

**Oracle RAC 12.1.0.2.0 on SUSE Linux
Enterprise Server 12 - x86_64**



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Introduction

This documentation provides the details for install Oracle RAC 12.1.0.2.0 on SUSE Linux Enterprise Server 12 OS. Here, x86_64 version of both Oracle Database 12c Enterprise and SUSE Linux Enterprise Server is used. Similar steps applies to other platforms(x86, ia64, etc.). If you encounter any problem or have general question, please post your query to suse-oracle@listx.novell.com.

The oracle official product documentation available at: <http://docs.oracle.com/en/>

Hardware and Software Requirements

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 12 SP1 (x86_64)
(<http://download.suse.de/install>)

Oracle

- Database 12c Enterprise/Standard Editions (x86_64)
(<http://www.oracle.com/technetwork/indexes/downloads/index.html#database>)

Testing 4-node cluster information

HP DL360 Gen9 Server (Intel Xeon 2x12 core ~ 48 CPU), 64GB RAM
4 NIC per server (two bonded as active/passive) + Static IP Address
Local HDD (500 GB)
Three shared SAN Partition (ASM: 30GB & NFS:400 GB, Other:600GB)
SUSE Linux Enterprise Server 12 SP1 (x86_64)
Kernel version: 3.12.49-11-default

Prerequisites

1. Install SUSE Linux Enterprise Server 12 on each cluster node.

Follow the official document (URL:<https://www.suse.com/documentation/sles-12/>) to Install SLES 12 (x86_64) on each node in the cluster.

2. Network configuration for Oracle RAC installation as follows.

#Private:

```
10.1.1.1    c2n1-priv
10.1.1.2    c2n2-priv
10.1.1.3    c2n3-priv
10.1.1.4    c2n4-priv
```

#Public:

```
137.65.135.72  c2n1.provo.novell.com c2n1
137.65.135.73  c2n2.provo.novell.com c2n2
137.65.135.74  c2n3.provo.novell.com c2n3
137.65.135.75  c2n4.provo.novell.com c2n4
```

Virtual

```
137.65.135.76      c2n1-vip      c2n1-vip.provo.novell.com
137.65.135.77      c2n2-vip      c2n2-vip.provo.novell.com
137.65.135.78      c2n3-vip      c2n3-vip.provo.novell.com
137.65.135.79      c2n4-vip      c2n4-vip.provo.novell.com
```

#SCAN:

```
c2-scan.provo.novell.com (137.65.135.87)
c2-scan.provo.novell.com (137.65.135.148)
c2-scan.provo.novell.com (137.65.135.149)
```

Oracle RAC Installation

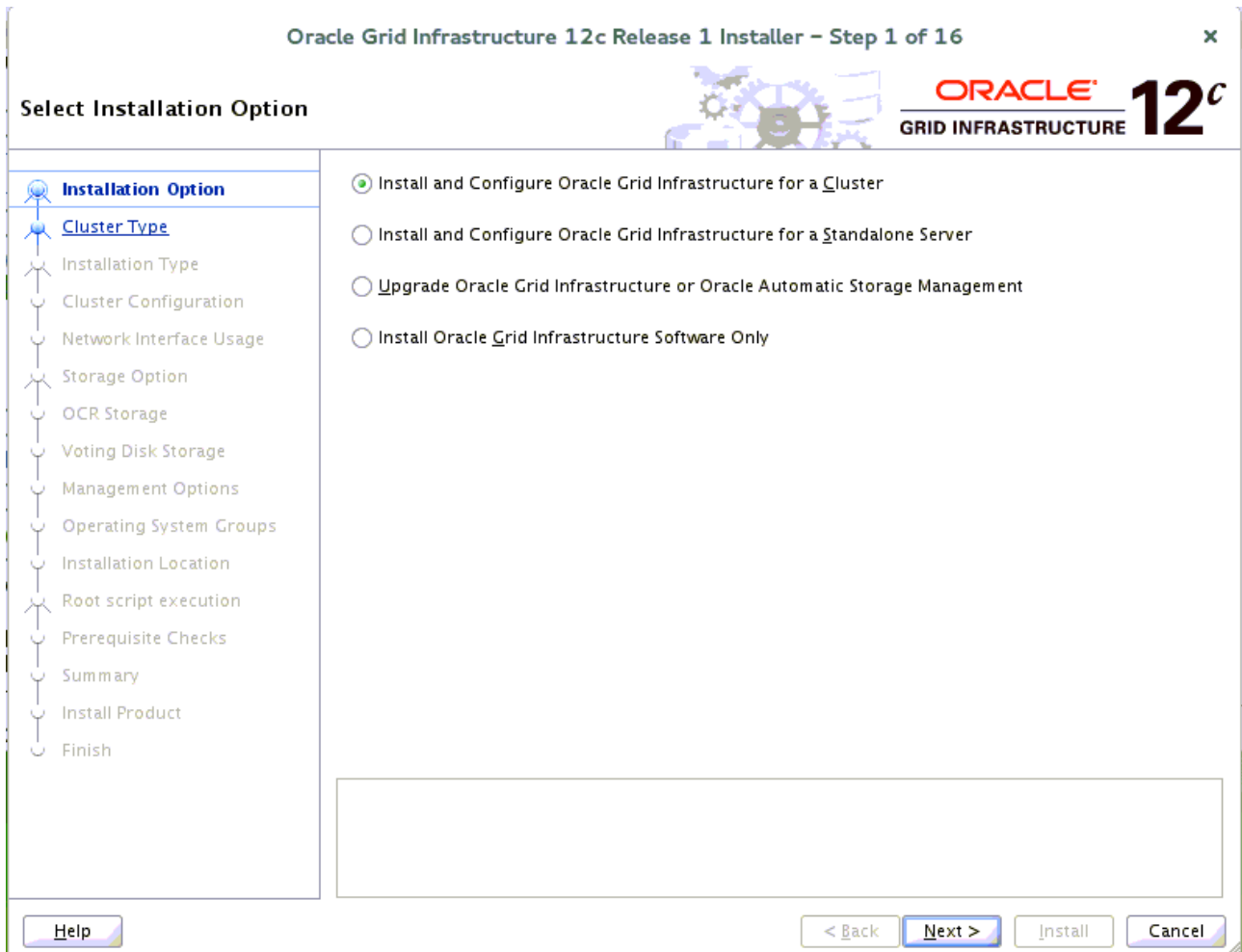
1. Installing Oracle Grid Infrastructure.

1-1. Login to the SLES 12 64-bit OS as a non-admin user. Download the Oracle Database 12c Release 1 Grid Infrastructure (12.1.0.2.0) for Linux x86-64.

1-2. Extract grid.zip and run the installer './runInstaller' from Grid ShipHome.

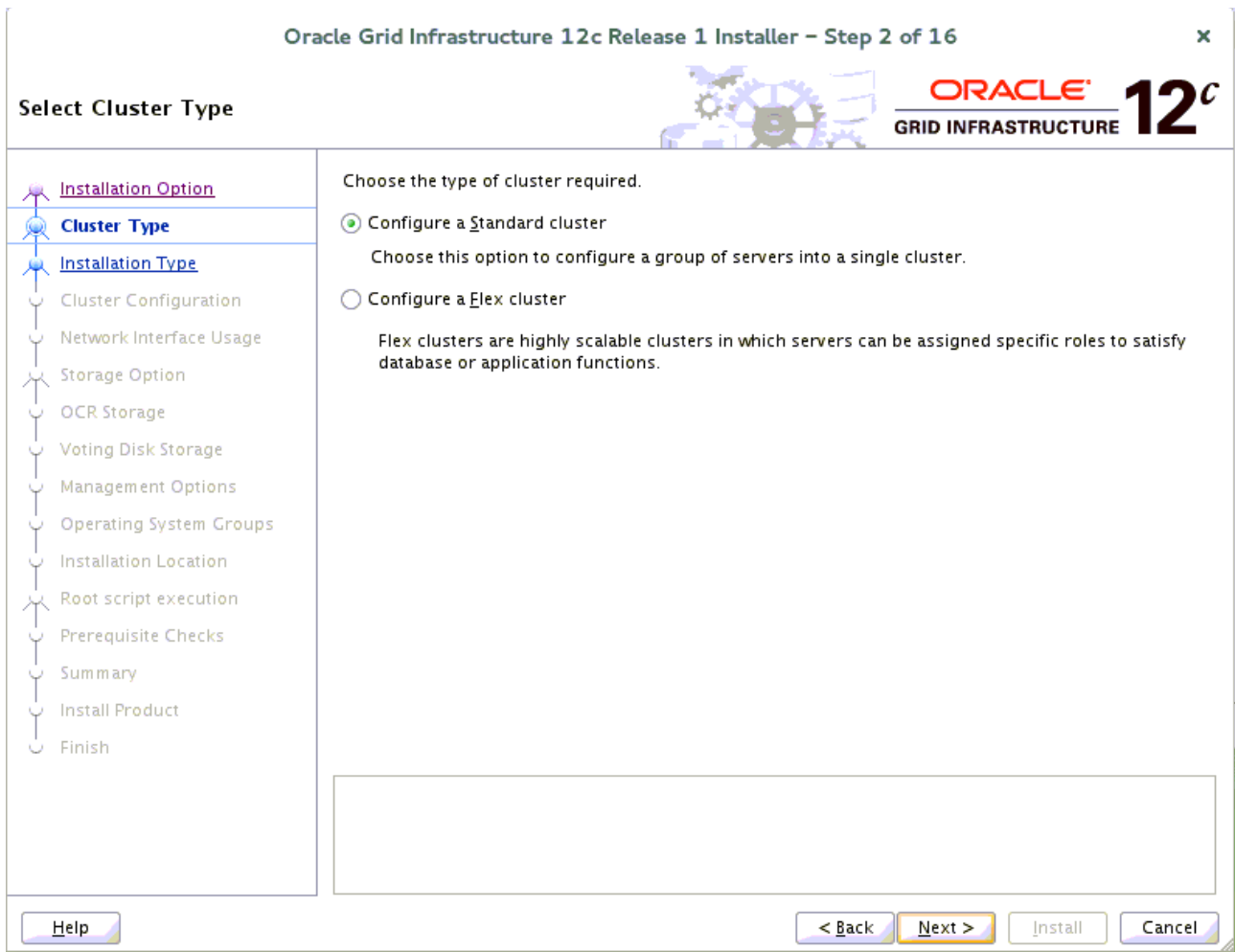
Install Flow:

