

# Oracle 19c Administration

## STEPS TO CREATE THE CONTAINER DATABASE AND ITS TWO PDBS NAMED orclpdb1 AND orclpdb2

### Note:

- Execute **xhost +** command as root.
- Login as oracle user using the **su – oracle** command.
- Note: If the LISTENER is down then start using this command:

```
[oracle@host01 ~]$ lsnrctl status  
[oracle@host01 ~]$ lsnrctl start
```

1. Open a terminal window and invoke **dbca**.

```
[oracle@host01 dbhome_11]$ cd  
[oracle@host01 /]$ dbca
```

2. Select **Create Database** and click **Next**.



3. Select **Advanced Configuration** and click **Next**.

Database Configuration Assistant - Create a database - Step 2 of 14

**19c ORACLE Database**

### Select Database Creation Mode

- Database Operation
- Creation Mode**
- Deployment Type
- Database Identification
- Storage Option
- Fast Recovery Option
- Database Options
- Configuration Options
- Management Options
- User Credentials
- Creation Option
- Summary
- Progress Page
- Finish

☐ Typical configuration

Global database name:

Storage type:

Database files location:

Fast Recovery Area (FRA):

Database character set:

Administrative password:

Confirm password:

☒ Create as Container database

Pluggable database name:

☒ **Advanced configuration**

4. Choose **Oracle Single Instance database** as the Database Type. Choose **General Purpose or Transaction Processing** template. Click **Next**.

Database Configuration Assistant - Create a database - Step 3 of 14

### Select Database Deployment Type

**19c ORACLE Database**

Select the type of database you want to create.

Database type:

Configuration type:

Select a template for your database.

Templates that include datafiles contain pre-created databases. They allow you to create a new database quickly. Use templates without datafiles only when necessary, such as when you need to change attributes like block size that cannot be altered after database creation.

	Template name	Include datafiles	Details
<input type="radio"/>	Custom Database	No	<a href="#">View details</a>
<input type="radio"/>	Data Warehouse	Yes	<a href="#">View details</a>
<input checked="" type="radio"/>	General Purpose or Transaction Processing	Yes	<a href="#">View details</a>

Template location: /u01/app/oracle/product/19.3.0/dbhome\_1/assistants/dbca/templates

5. Verify and update these entries as per screen shot and click **Next**:

- Global database name: **orclcdb**
- SID: **orclcdb**
- Check **Create as Container database**
- Check **Use Local Undo Tablespace for PDBs**
- Choose **Create a Container database with one or more PDBs**
- Number of PDBs: **2**
- PDB name prefix: **orclpdb**

Database Configuration Assistant - Create a database - Step 4 of 14

**Specify Database Identification Details** **19c ORACLE Database**

Database Operation:  
Creation Mode:  
Deployment Type:  
**Database Identification**  
Storage Option:  
Fast Recovery Option:  
Database Options:  
Configuration Options:  
Management Options:  
User Credentials:  
Creation Option:  
Summary:  
Progress Page:  
Finish:

Provide a unique database identifier information. An Oracle database is uniquely identified by a Global database name, typically of the form "name.domain".

Global database name:

SID:

Service name:

☒ **Create as Container database**

A Container database can be used for consolidating multiple databases into a single database, and it enables database virtualization. A Container database (CDB) can have zero or more pluggable databases (PDB).

☒ Use Local Undo tablespace for PDBs

☐ Create an empty Container database

☒ **Create a Container database with one or more PDBs**

Number of PDBs:

PDB name prefix:

Help < Back Next > Finish Cancel

6. Choose **Use following for the database storage attributes**, verify values as per the screenshot and click **Next**.

Database Configuration Assistant - Create 'orclpdb' database - Step 5 of 14

### Select Database Storage Option

**19c ORACLE Database**

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option**
- Fast Recovery Option
- Database Options
- Configuration Options
- Management Options
- User Credentials
- Creation Option
- Summary
- Progress Page
- Finish

☐ Use template file for database storage attributes  
Storage type and location for database files will be picked up from the specified template (General Purpose or Transaction Processing).

☒ Use following for the database storage attributes  
All the database files will be put at the specified location below. You can customize the name and location of each datafile in the subsequent screen.

Database files storage type: File System

Database files location: {ORACLE\_BASE}/oradata/{DB\_UNIQUE\_NAME} Browse...

Oracle Managed files option will enable Oracle to automatically generate the names of the datafiles for simplified database management.

☐ Use Oracle-Managed Files (OMF) Multiplex redo logs and control files...

File location variables...

Help < Back Next > Finish Cancel

7. Choose **Specify Fast Recovery** and accept the defaults as shown in the screenshot, and click **Next**.

Database Configuration Assistant - Create 'orclcdb' database - Step 6 of 14

## Select Fast Recovery Option

19c ORACLE Database

Choose the recovery options for the database.

☒ **Specify Fast Recovery Area**

Recovery files storage type: File System

Fast Recovery Area: {ORACLE\_BASE}/fast\_recovery\_area/{DB\_UNIQUE\_} Browse...

Fast Recovery Area size: 14970 MB

☐ Enable archiving Edit archive mode parameters...

Help < Back Next > Finish Cancel

8. Choose settings as per the screenshots and click **Next**.

**Note:** If you do not see LISTENER listed, please verify LISTENER is up and running or check **Create a new listener** to create a listener and provide the listener name as **LISTENER** and **Port 1521 or 1522**.

