Cisco IoT Field Network Director—Oracle DB Installation and Upgrade Guide

First Published: 2021-11-30

Last Modified: 2024-07-05

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

© 2024 Cisco Systems, Inc. All rights reserved.

CONTENTS

CHAPTER 1 **Overview** 1

Organization 1

Conventions 1

CHAPTER 2 **Install Oracle DB 19c** 3

Pre-Installation Steps 3

Setting Up a Virtual Machine 3

Oracle Prerequisites 4

Install Oracle 19c 8

Run Installer 9

Configuring Oracle DB with FND 17

Create, Configure, and Start CG-NMS DB 17

Install CGMS RPM 20

CHAPTER 3 **Upgrade from Oracle 18c to 19c** 21

Minimum Hardware Requirements 21

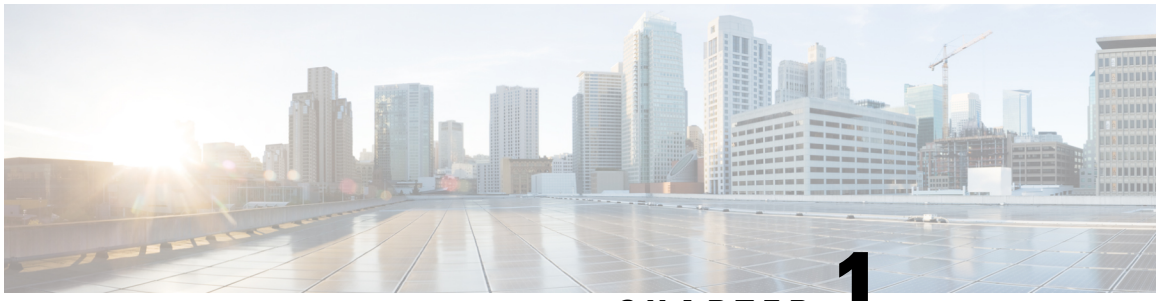
Upgrade Steps 22

Post Upgrade Steps 33

CHAPTER 4 **Oracle Patch Installation** 35

Oracle Patch Installation (Optional) 35

Upgrading OPatch 39



CHAPTER 1

Overview

This document provides steps for Oracle 19c database installation and upgrade from 18c to 19c.

- Organization, on page 1
- Conventions, on page 1

Organization

This guide includes the following sections.

Conventions	Provides details on the use of bold and italic keywords, brackets, and parentheses within the document.
Install Oracle DB 19c, on page 3	Step-by-step instructions for installing Oracle 19c database software.
Upgrade from Oracle 18c to 19c, on page 21	Step-by-step instructions for upgrading the Oracle database from 18c to 19c.
Oracle Patch Installation, on page 35	Step-by-step Oracle patch installation instructions.

Conventions

This document uses the following conventions.

Conventions	Indication
bold font	Commands and keywords and user-entered text appear in bold font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.

Conventions	Indication
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
courier font	Terminal sessions and information the system displays appear in courier font.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

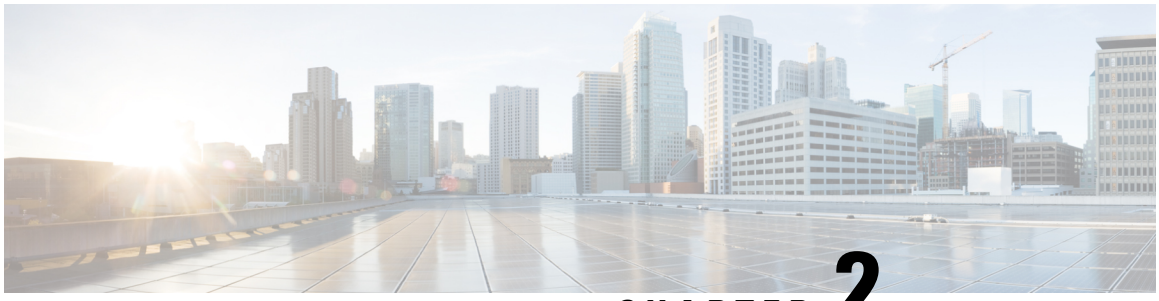
Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution: Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning: IMPORTANT SAFETY INSTRUCTIONS

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS



CHAPTER 2

Install Oracle DB 19c

This section provides installation steps for Oracle DB 19c.

- Pre-Installation Steps, on page 3
- Install Oracle 19c, on page 8
- Run Installer, on page 9
- Configuring Oracle DB with FND, on page 17

Pre-Installation Steps

Ensure that the following prerequisites are completed before starting the Oracle 19c installation on RHEL 8.x.

- Setting Up a Virtual Machine, on page 3
- Oracle Prerequisites, on page 4

Setting Up a Virtual Machine

Before you begin

Hardware requirements for the virtual machine:

Hard Disk	200 GB (Minimum 120 GB)
Memory	16 GB (Minimum 4 GB)
vCPU	4

Step 1 Deploy the virtual machine with RHEL ISO file (example: `rhel-8.5-x86_64-dvd.iso`).

Step 2 Run the following commands to activate YUM or DNF from the **local repository**. For more information, see Configuring YUM.

a) To mount the CD-ROM ISO contents on an ESXi VM, ensure that the Datastore_ISO_File is selected and in connected state in the Edit_Settings of the VM instance (Mounting CD-ROM on CentOS).

b) `mount /dev/cdrom /mnt`

c) `mkdir /Package`

d) `cp -rv /mnt/* /Package`

e) `cp -v /Package/media.repo /etc/yum.repos.d/rhel8.repo`

f) `chmod 644 /etc/yum.repos.d/rhel8.repo`

Add repository entries in the `/etc/yum.repos.d/rhel8.repo` file.

```
[root@fnd-rhel8-33 ~]# vim /etc/yum.repos.d/rhel8.repo
[InstallMedia-BaseOS]
name=Red Hat Enterprise Linux 8 - BaseOS
metadata_expire=-1
gpgcheck=1
enabled=1
baseurl=file:file:///Package/BaseOS/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release

[InstallMedia-AppStream]
name=Red Hat Enterprise Linux 8 - AppStream
metadata_expire=-1
gpgcheck=1
enabled=1
baseurl=file:///Package/AppStream/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
```

g) `yum clean all`

h) `subscription-manager clean`

i) `yum repolist`

j) To prevent the following message, go to **`/etc/yum/pluginconf.d/subscription-manager.conf`** and change the parameter "enabled=1" to **`"enabled=0"`**

"This system is not registered with Red Hat Subscription Management. You can use the subscription-manager to register."

```
# vim /etc/yum/pluginconf.d/subscription-manager.conf

[main]

enabled=0
```

k) Run `yum install nginx` to confirm YUM.

What to do next

Oracle Prerequisites, on page 4

Oracle Prerequisites

Before you begin

Setting Up a Virtual Machine, on page 3

Step 1 Login as a root user to create a "dba" group and "Oracle" user.

a) `groupadd dba`

b) `adduser -d /home/oracle -g dba -s /bin/bash oracle`

Step 2 Create the following directories to install the Oracle software.

a) `mkdir -p /home/oracle/app/oracle/product/19.0.0/dbhome_1`

b) `chown -R oracle:dba /home/oracle/app/oracle/product/19.0.0/dbhome_1`

c) `chmod -R 775 /home/oracle/app/oracle/product/19.0.0/dbhome_1`

Step 3 Download Oracle software.

a) Log in as a root user and save the zip file in a directory (example: `mkdir /usr/programs`, choosing the directory is your choice).

LINUX.X64_193000_db_home.zip (Oracle19.3_EntEditionLinux_x86-64).

Step 4 Manual set up to install Oracle 19c. For more information, see Manual setup instructions.

a) Add the following lines to either "`/etc/sysctl.conf`" or "`/etc/sysctl.d/98-oracle.conf`" file.

```
[root@fnd-rhel8-33 ~]# vim /etc/sysctl.conf
fs.file-max = 6815744

kernel.sem = 250 32000 100 128

kernel.shmmni = 4096

kernel.shmall = 1073741824

kernel.shmmax = 4398046511104

kernel.panic_on_oops = 1

net.core.rmem_default = 262144

net.core.rmem_max = 4194304

net.core.wmem_default = 262144

net.core.wmem_max = 1048576

net.ipv4.conf.all.rp_filter = 2

net.ipv4.conf.default.rp_filter = 2

fs.aio-max-nr = 1048576

net.ipv4.ip_local_port_range = 9000 65500
```

b) To change the current kernel parameters, run the following command, which depends on the file you edited in the above step.

```
/sbin/sysctl -p
```

(or)

```
/sbin/sysctl -p /etc/sysctl.d/98-oracle.conf
```

c) Add the following lines to the "`/etc/security/limits.d/oracle-database-preinstall-19c.conf`" file.

```
[root@fnd-rhel8-33 ~]# vim /etc/security/limits.d/oracle-database-preinstall-19c.conf
oracle   soft   nofile    1024

oracle   hard   nofile    65536

oracle   soft   nproc    16384

oracle   hard   nproc    16384
```

```
oracle   soft   stack    10240

oracle   hard   stack    32768

oracle   hard   memlock    134217728

oracle   soft   memlock    134217728
```

d) **Install the pre-install packages.**

Note Some files in the package may not get installed, you can skip them as it may not stop the installation of the rest of the pre-install 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 # Clusterware

# dnf install -y nfs-utils # ACFS

# dnf install -y python # ACFS
```

```
# dnf install -y python-configshell # ACFS

# dnf install -y python-rtslib # ACFS

# dnf install -y python-six # ACFS

# dnf install -y targetcli # ACFS

dnf install -y smartmontools

dnf install -y sysstat

dnf install -y unixODBC

# New for OL8

dnf install -y libnsl

dnf install -y libnsl.i686

dnf install -y libnsl2

dnf install -y libnsl2.i686
```

e) Create new groups and users.

```
groupadd -g 54321 oinstall

groupadd -g 54322 dba

groupadd -g 54323 oper

useradd -u 54321 -g oinstall -G dba,oper oracle
```

f) Set secure Linux to permissive mode by editing the "`/etc/selinux/config`" file.
Ensure that the SELINUX flag is set as follows:

1. `vim /etc/selinux/config`
2. `SELINUX=permissive`

g) Once the SELINUX flag is set (as in the step above), restart the server or run the following command.

```
setenforce Permissive
```

h) Disable the Linux firewall (if you had enabled).

1. `systemctl stop firewalld`
2. `systemctl disable firewalld`

What to do next

Install Oracle 19c, on page 8

Install Oracle 19c

To install Oracle 19c:

Before you begin

Pre-Installation Steps, on page 3

Step 1 Login as a root user.

a) `xhost +local:oracle`

b) `cd /home/oracle/app/oracle/product/19.0.0/dbhome_1`

Step 2 Unzip the Oracle software that is downloaded from the Oracle website and place it in the `/usr/programs` directory. For more information, see Oracle Prerequisites.

```
unzip -oq /usr/programs/LINUX.X64_193000_db_home.zip
```

Step 3 Run the `chown -R` and the `chmod -R 775` commands on the unzipped directory again.

a) `chown -R oracle:dba /home/oracle/app/oracle/product/19.0.0/dbhome_1`

b) `chmod -R 775 /home/oracle/app/oracle/product/19.0.0/dbhome_1`

Step 4 Create a "`scripts`" directory and make a shell file, "`setEnv.sh`", with the following content:

a) `mkdir /home/oracle/scripts`

b) Copy and paste the following content on the terminal:

```
cat > /home/oracle/scripts/setEnv.sh <<EOF

# Oracle Settings

export ORACLE_BASE=/home/oracle/app/oracle

export ORACLE_HOME=\$ORACLE_BASE/product/19.0.0/dbhome_1

export PATH=\$PATH:\$ORACLE_HOME/bin

export ORACLE_SID=cgms

EOF
```

Step 5 Add a reference to the "`setEnv.sh`" file at the end of the "`/home/oracle/.bash_profile`" file.

