

ORACLE 19c New Features DataBase Creation

STEPS TO CREATE THE CONTAINER DATABASE NAMED ORCL AND ITS PDB NAMED pdb1

Note:

- Execute **xhost +** command as root.
- Login as oracle user using the **su – oracle** command.
- Create the directories and grant required privileges to the oracle user (for Oracle software)
 - **mkdir -p /u03/app/oracle/fast_recovery_area/ORCL**
 - **chown -R oracle:oinstall /u03**
 - **chmod -R 775 /u03**
 - **mkdir -p /u04/app/oracle/redo/ORCL**
 - **chown -R oracle:oinstall /u04**
 - **chmod -R 775 /u04**
- 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.

Select Database Operation

19^c 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

Select the operation that you want to perform.

- ☒ **Create a database**
- ☐ Configure an existing database
- ☐ Delete database
- ☐ Manage templates
- ☐ Manage Pluggable databases
- ☐ Oracle RAC database Instance management

[Help](#)

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Next >

Finish

Cancel

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

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

19^c 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

19c ORACLE Database

Select Database Deployment Type

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	View details
<input type="radio"/>	Data Warehouse	Yes	View details
<input checked="" type="radio"/>	General Purpose or Transaction Processing	Yes	View details

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: **orcl**
- SID: **orcl**
- 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: **1**
- PDB name : **pdb1**

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

19^c ORACLE[®] Database

Specify Database Identification Details

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:

Help < Back Next > Finish Cancel

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

Database Configuration Assistant - Create 'orcl' database - Step 5 of 15

Select Database Storage Option

19c 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

☐ 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:

Database files location:

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

☐ Use Oracle-Managed Files (OMF)

7. Choose **Specify Fast Recovery**, in **Fast Recovery Area** attribute enter the location as per the screenshot, and check **Enable Archiving** as shown in the screenshot, and click **Next**.

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

Select Fast Recovery Option

19^c ORACLE Database

Choose the recovery options for the database.

