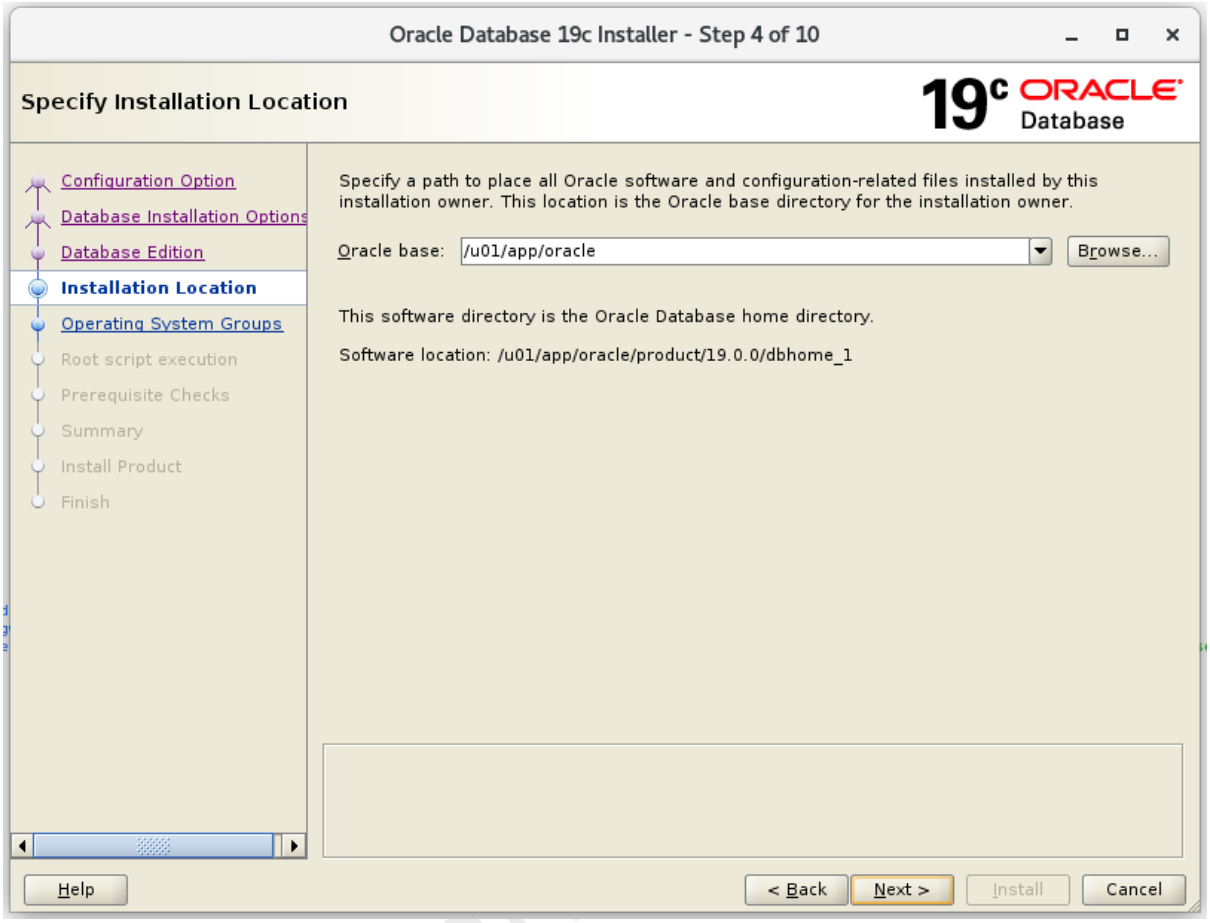
In install step 2 we choose first option as s/w installation will be for NON-RAC environment



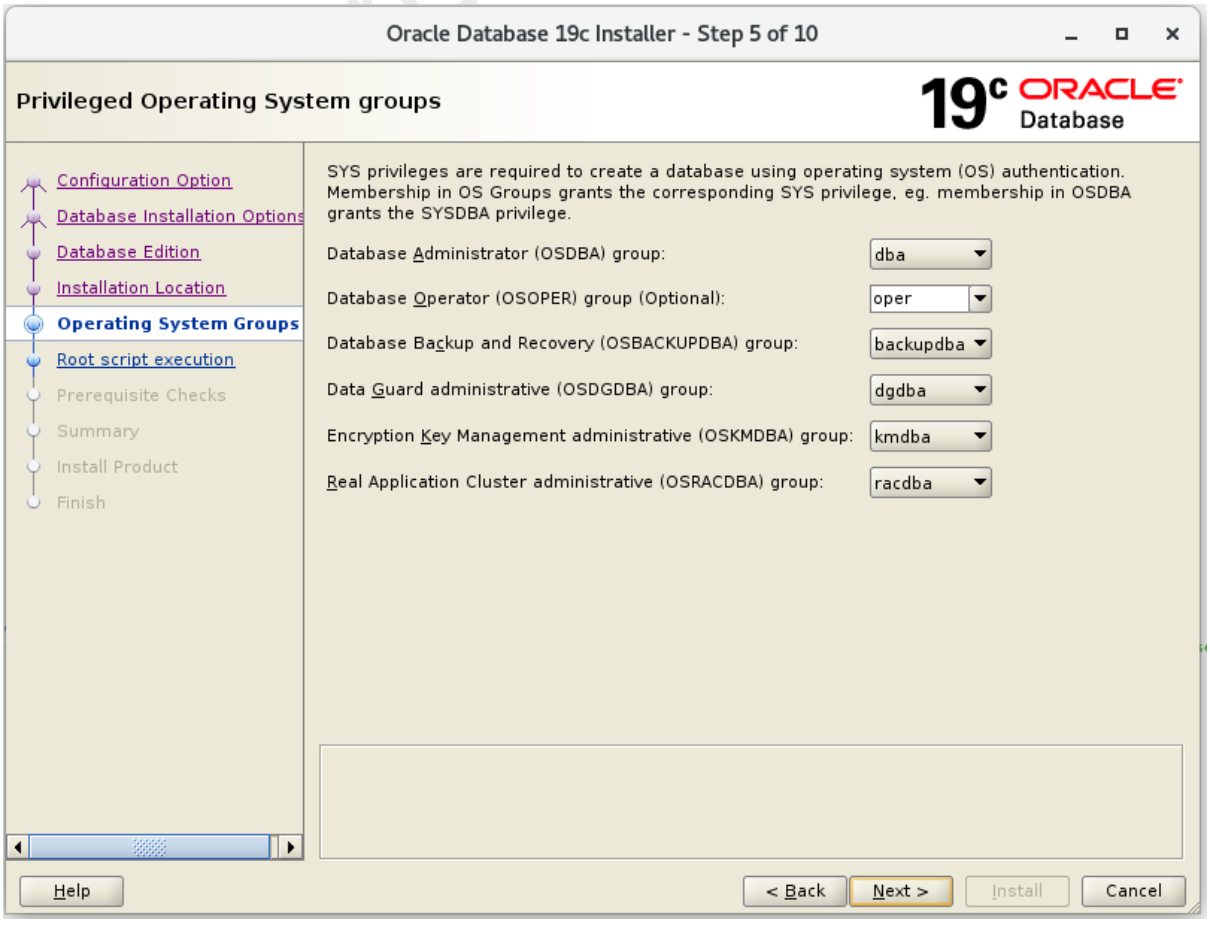
In install step 3 we choose the first option as oracle s/w is enterprise edition (EE)



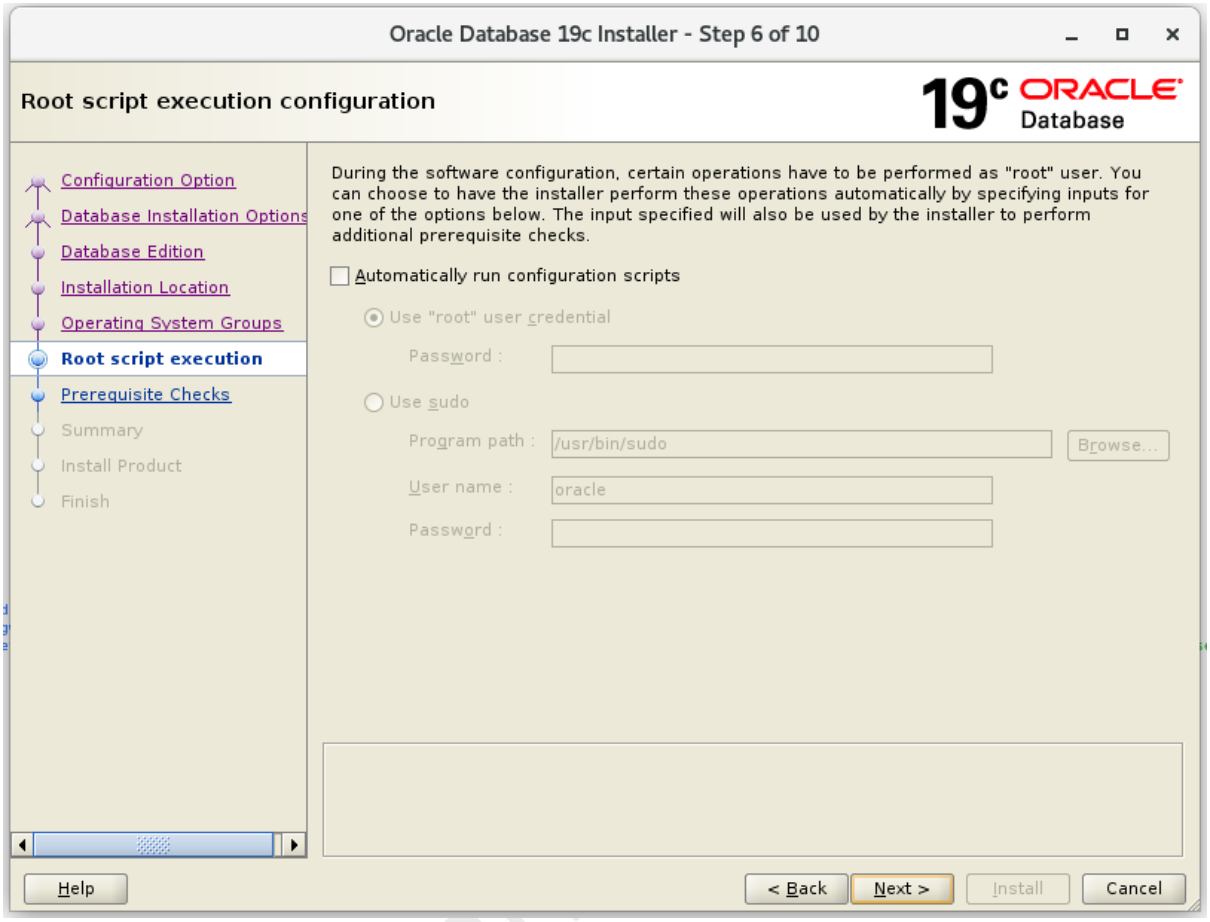
In install step 4 we will specify the ORACLE BASE location



