

Oracle RAC 19c(19.24.0.0.0) on SUSE Linux Enterprise Server 15 (SP6) for x86-64

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Introduction

This document provides details on installing Oracle Grid/Database 19c on SUSE Linux Enterprise Server 15 SP6. It covers x86_64 version but installation steps are same for other supported platforms. (x86, ia64, System z, etc.).

Official Oracle product documentation is available at: <http://docs.oracle.com/en/>

System Requirements and Specifications

Hardware Requirements

Requirement	Minimum
RAM	32 GB
Swap space	Approx. twice the size of RAM
Disk space in /tmp	8 GB
Disk space for software files	8 GB
Disk space for database files	8 GB

Software Requirements

SUSE

- *SUSE Linux Enterprise Server 15 SP6 GM (x86_64)*
(<https://www.suse.com/products/server/download>)

Oracle

- *Oracle Grid Infrastructure 19c (19.3) (x86_64)*
- *Oracle Database 19c (19.3) (x86_64)*
(<https://www.oracle.com/database/technologies/oracle19c-linux-downloads.html>)
- *Patch 36582629: GI RELEASE UPDATE 19.24.0.0.0*
- *Patch 6880880: OPatch utility 12.2.0.1.43 for DB 23.0.0.0.0*
(<https://support.oracle.com>)

Cluster(4-node) Information

Dell PowerEdge R750 Server (2 x CPU Intel Xeon Gold 5318Y 2.1G, 24C/48T, 11.2GT/s, 36M Cache, Turbo, HT (165W)), DDR4-2933 128GB of memory

Local 2 x SSD (1TB, NVMe)

2 x NIC Intel Ethernet Converged Network Adapter X710-DA2 (10GbE SFP+, Dual Port) (two bonded as active/passive) + Static IP Address

Shared SAN Partition: 100G(ASM disk group for OCR and voting disk), 600G(ASM disk group for DB data)

OS: SUSE Linux Enterprise Server 16 SP6 (x86_64)

Kernel version: 6.4.0-150600.21-default

Network configuration:

Public IP:

10.200.176.11 c3n1.oraclab.bej.suse.com c3n1

10.200.176.12 c3n2.oraclab.bej.suse.com c3n2

10.200.176.13 c3n3.oraclab.bej.suse.com c3n3

10.200.176.14 c3n4.oraclab.bej.suse.com c3n4

Private IP:

192.168.3.1 c3n1-priv c3n1-priv

192.168.3.2 c3n2-priv c3n2-priv

192.168.3.3 c3n3-priv c3n3-priv

192.168.3.4 c3n4-priv c3n4-priv

Virtual IP:

10.200.176.15 c3n1-vip.oraclab.bej.suse.com c3n1-vip

10.200.176.16 c3n2-vip.oraclab.bej.suse.com c3n2-vip

10.200.176.17 c3n3-vip.oraclab.bej.suse.com c3n3-vip

10.200.176.18 c3n4-vip.oraclab.bej.suse.com c3n4-vip

SCAN

c3-scan.oraclab.bej.suse.com - (10.200.176.30, 10.200.176.31, 10.200.176.32)

Prerequisites

1. Installing SUSE Linux Enterprise Server 15 SP6 on each cluster node

1-1. Install SUSE Linux Enterprise Server 15 SP6 with “Enhanced Base System, Software Management, X Window System, Oracle Server Base” pattern. You can follow official Oracle Grid/Database Installation manual for selective SLES OS required rpms, however “Oracle Server Base” pattern from SUSE will fulfil minimum setup required for Oracle RAC Installation.

Figure 1-1 Software Installed as shown below

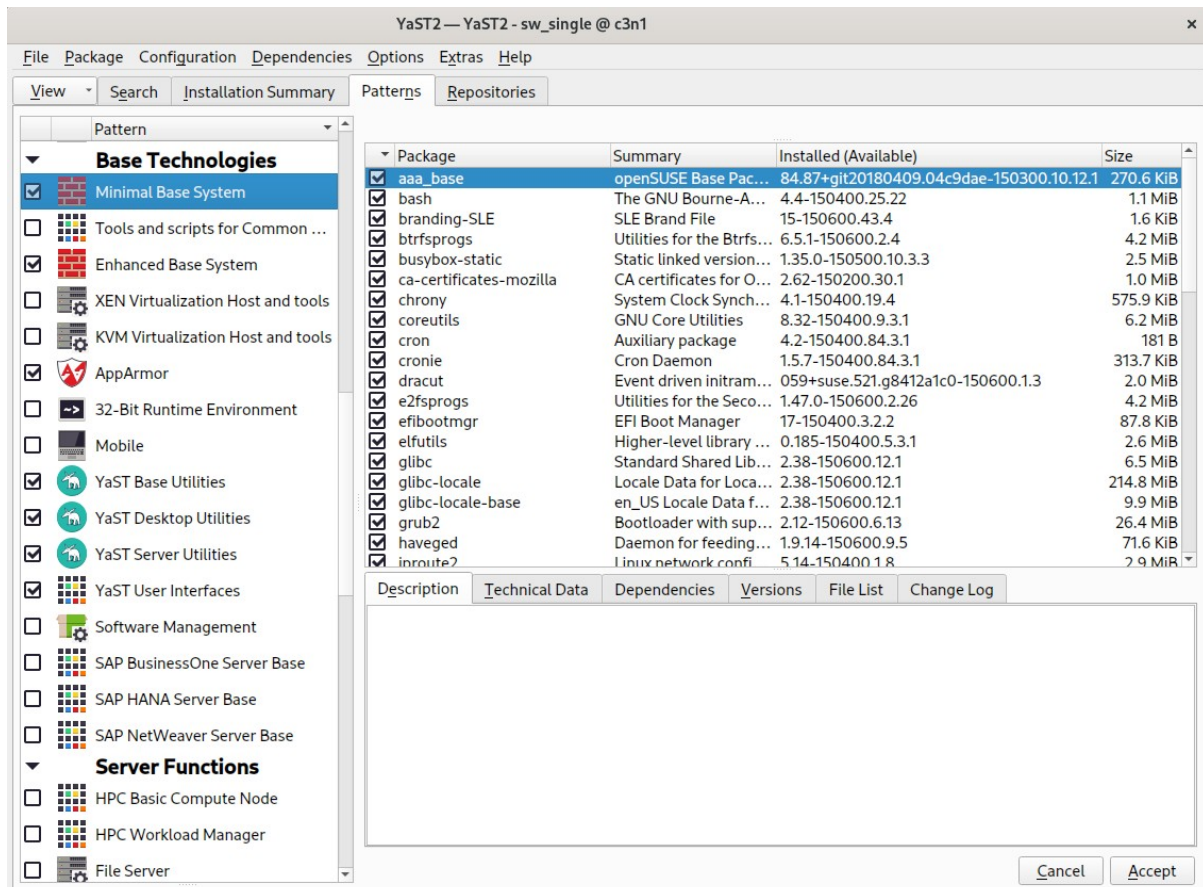
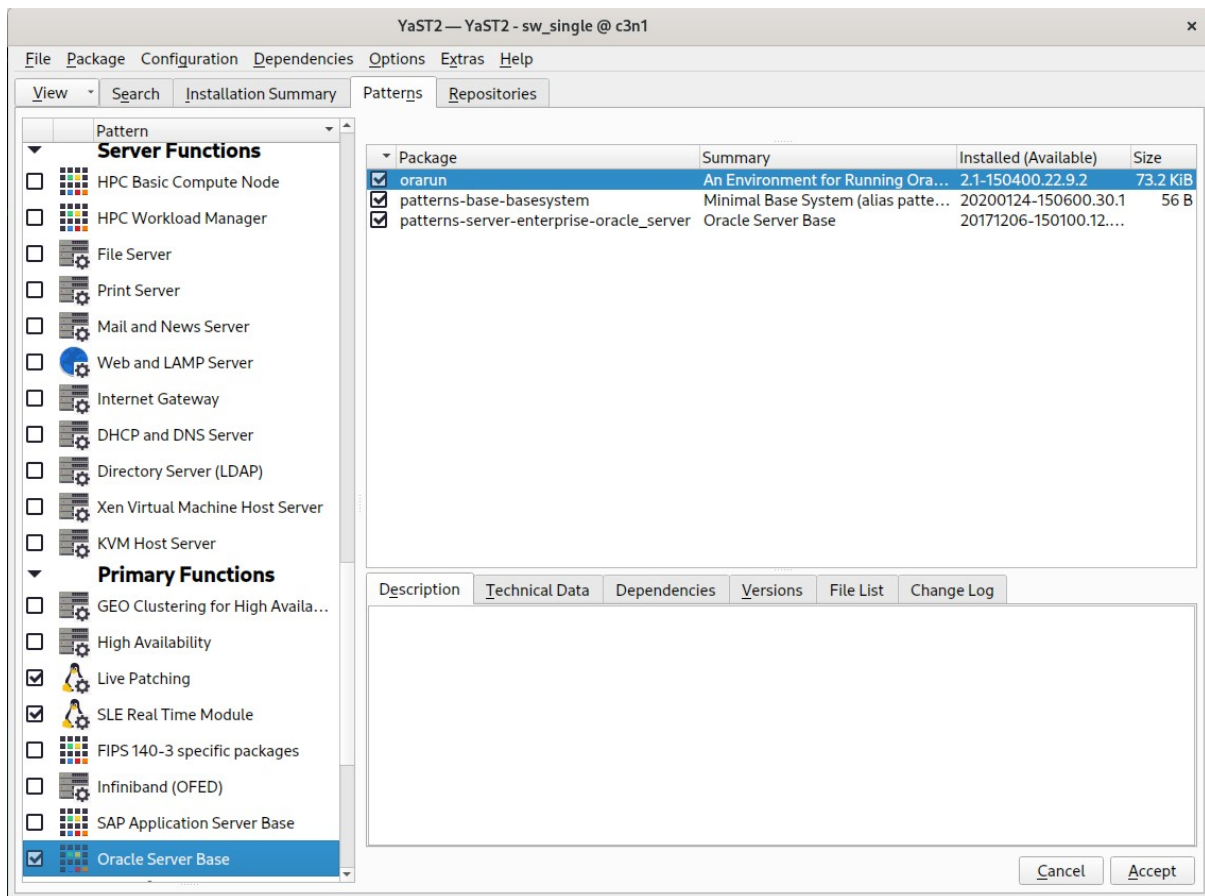


Figure 1-2 Software Installed as shown below**Figure 1-3 OS release information and kernel version**

```
oracle@c3n1:~> more /etc/os-release
NAME="SLES"
VERSION="15-SP6"
VERSION_ID="15.6"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP6"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp6"
DOCUMENTATION_URL="https://documentation.suse.com/"
oracle@c3n1:~> uname -a
Linux c3n1 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09/lp) x86_64 x86_64 x86_64 GNU/Linux
oracle@c3n1:~>
```

2. Oracle software pre-install verify

2-1. Login to the SLES 15 SP6 64-bit OS as a non-admin user.

Download Oracle Database 19c Grid Infrastructure (19.3) for Linux x86-64 from:
<https://www.oracle.com/database/technologies/oracle19c-linux-downloads.html>.

Download GI RELEASE UPDATE 19.24.0.0.0(Patch 36582629) and OPatch utility 12.2.0.1.43(Patch 6880880) from:
<https://support.oracle.com>.

2-2. Extract LINUX.X64_193000_grid_home.zip, p36582629_190000_Linux-x86-64.zip, and p6880880_230000_Linux-x86-64.zip. Replace the OPatch directory located in the Grid 19.3 ShipHome with OPatch version 12.2.0.1.43. Then, through the Grid Installer(gridSetup.sh) to apply the patch 36582629(GI RELEASE UPDATE 19.24.0.0.0).

```
oracle@c3n1:/home/oracle/grid_19c> ./gridSetup.sh -applyRU /home/ORACLE_SW/patch_RU_192400/36582629/  
Preparing the home to patch...  
Applying the patch /home/ORACLE_SW/patch_RU_192400/36582629/...  
Successfully applied the patch.
```

2-3. After successfully installing the patch, stop the grid Installer(gridSetup.sh). Run the Oracle 'runcluvfy.sh' tool to verify that the cluster setup is ready for installation. Before proceeding, resolve any issues you encounter. Please refer to the official Oracle Installation Guide for assistance.

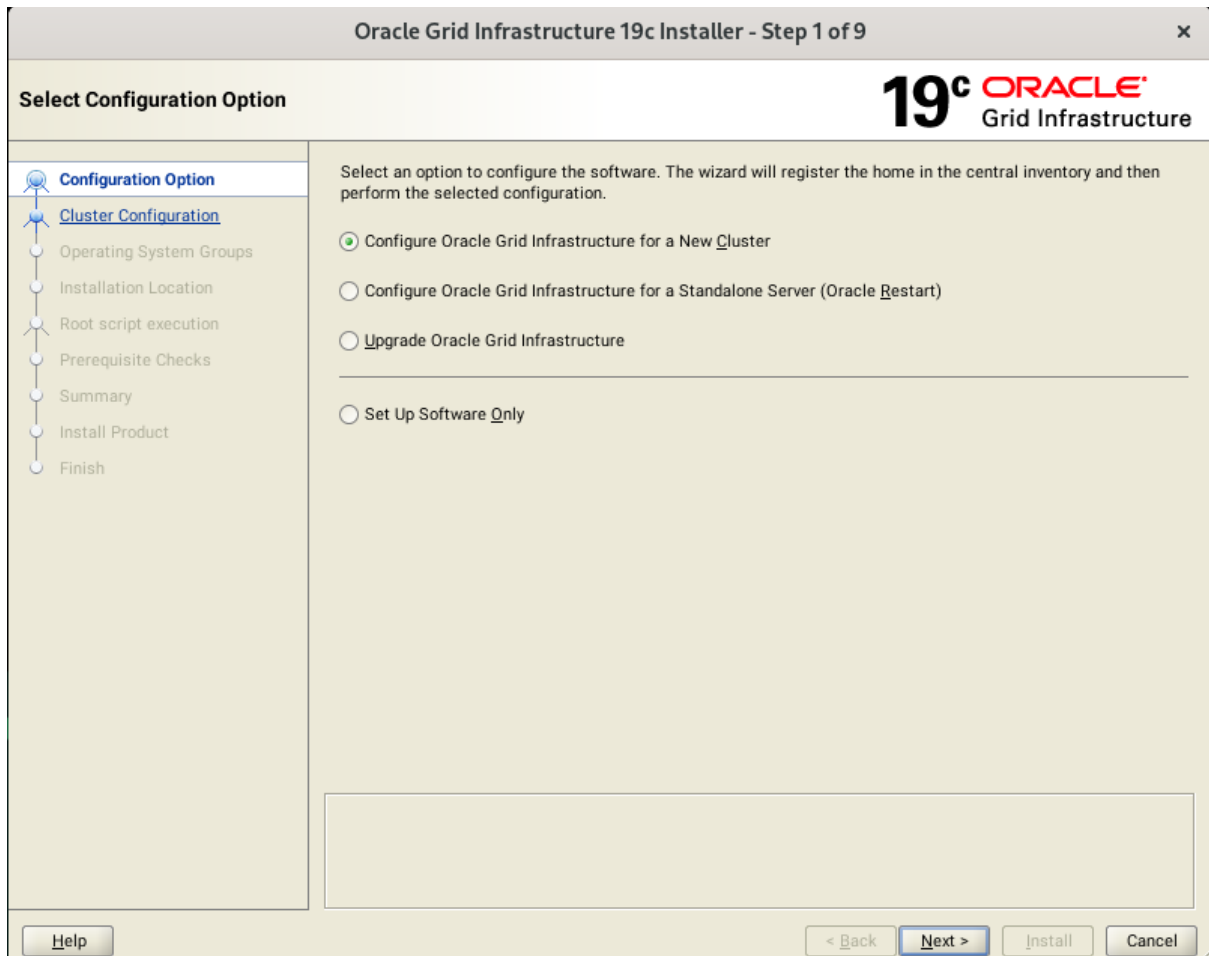
Oracle RAC Installation

1. Installing Oracle Grid Infrastructure.

1-1. Export `SRVM_DISABLE_MTTRANS=true`, then run Oracle Grid installer `./gridSetup.sh` from Grid ShipHome.

Install Flow:

1). Select Configuration Option.



Choose option **"Configure Oracle Grid Infrastructure for a New Cluster"**, then click **Next** to continue.

2). Select Cluster Configuration.

Oracle Grid Infrastructure 19c Installer - Step 2 of 9

Select Cluster Configuration

19c ORACLE Grid Infrastructure

Choose the required cluster configuration.

- Configure an Oracle Standalone Cluster
- Configure an Oracle Domain Services Cluster
- Configure an Oracle Member Cluster for Oracle Databases
- Configure an Oracle Member Cluster for Applications

Oracle Extended clusters are special purpose clusters that constitute nodes which span across multiple sites. Specify a minimum of 3 site names and a maximum of 5 (e.g., siteA, siteB, siteC).

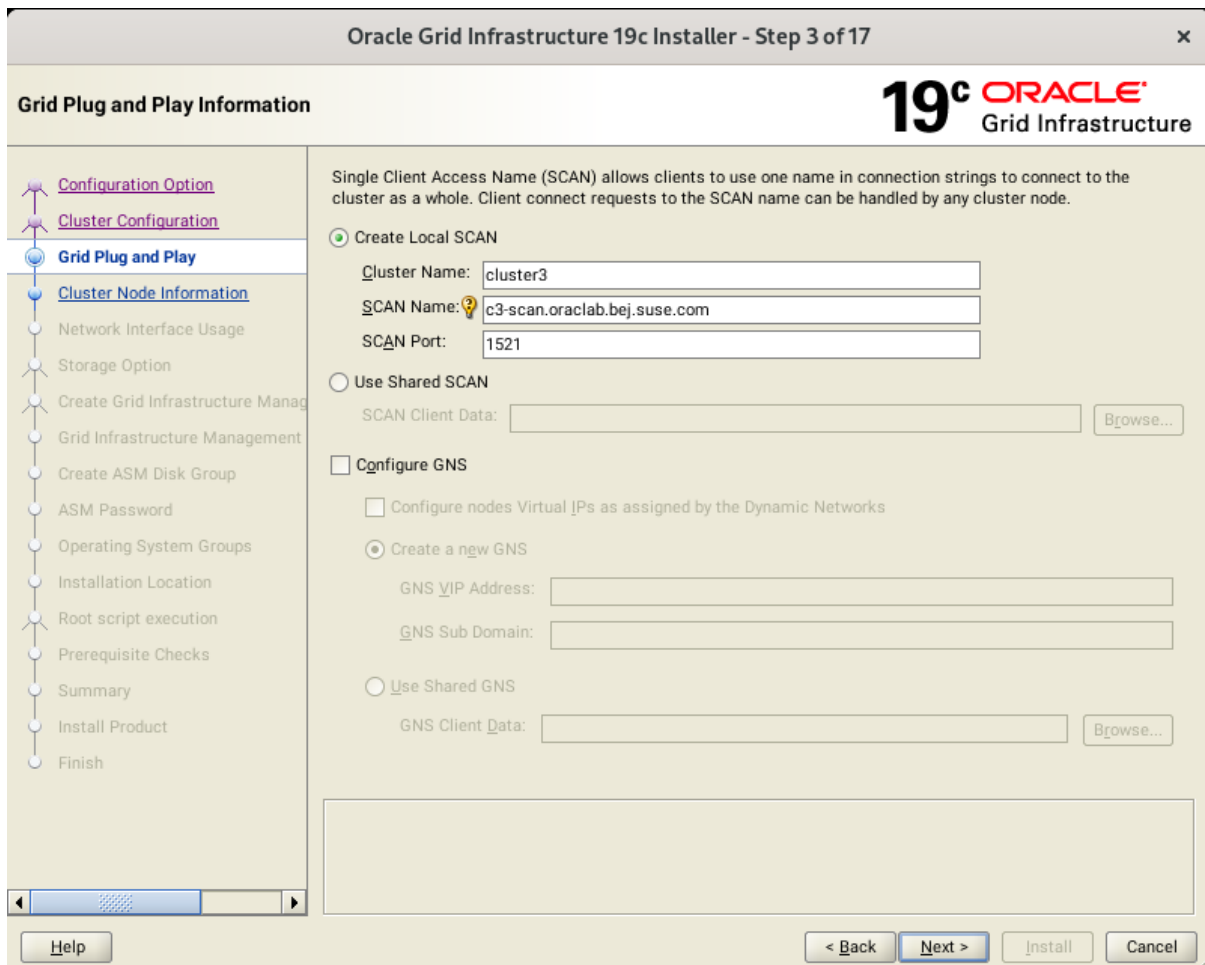
Configure as an Oracle Extended cluster

Site names:

Help < Back Next > Install Cancel

Choose option "**Configure an Oracle Standalone Cluster**", then click **Next** to continue.