**Note: If the LISTENER is down then start using this command:**

```
[oracle@host01 ~]$ lsnrctl status
[oracle@host01 ~]$ lsnrctl start
```

Database Configuration Assistant - Create 'orclcdb' database - Step 7 of 14

**Specify Network Configuration Details**

19<sup>c</sup> ORACLE Database

Database Operation  
Creation Mode  
Deployment Type  
Database Identification  
Storage Option  
Fast Recovery Option  
**Network Configuration**  
Configuration Options  
Management Options  
User Credentials  
Creation Option  
Summary  
Progress Page  
Finish

**Listener selection**

Listeners from current Oracle home are listed below. Specify the listener name and port to create a new listener in current Oracle home.

	Name	Port	Oracle home	Status
✓	LISTENER	1521	/u01/app/oracle/product/19.3.0/dbhome_1	Up

☐ Create a new listener

Listener name:

Listener port:

Oracle home:

Help < Back Next > Finish Cancel



9. No changes on Database Vault or Label Security. Click **Next**.

10. In the **Specify Configuration Options** screen, under the **Memory** tab, enter settings as per the screenshot. Click **Next**.

Database Configuration Assistant - Create 'orclcdb' database - Step 9 of 15

**Specify Configuration Options**

19<sup>c</sup> ORACLE Database

Database Operation  
Creation Mode  
Deployment Type  
Database Identification  
Storage Option  
Fast Recovery Option  
Network Configuration  
Data Vault Option  
**Configuration Options**  
Management Options  
User Credentials  
Creation Option  
Summary  
Progress Page  
Finish

**Memory** | Sizing | Character sets | Connection mode

☒ Use Automatic Shared Memory Management

SGA size: 1920 MB

PGA Size: 640 MB

☐ Use Manual Shared Memory Management

Shared pool size: 0 MB

Buffer cache size: 0 MB

Java pool size: 0 MB

Large pool size: 0 MB

PGA size: 0 MB

Total memory for database 0 MB

☐ Use Automatic Memory Management

Memory target: 3248 MB

40%

Help < Back Next > Finish Cancel



11. Check **Configure Enterprise Manager (EM) database express**. Specify the port **5500** and click **Next** .

Database Configuration Assistant - Create 'orclpdb' database - Step 10 of 15

### Specify Management Options

19<sup>c</sup> ORACLE Database

Specify the management options for the database:

- ☒ **Configure Enterprise Manager (EM) database express**
  - EM database express port:
  - ☐ Configure EM database express port as global port
- ☐ **Register with Enterprise Manager (EM) cloud control**
  - O<sup>1</sup>MS host:
  - O<sup>1</sup>MS port:
  - EM admin username:
  - EM admin password:

Help < Back Next > Finish Cancel

12. Check **Use the same administrative password for all accounts** Password: **fenago**.  
Click **Next**.

Database Configuration Assistant - Create 'orclcdb' database - Step 11 of 15

### Specify Database User Credentials

**19c ORACLE Database**

You must specify passwords for the following user accounts in the new database for security reasons.

☐ Use different administrative passwords

	Password	Confirm password
<u>S</u> YS	<input type="text"/>	<input type="text"/>
<u>S</u> YSTEM	<input type="text"/>	<input type="text"/>
<u>P</u> DBADMIN	<input type="text"/>	<input type="text"/>

☒ Use the same administrative password for all accounts

Password:  Confirm password:

13. Choose settings as per the screenshot. Click **Next**.

Database Configuration Assistant - Create 'orclcdb' database - Step 12 of 15

**19c ORACLE Database**

### Select Database Creation Option

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option
- Fast Recovery Option
- Network Configuration
- Data Vault Option
- Configuration Options
- Management Options
- User Credentials**
- Creation Option**
- Summary
- Progress Page
- Finish

Select the database creation options.

☒ **Create database**

Specify the SQL scripts you want to run after the database is created. The scripts are run in the order listed below.

Post DB creation scripts:  [Browse...](#)

☐ **Save as a database template**

Template name:

Template location:  [Browse...](#)

Description:

☒ **Generate database creation scripts**

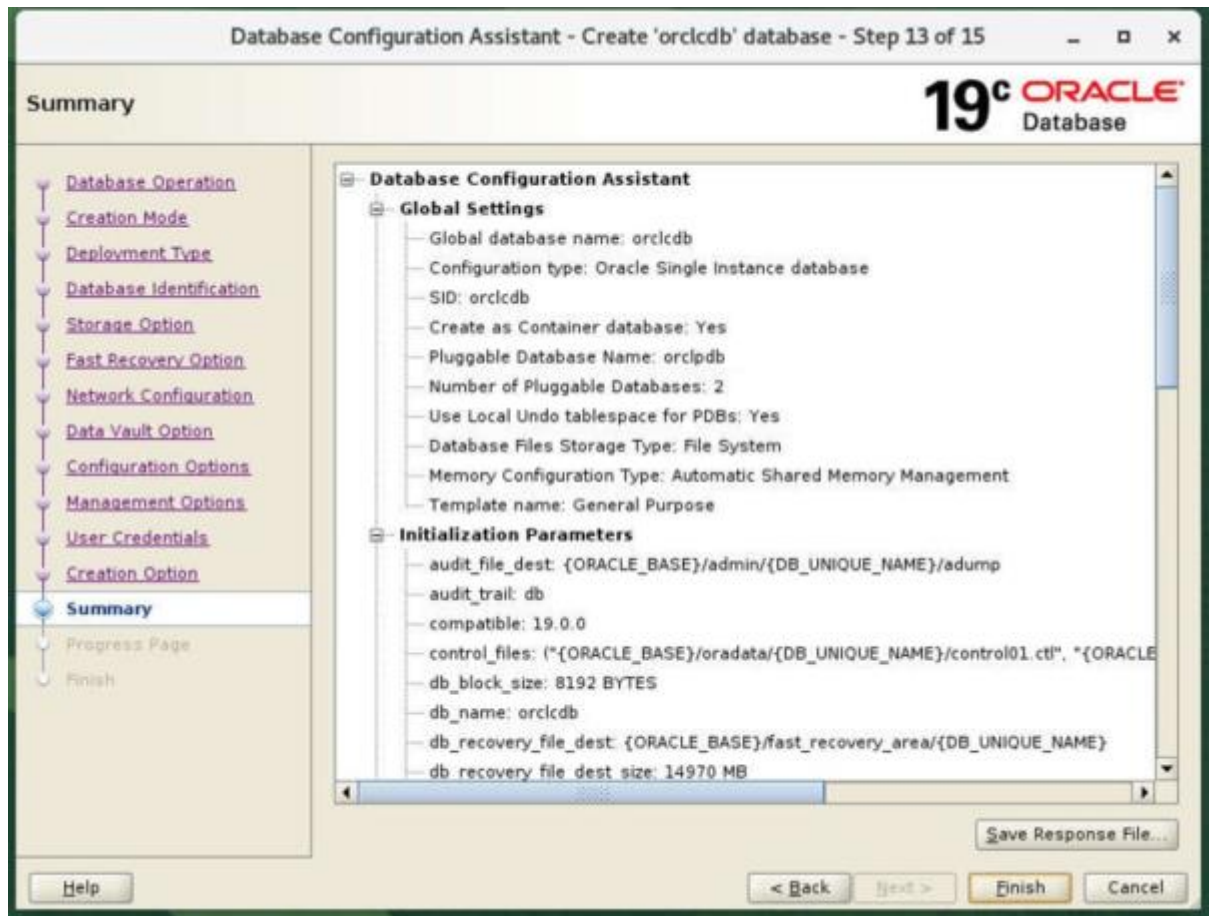
Destination directory:  [Browse...](#)

Following advanced configuration options can be used to configure initialization parameters and customize database storage locations.

[All Initialization Parameters...](#) [Customize Storage Locations...](#)

[Help](#) [< Back](#) [Next >](#) [Finish](#) [Cancel](#)

14. Click **Finish**.



Click **Close** once database creation is complete.

This completes the **ORCLCDB** database creation.

15. Verify that the instance is started by checking whether the PMON background process is running.

```
$ ps -ef|grep pmon
```

```
[oracle@host01 ~]$ ps -ef|grep pmon
oracle      8967      1  0 03:27 ?        00:00:00 ora_pmon_orclcdb
oracle     12194  12018  0 04:12 pts/1    00:00:00 grep --color=auto pmon
[oracle@host01 ~]$
```

16. Change to the \$HOME directory.

```
[oracle@host01 ~]$
[oracle@host01 /]$
[oracle@host01 /]$ cd $HOME
[oracle@host01 ~]$ pwd
/home/oracle
[oracle@host01 ~]$
```

17. Connect to the orclcdb database instance as the SYS user with SYSDBA privilege.

```
[oracle@host01 ~]$ . oraenv
ORACLE_SID = [oracle] ? orclcdb
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@host01 ~]$ sqlplus

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Dec 11
06:30:36 2020
Version 19.3.0.0.0

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

Enter user-name: /as sysdba

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.3.0.0.0
SQL>
```

18. Check the current state of PDBs.

```
SQL> SHOW PDBS
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	READ	ONLY	NO
3	ORCLPDB1	READ	WRITE	NO
4	ORCLPDB2	READ	WRITE	NO

- a. If the PDBs are not open, open them. If it is open, you can skip this step.

Note: **Do not run this command if your PDB is already opened.**

```
SQL> ALTER PLUGGABLE DATABASE ORCLPDB1 OPEN;
```

```
Pluggable database altered.
```

```
SQL> ALTER PLUGGABLE DATABASE ORCLPDB2 OPEN;
```

```
Pluggable database altered.
```

- b. Save the state so that PDB1 is opened every time the CDB is opened. Exit SQL\*Plus.