```
echo ". /home/oracle/scripts/setEnv.sh" >> /home/oracle/.bash_profile
```

Step 6 Give the permission.

a) `chown -R oracle:oinstall /home/oracle/scripts`

b) `chmod u+x /home/oracle/scripts/*.sh`

Step 7 Create an OraInventory.

a) `mkdir -p /home/oracle/app/oraInventory`

b) `chown -R oracle:dba /home/oracle/app/oraInventory`

c) `chmod -R 775 /home/oracle/app/oraInventory`

Step 8 **Must run the following steps on the ESXi VM terminal desktop instance.**

a) Login as an Oracle user to set the 'CV_ASSUME_DISTID' to 'OEL8.1' (For more information, see Unexpected Errors During Oracle 19c Installation).

1. `su - oracle`
2. `export DISPLAY=:0.0`
3. `export CV_ASSUME_DISTID=OEL8.1`

b) [*Optional*] Source the updated `.bash_profile` on Oracle user.

- `source /home/oracle/.bash_profile`

c) Run the runInstaller.

- `cd /home/oracle/app/oracle/product/19.0.0/dbhome_1/`
- `./runInstaller`

Follow the runInstaller GUI instructions for Oracle 19c installation

What to do next

Run Installer, on page 9.

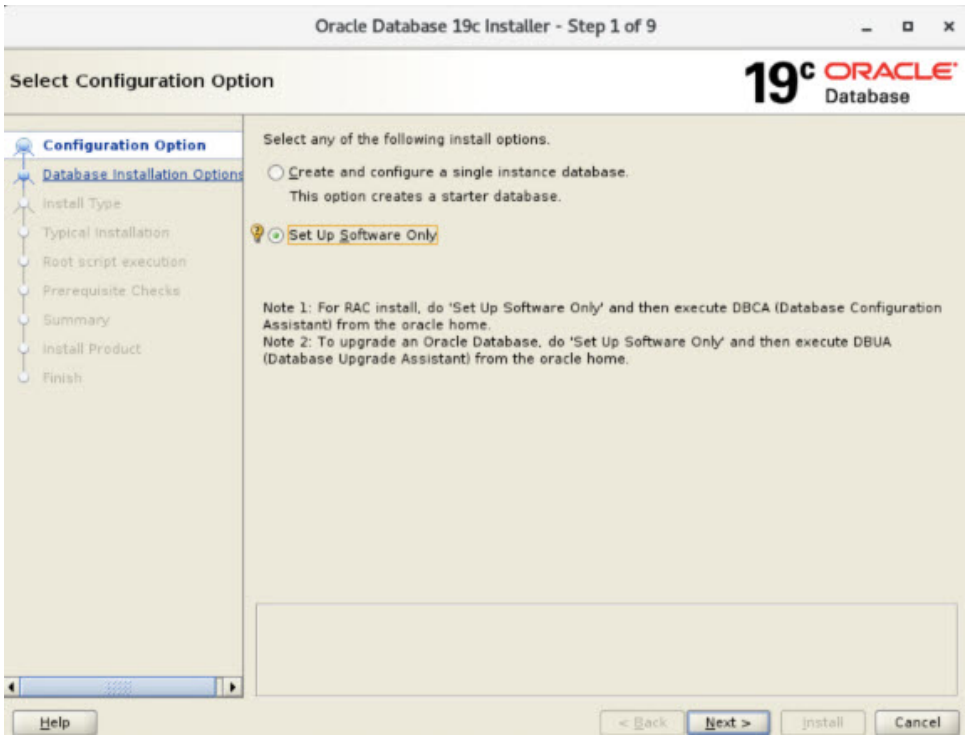
Run Installer

To run the installer:

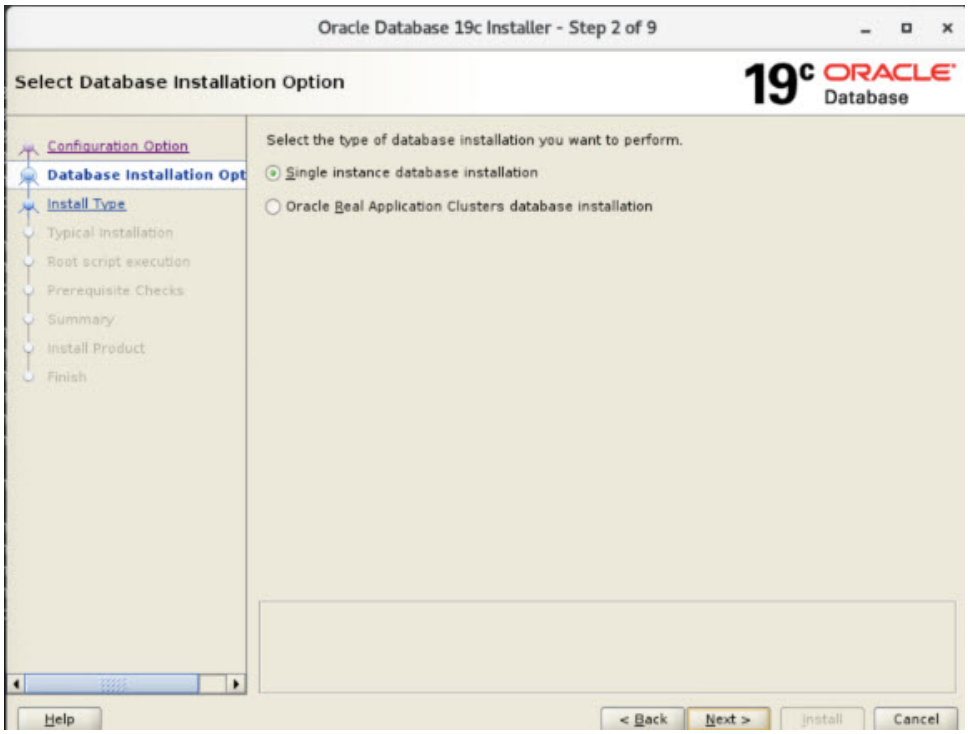
Before you begin

Install Oracle 19c, on page 8

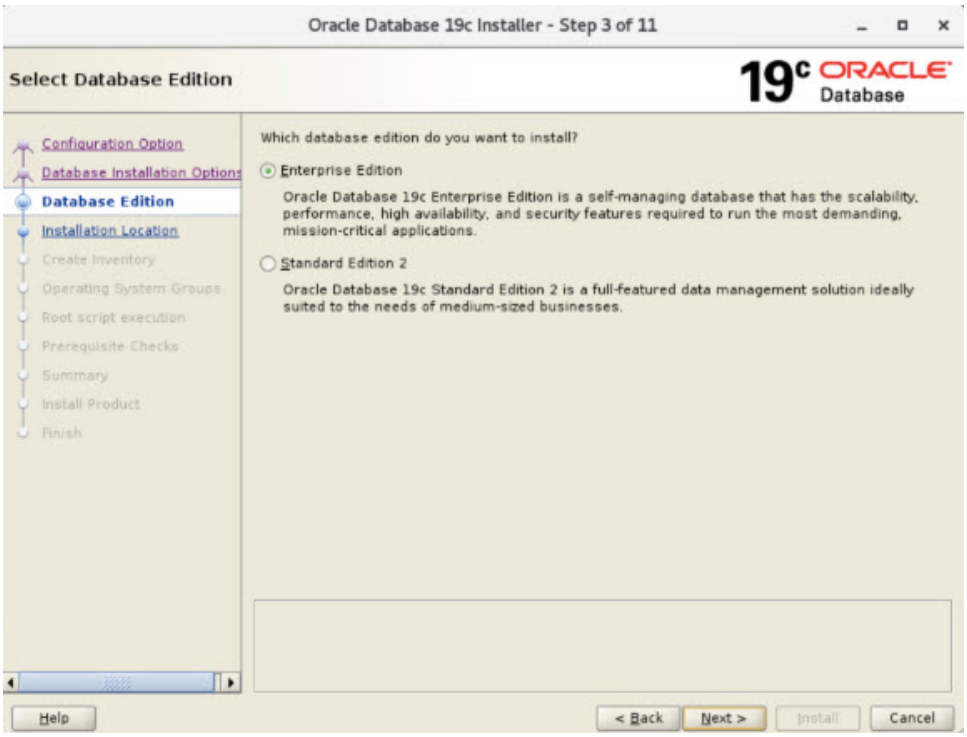
Step 1 Select **Set Up Software Only** and click **Next**.



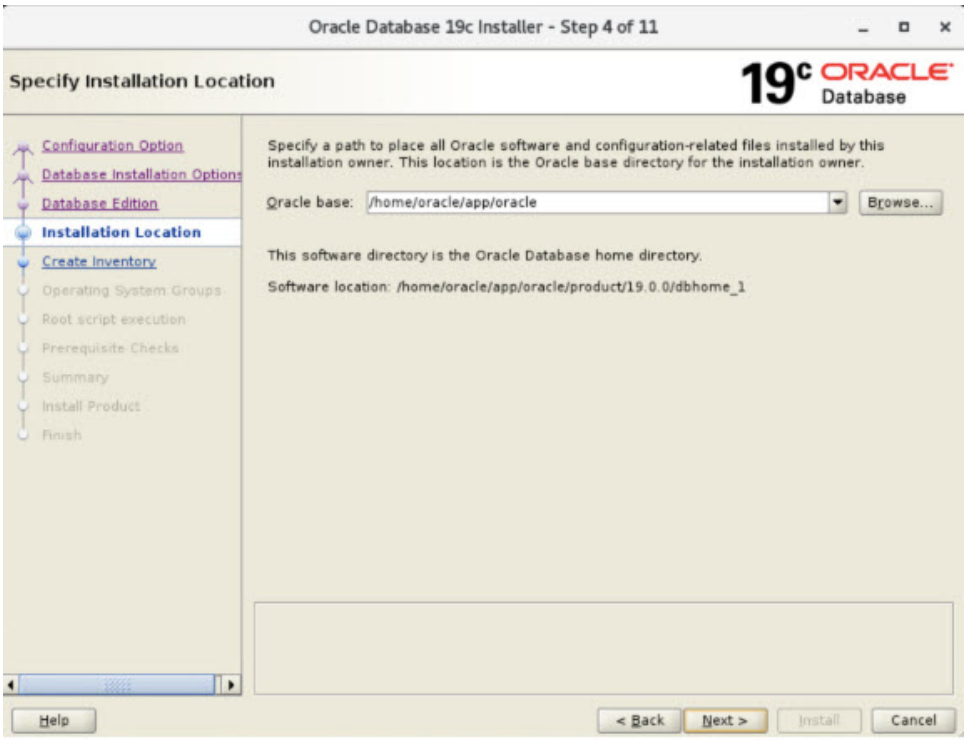
Step 2 Select **Single instance database installation** and click **Next**



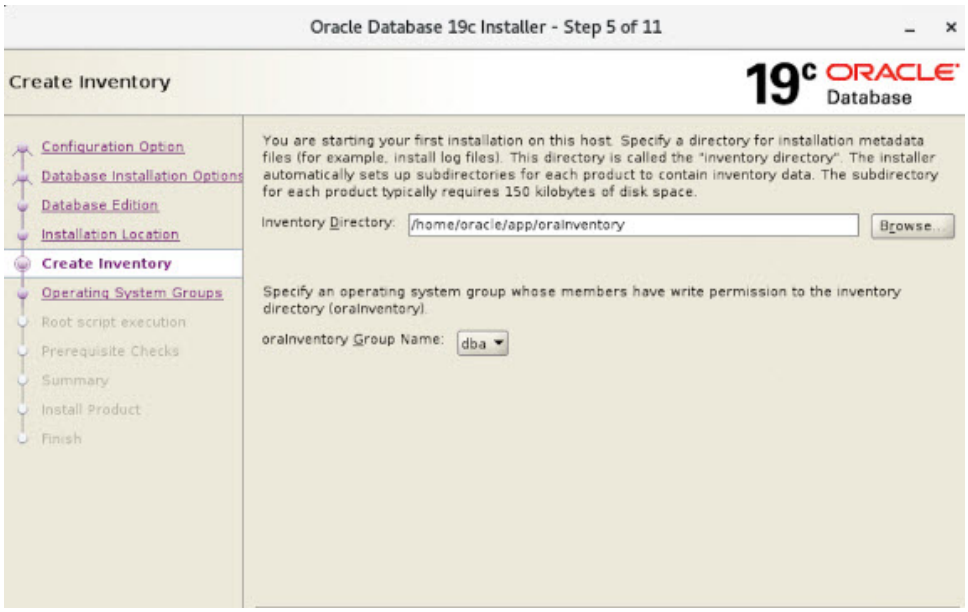
Step 3 Select **Enterprise Edition** and click **Next**.



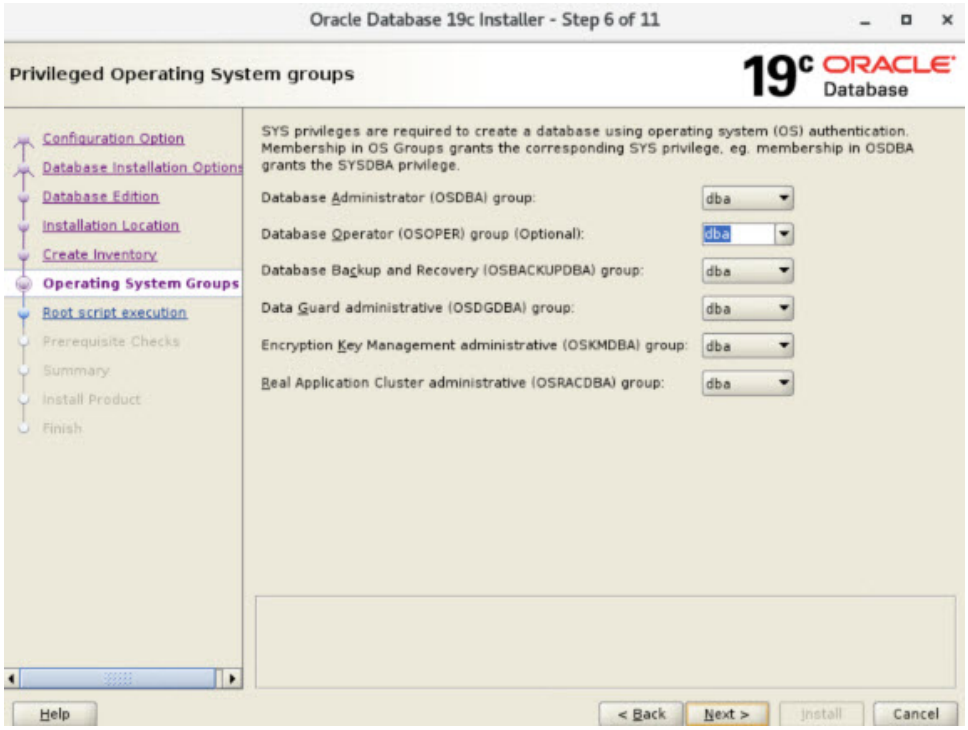
Step 4 Browse and select the **Oracle base** path (`/home/oracle/app/oracle`) and click **Next**.



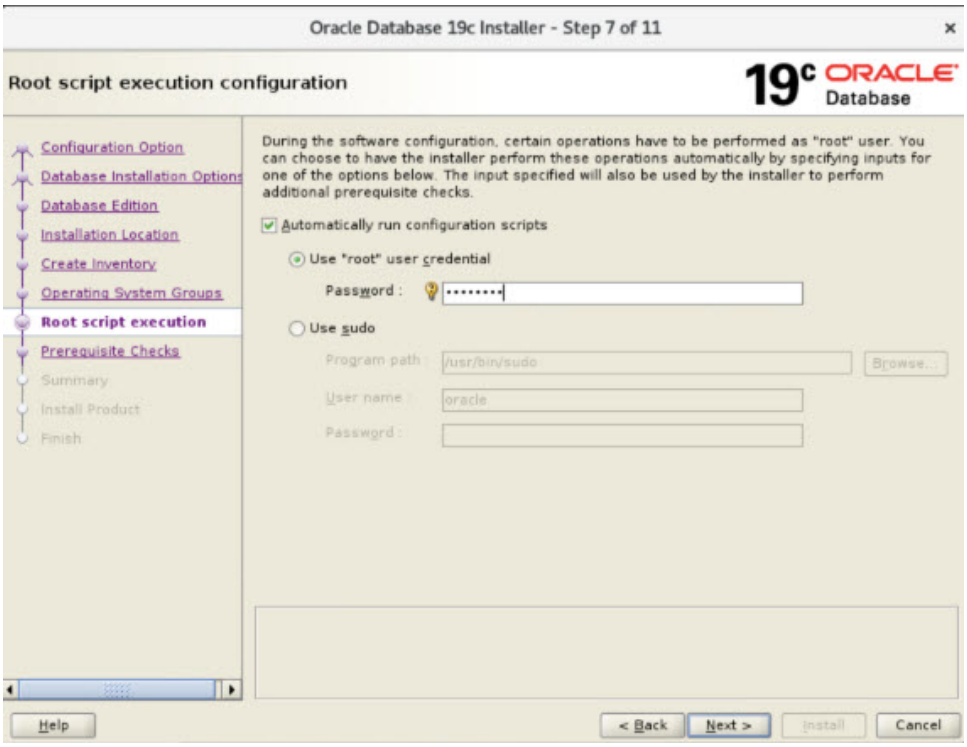
Step 5 Browse and select the **Inventory Directory** (`/home/oracle/app/oraInventory`) and then select `dba` from the **Group Name** drop-down list and click **Next**.



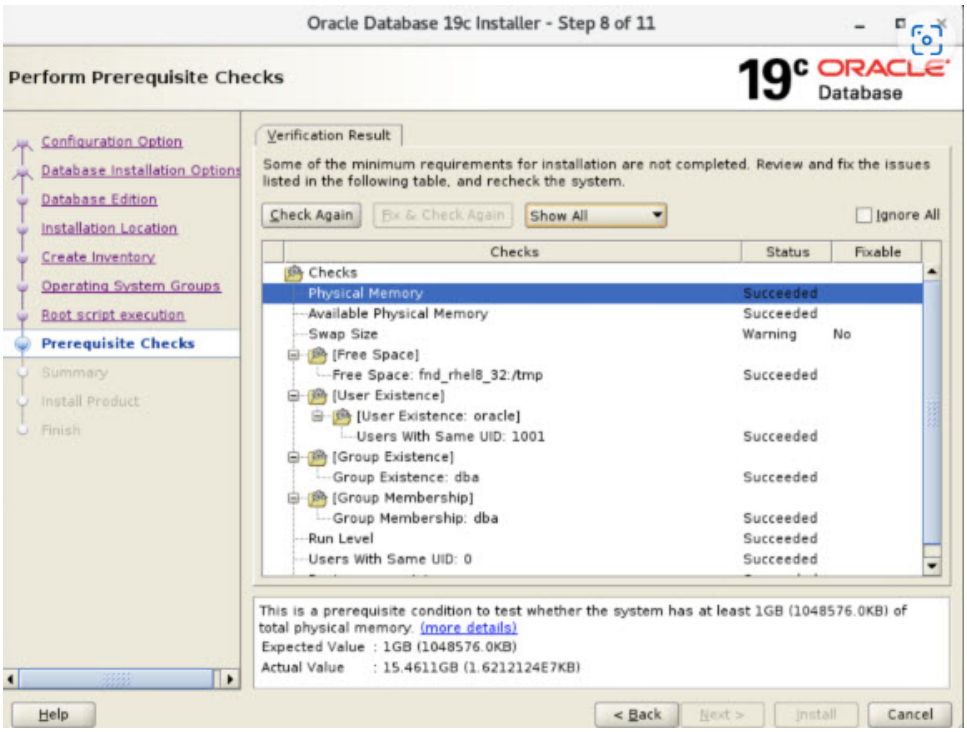
Step 6 Select `dba` for all groups and click **Next**.



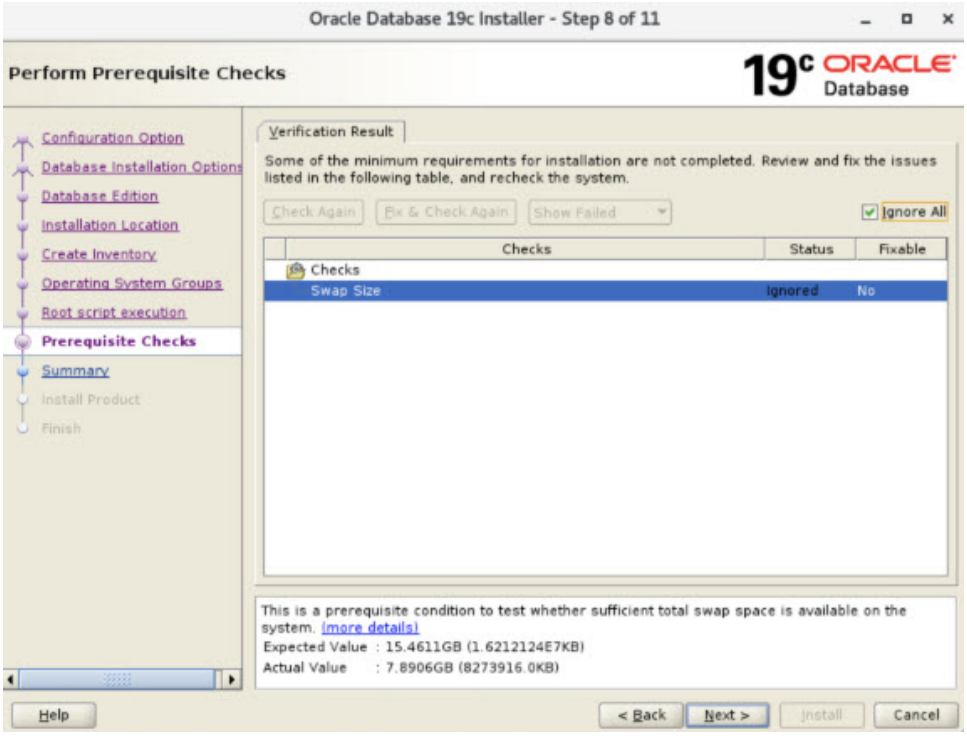
Step 7 Check the **Automatically run configuration scripts** check box and then provide the root user password and click **Next**.



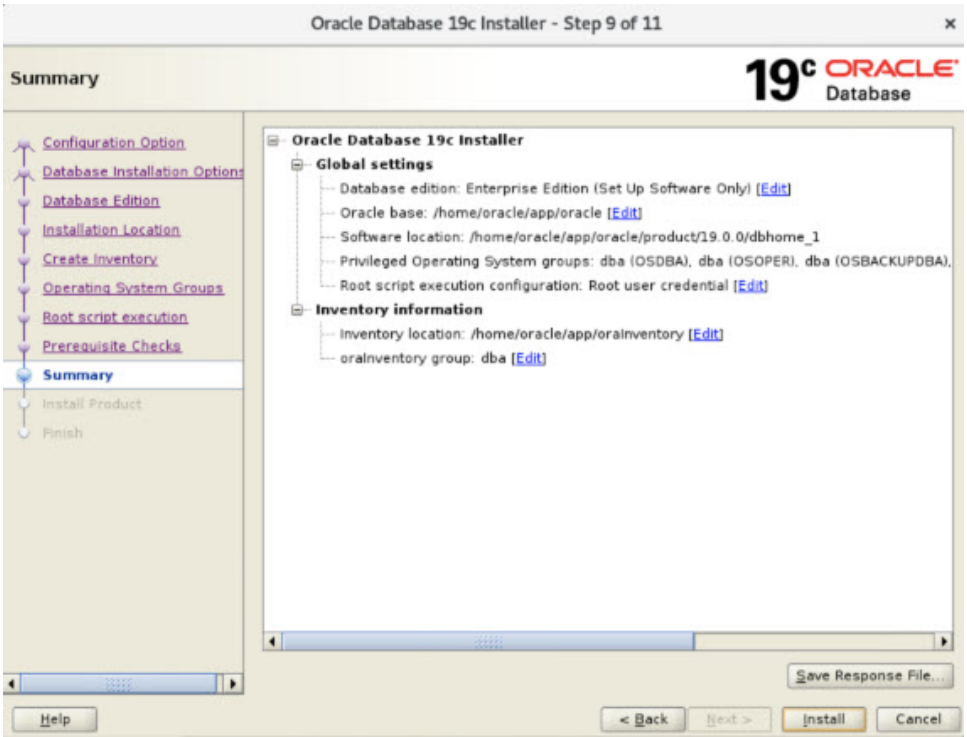
Step 8 Check the **Ignore All** check box to force install and click **Next**.



Click **Yes** in the confirmation pop-up.

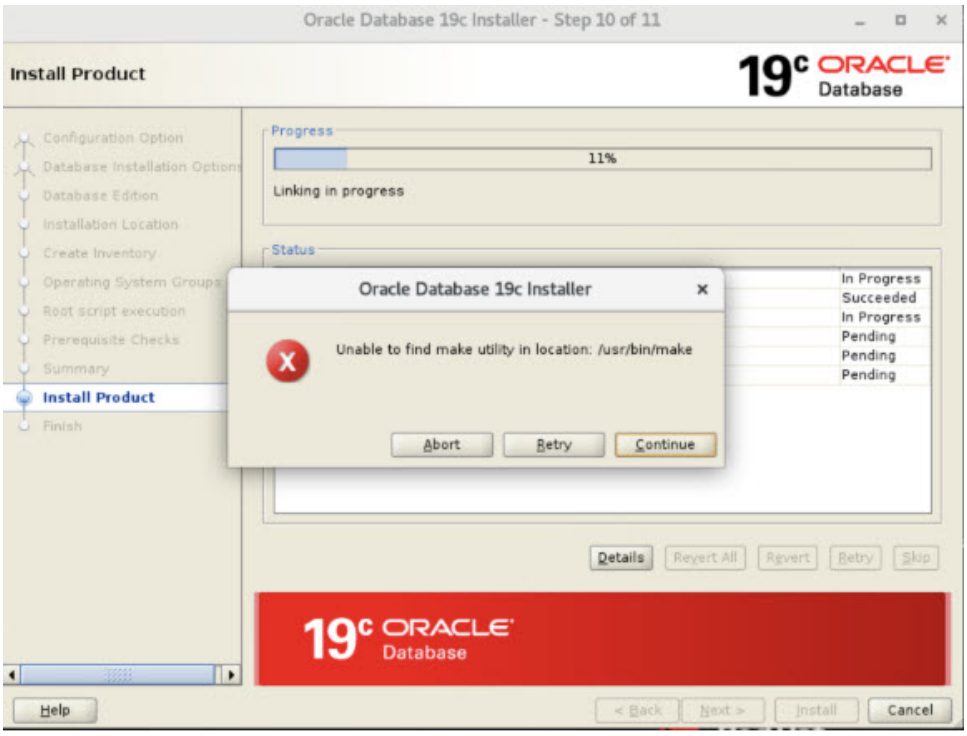


Step 9 On completion of the required settings, click **Install**.

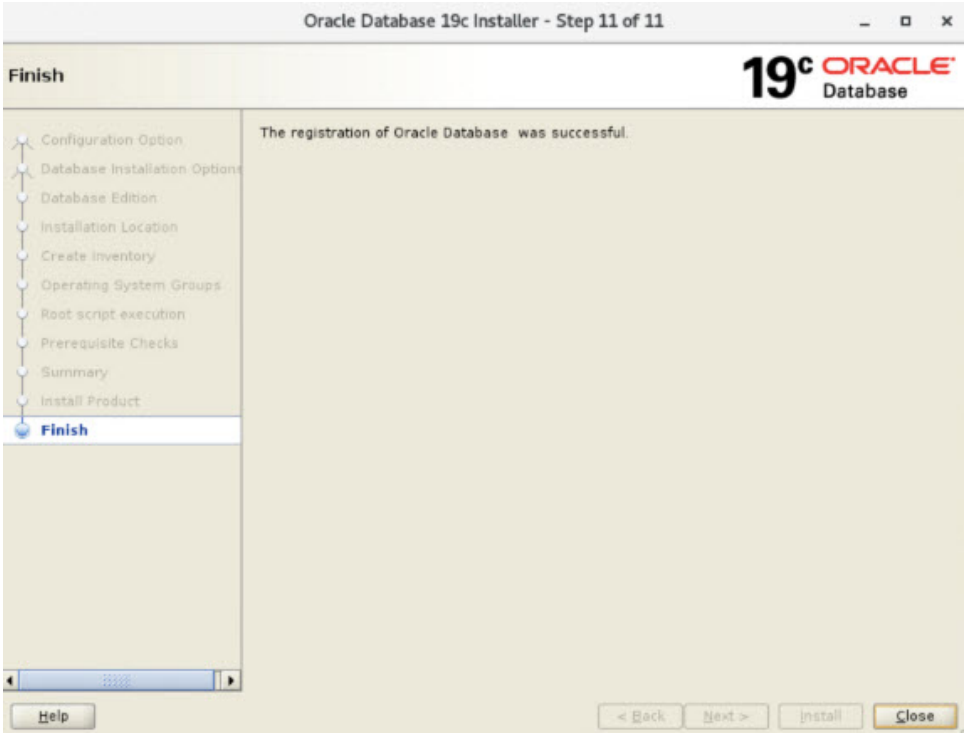


Step 10 The **Install Product** section starts to install Oracle 19c.

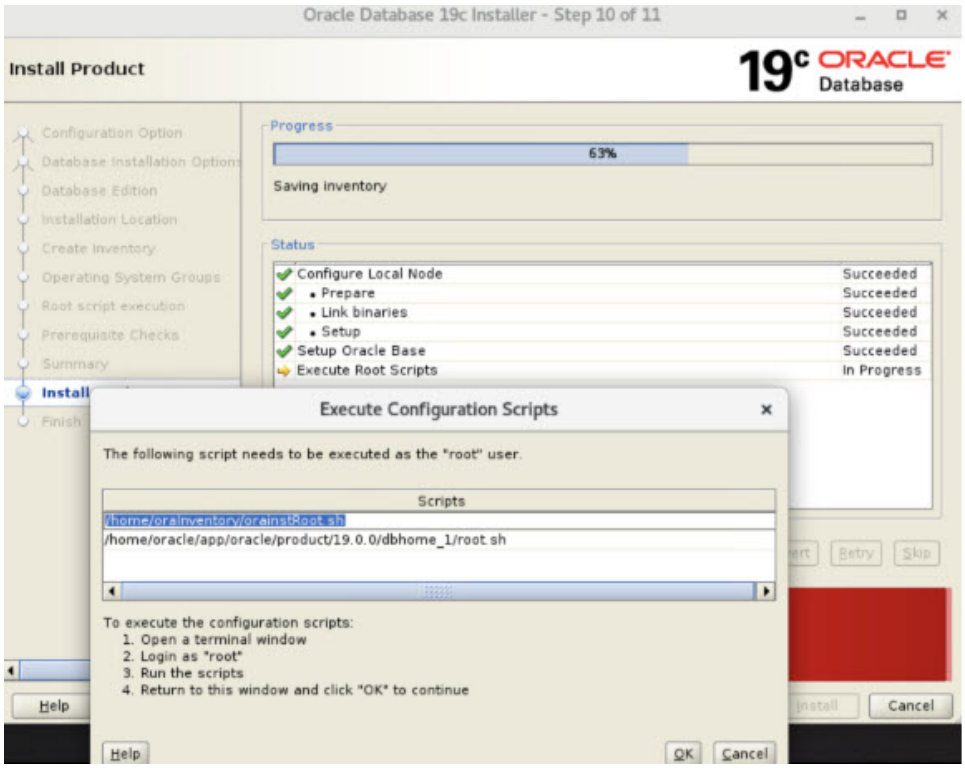
Note The pop-up error can be fixed by installing the required modules/packages to proceed further.



Step 11 On successful completion of the installation, the following message appears.



In case if you missed selecting the **Automatically run configuration scripts** option and root password, the following screen appears. You should execute the following scripts manually on another terminal.



a. Login as a root user.