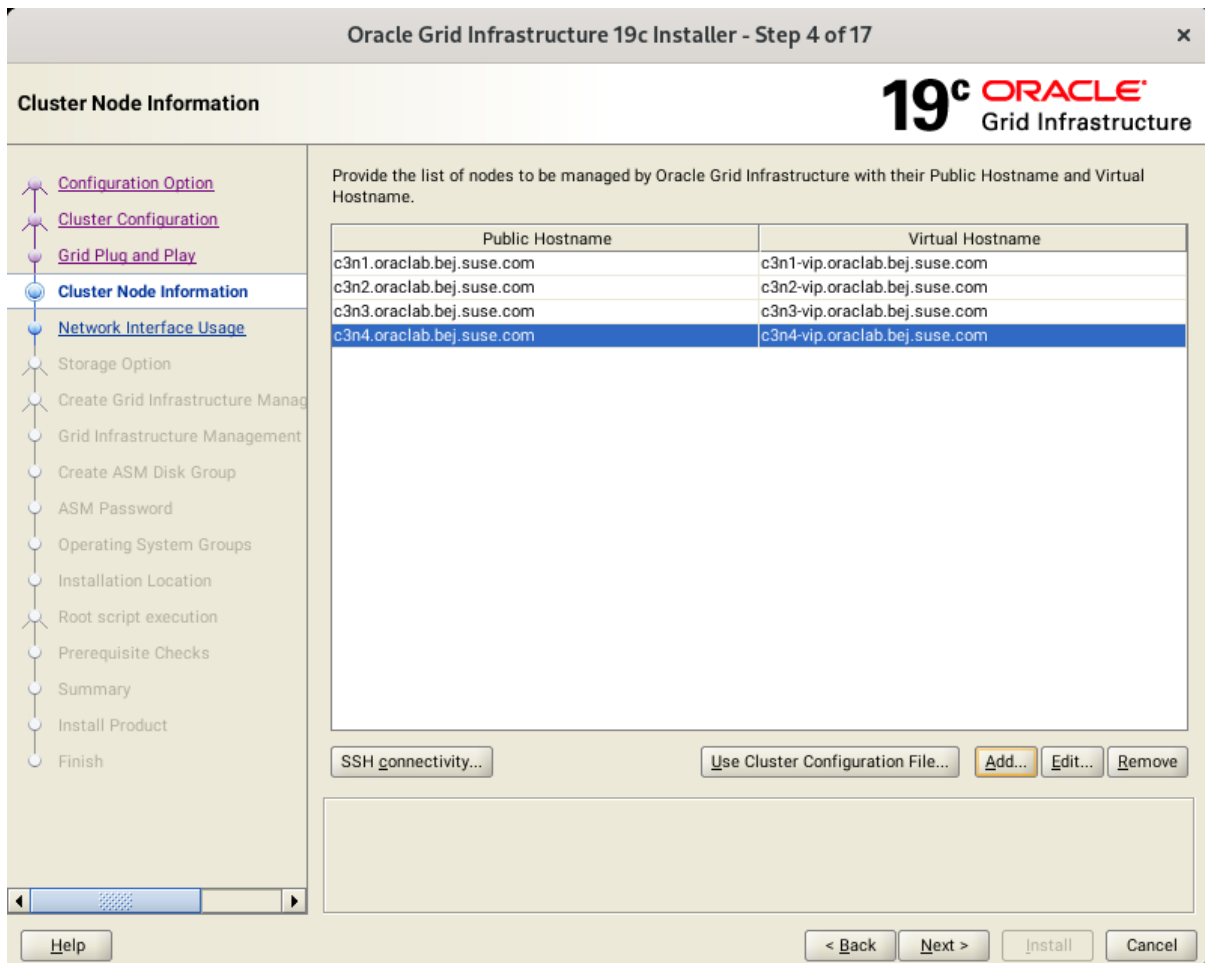
3). Grid Plug and Play Information.



Enter the names of the cluster and scan in the **Cluster Name** and **SCAN Name** fields, which are unique across the entire subnet, and then click **Next** to continue.

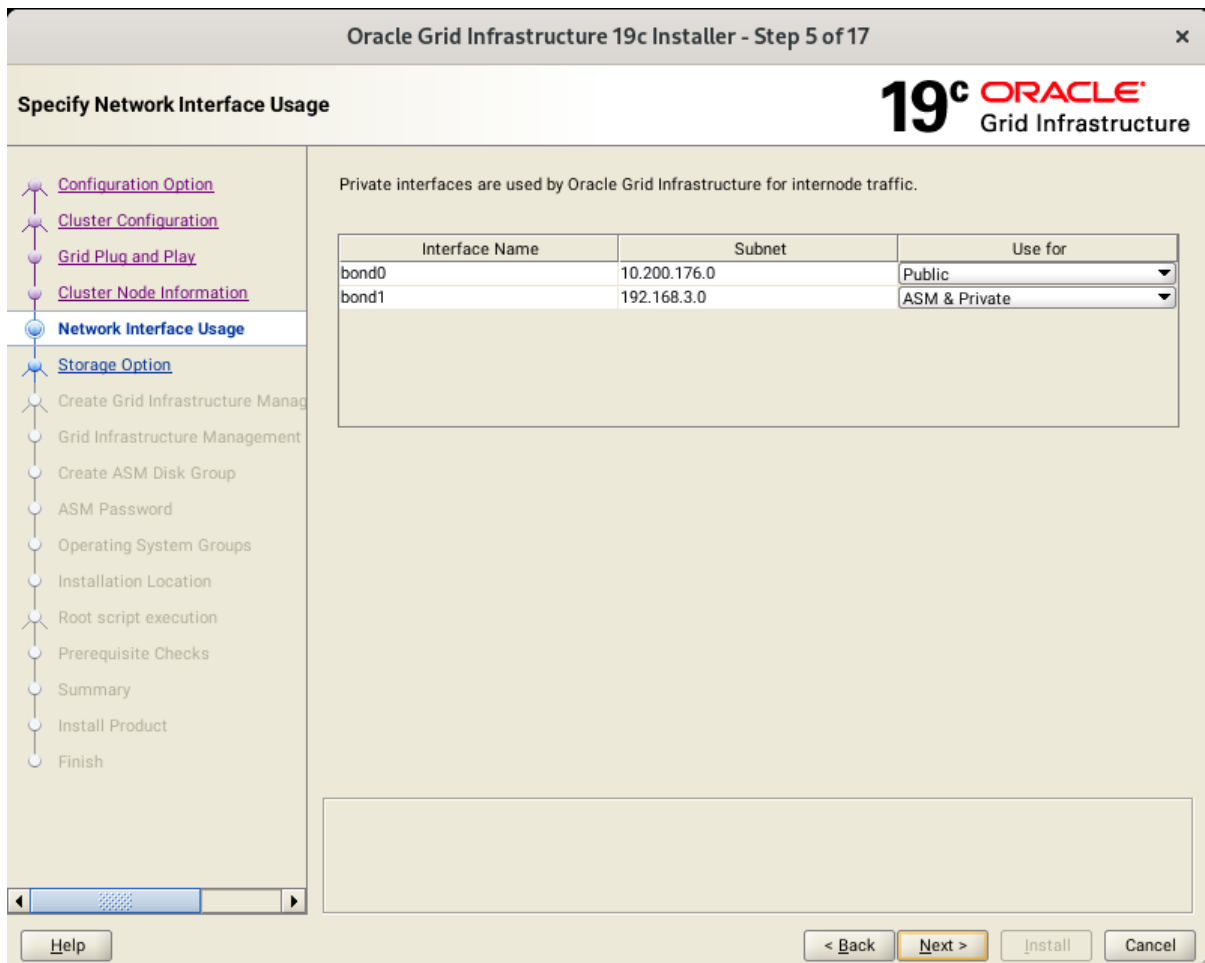
(More details for GNS configuration please see Oracle official document.)

4). The 'Cluster Node Information' screen appears.



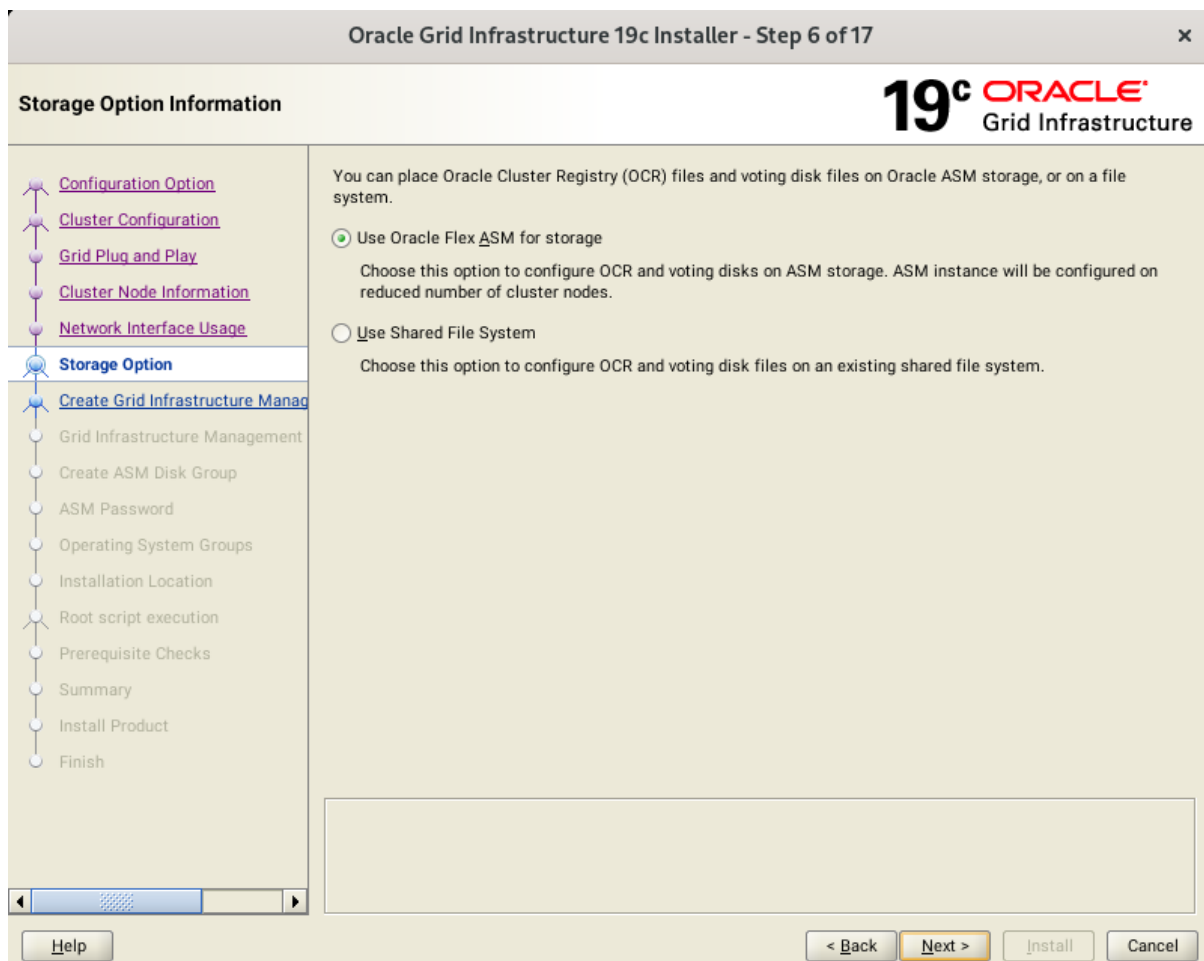
In the Public Hostname column of the table of cluster nodes, you should see your local node. Click **Add** to add another node to the cluster. Enter the second node's public name (node2), and virtual IP name (node2-vip), then click OK. Make sure all nodes are selected, then click the SSH Connectivity button at the bottom of the window. After a short period, another message window appears indicating that passwordless SSH connectivity has been established between the cluster nodes. Click **OK** to continue. When returned to the Cluster Node Information window, click **Next** to continue.

5). Specify Network Interface Usage.



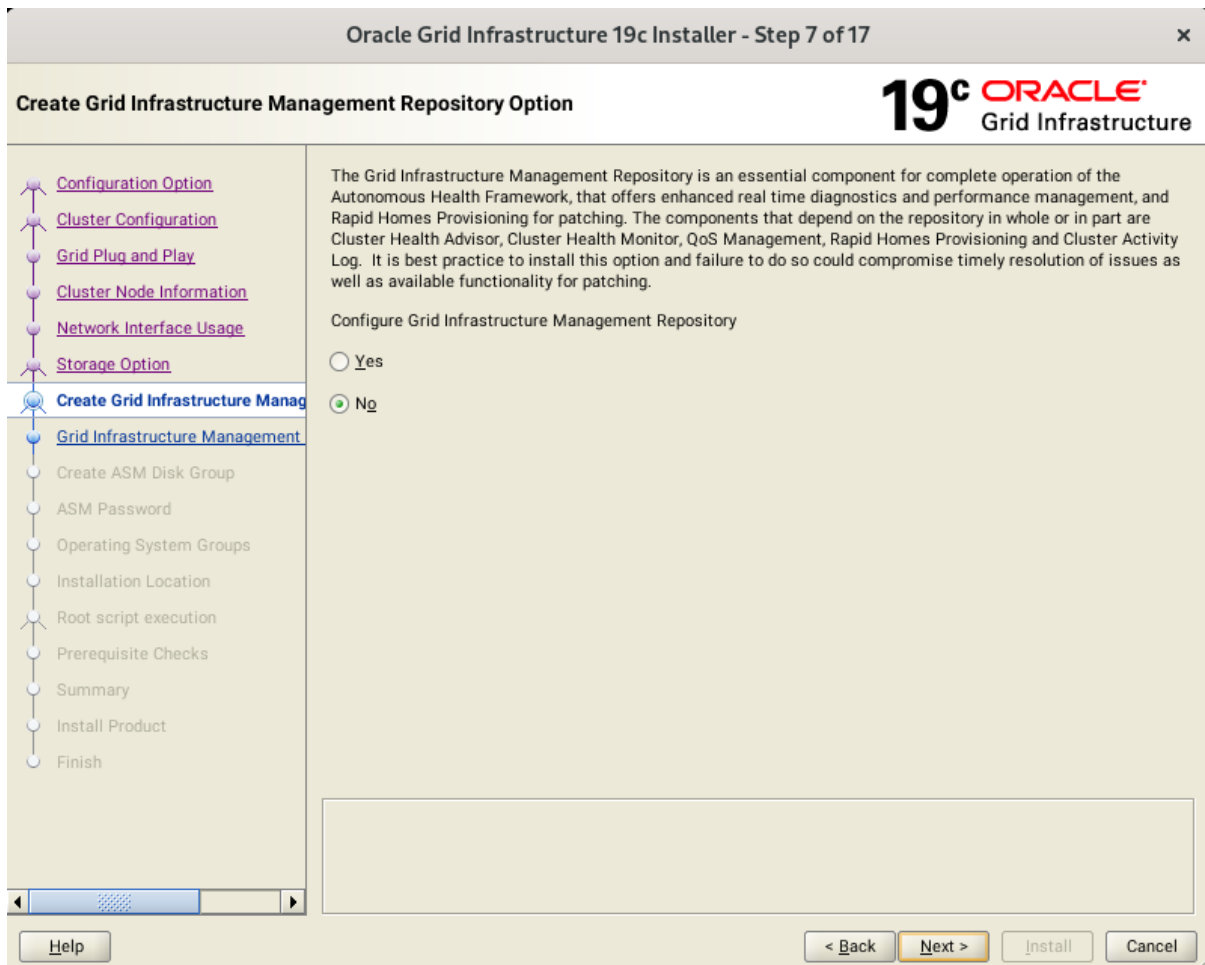
Verify that each interface has the correct interface type associated with it. If you have network interfaces that should not be used by Oracle Clusterware, then set the network interface type to **Do Not Use**. For example, if you have only two network interfaces, then set the public interface to have a Use For value of **Public** and set the private network interface to have a Use For value of **ASM & Private**, then click **Next** to continue.

6). Storage Option Information.



Choose option **"Use Oracle Flex ASM for storage"**, then click **Next** to continue.

7). Grid Infrastructure Management Repository Option.



Choose whether you want to store the Grid Infrastructure Management Repository in a separate Oracle ASM disk group, then click **Next** to continue.

8). Create ASM Disk Group.

Oracle Grid Infrastructure 19c Installer - Step 8 of 16

Create ASM Disk Group

OCR and Voting disk data will be stored in the following ASM Disk group. Select disks and characteristics of this Disk group.

Disk group name:

Redundancy: Flex High Normal External

Allocation Unit Size: MB

Select Disks:

<input type="checkbox"/>	Disk Path	Size (in MB)	Status	Failure Group
<input checked="" type="checkbox"/>	/dev/asm/disk1	30720	Candidate	
<input checked="" type="checkbox"/>	/dev/asm/disk2	30720	Candidate	
<input checked="" type="checkbox"/>	/dev/asm/disk3	30720	Candidate	
<input type="checkbox"/>	/dev/asm/disk4	112640	Candidate	
<input type="checkbox"/>	/dev/asm/disk5	112640	Candidate	
<input type="checkbox"/>	/dev/asm/disk6	112640	Candidate	
<input type="checkbox"/>	/dev/asm/disk7	112640	Candidate	

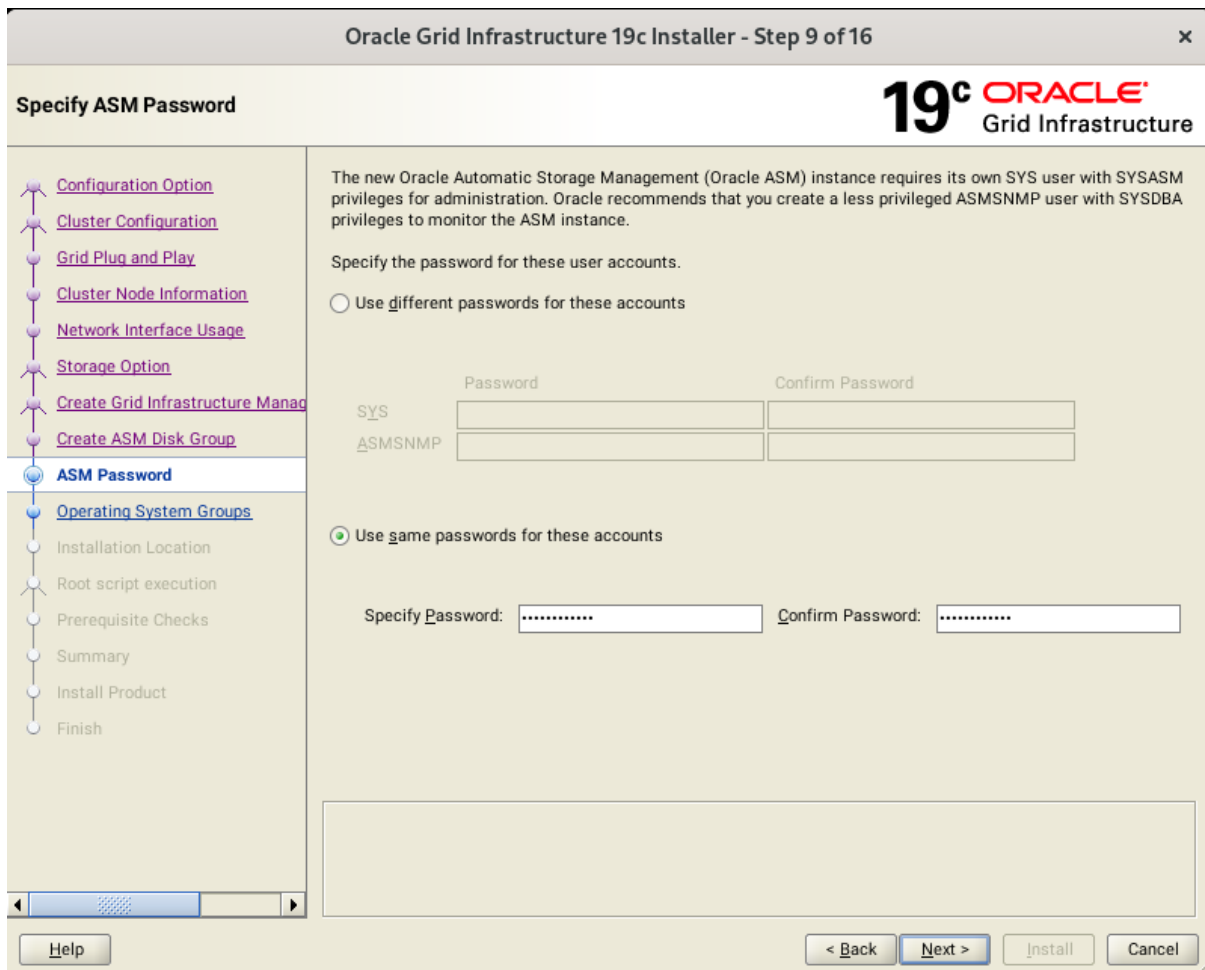
Disk Discovery Path: /dev/asm/**

Configure Oracle ASM Filter Driver

Select this option to configure ASM Filter Driver (AFD) to simplify configuration and management of disk devices by Oracle ASM.