1). Select Installation Option.



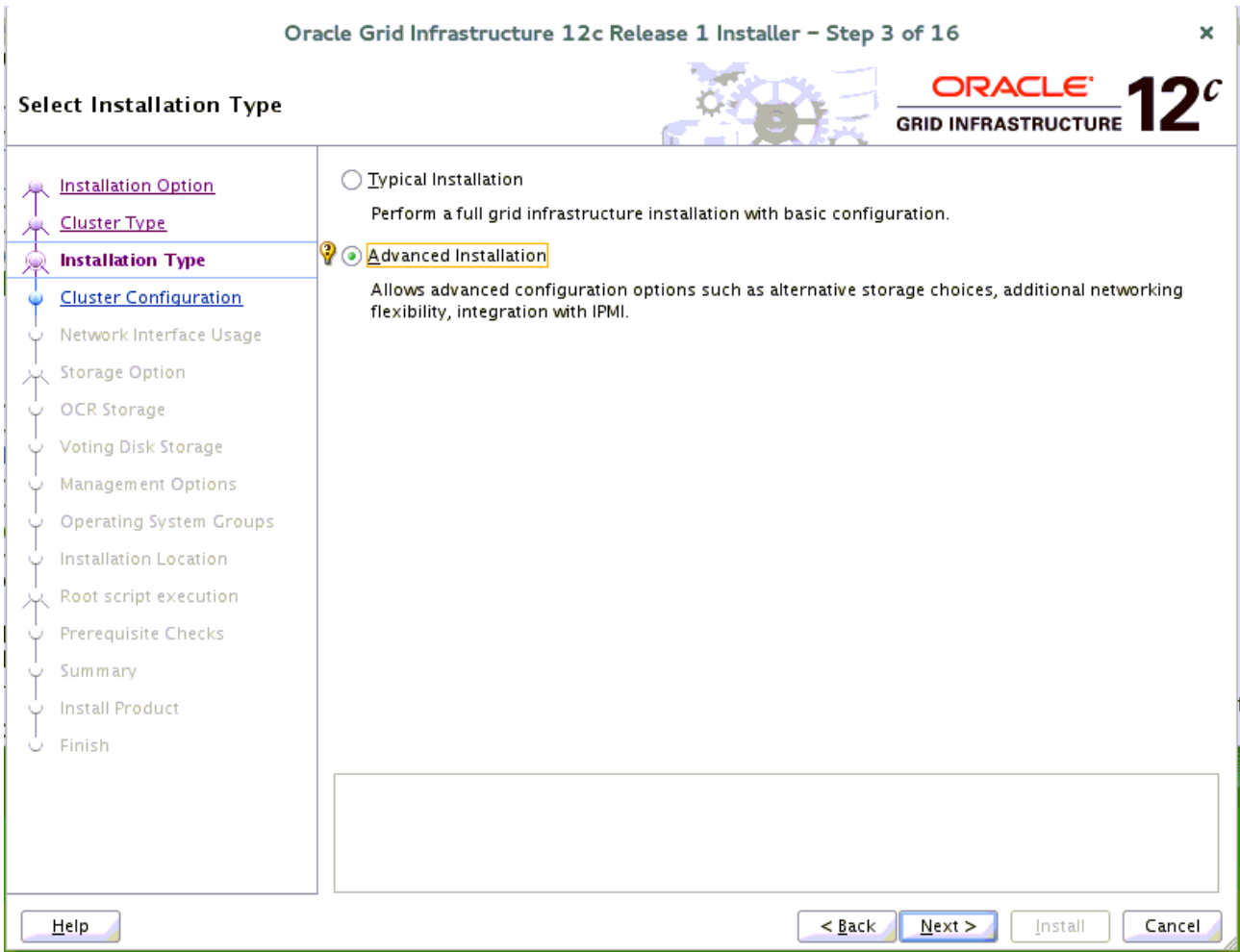
Choose option "Install and Configure Oracle Grid Infrastructure for a Cluster", then click **Next** to continue.

2). Select Cluster Type.



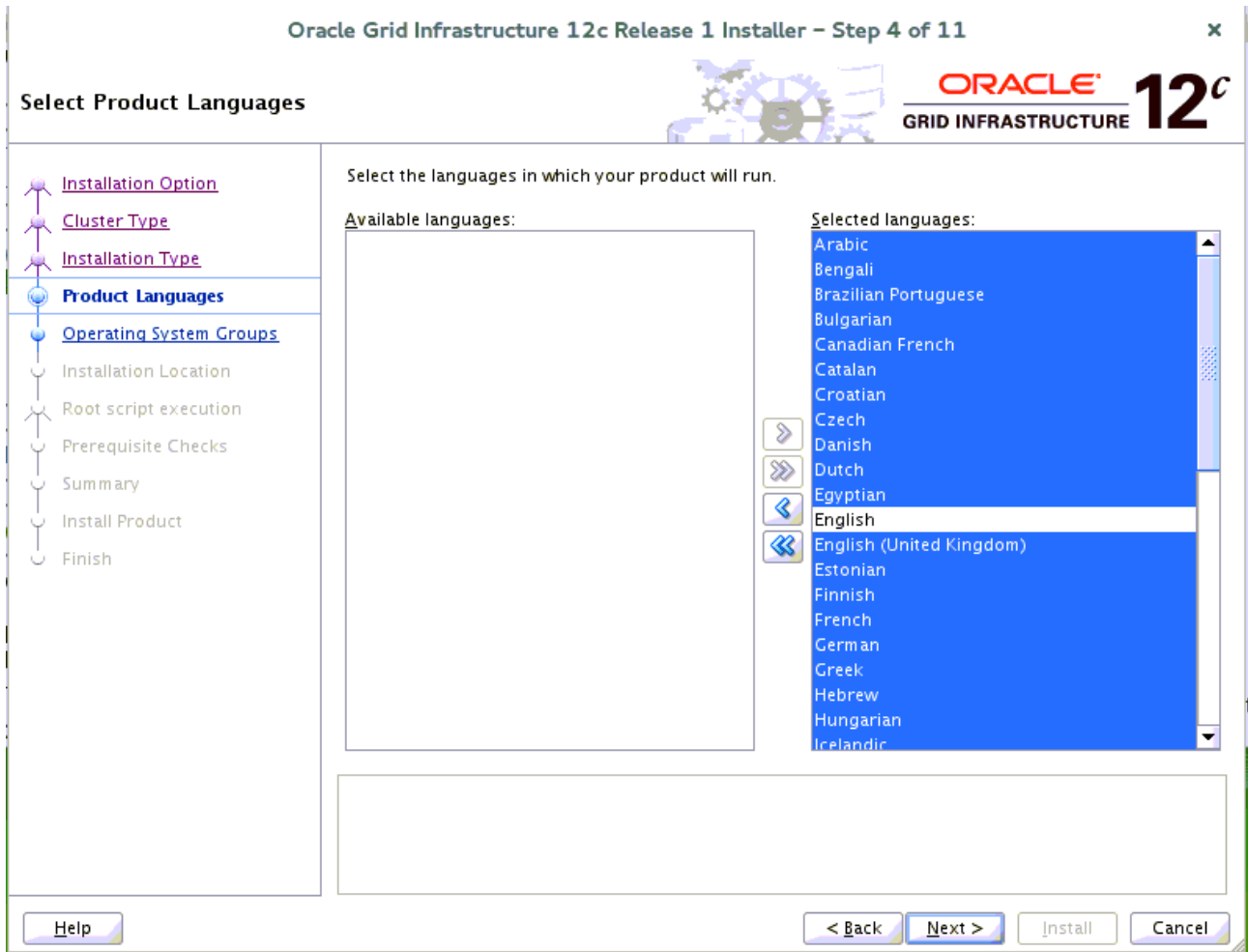
Choose option "Configure a Standard Cluster", then click Next to continue.

