

# ORACLE 21C DATABASE ADMINISTRATOR

FIRST EDITION



RAVINDRA MALWAL



## Topic: Oracle 21C software installation and database creation using DBCA on RHEL 8

In this QuickStart, we learn how to:

- Infrastructure details
- System configuration and **RPM** installation
- Directory and User Creation
- Unzip 12c Software Binaries and installation
- Set oracle user pash profile
- Configure listener and network service
- Install database Using DBCA
- Validation

### Step-1 Infrastructure details

OS Details	Host Name	Database Version	ORACLE_HOME
CentOS 8.2	DB21C.example.com	21.0.0.0.0	/u01/app/oracle/product/21.0.0/db_1

### Ste-2 System configuration and rpm installation

Install below RPM package

```
dnf install -y bc
dnf install -y binutils
dnf install -y compat-libstdc++-33
dnf install -y elfutils-libelf
dnf install -y elfutils-libelf-devel
dnf install -y fontconfig-devel
dnf install -y glibc
dnf install -y glibc-devel
dnf install -y ksh
dnf install -y libaio
dnf install -y libaio-devel
dnf install -y libXrender
dnf install -y libXrender-devel
dnf install -y libX11
dnf install -y libXau
dnf install -y libXi
dnf install -y libXtst
dnf install -y libgcc
dnf install -y librdmacm-devel
dnf install -y libstdc++
dnf install -y libstdc++-devel
dnf install -y libxcb
dnf install -y make
dnf install -y net-tools
```

```
dnf install -y nfs-utils
dnf install -y smartmontools
dnf install -y sysstat
dnf install -y unixODBC
dnf install -y libnsl
dnf install -y libnsl.i686
dnf install -y libnsl2
dnf install -y libnsl2.i686
dnf install -y xorg-x11*
```

### Step-3 Directory and User Creation

```
[oracle@DB21C ~]$groupadd oinstall
[oracle@DB21C ~]$groupadd dba
[oracle@DB21C ~]$groupadd oper
[oracle@DB21C ~]$useradd -g oinstall -G dba,oper oracle
[oracle@DB21C ~]$passwd oracle
[oracle@DB21C ~]$mkdir -p /u01/app/oracle/product/21.0.0/db_1
[oracle@DB21C ~]$mkdir -p /u01/archive
[oracle@DB21C ~]$chown -R oracle:oinstall /u01
```

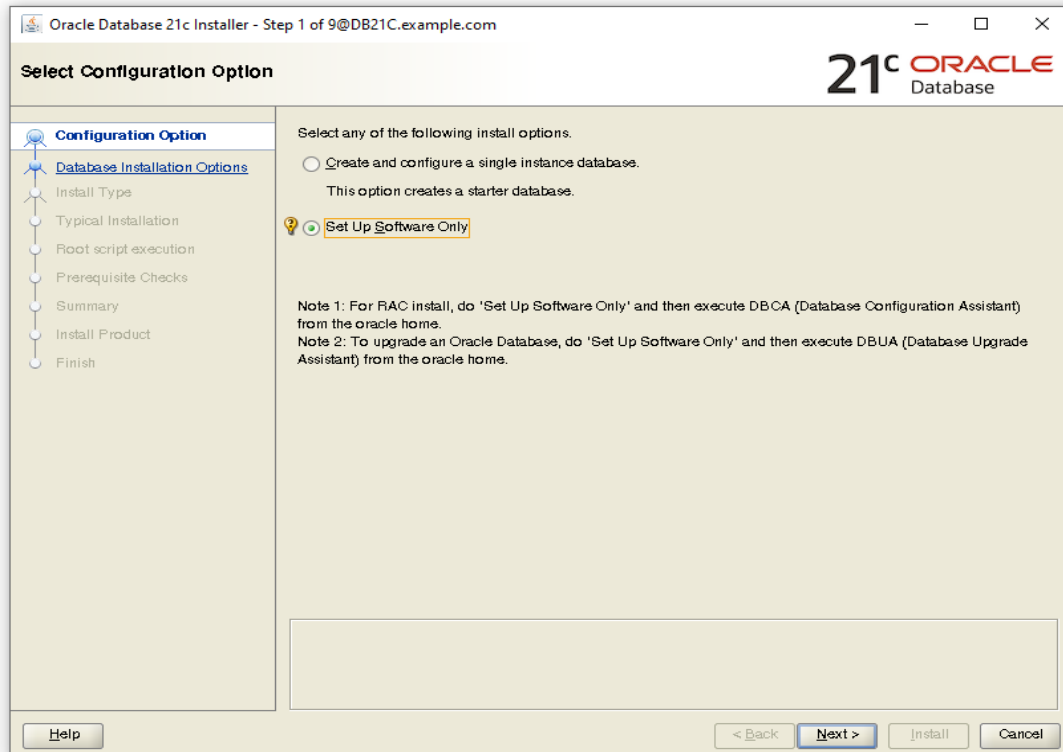
### Step-4 Unzip 21c Software Binaries and installation

```
[oracle@DB21C tmp]$
[oracle@DB21C tmp]$ pwd
/tmp
[oracle@DB21C tmp]$ ls -ltr *.zip
-rw-r--r--. 1 oracle oinstall 3109225519 Aug 13 22:32 LINUX.X64_213000_db_home.zip
[oracle@DB21C tmp]$ unzip -q LINUX.X64_213000_db_home.zip -d /u01/app/oracle/product/21.0.0/db_1/
[oracle@DB21C tmp]$ █
```

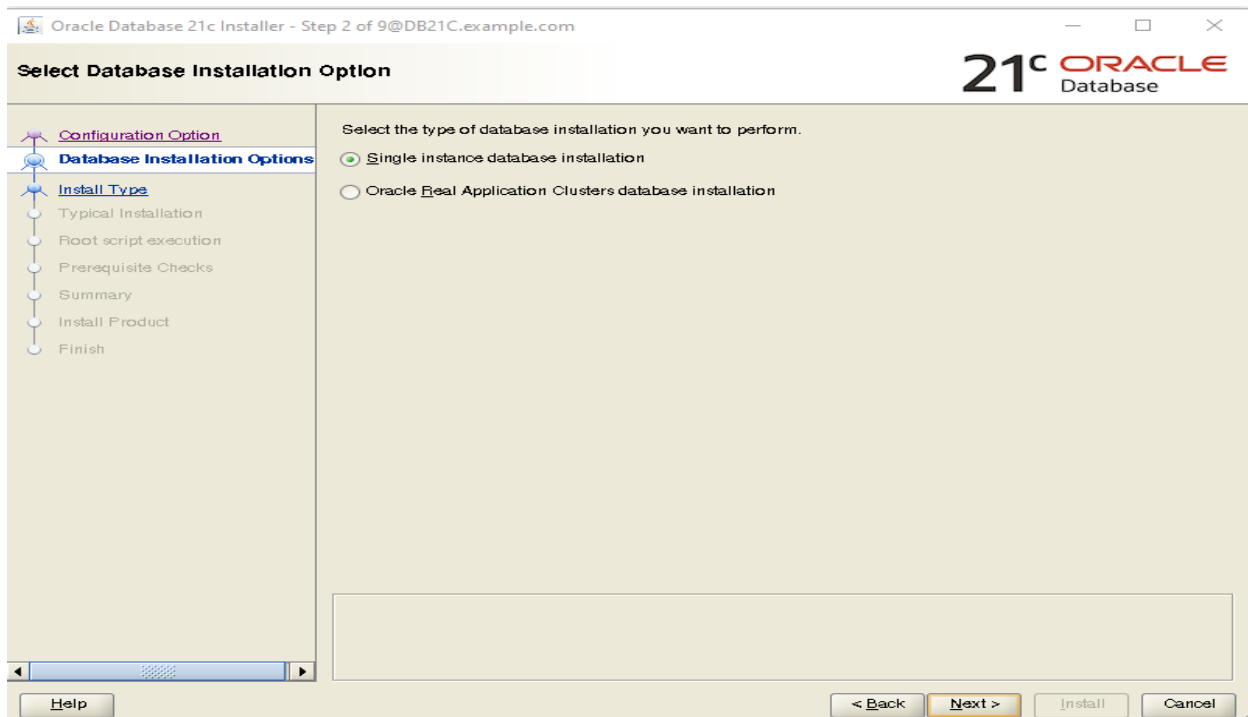
Go to **ORACLE\_HOME** location and execute **runInstaller**

```
[oracle@DB21C db_1]$ ./runInstaller
```

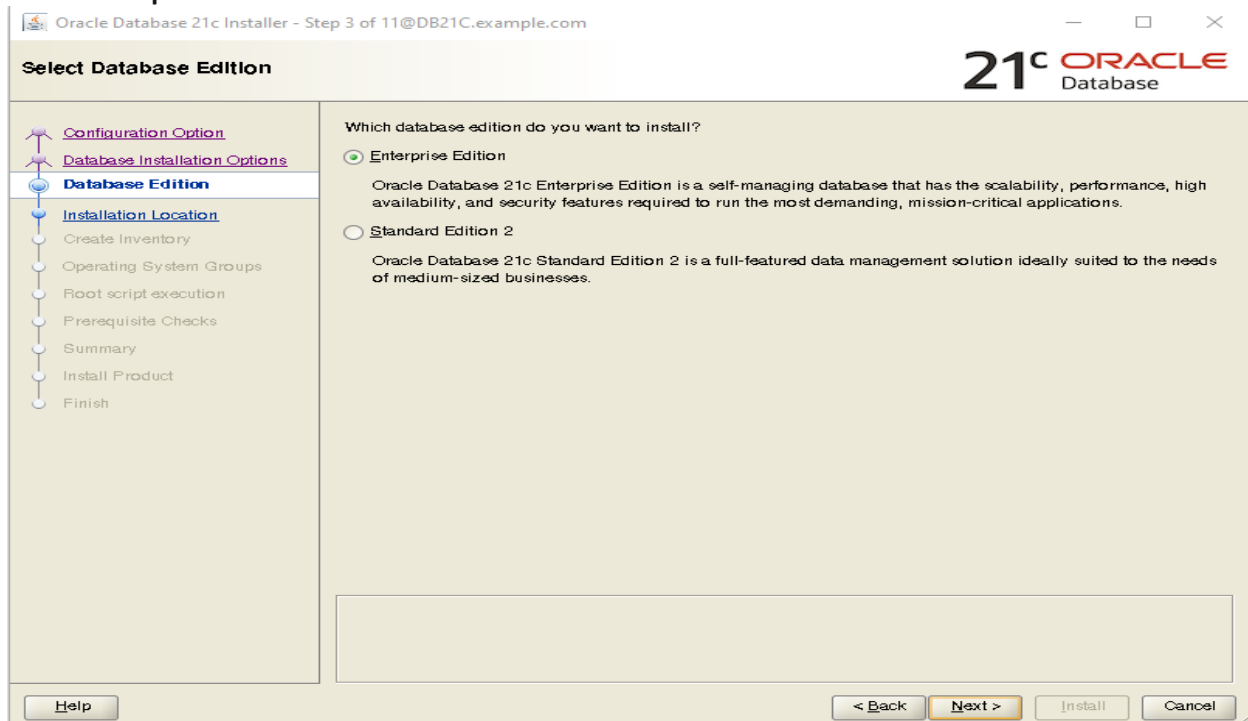
Select **Setup Software Only** and click next