```
su - root
```

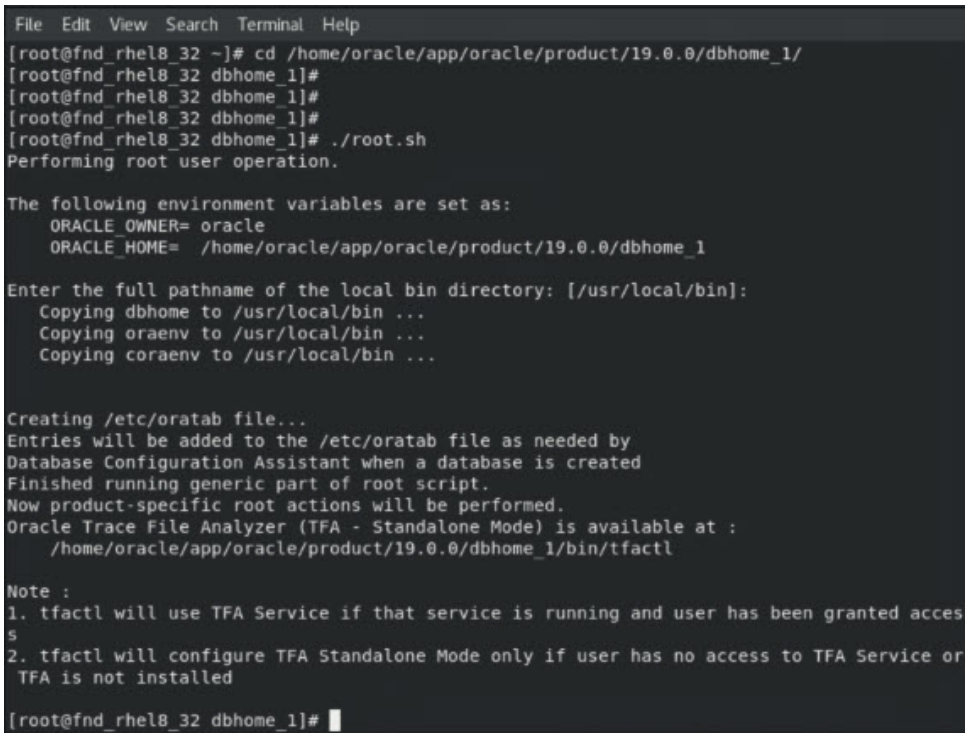
b. Go to the `cd /home/oracle/app/oraInventory/` directory and run the following script.