```
SQL> ALTER PLUGGABLE DATABASE orclpdb1 SAVE STATE;
```

```
Pluggable database altered.
```

```
SQL> ALTER PLUGGABLE DATABASE orclpdb2 SAVE STATE;
```

```
Pluggable database altered.
```

```
SQL> exit
```

19. Check whether the listener is started and if not, start the listener.

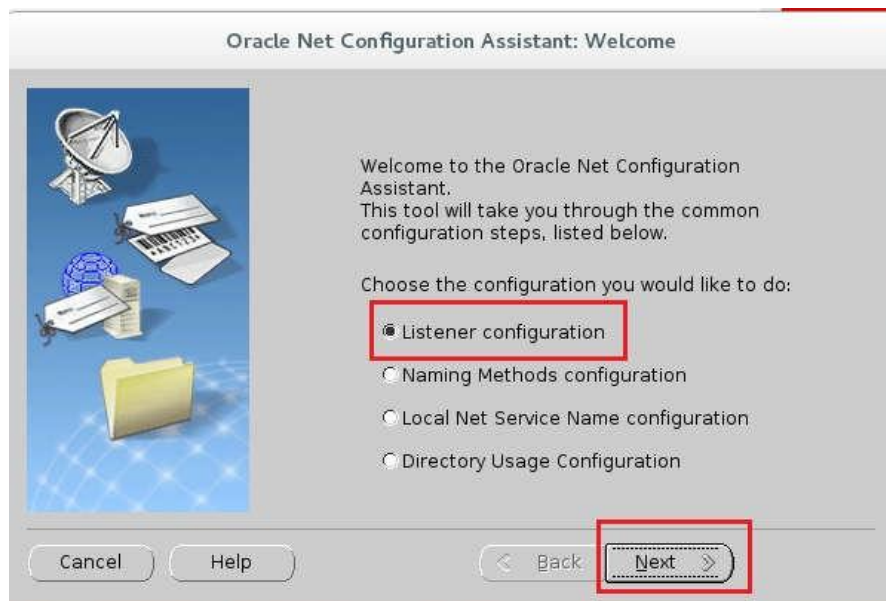
```
[oracle@host01 ~]$ lsnrctl status  
[oracle@host01 ~]$ lsnrctl start
```

If **LISTENER** fails to start then execute these steps else skip them:

a. Invoke netca (Oracle Net Configuration Assistant).

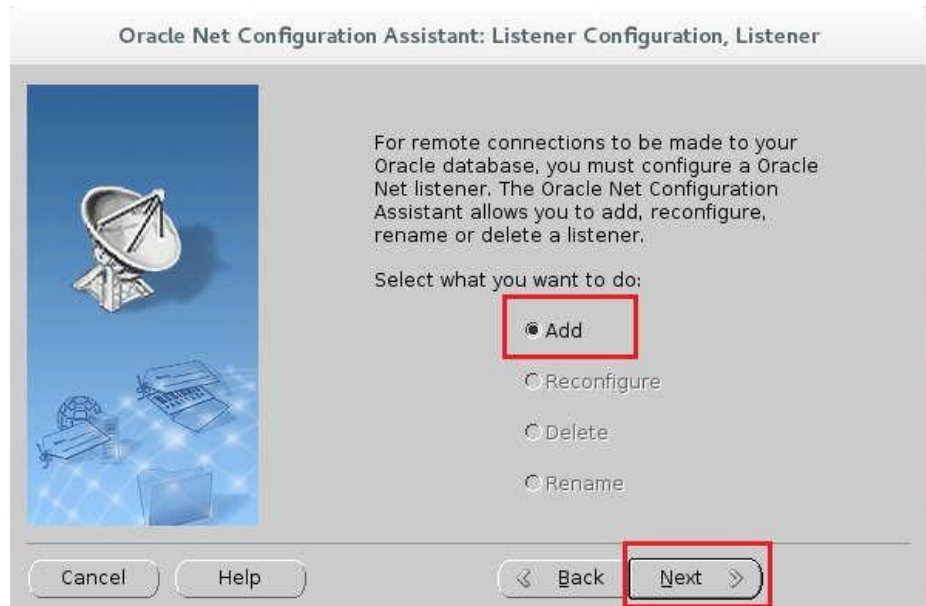
**\$ netca**

Choose settings as per the screenshot and click **Next**.

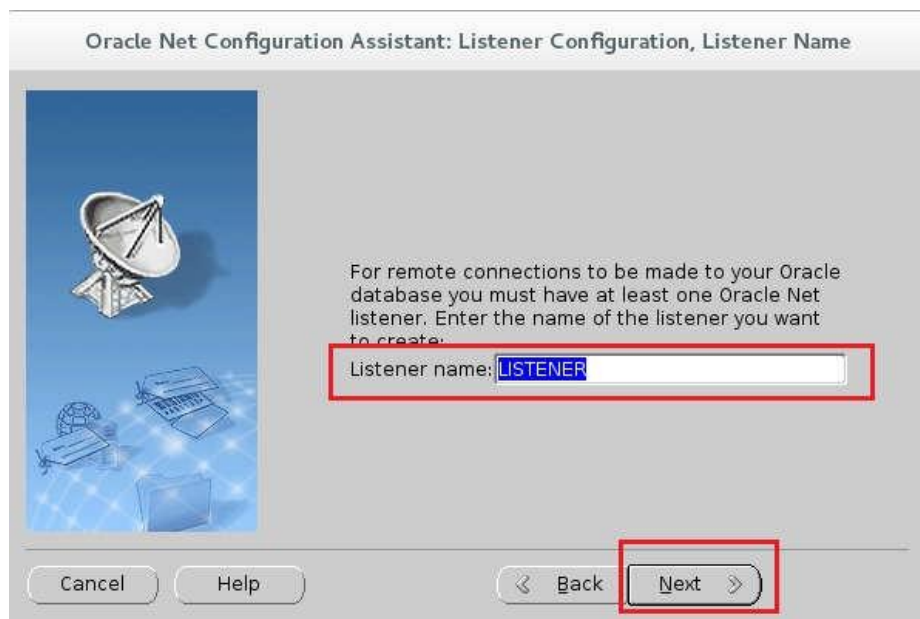