3). Select Installation Type.



Choose option "**Advanced Installation**", then click **Next** to continue.

4). Select Product Languages.



Select all languages, then click **Next** to continue.

5). Grid Plug and Play Information.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 5 of 18

Grid Plug and Play Information

Single Client Access Name (SCAN) allows clients to use one name in connection strings to connect to the cluster as a whole. Client connect requests to the SCAN name can be handled by any cluster node.

Cluster Name:

SCAN Name:

SCAN Port:

Configure GNS

Configure nodes Virtual IPs as assigned by the Dynamic Networks

Create a new GNS

GNS VIP Address:

GNS Sub Domain:

Use Shared GNS

GNS Client Data:


Fill in the information as seen above, then click **Next** to continue.

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

6). Cluster Node Information.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 6 of 18 x

Cluster Node Information



Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
c2n1.provo.novell.com	c2n1-vip.provo.novell.com
c2n2.provo.novell.com	c2n2-vip.provo.novell.com
c2n3.provo.novell.com	c2n3-vip.provo.novell.com
c2n4.provo.novell.com	c2n4-vip.provo.novell.com

Provide the list of nodes with their public hostname and virtual hostname, then click **Next** to continue.

7). Specify Network Interface Usage.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 7 of 18

Specify Network Interface Usage

Private interfaces are used by Oracle Grid Infrastructure for internode traffic.

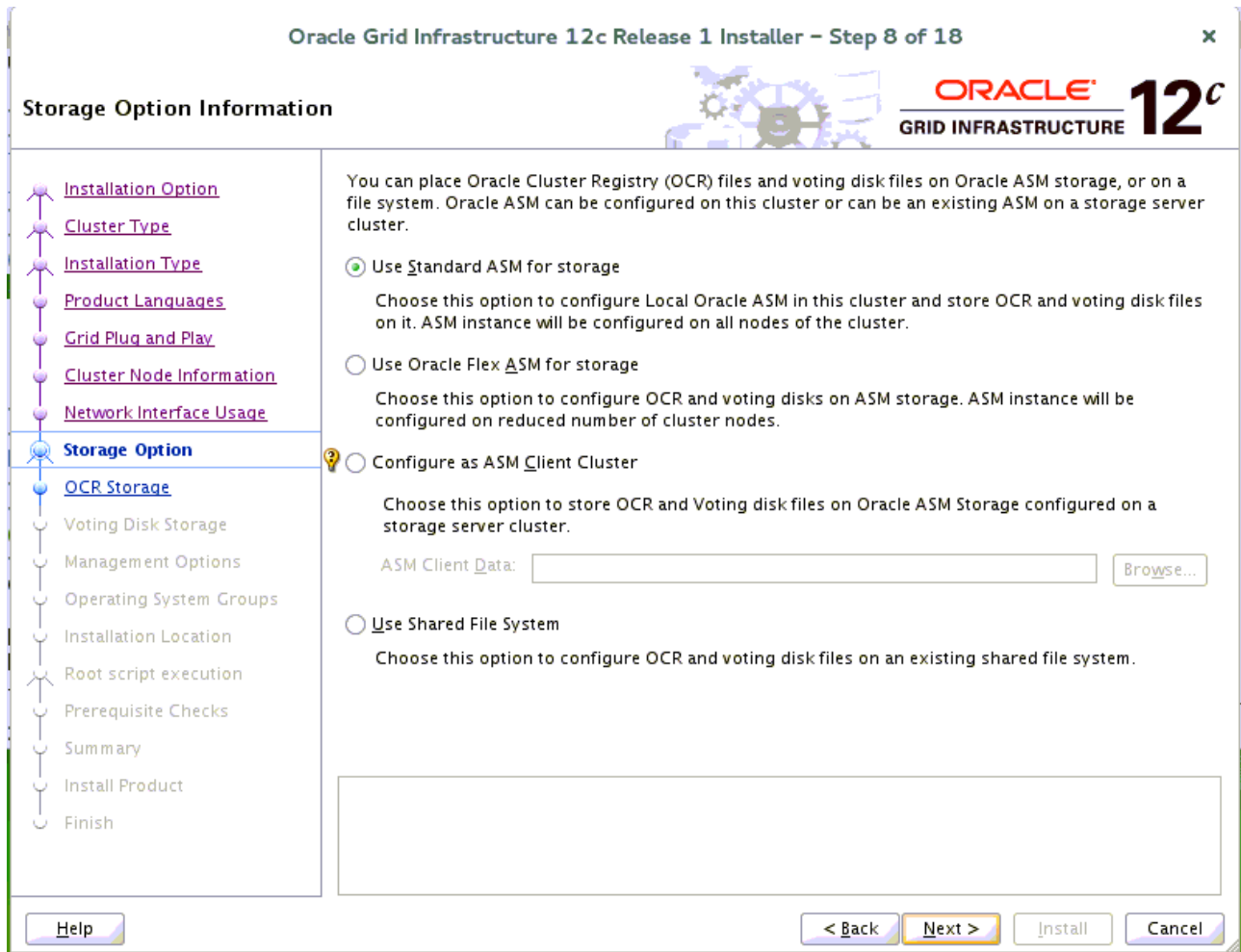
Interface Name	Subnet	Use for
bond1	137.65.135.0	Public
bond0	10.1.1.0	Private

Note: If you intend to store Oracle Cluster Registry (OCR) and voting disk files using Oracle Flex Automatic Storage Management (Oracle Flex ASM), then you must designate at least one of the private interface subnets either as "ASM" or as "ASM & Private".

Help < Back Next > Install Cancel

Provide interfaces are used by Oracle Grid for public and private traffic, then click **Next** to continue.

8). Storage Option Information.



Choose option "Use Standard ASM for storage", then click Next to continue.

9). Create ASM Disk Group.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 9 of 18

Create ASM Disk Group

Select Disk Group characteristics and select disks

Disk group name:

Redundancy: High Normal External

Allocation Unit Size: MB

Add Disks

Candidate Disks All Disks

<input type="checkbox"/>	Disk Path	Size (in MB)	Status
<input type="checkbox"/>	/dev/oradata/asm disk9	100352	Candidate
<input checked="" type="checkbox"/>	/dev/oradata/disk1	7629	Candidate
<input type="checkbox"/>	/dev/oradata/disk10	10240	Candidate
<input type="checkbox"/>	/dev/oradata/disk11	10240	Candidate
<input checked="" type="checkbox"/>	/dev/oradata/disk2	7629	Candidate
<input checked="" type="checkbox"/>	/dev/oradata/disk3	7629	Candidate
<input type="checkbox"/>	/dev/oradata/disk5	307200	Candidate
<input type="checkbox"/>	/dev/oradata/disk6	307100	Candidate

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

10). Specify ASM Password.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 10 of 18

Specify ASM Password

The new Oracle Automatic Storage Management (Oracle ASM) instance requires its own SYS user with SYSASM privileges for administration. Oracle recommends that you create a less privileged ASMSNMP user with SYSDBA privileges to monitor the ASM instance.

Specify the password for these user accounts.

Use different passwords for these accounts

	Password	Confirm Password
SYS		
ASMSNMP		

Use game passwords for these accounts

Specify Password: Confirm Password:

Messages:

Specify Password:[INS-30011] The password entered does not conform to the Oracle recommended standards.


Help < Back Next > Install Cancel

Fill in ASM Password as shown above, then click **Next** to continue.

11). Failure Isolation Support.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 11 of 19 x

Failure Isolation Support



- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)**
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)
- [Root script execution](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

Choose one of the following Failure Isolation Support options.

Use Intelligent Platform Management Interface (IPMI)

To ensure successful installation with IPMI enabled, ensure your IPMI drivers are properly installed and enabled.