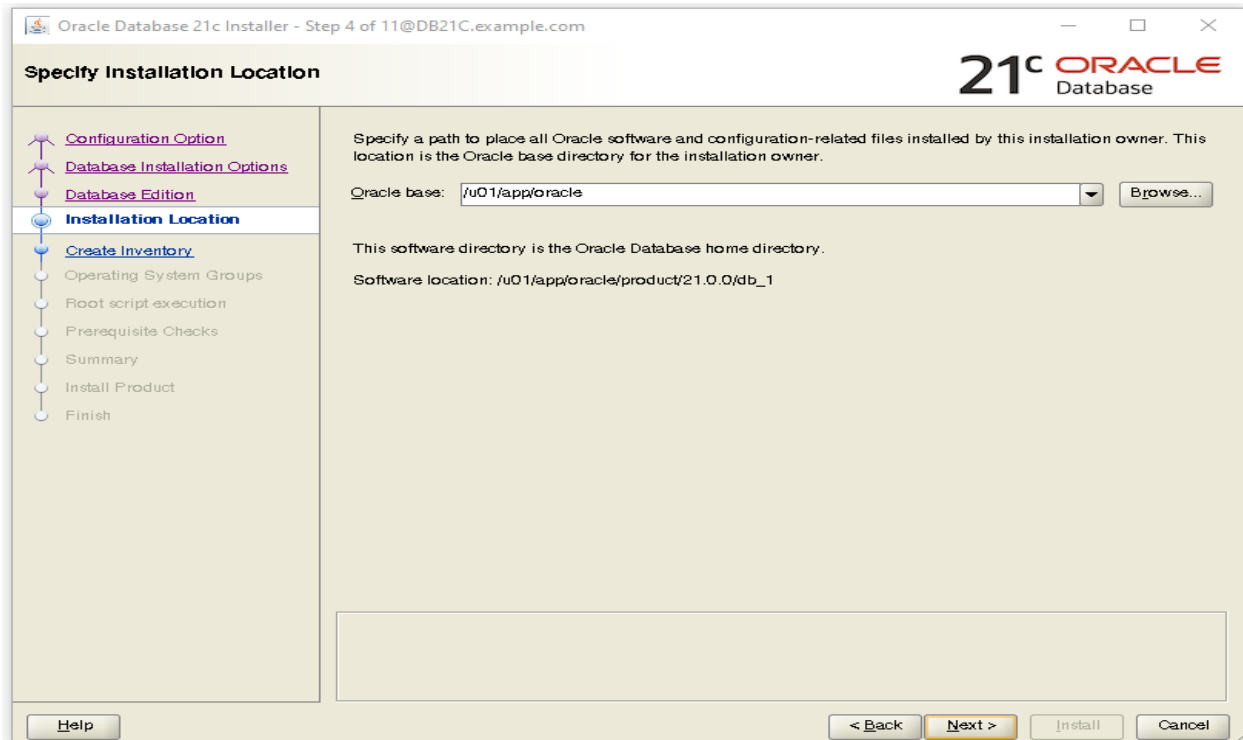
Select **single instance database installation** and click next



Select **Enterprise Edition** and click next



Choose **oracle base location** and click next



Select **oracle Inventory Location** and specify the **Oinstall** Group for **OralInventory Group Name**

Oracle Database 21c Installer - Step 5 of 11@DB21C.example.com

## Create Inventory

You are starting your first installation on this host. Specify a directory for installation metadata files (for example, install log files). This directory is called the "inventory directory". The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory for each product typically requires 150 kilobytes of disk space.

Inventory Directory:

Specify an operating system group whose members have write permission to the inventory directory (oralInventory).

oralInventory Group Name:

Next screen automatically takes **OS group** name from which we created for oracle user

Oracle Database 21c Installer - Step 6 of 11@DB21C.example.com

## Privileged Operating System groups

SYS privileges are required to create a database using operating system (OS) authentication. Membership in OS Groups grants the corresponding SYS privilege, eg. membership in OSDBA grants the SYSDBA privilege.

Database Administrator (OSDBA) group:

Database Operator (OSOPER) group (Optional):

Database Backup and Recovery (OSBACKUPDBA) group:

Data Guard administrative (OSDGDBA) group:

Encryption Key Management administrative (OSKMDBA) group:

Real Application Cluster administrative (OSRACDBA) group:

Click **next**

Oracle Database 21c Installer - Step 7 of 11@DB21C.example.com

## Root script execution configuration

During the software configuration, certain operations have to be performed as "root" user. You can choose to have the installer perform these operations automatically by specifying inputs for one of the options below. The input specified will also be used by the installer to perform additional prerequisite checks.

☐ Automatically run configuration scripts

☒ Use "root" user credential

Password :

☐ Use sudo

Program path :  

User name :

Password :

Click **install**

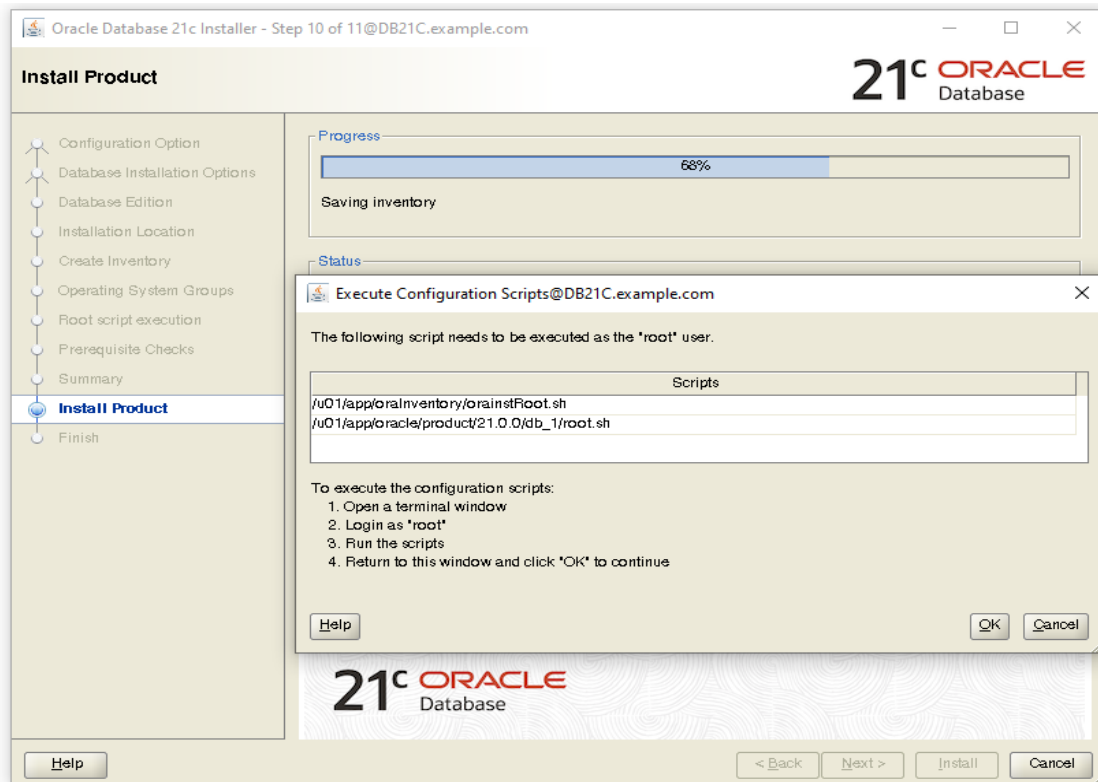
Oracle Database 21c Installer - Step 9 of 11@DB21C.example.com

## Summary

**Oracle Database 21c Installer**

- Global settings**
  - Database edition: Enterprise Edition (Set Up Software Only) [\[Edit\]](#)
  - Oracle base: /u01/app/oracle [\[Edit\]](#)
  - Software location: /u01/app/oracle/product/21.0.0/db\_1
  - Privileged Operating System groups: dba (OSDBA), oper (OSOPER), dba (OSBACKUPDBA), dba (OS...
  - Root script execution configuration: Manual configuration [\[Edit\]](#)
- Inventory information**
  - Inventory location: /u01/app/oralInventory [\[Edit\]](#)
  - oraInventory group: oinstall [\[Edit\]](#)

Login to **Root** user and execute **both scripts**, once script executed successfully then click on **OK**



```
[root@DB21C ~]#  
[root@DB21C ~]# /u01/app/oraInventory/orainstRoot.sh  
Changing permissions of /u01/app/oraInventory.  
Adding read,write permissions for group.  
Removing read,write,execute permissions for world.  
  
Changing groupname of /u01/app/oraInventory to oinstall.  
The execution of the script is complete.  
[root@DB21C ~]# /u01/app/oracle/product/21.0.0/db_1/root.sh  
Performing root user operation.
```