b. Choose settings as per the screenshot and click **Next**.





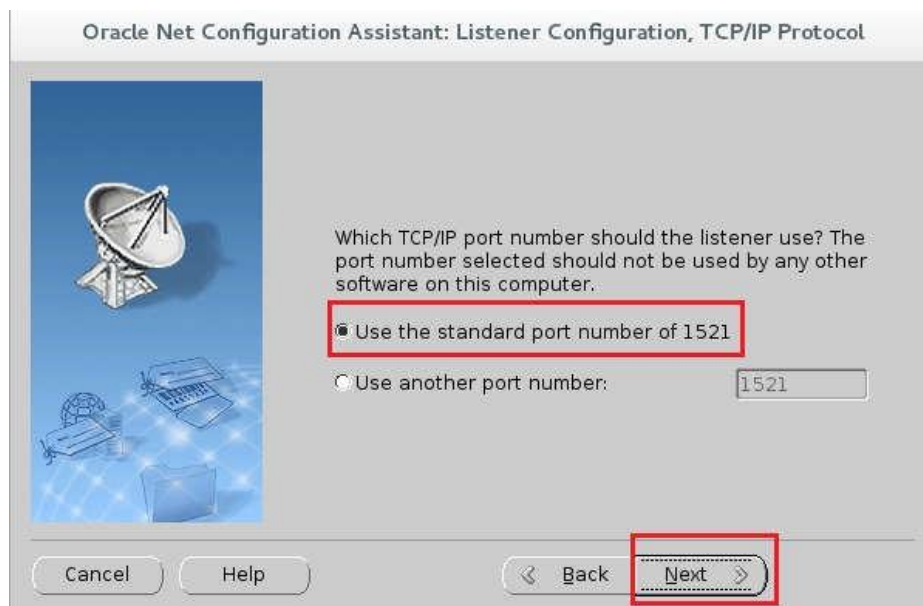
- c. Choose the settings as per the screenshot and click **Next**.



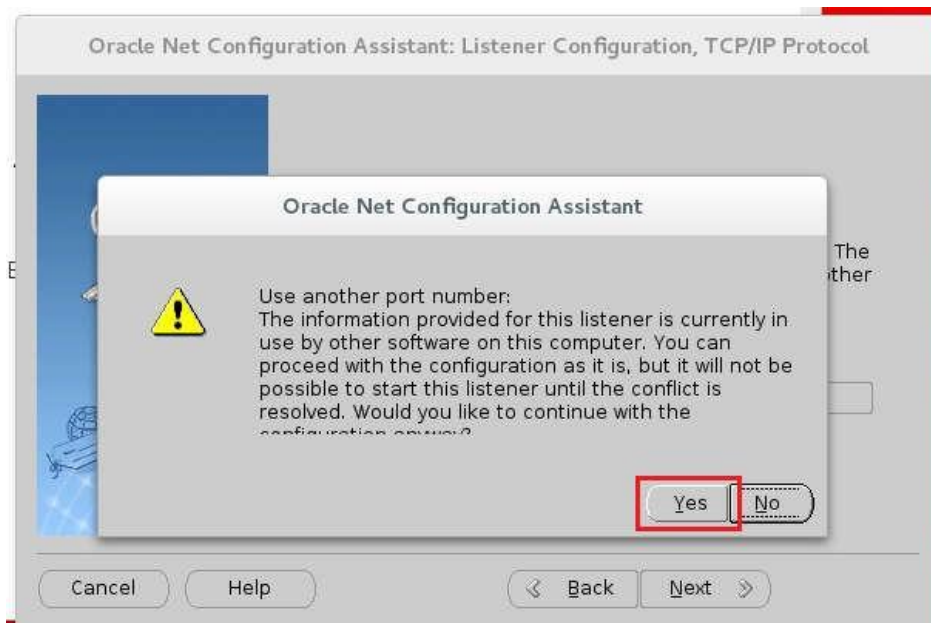
- d. Choose settings as per the screenshot and click **Next**:



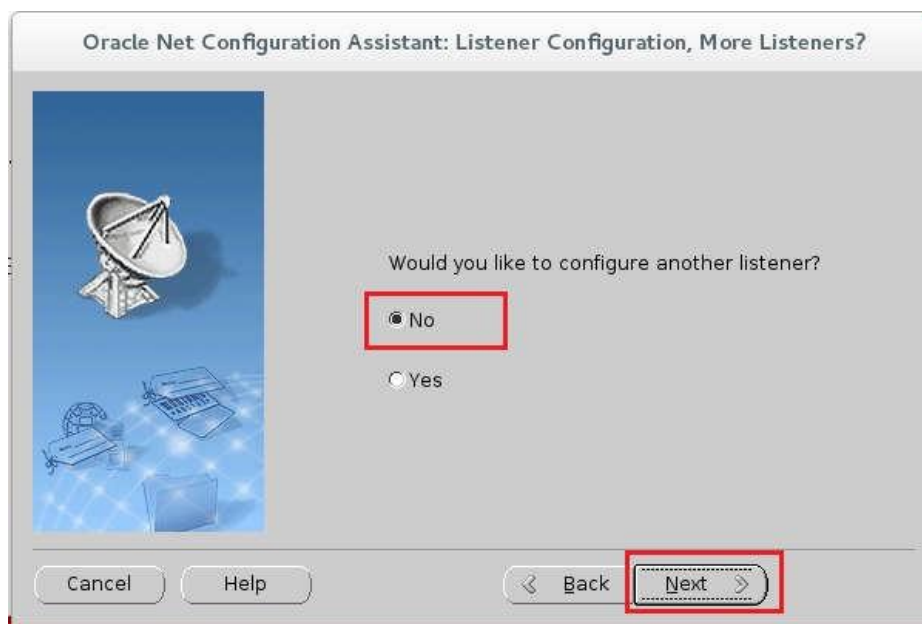
- e. Choose settings as per the screenshot and click **Next**.



- f. Click **Yes** if you get this warning:



- g. Click **No** and then **Next**.



- h. Click **Next** and **Finish**.

This completes your LISTENER configuration.

20. Verify that you can connect to the `orclpdb1` and `orclpdb2` PDBs by using the service name. Exit SQL\*Plus.

**Note: If you get an error then proceed to the next step.**