User Name :

Password :

Do not use Intelligent Platform Management Interface (IPMI)

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

Choose option "Do not use IPMI", then click **Next** to continue.

12). Specify Management Options.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 12 of 19 x

Specify Management Options

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)
- Management Options**
- [Operating System Groups](#)
- [Installation Location](#)
- [Root script execution](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

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:

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

Selected/Deselected option "Register with EM" depend on your needs, then click **Next** to continue.

13). Privileged Operating System Groups.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 13 of 19

Privileged Operating System Groups

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="dba"/>
Oracle ASM <u>D</u> BA (OSDBA for ASM) Group	<input type="text" value="oinstall"/>
Oracle ASM <u>O</u> perator (OSOPER for ASM) Group (Optional)	<input type="text"/>

Operating System Groups

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


Help < Back Next > Install Cancel

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

14). Specify Installation Location.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 14 of 19 x

Specify Installation Location



- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)**
- [Root script execution](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

Specify the Oracle Grid Infrastructure for a Cluster Oracle base. By default, Oracle Grid Infrastructure is installed in a path indicating the Oracle Grid Infrastructure release and grid infrastructure software owner.

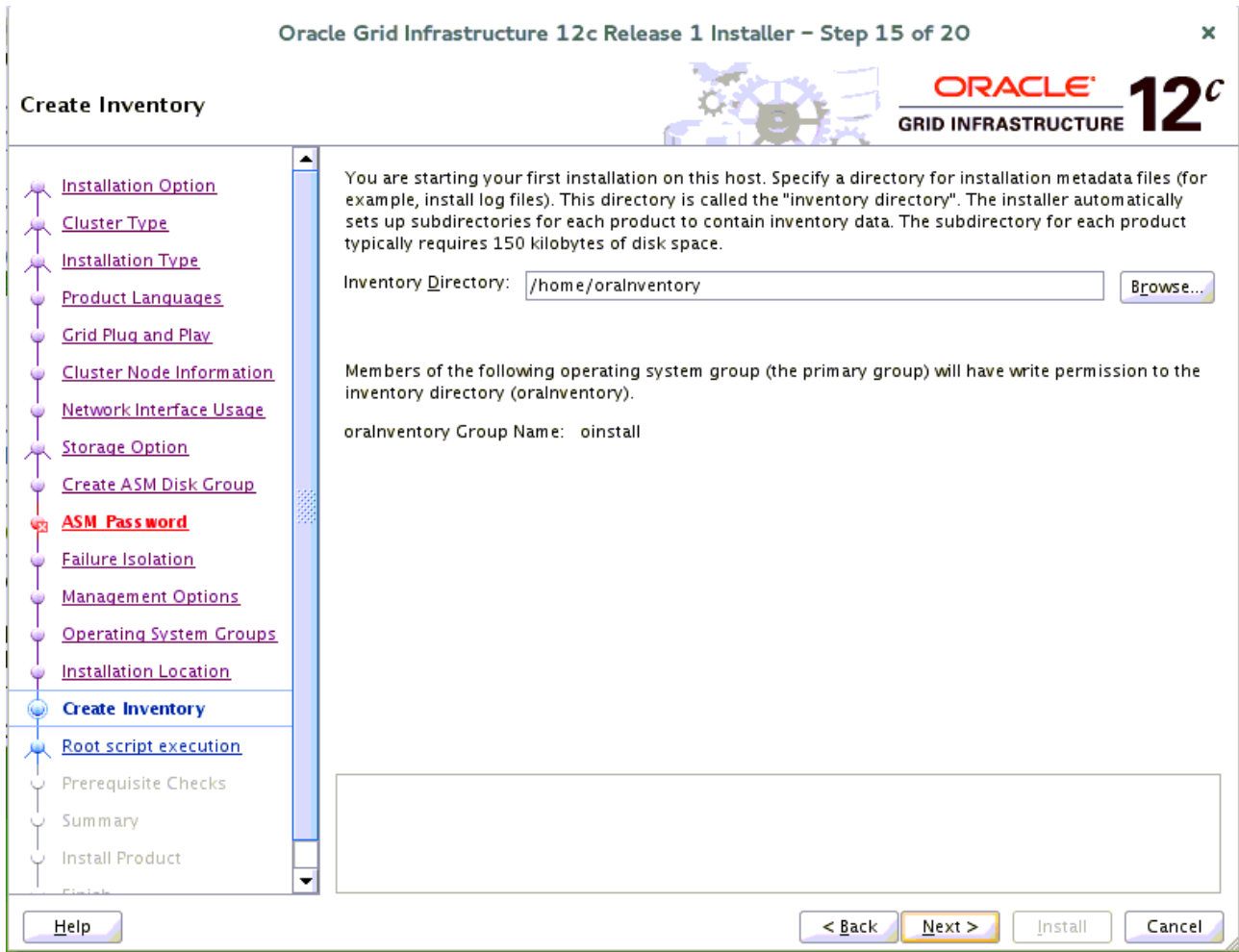
Oracle base:

Specify a location for storing Oracle software files separate from configuration files in the Oracle base directory. This software directory is the Oracle Grid Infrastructure home directory.

Software location

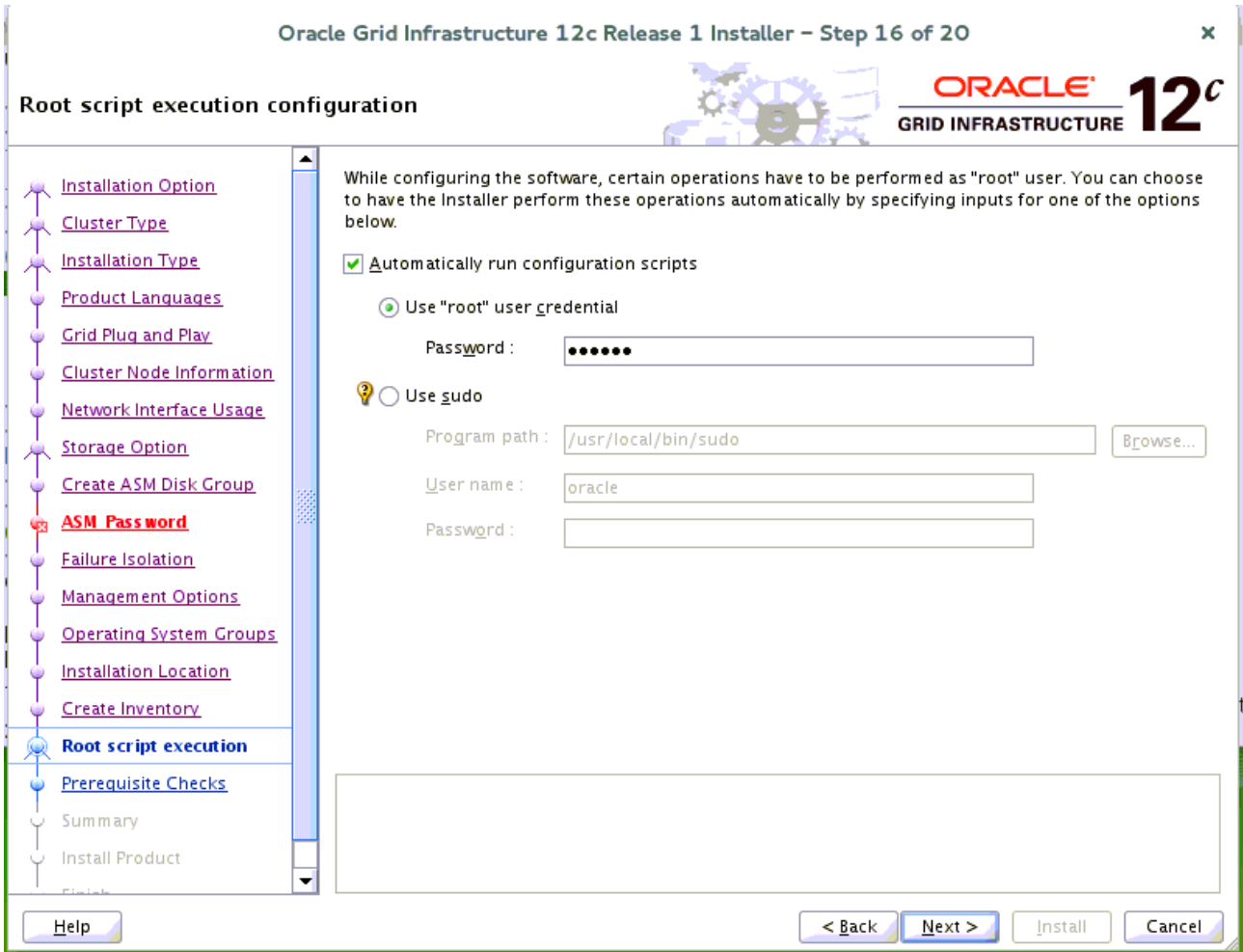
Fill in **Oracle base** and **Software location**, then click **Next** to continue.