Depending on your needs to create ASM Disk Group, then click **Next** to continue.

9). Specify ASM Password.



Choose the same password for the Oracle ASM SYS and ASMSNMP account, or specify different passwords for each account, then click **Next** to continue.

10). Failure Isolation Support.

The screenshot shows the Oracle Grid Infrastructure 19c Installer window at Step 10 of 18. The title bar reads "Oracle Grid Infrastructure 19c Installer - Step 10 of 18". The main window has a header with "Failure Isolation Support" on the left and the "19c ORACLE Grid Infrastructure" logo on the right. A left-hand navigation pane lists various configuration steps, with "Failure Isolation" selected and highlighted in blue. Below "Failure Isolation", several sub-options are listed: "Management Options", "Operating System Groups", "Installation Location", "Root script execution", "Prerequisite Checks", "Summary", "Install Product", and "Finish". The main content area is titled "Choose one of the following Failure Isolation Support options." and contains two radio button options. The first option is "Use Intelligent Platform Management Interface (IPMI)", which is currently unselected. Below this option is a text box for "User Name" and another for "Password", with a note: "To ensure successful installation with IPMI enabled, ensure your IPMI drivers are properly installed and enabled." The second option is "Do not use Intelligent Platform Management Interface (IPMI)", which is selected and highlighted with a yellow border. At the bottom of the window, there are four buttons: "Help", "< Back", "Next >", and "Install". The "Next >" button is highlighted in blue.

Select the option "**Do not use Intelligent Platform Management Interface (IPMI)**", then click **Next** to continue.

11). Specify Management Options.

Oracle Grid Infrastructure 19c Installer - Step 11 of 18

Specify Management Options

19c ORACLE
Grid Infrastructure

You can configure to have this instance of Oracle Grid Infrastructure and Oracle Automatic Storage Management to be managed by Enterprise Manager Cloud Control. Specify the details of the Cloud Control configuration to perform the registration.

Register with Enterprise Manager (EM) Cloud Control

OMS host:

OMS port:

EM Admin User Name:

EM Admin Password:

Management Options

- Configuration Option
- Cluster Configuration
- Grid Plug and Play
- Cluster Node Information
- Network Interface Usage
- Storage Option
- Create Grid Infrastructure Manag
- Create ASM Disk Group
- ASM Password
- Failure Isolation
- Management Options**
- Operating System Groups
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Help < Back Next > Install Cancel

Selected/Deselected the option "Register with EM...", then click **Next** to continue.

12). Privileged Operating System Groups.

The screenshot shows the 'Privileged Operating System Groups' step in the Oracle Grid Infrastructure 19c installer. The window title is 'Oracle Grid Infrastructure 19c Installer - Step 12 of 18'. The Oracle 19c logo is visible in the top right. A navigation pane on the left lists various steps, with 'Operating System Groups' selected. The main area contains the following text and controls:

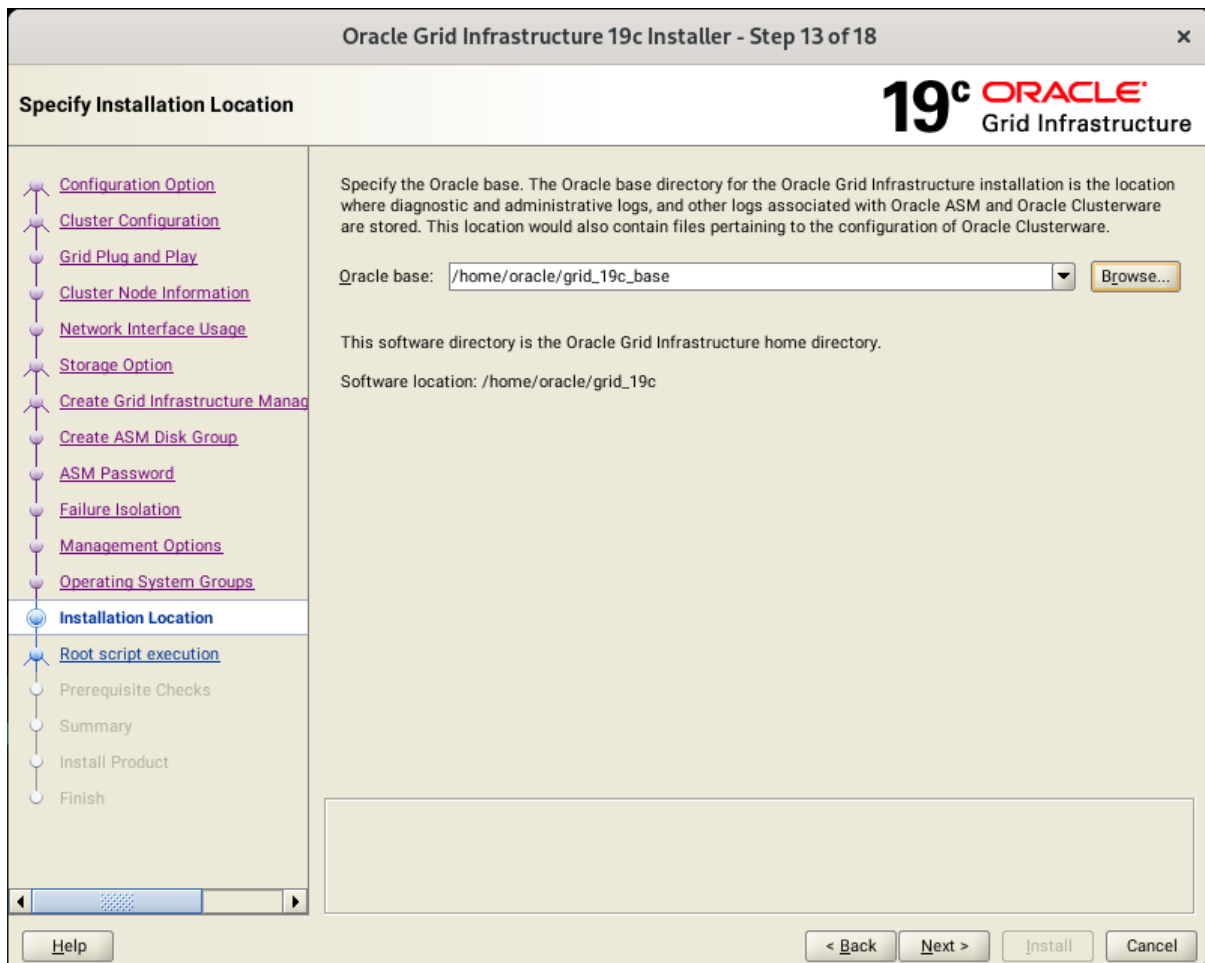
Select the name of the operating system group, that you want to use for operating system authentication to Oracle Automatic Storage Management.

Oracle <u>A</u> SM Administrator (OSASM) Group	<input type="text" value="asmadmin"/>
Oracle ASM <u>D</u> BA (OSDBA for ASM) Group	<input type="text" value="asmdba"/>
Oracle ASM <u>O</u> perator (OSOPER for ASM) Group (Optional)	<input type="text"/>

At the bottom of the window, there are four buttons: 'Help', '< Back', 'Next >', and 'Install'. The 'Next >' button is highlighted in yellow.

Accept the default operating system group names for Oracle ASM administration, then click **Next** to continue.

13). Specify Installation Location.



Specify the directory to use for the Oracle base for the Oracle Grid Infrastructure installation, then click **Next** to continue. The Oracle base directory must be different from the Oracle home directory.

14). Create Inventory

Oracle Grid Infrastructure 19c Installer - Step 14 of 19

Create Inventory

19c ORACLE
Grid Infrastructure

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.

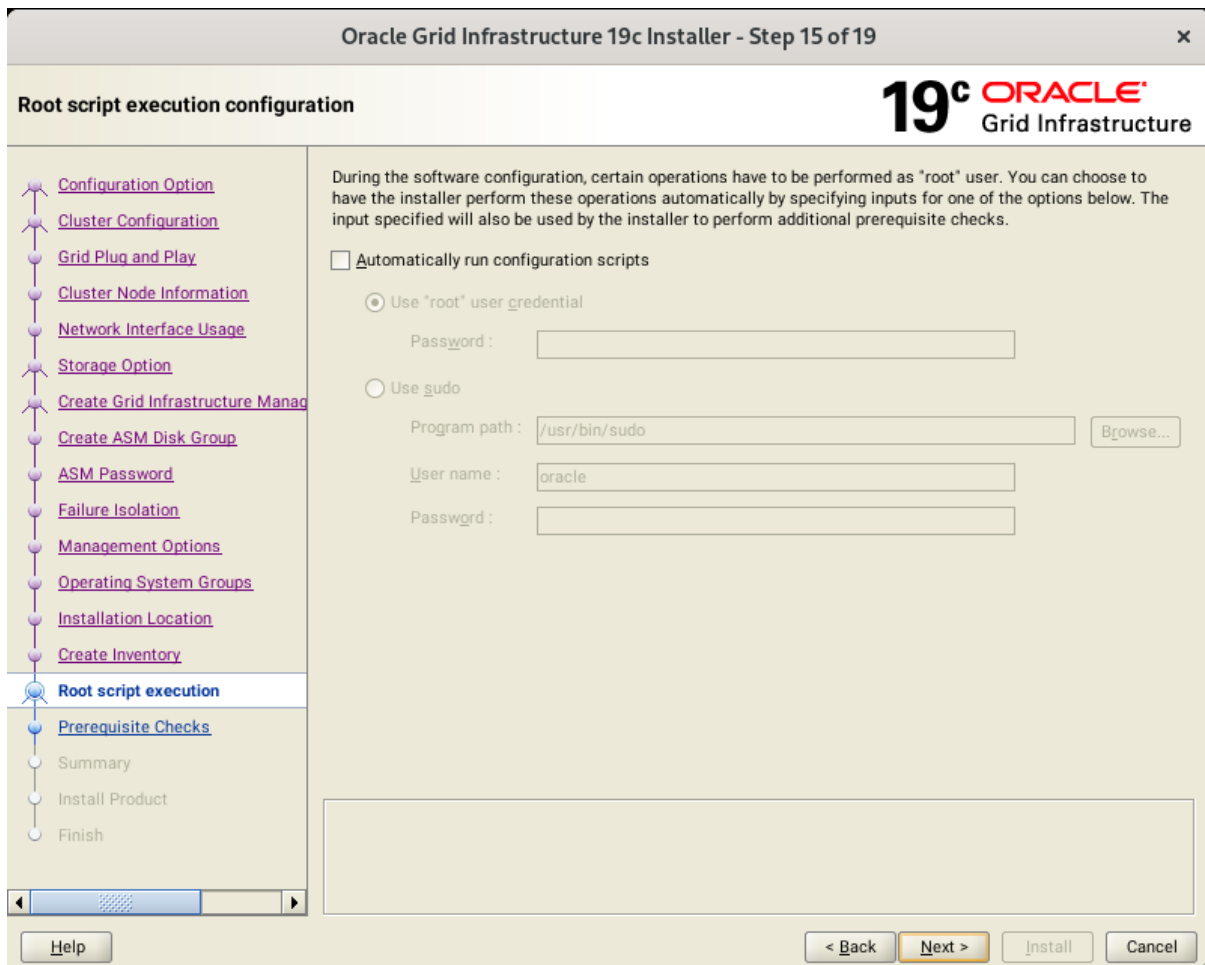
Inventory Directory:

Members of the following operating system group (the primary group) will have write permission to the inventory directory (orainventory).

oraInventory Group Name: oinstall

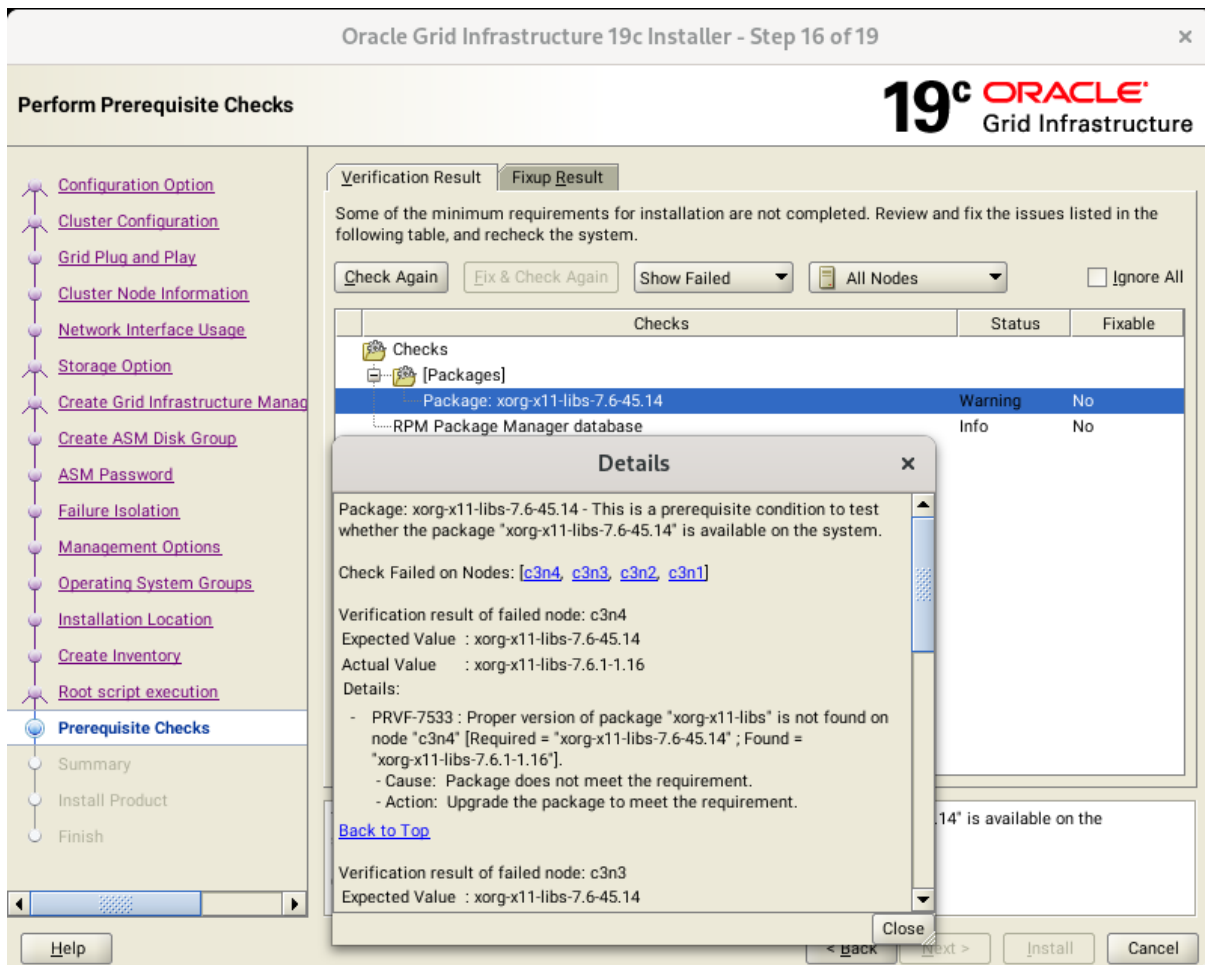
Specify a directory for installation metadata files, and then click **Next** to continue.

15). Root script execution configuration.



If select the option **Automatically run configuration scripts**, enter the credentials for the root user or a sudo account. Alternatively, run the scripts manually as the root user at the installation process when prompted by the installer. Click **Next** to continue.

16). Perform Prerequisite Checks.



Resolve all the errors and warnings on all nodes in the cluster & run "Fix & Check Again". If the "Fix & check again" button is not available, try to fix manually.

Once verified, select option "Ignore All", then click **Next** to continue.

Oracle Grid Infrastructure 19c Installer - Step 16 of 19

Perform Prerequisite Checks

19c ORACLE Grid Infrastructure

Verification Result **Fixup Result**

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Check Again Fix & Check Again Show Failed All Nodes Ignore All

Checks	Status	Fixable
Checks		
[Packages]		
Package: xorg-x11-libs-7.6-45.14	Ignored	No
RPM Package Manager database	Ignored	No

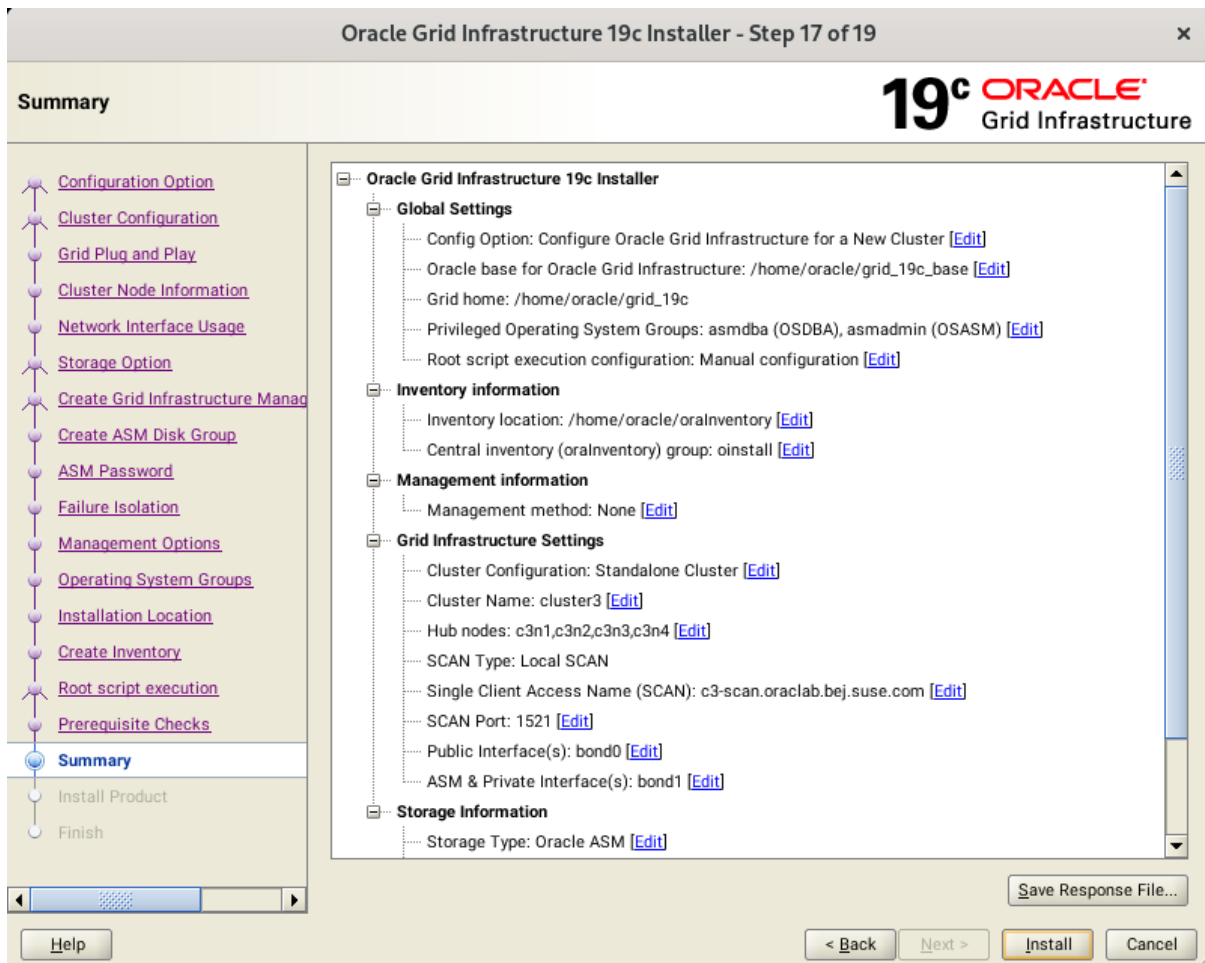
This is a prerequisite condition to test whether the package "xorg-x11-libs-7.6-45.14" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c3n4, c3n3, c3n2, c3n1]

Help < Back Next > Install Cancel

(Note: The version of xorg-x11-libs in SLES15 SP6 is 7.6.1-1.16.)

16). Summary.



Installation Summary as shown above, click **Install** to continue.

17). Install Product.