```
./orainstRoot.sh
```

c. Go to the `cd /home/oracle/app/oracle/product/19.0.0/dbhome_1/` directory and run the following script.

```
./root.sh
```

After executing the above scripts as a root user, click **OK** in the **Execute Configuration Scripts** pop-up window to complete the installation. Click **Finish** on successful completion.



What to do next

Create, Configure, and Start CG-NMS DB, on page 17

Configuring Oracle DB with FND

This section talks about configuring Oracle DB with FND.

Create, Configure, and Start CG-NMS DB

Before you begin

Run Installer, on page 9

Step 1 Download the `cgms-oracle rpm` from the Cisco Software Download page and save the rpm in a directory of your choice. (Example: You can save the rpm in the `/usr/programs` directory).

Step 2 Install the rpm.

```
rpm -ivh cgms-oracle-<release number>-<build number>86_64.rpm
```

Step 3 Run the `/opt/cgms-oracle/scripts/installCgmsOracleScripts.sh` script after updating the following scripts with 19.0.0 version.

a) Go to `cd /opt/cgms-oracle/scripts`

b) Update the Oracle version in the `/opt/cgms-oracle/scripts/`**`common.sh`** script with 19.0.0 (from 11.2.0 to 19.0.0)

- `ORACLE_VERSION=`**`19.0.0`**
- `DEFAULT_ORACLE_HOME=/home/oracle/app/oracle/product/`**`19.0.0`**`/dbhome_1`
- Also, update the `/opt/cgms-oracle/scripts`**`/installCgmsOracleScripts.sh`** script with **version 19.0.0**

```
[root@fnd-rhel8-33 scripts]# ./installCgmsOracleScripts.sh
02-11-2022 10:06:17 EST: INFO: ======== IoT-FND Oracle Scripts Installation Started ==========
02-11-2022 10:06:17 EST: INFO: Log file: /tmp/cgms_oracle_scripts_installation.log
Are you sure you want to install IoT-FND Oracle scripts, templates & tools in
/home/oracle/app/oracle//cgms (y/n)? y
02-11-2022 10:06:22 EST: INFO: User response: y
Enter 'y' if this is a secondary database server in HA configuration. Else enter 'n' (y/n)?
n
02-11-2022 10:06:26 EST: INFO: User response: n
02-11-2022 10:06:26 EST: INFO: Oracle SID: cgms
Enter the ORACLE_HOME directory [/home/oracle/app/oracle/product/19.0.0/dbhome_1]:
02-11-2022 10:06:34 EST: INFO: Oracle home directory:
/home/oracle/app/oracle/product/19.0.0/dbhome_1
02-11-2022 10:06:34 EST: INFO: Copying files ...
PSK generation started...
Base dir : /home/oracle/app/oracle//cgms
Warning:
The JCEKS keystore uses a proprietary format. It is recommended to migrate to PKCS12 which is
 an industry standard format using "keytool -importkeystore -srckeystore
/home/oracle/app/oracle//cgms/scripts/fnd_psk.keystore -destkeystore
/home/oracle/app/oracle//cgms/scripts/fnd_psk.keystore -deststoretype pkcs12".
New PSK generation completed
02-11-2022 10:06:35 EST: INFO: Setting permissions ...
02-11-2022 10:06:35 EST: INFO: Updating /home/oracle/.bashrc file ...
02-11-2022 10:06:35 EST: INFO: ========== IoT-FND Oracle Scripts Installation Completed
Successfully ==========
[root@fnd-rhel8-33 scripts]#
```

Note The `/opt/cgms-oracle/scripts/installCgmsOracleScripts.sh` script automatically updates the following:

- Copies scripts, templates, and tools from `/opt/cgms-oracle to /home/oracle/app/oracle/cgms` folder.
- Sets all the required `env variable` in the `/home/oracle/.bashrc` file.

Step 4 Run the `setupCgmsDb.sh` script as an Oracle user:

a) `su - oracle`

b) `# export ORACLE_BASE=/home/oracle/app/oracle`

c) `cd $ORACLE_BASE/cgms/scripts`

d) **`./setupCgmsDb.sh`**

- Enter `cgmsDba123` for **`SYS DBA`** password and `cgms123` for **`CG-NMS Database`** password.

Note On successful completion, the `setCgmsDb.sh` script starts Oracle automatically.

```
[oracle@fnd-rhel8-33 scripts]$ ./setupCgmsDb.sh
02-11-2022 10:15:46 EST: INFO: ======== CGMS Database Setup Started ==========
02-11-2022 10:15:46 EST: INFO: Log file: /tmp/cgmsdb_setup.log
Are you sure you want to setup IoT-FND database (y/n)? y
02-11-2022 10:15:55 EST: INFO: User response: y
02-11-2022 10:15:55 EST: INFO: CGMS database does not exist.
Enter new password for SYS DBA:            <cgmsDba123>
Re-enter new password for SYS DBA:    <cgmsDba123>
```

```
02-11-2022 10:16:10 EST: INFO: User entered SYS DBA password.
Enter new password for IoT-FND database:     <cgms123>
Re-enter new password IoT-FND database:     <cgms123>
02-11-2022 10:16:17 EST: INFO: User entered IoT-FND DB password.
02-11-2022 10:16:17 EST: INFO: Stopping listener ...
02-11-2022 10:16:58 EST: INFO: Listener already stopped.
02-11-2022 10:16:58 EST: INFO: Deleting database files ...
02-11-2022 10:16:58 EST: INFO: Creating listener ...
02-11-2022 10:16:58 EST: INFO: Listener creation completed successfully.
02-11-2022 10:16:58 EST: INFO: Configuring listener ...
02-11-2022 10:16:58 EST: INFO: Listener successfully configured.
02-11-2022 10:16:58 EST: INFO: Oracle version : 19c
02-11-2022 10:16:58 EST: INFO: Creating database. This may take a while. Please be patient
...
02-11-2022 10:23:43 EST: INFO: Database creation completed successfully.
02-11-2022 10:23:43 EST: INFO: Updating /etc/oratab ...
02-11-2022 10:23:43 EST: INFO: /etc/oratab updated.
02-11-2022 10:23:43 EST: INFO: Configuring database ...
02-11-2022 10:23:44 EST: INFO: Starting listener ...
02-11-2022 10:23:54 EST: INFO: Listener start completed successfully.
02-11-2022 10:23:54 EST: INFO: Starting database configuration ...
02-11-2022 10:24:51 EST: INFO: Database configuration completed successfully.
02-11-2022 10:24:51 EST: INFO: Starting Oracle ...
02-11-2022 10:24:51 EST: INFO: Starting Oracle in mount state ...
ORACLE instance started.
Total System Global Area 4982831096 bytes
Fixed Size                  8906744 bytes
Variable Size             905969664 bytes
Database Buffers         4060086272 bytes
Redo Buffers                7868416 bytes
Database mounted.
02-11-2022 10:25:03 EST: INFO: Opening database for read/write ...
Database altered.
02-11-2022 10:25:04 EST: INFO: ========== CGMS Database Setup Completed Successfully ==========
[oracle@fnd-rhel8-33 scripts]$
```

Step 5 To start Oracle automatically on a system reboot, execute the `$ORACLE_BASE/cgms/scripts/installOracleJob.sh` script as an Oracle user.

a) `su - oracle`

b) `cd $ORACLE_BASE/cgms/scripts`

c) **`./installOracleJob.sh`**

```
[oracle@fnd-rhel8-33 scripts]$ ./installOracleJob.sh
02-15-2022 17:26:24 IST: INFO: ========== Started ==========
02-15-2022 17:26:24 IST: INFO: Log file: /tmp/cgms_oracle_cronjob.log
02-15-2022 17:26:24 IST: INFO: Creating Oracle cronjob ...
no crontab for oracle
ORACLE_HOME=/home/oracle/app/oracle/product/19.0.0/dbhome_1
ORACLE_BASE=/home/oracle/app/oracle
DISPLAY=localhost:0
ORACLE_SID=cgms
@reboot /home/oracle/app/oracle/cgms/scripts/startOracle.sh
02-15-2022 17:26:24 IST: INFO: Successfully created Oracle cronjob.
02-15-2022 17:26:24 IST: INFO: ==========  Completed Successfully ==========
```

What to do next

Install CGMS RPM, on page 20

Install CGMS RPM

To install CGMS rpm:

Before you begin

Create, Configure, and Start CG-NMS DB, on page 17

Step 1 Install the `cgms rpm`.

a) `rpm -ivh cgms-<release number>-<build number>86_64.rpm`

Step 2 **[This step is Optional]** Copy the `cgms_keystore` and `cgms.properties` from any working FND server into the `/opt/cgms/server/cgms/conf/` directory.

Step 3 Run `db-migrate`.

a) `cd /opt/cgms/bin/`

b) `./db-migrate`

```
[root@fnd-rhel8-33 bin]#./db-migrate
Enter database password: <cgms123>
02-11-2022 10:48:11 EST: INFO: Log file: /opt/cgms/bin/../server/cgms/log/cgms_setup.log
02-11-2022 10:48:11 EST: INFO: Performing pre migration. This may take a while. Please wait ...
02-11-2022 10:48:12 EST: INFO: Pre migration completed.
02-11-2022 10:48:12 EST: INFO: Performing migration. This may take a while. Please wait ...
02-11-2022 10:48:58 EST: INFO: Migration completed.
02-11-2022 10:48:58 EST: INFO: Performing post migration. This may take a while. Please wait ...
02-11-2022 10:51:57 EST: INFO: Post migration completed.
[root@fnd-rhel8-33 bin]#
```

Step 4 Start the cgms service.

```
service cgms start
```

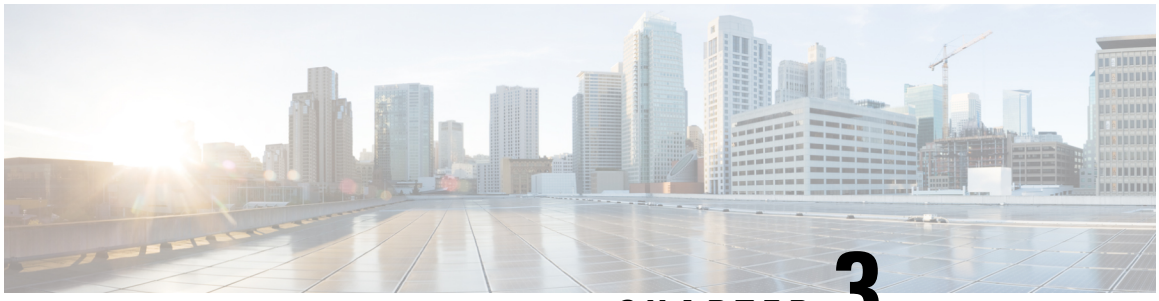
Step 5 Check the cgms service status.