15). Create Inventory.



Specify a directory for installation metadata files if this is your first installation on this host, then click **Next** to continue.

16). Root script execution configuration.



While configuring the software, certain operations have to be performed as "root" user. Choose the option as shown above, the Installer will perform these operations automatically. Fill in the password for "root" user, then click **Next** to continue.

17). Perform Prerequisite Checks.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 17 of 20

Perform Prerequisite Checks

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

Verification 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
Package: cvuqdisk-1.0.9-1	Warning	Yes
Package: libaio-0.3.104	Warning	No
Package: ksh-93t	Warning	No
Package: libstdc++33-3.3.3	Warning	No
Package: libstdc++43-devel-4.3.3_20081022	Warning	No
Package: libstdc++43-4.3.3_20081022	Warning	No
Package: libgcc43-4.3.3_20081022	Warning	No
Device Checks for ASM	Warning	No
/dev/shm mounted as temporary file system	Warning	No

This is a prerequisite condition to test whether the package "cvuqdisk-1.0.9-1" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

Help < Back Next > Install Cancel

Perform Pre-Check as shown above; Click **Fix&Check Again** to recheck the system.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 17 of 20

Perform Prerequisite Checks

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

Verification 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
Package: cvuqdisk-1.0.9-1	Warning	Yes
Package: libaio-0.3.104	Warning	No
Package: ksh-93t	Warning	No
Package: libstdc++33-3.3.3	Warning	No
Package: libstdc++43-devel-4.3.3_20081022	Warning	No
Package: libstdc++43-4.3.3_20081022	Warning	No
Package: libgcc43-4.3.3_20081022	Warning	No
Device Checks for ASM	Warning	No
/dev/shm mounted as temporary file system	Warning	No

This is a prerequisite condition to test whether the package "cvuqdisk-1.0.9-1" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

Help < Back Next > Install Cancel

Fixup Script

Some of the prerequisites have failed on the following nodes. Installer has generated a fixup script that needs to be run as a privileged user (root). Installer will run the fixup script (/tmp/CVU_12.1.0.2.0_oracle/runfixup.sh) on the listed nodes using the privileged user credentials provided earlier. Click "OK" to proceed.

Nodes: c2n1
c2n2
c2n3

OK Cancel

Follow the prompts, manual run Fixup Script as "root" user on each node, then click **OK**.

```
c2n1:/home # /tmp/CVU_12.1.0.2.0_oracle/runfixup.sh
All Fix-up operations were completed successfully.
c2n1:/home # █
```

Oracle Grid Infrastructure 12c Release 1 Installer – Step 17 of 20

Perform Prerequisite Checks

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.

Ignore All

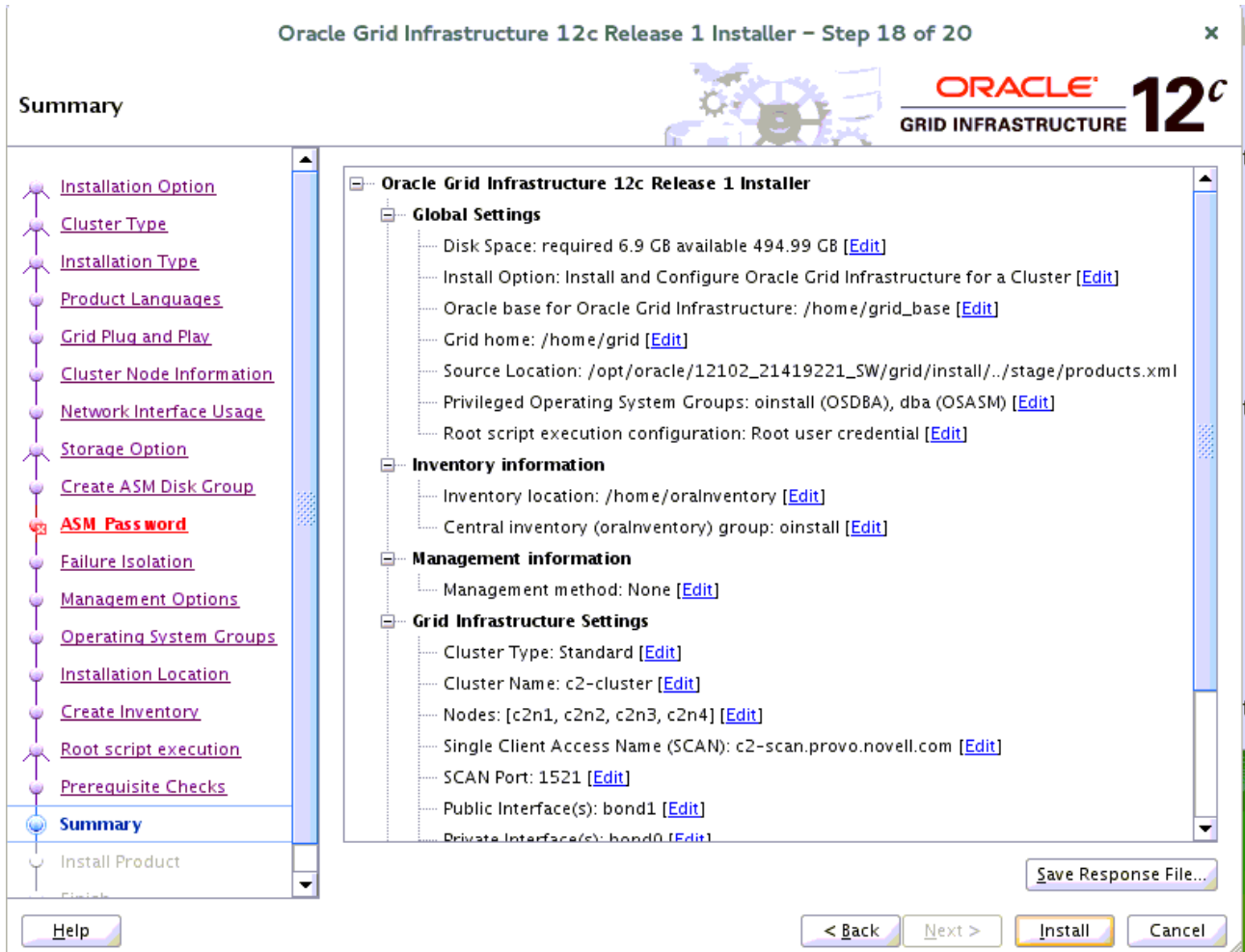
Checks	Status	Fixable
Checks		
Packages		
Package: libaio-0.3.104	Ignored	No
Package: ksh-93t	Ignored	No
Package: libstdc++33-3.3.3	Ignored	No
Package: libstdc++43-devel-4.3.3_20081022	Ignored	No
Package: libstdc++43-4.3.3_20081022	Ignored	No
Package: libgcc43-4.3.3_20081022	Ignored	No
Device Checks for ASM	Ignored	No
/dev/shm mounted as temporary file system	Ignored	No

This is a prerequisite condition to test whether the package "libaio-0.3.104" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