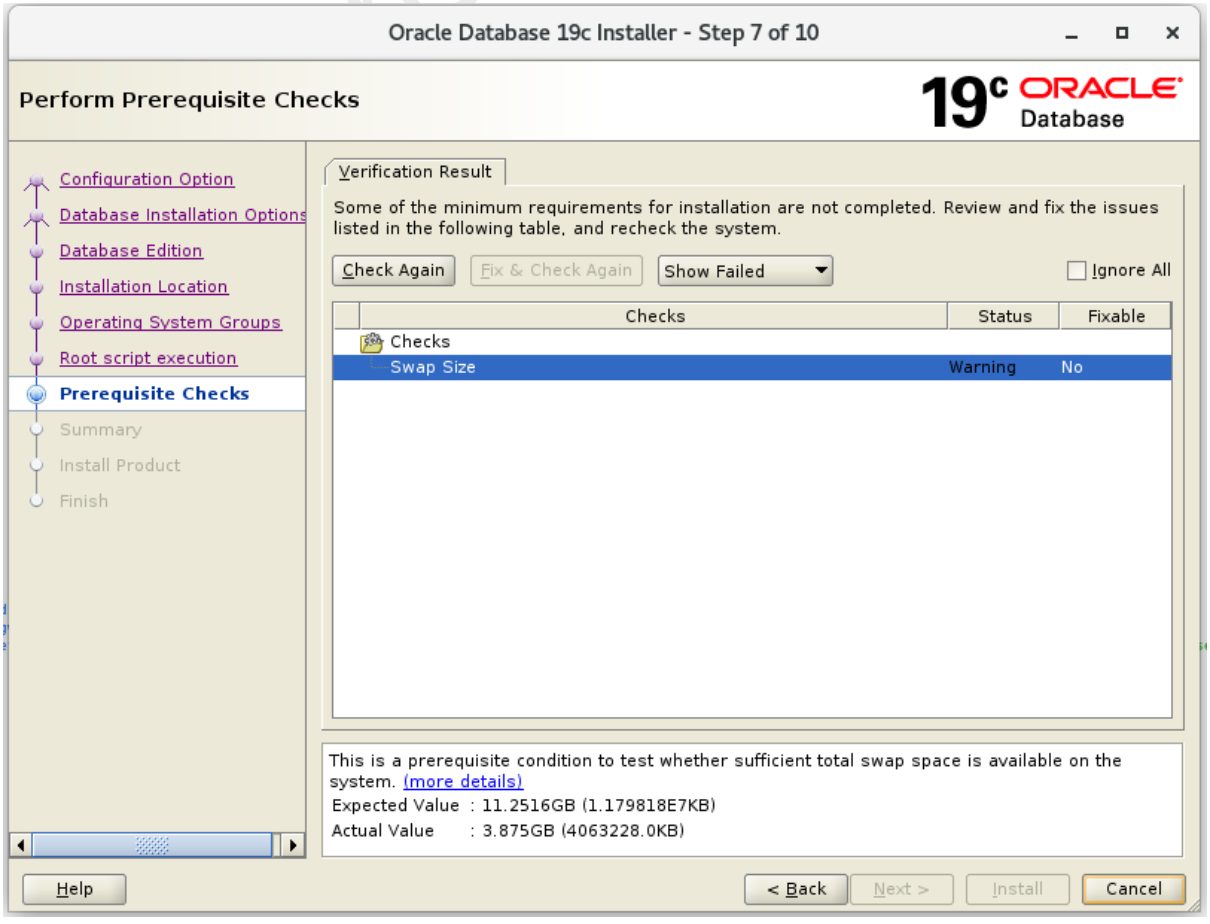
In install step 5 we will define the groups privileges (choose the defaults)



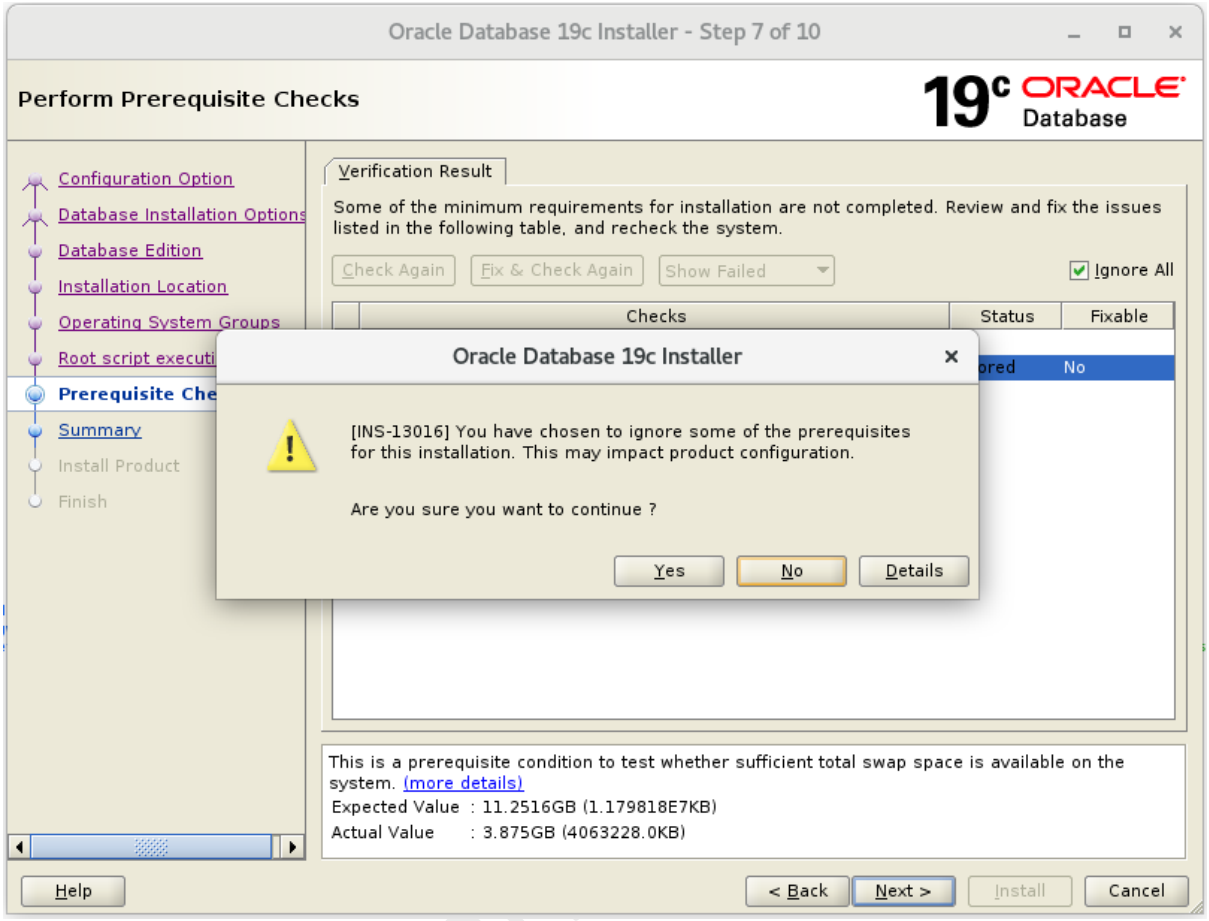
In install step 6 we will not choose anything



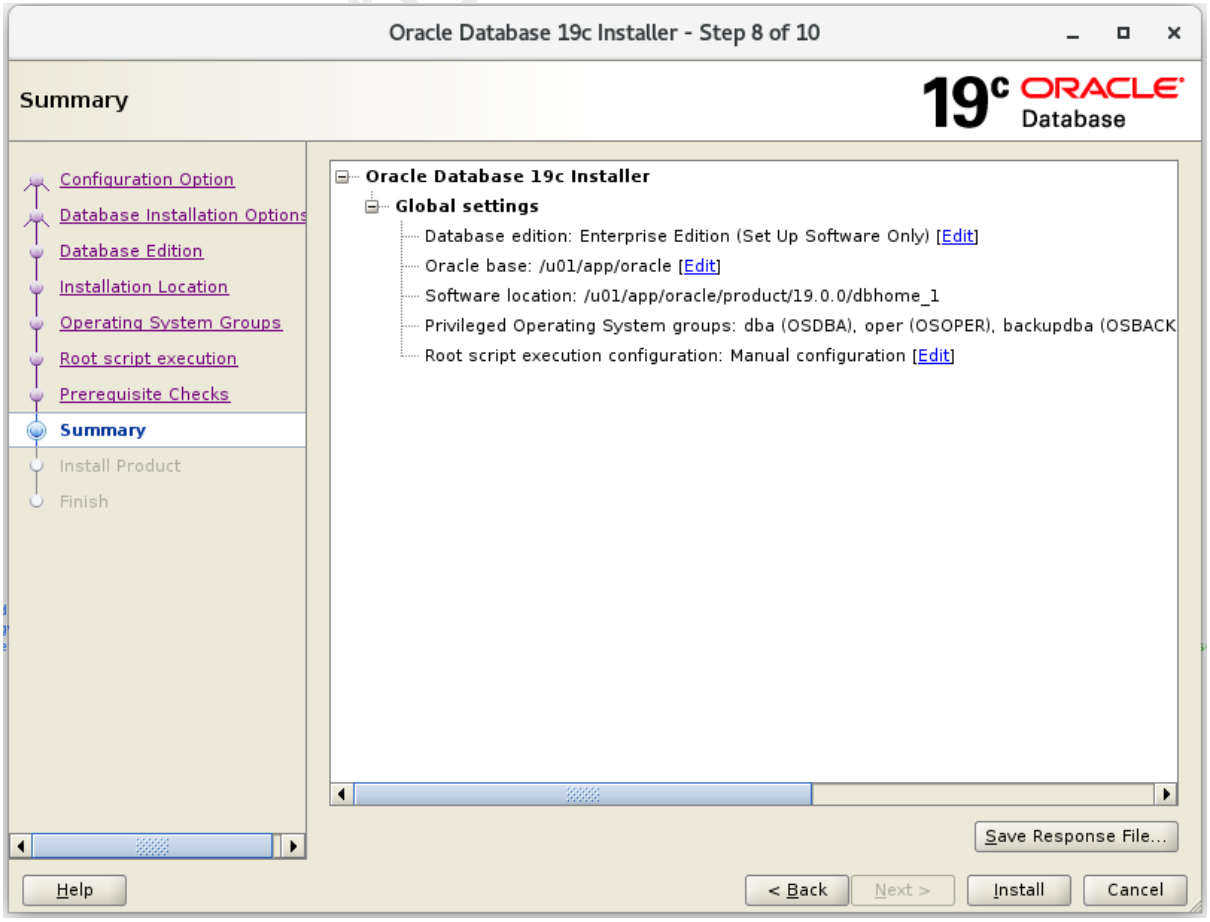
In install step 7 we do the prerequisite checks (fix the checks then only proceed to next step)