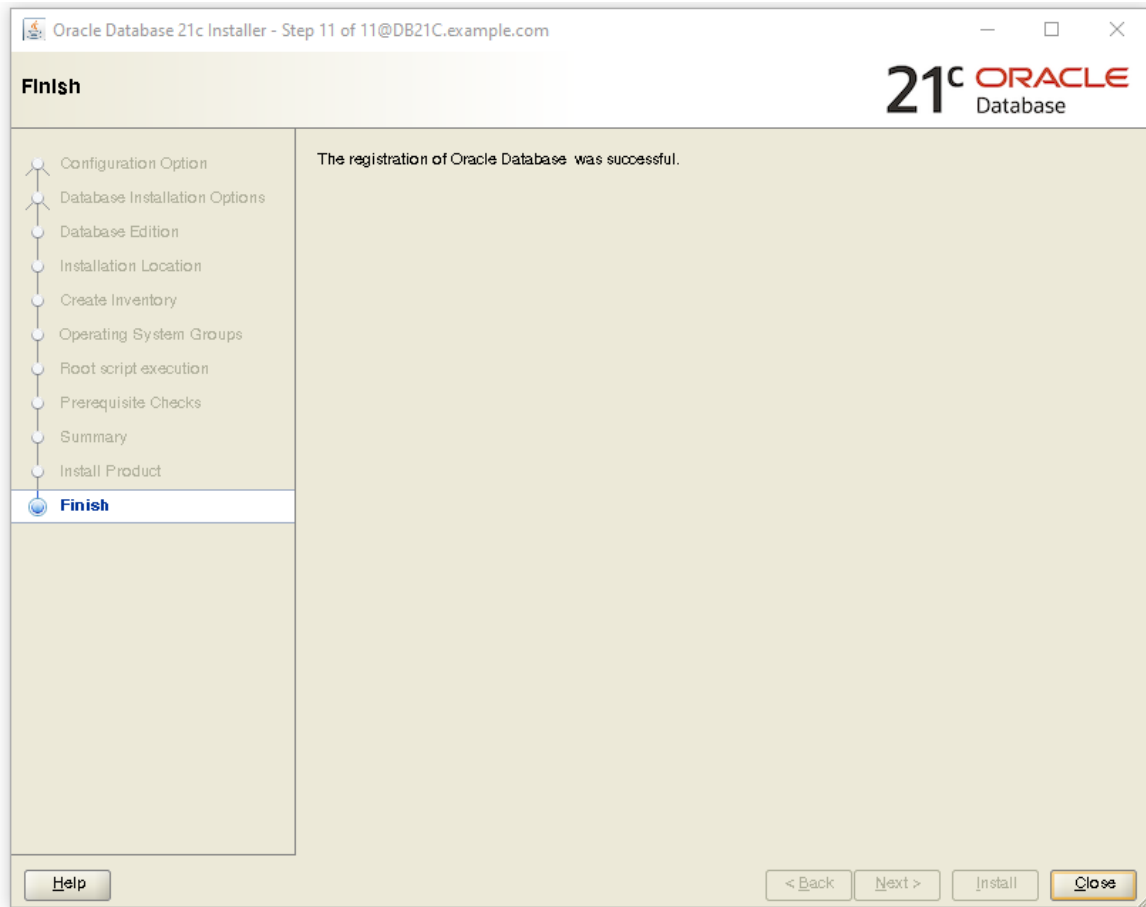
```
The following environment variables are set as:  
ORACLE_OWNER= oracle  
ORACLE_HOME= /u01/app/oracle/product/21.0.0/db_1
```

```
Enter the full pathname of the local bin directory: [/usr/local/bin]:  
Copying dbhome to /usr/local/bin ...  
Copying oraenv to /usr/local/bin ...  
Copying coraenv to /usr/local/bin ...
```

```
Creating /etc/oratab file...  
Entries will be added to the /etc/oratab file as needed by  
Database Configuration Assistant when a database is created  
Finished running generic part of root script.  
Now product-specific root actions will be performed.  
[root@DB21C ~]# █
```



Click on **Close**



```
[oracle@DB21C db_1]$ ./runInstaller
Launching Oracle Database Setup Wizard...
```

The response file for this session can be found at:  
/u01/app/oracle/product/21.0.0/db\_1/install/response/db\_2021-08-14\_00-25-41AM.rsp

You can find the log of this install session at:  
/tmp/InstallActions2021-08-14\_00-25-41AM/installActions2021-08-14\_00-25-41AM.log  
Moved the install session logs to:  
/u01/app/oraInventory/logs/InstallActions2021-08-14\_00-25-41AM  
[oracle@DB21C db\_1]\$

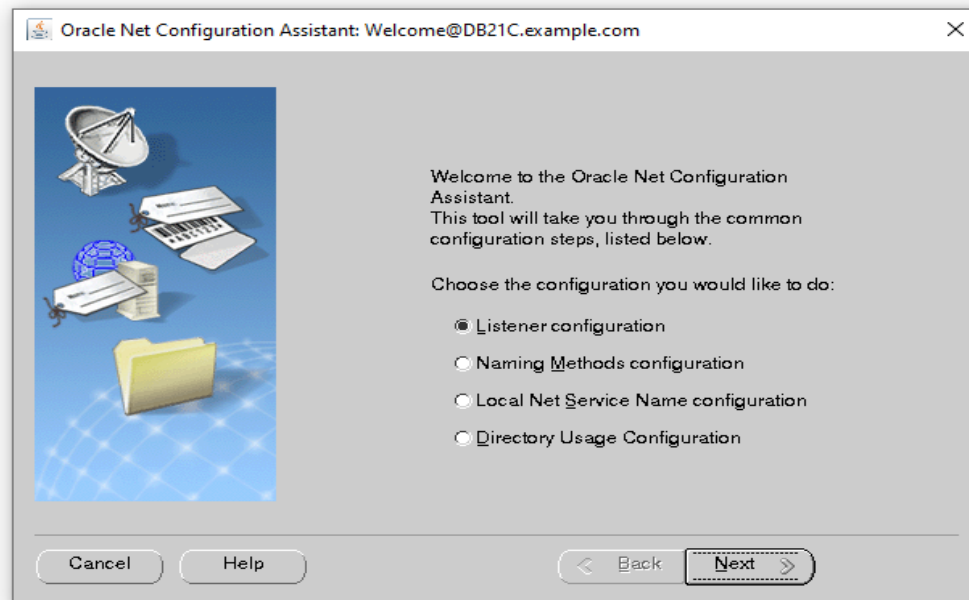
## Step-5 Set oracle user pash profile

```
[oracle@DB21C ~]$  
[oracle@DB21C ~]$ cat .bash_profile  
# .bash_profile  
  
# Get the aliases and functions  
if [ -f ~/.bashrc ]; then  
    . ~/.bashrc  
fi  
  
# User specific environment and startup programs  
# Oracle Settings  
TMP=/tmp; export TMP  
TMPDIR=$TMP; export TMPDIR  
  
ORACLE_HOSTNAME=DB21C.example.com; export ORACLE_HOSTNAME  
ORACLE_UNQNAME=DB21C; export ORACLE_UNQNAME  
ORACLE_BASE=/u01/app/oracle; export ORACLE_BASE  
ORACLE_HOME=$ORACLE_BASE/product/21.0.0/db_1; export ORACLE_HOME  
ORACLE_SID=DB21C; export ORACLE_SID  
PATH=/usr/sbin:$PATH; export PATH  
PATH=$ORACLE_HOME/bin:$PATH; export PATH  
LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib; export LD_LIBRARY_PATH  
CLASSPATH=$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib; export CLASSPATH  
[oracle@DB21C ~]$  
[oracle@DB21C ~]$ . .bash_profile  
[oracle@DB21C ~]$ echo $ORACLE_SID  
DB21C  
[oracle@DB21C ~]$ █
```