- ☒ Specify Fast Recovery Area
 - Recovery files storage type: File System
 - Fast Recovery Area: /u03/app/oracle/fast_recovery_area [Browse...](#)
 - Fast Recovery Area size: 15000 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 start
```

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

Specify Network Configuration Details

19c 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: /u01/app/oracle/product/19.3.0/dbhome_1

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 'orcl' database - Step 9 of 15

Specify Configuration Options

19c 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 | Sample schemas

☒ Use Automatic Shared Memory Management

SGA size: 1350 MB

PGA Size: 450 MB

Total memory for database 1800 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: 3249 MB

Total memory for database 3249 MB (39%)

Help < Back Next > Finish Cancel

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

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

Specify Management Options **19c 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_{MS} host:

O_{MS} port:

EM admin username:

EM admin password:

Management Options

Creation Option

Summary

Progress Page

Finish

Help < Back Next > Finish Cancel

12. Check **Use the same administrative password for all accounts** Password: **Welcome_1**. Click **Next**.

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

Specify Database User Credentials

19^c 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:

User Credentials

[Creation Option](#)

Summary

Progress Page

Finish

Help

< Back Next > Finish Cancel

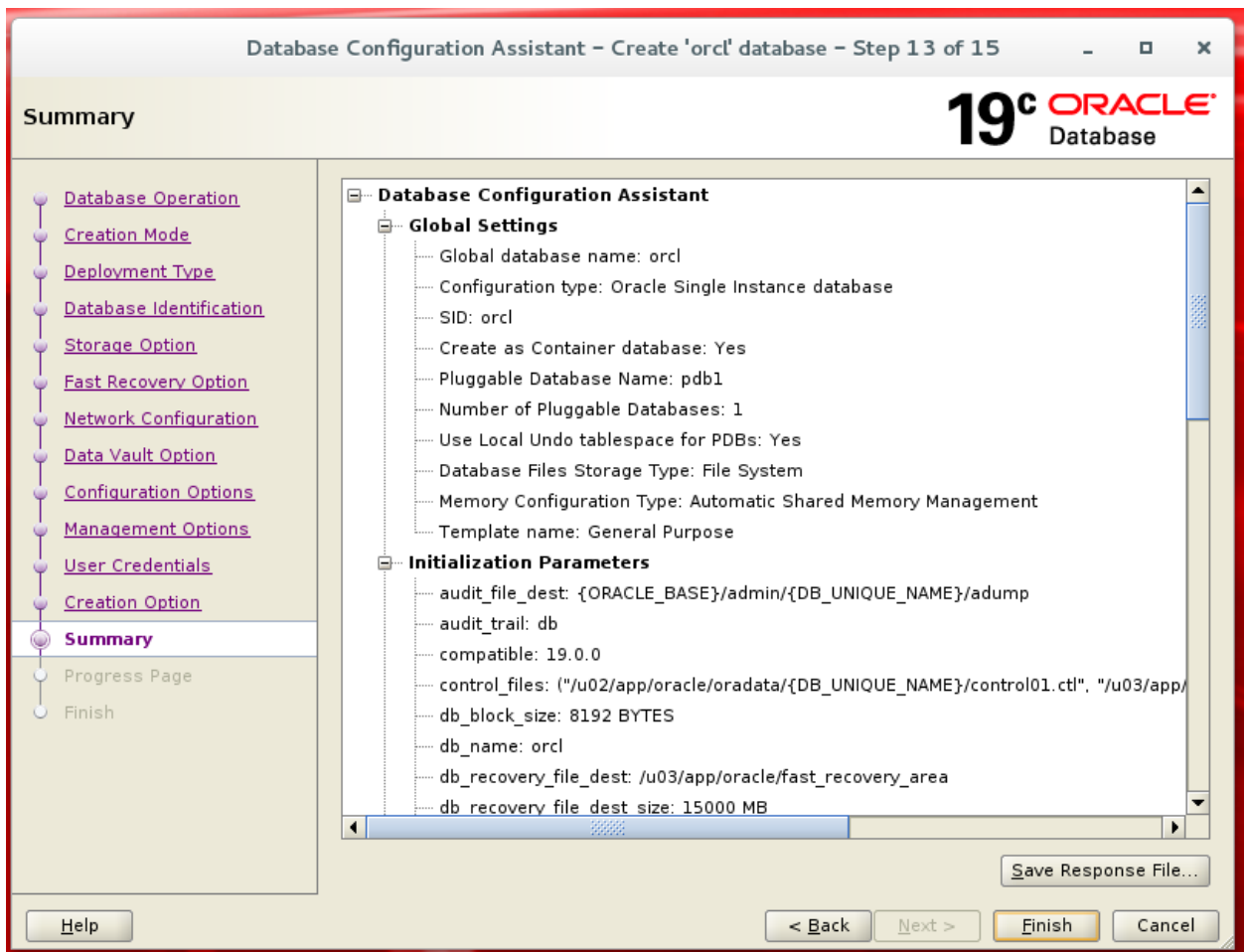
13. Choose settings as per the screenshot. Click **Next**.

The screenshot shows the 'Database Configuration Assistant - Create 'orcl' database - Step 12 of 15' window. The title bar includes standard window controls. The main window has a header with the '19c ORACLE Database' logo. On the left is a vertical navigation pane with a list of steps: 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** (highlighted with a purple circle), Summary, Progress Page, and Finish. The main content area is titled 'Select Database Creation Option' and contains the following elements:

- A sub-header: 'Select the database creation options.'
- A checked checkbox labeled 'Create database'.
- Text: 'Specify the SQL scripts you want to run after the database is created. The scripts are run in the order listed below.'
- A text field for 'Post DB creation scripts:' followed by a 'Browse...' button.
- An unchecked checkbox labeled 'Save as a database template'.
- Fields for 'Template name:' (containing 'dbca_template_2021-02-09_01-18-'), 'Template location:' (containing '/u01/app/oracle/product/19.3.0/dbhome_1/assistants/dbca/t'), and 'Description:' (empty), each followed by a 'Browse...' button.
- An unchecked checkbox labeled 'Generate database creation scripts'.
- A text field for 'Destination directory:' (containing '{ORACLE_BASE}/admin/{DB_UNIQUE_NAME}/scripts') followed by a 'Browse...' button.
- Text: 'Following advanced configuration options can be used to configure initialization parameters and customize database storage locations.'
- Two buttons: 'All Initialization Parameters...' and 'Customize Storage Locations...'.

At the bottom of the window are four buttons: 'Help', '< Back', 'Next >', 'Finish', and 'Cancel'.

14. Click **Finish**.



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

This completes the **ORCL** database creation.

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

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

```
[oracle@Host01 Desktop]$ ps -ef|grep pmon
oracle      7461      1  0 11:38 ?        00:00:00 ora_pmon_orcl
oracle      7998    3486  0 11:42 pts/0    00:00:00 grep  --color=auto pmon
```

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 orcl database instance as the SYS user with SYSDBA privilege.

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

SQL*Plus: Release 19.0.0.0.0
...
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 PDB.