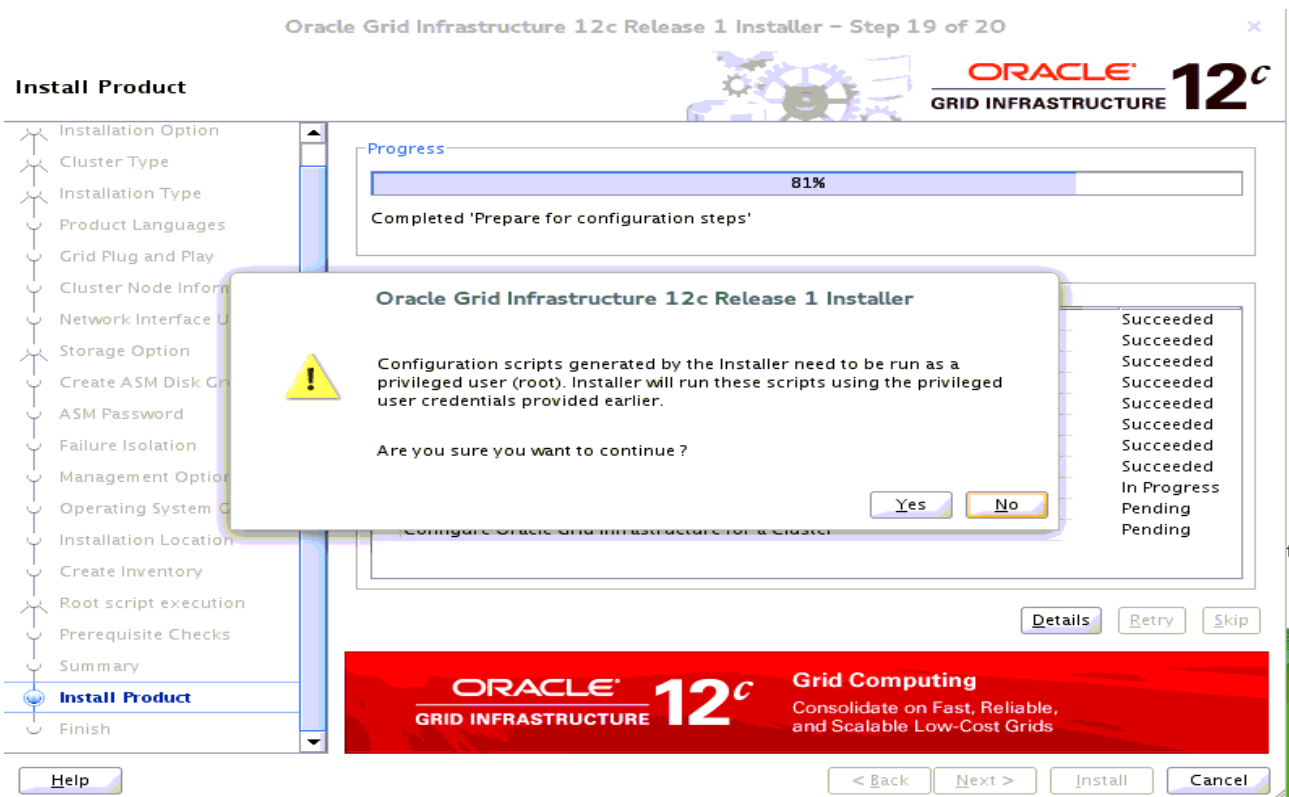
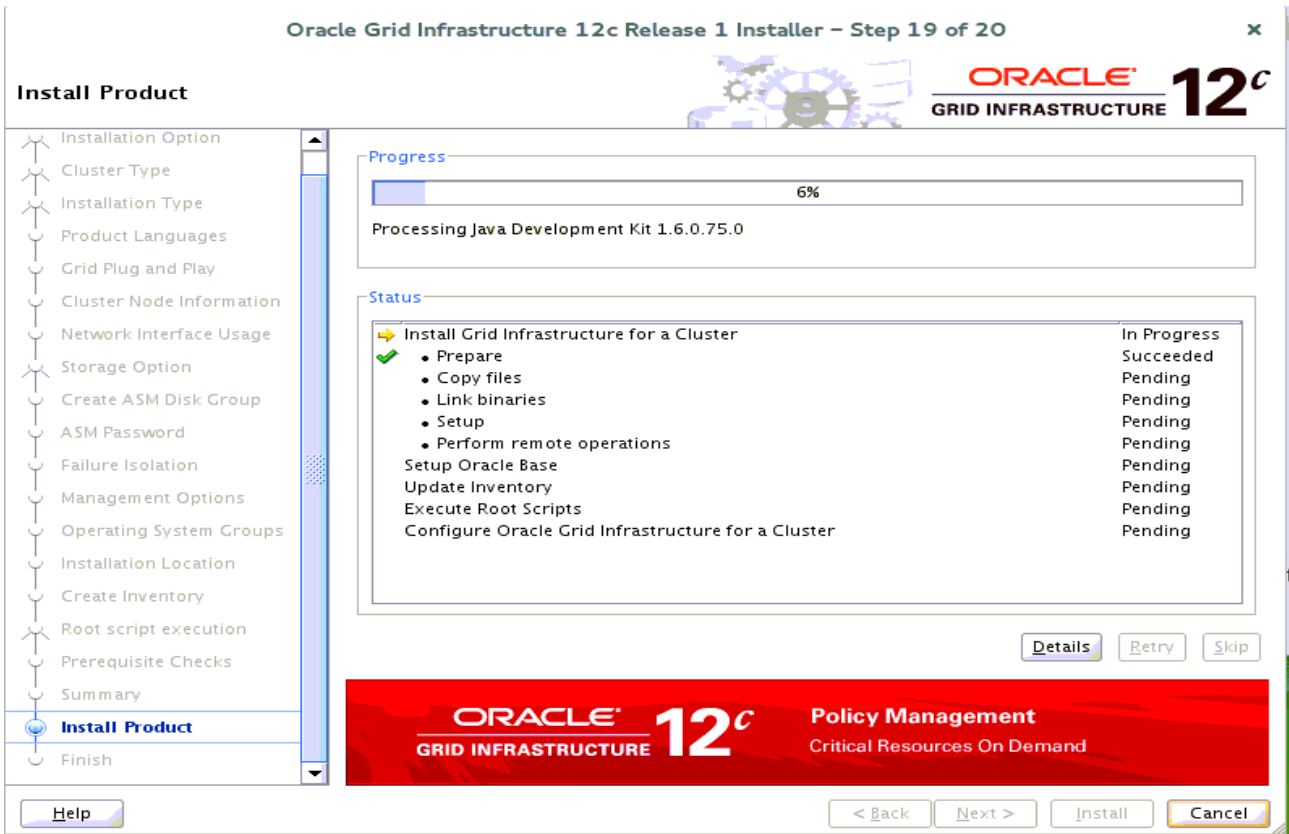
Select option **"Ignore All"**, then click **Next** to continue.

18). Summary.

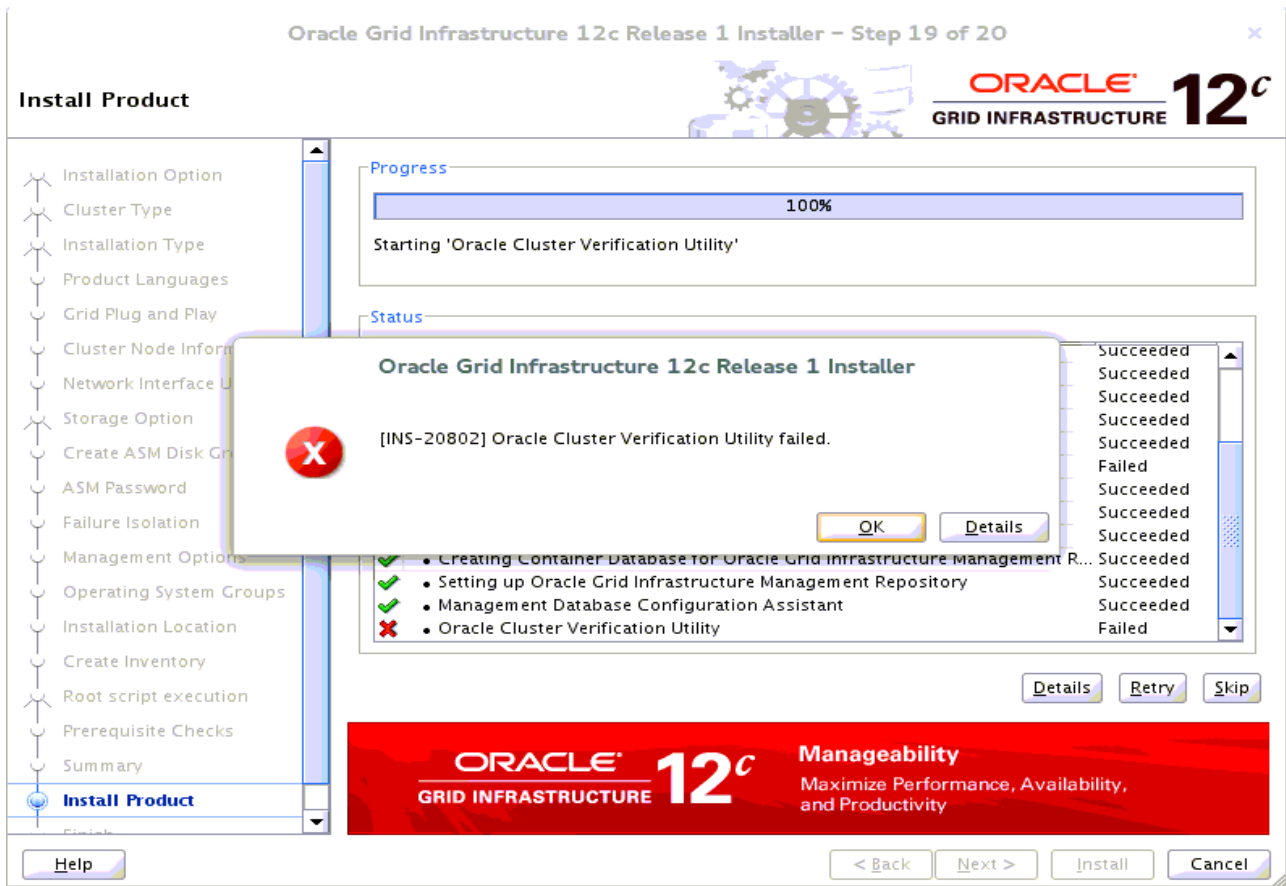


Installation Summary as shown above, click **Install** to continue.