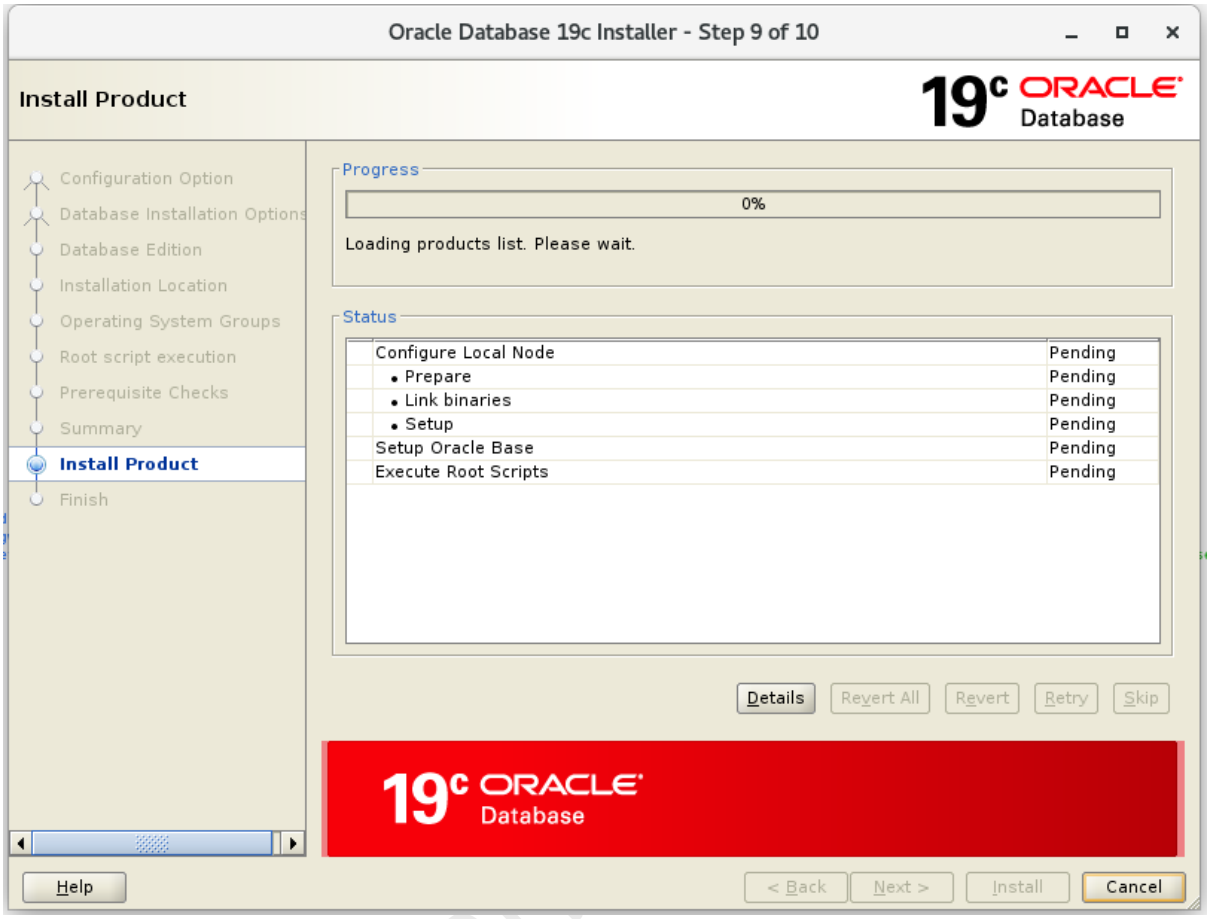
In install step 7 we do the prerequisite checks (here we can skip the check as it is just a warning)



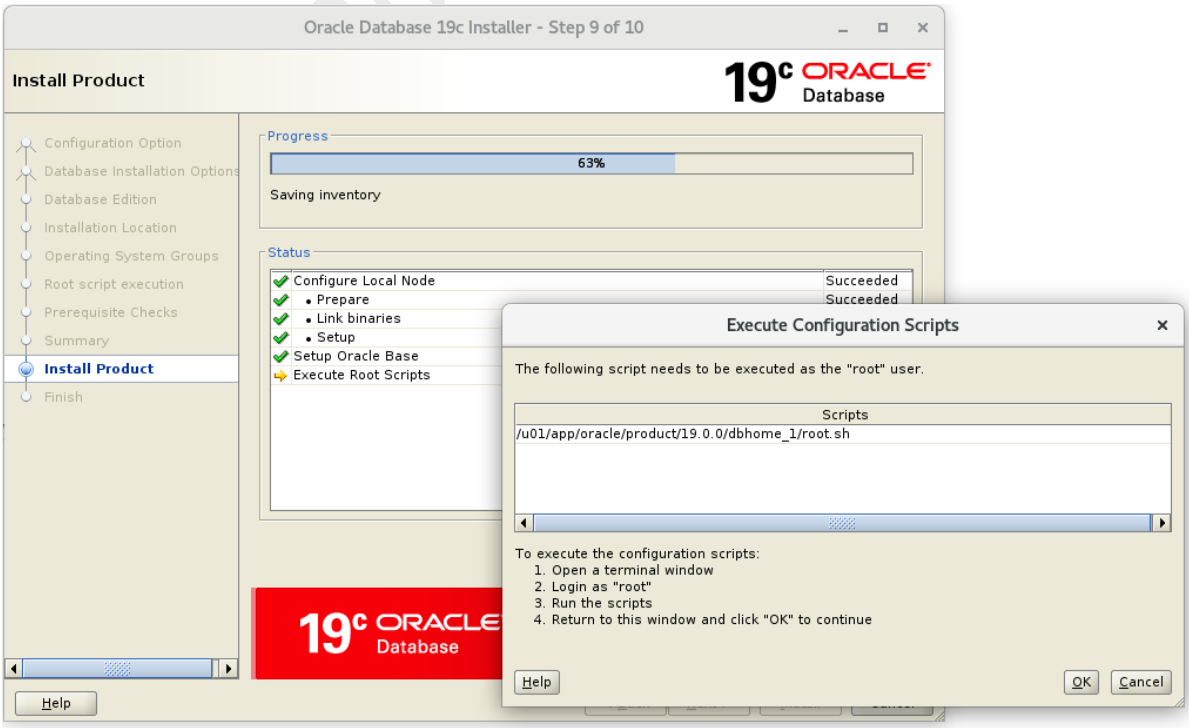
In install step 8 we see the summary of all that we have chosen during the install wizard.



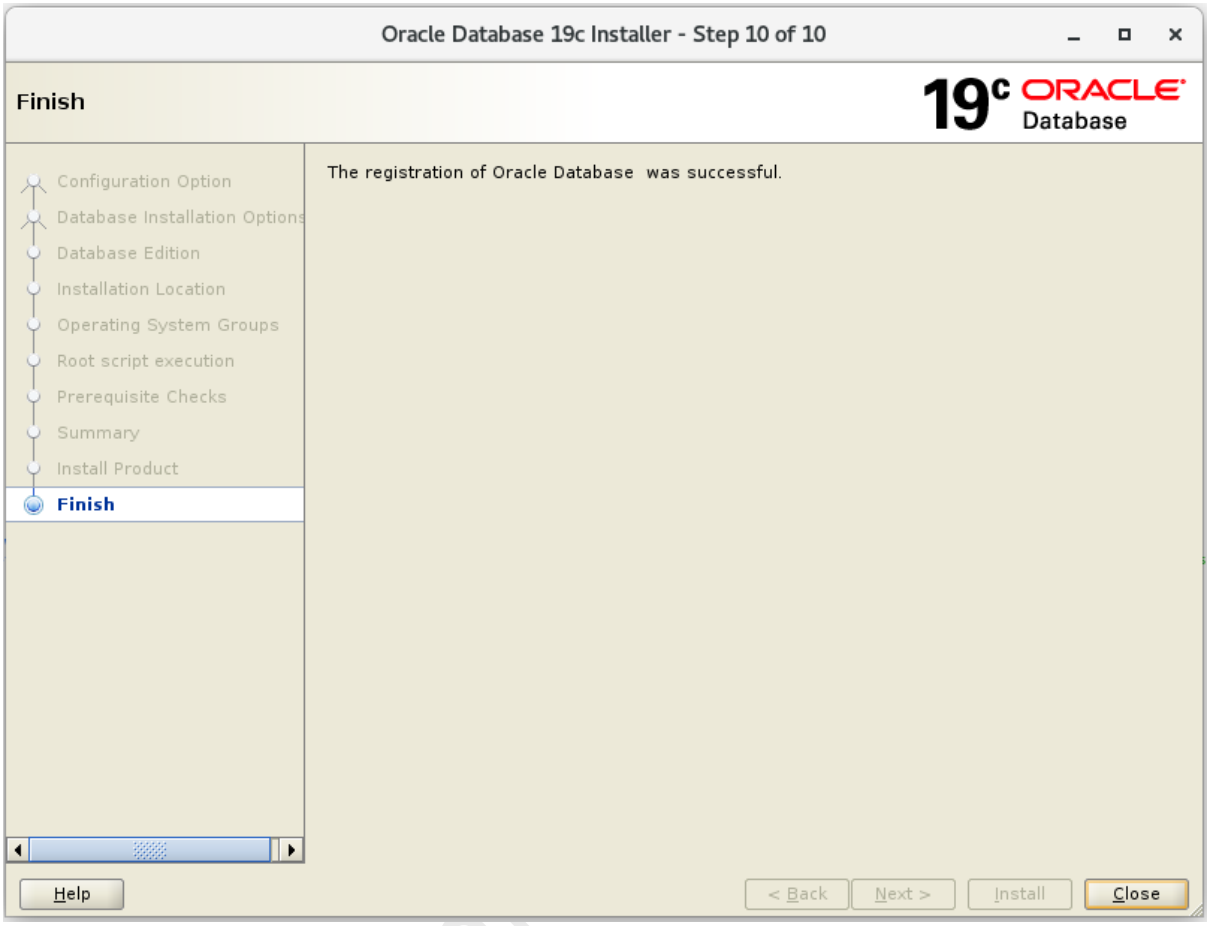
In install step 9 we can see the installation progress



In install step 9 run the root.sh script as root user (don't skip it)



In install step 10 we can see database software installation was successful.