```
[root@fnd-rhel8-33 ~]# service cgms status

IoT-FND Version 4.8.1-8
02-14-2022 14:43:30 IST: INFO: IoT-FND database server: localhost
02-14-2022 14:43:31 IST: INFO: IoT-FND database connection verified.
02-14-2022 14:43:32 IST: INFO: IoT-FND application server is up and running.
02-14-2022 14:43:32 IST: INFO: IoT-FND is up and running.
[root@fnd-rhel8-33 ~]#
```

What to do next

For the patch installation steps, if necessary, see Patch Installation.



CHAPTER 3

Upgrade from Oracle 18c to 19c

This section provides steps for upgrading Oracle DB from 18c to 19c.

- Minimum Hardware Requirements, on page 21
- Upgrade Steps, on page 22
- Post Upgrade Steps, on page 33

Minimum Hardware Requirements

Ensure that your FND system meets the following physical memory requirements in the below table.

The recommendations in the Minimum Hardware Requirements table below are specified in the Server Configuration Checklist for Oracle Database Installation and Storage Checklist for Oracle Database Installation. Additional RAM and swap space may be required to tune and/or improve the RDBMS performance as provided in Additional Requirements to Support Oracle Install table.

Table 1: Minimum Hardware Requirements to Upgrade from 18c to 19c

RAM	Swap Space Allocation Relative to RAM
Between 1GB (minimum) and 2GB (recommended)	1.5 times the size of RAM
Between 2GB and 16GB	Equal to the size of RAM
Greater than 16GB	16GB

Table 2: Additional Requirements to Support Oracle Install

Item	Requirement
Disk space allocated to the `/tmp` directory	At least 1 GB of space in the `/tmp` directory.
Local disk space for Database software files	7.2 GB

Upgrade Steps

After you have successfully installed the Oracle 19c database, you can now upgrade your Oracle 18c software to Oracle 19c software by following the information noted under each step (for example, 1, 2 and 3, etc.) and sub-step (a, b, c, etc.) summarized below:

Before you begin

Install Oracle DB 19c, on page 3

Step 1 Go to the following directory:
`/home/oracle/app/oracle/product/19.0.0.0/dbhome_1/bin`

Step 2 Before running the upgrade process, run the following queries on the 18c database:

/home/oracle/app/oracle/product/18.1.0/dbhome_1/jdk/bin/java-jar

/home/oracle/app/oracle/product/19.0.0.0/dbhome_1/rdbms/admin/preupgrade.jar

SQL>@/home/oracle/app/oracle/cfgtoollogs/CGMS/preupgrade/preupgrade_fixups.sql

SQL>@$ORACLE_HOME/rdbms/admin/utlrp.sql

- Remove Spatial

  connect / as sysdba

  alter session set current_schema=“MDSYS”;

  @?/md/admin/deinssdo.sql

- Remove Oracle Multimedia

  connect / as sysdba

  @?/ord/im/admin/imremov.sql

  Enter “Y” when prompted

- Remove the parameters:

  NLS_SORT=‘BINARY’_CI’

  NLS_COMP=‘LINGUISTIC’

  by entering the following commands

  alter system reset NLS_SORT;

  alter system reset NLS_COMP;

- connect / as sysdba

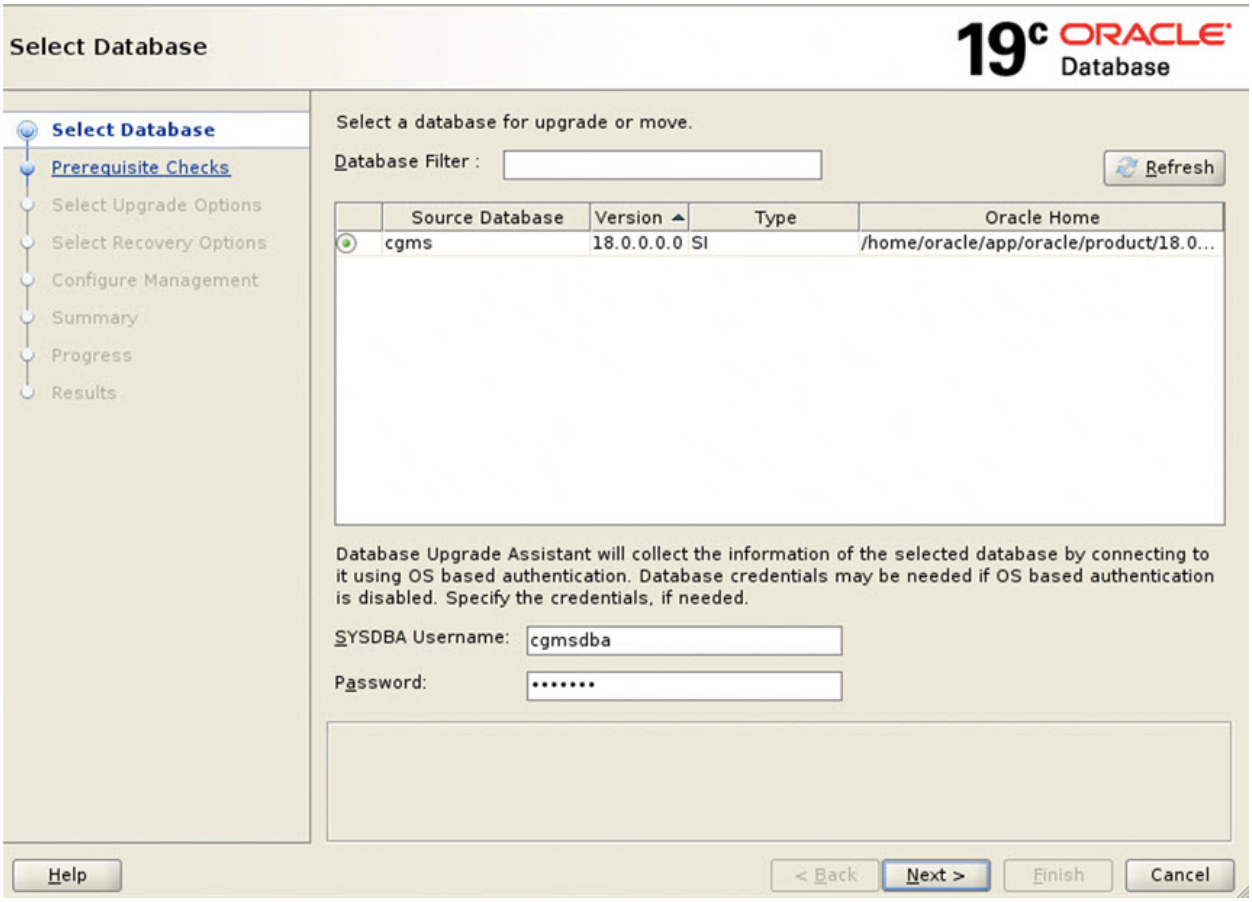
  @$ORACLE_HOME/rdbms/admin/utlrp.sql

- SET SERVEROUTPUT ON;

  EXECUTE DBMS_PREUP.INVALID_OBJECTS;

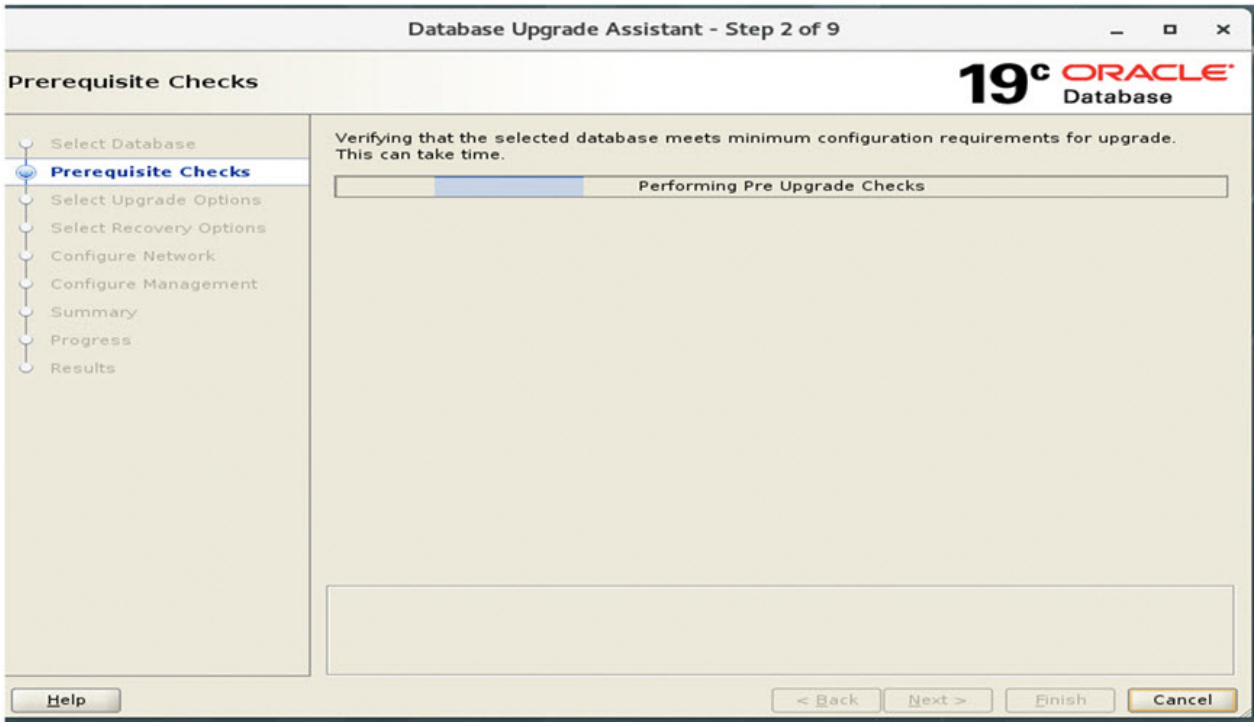
Once done, start the upgrade process by entering: **./dbua**. Follow the screen instructions in the Database Upgrade Assistant.

Select the database and click **Next >**. The Database Upgrade Assistant ensures the database meets the necessary requirements by performing a prerequisite check.



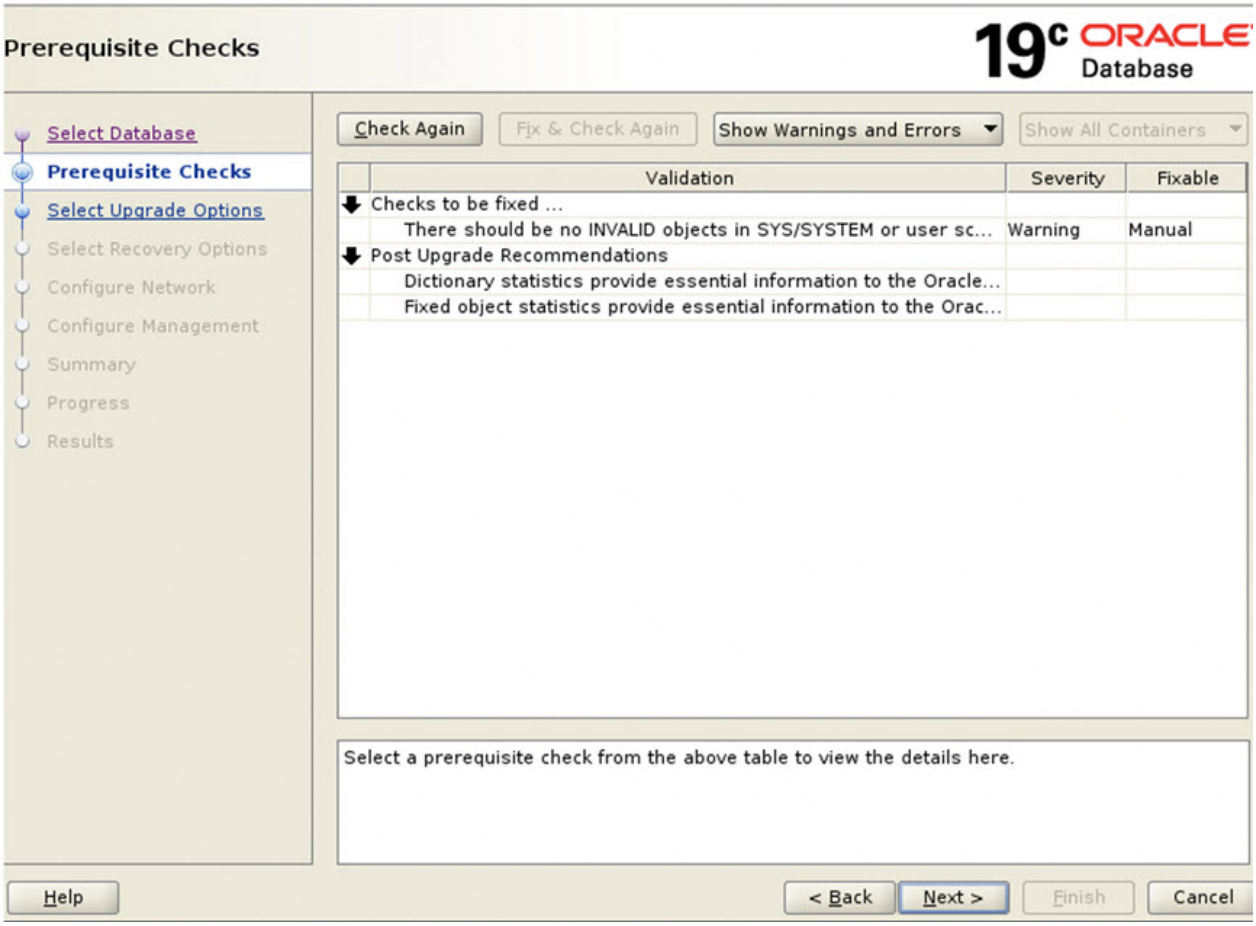
Step 3 Database Upgrade Assistant : Prerequisite Checks

Click **Next >**. The upgrade begins. If there are any issues with the upgrade, a screen displays the issues that need to be resolved.

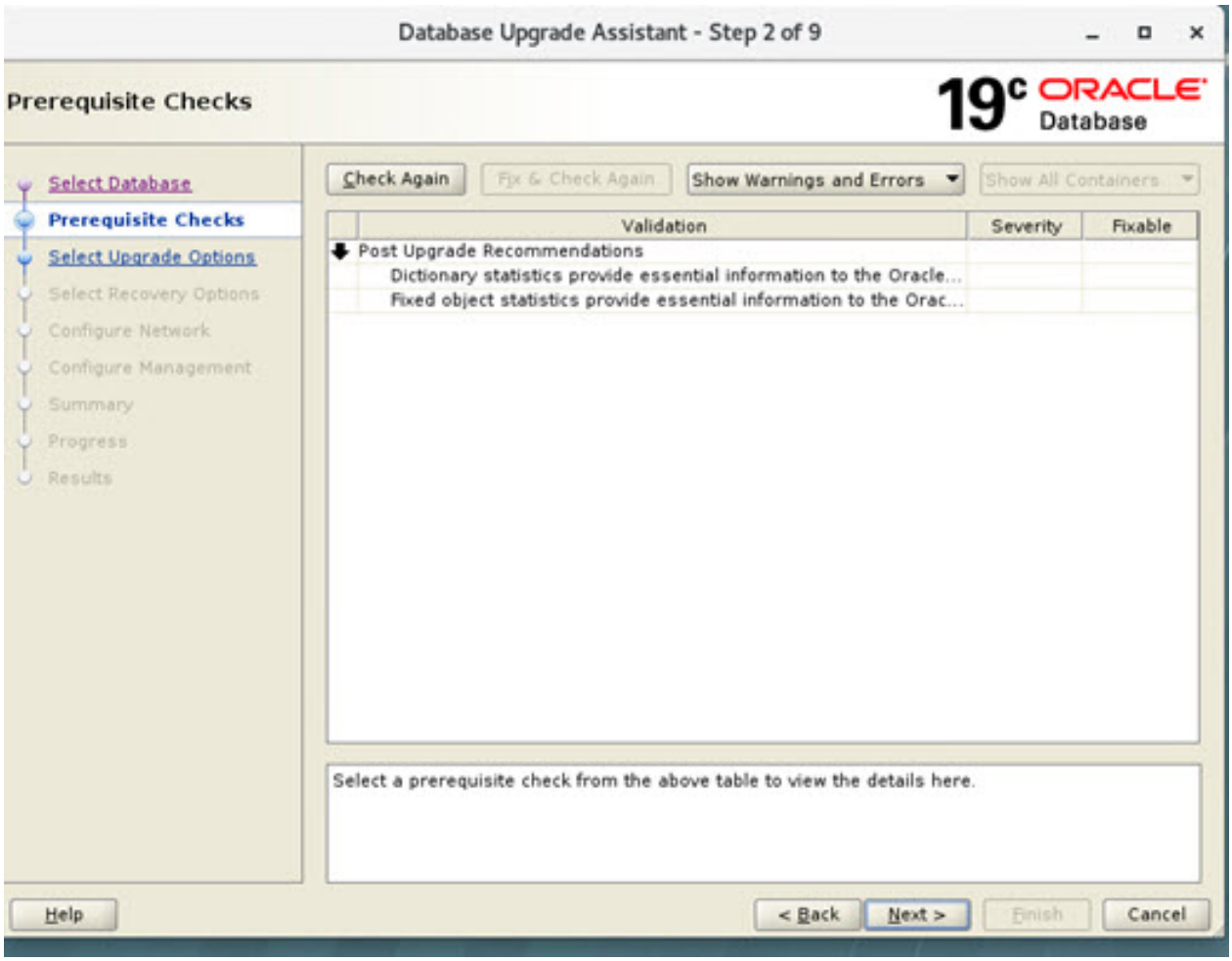


Step 4 Database Upgrade Assistant : Displays Issues to Fix Before and After Upgrade

After resolving any outstanding issues noted under Checks to be fixed, click **Next >**.

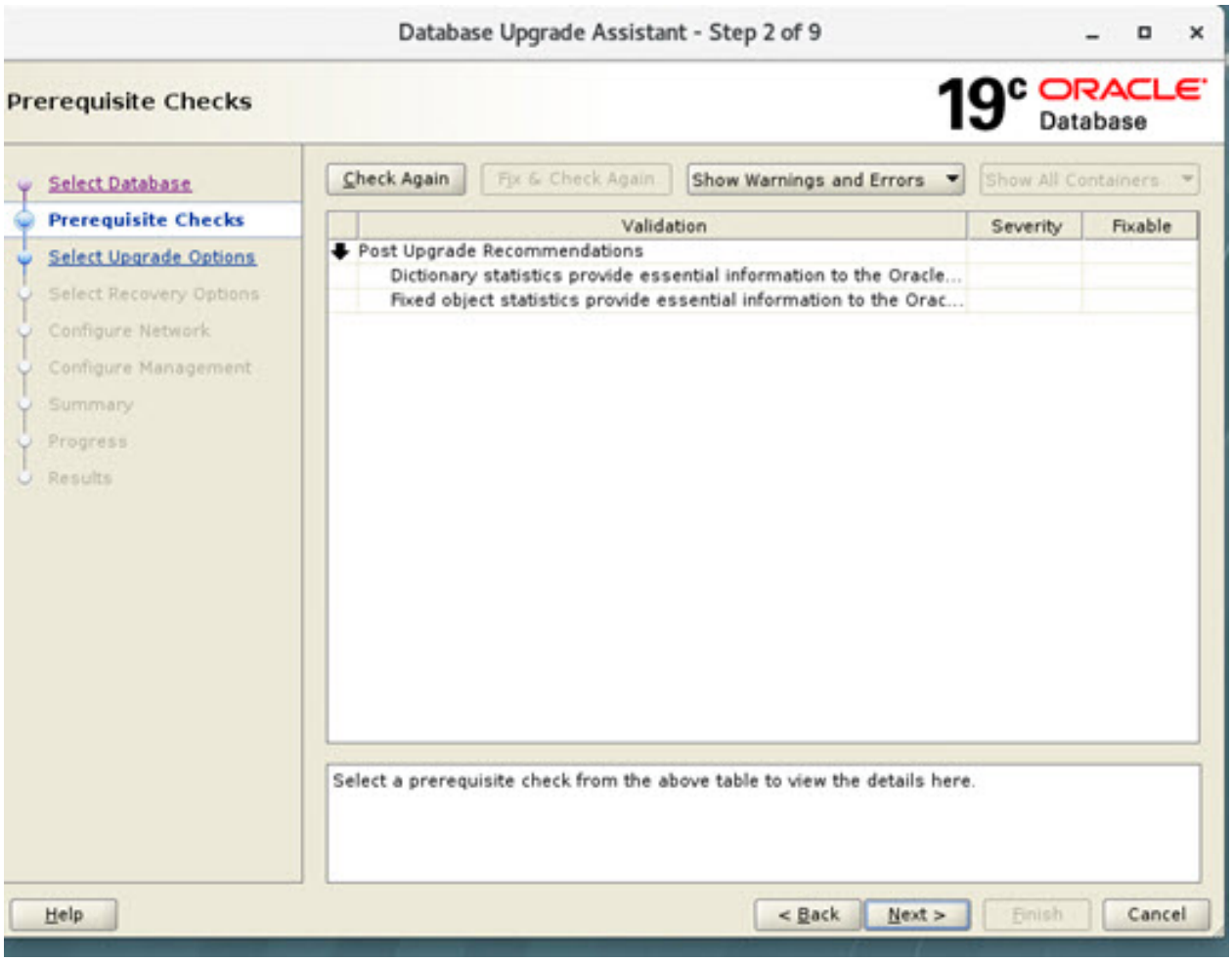


A page displays Recommendations for items that you should address after the upgrade completes (Post Upgrade).



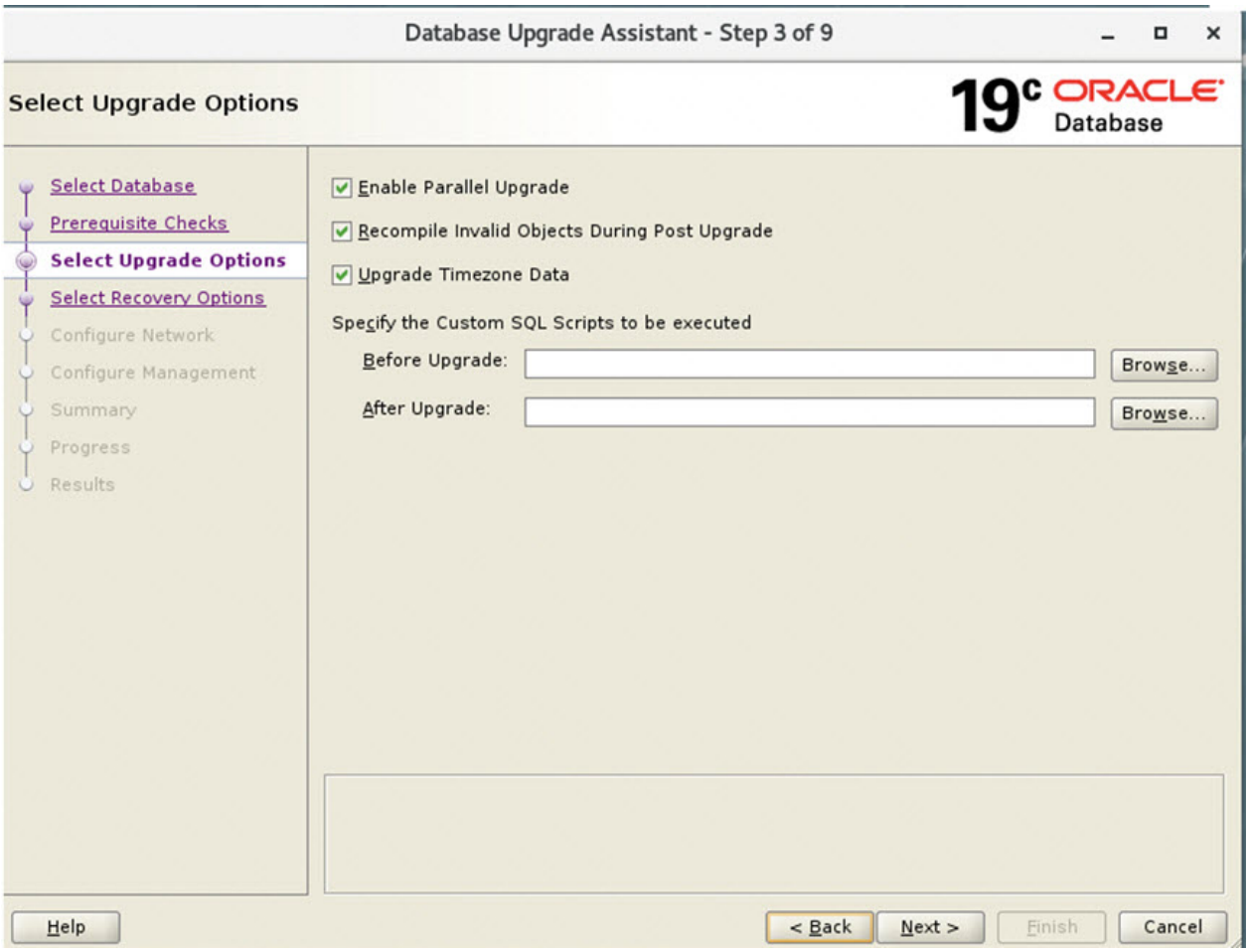
Step 5 Displays Issues to Fix After Upgrade

Click **Next >** to go to the next screen.

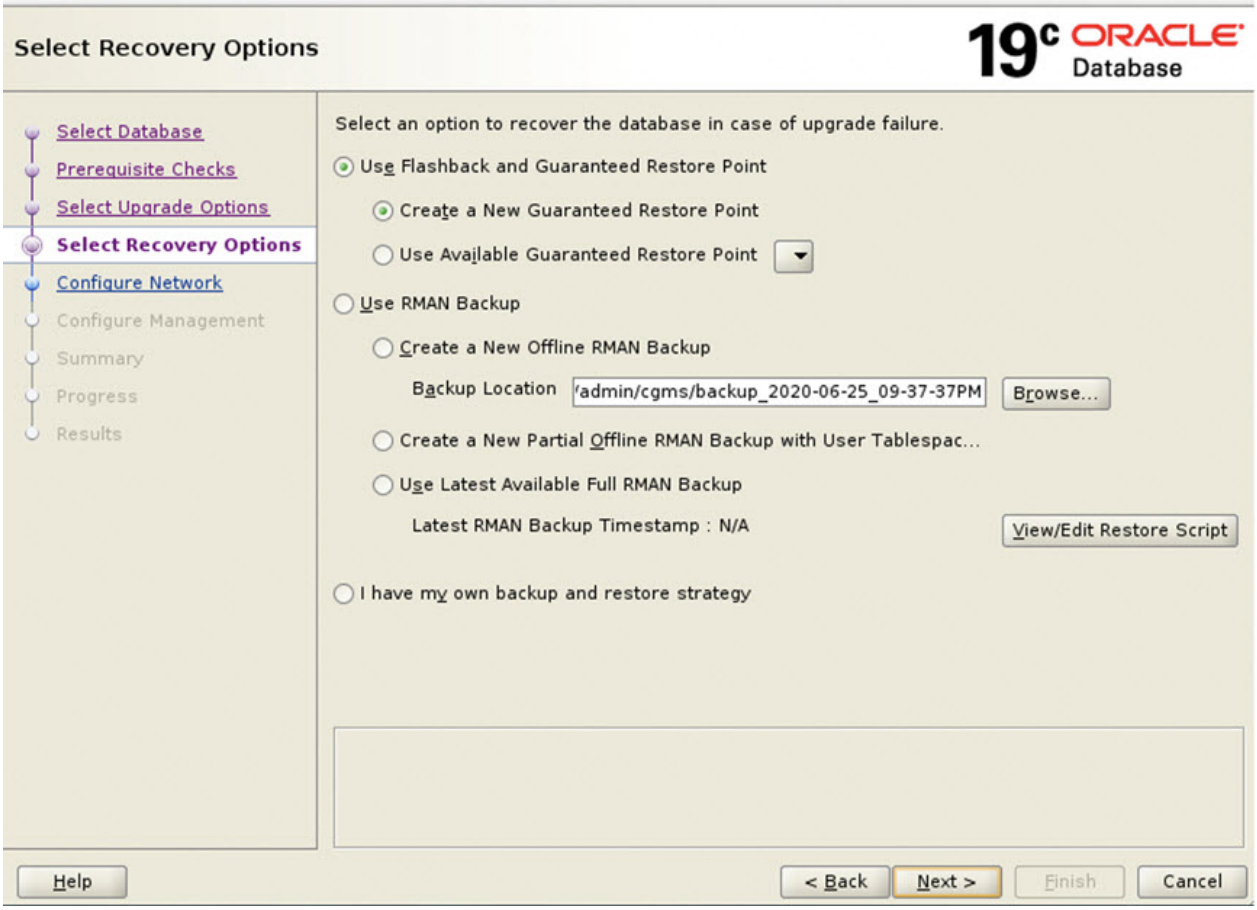


Step 6 Select Upgrade Options. Uncheck the Recompile Invalid Object During Post Upgrade option.

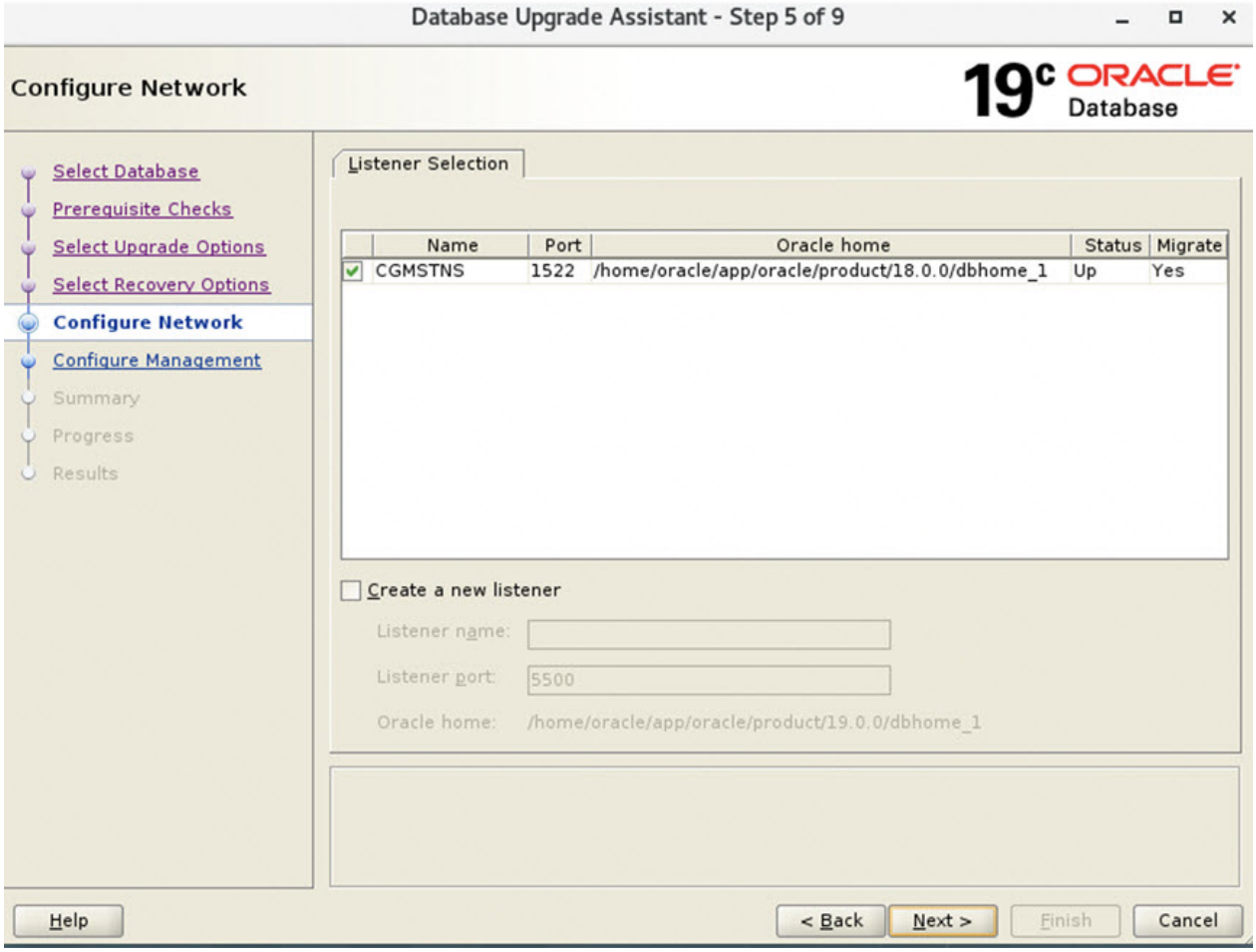
Ensure that the Enable Parallel Upgrade and Unable Timezone Data options remain checked. Click **Next >**.



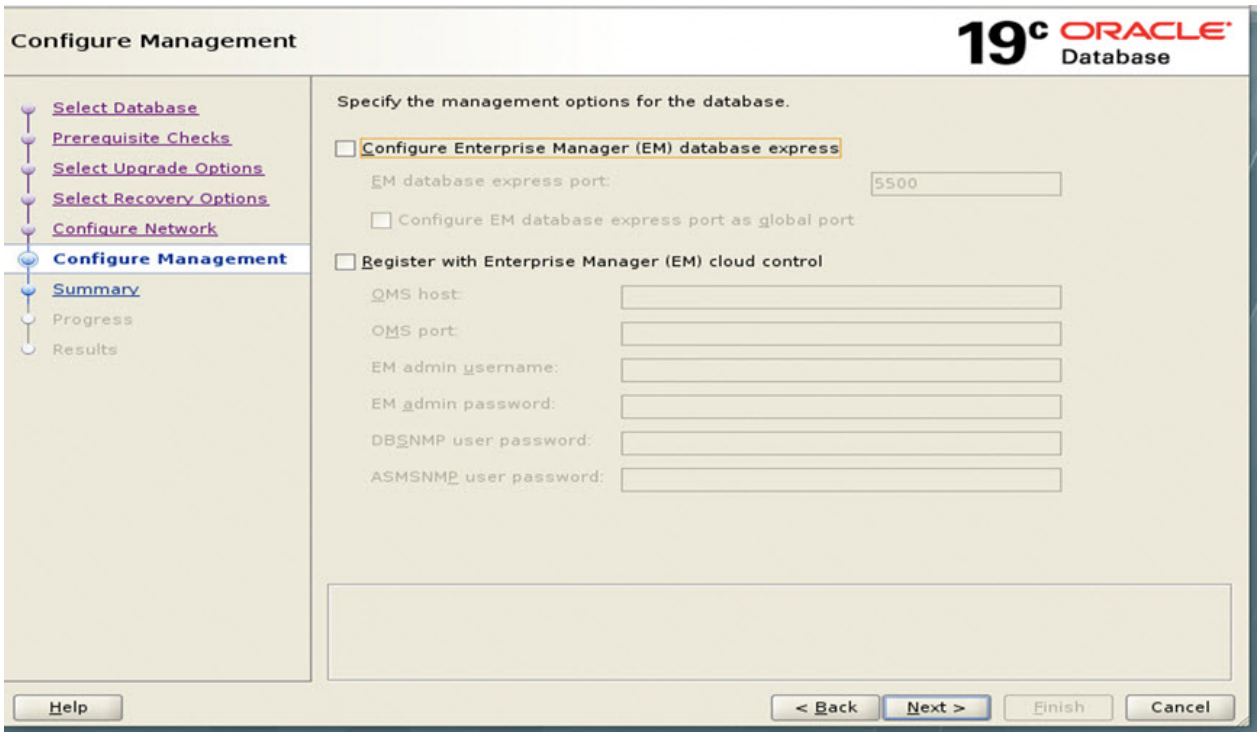
Step 7 Select Recovery Options. Select Use Flashback and Guaranteed Restore Point and Create a New Guaranteed Restore Point. Click **Next >**.



Step 8 Configure Network. In the Listener Selection window, select the check box for 'CGMSTNS' (if not already checked). Click **Next** >.

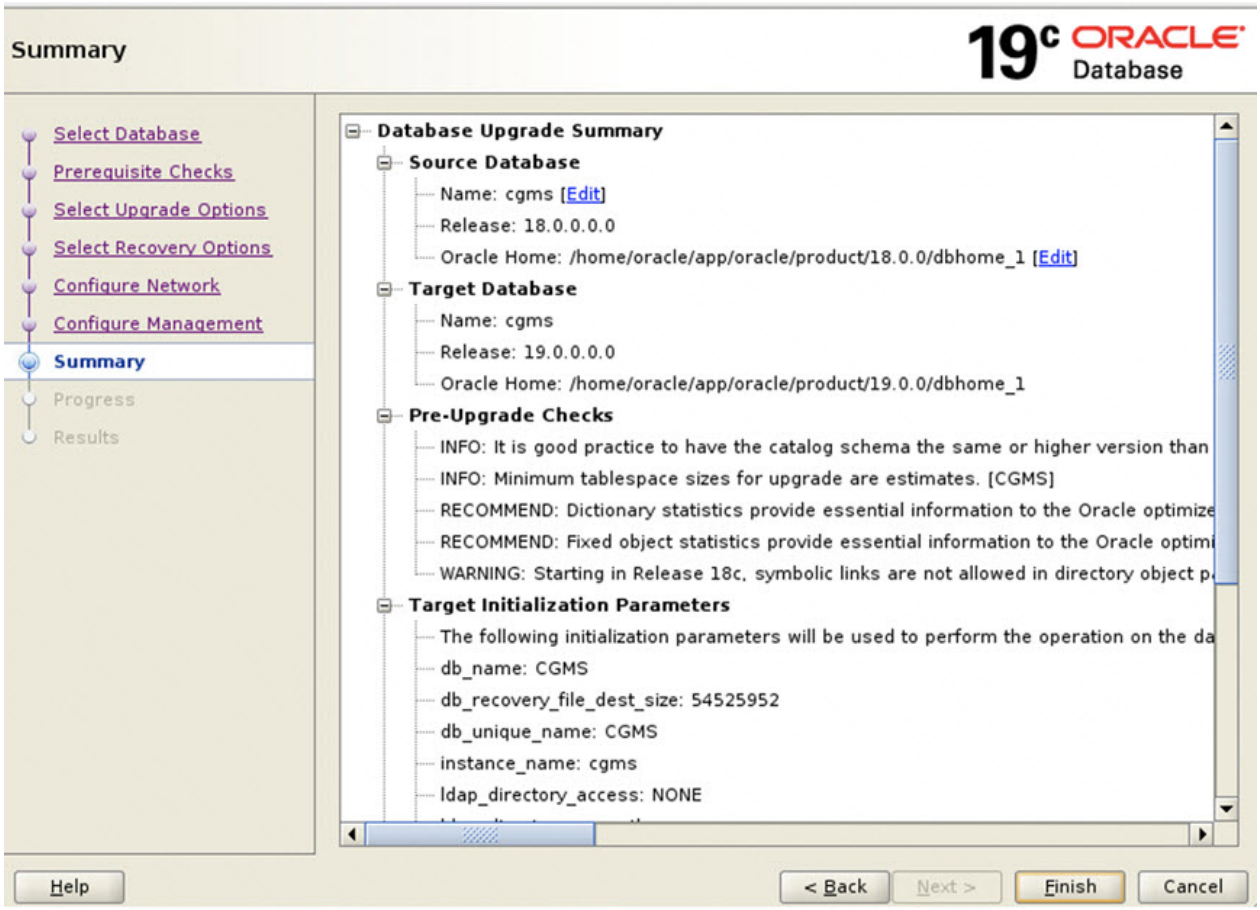


Step 9 Configure Management. Ensure that the check box next to Configure Enterprise Manager (EM) database express option is unchecked. Click **Next** >.

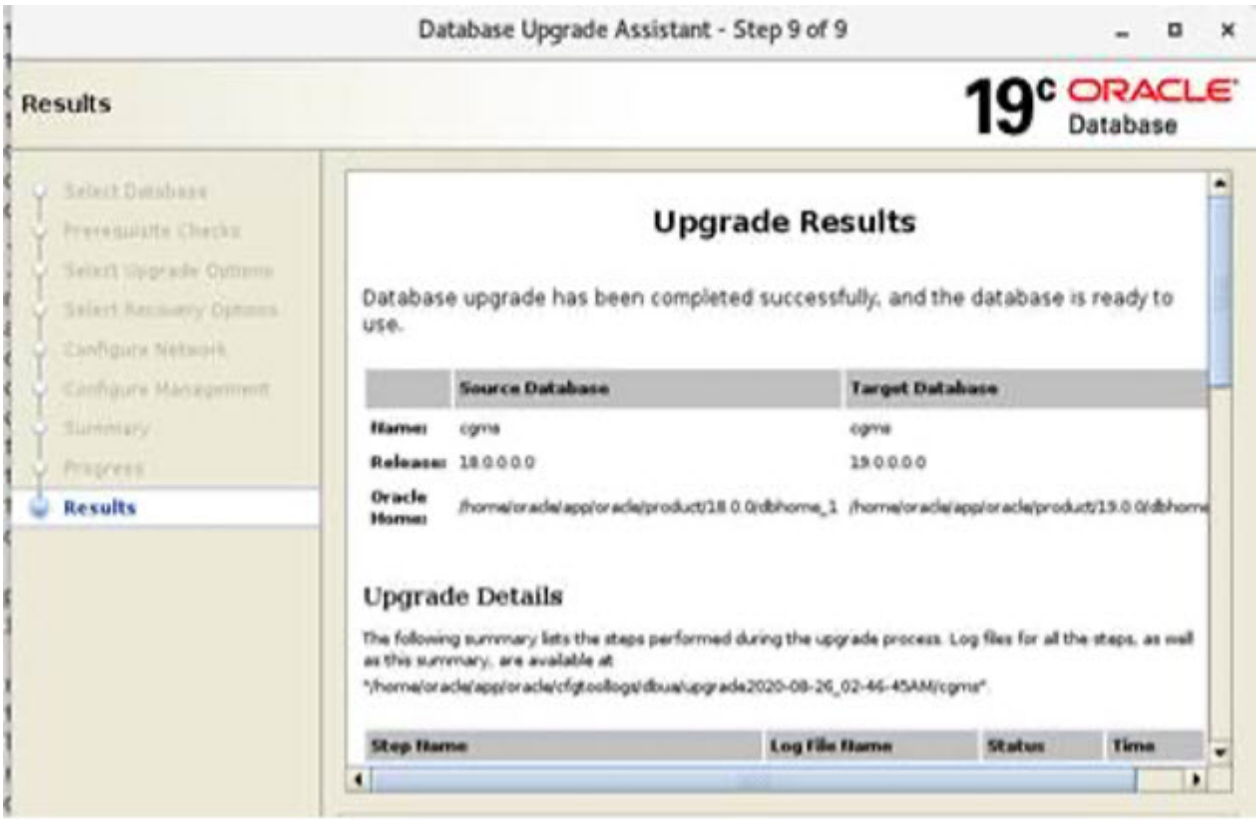


Step 10 Database Upgrade Summary Page

At the Database Upgrade Summary page, click **Finish**. The Database Upgrade Assistant page appears noting that the Oracle 18c to Oracle 19c upgrade was a success.



The database upgrade results are displayed.



Post Upgrade Steps

Step 1 Once the DBUA process is successfully executed, update the /home/oracle/.bashrc file with the Oracle 19.0.0 path by removing the old 18c path.

vim /home/oracle/.bashrc