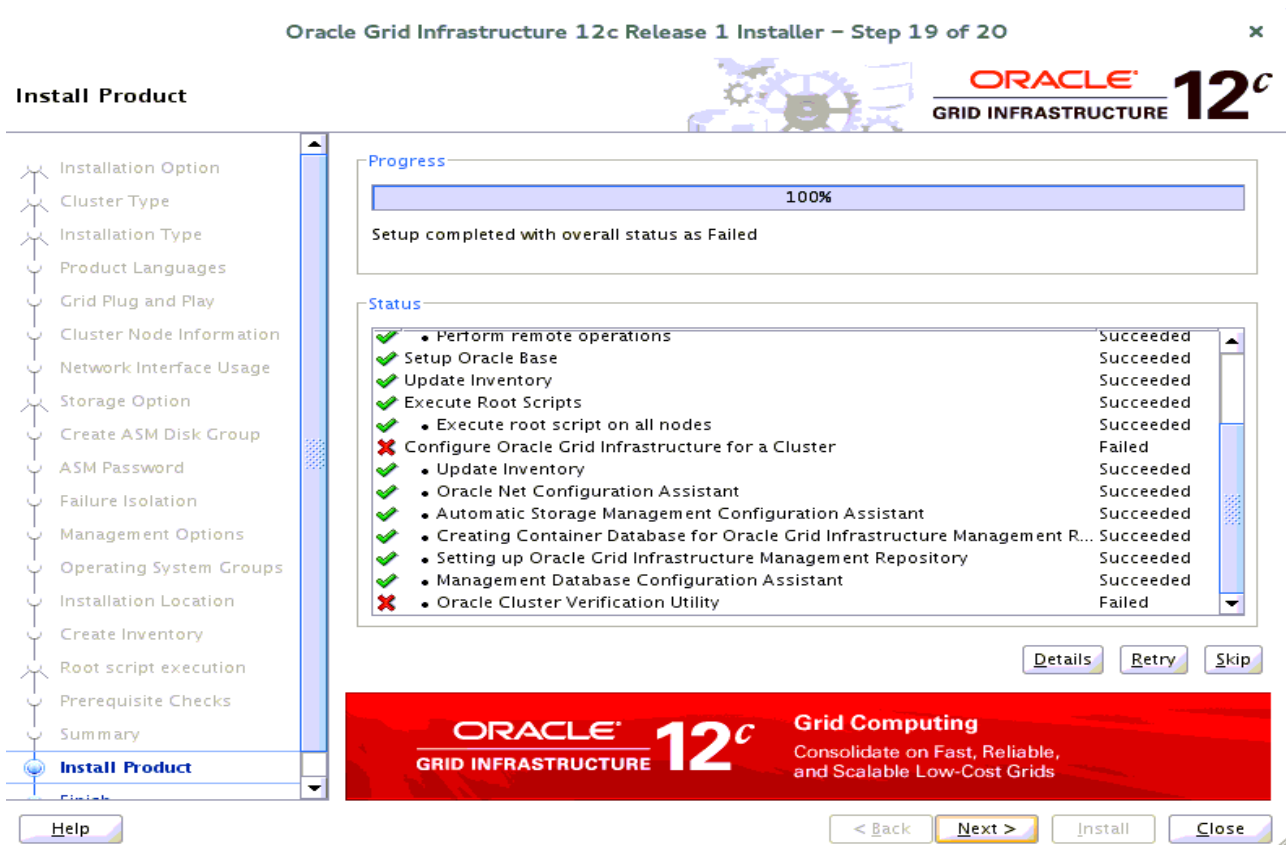
19). Install Product.



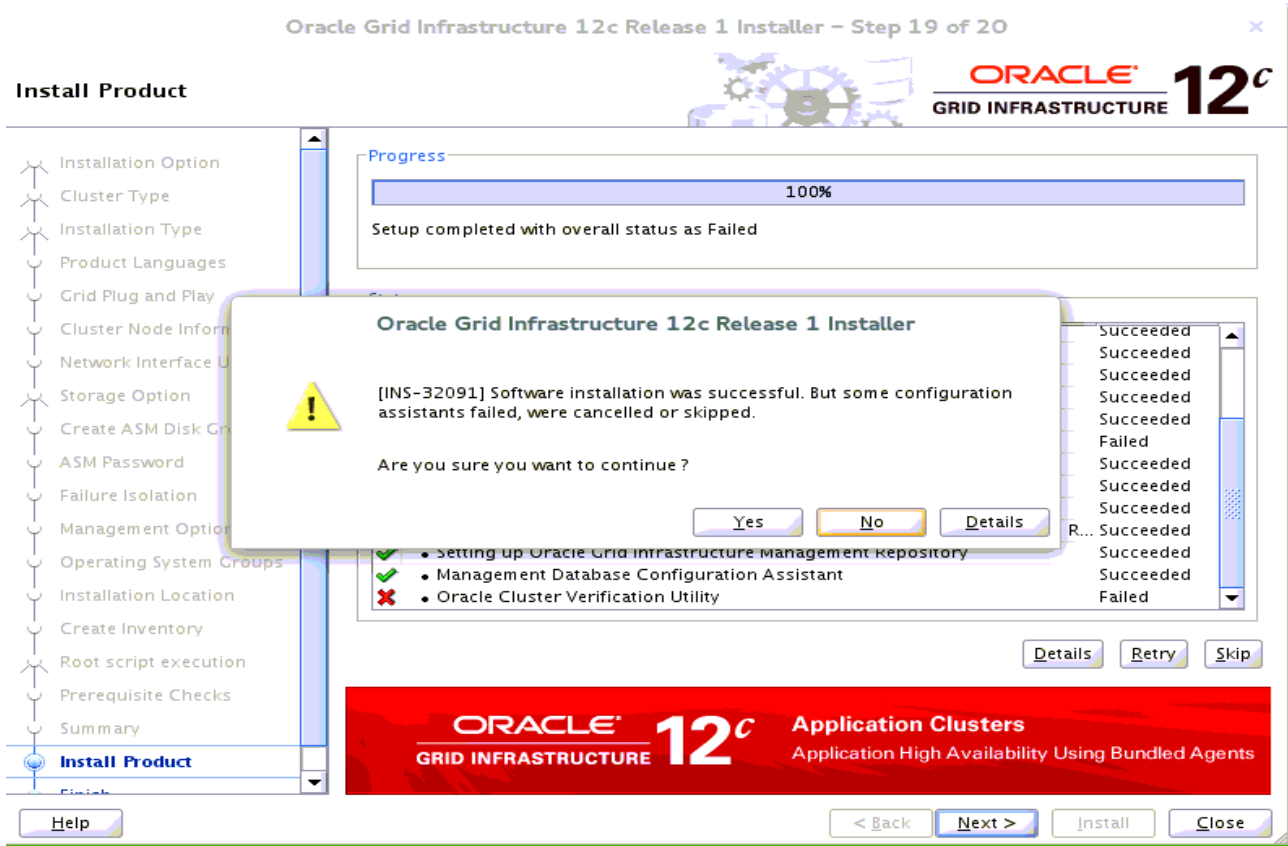
Completed 'prepare for configuration steps'. Here to stay and install **Oracle Patch 18456643** first, then click **Yes** to run configuration scripts.