Oracle Grid Infrastructure 19c Installer - Step 18 of 19

Install Product **19^c ORACLE[®]**
Grid Infrastructure

Progress

7%

Copying /home/oracle/grid_19c to remote nodes

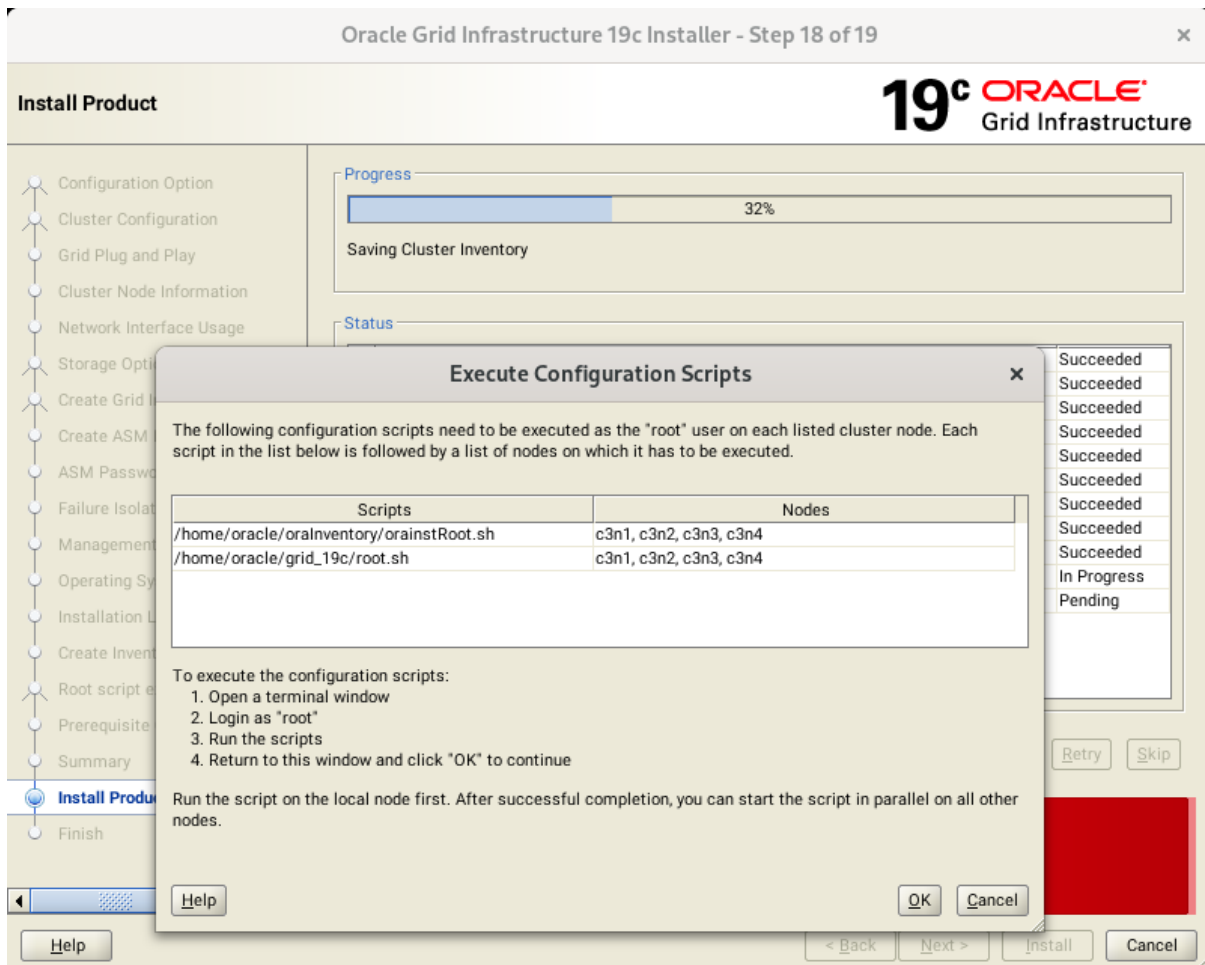
Status

✓	Configure Local Node	Succeeded
✓	• Prepare	Succeeded
✓	• Link binaries	Succeeded
✓	• Setup	Succeeded
→	Copy Files to Remote Nodes	In Progress
	Configure Remote Nodes	Pending
	• Prepare	Pending
	• Setup	Pending
	Setup Oracle Base	Pending
	Execute Root Scripts	Pending
	Configure Oracle Grid Infrastructure for a Cluster	Pending

19^c ORACLE[®]
Grid Infrastructure

Help < Back Next > Install Cancel

Installer prompted you to run the orainstRoot.sh and root.sh scripts.



```
c3n1:/home/oracle # /home/oracle/oraInventory/orainstRoot.sh
Changing permissions of /home/oracle/oraInventory.
Adding read,write permissions for group.
Removing read,write,execute permissions for world.

Changing groupname of /home/oracle/oraInventory to oinstall.
The execution of the script is complete.
```

```

c3n1:/home/oracle # /home/oracle/grid_19c/root.sh
Performing root user operation.

The following environment variables are set as:
  ORACLE_OWNER= oracle
  ORACLE_HOME= /home/oracle/grid_19c

Enter the full pathname of the local bin directory: [/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

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.
Relinking oracle with rac_on option
Using configuration parameter file: /home/oracle/grid_19c/crs/install/crsconfig_params
The log of current session can be found at:
  /home/oracle/grid_19c_base/crsdata/c3n1/crsconfig/rootcrs_c3n1_2024-07-31_04-21-51PM.log
2024/07/31 16:21:57 CLSRSC-594: Executing installation step 1 of 19: 'ValidateEnv'.
2024/07/31 16:21:57 CLSRSC-594: Executing installation step 2 of 19: 'CheckFirstNode'.
2024/07/31 16:22:00 CLSRSC-594: Executing installation step 3 of 19: 'GenSiteGUIDs'.
2024/07/31 16:22:01 CLSRSC-594: Executing installation step 4 of 19: 'SetupOSD'.
2024/07/31 16:22:02 CLSRSC-594: Executing installation step 5 of 19: 'CheckCRSConfig'.
2024/07/31 16:22:02 CLSRSC-594: Executing installation step 6 of 19: 'SetupLocalGPNP'.
2024/07/31 16:22:16 CLSRSC-594: Executing installation step 7 of 19: 'CreateRootCert'.
2024/07/31 16:22:26 CLSRSC-594: Executing installation step 8 of 19: 'ConfigQLR'.
2024/07/31 16:22:47 CLSRSC-594: Executing installation step 9 of 19: 'ConfigCHMOS'.
2024/07/31 16:23:19 CLSRSC-594: Executing installation step 10 of 19: 'CreateOHASD'.
2024/07/31 16:23:26 CLSRSC-594: Executing installation step 11 of 19: 'ConfigOHASD'.
2024/07/31 16:23:26 CLSRSC-330: Adding Clusterware entries to file 'oracle-ohasd.service'
2024/07/31 16:23:55 CLSRSC-594: Executing installation step 12 of 19: 'SetupTFA'.
2024/07/31 16:23:55 CLSRSC-594: Executing installation step 13 of 19: 'InstallAFD'.
2024/07/31 16:24:03 CLSRSC-594: Executing installation step 14 of 19: 'InstallACFS'.
2024/07/31 16:24:03 CLSRSC-594: Executing installation step 15 of 19: 'InstallKA'.
2024/07/31 16:24:11 CLSRSC-594: Executing installation step 16 of 19: 'InitConfig'.

ASM has been created and started successfully.

[DBT-30001] Disk groups created successfully. Check /home/oracle/grid_19c_base/cfgtoollogs/asmca/asmca-240731PM042443.log for details.

2024/07/31 16:25:24 CLSRSC-482: Running command: '/home/oracle/grid_19c/bin/ocrconfig -upgrade oracle oinstall'
CRS-4256: Updating the profile
Successful addition of voting disk 06961cfd41524fb7bfc2c63ab431adf9.
Successful addition of voting disk 2ba9f3aef1274f56bf437a6a571c0340.
Successful addition of voting disk e8aee5064ff34fdbff7dc3c64aff4bb.
Successfully replaced voting disk group with +SUSEDATA1.
CRS-4256: Updating the profile
CRS-4266: Voting file(s) successfully replaced
## STATE File Universal Id File Name Disk group
---
 1. ONLINE 06961cfd41524fb7bfc2c63ab431adf9 (/dev/asm/disk1) [SUSEDATA1]
 2. ONLINE 2ba9f3aef1274f56bf437a6a571c0340 (/dev/asm/disk2) [SUSEDATA1]
 3. ONLINE e8aee5064ff34fdbff7dc3c64aff4bb (/dev/asm/disk3) [SUSEDATA1]
Located 3 voting disk(s).
2024/07/31 16:26:06 CLSRSC-4002: Successfully installed Oracle Trace File Analyzer (TFA) Collector.
2024/07/31 16:26:38 CLSRSC-594: Executing installation step 17 of 19: 'StartCluster'.
2024/07/31 16:27:41 CLSRSC-343: Successfully started Oracle Clusterware stack
2024/07/31 16:27:41 CLSRSC-594: Executing installation step 18 of 19: 'ConfigNode'.
2024/07/31 16:28:51 CLSRSC-594: Executing installation step 19 of 19: 'PostConfig'.
2024/07/31 16:29:13 CLSRSC-325: Configure Oracle Grid Infrastructure for a Cluster ... succeeded
c3n1:/home/oracle #

```

After successfully executing the above script on each node, click **OK** to continue.

Oracle Grid Infrastructure 19c Installer - Step 18 of 19

19c ORACLE Grid Infrastructure

Install Product

Progress: 38%
Starting 'Update Inventory'

Status:

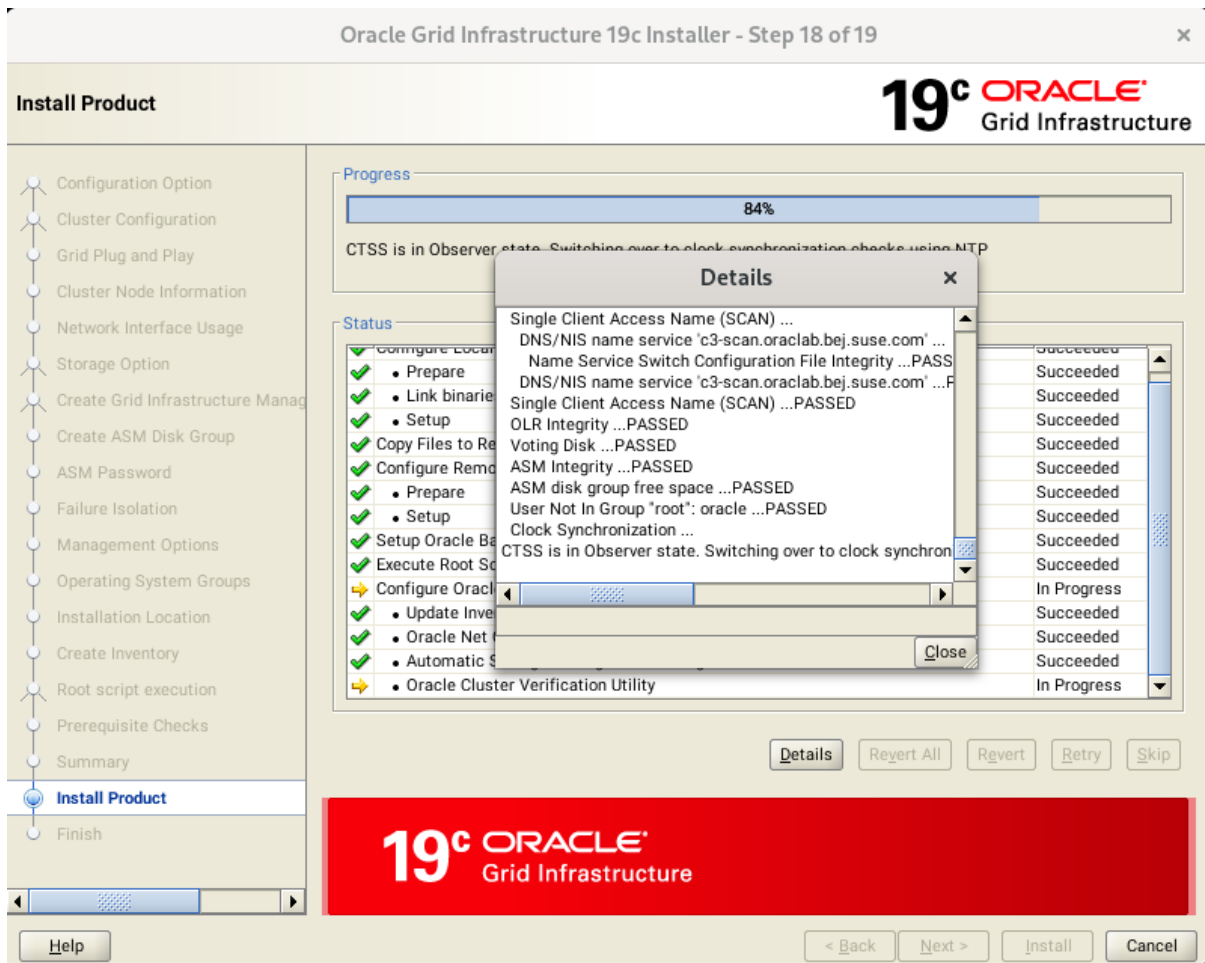
✓	Configure Local Node	Succeeded
✓	• Prepare	Succeeded
✓	• Link binaries	Succeeded
✓	• Setup	Succeeded
✓	Copy Files to Remote Nodes	Succeeded
✓	Configure Remote Nodes	Succeeded
✓	• Prepare	Succeeded
✓	• Setup	Succeeded
✓	Setup Oracle Base	Succeeded
✓	Execute Root Scripts	Succeeded
→	Configure Oracle Grid Infrastructure for a Cluster	In Progress
→	• Update Inventory	In Progress
	• Oracle Net Configuration Assistant	Pending
	• Automatic Storage Management Configuration Assistant	Pending
	• Oracle Cluster Verification Utility	Pending

Buttons: Details, Revert All, Revert, Retry, Skip

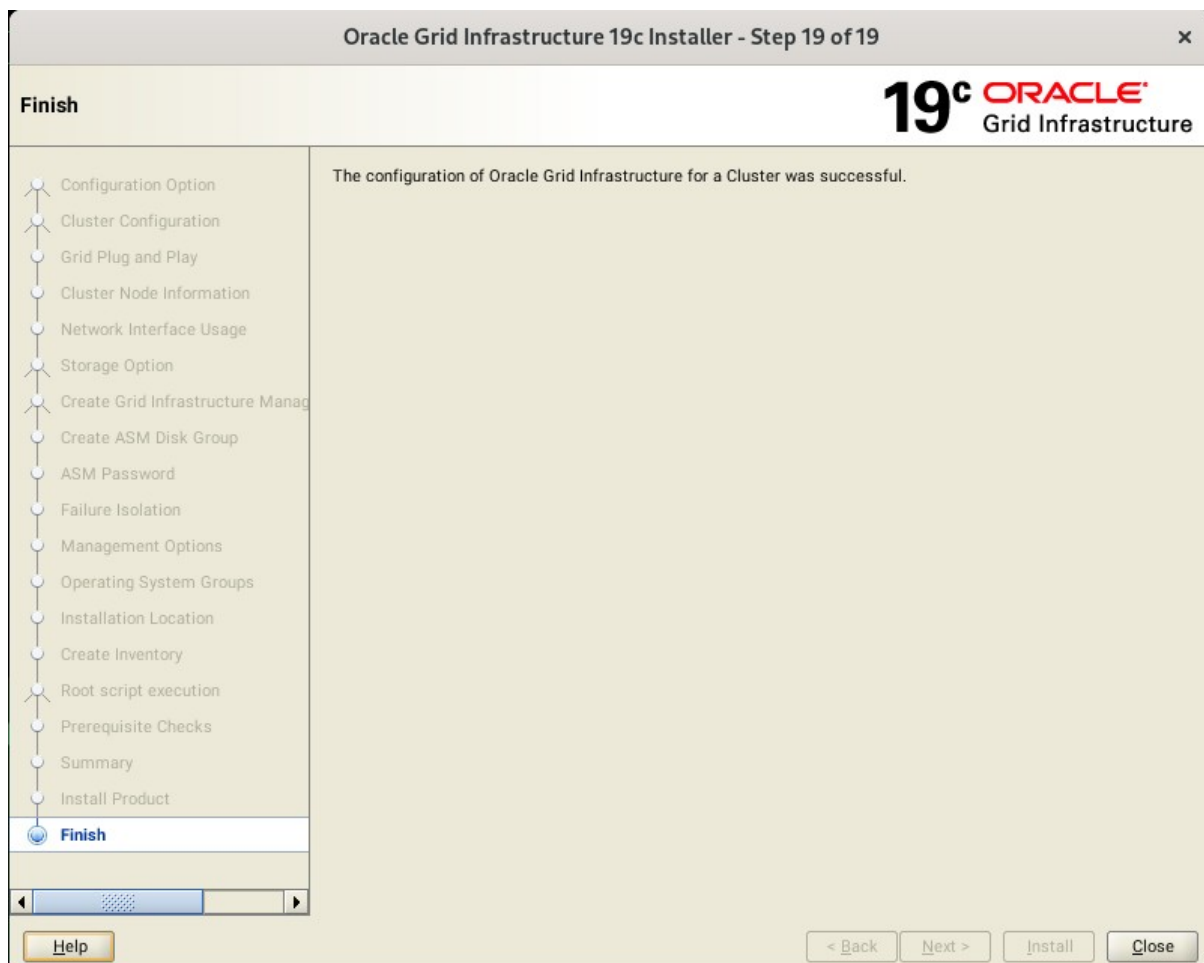
19c ORACLE Grid Infrastructure

Buttons: Help, < Back, Next >, Install, Cancel

Continue monitoring the installation until the Finish window appears.



18). Finish.



Click **Close** to complete the installation process and exit the installer.

1-2. Oracle Database 19c(19.24.0.0.0) Grid Infrastructure Post-Install Checks.

1). Check Oracle Clusterware health and resources.

```
oracle@c3n1:~> /home/oracle/grid_19c/bin/crsctl check cluster -all
*****
c3n1:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n2:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n3:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n4:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
oracle@c3n1:~> /home/oracle/grid_19c/bin/srvctl status nodeapps
VIP 10.200.176.15 is enabled
VIP 10.200.176.15 is running on node: c3n1
VIP 10.200.176.16 is enabled
VIP 10.200.176.16 is running on node: c3n2
VIP 10.200.176.17 is enabled
VIP 10.200.176.17 is running on node: c3n3
VIP 10.200.176.18 is enabled
VIP 10.200.176.18 is running on node: c3n4
Network is enabled
Network is running on node: c3n1
Network is running on node: c3n2
Network is running on node: c3n3
Network is running on node: c3n4
ONS is enabled
ONS daemon is running on node: c3n1
ONS daemon is running on node: c3n2
ONS daemon is running on node: c3n3
ONS daemon is running on node: c3n4
oracle@c3n1:~> █
```


2). Check status of designated resources.

```
oracle@c3n1:~> /home/oracle/grid_19c/bin/crsctl stat res -t
-----
Name                Target  State        Server                State details
-----
Local Resources
-----
ora.LISTENER.lsnr
    ONLINE  ONLINE      c3n1                 STABLE
    ONLINE  ONLINE      c3n2                 STABLE
    ONLINE  ONLINE      c3n3                 STABLE
    ONLINE  ONLINE      c3n4                 STABLE
ora.chad
    ONLINE  ONLINE      c3n1                 STABLE
    ONLINE  ONLINE      c3n2                 STABLE
    ONLINE  ONLINE      c3n3                 STABLE
    ONLINE  ONLINE      c3n4                 STABLE
ora.net1.network
    ONLINE  ONLINE      c3n1                 STABLE
    ONLINE  ONLINE      c3n2                 STABLE
    ONLINE  ONLINE      c3n3                 STABLE
    ONLINE  ONLINE      c3n4                 STABLE
ora.ons
    ONLINE  ONLINE      c3n1                 STABLE
    ONLINE  ONLINE      c3n2                 STABLE
    ONLINE  ONLINE      c3n3                 STABLE
    ONLINE  ONLINE      c3n4                 STABLE
-----
```

```

Cluster Resources
-----
ora.ASMNET1LSNR_ASM.lsnr(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.LISTENER_SCAN1.lsnr
  1      ONLINE  ONLINE  c3n2      STABLE
ora.LISTENER_SCAN2.lsnr
  1      ONLINE  ONLINE  c3n3      STABLE
ora.LISTENER_SCAN3.lsnr
  1      ONLINE  ONLINE  c3n1      STABLE
ora.SUSEDATA1.dg(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.asm(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      Started,STABLE
  2      ONLINE  ONLINE  c3n2      Started,STABLE
  3      ONLINE  ONLINE  c3n3      Started,STABLE
ora.asmnet1.asmnetwork(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.c3n1.vip
  1      ONLINE  ONLINE  c3n1      STABLE
ora.c3n2.vip
  1      ONLINE  ONLINE  c3n2      STABLE
ora.c3n3.vip
  1      ONLINE  ONLINE  c3n3      STABLE
ora.c3n4.vip
  1      ONLINE  ONLINE  c3n4      STABLE
ora.cvu
  1      ONLINE  ONLINE  c3n1      STABLE
ora.qosmsserver
  1      ONLINE  ONLINE  c3n1      STABLE
ora.scan1.vip
  1      ONLINE  ONLINE  c3n2      STABLE
ora.scan2.vip
  1      ONLINE  ONLINE  c3n3      STABLE
ora.scan3.vip
  1      ONLINE  ONLINE  c3n1      STABLE
-----
oracle@c3n1:~> █

```

3). Check OCR and Voting disk files.

```
oracle@c3n1:~> /home/oracle/grid_19c/bin/ocrcheck
Status of Oracle Cluster Registry is as follows :
  Version                   : 4
  Total space (kbytes)      : 901284
  Used space (kbytes)       : 84324
  Available space (kbytes)  : 816960
  ID                        : 870505982
  Device/File Name         : +SUSEDATA1
                           Device/File integrity check succeeded

                           Device/File not configured

                           Device/File not configured

                           Device/File not configured

                           Device/File not configured

  Cluster registry integrity check succeeded

  Logical corruption check bypassed due to non-privileged user

oracle@c3n1:~> /home/oracle/grid_19c/bin/crsctl query css votedisk
## STATE      File Universal Id                File Name Disk group
--  -
 1. ONLINE    06961cfd41524fb7bfc2c63ab431adf9 (/dev/asm/disk1) [SUSEDATA1]
 2. ONLINE    2ba9f3aef1274f56bf437a6a571c0340 (/dev/asm/disk2) [SUSEDATA1]
 3. ONLINE    e8aee5064ff34fdcbff7dc3c64aff4bb (/dev/asm/disk3) [SUSEDATA1]
Located 3 voting disk(s).
oracle@c3n1:~> █
```

2. Installing Oracle Database.

2-1. Login to the SLES 15 SP6 64-bit OS as a non-admin user. Download Oracle Database 19c (19.3) for Linux x86-64 from:

<https://www.oracle.com/database/technologies/oracle19c-linux-downloads.html>.