```
[oracle@host01 ~]$ . oraenv
ORACLE_SID = [orclpdb] ?
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@host01 ~]$
[oracle@host01 ~]$ sqlplus system/fenago@orclpdb1

...
Copyright (c) 1982, 2018, Oracle. All rights reserved.
...
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.3.0.0.0

SQL>
SQL> exit;

[oracle@host01 ~]$ sqlplus system/fenago@orclpdb2

...
Copyright (c) 1982, 2018, Oracle. All rights reserved.
...
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.3.0.0.0

SQL>
SQL> exit;
```

21. If you are unable to connect to orclpdb1 and orclpdb2 using the service name then add these lines to tnsnames.ora, else skip these steps.

a. Navigate to \$ORACLE\_HOME/network/admin and open tnsnames.ora :

```
[oracle@host01 ~]$ cd $ORACLE_HOME
[oracle@host01 dbhome_1]$ cd network/admin/
[oracle@host01 dbhome_1]$ vi tnsnames.ora
```

b. Add these lines to tnsnames.ora, if not already present:

```
ORCLPDB1 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = ) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = ORCLPDB1)
    )
  )

ORCLCDB =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = ) (PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = orclcdb)
    )
  )

ORCLPDB2 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = ) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = ORCLPDB2)
    )
  )
```

- c. Save the file and quit the vi editor (:wq).
22. Verify that the HR (sample schemas) user was created and there is data in the database.

```
[oracle@host01 /]$ . oraenv
ORACLE_SID = [orclcdb] ? orclcdb
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@host01 /]$ sqlplus

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Dec 12 06:43:10
2019
Version 19.3.0.0.0

Copyright (c) 1982, 2018, Oracle. All rights reserved.

Enter user-name: /as sysdba

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production
Version 19.3.0.0.0

SQL> conn sys/fenago@orclpdb1 as sysdba
Connected.

SQL> ALTER USER hr IDENTIFIED BY fenago account unlock;

User altered.

Note: If you encounter an error "ORA-01918: user 'HR' does not
exist" then follow these steps to install HR schema.

SQL> conn sys/fenago@orclpdb1
Connected.

SQL> @?/demo/schema/human_resources/hr_main.sql

specify password for HR as parameter 1:
Enter value for 1:
SP2-0137: DEFINE requires a value following equal sign

specify default tablespace for HR as parameter 2:
Enter value for 2: users
```

```
specify temporary tablespace for HR as parameter 3:  
Enter value for 3: temp
```

```
specify log path as parameter 4:  
Enter value for 4: $ORACLE_HOME/demo/schema/log
```

```
PL/SQL procedure successfully completed.
```

```
Enter value for pass: fenago
```

```
SQL> Select count(*) from employees;
```

```
      COUNT(*)  
-----  
          107
```

**Note: Execute the above steps for PDB ORCLPDB2 too.**

This completes the network and schema configuration.

23. Symlink has been created from path /headles/Desktop/oracle19c-administration/labs to /home/oracle/labs.

```
[oracle@host01 ~]$ cd /home/oracle/labs  
  
[oracle@host01 ~]$ ls -ltr
```

**24. Execute these to configure EM Express:**

a. Configure EM Express by running these commands:



```

$sqlplus / as sysdba
SQL> @?/rdbms/admin/execemx omx
SQL> alter session set container=orclpdb1;
SQL> @?/rdbms/admin/execemx omx
SQL> alter session set container=orclpdb2;
SQL> @?/rdbms/admin/execemx omx

```

**b. Check oracle Shell Environment. Execute these commands as oracle user:**

```

$ echo $ORACLE_HOME
$ echo $ORACLE_SID

```

**c. Configure EM Express for Global Port Use. Execute these commands:**