```
SQL> SHOW PDBS;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	PDB1	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 PDB1 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 pdb1 SAVE STATE;
```

```
Pluggable database altered.
```

```
SQL> exit
```

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

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

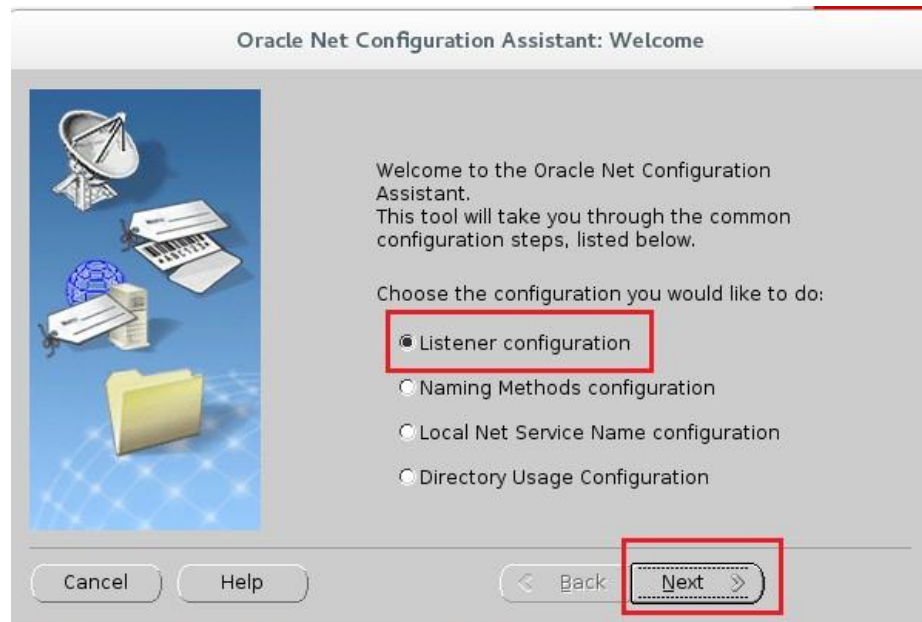
```
[oracle@host01 ~]$ lsnrctl start
```

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

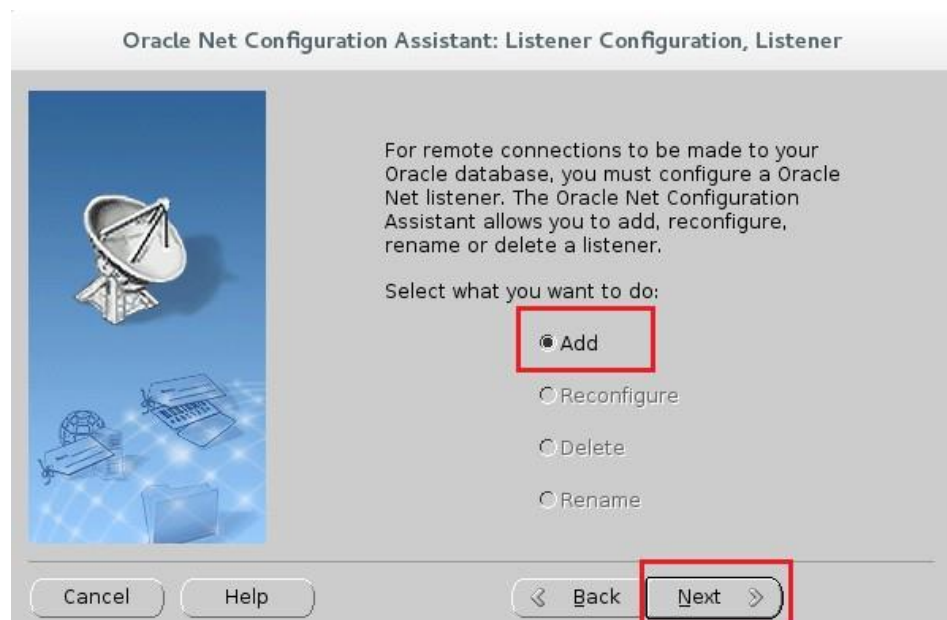
a. Invoke netca (Oracle Net Configuration Assistant).

\$ 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**.

Oracle Net Configuration Assistant: Listener Configuration, Listener Name



For remote connections to be made to your Oracle database you must have at least one Oracle Net listener. Enter the name of the listener you want to create:

Listener name:

Cancel Help < Back Next >

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