2-2. Extract LINUX.X64_193000_db_home.zip and replace the OPatch directory located in the Database 19.3 ShipHome with OPatch version 12.2.0.1.43.

Also, export SRVM_DISABLE_MTTTRANS=true.

Then, run Oracle DB installer(runInstaller) from Database ShipHome with the parameters to apply the required patches:

```
-applyRU /home/ORACLE_SW/patch_RU_192400/36582629/36582781/
-applyOneOffs /home/ORACLE_SW/patch_RU_192400/36582629/36587798/
```

These parameters will apply the recommended 19.24.0.0.0 release updates (RUs) and one-off patches to the database.

Install Flow:

1). Select Configuration Option.



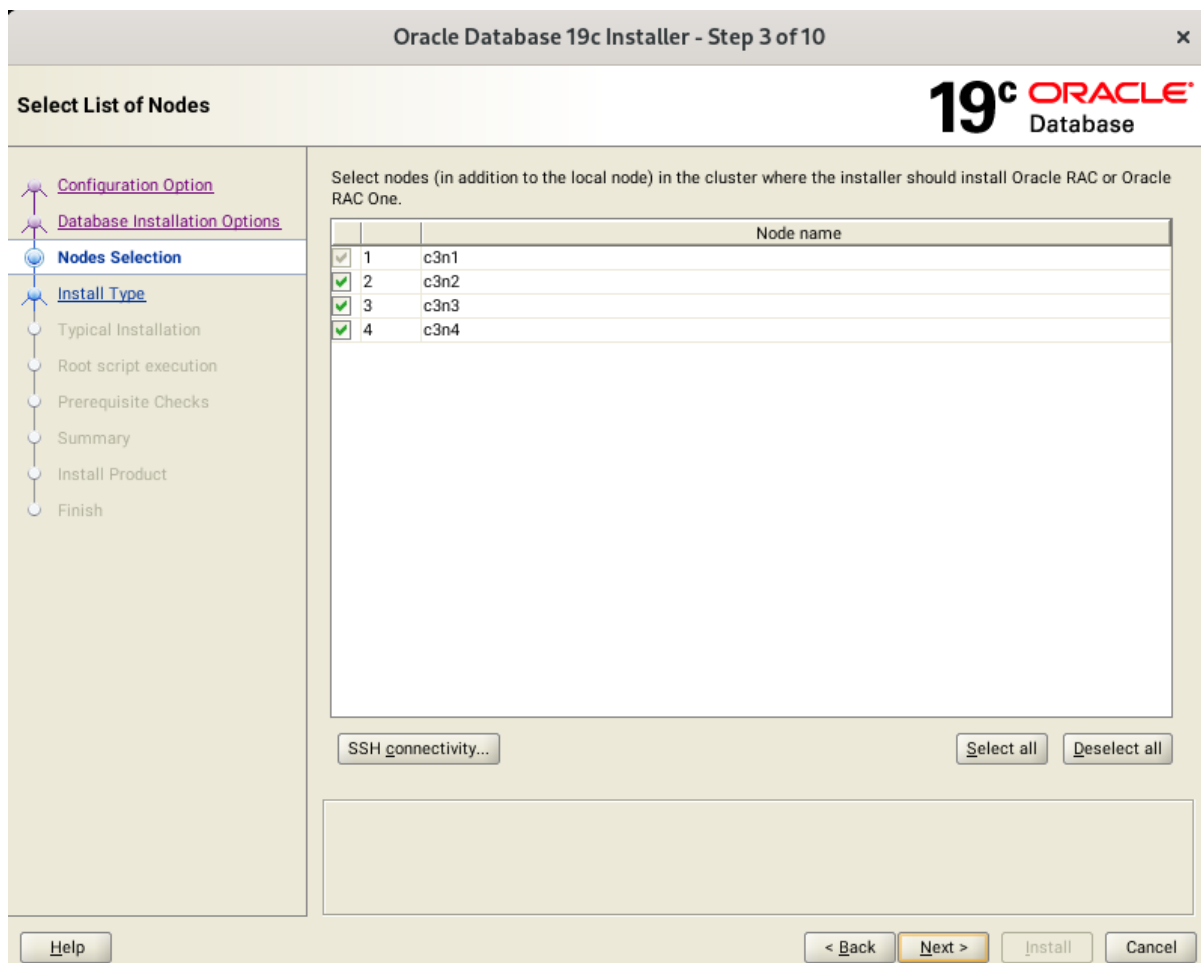
Select option "Set Up Software Only", then click **Next** to continue.

2). Select Database Installation Option.



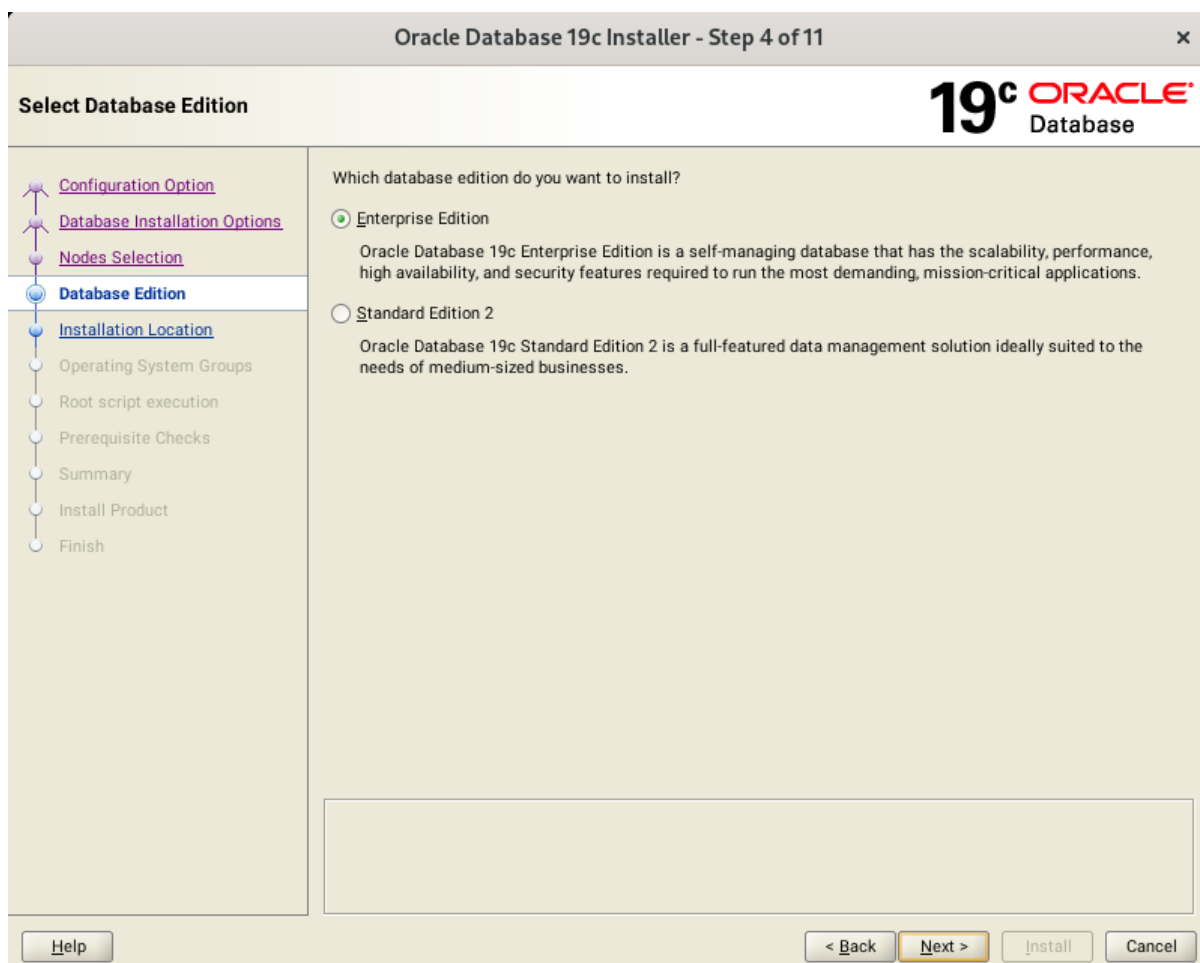
Choose option **"Oracle Real Application Clusters database installation"**, then click **Next** to continue.

3). Select List of Nodes.



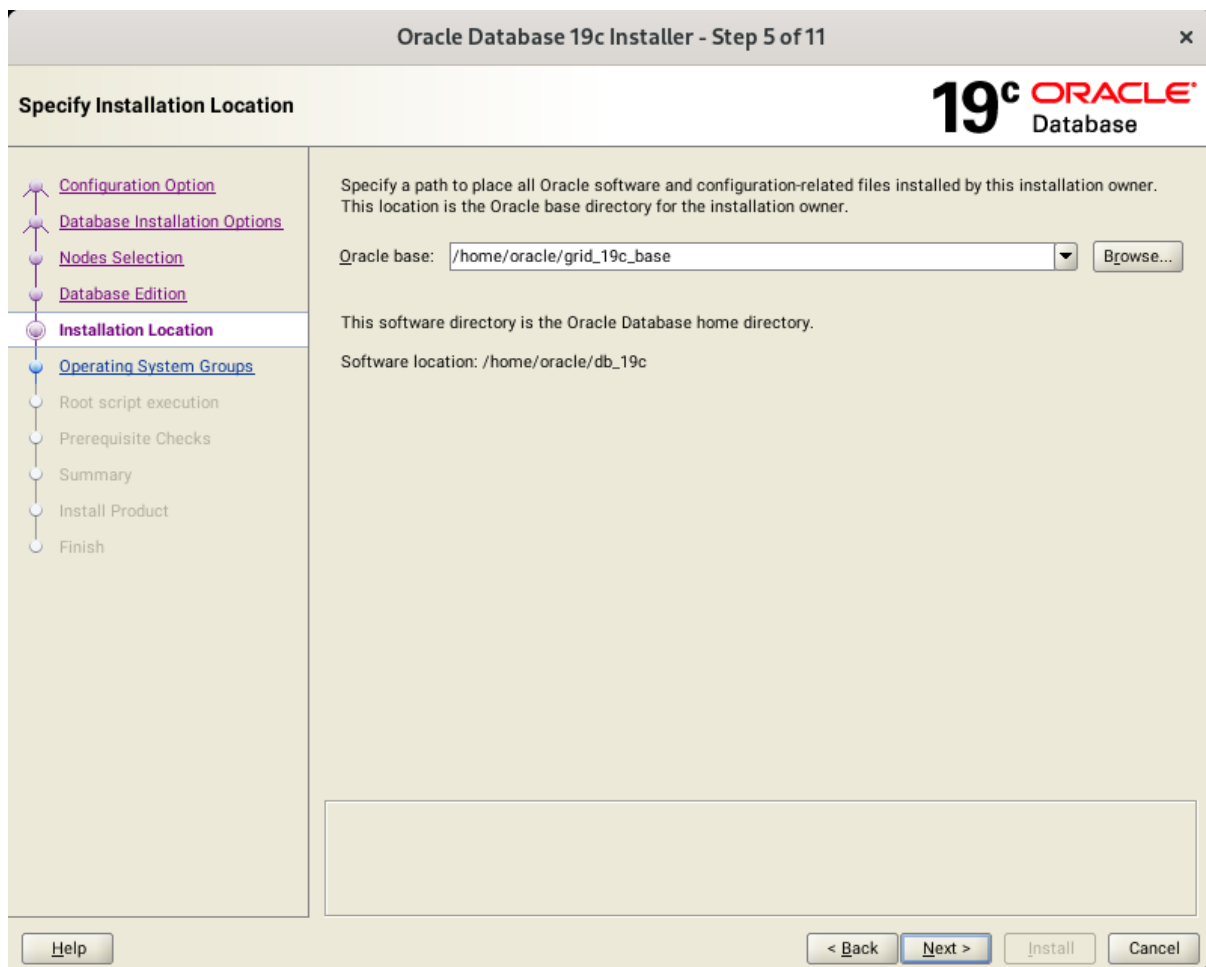
Select all nodes in the cluster, then click **Next** to continue.

4). Select Database Edition.



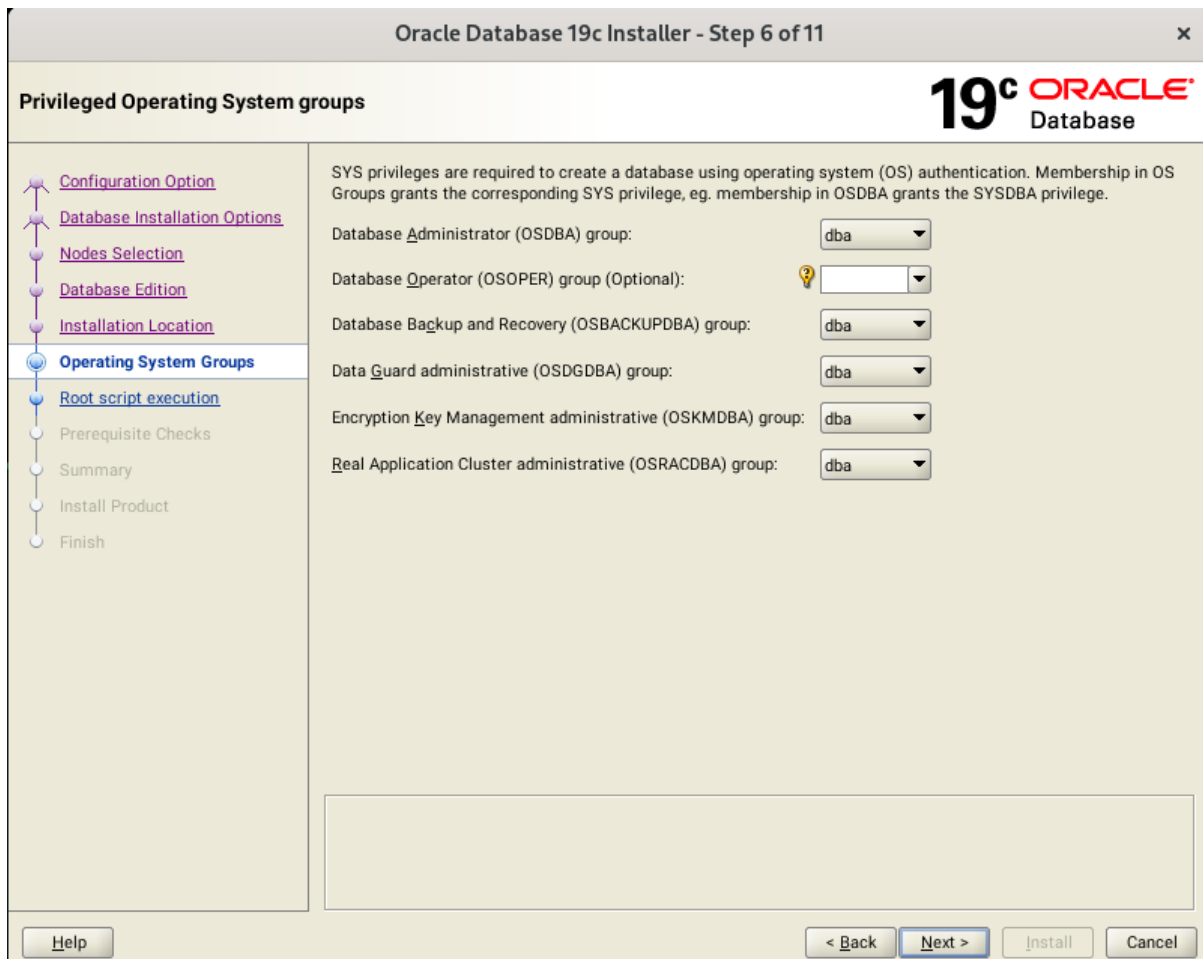
Choose option **"Enterprise Edition"**, then click **Next** to continue.

5). Specify Installation Location.



Fill in **Oracle base** as shown above, then click **Next** to continue.

6). Privileged Operating System groups.



The screenshot shows the Oracle Database 19c Installer window at Step 6 of 11, titled "Privileged Operating System groups". The window features a navigation pane on the left with the following steps: Configuration Option, Database Installation Options, Nodes Selection, Database Edition, Installation Location, Operating System Groups (highlighted), Root script execution, Prerequisite Checks, Summary, Install Product, and Finish. The main area contains the following text and configuration options:

19^c ORACLE[®] Database

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: dba

Database Operator (OSOPER) group (Optional): ?

Database Backup and Recovery (OSBACKUPDBA) group: dba

Data Guard administrative (OSDGDBA) group: dba

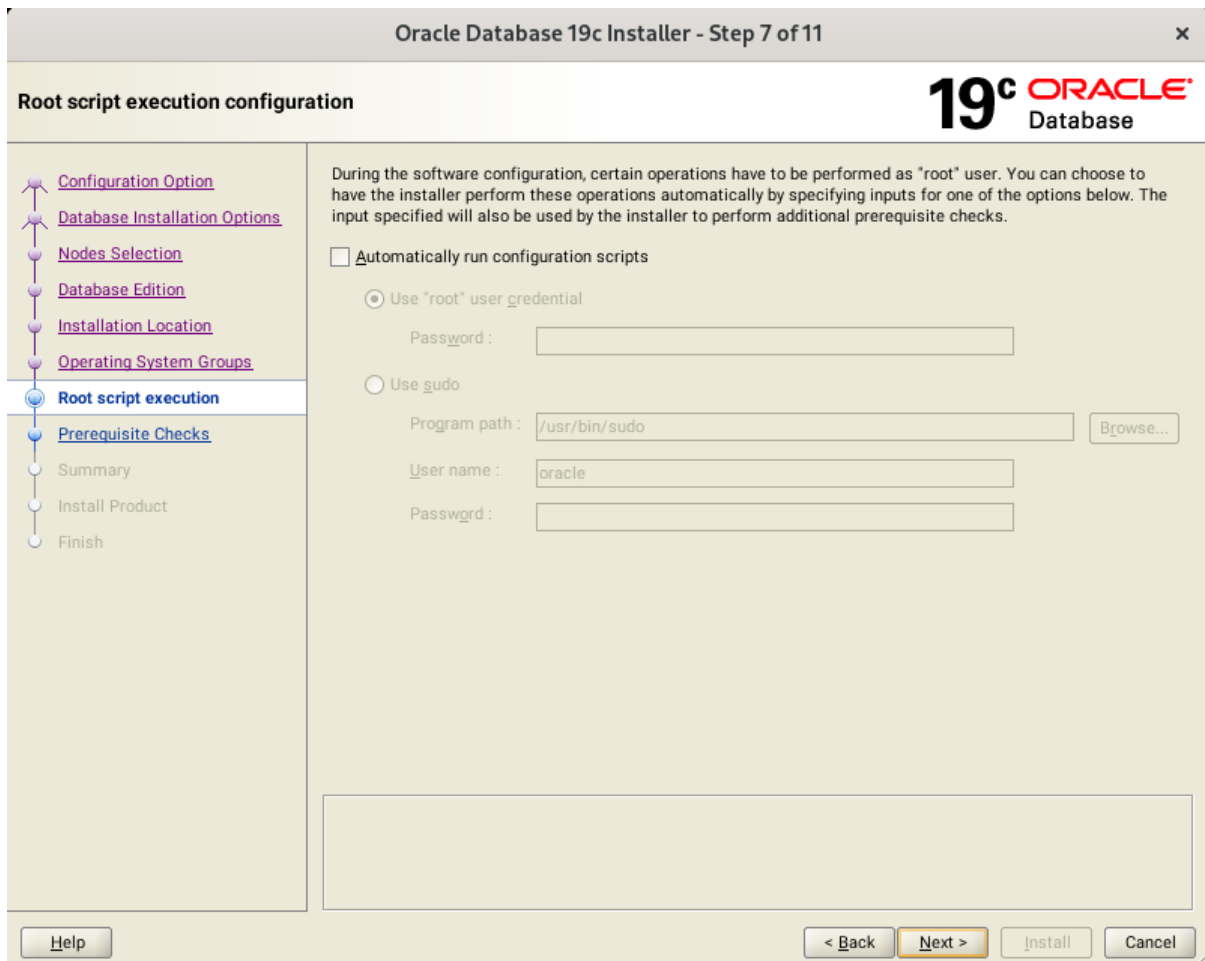
Encryption Key Management administrative (OSKMDBA) group: dba

Real Application Cluster administrative (OSRACDBA) group: dba

At the bottom of the window, there are four buttons: Help, < Back, Next >, and Install. The "Next >" button is highlighted.