DATABASE RMAN BACKUP

As a prerequisite it Is recommended to take the full backup of the database.

We used the below shell script to take the RMAN backup of database (datafiles, controlfiles, spfile and archive logs) files.

```
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME/u01/app/oracle/product/12.2.0.1/db_1
export ORACLE_SID=SHOAIBCDB
export BACKUP_LOCATION=/u02/oracle/backup/shoaibncdb12c

LOG_FILE=${BACKUP_LOCATION}/db_rman_backup.log

$ORACLE_HOME/bin/rman msglog=${LOG_FILE} << EOF

connect target /
run {
allocate channel d1 type disk;
backup database format '/u02/oracle/backup/shoaibncdb12c/db_%d_%u_%s.bkp';
release channel d1;
}
sql 'alter system archive log current';
run {
allocate channel a1 type disk;
backup archivelog all format '/u02/oracle/backup/shoaibncdb12c/arch_%d_%u_%s.bkp';
release channel a1;
}
run {
allocate channel c1 type disk;
backup current controlfile for standby format
'/u02/oracle/backup/shoaibncdb12c/Control_%d_%u_%s.bkp';
release channel c1;
}
exit;
EOF
```

LOOK FOR INVALID OBJECTS

As a prerequisite it Is recommended to check for the invalid objects in the container database. In our case there are no invalid objects.

```
[oracle@OMmac1 dbs]$ . oraenv
ORACLE_SID = [shoaibNCDB] ?
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@OMmac1 dbs]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Sun Jan 16 00:43:52 2022

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Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SYS@shoaibNCDB 16-JAN-22>select name,open_mode,database_role from v$database;

NAME      OPEN_MODE            DATABASE_ROLE
--------- -------------------- ----------------
SHOAIBNC  READ WRITE           PRIMARY

SYS@shoaibNCDB 16-JAN-22>select count(*) from dba_objects where status='INVALID';

  COUNT(*)
----------
         0

SYS@shoaibNCDB 16-JAN-22>
```

CREATE THE REQUIRED DIRECTORY

As a prerequisite we will create a directory location to keep all the upgrade logs and files

```
[oracle@OMmac1 ~]$
[oracle@OMmac1 ~]$ mkdir -p /u01/SPOOL/preupgrade
[oracle@OMmac1 ~]$
```

PREUPGRADE

In below screenshot we have executed the preupgrade.jar from the 19c Oracle Home. The preupgrade.jar output provides pre and post upgradation recommendation fixup sql script. The pre and post upgradation fixup sql scripts can be located in the directory location as created above. In the output we also get the command to run the pre and post fixup steps.

```
[oracle@OMmac1 ~]$ /u01/app/oracle/product/12.2.0.1/db_1/jdk/bin/java -jar
/u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/preupgrade.jar FILE DIR
 /u01/SPOOL/preupgrade/
==================
PREUPGRADE SUMMARY
==================
  /u01/SPOOL/preupgrade/preupgrade.log
  /u01/SPOOL/preupgrade/preupgrade_fixups.sql
  /u01/SPOOL/preupgrade/postupgrade_fixups.sql

Execute fixup scripts as indicated below:

Before upgrade:

Log into the database and execute the preupgrade fixups
@/u01/SPOOL/preupgrade/preupgrade_fixups.sql

After the upgrade:

Log into the database and execute the postupgrade fixups
@/u01/SPOOL/preupgrade/postupgrade_fixups.sql

Preupgrade complete: 2022-01-16T00:52:21
[oracle@OMmac1 ~]$
```

VIEW PRE UPGRADE LOG

```
[oracle@OMmac1 ~]$ cat /u01/SPOOL/preupgrade/preupgrade.log
Report generated by Oracle Database Pre-Upgrade Information Tool Version
19.0.0.0.0 Build: 1 on 2022-01-16T00:57:54

Upgrade-To version: 19.0.0.0.0

======================================
Status of the database prior to upgrade
======================================
      Database Name:  SHOAIBNC
     Container Name:  shoaibNC
       Container ID:  0
            Version:  12.2.0.1.0
     DB Patch Level:  No Patch Bundle applied
         Compatible:  12.2.0
          Blocksize:  8192
           Platform:  Linux x86 64-bit
      Timezone File:  26
  Database log mode:  ARCHIVELOG
           Readonly:  FALSE
            Edition:  EE

  Oracle Component                       Upgrade Action    Current Status
  ----------------                       --------------    --------------
  Oracle Server                          [to be upgraded]  VALID
  JServer JAVA Virtual Machine           [to be upgraded]  VALID
  Oracle XDK for Java                    [to be upgraded]  VALID
  Real Application Clusters              [to be upgraded]  OPTION OFF
  Oracle Workspace Manager               [to be upgraded]  VALID
  OLAP Analytic Workspace                [to be upgraded]  VALID
  Oracle Label Security                  [to be upgraded]  VALID
  Oracle Database Vault                  [to be upgraded]  VALID
  Oracle Text                            [to be upgraded]  VALID
  Oracle XML Database                    [to be upgraded]  VALID
  Oracle Java Packages                   [to be upgraded]  VALID
  Oracle Multimedia                      [to be upgraded]  VALID
  Oracle Spatial                         [to be upgraded]  VALID
  Oracle OLAP API                        [to be upgraded]  VALID
```

```
==============
BEFORE UPGRADE
==============

  REQUIRED ACTIONS
  ================
  None

  RECOMMENDED ACTIONS
  ===================
  1.  (AUTOFIXUP) Gather stale data dictionary statistics prior to database
      upgrade in off-peak time using:

      EXECUTE DBMS_STATS.GATHER_DICTIONARY_STATS;

      Dictionary statistics do not exist or are stale (not up-to-date).

      Dictionary statistics help the Oracle optimizer find efficient SQL
      execution plans and are essential for proper upgrade timing. Oracle
      recommends gathering dictionary statistics in the last 24 hours before
      database upgrade.

      For information on managing optimizer statistics, refer to the 12.2.0.1
      Oracle Database SQL Tuning Guide.

  2.  (AUTOFIXUP) Gather statistics on fixed objects prior the upgrade.

      None of the fixed object tables have had stats collected.

      Gathering statistics on fixed objects, if none have been gathered yet, is
      recommended prior to upgrading.

      For information on managing optimizer statistics, refer to the 12.2.0.1
      Oracle Database SQL Tuning Guide.


  INFORMATION ONLY
  ================
  3.  To help you keep track of your tablespace allocations, the following
      AUTOEXTEND tablespaces are expected to successfully EXTEND during the
      upgrade process.

                                          Min Size
      Tablespace                   Size   For Upgrade
      ----------                ---------  -----------
      SYSAUX                      460 MB       500 MB
      SYSTEM                      800 MB       912 MB
      TEMP                         32 MB       150 MB
      UNDOTBS1                     70 MB       439 MB

      Minimum tablespace sizes for upgrade are estimates.

  4.  Check the Oracle Backup and Recovery User's Guide for information on how
      to manage an RMAN recovery catalog schema.

      If you are using a version of the recovery catalog schema that is older
      than that required by the RMAN client version, then you must upgrade the
      catalog schema.

      It is good practice to have the catalog schema the same or higher version
      than the RMAN client version you are using.

  ORACLE GENERATED FIXUP SCRIPT
  =============================
  All of the issues in database SHOAIBNC
  which are identified above as BEFORE UPGRADE "(AUTOFIXUP)" can be resolved by
  executing the following

    SQL>@/u01/SPOOL/preupgrade/preupgrade_fixups.sql
```

```
=============
AFTER UPGRADE
=============

  REQUIRED ACTIONS
  ================
  None

  RECOMMENDED ACTIONS
  ===================
  5.  Upgrade the database time zone file using the DBMS_DST package.

      The database is using time zone file version 26 and the target 19 release
      ships with time zone file version 32.

      Oracle recommends upgrading to the desired (latest) version of the time
      zone file.  For more information, refer to "Upgrading the Time Zone File
      and Timestamp with Time Zone Data" in the 19 Oracle Database
      Globalization Support Guide.

  6.  To identify directory objects with symbolic links in the path name, run
      $ORACLE_HOME/rdbms/admin/utldirsymlink.sql AS SYSDBA after upgrade.
      Recreate any directory objects listed, using path names that contain no
      symbolic links.

      Some directory object path names may currently contain symbolic links.

      Starting in Release 18c, symbolic links are not allowed in directory
      object path names used with BFILE data types, the UTL_FILE package, or
      external tables.

  7.  (AUTOFIXUP) Gather dictionary statistics after the upgrade using the
      command:

        EXECUTE DBMS_STATS.GATHER_DICTIONARY_STATS;

      Oracle recommends gathering dictionary statistics after upgrade.

      Dictionary statistics provide essential information to the Oracle
      optimizer to help it find efficient SQL execution plans. After a database
      upgrade, statistics need to be re-gathered as there can now be tables
      that have significantly changed during the upgrade or new tables that do
      not have statistics gathered yet.

  8.  Gather statistics on fixed objects after the upgrade and when there is a
      representative workload on the system using the command:

        EXECUTE DBMS_STATS.GATHER_FIXED_OBJECTS_STATS;

      This recommendation is given for all preupgrade runs.

      Fixed object statistics provide essential information to the Oracle
      optimizer to help it find efficient SQL execution plans.  Those
      statistics are specific to the Oracle Database release that generates
      them, and can be stale upon database upgrade.

      For information on managing optimizer statistics, refer to the 12.2.0.1
      Oracle Database SQL Tuning Guide.

  ORACLE GENERATED FIXUP SCRIPT
  =============================
  All of the issues in database SHOAIBNC
  which are identified above as AFTER UPGRADE "(AUTOFIXUP)" can be resolved by
  executing the following

    SQL>@/u01/SPOOL/preupgrade/postupgrade_fixups.sql

[oracle@OMmac1 ~]$
```