Oracle Net Configuration Assistant: Listener Configuration, Select Protocols




You can configure the listener to accept connections over one or more protocols. Select which protocols you want to configure for this listener. Keep your configuration as simple as possible by configuring only the protocols you need.

Available Protocols		Selected Protocols
TCP	>	TCP
IPC	<	

Cancel Help < Back Next >

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

Oracle Net Configuration Assistant: Listener Configuration, TCP/IP Protocol



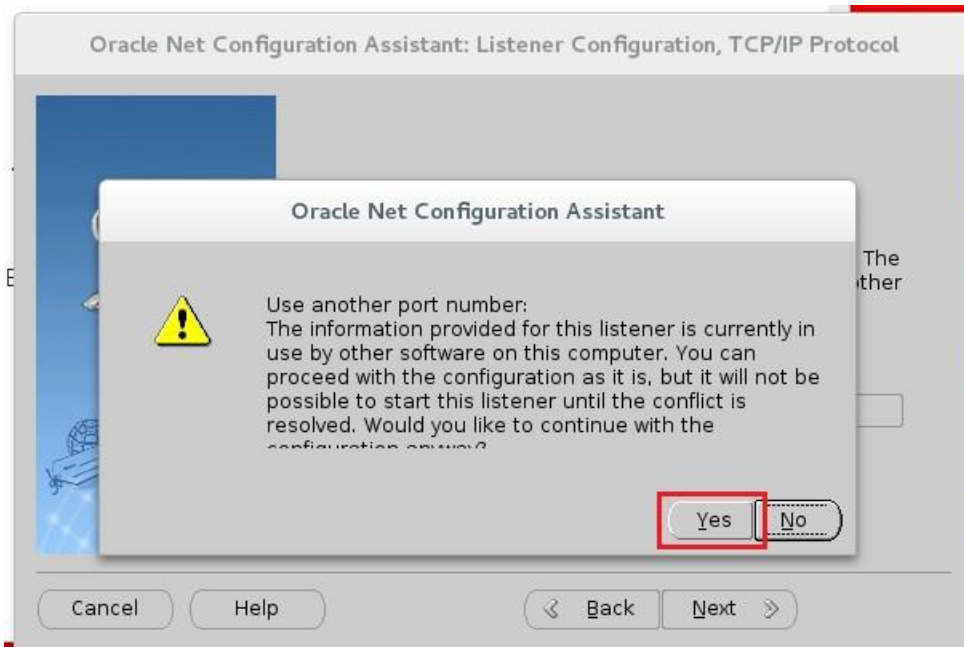
Which TCP/IP port number should the listener use? The port number selected should not be used by any other software on this computer.

☒ Use the standard port number of 1521

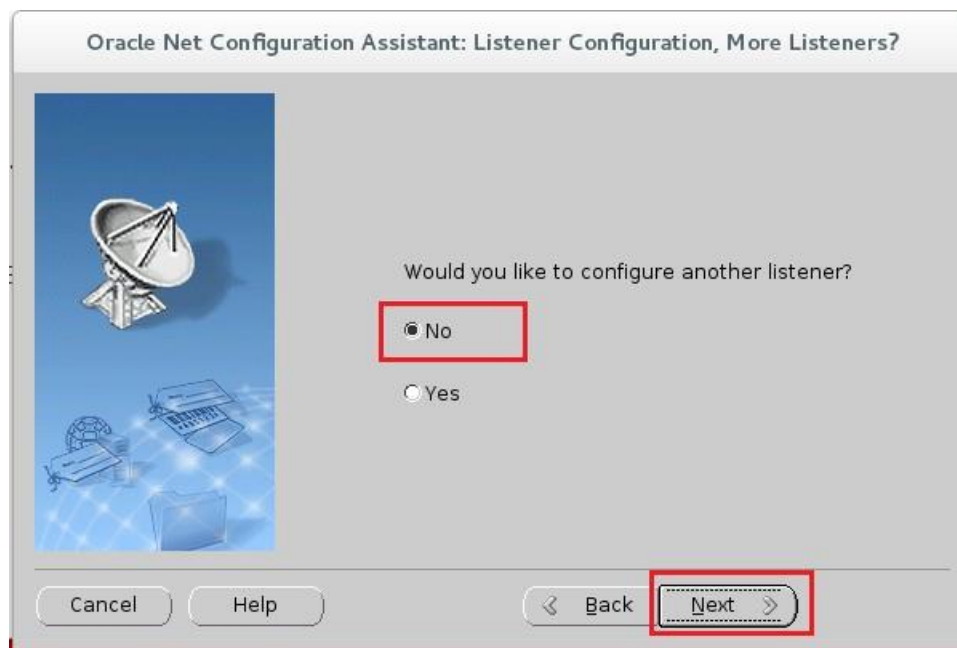
☐ Use another port number:

Cancel Help < Back 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.

Verify that you can connect to the `pdb1` PDB by using the service name.

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