## Step-6 Configure listener and network service

Create **Listener** for database configuration

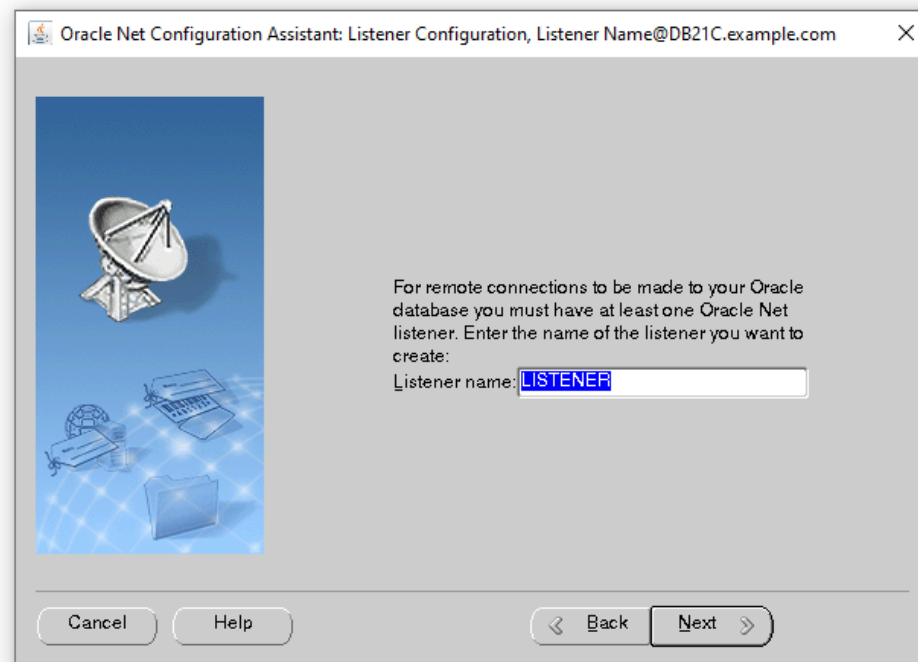
```
[oracle@DB21C ~]$ netca
```



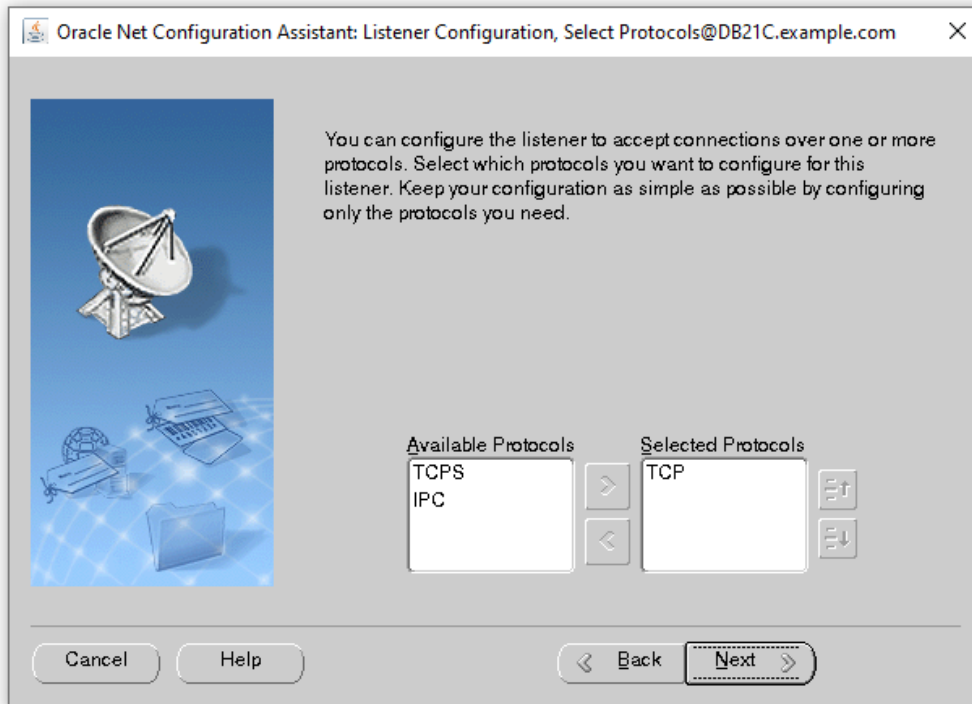
Select **Add**



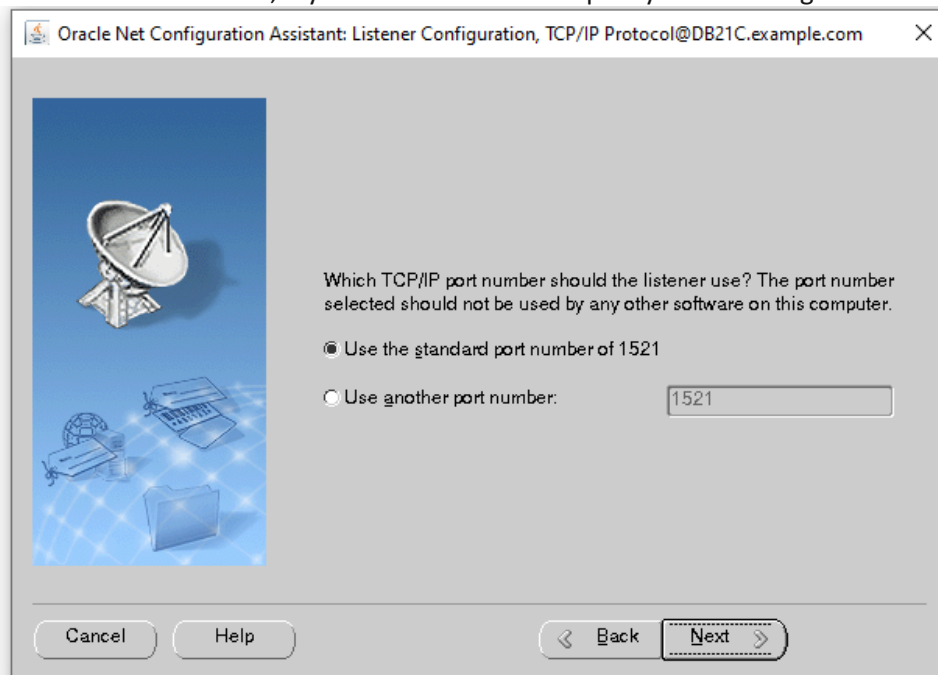
Keep default **Listener** name, if you want you change it



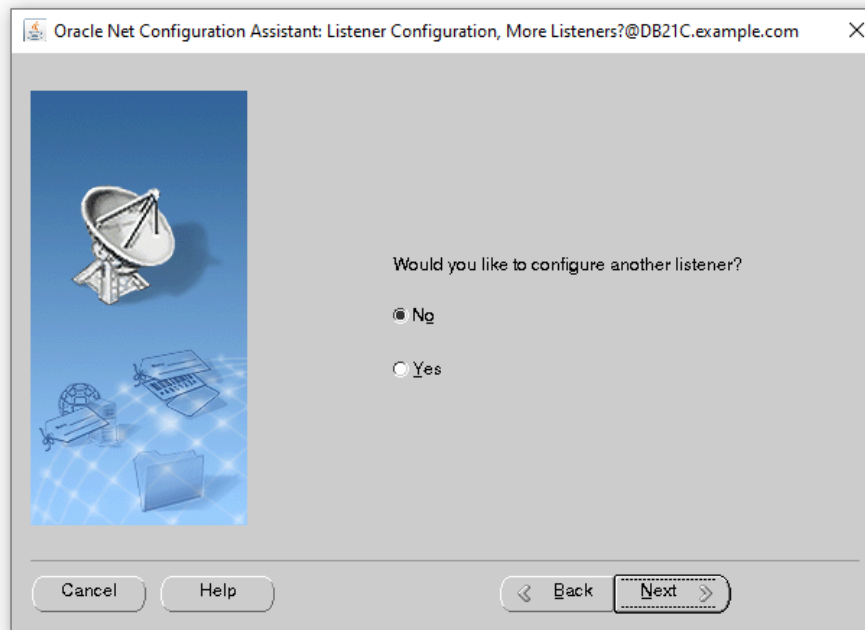
Click on **next**



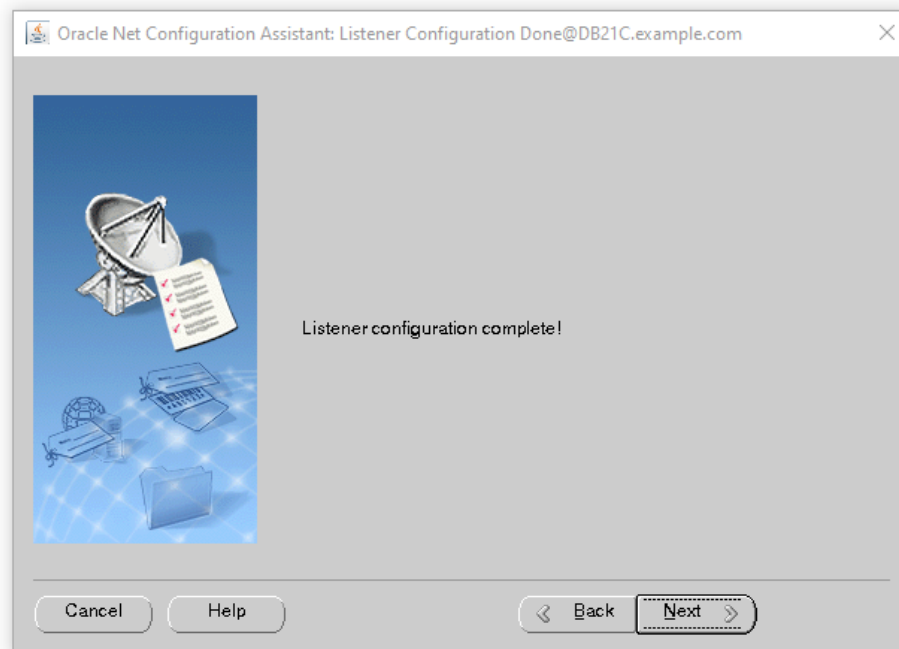
Set the **port** number for **listener**, if you don't want default port you can change it



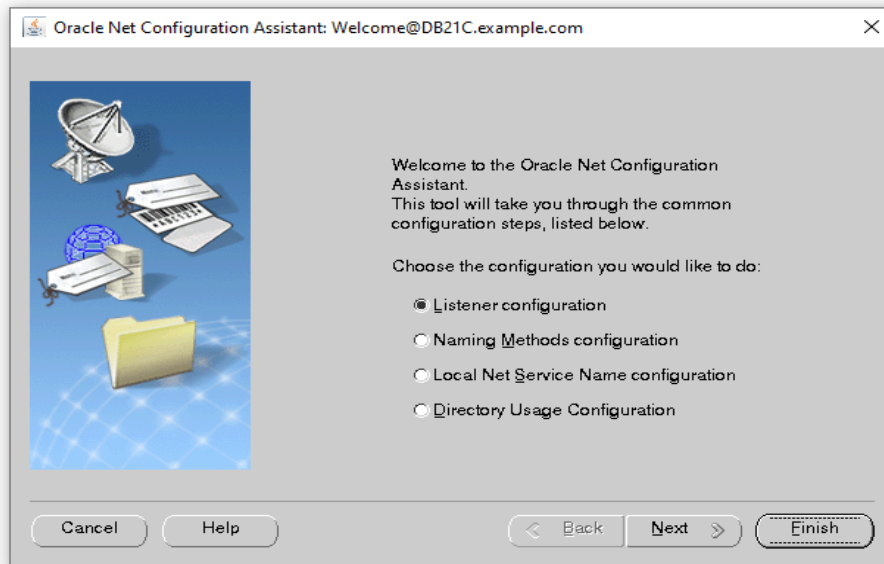
Select **No** and click **next**



Click on **next**



Click on **Finish**

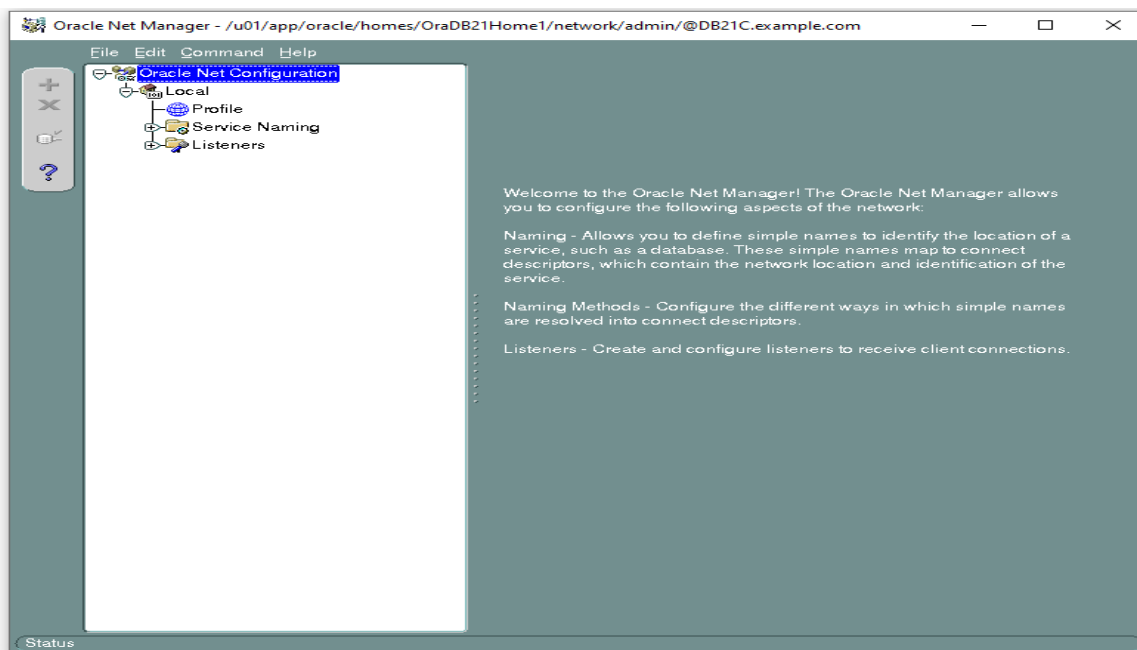


```
[oracle@DB21C ~]$  
[oracle@DB21C ~]$ netca
```