VERIFY TABLESPACE SIZE

```
[oracle@OMmac1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Sun Jan 16 01:34:26 2022

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Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SYS@shoaibNCDB 16-JAN-22>set lines 300 pages 100
SYS@shoaibNCDB 16-JAN-22>col file_name for a90
SYS@shoaibNCDB 16-JAN-22>select FILE_ID,FILE_NAME,TABLESPACE_NAME, BYTES/1024/1024 "MB", AUTOEXTENSIBLE from dba_data_files;

   FILE_ID FILE_NAME                                                                                TABLESPACE_NAME                     MB AUT
---------- ------------------------------------------------------------------------------------------ ------------------------------ ---------- ---
         7 /u01/app/oracle/oradata/SHOAIBNCDB/datafile/o1_mf_users_jy78d7gg_.dbf                      USERS                               5 YES
         4 /u01/app/oracle/oradata/SHOAIBNCDB/datafile/o1_mf_undotbs1_jy78d6d1_.dbf                   UNDOTBS1                           70 YES
         1 /u01/app/oracle/oradata/SHOAIBNCDB/datafile/o1_mf_system_jy78bb4w_.dbf                     SYSTEM                            800 YES
         3 /u01/app/oracle/oradata/SHOAIBNCDB/datafile/o1_mf_sysaux_jy78cf86_.dbf                     SYSAUX                            470 YES

SYS@shoaibNCDB 16-JAN-22>select FILE_ID,FILE_NAME,TABLESPACE_NAME, BYTES/1024/1024 "MB", AUTOEXTENSIBLE from dba_temp_files;

   FILE_ID FILE_NAME                                                                                TABLESPACE_NAME                     MB AUT
---------- ------------------------------------------------------------------------------------------ ------------------------------ ---------- ---
         1 /u01/app/oracle/oradata/SHOAIBNCDB/datafile/o1_mf_temp_jy78fl46_.tmp                       TEMP                               32 YES

SYS@shoaibNCDB 16-JAN-22>
```

GATHER DICTIONARY STATS

Before the upgrade process, gather stats. One of the recommendations is to export the stats as well.

```
SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>SET ECHO ON;
SYS@shoaibNCDB 16-JAN-22>SET SERVEROUTPUT ON;
SYS@shoaibNCDB 16-JAN-22>EXECUTE DBMS_STATS.GATHER_DICTIONARY_STATS;

PL/SQL procedure successfully completed.

SYS@shoaibNCDB 16-JAN-22>
```

PURGE RECYCLE BIN

Before the upgrade process, empty the recycle bin.

```
SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>PURGE DBA_RECYCLEBIN;

DBA Recyclebin purged.

SYS@shoaibNCDB 16-JAN-22>
```

RUN PREUPGRADE FIXUP SQL

```
SYS@shoaibNCDB 16-JAN-22>@/u01/SPOOL/preupgrade/preupgrade_fixups.sql
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>REM    Oracle PRE-Upgrade Fixup Script
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>REM    Auto-Generated by:       Oracle Preupgrade Script
SYS@shoaibNCDB 16-JAN-22>REM                             Version: 19.0.0.0.0 Build: 1
SYS@shoaibNCDB 16-JAN-22>REM    Generated on:            2022-01-16 00:57:53
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>REM    Source Database:         SHOAIBNC
SYS@shoaibNCDB 16-JAN-22>REM    Source Database Version: 12.2.0.1.0
SYS@shoaibNCDB 16-JAN-22>REM    For Upgrade to Version:  19.0.0.0.0
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>REM    Setup Environment
SYS@shoaibNCDB 16-JAN-22>REM
SYS@shoaibNCDB 16-JAN-22>SET ECHO OFF SERVEROUTPUT ON FORMAT WRAPPED TAB OFF LINESIZE 200;

Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by:       Oracle Preupgrade Script
                         Version: 19.0.0.0.0 Build: 1
Generated on:            2022-01-16 00:57:53

For Source Database:     SHOAIBNC
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.  dictionary_stats             YES         None.
    2.  pre_fixed_objects            YES         None.
    3.  tablespaces_info             NO          Informational only.
                                                 Further action is optional.
    4.  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.
```

VERIFY ARCHIVE DEST SIZE

Ensure you have enough free space in db_recovery_file_dest and make changes to the parameter db_recovery_file_dest_size if needed.

```
SYS@shoaibNCDB 16-JAN-22>archive log list
Database log mode              Archive Mode
Automatic archival             Enabled
Archive destination            USE_DB_RECOVERY_FILE_DEST
Oldest online log sequence     1
Next log sequence to archive   2
Current log sequence           2
SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>show parameter DB_RECOVERY_FILE_DEST

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
db_recovery_file_dest                string      /u01/app/oracle/fast_recovery_
                                                 area/shoaibNCDB
db_recovery_file_dest_size           big integer 8016M
SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>!df -h /u01
Filesystem           Size  Used Avail Use% Mounted on
/dev/mapper/ol-root   46G   34G   12G  75% /

SYS@shoaibNCDB 16-JAN-22>
```

STOP DATABASE LISTENER

```
SYS@shoaibNCDB 16-JAN-22>!ps -ef|grep -i tns
root        16     2  0 Jan15 ?        00:00:00 [netns]
oracle   12991 26917  0 05:51 pts/0    00:00:00 /bin/bash -c ps -ef|grep -i tns
oracle   12993 12991  0 05:51 pts/0    00:00:00 grep -i tns
oracle   16605     1  0 Jan15 ?        00:00:00 /u01/app/oracle/product/12.2.0.1/db_1/bin/tnslsnr LISTENER_PRIMARY -inherit

SYS@shoaibNCDB 16-JAN-22>
SYS@shoaibNCDB 16-JAN-22>!tnsping SHOAIBDB

TNS Ping Utility for Linux: Version 12.2.0.1.0 - Production on 16-JAN-2022 05:52:16

Copyright (c) 1997, 2016, Oracle.  All rights reserved.

Used parameter files:
/u01/app/oracle/product/12.2.0.1/db_1/network/admin/sqlnet.ora


Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = OMmac1)(PORT = 1524))) (CONNECT_DATA = (SERVICE_NAME = shoaibncdb)))
OK (0 msec)

SYS@shoaibNCDB 16-JAN-22>!lsnrctl stop LISTENER_PRIMARY

LSNRCTL for Linux: Version 12.2.0.1.0 - Production on 16-JAN-2022 05:53:01

Copyright (c) 1991, 2016, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=OMmac1)(PORT=1524)))
The command completed successfully
```

CREATE FLASHBACK GUARANTEED RESTORE POINT

- From 11.2.0.1 onwards we don't require to enable the Flashback Database
- The Database need to be in Archive Log mod
- Don't change the compatible parameter to higher version

```
SYS@shoaibNCDB 16-JAN-22>SELECT FLASHBACK_ON FROM V$DATABASE;

FLASHBACK_ON
------------------
NO


SYS@shoaibNCDB 16-JAN-22>SELECT NAME,OPEN_MODE,LOG_MODE FROM V$DATABASE;

NAME      OPEN_MODE            LOG_MODE
--------- -------------------- ------------
SHOAIBNC  READ WRITE           ARCHIVELOG

SYS@shoaibNCDB 16-JAN-22>
```

```
SYS@shoaibNCDB 16-JAN-22>show parameter compatible

NAME                                 TYPE        VALUE
------------------------------------ ----------- -------
compatible                           string      12.2.0
noncdb_compatible                    boolean     FALSE
SYS@shoaibNCDB 16-JAN-22>
```

```
SYS@shoaibNCDB 16-JAN-22>create restore point PRE_UPGRD guarantee flashback database;

Restore point created.

SYS@shoaibNCDB 16-JAN-22>col name for a15
SYS@shoaibNCDB 16-JAN-22>col time for a40
SYS@shoaibNCDB 16-JAN-22>set lines 200
SYS@shoaibNCDB 16-JAN-22>SELECT NAME,GUARANTEE_FLASHBACK_DATABASE,TIME FROM V$RESTORE_POINT;

NAME            GUA TIME
--------------- --- ----------------------------------------
PRE_UPGRD       YES 16-JAN-22 06.02.28.000000000 AM

SYS@shoaibNCDB 16-JAN-22>
```

SHUTDOWN DATABASE

```
SYS@shoaibNCDB 16-JAN-22>SELECT NAME,OPEN_MODE,DATABASE_ROLE FROM V$DATABASE;

NAME            OPEN_MODE            DATABASE_ROLE
--------------- -------------------- ----------------
SHOAIBNC        READ WRITE           PRIMARY

SYS@shoaibNCDB 16-JAN-22>SHUT IMMEDIATE
Database closed.
Database dismounted.
ORACLE instance shut down.
SYS@shoaibNCDB 16-JAN-22>
```

COPY [SPFILE/PASSWORD] FILES FROM 12C TO 19C ORACLE HOME

```
[oracle@OMmac1 dbs]$ pwd
/u01/app/oracle/product/12.2.0.1/db_1/dbs
[oracle@OMmac1 dbs]$ cp orapwshoaibNCDB spfileshoaibNCDB.ora /u01/app/oracle/product/19.0.0/dbhome_1/dbs
[oracle@OMmac1 dbs]$ ls -lrth /u01/app/oracle/product/19.0.0/dbhome_1/dbs
total 12K
-rw-r--r--. 1 oracle oinstall 3.1K May 14  2015 init.ora
-rw-r-----. 1 oracle oinstall 3.5K Jan 16 06:14 spfileshoaibNCDB.ora
-rw-r-----. 1 oracle oinstall 3.5K Jan 16 06:14 orapwshoaibNCDB
[oracle@OMmac1 dbs]$
```

EDIT ORATAB – MAKE 19C ORACLE HOME ACTIVE

```
[oracle@OMmac1 ~]$ cat /etc/oratab
#


# This file is used by ORACLE utilities.  It is created by root.sh
# and updated by either Database Configuration Assistant while creating
# a database or ASM Configuration Assistant while creating ASM instance.

# A colon, ':', is used as the field terminator.  A new line terminates
# the entry.  Lines beginning with a pound sign, '#', are comments.
#
# Entries are of the form:
#   $ORACLE_SID:$ORACLE_HOME:<N|Y>:
#
# The first and second fields are the system identifier and home
# directory of the database respectively.  The third field indicates
# to the dbstart utility that the database should , "Y", or should not,
# "N", be brought up at system boot time.
#
# Multiple entries with the same $ORACLE_SID are not allowed.
#
#
#shoaibNCDB:/u01/app/oracle/product/12.2.0.1/db_1:N
shoaibNCDB:/u01/app/oracle/product/19.0.0/dbhome_1:N
[oracle@OMmac1 ~]$
```