```
#Oracle Settings updated with Oracle 19.0.0 path
export ORACLE_BASE=/home/oracle/app/oracle
export ORACLE_HOME=/home/oracle/app/oracle/product/19.0.0/dbhome_1
export PATH=$PATH:/home/oracle/app/oracle/product/19.0.0/dbhome_1/bin
export LD_LIBRARY_PATH=/home/oracle/app/oracle/product/19.0.0/dbhome_1/lib:
export ORACLE_SID=cgms
```

Step 2 Restart the Database.

su - oracle

cd /opt/cgms-oracle/scripts

./stopOracle.sh

./startOracle.sh

Step 3 Update Cron job points to Oracle 19.0.0 to auto-start the Oracle for VM reboot.

./deinstallOracleJob.sh

./installOracleJob.sh

Step 4 Start FND service by entering:

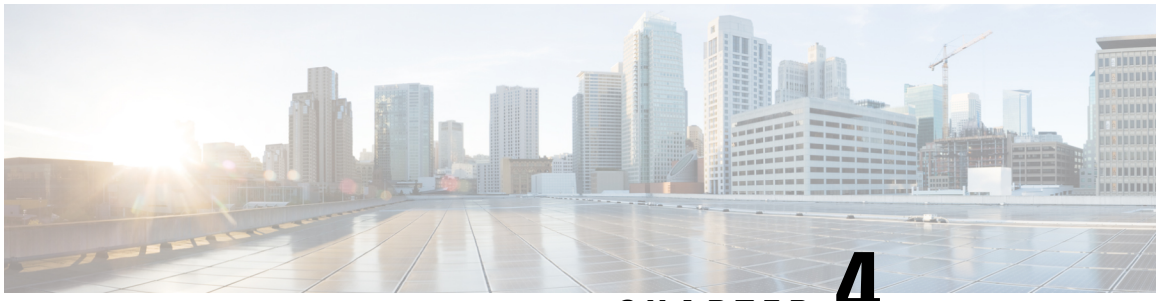
service cgms start

Step 5 Check whether the listener is pointing to 19.0.0.0 database instead of 18c by entering:

ps -ef | grep oracle

00:00:02 /home/oracle/app/oracle/product/19.0.0.0/dbhome_1/bin/tnslsnr CGMSTNS -inherit

Step 6 Once FND service is started, log into the FND UI and verify the data. If there is no issue, the Oracle 18c to 19c upgrade process is completed.



CHAPTER 4

Oracle Patch Installation

This section provides the steps for Oracle patch installation.

- Oracle Patch Installation (Optional), on page 35

Oracle Patch Installation (Optional)

To install the Oracle patch:

Before you begin

Note This is an illustration of the Oracle 19c patch installation (from 19.3.0.0.0 to 19.18.0.0.0).

1. Check the current Oracle version.

```
[root@iot-fnd-oracle ~]# su - oracle

[oracle@iot-fnd-oracle ~]$ sqlplus / as sysdba
SQL*Plus: Release 19.0.0.0.0 - Production on Wed Mar 29 20:59:44 2023
Version 19.3.0.0.0

Copyright (c) 1982, 2019, 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> exit;
```

2. Stop the FND application (if running).