Selected by default, then click **Next** to continue.

7). Root script execution configuration.



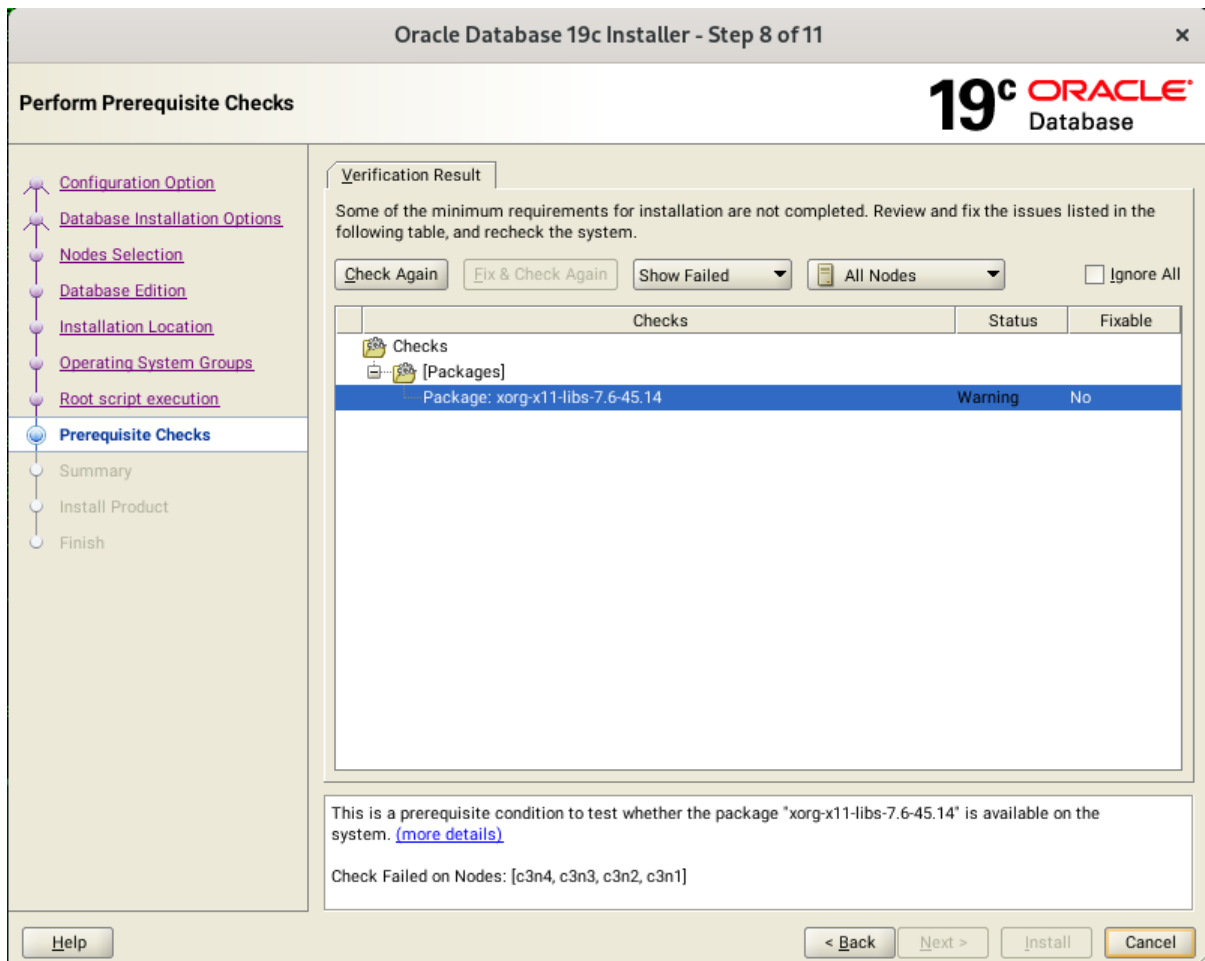
The screenshot shows the Oracle Database 19c Installer window at Step 7 of 11. The title bar reads "Oracle Database 19c Installer - Step 7 of 11". The main window has a header with "19c ORACLE Database". The left sidebar contains a navigation tree with the following items: Configuration Option, Database Installation Options, Nodes Selection, Database Edition, Installation Location, Operating System Groups, **Root script execution** (highlighted), Prerequisite Checks, Summary, Install Product, and Finish. The main content area is titled "Root script execution configuration" and contains the following text: "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." Below this text are the following options and input fields:

- Automatically run configuration scripts
- Use "root" user gredential
 - Password :
- Use sudo
 - Program path :
 - User name :
 - Passwrd :

At the bottom of the window, there are four buttons: Help, < Back, Next > (highlighted), Install, and Cancel.

If select the option **Automatically run configuration scripts**, enter the credentials for the root user or a sudo account. Alternatively, run the scripts manually as the root user at the installation process when prompted by the installer. Click **Next** to continue.

8). Perform Prerequisite Checks.

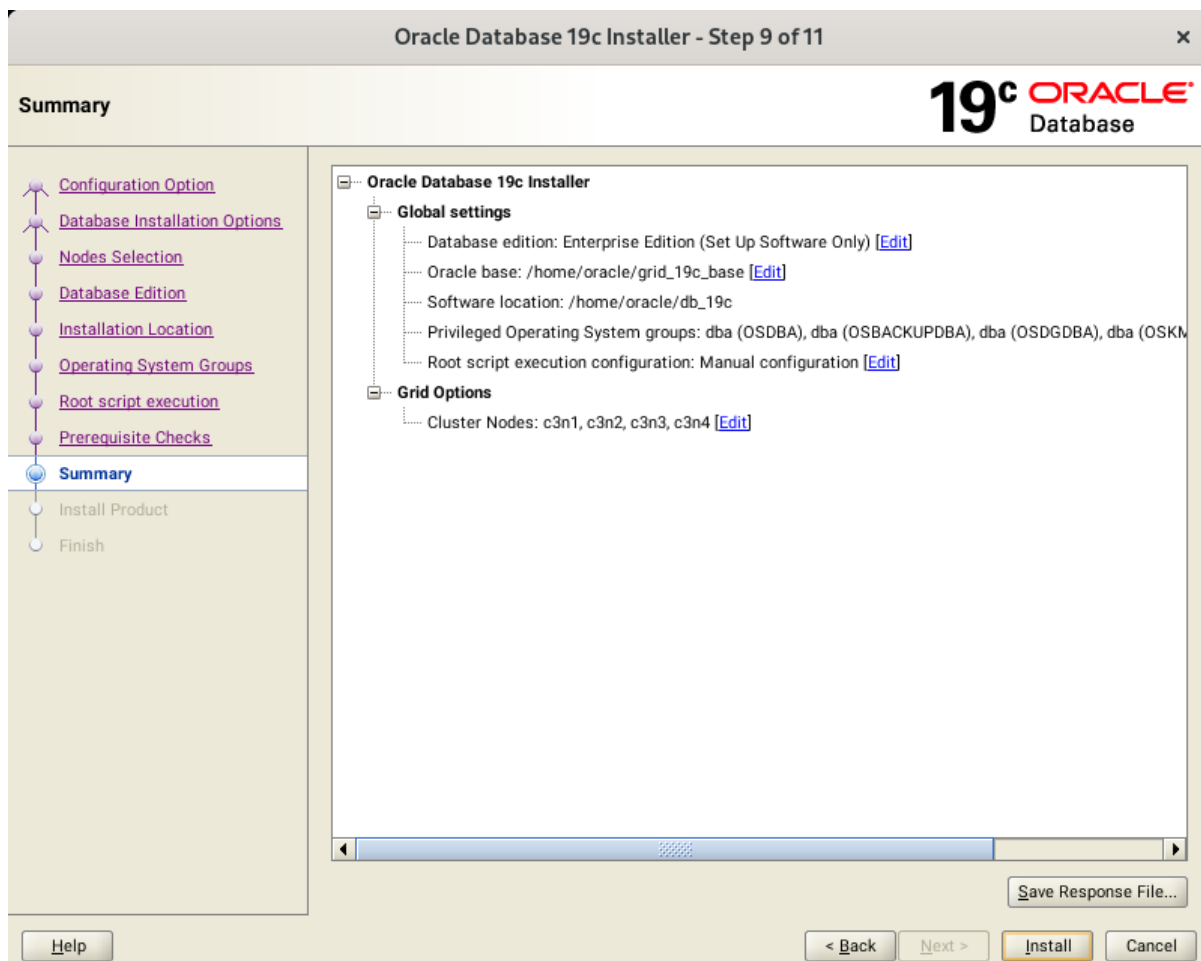


Perform Pre-Check as shown above. Resolve all the errors and warnings on all nodes in the cluster & run **“Fix & Check Again”**. If the **“Fix & check again”** button is not available, try to fix manually.

Select option "Ignore All", then click **Next** to continue.

The screenshot shows the Oracle Database 19c Installer window at Step 8 of 11, titled "Perform Prerequisite Checks". The interface includes a navigation pane on the left with options like "Configuration Option", "Database Installation Options", "Nodes Selection", "Database Edition", "Installation Location", "Operating System Groups", "Root script execution", "Prerequisite Checks", "Summary", "Install Product", and "Finish". The main area displays a "Verification Result" section with a message: "Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system." Below this message are buttons for "Check Again", "Fix & Check Again", "Show Failed", "All Nodes", and a checked "Ignore All" option. A table lists the checks, with one entry for "Package: xorg-x11-libs-7.6-45.14" showing a status of "Ignored" and "No" for "Fixable". A "Details" dialog box is open, providing information about the failed check on nodes c3n4, c3n3, c3n2, and c3n1. The dialog text includes: "Package: xorg-x11-libs-7.6-45.14 - This is a prerequisite condition to test whether the package 'xorg-x11-libs-7.6-45.14' is available on the system.", "Check Failed on Nodes: [c3n4, c3n3, c3n2, c3n1]", "Verification result of failed node: c3n4", "Expected Value : xorg-x11-libs-7.6-45.14", "Actual Value : xorg-x11-libs-7.6.1-1.16", "Details: - PRVF-7533 : Proper version of package 'xorg-x11-libs' is not found on node 'c3n4' [Required = 'xorg-x11-libs-7.6-45.14' ; Found = 'xorg-x11-libs-7.6.1-1.16']. - Cause: Package does not meet the requirement. - Action: Upgrade the package to meet the requirement.", and a "Back to Top" link. The dialog also shows the start of the verification result for node c3n3. At the bottom of the installer window, there are buttons for "Help", "< Back", "Next >", "Install", and "Cancel".

9). Summary.



Installation Summary as shown above, click **Install** to continue.

10). Install Product.

Oracle Database 19c Installer - Step 10 of 11

19^c ORACLE[®] Database

Install Product

Configuration Option
Database Installation Options
Nodes Selection
Database Edition
Installation Location
Operating System Groups
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

Progress
12%
Linking OID Client

Status

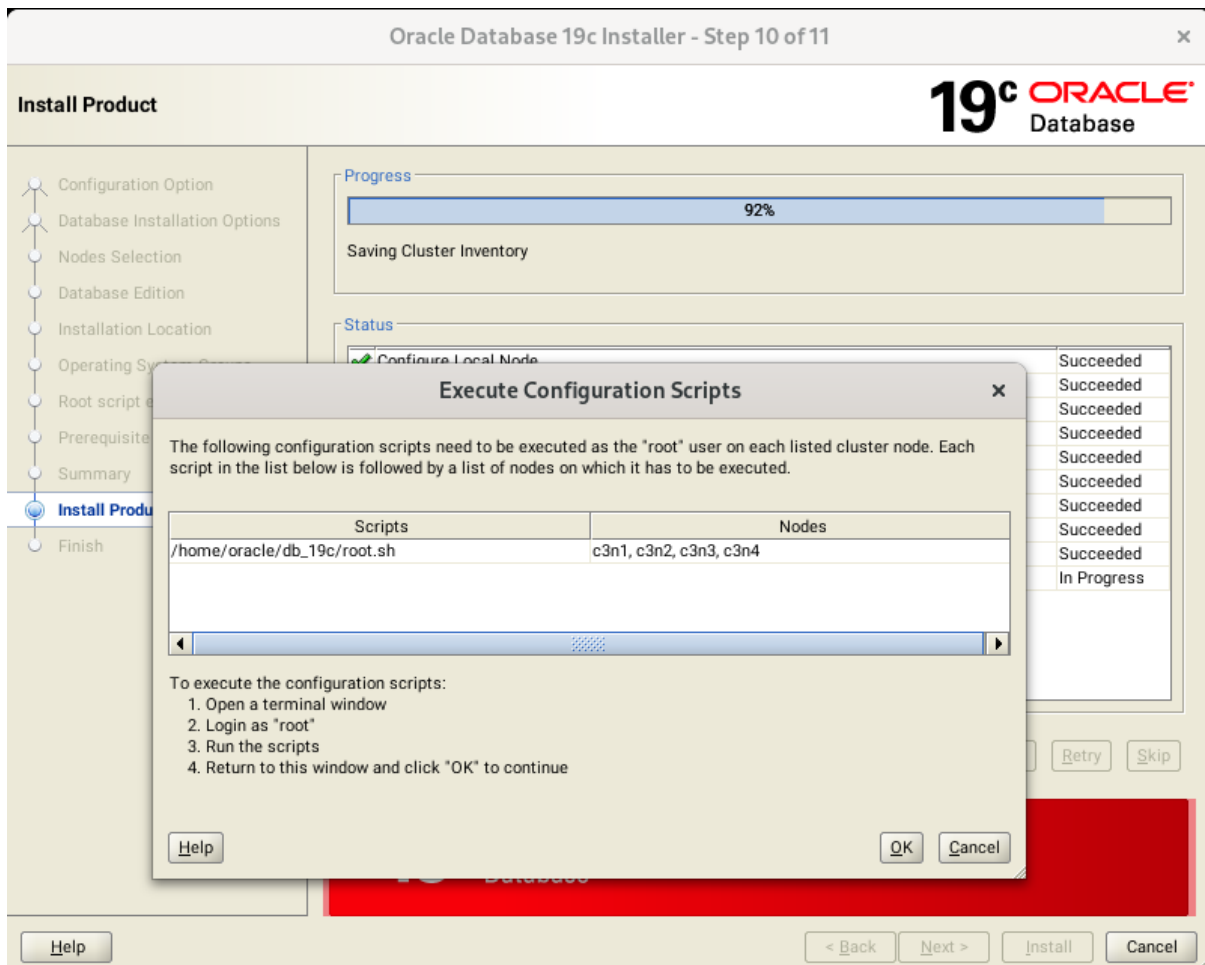
➔ Configure Local Node	In Progress
• Prepare	Succeeded
➔ • Link binaries	In Progress
• Setup	Pending
Copy Files to Remote Nodes	Pending
Configure Remote Nodes	Pending
• Prepare	Pending
• Setup	Pending
Setup Oracle Base	Pending
Execute Root Scripts	Pending

Details Revert All Revert Retry Skip

19^c ORACLE[®] Database

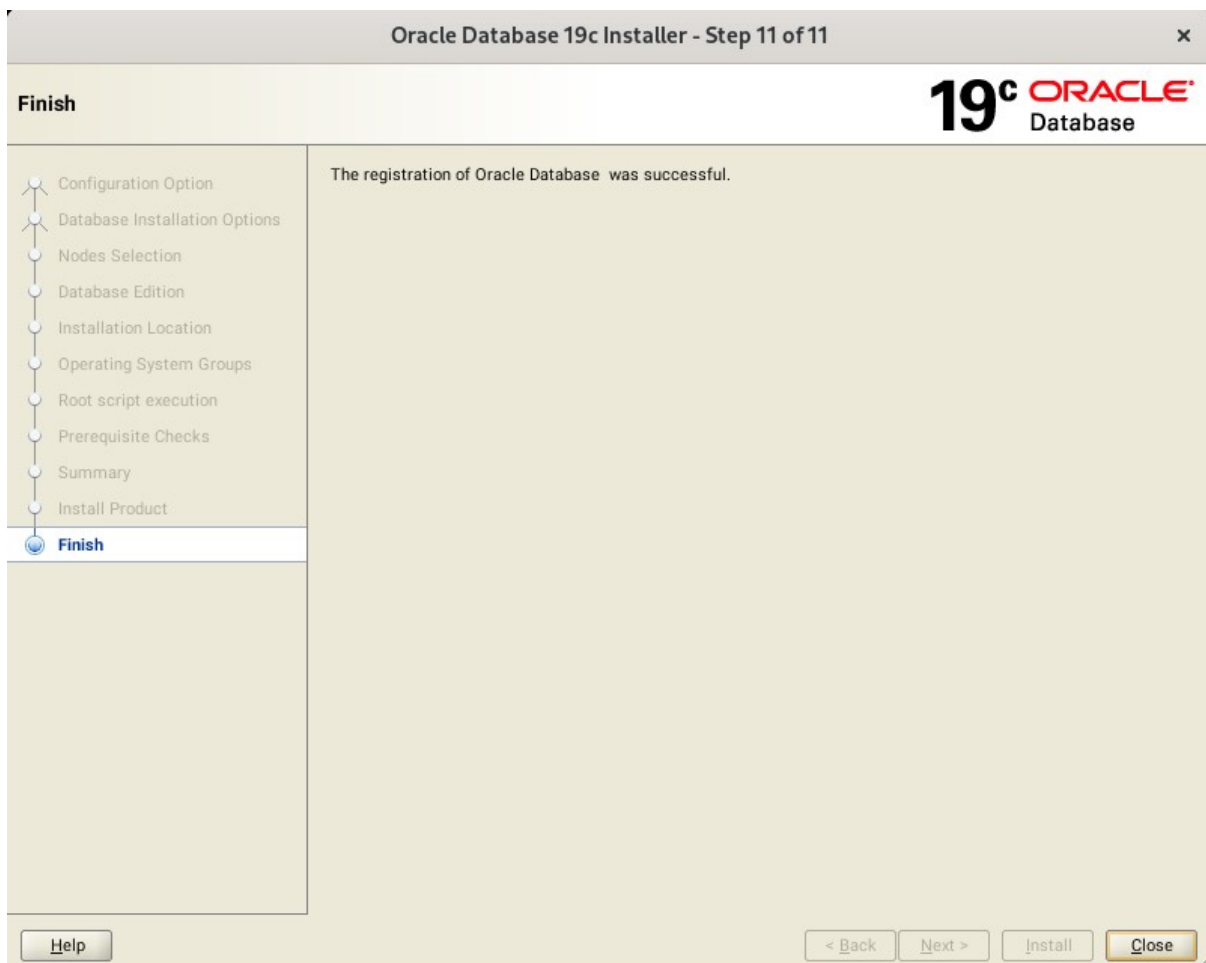
Help < Back Next > Install Cancel

Installer prompted you to run the root.sh scripts.