START DATABASE IN UPGRADE FROM 19C HOME

```
[oracle@OMmac1 dbs]$ . oraenv
ORACLE_SID = [shoaibNCDB] ?
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@OMmac1 dbs]$ which sqlplus
/u01/app/oracle/product/19.0.0/dbhome_1/bin/sqlplus
[oracle@OMmac1 dbs]$
[oracle@OMmac1 dbs]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Sun Jan 16 06:17:49 2022
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 3623876800 bytes
Fixed Size                  8902848 bytes
Variable Size             738197504 bytes
Database Buffers         2868903936 bytes
Redo Buffers                7872512 bytes
Database mounted.
Database opened.
SQL>
SQL> SELECT NAME,OPEN_MODE,CDB,VERSION,STATUS FROM V$DATABASE,V$INSTANCE;

NAME      OPEN_MODE            CDB VERSION           STATUS
--------- -------------------- --- ----------------- ------------
SHOAIBNC  READ WRITE           NO  19.0.0.0.0        OPEN MIGRATE
```

RUN DBUPGRADE FROM 19C HOME

```
[oracle@OMmac1 bin]$ pwd
/u01/app/oracle/product/19.0.0/dbhome_1/bin
[oracle@OMmac1 bin]$
[oracle@OMmac1 bin]$ ./dbupgrade

Argument list for [/u01/app/oracle/product/19.0.0/dbhome_1/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 = 0
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]


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


/u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/orahome = [/u01/app/oracle/product/19.0.0/dbhome_1]
/u01/app/oracle/product/19.0.0/dbhome_1/bin/orabasehome = [/u01/app/oracle/product/19.0.0/dbhome_1]
catctlGetOraBaseLogDir = [/u01/app/oracle/product/19.0.0/dbhome_1]

Analyzing file /u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/catupgrd.sql

Log file directory = [/tmp/cfgtoollogs/upgrade20220116064556]

catcon::set_log_file_base_path: ALL catcon-related output will be written to [/tmp/cfgtoollogs/upgrade20220116064556/catupgrd_catcon_16851.lst]

catcon::set_log_file_base_path: catcon: See [/tmp/cfgtoollogs/upgrade20220116064556/catupgrd*.log] files for output generated by scripts

catcon::set_log_file_base_path: catcon: See [/tmp/cfgtoollogs/upgrade20220116064556/catupgrd_*.lst] files for spool files, if any


Number of Cpus        = 1
Database Name         = shoaibNCDB
DataBase Version      = 12.2.0.1.0
catcon::set_log_file_base_path: ALL catcon-related output will be written to [/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606/catupgrd_catcon_16851.lst]

catcon::set_log_file_base_path: catcon: See [/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606/catupgrd*.log] files for output generated by scripts

catcon::set_log_file_base_path: catcon: See [/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606/catupgrd_*.lst] files for spool files, if any


Log file directory = [/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606]

Parallel SQL Process Count           = 4
Components in [shoaibNCDB]
    Installed [APS CATALOG CATJAVA CATPROC CONTEXT DV JAVAVM OLS ORDIM OWM SDO XDB XML XOQ]
Not Installed [APEX EM MGW ODM RAC WK]
```

```
Parallel SQL Process Count            = 4
Components in [shoaibNCDB]
    Installed [APS CATALOG CATJAVA CATPROC CONTEXT DV JAVAVM OLS ORDIM OWM
SDO XDB XML XOQ]
Not Installed [APEX EM MGW ODM RAC WK]

------------------------------------------------------
Phases [0-107]         Start Time:[2022_01_16 06:46:17]
------------------------------------------------------
***********   Executing Change Scripts   ***********
Serial   Phase #:0    [shoaibNCDB] Files:1    Time: 18s
***************   Catalog Core SQL   ***************
Serial   Phase #:1    [shoaibNCDB] Files:5    Time: 33s
Restart  Phase #:2    [shoaibNCDB] Files:1    Time: 1s
***********   Catalog Tables and Views   ***********
Parallel Phase #:3    [shoaibNCDB] Files:19   Time: 20s
Restart  Phase #:4    [shoaibNCDB] Files:1    Time: 1s
*************   Catalog Final Scripts   ************
Serial   Phase #:5    [shoaibNCDB] Files:7    Time: 14s
*****************   Catproc Start   ****************
Serial   Phase #:6    [shoaibNCDB] Files:1    Time: 10s
*****************   Catproc Types   ****************
Serial   Phase #:7    [shoaibNCDB] Files:2    Time: 9s
Restart  Phase #:8    [shoaibNCDB] Files:1    Time: 1s
****************   Catproc Tables   ****************
Parallel Phase #:9    [shoaibNCDB] Files:67   Time: 36s
Restart  Phase #:10   [shoaibNCDB] Files:1    Time: 1s
*************   Catproc Package Specs   ************
Serial   Phase #:11   [shoaibNCDB] Files:1    Time: 60s
Restart  Phase #:12   [shoaibNCDB] Files:1    Time: 1s
**************   Catproc Procedures   **************
Parallel Phase #:13   [shoaibNCDB] Files:94   Time: 11s
Restart  Phase #:14   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:15   [shoaibNCDB] Files:120  Time: 20s
Restart  Phase #:16   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:17   [shoaibNCDB] Files:22   Time: 5s
Restart  Phase #:18   [shoaibNCDB] Files:1    Time: 1s
*****************   Catproc Views   ****************
Parallel Phase #:19   [shoaibNCDB] Files:32   Time: 24s
Restart  Phase #:20   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:21   [shoaibNCDB] Files:3    Time: 12s
Restart  Phase #:22   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:23   [shoaibNCDB] Files:25   Time: 168s
Restart  Phase #:24   [shoaibNCDB] Files:1    Time: 0s
Parallel Phase #:25   [shoaibNCDB] Files:12   Time: 104s
Restart  Phase #:26   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:27   [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:28   [shoaibNCDB] Files:3    Time: 5s
Serial   Phase #:29   [shoaibNCDB] Files:1    Time: 0s
Restart  Phase #:30   [shoaibNCDB] Files:1    Time: 1s
***************   Catproc CDB Views   **************
Serial   Phase #:31   [shoaibNCDB] Files:1    Time: 2s
Restart  Phase #:32   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:34   [shoaibNCDB] Files:1    Time: 0s
*****************   Catproc PLBs   *****************
Serial   Phase #:35   [shoaibNCDB] Files:293  Time: 21s
Serial   Phase #:36   [shoaibNCDB] Files:1    Time: 0s
Restart  Phase #:37   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:38   [shoaibNCDB] Files:6    Time: 5s
Restart  Phase #:39   [shoaibNCDB] Files:1    Time: 1s
***************   Catproc DataPump   ***************
Serial   Phase #:40   [shoaibNCDB] Files:3    Time: 34s
Restart  Phase #:41   [shoaibNCDB] Files:1    Time: 2s
******************   Catproc SQL   ******************
Parallel Phase #:42   [shoaibNCDB] Files:13   Time: 114s
Restart  Phase #:43   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:44   [shoaibNCDB] Files:11   Time: 11s
Restart  Phase #:45   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:46   [shoaibNCDB] Files:3    Time: 3s
Restart  Phase #:47   [shoaibNCDB] Files:1    Time: 1s
*************   Final Catproc scripts   ************
Serial   Phase #:48   [shoaibNCDB] Files:1    Time: 6s
Restart  Phase #:49   [shoaibNCDB] Files:1    Time: 1s
**************   Final RDBMS scripts   *************
Serial   Phase #:50   [shoaibNCDB] Files:1    Time: 4s
```

```
************   Upgrade Component Start   ***********
Serial   Phase #:51   [shoaibNCDB] Files:1    Time: 2s
Restart  Phase #:52   [shoaibNCDB] Files:1    Time: 1s
**********   Upgrading Java and non-Java   *********
Serial   Phase #:53   [shoaibNCDB] Files:2    Time: 179s
****************   Upgrading XDB   ****************
Restart  Phase #:54   [shoaibNCDB] Files:1    Time: 2s
Serial   Phase #:56   [shoaibNCDB] Files:3    Time: 7s
Serial   Phase #:57   [shoaibNCDB] Files:3    Time: 6s
Parallel Phase #:58   [shoaibNCDB] Files:10   Time: 5s
Parallel Phase #:59   [shoaibNCDB] Files:25   Time: 7s
Serial   Phase #:60   [shoaibNCDB] Files:4    Time: 9s
Serial   Phase #:61   [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:62   [shoaibNCDB] Files:32   Time: 6s
Serial   Phase #:63   [shoaibNCDB] Files:1    Time: 0s
Parallel Phase #:64   [shoaibNCDB] Files:6    Time: 9s
Serial   Phase #:65   [shoaibNCDB] Files:2    Time: 15s
Serial   Phase #:66   [shoaibNCDB] Files:3    Time: 21s
***************   Upgrading ORDIM   ***************
Restart  Phase #:67   [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:69   [shoaibNCDB] Files:1    Time: 5s
Parallel Phase #:70   [shoaibNCDB] Files:2    Time: 28s
Restart  Phase #:71   [shoaibNCDB] Files:1    Time: 0s
Parallel Phase #:72   [shoaibNCDB] Files:2    Time: 5s
Serial   Phase #:73   [shoaibNCDB] Files:2    Time: 4s
*****************   Upgrading SDO   *****************
Restart  Phase #:74   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:76   [shoaibNCDB] Files:1    Time: 26s
Serial   Phase #:77   [shoaibNCDB] Files:2    Time: 5s
Restart  Phase #:78   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:79   [shoaibNCDB] Files:1    Time: 32s
Restart  Phase #:80   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:81   [shoaibNCDB] Files:3    Time: 68s
Restart  Phase #:82   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:83   [shoaibNCDB] Files:1    Time: 7s
Restart  Phase #:84   [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:85   [shoaibNCDB] Files:1    Time: 10s
Restart  Phase #:86   [shoaibNCDB] Files:1    Time: 1s
Restart  Phase #:86   [shoaibNCDB] Files:1    Time: 1s
Parallel Phase #:87   [shoaibNCDB] Files:4    Time: 98s
Restart  Phase #:88   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:89   [shoaibNCDB] Files:1    Time: 5s
Restart  Phase #:90   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:91   [shoaibNCDB] Files:2    Time: 9s
Restart  Phase #:92   [shoaibNCDB] Files:1    Time: 1s
Serial   Phase #:93   [shoaibNCDB] Files:1    Time: 2s
Restart  Phase #:94   [shoaibNCDB] Files:1    Time: 1s
*******   Upgrading ODM, WK, EXF, RUL, XOQ   *******
Serial   Phase #:95   [shoaibNCDB] Files:1    Time: 10s
Restart  Phase #:96   [shoaibNCDB] Files:1    Time: 1s
***********   Final Component scripts    ***********
Serial   Phase #:97   [shoaibNCDB] Files:1    Time: 3s
*************   Final Upgrade scripts   ************
Serial   Phase #:98   [shoaibNCDB] Files:1    Time: 162s
******************   Migration   ******************
Serial   Phase #:99   [shoaibNCDB] Files:1    Time: 2s
***   End PDB Application Upgrade Pre-Shutdown   ***
Serial   Phase #:100  [shoaibNCDB] Files:1    Time: 2s
Serial   Phase #:101  [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:102  [shoaibNCDB] Files:1    Time: 46s
*****************   Post Upgrade   *****************
Serial   Phase #:103  [shoaibNCDB] Files:1    Time: 10s
****************   Summary report   ****************
Serial   Phase #:104  [shoaibNCDB] Files:1    Time: 3s
***   End PDB Application Upgrade Post-Shutdown   **
Serial   Phase #:105  [shoaibNCDB] Files:1    Time: 2s
Serial   Phase #:106  [shoaibNCDB] Files:1    Time: 0s
Serial   Phase #:107  [shoaibNCDB] Files:1     Time: 58s

-----------------------------------------------------
Phases [0-107]         End Time:[2022_01_16 07:13:48]
-----------------------------------------------------

Grand Total Time: 1652s


-----------------------------------------------------
Phases [0-107]         End Time:[2022_01_16 07:13:48]
-----------------------------------------------------

Grand Total Time: 1652s

 LOG FILES: (/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606/catupgrd*.log)

Upgrade Summary Report Located in:
/u01/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/shoaibNCDB/upgrade20220116064606/upg_summary.log

Grand Total Upgrade Time:    [0d:0h:27m:32s]
[oracle@OMmac1 bin]$
```