```

$ sqlplus / as sysdba
SQL> exec dbms_xdb_config.setglobalportenabed(TRUE);

```

**d. Configure Firefox Browser for EM Express. Execute these steps:**

Navigate to <https://localhost:5500/em>

**Note:** If you get a security exception then follow these steps:

Your connection is not secure dialog appears. Navigate through:

Advanced

Add exception

Confirm Security Exception

Navigate through Firefox -> Preferences -> Home Page

Use Current Page: <https://localhost:5500/em/login>

Install full GitHub sample schemas into each PDB

**25. Download sample schemas from this location:**

<https://github.com/oracle/db-sample-schemas/releases/tag/v19.2>

**26. Copy the downloaded file to \$ORACLE\_HOME/demo/schema/ and unzip.**

**27. Execute cd \$ORACLE\_HOME/demo/schema/**

**28. Execute perl -p -i.bak -e 's#\_\_SUB\_\_CWD\_\_#'\$ (pwd) '#g' \*.sql \*/\*.sql \*/\*.dat**

**29. sqlplus / as sysdba**

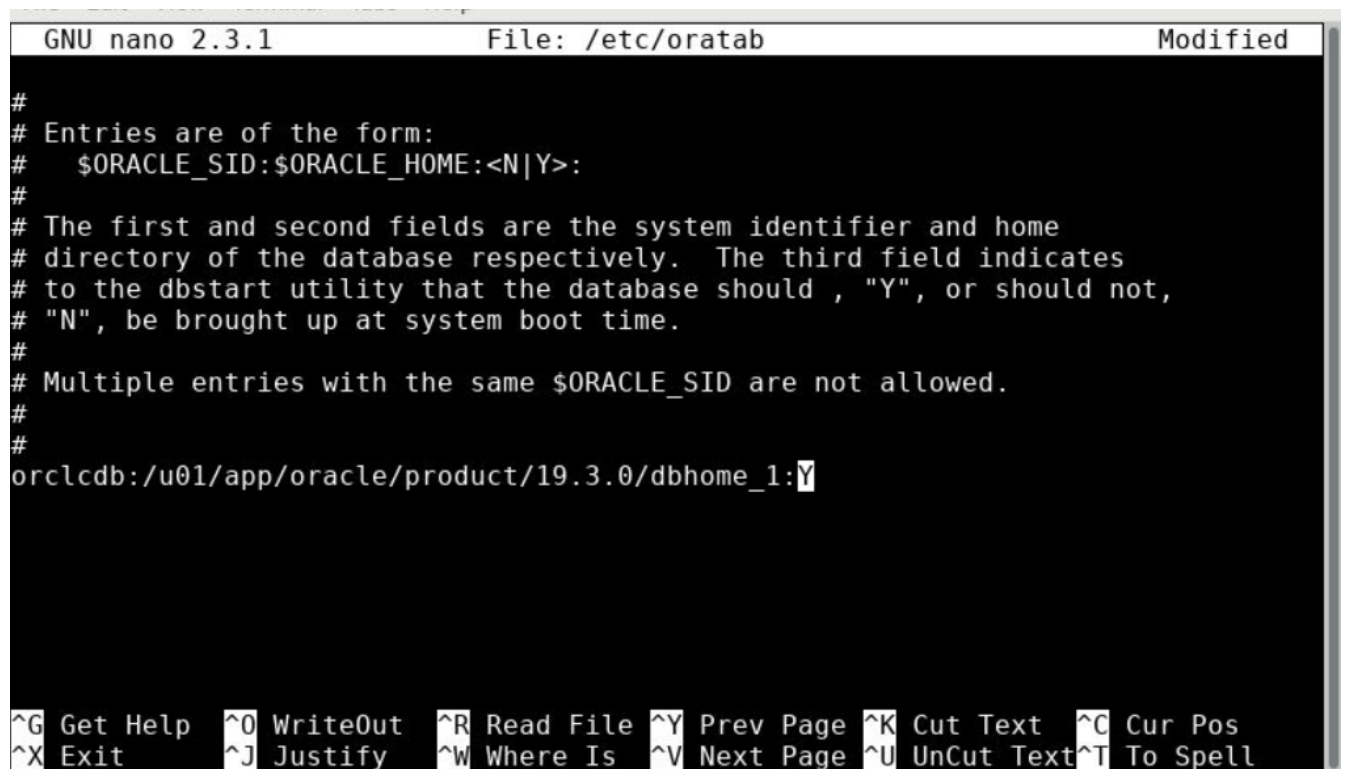
**30. Execute SQL> @?/demo/schema/mksample fenago fenago fenago fenago fenago fenago users temp /home/oracle/setup/schema1/ localhost:1521/orclpdb1**

31. Execute SQL> @?/demo/schema/mksample fenago fenago fenago  
fenago fenago fenago fenago fenago users temp  
/home/oracle/setup/schema1/ localhost:1521/orclpdb2

### Start Database After Reboot

Edit /etc/oratab and set orclcdb as **Y** and running following commands:

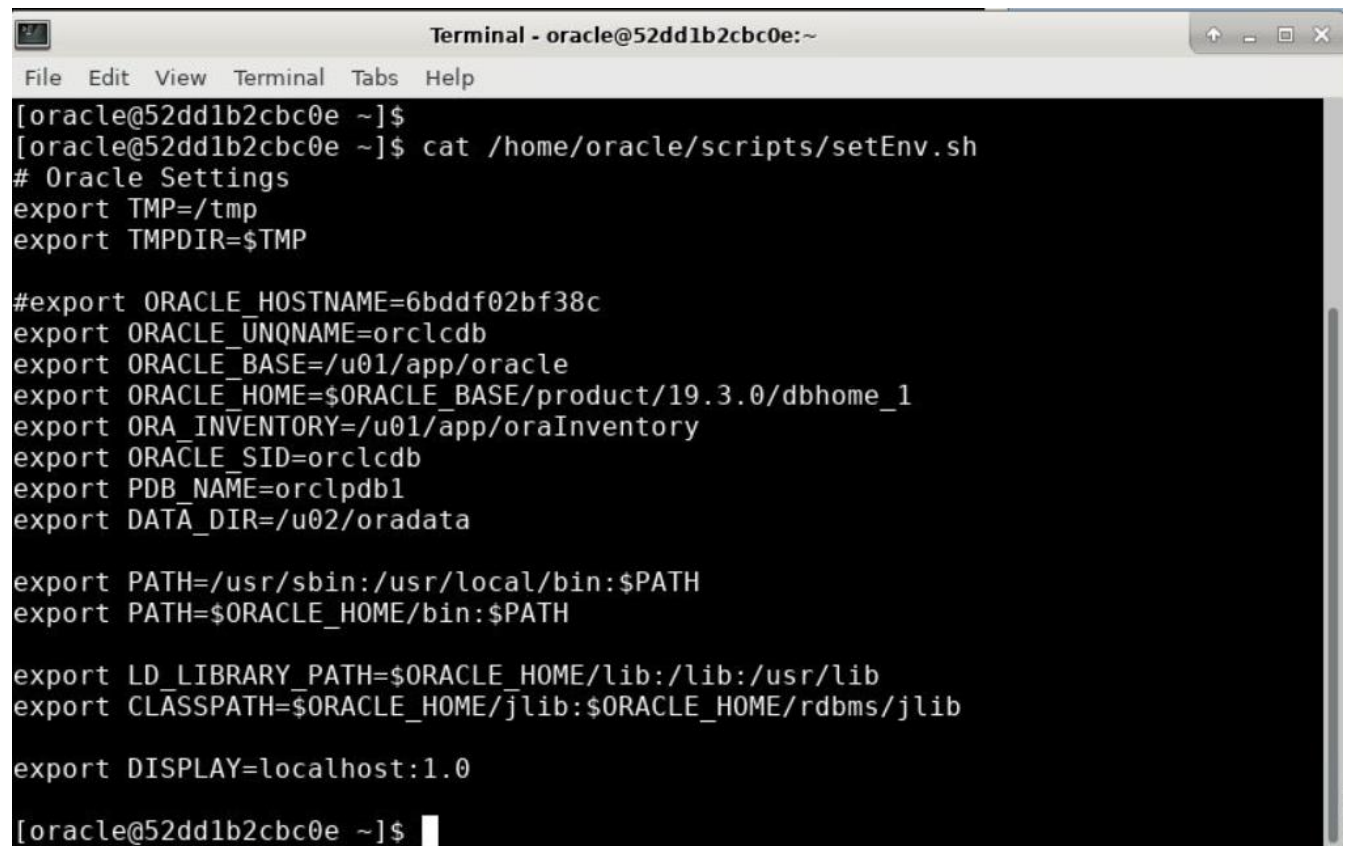
```
$ su - oracle
$ lsnrctl status
$ lsnrctl start
$ dbstart $ORACLE_HOME
```