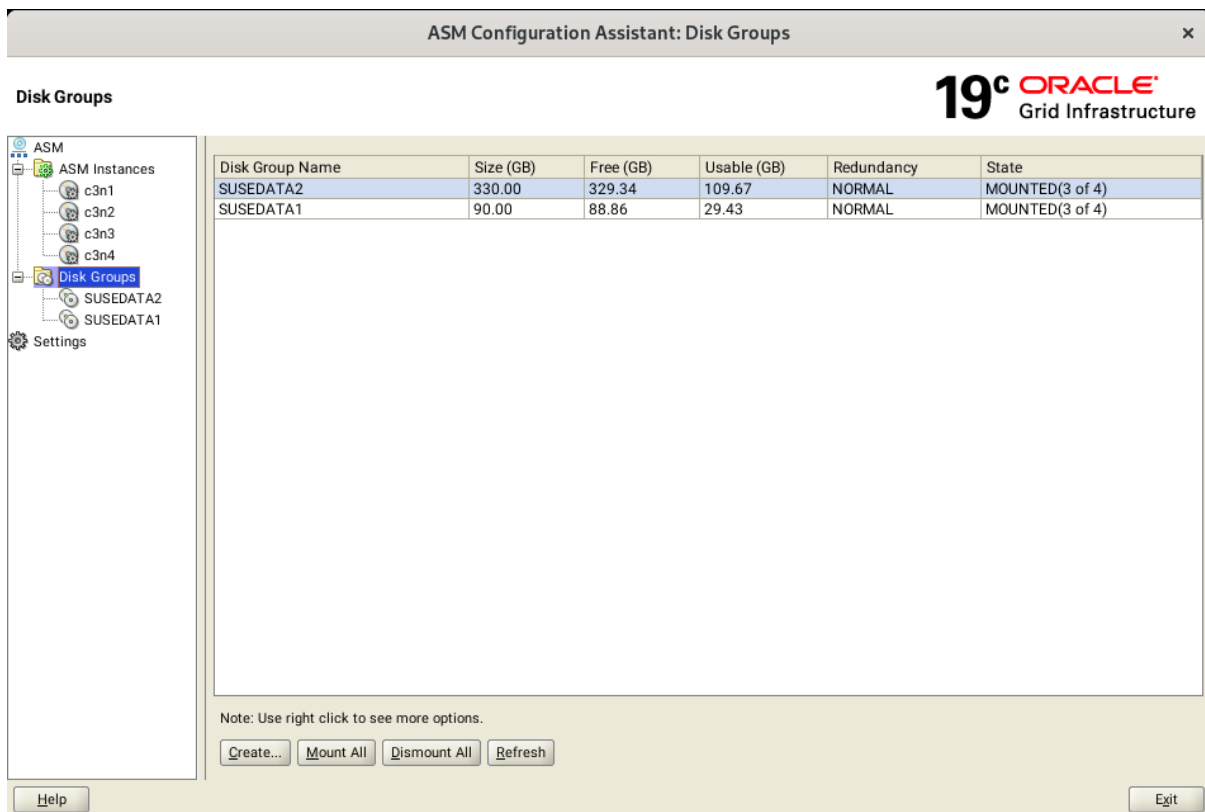
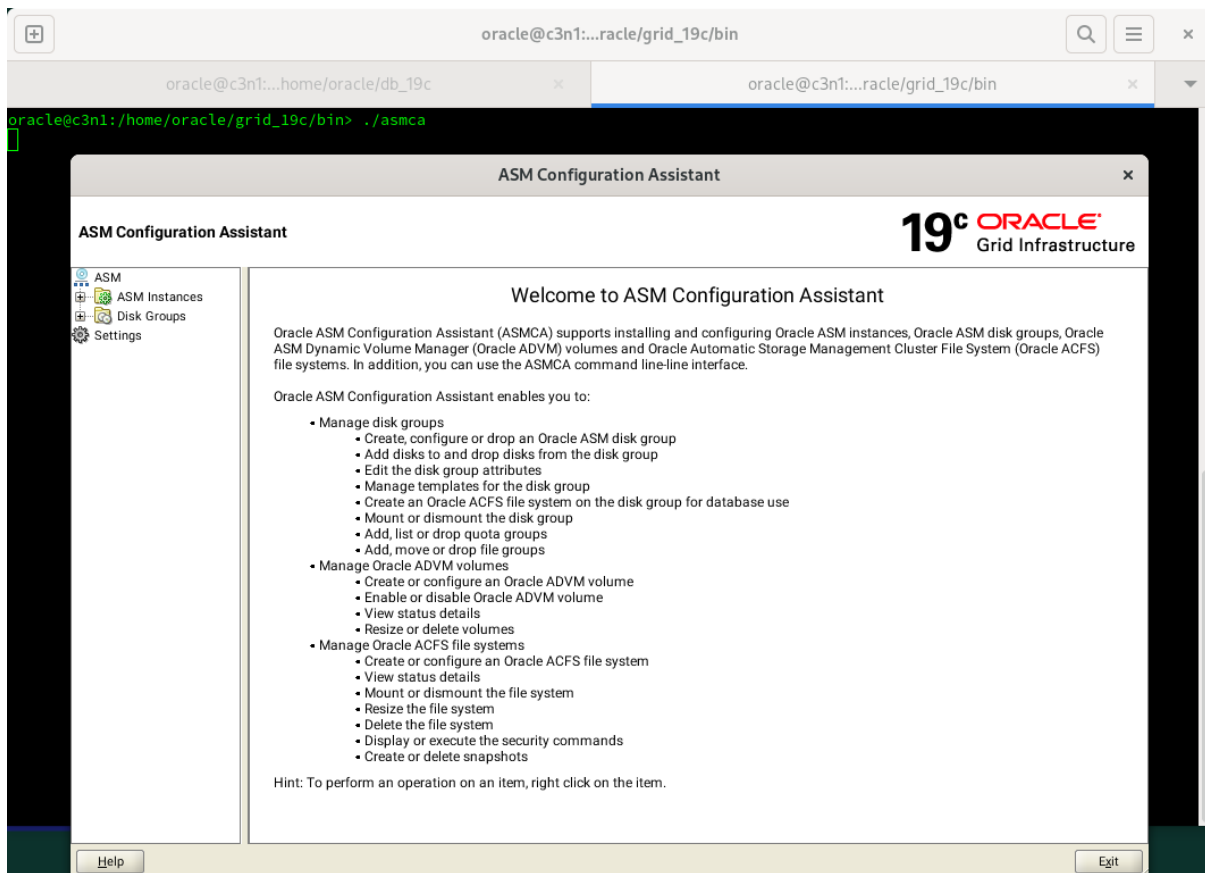
After successfully executing the above script on each node, click **OK** to continue. Monitoring the installation until the Finish window appears.

11). Finish



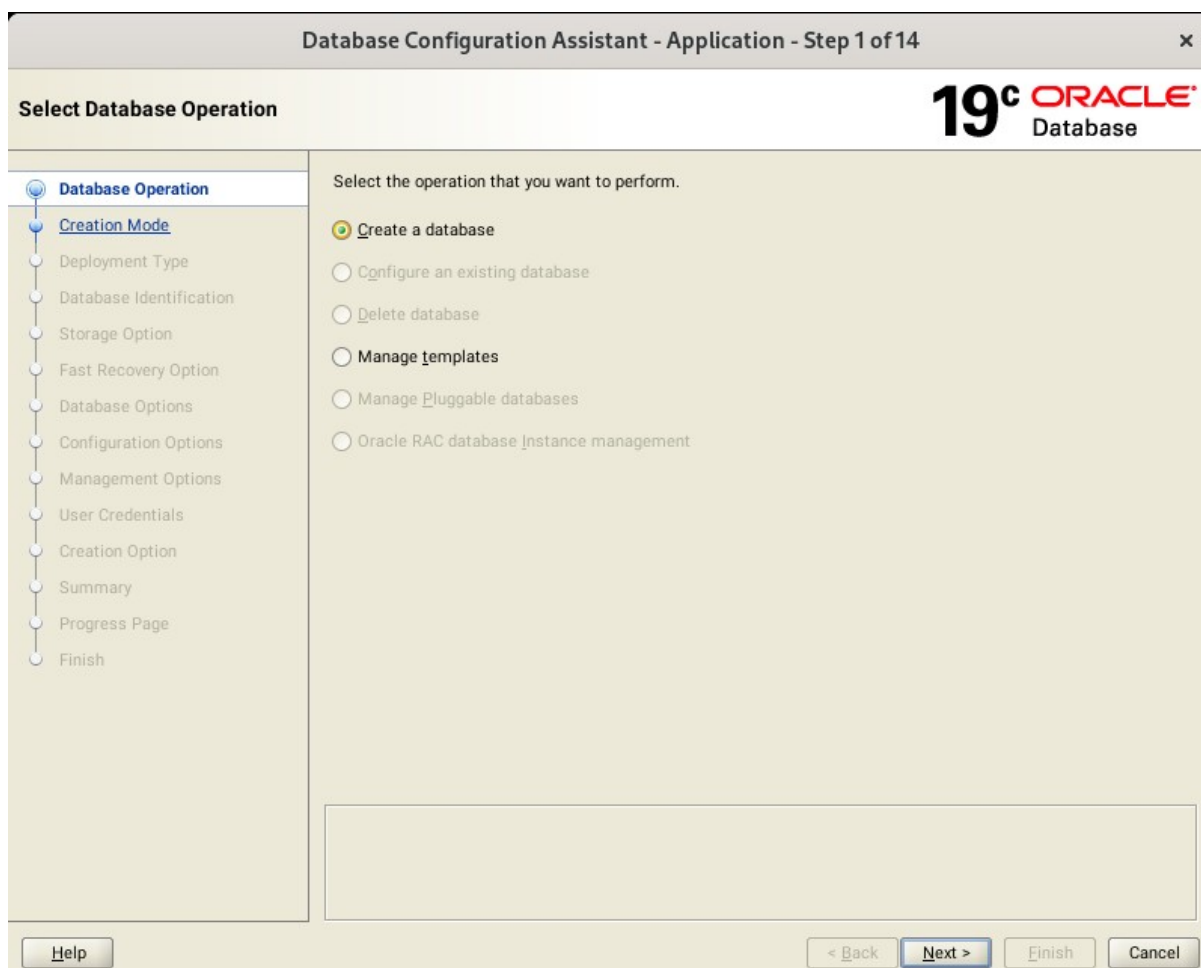
The installation of Oracle Database is finished, click **Close** to dismiss the screen.

2-3. Using ASM Configuration Assistant to create ASM Disk Group for Database files.



2-4. Using DBCA to create Oracle RAC DataBase.

1). Select Database Operation.



Select option "**Create a database**", then click **Next** to continue.

2). Select Database Creation Mode.

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

Select Database Creation Mode

19c ORACLE Database

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

Typical configuration

Global database name:

Storage type:

Database files location:

Fast Recovery Area (FRA):

Database character set:

Administrative password:

Confirm password:

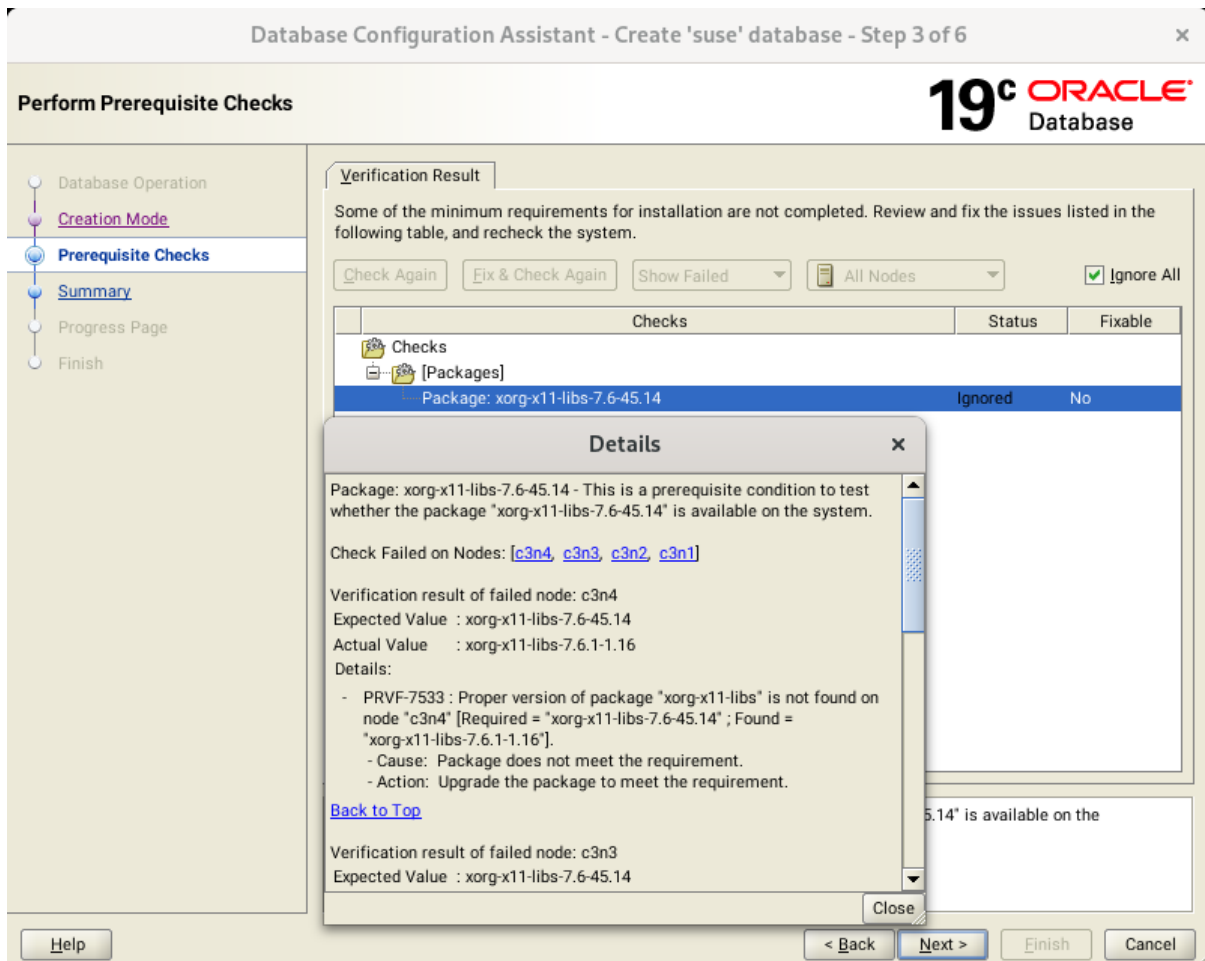
Create as Container database

Pluggable database name:

Advanced configuration

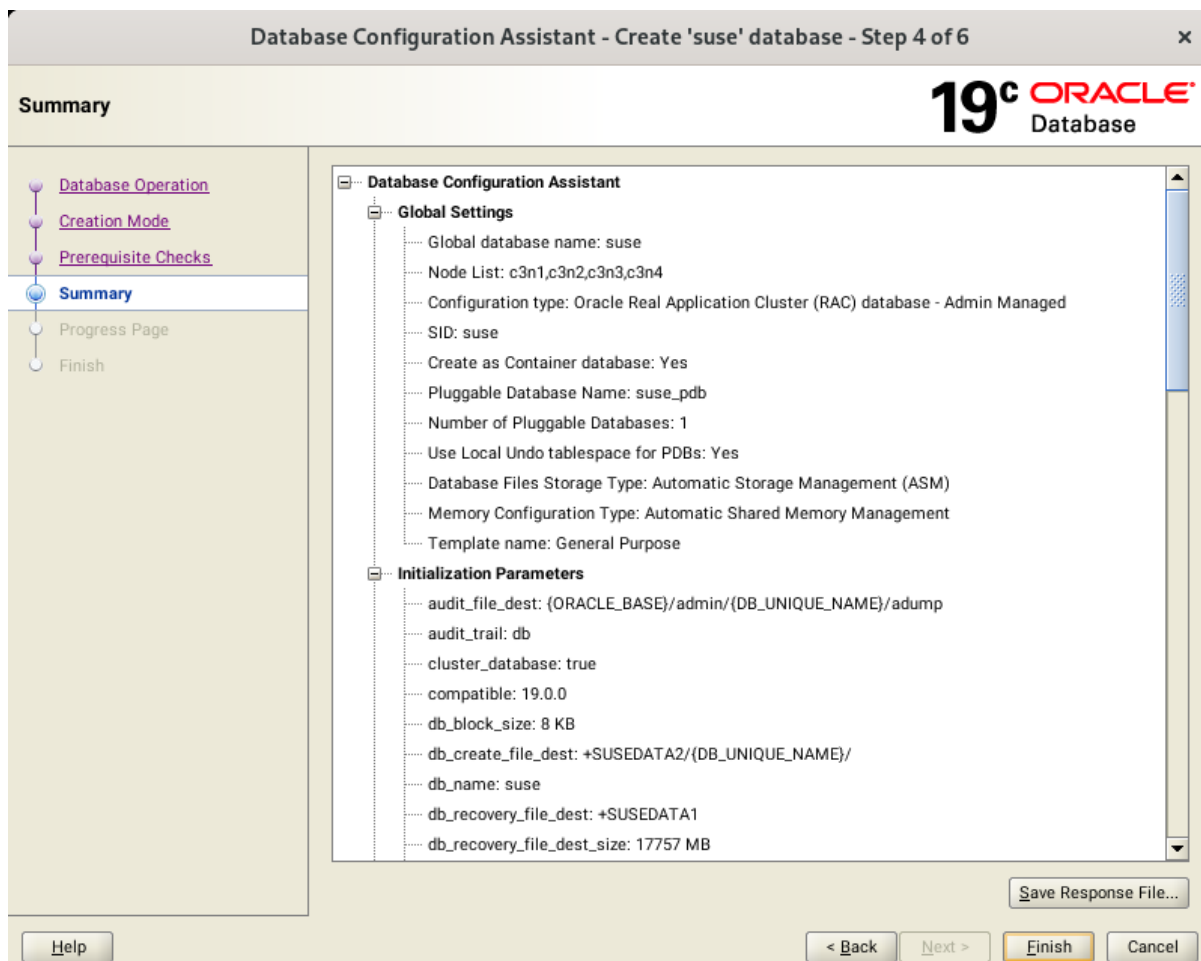
Select option "**Typical configuration**" and fill in administrator password. Then, click **Next** to continue.

3). Perform Prerequisite Checks.



Perform Pre-Check as shown above. Select option "Ignore All", then click **Next** to continue.

4). Summary.



Database Configuration Summary as shown above, review the information, then click **Finish** to continue.

5). Progress Page.