AFTER UPGRADE SIMPLY START THE DATABASE FROM 19C HOME

```
[oracle@OMmac1 bin]$ which sqlplus
/u01/app/oracle/product/19.0.0/dbhome_1/bin/sqlplus
[oracle@OMmac1 bin]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Sun Jan 16 07:35:50 2022
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 3623876800 bytes
Fixed Size                  8902848 bytes
Variable Size             838860800 bytes
Database Buffers         2768240640 bytes
Redo Buffers                7872512 bytes
Database mounted.
Database opened.
SQL> SELECT NAME,OPEN_MODE,CDB,VERSION,STATUS FROM V$DATABASE,V$INSTANCE;

NAME      OPEN_MODE            CDB VERSION           STATUS
--------- -------------------- --- ----------------- ------------
SHOAIBNC  READ WRITE           NO  19.0.0.0.0        OPEN
```

AFTER UPGRADE CHECK THE REGISTRY

```
SQL> set lines 200 pages 200
SQL> col comp_id for a10
SQL> col version for a15
SQL> col status for a10
SQL> col comp_name for a37
SQL> select comp_id,comp_name,version,status from dba_registry;

COMP_ID    COMP_NAME                             VERSION         STATUS
---------- ------------------------------------- --------------- ---------
CATALOG    Oracle Database Catalog Views         19.0.0.0.0      UPGRADED
CATPROC    Oracle Database Packages and Types    19.0.0.0.0      UPGRADED
JAVAVM     JServer JAVA Virtual Machine          19.0.0.0.0      UPGRADED
XML        Oracle XDK                            19.0.0.0.0      UPGRADED
CATJAVA    Oracle Database Java Packages         19.0.0.0.0      UPGRADED
APS        OLAP Analytic Workspace               19.0.0.0.0      UPGRADED
RAC        Oracle Real Application Clusters      19.0.0.0.0      UPGRADED
XDB        Oracle XML Database                   19.0.0.0.0      UPGRADED
OWM        Oracle Workspace Manager              19.0.0.0.0      UPGRADED
CONTEXT    Oracle Text                           19.0.0.0.0      UPGRADED
ORDIM      Oracle Multimedia                     19.0.0.0.0      UPGRADED
SDO        Spatial                               19.0.0.0.0      UPGRADED
XOQ        Oracle OLAP API                       19.0.0.0.0      UPGRADED
OLS        Oracle Label Security                 19.0.0.0.0      UPGRADED
DV         Oracle Database Vault                 19.0.0.0.0      UPGRADED

15 rows selected.

SQL>
```

POST UPGRADE RUN UTLRP.SQL

```
SQL> select count(*) from dba_objects where status='INVALID';

  COUNT(*)
----------
      2549

SQL> select count(*) from dba_objects where status='INVALID' and owner in ('SYS','SYSTEM');

  COUNT(*)
----------
       698

SQL> @?/rdbms/admin/utlrp.sql


TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP UTLRP_BGN              2022-01-16 07:42:48

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
DOC>            WHERE job_name like 'UTL_RECOMP_SLAVE_%';
DOC>#

PL/SQL procedure successfully completed.
```

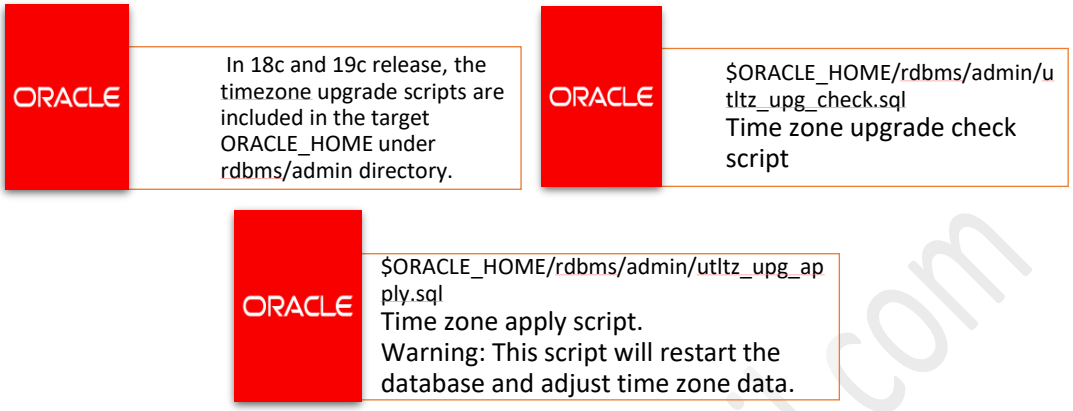
```
TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP UTLRP_END              2022-01-16 07:47:40

DOC> The following query reports the number of invalid objects.
DOC>
DOC> If the number is higher than expected, please examine the error
DOC> messages reported with each object (using SHOW ERRORS) to see if they
DOC> point to system misconfiguration or resource constraints that must be
DOC> fixed before attempting to recompile these objects.
DOC>#

OBJECTS WITH ERRORS
-------------------
                  0

DOC> The following query reports the number of exceptions caught during
DOC> recompilation. If this number is non-zero, please query the error
DOC> messages in the table UTL_RECOMP_ERRORS to see if any of these errors
DOC> are due to misconfiguration or resource constraints that must be
DOC> fixed before objects can compile successfully.
DOC> Note: Typical compilation errors (due to coding errors) are not
DOC>       logged into this table: they go into DBA_ERRORS instead.
DOC>#

ERRORS DURING RECOMPILATION
---------------------------
                           0


Function created.


PL/SQL procedure successfully completed.


Function dropped.


PL/SQL procedure successfully completed.



SQL> select count(*) from dba_objects where status='INVALID';

  COUNT(*)
----------
         0

SQL> select count(*) from dba_objects where status='INVALID' and owner in ('SYS','SYSTEM');

  COUNT(*)
----------
         0

SQL>
```

RUN POST UPGRADE FIXUP SQL

```
SQL> @/u01/SPOOL/preupgrade/postupgrade_fixups.sql

Session altered.


PL/SQL procedure successfully completed.


PL/SQL procedure successfully completed.


PL/SQL procedure successfully completed.


Package created.

No errors.

Package body created.


PL/SQL procedure successfully completed.

No errors.




Package created.

No errors.

Package body created.

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

```
Auto-Generated by:       Oracle Preupgrade Script
                         Version: 19.0.0.0.0 Build: 1
Generated on:            2022-01-16 00:57:54

For Source Database:     SHOAIBNC
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
------  ---------------------------  ----------  ------------------------------
    5.  old_time_zones_exist         NO          Manual fixup recommended.
    6.  dir_symlinks                 YES         None.
    7.  post_dictionary              YES         None.
    8.  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.

SQL>
```

UPGRADE TIMEZONE




```
SQL> select version from v$timezone_file;

  VERSION
----------
        26

SQL> @/u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/utltz_upg_check.sql
Session altered.

INFO: Starting with RDBMS DST update preparation.
INFO: NO actual RDBMS DST update will be done by this script.
INFO: If an ERROR occurs the script will EXIT sqlplus.
INFO: Doing checks for known issues ...
INFO: Database version is 19.0.0.0 .
INFO: Database RDBMS DST version is DSTv26 .
INFO: No known issues detected.
INFO: Now detecting new RDBMS DST version.
A prepare window has been successfully started.
INFO: Newest RDBMS DST version detected is DSTv32 .
INFO: Next step is checking all TSTZ data.
INFO: It might take a while before any further output is seen ...
A prepare window has been successfully ended.
INFO: A newer RDBMS DST version than the one currently used is found.
INFO: Note that NO DST update was yet done.
INFO: Now run utltz_upg_apply.sql to do the actual RDBMS DST update.
INFO: Note that the utltz_upg_apply.sql script will
INFO: restart the database 2 times WITHOUT any confirmation or prompt.

Session altered.
```

```
SQL> @/u01/app/oracle/product/19.0.0/dbhome_1/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.
ORACLE instance started.

Total System Global Area 3623876800 bytes
Fixed Size                  8902848 bytes
Variable Size             838860800 bytes
Database Buffers         2768240640 bytes
Redo Buffers                7872512 bytes
Database mounted.
Database opened.
INFO: Starting the RDBMS DST upgrade.
INFO: Upgrading all SYS owned TSTZ data.
INFO: It might take time before any further output is seen ...
An upgrade window has been successfully started.
INFO: Restarting the database in NORMAL mode to upgrade non-SYS TSTZ data.
Database closed.
Database dismounted.
ORACLE instance shut down.
ORACLE instance started.