```
service cgms stop
```

3. Log into Oracle.

```
su - oracle
```

4. Stop the Oracle service (if running).

```
cd /opt/cgms-oracle/scripts
./stopOracle.sh
```

5. Apply the patch file: `p34765931_190000_Linux-x86-64.zip`.

Step 1 Create a `patches` directory under the `/home/oracle` folder to place the patch zip files.

```
mkdir /home/oracle/patches
```

Step 2 Download the database patch zip file (p34765931_190000_Linux-x86-64.zip) from Oracle Database 19c Release Update & Release Update Revision January 2023 Known Issues.

Step 3 Copy the patch zip files to the `/home/oracle/patches` folder.

Step 4 Unzip the patch files (p34765931_190000_Linux-x86-64.zip) in the `/home/oracle/patches` folder.

```
su - oracle
cd /home/oracle/patches/
unzip p34765931_190000_Linux-x86-64.zip
```

Step 5 Go to the patch directory **`cd /home/oracle/patches/34765931/`** and run the following command to check if the prerequisites are passing.

```
[oracle@iot-fnd-oracle 34765931]$
/home/oracle/app/oracle/product/19.0.0/dbhome_1/OPatch/opatch prereq
CheckConflictAgainstOHWithDetail -ph ./
Oracle Interim Patch Installer version 12.2.0.1.17
Copyright (c) 2023, Oracle Corporation.  All rights reserved.

PREREQ session

Oracle Home       : /home/oracle/app/oracle/product/19.0.0/dbhome_1
Central Inventory : /home/oracle/app/oraInventory
from           : /home/oracle/app/oracle/product/19.0.0/dbhome_1/oraInst.loc
OPatch version    : 12.2.0.1.17
OUI version       : 12.2.0.7.0
Log file location :
/home/oracle/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/opatch/opatch2023-02-10_07-15-33AM_1.log

Invoking prereq "checkconflictagainstohwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.
```

The minimum OPatch version required is 12.2.0.1.34. The patch installation FAILS if the OPatch version is below 12.2.0.1.34. For more information on applying the minimum OPatch version, see Upgrading OPatch, on page 39.

Step 6 Run the following command to apply the patch.

```
[oracle@iot-fnd-oracle 34765931]$
/home/oracle/app/oracle/product/19.0.0/dbhome_1/OPatch/opatch apply
```

```
Oracle Interim Patch Installer version 12.2.0.1.36
Copyright (c) 2023, Oracle Corporation.  All rights reserved.


Oracle Home       : /home/oracle/app/oracle/product/19.0.0/dbhome_1
Central Inventory : /home/oracle/app/oraInventory
from           : /home/oracle/app/oracle/product/19.0.0/dbhome_1/oraInst.loc
OPatch version    : 12.2.0.1.36
OUI version       : 12.2.0.7.0
Log file location :
/home/oracle/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/opatch/opatch2023-03-23_11-45-20AM_1.log

Verifying environment and performing prerequisite checks...
```

```
OPatch continues with these patches:   34765931

Do you want to proceed? [y|n] y
User Responded with: Y
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = '/home/oracle/app/oracle/product/19.0.0/dbhome_1')


Is the local system ready for patching? [y|n] y
User Responded with: Y
Backing up files...
Applying interim patch '34765931' to OH '/home/oracle/app/oracle/product/19.0.0/dbhome_1'
ApplySession: Optional component(s) [ oracle.network.gsm, 19.0.0.0.0 ] ,
[ oracle.rdbms.ic, 19.0.0.0.0 ] , [ oracle.rdbms.tg4db2, 19.0.0.0.0 ] ,
[ oracle.tfa, 19.0.0.0.0 ] , [ oracle.sdo.companion, 19.0.0.0.0 ] ,
[ oracle.options.olap.api, 19.0.0.0.0 ] , [ oracle.oid.client, 19.0.0.0.0 ] ,
[ oracle.xdk.companion, 19.0.0.0.0 ] , [ oracle.network.cman, 19.0.0.0.0 ] ,
[ oracle.rdbms.tg4msql, 19.0.0.0.0 ] , [ oracle.ons.eons.bwcompat, 19.0.0.0.0 ] ,
[ oracle.net.cman, 19.0.0.0.0 ] , [ oracle.rdbms.tg4tera, 19.0.0.0.0 ] ,
[ oracle.options.olap, 19.0.0.0.0 ] , [ oracle.rdbms.tg4sybs, 19.0.0.0.0 ] ,
[ oracle.ons.cclient, 19.0.0.0.0 ] , [ oracle.rdbms.tg4ifmx, 19.0.0.0.0 ] ,
[ oracle.jdk, 1.8.0.191.0 ]  not present in the Oracle Home or a higher version is found.

Patching component oracle.slax.rsf, 19.0.0.0.0...
Patching component oracle.ordim.jai, 19.0.0.0.0...
Patching component oracle.bali.jewt, 11.1.1.6.0...
Patching component oracle.bali.ewt, 11.1.1.6.0...
Patching component oracle.help.ohj, 11.1.1.7.0...
Patching component oracle.rdbms.locator, 19.0.0.0.0...
Patching component oracle.perlint.expat, 2.0.1.0.4...
Patching component oracle.rdbms.util, 19.0.0.0.0...
Patching component oracle.rdbms, 19.0.0.0.0...
Patching component oracle.rdbms.rsf, 19.0.0.0.0...
Patching component oracle.assistants.acf, 19.0.0.0.0...
Patching component oracle.assistants.deconfig, 19.0.0.0.0...
Patching component oracle.assistants.server, 19.0.0.0.0...
Patching component oracle.blaslapack, 19.0.0.0.0...
Patching component oracle.buildtools.rsf, 19.0.0.0.0...
Patching component oracle.ctx, 19.0.0.0.0...
Patching component oracle.dbdev, 19.0.0.0.0...
Patching component oracle.dbjava.ic, 19.0.0.0.0...
Patching component oracle.dbjava.jdbc, 19.0.0.0.0...
Patching component oracle.dbjava.ucp, 19.0.0.0.0...
Patching component oracle.duma, 19.0.0.0.0...
Patching component oracle.javavm.client, 19.0.0.0.0...
Patching component oracle.ldap.owm, 19.0.0.0.0...
Patching component oracle.ldap.rsf, 19.0.0.0.0...
Patching component oracle.ldap.security.osdt, 19.0.0.0.0...
Patching component oracle.marvel, 19.0.0.0.0...
Patching component oracle.network.rsf, 19.0.0.0.0...
Patching component oracle.odbc.ic, 19.0.0.0.0...
Patching component oracle.ons, 19.0.0.0.0...
Patching component oracle.ons.ic, 19.0.0.0.0...
Patching component oracle.oracore.rsf, 19.0.0.0.0...
Patching component oracle.perlint, 5.28.1.0.0...
Patching component oracle.precomp.common.core, 19.0.0.0.0...
Patching component oracle.precomp.rsf, 19.0.0.0.0...
Patching component oracle.rdbms.crs, 19.0.0.0.0...
Patching component oracle.rdbms.dbscripts, 19.0.0.0.0...
Patching component oracle.rdbms.deconfig, 19.0.0.0.0...
Patching component oracle.rdbms.oci, 19.0.0.0.0...
Patching component oracle.rdbms.rsf.ic, 19.0.0.0.0...
```

```
Patching component oracle.rhp.db, 19.0.0.0.0...
Patching component oracle.sdo, 19.0.0.0.0...
Patching component oracle.sdo.locator.jrf, 19.0.0.0.0...
Patching component oracle.sqlplus, 19.0.0.0.0...
Patching component oracle.sqlplus.ic, 19.0.0.0.0...
Patching component oracle.wwg.plsql, 19.0.0.0.0...
Patching component oracle.ldap.rsf.ic, 19.0.0.0.0...
Patching component oracle.network.listener, 19.0.0.0.0...
Patching component oracle.rdbms.lbac, 19.0.0.0.0...
Patching component oracle.nlsrtl.rsf, 19.0.0.0.0...
Patching component oracle.rdbms.hs_common, 19.0.0.0.0...
Patching component oracle.network.client, 19.0.0.0.0...
Patching component oracle.sdo.locator, 19.0.0.0.0...
Patching component oracle.xdk.rsf, 19.0.0.0.0...
Patching component oracle.rdbms.drdaas, 19.0.0.0.0...
Patching component oracle.oraolap, 19.0.0.0.0...
Patching component oracle.rdbms.dv, 19.0.0.0.0...
Patching component oracle.javavm.server, 19.0.0.0.0...
Patching component oracle.ldap.ssl, 19.0.0.0.0...
Patching component oracle.ctx.atg, 19.0.0.0.0...
Patching component oracle.rdbms.hsodbc, 19.0.0.0.0...
Patching component oracle.xdk, 19.0.0.0.0...
Patching component oracle.mgw.common, 19.0.0.0.0...
Patching component oracle.oraolap.dbscripts, 19.0.0.0.0...
Patching component oracle.xdk.xquery, 19.0.0.0.0...
Patching component oracle.rdbms.rman, 19.0.0.0.0...
Patching component oracle.odbc, 19.0.0.0.0...
Patching component oracle.rdbms.install.plugins, 19.0.0.0.0...
Patching component oracle.oraolap.api, 19.0.0.0.0...
Patching component oracle.rdbms.scheduler, 19.0.0.0.0...
Patching component oracle.rdbms.install.common, 19.0.0.0.0...
Patching component oracle.xdk.parser.java, 19.0.0.0.0...
Patching component oracle.ovm, 19.0.0.0.0...
Patching component oracle.ctx.rsf, 19.0.0.0.0...
Patching component oracle.ldap.client, 19.0.0.0.0...
Patching component oracle.install.deinstalltool, 19.0.0.0.0...
Patching component oracle.dbtoolslistener, 19.0.0.0.0...
Patching component oracle.precomp.lang, 19.0.0.0.0...
Patching component oracle.precomp.common, 19.0.0.0.0...
Patching component oracle.jdk, 1.8.0.201.0...
Patch 34765931 successfully applied.
Sub-set patch [29517242] has become inactive due to the application of a super-set patch [34765931].
Please refer to Doc ID 2161861.1 for any possible further required actions.
og file location:
/home/oracle/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/opatch/opatch2023-03-23_11-45-20AM_1.log

OPatch succeeded.
```

Step 7 Check if the upgraded patch version is 19.18.0 in the interim patches.

```
[oracle@iot-fnd-oracle ~]$
/home/oracle/app/oracle/product/19.0.0/dbhome_1/OPatch/opatch lsinventory -details

Patch  34765931     : applied on Thu Mar 23 11:51:24 EDT 2023
Unique Patch ID:  25098466
Patch description:
"DATABASE RELEASE UPDATE : 19.18.0.0.230117 (REL-JAN230131) (34765931)"
Created on 27 Jan 2023, 11:25:14 hrs UTC
```

Step 8 Confirm the upgraded patch.

```
[root@iok-oracle ~]# su - oracle
[oracle@iok-oracle ~]$ sqlplus / as sysdba
SQL*Plus: Release 19.0.0.0.0 - Production on Wed Mar 29 15:34:04 2023
```

```
Version 19.18.0.0.0

Copyright (c) 1982, 2022, Oracle.  All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.18.0.0.0

SQL> exit;
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.18.0.0.0
[oracle@iok-oracle ~]$exit
```

What to do next

Start Oracle.

```
su - oracle
 cd /opt/cgms-oracle/scripts
 ./startOracle.sh
```

Upgrading OPatch

To apply the Oracle patch 19.18, the minimum required OPatch version is 12.2.0.1.34. If the OPatch version is low, you will see the following error. You can resolve this issue by applying the minimum OPatch version 12.2.0.1.34.

```
[oracle@iot-fnd-oracle 34765931]$
/home/oracle/app/oracle/product/19.0.0/dbhome_1/OPatch/opatch apply
Oracle Interim Patch Installer version 12.2.0.1.17
Copyright (c) 2023, Oracle Corporation.  All rights reserved.
Oracle Home       : /home/oracle/app/oracle/product/19.0.0/dbhome_1
Central Inventory : /home/oracle/app/oraInventory
from           : /home/oracle/app/oracle/product/19.0.0/dbhome_1/oraInst.loc
OPatch version    : 12.2.0.1.17
OUI version       : 12.2.0.7.0
Log file location :
/home/oracle/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/opatch/opatch2023-02-10_07-16-05AM_1.log
Verifying environment and performing prerequisite checks...
Prerequisite check "CheckMinimumOPatchVersion" failed.
The details are:
The OPatch being used has version 12.2.0.1.17 while the following patch(es) require higher
 versions:
Patch 34765931 requires OPatch version 12.2.0.1.34.
Please download latest OPatch from My Oracle Support.
UtilSession failed: Prerequisite check "CheckMinimumOPatchVersion" failed.
Log file location:
/home/oracle/app/oracle/product/19.0.0/dbhome_1/cfgtoollogs/opatch/opatch2023-02-10_07-16-05AM_1.log
OPatch failed with error code 73
```

The steps are an illustration for requesting the minimum OPatch version 12.2.0.1.34 to apply the 19.18 patch on an old OPatch version 12.2.0.1.17.

Step 1 To upgrade the OPatch version, download the **12.2.0.1.36** OPatch version from the Oracle support Patch 6880880 (oracle.com) .

Step 2 Place the zip file in the **$ORACLE_HOME** directory and follow the steps that are given below.

The OPatch file is: **p6880880_190000_Linux-x86-64.zip**

a) Change directory to $ORACLE_HOME/OPatch/

```
[oracle@iot-fnd-oracle 34765931]$
cd $ORACLE_HOME/OPatch/
```

b) Check the current version of OPatch.

```
[oracle@iot-fnd-oracle OPatch]$ ./opatch version
OPatch Version: 12.2.0.1.17
OPatch succeeded.
```

c) Take backup of the present OPatch in the following directory.

```
[oracle@iot-fnd-oracle ]$
cd /home/oracle/app/oracle/product/19.0.0/dbhome_1
[oracle@iot-fnd-oracle dbhome_1]$
tar -cvzPpf OPatch_backup.tar OPatch/
```

d) Remove the OPatch folder.

```
[oracle@iot-fnd-oracle dbhome_1]$
rm -rf OPatch
```

e) Unzip 12.2.0.1.36 the OPatch version and check if the OPatch folder is created under the **dbhome_1** directory.

```
[oracle@iot-fnd-oracle dbhome_1]$
unzip p6880880_190000_Linux-x86-64.zip
```

f) Check the upgraded OPatch version.

```
[oracle@iot-fnd-oracle dbhome_1]$ cd OPatch
[oracle@iot-fnd-oracle OPatch]$ ./opatch version
OPatch Version: 12.2.0.1.36
OPatch succeeded.
```