Database Configuration Assistant - Create 'suse' database - Step 5 of 6

Progress Page **19c ORACLE Database**

Progress

53%

Completing Database Creation : In Progress

Status

Task	Status
➔ DB Creation	In Progress
• Prepare for db operation	Succeeded
• Copying database files	Succeeded
• Creating and starting Oracle instance	Succeeded
• Creating cluster database views	Succeeded
➔ • Completing Database Creation	In Progress
• Creating Pluggable Databases	Pending
• Executing Post Configuration Actions	Pending

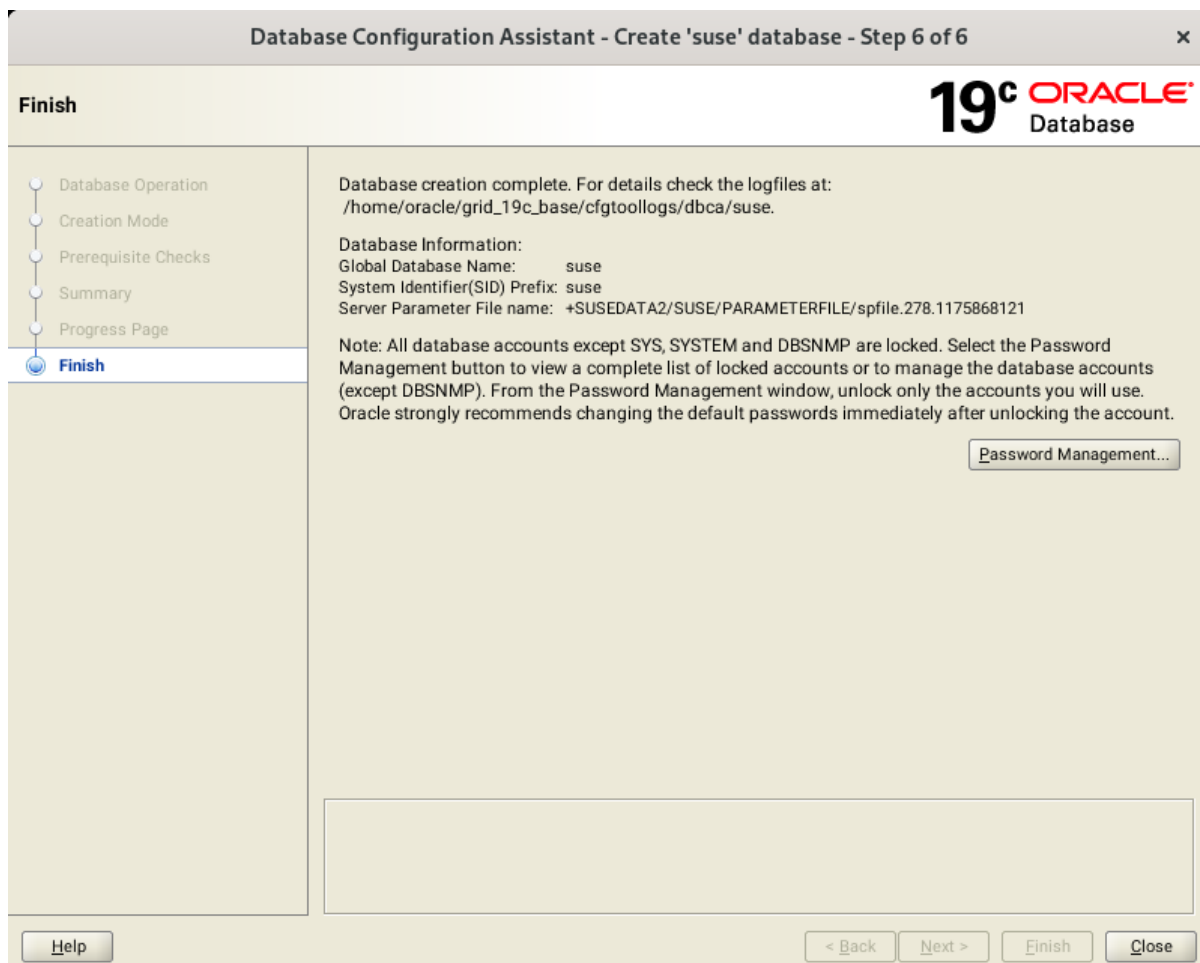
DBCA Log Location:
/home/oracle/grid_19c_base/cfgtoollogs/dbca/suse/trace.log_2024-08-01_01-29-21PM

Database Alert Log Location:
/home/oracle/grid_19c_base/diag/rdbms/suse/suse1/trace/alert_suse1.log

Buttons: **Help**, **< Back**, **Next >**, **Finish**, **Cancel**, **Details**, **Revert All**, **Revert**, **Retry**, **Skip**

Database creating progress as shown above, waiting until the creation is complete.

6). Finish.



Database creation complete, some details as shown above. Click **Close** to dismiss the screen.

2-5. Oracle Database 19c(19.24.0.0.0) Post-Install Checks.

1). *Checking database status and configuration.*

```
oracle@c3n1:~> export ORACLE_HOME=/home/oracle/db_19c/
oracle@c3n1:~> /home/oracle/db_19c/bin/srvctl status database -d suse -a
Instance suse1 is running on node c3n1
Instance suse1 is connected to ASM instance +ASM1
Instance suse2 is running on node c3n2
Instance suse2 is connected to ASM instance +ASM2
Instance suse3 is running on node c3n3
Instance suse3 is connected to ASM instance +ASM3
Instance suse4 is running on node c3n4
Instance suse4 is connected to ASM instance +ASM3
oracle@c3n1:~> /home/oracle/db_19c/bin/srvctl config database -d suse -a
Database unique name: suse
Database name: suse
Oracle home: /home/oracle/db_19c
Oracle user: oracle
Spfile: +SUSEDATA2/SUSE/PARAMETERFILE/spfile.278.1175868121
Password file: +SUSEDATA2/SUSE/PASSWORD/pwdsuse.256.1175866793
Domain:
Start options: open
Stop options: immediate
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools:
Disk Groups: SUSEDATA1,SUSEDATA2
Mount point paths:
Services:
Type: RAC
Start concurrency:
Stop concurrency:
Database is enabled
Database is individually enabled on nodes:
Database is individually disabled on nodes:
OSDBA group: dba
OSOPER group:
Database instances: suse1,suse2,suse3,suse4
Configured nodes: c3n1,c3n2,c3n3,c3n4
CSS critical: no
CPU count: 0
Memory target: 0
Maximum memory: 0
Default network number for database services:
Database is administrator managed
oracle@c3n1:~> █
```


2-6. Oracle RAC 19c(19.24.0.0.0) Post-Install Checks.

1). Checking Oracle RAC status and resources.

```
oracle@c3n1:~> /home/oracle/grid_19c/bin/crsctl check cluster -all
*****
c3n1:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n2:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n3:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c3n4:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
oracle@c3n1:~> /home/oracle/grid_19c/bin/srvctl status nodeapps
VIP 10.200.176.15 is enabled
VIP 10.200.176.15 is running on node: c3n1
VIP 10.200.176.16 is enabled
VIP 10.200.176.16 is running on node: c3n2
VIP 10.200.176.17 is enabled
VIP 10.200.176.17 is running on node: c3n3
VIP 10.200.176.18 is enabled
VIP 10.200.176.18 is running on node: c3n4
Network is enabled
Network is running on node: c3n1
Network is running on node: c3n2
Network is running on node: c3n3
Network is running on node: c3n4
ONS is enabled
ONS daemon is running on node: c3n1
ONS daemon is running on node: c3n2
ONS daemon is running on node: c3n3
ONS daemon is running on node: c3n4
oracle@c3n1:~> █
```

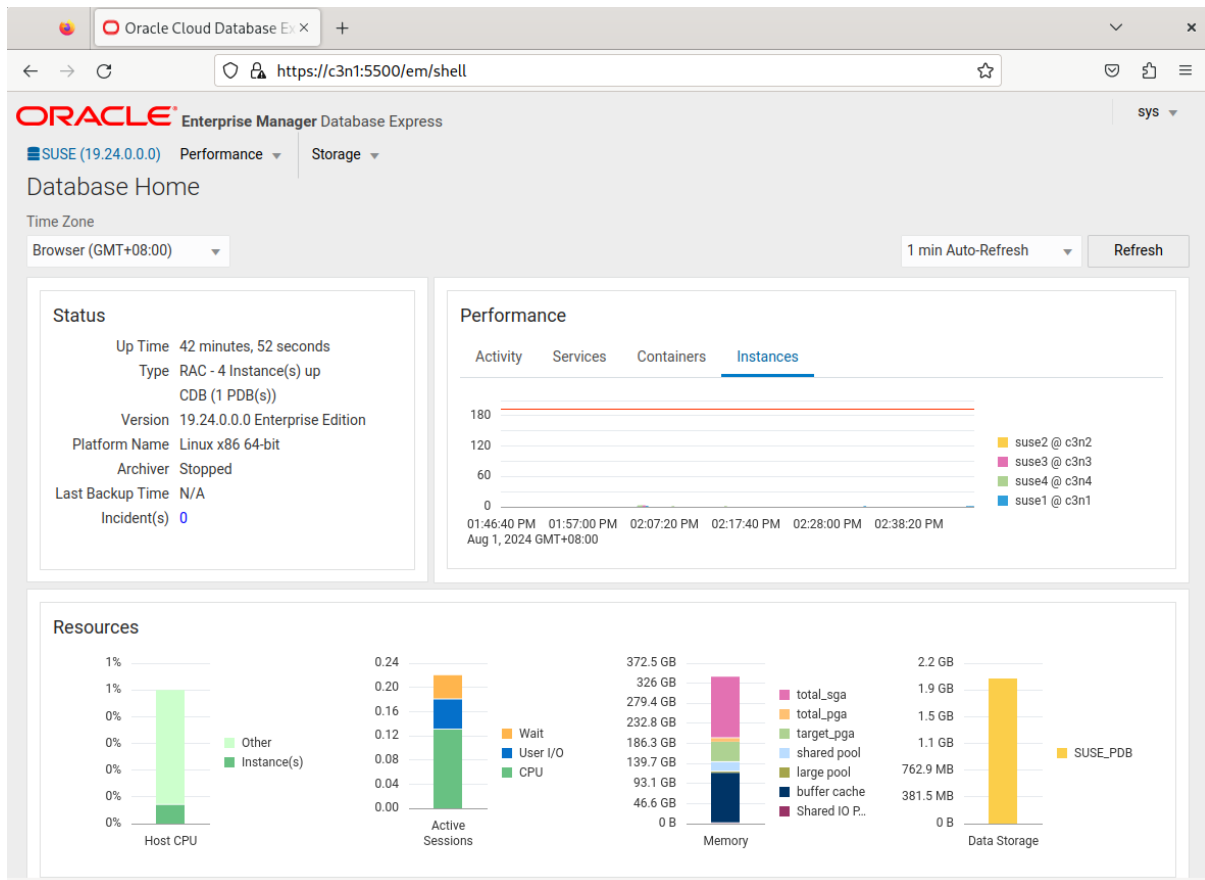
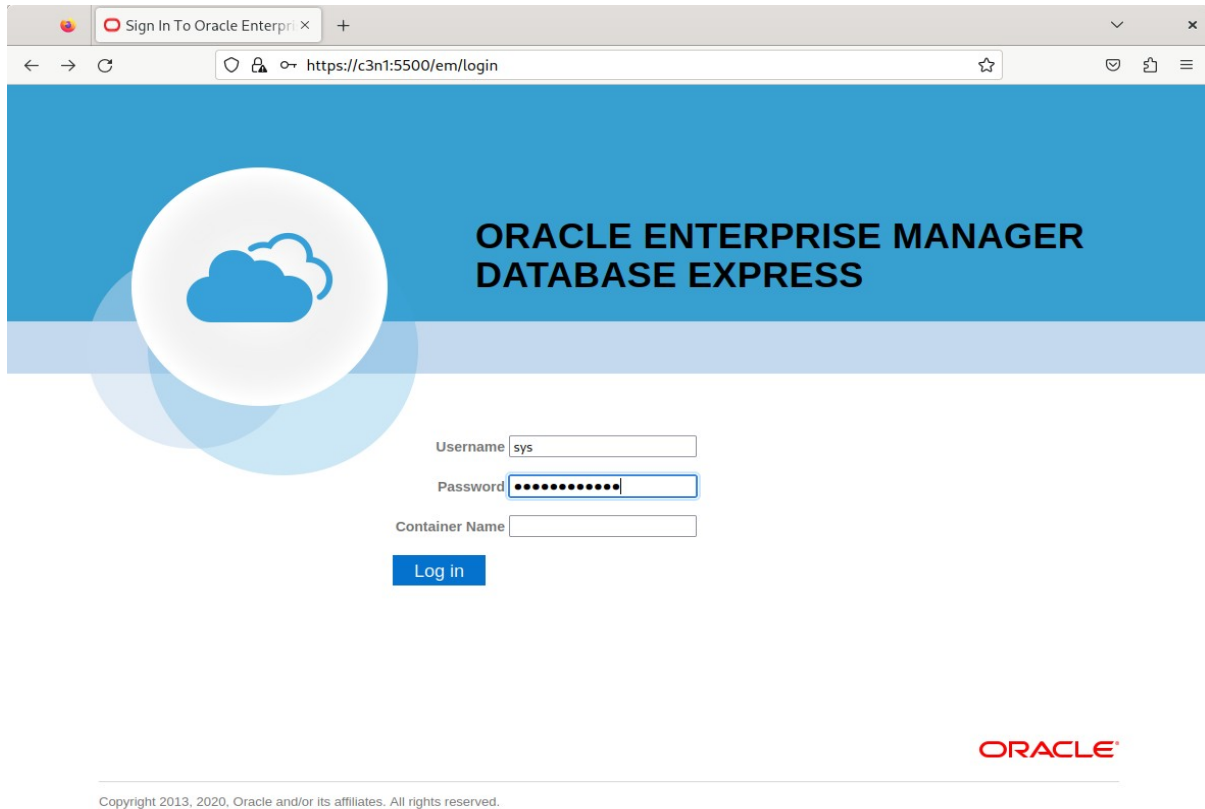
```
oracle@c3n1:~> /home/oracle/grid_19c/bin/crsctl stat res -t
-----
Name                Target  State        Server                State details
-----
Local Resources
-----
ora.LISTENER.lsnr
    ONLINE  ONLINE      c3n1                  STABLE
    ONLINE  ONLINE      c3n2                  STABLE
    ONLINE  ONLINE      c3n3                  STABLE
    ONLINE  ONLINE      c3n4                  STABLE
ora.chad
    ONLINE  ONLINE      c3n1                  STABLE
    ONLINE  ONLINE      c3n2                  STABLE
    ONLINE  ONLINE      c3n3                  STABLE
    ONLINE  ONLINE      c3n4                  STABLE
ora.net1.network
    ONLINE  ONLINE      c3n1                  STABLE
    ONLINE  ONLINE      c3n2                  STABLE
    ONLINE  ONLINE      c3n3                  STABLE
    ONLINE  ONLINE      c3n4                  STABLE
ora.ons
    ONLINE  ONLINE      c3n1                  STABLE
    ONLINE  ONLINE      c3n2                  STABLE
    ONLINE  ONLINE      c3n3                  STABLE
    ONLINE  ONLINE      c3n4                  STABLE
-----
```

```

Cluster Resources
-----
ora.ASMNET1LSNR_ASM.lsnr(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.LISTENER_SCAN1.lsnr
  1      ONLINE  ONLINE  c3n2      STABLE
ora.LISTENER_SCAN2.lsnr
  1      ONLINE  ONLINE  c3n3      STABLE
ora.LISTENER_SCAN3.lsnr
  1      ONLINE  ONLINE  c3n1      STABLE
ora.SUSEDATA1.dg(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.SUSEDATA2.dg(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.asm(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      Started,STABLE
  2      ONLINE  ONLINE  c3n2      Started,STABLE
  3      ONLINE  ONLINE  c3n3      Started,STABLE
ora.asmnet1.asmnetwork(ora.asmgroup)
  1      ONLINE  ONLINE  c3n1      STABLE
  2      ONLINE  ONLINE  c3n2      STABLE
  3      ONLINE  ONLINE  c3n3      STABLE
ora.c3n1.vip
  1      ONLINE  ONLINE  c3n1      STABLE
ora.c3n2.vip
  1      ONLINE  ONLINE  c3n2      STABLE
ora.c3n3.vip
  1      ONLINE  ONLINE  c3n3      STABLE
ora.c3n4.vip
  1      ONLINE  ONLINE  c3n4      STABLE
ora.cvu
  1      ONLINE  ONLINE  c3n1      STABLE
ora.qosmserver
  1      ONLINE  ONLINE  c3n1      STABLE
ora.scan1.vip
  1      ONLINE  ONLINE  c3n2      STABLE
ora.scan2.vip
  1      ONLINE  ONLINE  c3n3      STABLE
ora.scan3.vip
  1      ONLINE  ONLINE  c3n1      STABLE
ora.suse.db
  1      ONLINE  ONLINE  c3n1      Open,HOME=/home/oracle/db_19c,STABLE
  2      ONLINE  ONLINE  c3n2      Open,HOME=/home/oracle/db_19c,STABLE
  3      ONLINE  ONLINE  c3n3      Open,HOME=/home/oracle/db_19c,STABLE
  4      ONLINE  ONLINE  c3n4      Open,HOME=/home/oracle/db_19c,STABLE
-----

```

2). Access to Oracle Enterprise Manager.



2-7. View patch information on each node.

On c3n1:

```
oracle@c3n1:/home/oracle/grid_19c/OPatch> ./opatch lspatches
36758186;DBWLM RELEASE UPDATE 19.0.0.0.0 (36758186)
36648174;TOMCAT RELEASE UPDATE 19.0.0.0.0 (36648174)
36590554;ACFS RELEASE UPDATE 19.24.0.0.0 (36590554)
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n1:/home/oracle/grid_19c/OPatch> cd /home/oracle/db_19c/OPatch
oracle@c3n1:/home/oracle/db_19c/OPatch> ./opatch lspatches
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n1:/home/oracle/db_19c/OPatch> █
```

On c3n2:

```
oracle@c3n2:/home/oracle/grid_19c/OPatch> ./opatch lspatches
36758186;DBWLM RELEASE UPDATE 19.0.0.0.0 (36758186)
36648174;TOMCAT RELEASE UPDATE 19.0.0.0.0 (36648174)
36590554;ACFS RELEASE UPDATE 19.24.0.0.0 (36590554)
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n2:/home/oracle/grid_19c/OPatch> cd /home/oracle/db_19c/OPatch
oracle@c3n2:/home/oracle/db_19c/OPatch> ./opatch lspatches
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n2:/home/oracle/db_19c/OPatch> █
```

On c3n3:

```
oracle@c3n3:/home/oracle/grid_19c/OPatch> ./opatch lspatches
36758186;DBWLM RELEASE UPDATE 19.0.0.0.0 (36758186)
36648174;TOMCAT RELEASE UPDATE 19.0.0.0.0 (36648174)
36590554;ACFS RELEASE UPDATE 19.24.0.0.0 (36590554)
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n3:/home/oracle/grid_19c/OPatch> cd /home/oracle/db_19c/OPatch
oracle@c3n3:/home/oracle/db_19c/OPatch> ./opatch lspatches
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n3:/home/oracle/db_19c/OPatch> █
```

On c3n4:

```
oracle@c3n4:/home/oracle/grid_19c/OPatch> ./opatch lspatches
36758186;DBWLM RELEASE UPDATE 19.0.0.0.0 (36758186)
36648174;TOMCAT RELEASE UPDATE 19.0.0.0.0 (36648174)
36590554;ACFS RELEASE UPDATE 19.24.0.0.0 (36590554)
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n4:/home/oracle/grid_19c/OPatch> cd /home/oracle/db_19c/OPatch
oracle@c3n4:/home/oracle/db_19c/OPatch> ./opatch lspatches
36587798;OCW RELEASE UPDATE 19.24.0.0.0 (36587798)
36582781;Database Release Update : 19.24.0.0.240716 (36582781)

OPatch succeeded.
oracle@c3n4:/home/oracle/db_19c/OPatch> █
```

2-8. Checking database status by sqlplus.

```
oracle@c3n1:~> export ORACLE_HOME=/home/oracle/db_19c/
oracle@c3n1:~> export ORACLE_SID=suse
oracle@c3n1:~> /home/oracle/db_19c/bin/sqlplus /nolog

SQL*Plus: Release 19.0.0.0.0 - Production on Mon Aug 5 16:24:52 2024
Version 19.24.0.0.0

Copyright (c) 1982, 2024, Oracle. All rights reserved.

SQL> conn sys/██████████@c3n1:1521/suse as sysdba
Connected.
SQL> show sga

Total System Global Area 4.0265E+10 bytes
Fixed Size 37601016 bytes
Variable Size 6710886400 bytes
Database Buffers 3.3420E+10 bytes
Redo Buffers 96616448 bytes
SQL> show pdbs

  CON_ID  CON_NAME                                OPEN MODE  RESTRICTED
-----  -
  2  PDB$SEED                                READ ONLY  NO
  3  SUSE_PDB                                READ WRITE NO

SQL> █
```

Troubleshooting

- *GI&DB 19c(19.3) - GI/DB RunInstaller Fails with [INS-44000]&[INS-06006] Passwordless SSH connectivity not set up between the following node(s): [node1, node2...].*

Workaround: Apply GI RELEASE UPDATE 19.24.0.0.0(Patch 36582629).

```
#!/gridSetup.sh -applyRU /home/ORACLE_SW/patch_RU_192400/36582629/  
# ./runInstaller -applyRU /home/ORACLE_SW/patch_RU_192400/36582629/36582781/  
-applyOneOffs /home/ORACLE_SW/patch_RU_192400/36582629/36587798/
```

- *GI&DB 19c(19.24.0.0.0) - [INS-10113] Installer encountered errors while copying...*

Workaround:

```
# export SRVM_DISABLE_MTTRANS=true  
# ./gridSetup.sh  
# ./runInstaller
```

- *GI 19c(19.24.0.0.0) root.sh failed with error:
"/home/oracle/grid_19c/crs/utl/init.ohasd.sles: line 440: /bin/chrt: No such file or directory".*

Workaround: ln -s /usr/bin/chrt /bin/chrt

- *GI 19c root.sh failed with CLSRSC-317: FAILED TO REGISTER ORACLE OHASD SERVICE IN SLES15.(or If using ASMLib)*

Workaround: Install "insserv-compat" on the server. The package insserv-compat adds compatibility with System V init scripts to system.

- *GI 19c Installation/relink fails with:"Error in invoking target 'libasmclntsh19.ohso libasmperl19.ohso client_sharedlib' of makefile ins_rdbms.mk"*

Workaround: Install 'compat-libpthread-nonshared' package.

Additional Comments

This document provides a brief instruction to install Oracle RAC Database 19c on SLES 15 SP6. You can extend this topology to make it highly available and secure so it is suitable for a production system.

*Thanks for selecting **SUSE Linux Enterprise Server** as your Linux platform of choice!*