Total System Global Area 3623876800 bytes
Fixed Size                  8902848 bytes
Variable Size             838860800 bytes
Database Buffers         2768240640 bytes
Redo Buffers                7872512 bytes
Database mounted.
Database opened.
INFO: Upgrading all non-SYS TSTZ data.
INFO: It might take time before any further output is seen ...
INFO: Do NOT start any application yet that uses TSTZ data!
INFO: Next is a list of all upgraded tables:
Table list: "GSMADMIN_INTERNAL"."AQ$_CHANGE_LOG_QUEUE_TABLE_S"
Number of failures: 0
Table list: "GSMADMIN_INTERNAL"."AQ$_CHANGE_LOG_QUEUE_TABLE_L"
Number of failures: 0
Table list: "MDSYS"."SDO_DIAG_MESSAGES_TABLE"
Number of failures: 0
Table list: "DVSYS"."SIMULATION_LOG$"
Number of failures: 0
Table list: "DVSYS"."AUDIT_TRAIL$"
Number of failures: 0
INFO: Total failures during update of TSTZ data: 0 .
An upgrade window has been successfully ended.
INFO: Your new Server RDBMS DST version is DSTv32 .
INFO: The RDBMS DST update is successfully finished.
INFO: Make sure to exit this SQL*Plus session.
INFO: Do not use it for timezone related selects.

Session altered.
```

RUN UTLUSTS.SQL

```
SQL> @/u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/utlusts.sql TEXT

Oracle Database Release 19 Post-Upgrade Status Tool    01-16-2022 08:50:3
Database Name: SHOAIBNC

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

Oracle Server                             VALID      19.3.0.0.0  00:12:49
JServer JAVA Virtual Machine              VALID      19.3.0.0.0  00:00:47
Oracle XDK                                VALID      19.3.0.0.0  00:00:42
Oracle Database Java Packages             VALID      19.3.0.0.0  00:00:08
OLAP Analytic Workspace                   VALID      19.3.0.0.0  00:00:10
Oracle Label Security                     VALID      19.3.0.0.0  00:00:06
Oracle Database Vault                     VALID      19.3.0.0.0  00:00:17
Oracle Text                               VALID      19.3.0.0.0  00:00:22
Oracle Workspace Manager                  VALID      19.3.0.0.0  00:00:22
Oracle Real Application Clusters      OPTION OFF     19.3.0.0.0  00:00:00
Oracle XML Database                       VALID      19.3.0.0.0  00:01:19
Oracle Multimedia                         VALID      19.3.0.0.0  00:00:37
Spatial                                   VALID      19.3.0.0.0  00:04:22
Oracle OLAP API                           VALID      19.3.0.0.0  00:00:08
Datapatch                                                        00:02:37
Final Actions                                                    00:02:44
Post Upgrade                                                     00:00:07
Post Compile                                                     00:04:51

Total Upgrade Time: 00:30:26

Database time zone version is 32. It meets current release needs.

SQL>
```

RUN CATUPPST.SQL

```
SQL> @/u01/app/oracle/product/19.0.0/dbhome_1/rdbms/admin/catuppst.sql

TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP DBRESTART              2022-01-16 08:51:57
DBUA_TIMESTAMP DBRESTART     FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP DBRESTART         NONE 2022-01-16 08:51:57


TIMESTAMP
--------------------------------------------------------------------------------
DBUA_TIMESTAMP CATUPPST       STARTED 2022-01-16 08:51:57

TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP POSTUP_BGN             2022-01-16 08:51:57
DBUA_TIMESTAMP POSTUP_BGN    FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP POSTUP_BGN        NONE 2022-01-16 08:51:57


TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP CATREQ_BGN             2022-01-16 08:51:57
DBUA_TIMESTAMP CATREQ_BGN    FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP CATREQ_BGN        NONE 2022-01-16 08:51:57

catrequtlmg: b_StatEvt     = TRUE
catrequtlmg: b_SelProps    = FALSE
catrequtlmg: b_UpgradeMode = FALSE
catrequtlmg: b_InUtlMig    = FALSE

TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP CATREQ_END             2022-01-16 08:51:57
DBUA_TIMESTAMP CATREQ_END    FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP CATREQ_END        NONE 2022-01-16 08:51:57


catuppst: Dropping library DBMS_DDL_INTERNAL_LIB
catuppst: Dropping view _CURRENT_EDITION_OBJ_MIG
catuppst: Dropping view _ACTUAL_EDITION_OBJ_MIG
catuppst: Dropping view DBA_PART_KEY_COLUMNS_V$_MIG
catuppst: Dropping view DBA_SUBPART_KEY_COLUMNS_V$_MIG
catuppst: Dropping table OBJ$MIG
catuppst: Dropping table USER$MIG
catuppst: Dropping table COL$MIG
catuppst: Dropping table CLU$MIG
catuppst: Dropping table CON$MIG
catuppst: Dropping table BOOTSTRAP$MIG
catuppst: Dropping table TAB$MIG
catuppst: Dropping table TS$MIG
catuppst: Dropping table IND$MIG
catuppst: Dropping table ICOL$MIG
catuppst: Dropping table LOB$MIG
catuppst: Dropping table COLTYPE$MIG
catuppst: Dropping table SUBCOLTYPE$MIG
catuppst: Dropping table NTAB$MIG
catuppst: Dropping table REFCON$MIG
catuppst: Dropping table OPQTYPE$MIG
catuppst: Dropping table ICOLDEP$MIG
catuppst: Dropping table VIEWTRCOL$MIG
catuppst: Dropping table ATTRCOL$MIG
catuppst: Dropping table TYPE_MISC$MIG
catuppst: Dropping table LIBRARY$MIG
catuppst: Dropping table ASSEMBLY$MIG
catuppst: Dropping table TSQ$MIG
catuppst: Dropping table FET$MIG

TIMESTAMP
------------------------------------------------------------
COMP_TIMESTAMP POSTUP_END              2022-01-16 08:51:57
DBUA_TIMESTAMP POSTUP_END     FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP POSTUP_END         NONE 2022-01-16 08:51:57


TIMESTAMP
------------------------------------------------------------
COMP_TIMESTAMP CATUPPST               2022-01-16 08:51:57
DBUA_TIMESTAMP CATUPPST      FINISHED 2022-01-16 08:51:57
DBUA_TIMESTAMP CATUPPST          NONE 2022-01-16 08:51:57

SQL>
```

RERUN POST UPGRADE FIXUP SQL

```
SQL> @/u01/SPOOL/preupgrade/postupgrade_fixups.sql
No errors.
No errors.



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

Auto-Generated by:       Oracle Preupgrade Script
                         Version: 19.0.0.0.0 Build: 1
Generated on:            2022-01-16 00:57:54

For Source Database:     SHOAIBNC
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
------  ------------------------   ----------  --------------------------
    5.  old_time_zones_exist        YES         None.
    6.  dir_symlinks                YES         None.
    7.  post_dictionary             YES         None.
    8.  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.
SQL>
```

CHECK INVALID COUNTS

```
SQL> SELECT COUNT(*) FROM DBA_OBJECTS WHERE STATUS='INVALID';

  COUNT(*)
----------
         0
SQL>
SQL>
```

DROP RESTORE POINT

```
SQL> col name for a20
SQL> col GUARANTEE_FLASHBACK_DATABASE for a10
SQL> col TIME for a45
SQL> set lines 200
SQL> select NAME,GUARANTEE_FLASHBACK_DATABASE,TIME from V$restore_point;

NAME                 GUARANTEE_ TIME
-------------------- ---------- ---------------------------------------------
PRE_UPGRD            YES        16-JAN-22 06.02.28.000000000 AM
SQL>
SQL> !ls -ltr /u01/app/oracle/fast_recovery_area/shoaibNCDB/SHOAIBNCDB/flashback/
total 1228864
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 06:49 o1_mf_jy7yt41r_.flb
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 06:59 o1_mf_jy7yt6r4_.flb
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 07:01 o1_mf_jy81m7cx_.flb
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 07:10 o1_mf_jy824vsf_.flb
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 07:10 o1_mf_jy82tkk2_.flb
-rw-r-----. 1 oracle oinstall 209723392 Jan 16 08:51 o1_mf_jy828ztl_.flb

SQL> drop restore point PRE_UPGRD;
SQL>
SQL> !ls -ltr /u01/app/oracle/fast_recovery_area/shoaibNCDB/SHOAIBNCDB/flashback/
total 0

SQL>
```

SET COMPATIBLE PARAMETER

```
SQL> show parameter compatible

NAME                                 TYPE        VALUE
------------------------------------ ----------- -------
compatible                           string      12.2.0
noncdb_compatible                    boolean     FALSE
SQL>
SQL> alter system set compatible='19.0.0' scope=spfile;
SQL>
SQL> shut immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL>
SQL> startup
ORACLE instance started.

Total System Global Area 3623876800 bytes
Fixed Size                  8902848 bytes
Variable Size             838860800 bytes
Database Buffers         2768240640 bytes
Redo Buffers                7872512 bytes
Database mounted.
Database opened.
SQL>
SQL> show parameter compatible

NAME                                 TYPE        VALUE
------------------------------------ ----------- -------
compatible                           string      19.0.0
noncdb_compatible                    boolean     FALSE
SQL>
SQL>
```

VERIFY DBREGISTRY – FINAL CHECK

```
SQL> col COMP_ID for a10
SQL> col COMP_NAME for a40
SQL> col VERSION for a15
SQL> set lines 200 pages 100
SQL> select COMP_ID,COMP_NAME,VERSION,STATUS from dba_registry;

COMP_ID    COMP_NAME                                VERSION         STATUS
---------- ---------------------------------------- --------------- -----------
CATALOG    Oracle Database Catalog Views            19.0.0.0.0      VALID
CATPROC    Oracle Database Packages and Types       19.0.0.0.0      VALID
JAVAVM     JServer JAVA Virtual Machine             19.0.0.0.0      VALID
XML        Oracle XDK                               19.0.0.0.0      VALID
CATJAVA    Oracle Database Java Packages            19.0.0.0.0      VALID
APS        OLAP Analytic Workspace                  19.0.0.0.0      VALID
RAC        Oracle Real Application Clusters         19.0.0.0.0      OPTION OFF
XDB        Oracle XML Database                      19.0.0.0.0      VALID
OWM        Oracle Workspace Manager                 19.0.0.0.0      VALID
CONTEXT    Oracle Text                              19.0.0.0.0      VALID
ORDIM      Oracle Multimedia                        19.0.0.0.0      VALID
SDO        Spatial                                  19.0.0.0.0      VALID
XOQ        Oracle OLAP API                          19.0.0.0.0      VALID
OLS        Oracle Label Security                    19.0.0.0.0      VALID
DV         Oracle Database Vault                    19.0.0.0.0      VALID
SQL>
```