```
[oracle@host01 ~]$ . oraenv
ORACLE_SID = [orcl] ?
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@host01 ~]$
[oracle@host01 ~]$ sqlplus system/Welcome_1@pdb1

...
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;
```

20. If you are unable to connect to `pdb1` 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:

```
ORCL =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST =
host01.example.com) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = ORCL)
    )
  )
```

```

PDB1 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST =
host01.example.com) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = PDB1)
    )
  )
)

```

c. Save the file and quit the vi editor (:wq).

21. Verify that the HR (sample schemas) user was created and there is data in the database.

```

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

SQL*Plus: Release 19.0.0.0.0
...
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/Welcome_1@pdb1 as sysdba
Connected.

SQL> ALTER USER hr IDENTIFIED BY Welcome_1 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/Welcome_1@pdb1
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: Welcome_1

SQL> Select count(*) from employees;

COUNT(*)
-----
107

```

This completes the network and schema configuration.

22. Execute these SQL commands in ORCL

\$ORACLE_HOME/bin/sqlplus / AS SYSDBA

```

SQL> ALTER USER dbnmp IDENTIFIED BY Welcome_1 ACCOUNT UNLOCK
CONTAINER=ALL;

```

```
SQL> ALTER SYSTEM SWITCH LOGFILE;
SQL> ALTER SYSTEM SWITCH LOGFILE;
SQL> ALTER SYSTEM SWITCH LOGFILE;
SQL> ALTER PROFILE DEFAULT LIMIT
    PASSWORD_LIFE_TIME UNLIMITED
    PASSWORD_GRACE_TIME UNLIMITED
    PASSWORD_REUSE_TIME UNLIMITED
    PASSWORD_REUSE_MAX UNLIMITED
    FAILED_LOGIN_ATTEMPTS UNLIMITED
    PASSWORD_LOCK_TIME UNLIMITED
    INACTIVE_ACCOUNT_TIME UNLIMITED
    IDLE_TIME UNLIMITED
    PASSWORD_VERIFY_FUNCTION NULL;
```

```
SQL> ALTER PROFILE ORA_STIG_PROFILE LIMIT
    PASSWORD_LIFE_TIME UNLIMITED
    PASSWORD_GRACE_TIME UNLIMITED
    PASSWORD_REUSE_TIME UNLIMITED
    PASSWORD_REUSE_MAX UNLIMITED
    FAILED_LOGIN_ATTEMPTS UNLIMITED
    PASSWORD_LOCK_TIME UNLIMITED
    INACTIVE_ACCOUNT_TIME UNLIMITED
    IDLE_TIME UNLIMITED
    PASSWORD_VERIFY_FUNCTION NULL;
```

```
SQL> Exit;
```

23. Execute these SQL commands in PDB1

```
$ORACLE_HOME/bin/sqlplus SYS/Welcome_1@pdb1 AS SYSDBA
```

```
SQL> ALTER PROFILE DEFAULT LIMIT
    PASSWORD_LIFE_TIME UNLIMITED
    PASSWORD_GRACE_TIME UNLIMITED
    PASSWORD_REUSE_TIME UNLIMITED
    PASSWORD_REUSE_MAX UNLIMITED
    FAILED_LOGIN_ATTEMPTS UNLIMITED
    PASSWORD_LOCK_TIME UNLIMITED
    INACTIVE_ACCOUNT_TIME UNLIMITED
```



```
IDLE_TIME UNLIMITED  
PASSWORD_VERIFY_FUNCTION NULL;
```

```
SQL> ALTER PROFILE ORA_STIG_PROFILE LIMIT  
      PASSWORD_LIFE_TIME UNLIMITED  
      PASSWORD_GRACE_TIME UNLIMITED  
      PASSWORD_REUSE_TIME UNLIMITED  
      PASSWORD_REUSE_MAX UNLIMITED  
      FAILED_LOGIN_ATTEMPTS UNLIMITED  
      PASSWORD_LOCK_TIME UNLIMITED  
      INACTIVE_ACCOUNT_TIME UNLIMITED  
      IDLE_TIME UNLIMITED  
      PASSWORD_VERIFY_FUNCTION NULL;
```

```
SQL> Exit;
```

24. Move into `labs` directory as shown below:

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

This completes the setup