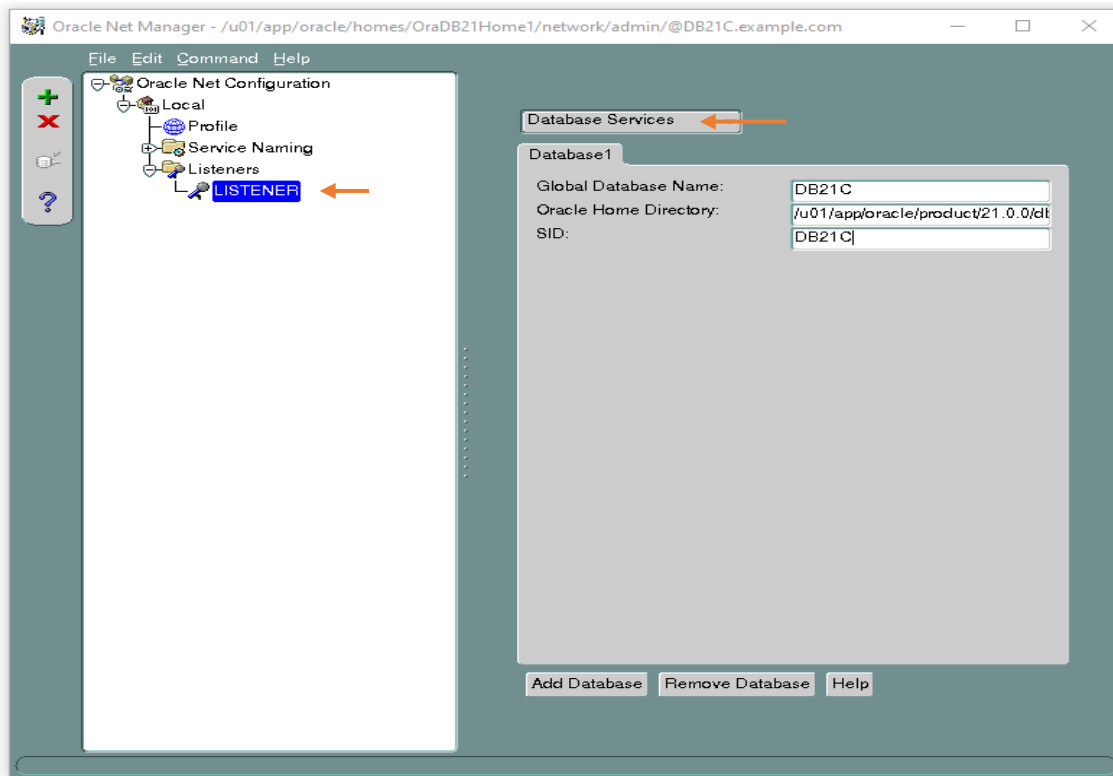
```
Oracle Net Services Configuration:  
Configuring Listener:LISTENER  
Listener configuration complete.  
Oracle Net Listener Startup:  
Running Listener Control:  
/u01/app/oracle/product/21.0.0/db_1/bin/lsnrctl start LISTENER  
Listener Control complete.  
Listener started successfully.  
Oracle Net Services configuration successful. The exit code is 0  
[oracle@DB21C ~]$
```

Create **Service** for Database

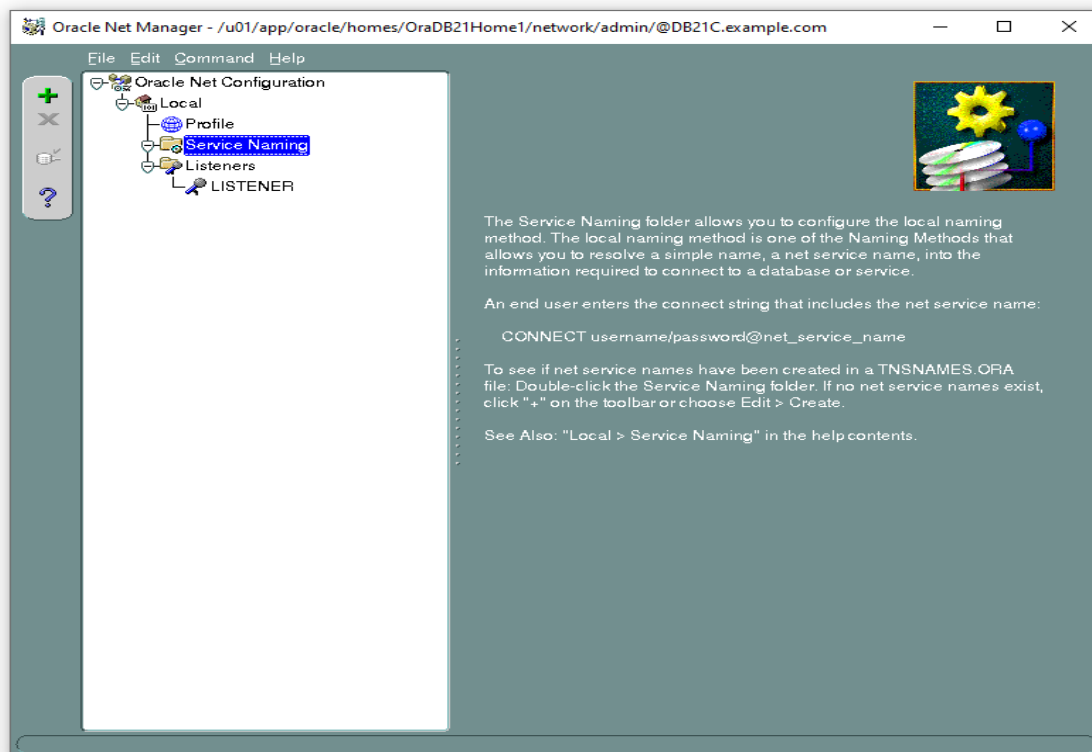
```
[oracle@DB21C ~]$ netmgr
```



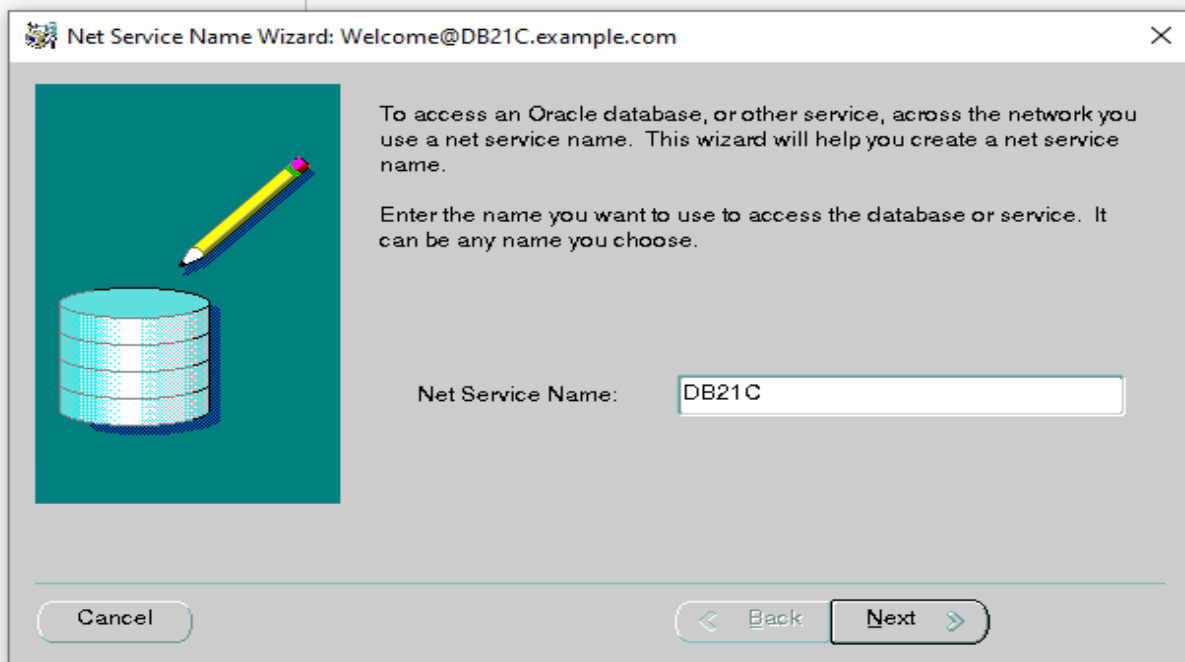
Click on **listener**, select **database service** and mention **database details**