```
GNU nano 2.3.1 File: /etc/oratab Modified
#
# 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.
#
#
orclcdb:/u01/app/oracle/product/19.3.0/dbhome_1:Y
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

## Oracle User Environment

Following script is being called in /home/oracle/.bashrc

A terminal window titled "Terminal - oracle@52dd1b2cbc0e:~" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal shows the execution of a script to set Oracle environment variables. The prompt is [oracle@52dd1b2cbc0e ~]\$. The command cat /home/oracle/scripts/setEnv.sh is entered, followed by the script's content: # Oracle Settings, export TMP=/tmp, export TMPDIR=\$TMP, #export ORACLE\_HOSTNAME=6bddf02bf38c, export ORACLE\_UNQNAME=orclcdb, export ORACLE\_BASE=/u01/app/oracle, export ORACLE\_HOME=\$ORACLE\_BASE/product/19.3.0/dbhome\_1, export ORA\_INVENTORY=/u01/app/oraInventory, export ORACLE\_SID=orclcdb, export PDB\_NAME=orclpdb1, export DATA\_DIR=/u02/oradata, export PATH=/usr/sbin:/usr/local/bin:\$PATH, export PATH=\$ORACLE\_HOME/bin:\$PATH, export LD\_LIBRARY\_PATH=\$ORACLE\_HOME/lib:/lib:/usr/lib, export CLASSPATH=\$ORACLE\_HOME/jlib:\$ORACLE\_HOME/rdbms/jlib, export DISPLAY=localhost:1.0. The prompt returns to [oracle@52dd1b2cbc0e ~]\$.

```
Terminal - oracle@52dd1b2cbc0e:~
File Edit View Terminal Tabs Help
[oracle@52dd1b2cbc0e ~]$
[oracle@52dd1b2cbc0e ~]$ cat /home/oracle/scripts/setEnv.sh
# Oracle Settings
export TMP=/tmp
export TMPDIR=$TMP

#export ORACLE_HOSTNAME=6bddf02bf38c
export ORACLE_UNQNAME=orclcdb
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/19.3.0/dbhome_1
export ORA_INVENTORY=/u01/app/oraInventory
export ORACLE_SID=orclcdb
export PDB_NAME=orclpdb1
export DATA_DIR=/u02/oradata

export PATH=/usr/sbin:/usr/local/bin:$PATH
export PATH=$ORACLE_HOME/bin:$PATH

export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib
export CLASSPATH=$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib

export DISPLAY=localhost:1.0
[oracle@52dd1b2cbc0e ~]$
```