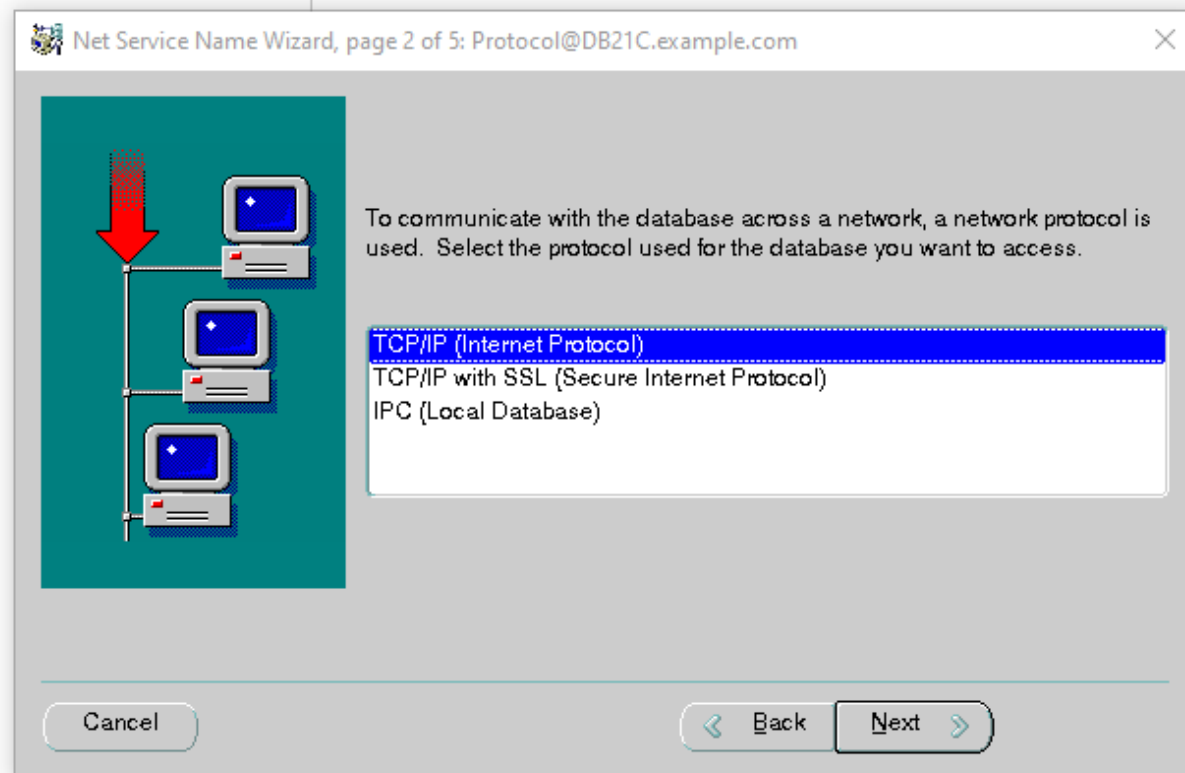
Click on **Service Naming**



Enter **service name**, using same **service name** you will access database



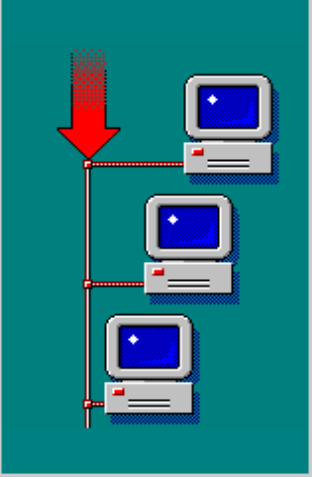
Click on **Next**





Enter **Host Name** and **Port Number**

Net Service Name Wizard, page 3 of 5: Protocol Settings@DB21C.example.com



To communicate with the database using the TCP/IP protocol, the database computer's host name is required. Enter the TCP/IP host name for the computer where the database is located.

Host Name:

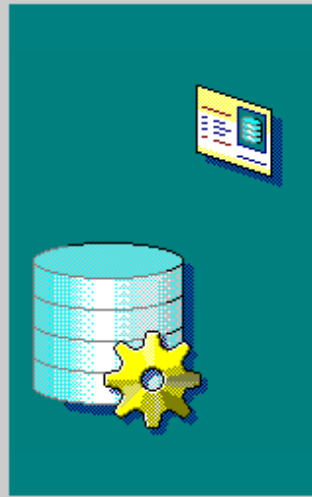
A TCP/IP port number is also required. The port number for Oracle databases is usually 1521. You should not normally need to specify a different port number.

Port Number:

Cancel Back Next

Enter **Service Name**

Net Service Name Wizard, page 4 of 5: Service@DB21C.example.com



Each Oracle database or service has a service name. An Oracle database's service name is normally its global database name. Enter the service name of the database or other service you want to access.

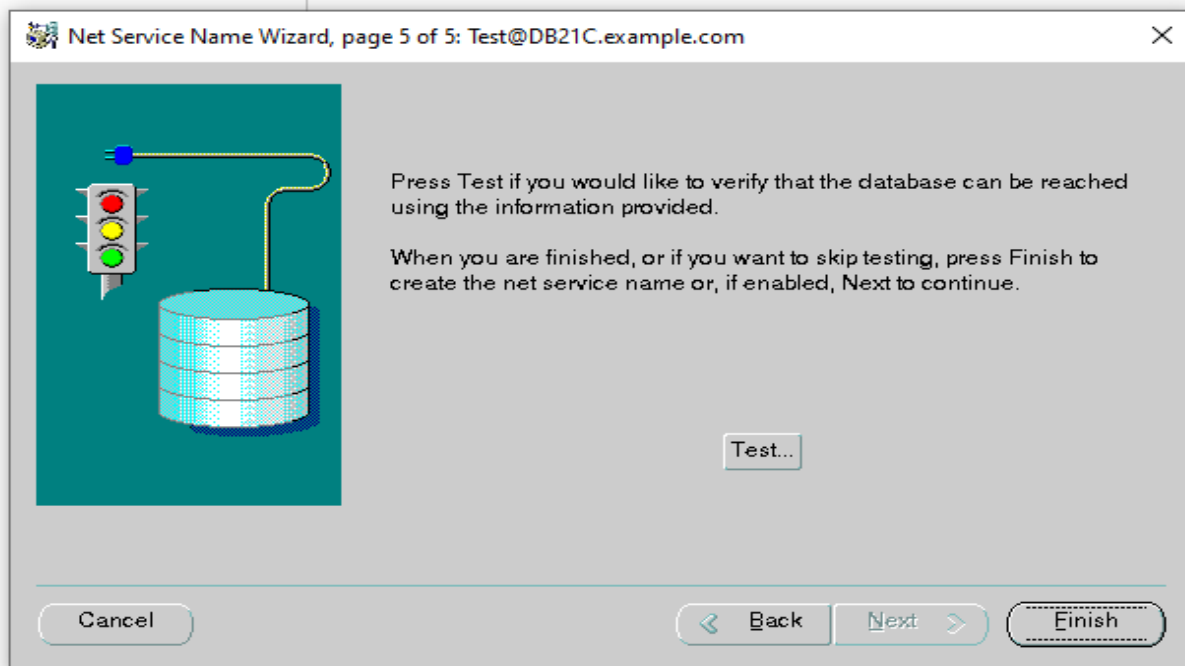
Service Name:

Optionally, you can choose if you want a shared, dedicated or pooled server database connection. The default is to let the database decide.

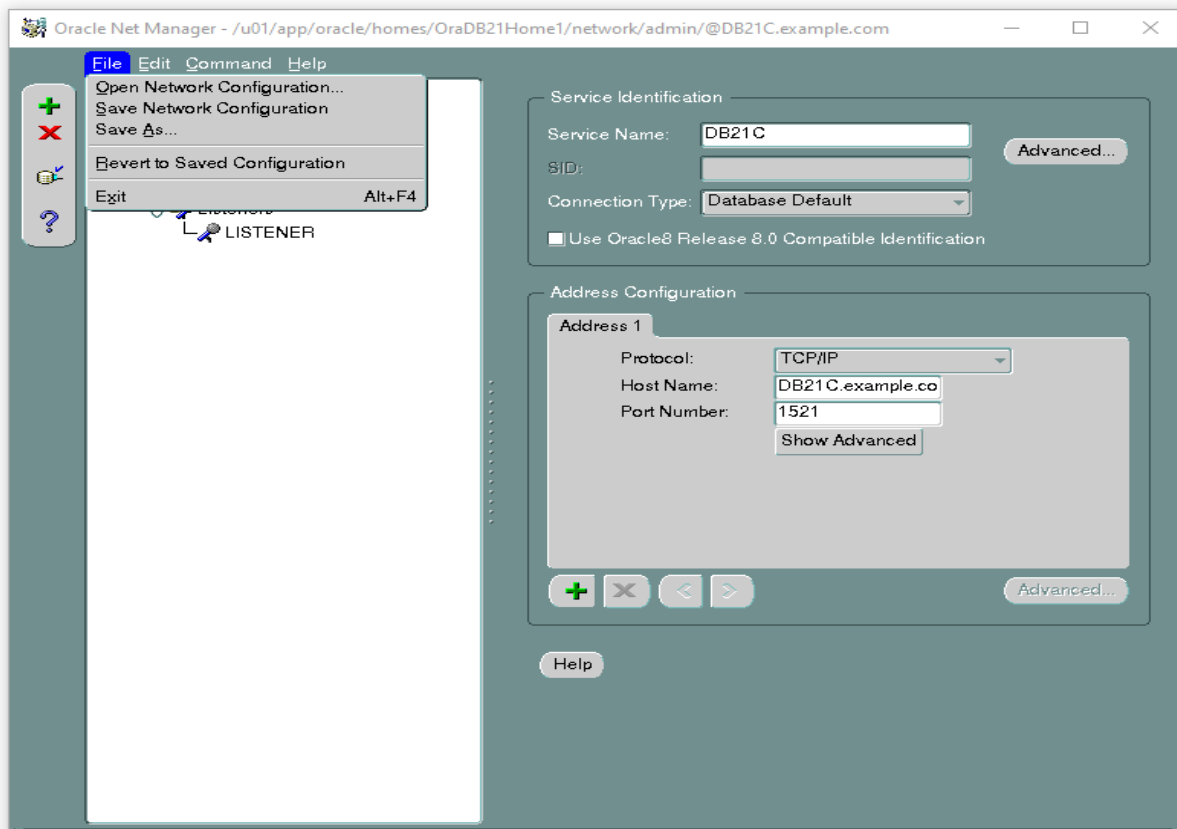
Connection Type:

Cancel Back Next

Click on **Finish**



Save **network configuration** and **exit**

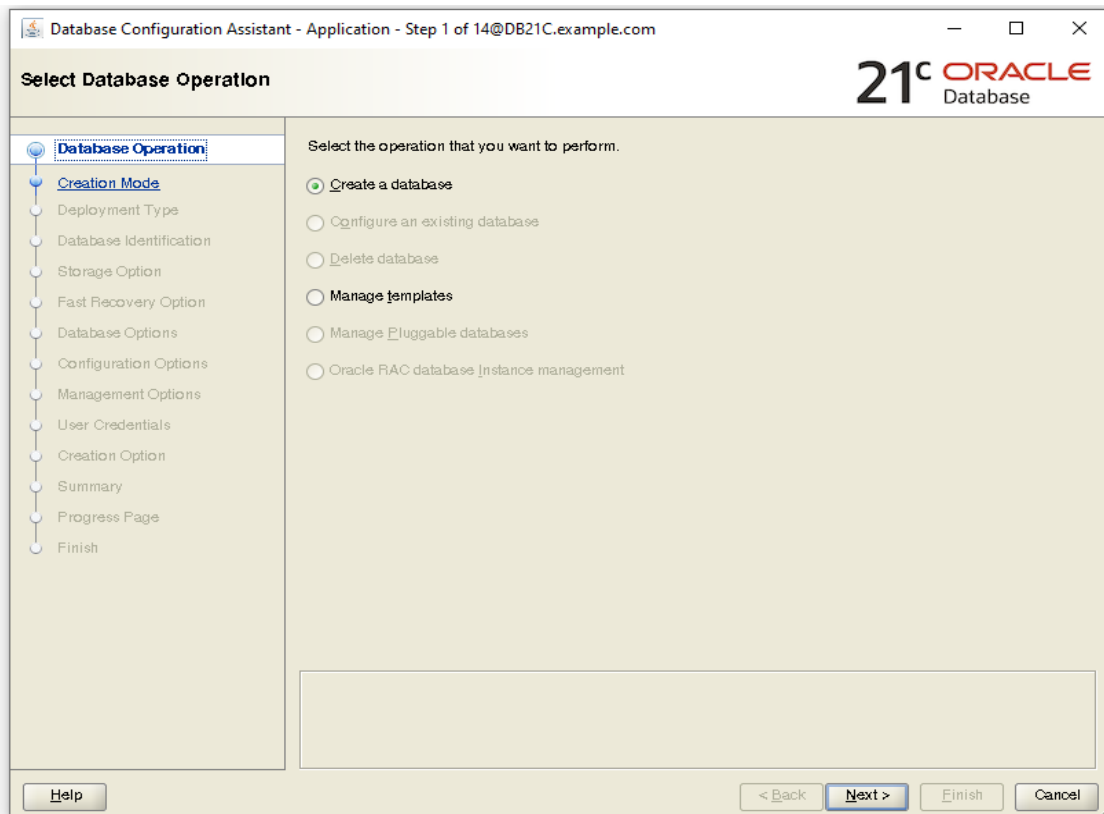


```
[oracle@DB21C samples]$  
[oracle@DB21C samples]$ tns ping DB21C  
  
TNS Ping Utility for Linux: Version 21.0.0.0.0 - Production on 14-AUG-2021 01:11:54  
  
Copyright (c) 1997, 2021, Oracle. All rights reserved.  
  
Used parameter files:  
  
Used TNSNAMES adapter to resolve the alias  
Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = DB21C.example.com)(PORT = 1521))) (CONNECT_DATA = (SERVICE_NAME = DB21C)))  
OK (0 msec)  
[oracle@DB21C samples]$
```

## Step-7 Install database Using DBCA

[oracle@DB21C ~]\$ dbca

Select **Create Database**



Select **Advance Configuration** and click **next**

Database Configuration Assistant - Create a database - Step 2 of 14@DB21C.example.com

**Select Database Creation Mode**

21<sup>c</sup> 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

☐ Typical configuration

Global database name: orcl.example.com

Storage type: File System

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

Fast Recovery Area (FRA): {ORACLE\_BASE}/fast\_recovery\_area/{DB\_UNIQUE\_NAME} Browse...

Database character set: AL32UTF8 - Unicode UTF-8 Universal character set

Administrative password:

Confirm password:

☒ Create as Container database

Pluggable database name:

☒ **Advanced configuration**

Help < Back Next > Finish Cancel

Select **General Purpose Database** option

Database Configuration Assistant - Create a database - Step 3 of 14@DB21C.example.com

**Select Database Deployment Type**

21<sup>c</sup> 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 type of database you want to create.

Database type: Oracle Single Instance database

Database Management Policy: Automatic

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

Template location: /u01/app/oracle/product/21.0.0/db\_1/assistants/dbca/templates Change...

Help < Back Next > Finish Cancel

Enter **Database SID**, **Global Database Name** and **Pluggable Database**

Database Configuration Assistant - Create a database - Step 4 of 14@DB21C.example.com

**Specify Database Identification Details**

21<sup>c</sup> ORACLE Database

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: DB21C

SID: DB21C

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: 1

PDB name: PDB1

Help < Back Next > Finish Cancel

---

**INFORMATION:** 21C onwards container database option not available, you have to create at least one pluggable database.

---

Click on **next**

Database Configuration Assistant - Create 'DB21C' database - Step 5 of 14

**Select Database Storage Option**

21<sup>c</sup> 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

Click on **Enable archiving**

Database Configuration Assistant - Create 'DB21C' database - Step 6 of 14

**Select Fast Recovery Option**

21<sup>c</sup> 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

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\_NAME} Browse...

Fast Recovery Area size: 13896 MB

☒ Enable archiving Edit archive mode parameters...

Help < Back Next > Finish Cancel

## Enter Archive log format and archive Destination

Database Configuration Assistant - Create 'DB21C' database - Step 6 of 14

Select Fast Recovery Option

21<sup>c</sup> ORACLE Database

Archive mode parameters@DB21C.example.com

☒ Automatic archiving

Archive log file format: %t\_%s\_%r.arc

Archive log destination may be specified below. It is recommended that archive log files be written to multiple locations spread across different disks. If archive log destination is not specified, Fast Recovery Area location will be used for archive log files.

	Archive log destinations
1	/u01/archive1
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

OK Cancel

Help < Back Next > Finish Cancel

Next screen automatically displays the running listener, if listener Not created you create it or skip it

Database Configuration Assistant - Create 'DB21C' database - Step 7 of 14

Specify Network Configuration Details

21<sup>c</sup> ORACLE Database

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
<input checked="" type="checkbox"/>	LISTENER	1521	/u01/app/oracle/product/21.0.0/db_1	Up

☐ Create a new listener

Listener name:

Listener port:

Oracle home: /u01/app/oracle/product/21.0.0/db\_1

Help < Back Next > Finish Cancel

Click on **Next**

Database Configuration Assistant - Create 'DB21C' database - Step 8 of 15

**Select Oracle Data Vault Config Option**

Database Vault owner:  Password:  Confirm password:

Create a separate account manager

Account manager:  Password:  Confirm password:

Configure Oracle Label Security

Configure Oracle Label Security with OJD

< Back Next > Finish Cancel

Keep all setting as it is and click **next**

Database Configuration Assistant - Create 'DB21C' database - Step 9 of 15

**Specify Configuration Options**

Memory Sizing Character sets Connection mode

Use Automatic Shared Memory Management

SGA size: 1124 MB PGA size: 375 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: 1499 MB 39%

< Back Next > Finish Cancel



Unclick on **EM database express** option and click next

Database Configuration Assistant - Create 'DB21C' database - Step 10 of 15

Specify Management Options

Specify the management options for the database.

☐ **Configure Enterprise Manager (EM) database express**

EM database express port: 5500

☐ Configure EM database express port as global port

☐ Register with Enterprise Manager (EM) cloud control

OMS host:

OMS port:

EM admin username:

EM admin password:

< Back Next > Finish Cancel

Enter **Administrator** password

Database Configuration Assistant - Create 'DB21C' database - Step 11 of 15

Specify Database User Credentials

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

☐ Use different administrative passwords

Password Confirm password

SYS

SYSTEM

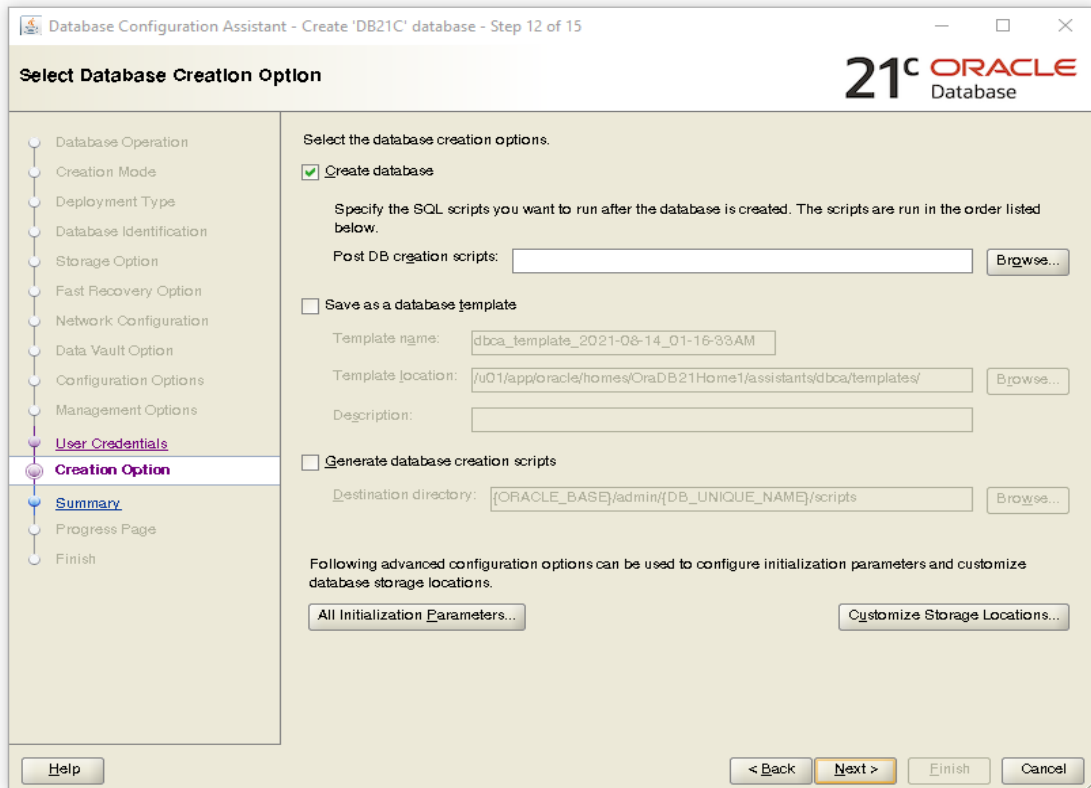
PDBADMIN

☒ Use the same administrative password for all accounts

Password: Confirm password:

< Back Next > Finish Cancel

Click on **Next**



Database Configuration Assistant - Create 'DB21C' database - Step 12 of 15

**Select Database Creation Option**

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**

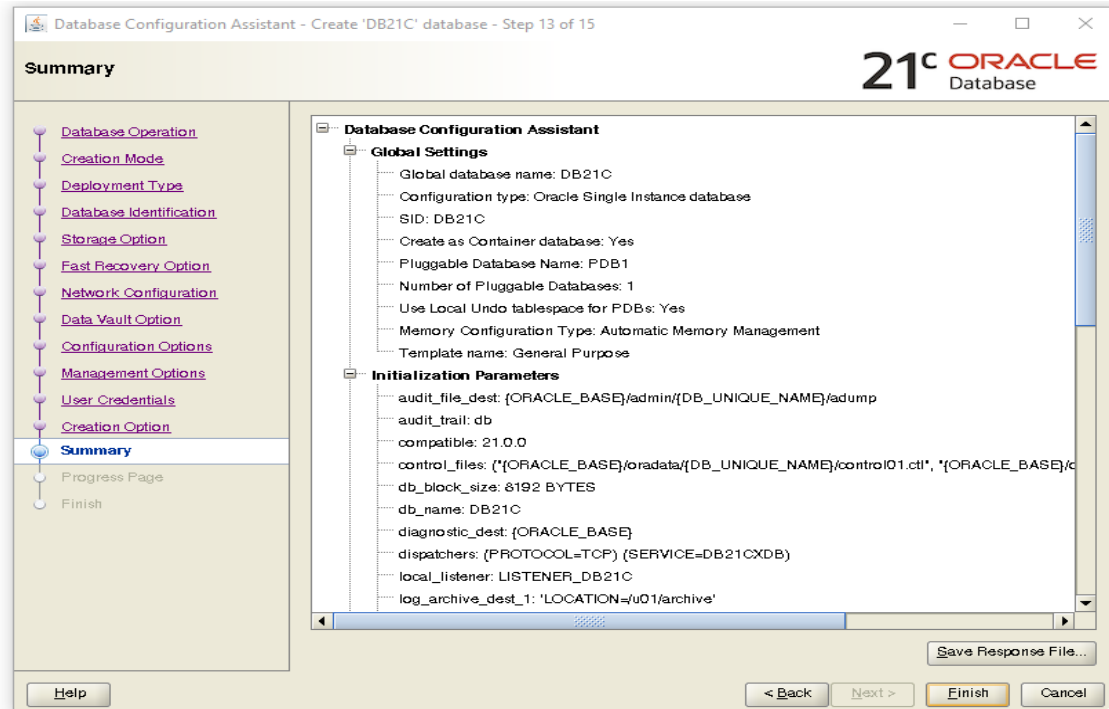
Destination directory:  [Browse...](#)

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](#)

Click on **Finish**



Database Configuration Assistant - Create 'DB21C' database - Step 13 of 15

**Summary**

Database Configuration Assistant

**Global Settings**

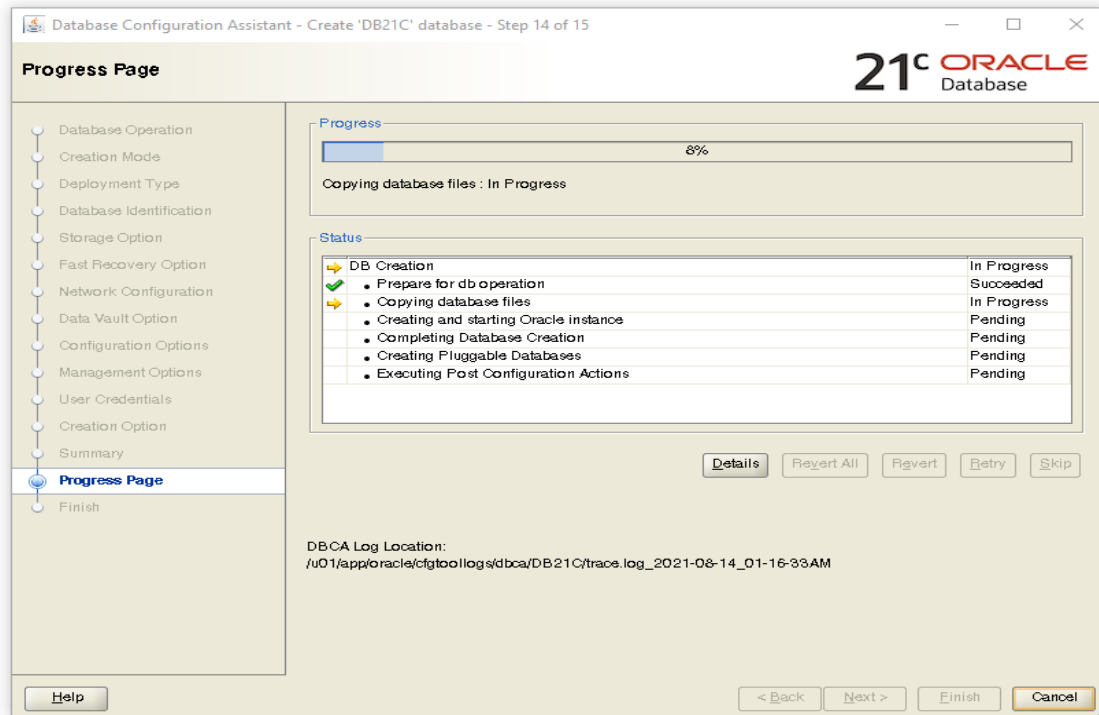
- Global database name: DB21C
- Configuration type: Oracle Single Instance database
- SID: DB21C
- Create as Container database: Yes
- Pluggable Database Name: PDB1
- Number of Pluggable Databases: 1
- Use Local Undo tablespaces for PDBs: Yes
- Memory Configuration Type: Automatic Memory Management
- Template name: General Purpose

**Initialization Parameters**

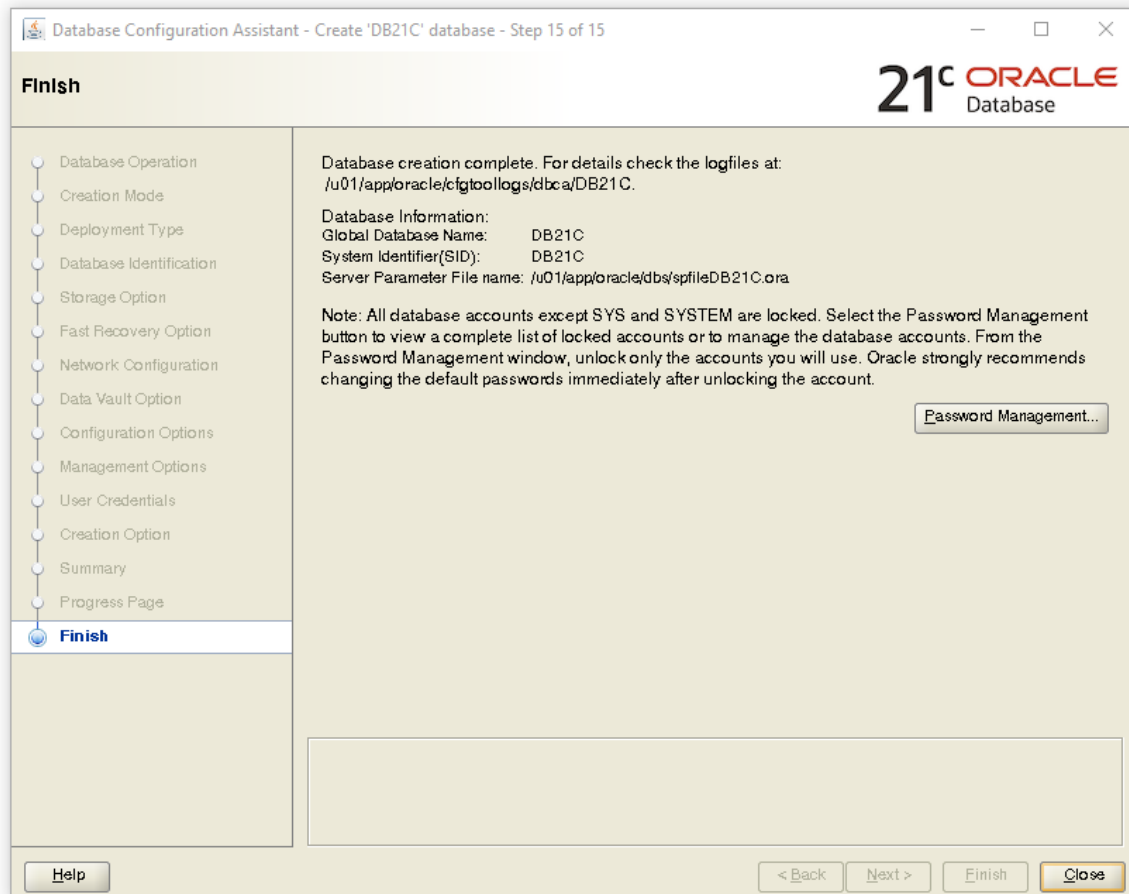
- audit\_file\_dest: {ORACLE\_BASE}/admin/{DB\_UNIQUE\_NAME}/adump
- audit\_trail: db
- compatible: 21.0.0
- control\_files: ('{ORACLE\_BASE}/oradata/{DB\_UNIQUE\_NAME}/control01.ctl', '{ORACLE\_BASE}/oradata/{DB\_UNIQUE\_NAME}/control02.ctl')
- db\_block\_size: 8192 BYTES
- db\_name: DB21C
- diagnostic\_dest: {ORACLE\_BASE}
- dispatchers: (PROTOCOL=TCP) (SERVICE=DB21CXDB)
- local\_listener: LISTENER\_DB21C
- log\_archive\_dest\_1: 'LOCATION=/u01/archive'

[Save Response File...](#)

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



Click on **Close**



## Step-8 Validation

```
[oracle@DB21C ~]$  
[oracle@DB21C ~]$ sqlplus  
  
SQL*Plus: Release 21.0.0.0.0 - Production on Sat Aug 14 01:41:29 2021  
Version 21.3.0.0.0  
  
Copyright (c) 1982, 2021, Oracle. All rights reserved.  
  
Enter user-name: /as sysdba  
  
Connected to:  
Oracle Database 21c Enterprise Edition Release 21.0.0.0.0 - Production  
Version 21.3.0.0.0  
  
SQL> select banner from v$version;  
  
BANNER  
-----  
Oracle Database 21c Enterprise Edition Release 21.0.0.0.0 - Production  
  
SQL> █
```