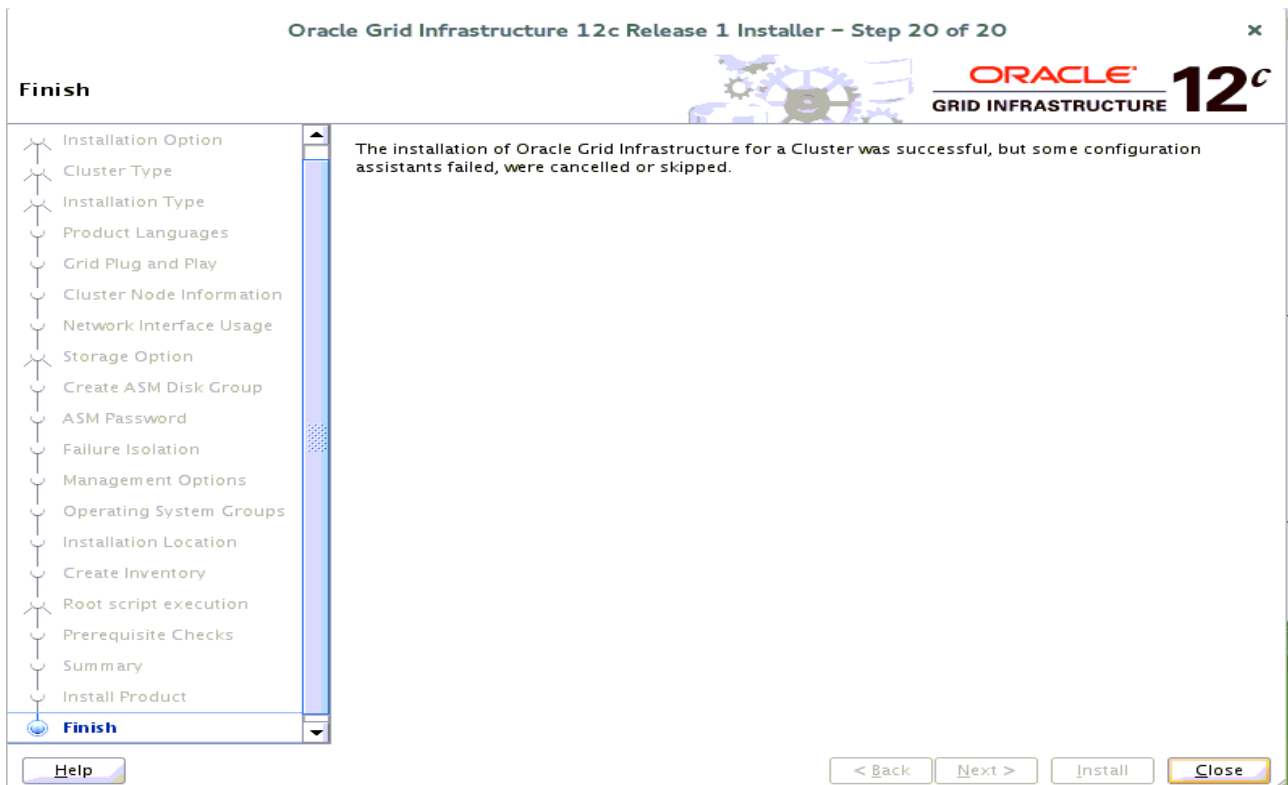
Oracle CVU failed. Ignore the error then click **OK** to continue.



Setup completed, click Next to continue.



Click **Yes** to confirm.



The installation of Oracle Grid Infrastructure for a Cluster is Finished.

1-3. Post-Install Checks.

1). Check Oracle Clusterware health.

```
oracle@c2n1:~> /home/grid/bin/crsctl check cluster -all
```

```
*****
```

```
c2n1:  
CRS-4537: Cluster Ready Services is online  
CRS-4529: Cluster Synchronization Services is online  
CRS-4533: Event Manager is online
```

```
*****
```

```
c2n2:  
CRS-4537: Cluster Ready Services is online  
CRS-4529: Cluster Synchronization Services is online  
CRS-4533: Event Manager is online
```

```
*****
```

```
c2n3:  
CRS-4537: Cluster Ready Services is online  
CRS-4529: Cluster Synchronization Services is online  
CRS-4533: Event Manager is online
```

```
*****
```

```
c2n4:  
CRS-4537: Cluster Ready Services is online  
CRS-4529: Cluster Synchronization Services is online  
CRS-4533: Event Manager is online
```

```
*****
```

2). Check Oracle Clusterware resources.

```
oracle@c2n1:~> /home/grid/bin/srvctl status nodeapps
```

```
VIP c2n1-vip.provo.novell.com is enabled  
VIP c2n1-vip.provo.novell.com is running on node: c2n1  
VIP c2n2-vip.provo.novell.com is enabled  
VIP c2n2-vip.provo.novell.com is running on node: c2n2  
VIP c2n3-vip.provo.novell.com is enabled  
VIP c2n3-vip.provo.novell.com is running on node: c2n3  
VIP c2n4-vip.provo.novell.com is enabled  
VIP c2n4-vip.provo.novell.com is running on node: c2n4  
Network is enabled  
Network is running on node: c2n1  
Network is running on node: c2n4  
Network is running on node: c2n3  
Network is running on node: c2n2  
ONS is enabled  
ONS daemon is running on node: c2n1  
ONS daemon is running on node: c2n4  
ONS daemon is running on node: c2n3  
ONS daemon is running on node: c2n2
```

3). Check status of designated resources.

oracle@c2n1:~> /home/grid/bin/crsctl stat res -t

Name	Target	State	Server	State details	

Local Resources					

ora.LISTENER.lsnr	ONLINE	ONLINE	c2n1	STABLE	
	ONLINE	ONLINE	c2n2	STABLE	
	ONLINE	ONLINE	c2n3	STABLE	
	ONLINE	ONLINE	c2n4	STABLE	
ora.SUSETEST.dg	ONLINE	ONLINE	c2n1	STABLE	
	ONLINE	ONLINE	c2n2	STABLE	
	ONLINE	ONLINE	c2n3	STABLE	
	ONLINE	ONLINE	c2n4	STABLE	
ora.asm	ONLINE	ONLINE	c2n1	Started,STABLE	
	ONLINE	ONLINE	c2n2	Started,STABLE	
	ONLINE	ONLINE	c2n3	Started,STABLE	
	ONLINE	ONLINE	c2n4	Started,STABLE	
ora.net1.network	ONLINE	ONLINE	c2n1	STABLE	
	ONLINE	ONLINE	c2n2	STABLE	
	ONLINE	ONLINE	c2n3	STABLE	
	ONLINE	ONLINE	c2n4	STABLE	
ora.ons	ONLINE	ONLINE	c2n1	STABLE	
	ONLINE	ONLINE	c2n2	STABLE	
	ONLINE	ONLINE	c2n3	STABLE	
	ONLINE	ONLINE	c2n4	STABLE	

Cluster Resources					

ora.LISTENER_SCAN1.lsnr	1	ONLINE	ONLINE	c2n4	STABLE
ora.LISTENER_SCAN2.lsnr	1	ONLINE	ONLINE	c2n3	STABLE
ora.LISTENER_SCAN3.lsnr	1	ONLINE	ONLINE	c2n1	STABLE
ora.MGMTLSNR	1	ONLINE	ONLINE	c2n1	169.254.38.57 10.1.1
					.1,STABLE
ora.c2n1.vip	1	ONLINE	ONLINE	c2n1	STABLE
ora.c2n2.vip	1	ONLINE	ONLINE	c2n2	STABLE
ora.c2n3.vip	1	ONLINE	ONLINE	c2n3	STABLE
ora.c2n4.vip	1	ONLINE	ONLINE	c2n4	STABLE
ora.cvu	1	ONLINE	ONLINE	c2n1	STABLE
ora.mgmtdb	1	ONLINE	ONLINE	c2n1	Open,STABLE
ora.oc4j					

1	ONLINE	ONLINE	c2n1	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	c2n4	STABLE
ora.scan2.vip				
1	ONLINE	ONLINE	c2n3	STABLE
ora.scan3.vip				
1	ONLINE	ONLINE	c2n1	STABLE

4). Check OCR and Voting disk files.

oracle@c2n1:~> /home/grid/bin/ocrcheck

Status of Oracle Cluster Registry is as follows :

```

Version           :      4
Total space (kbytes) : 409568
Used space (kbytes)  :   1696
Available space (kbytes) : 407872
ID                 : 1286433802
Device/File Name   : +SUSETEST
                   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@c2n1:~> /home/grid/bin/crsctl query css votedisk

```

## STATE   File Universal Id         File Name Disk group
--  -----
 1. ONLINE 3195ba343d234f0cbf92bf2df0f7d3b9 (/dev/oradata/disk1) [SUSETEST]
 2. ONLINE 3410554dce114fa1bfb86b8cd1f3288b (/dev/oradata/disk2) [SUSETEST]
 3. ONLINE 69bb2fac7bac4f71bf4b3ec63154f76c (/dev/oradata/disk3) [SUSETEST]
Located 3 voting disk(s).

```

2. Installing Oracle Database.

1-1. Login to the SLES 12 64-bit OS as a non-admin user. Download the Oracle Database 12c Release 1 (12.1.0.2.0) for Linux x86-64.

1-2. Extract grid.zip and run the installer './runInstaller' from Database ShipHome.

Install Flow:

1). Configure Security Updates.

Oracle Database 12c Release 1 Installer – Step 1 of 9

Configure Security Updates

Provide your email address to be informed of security issues, install the product and initiate configuration manager. [View details.](#)

Email:

Easier for you if you use your My Oracle Support email address/username.

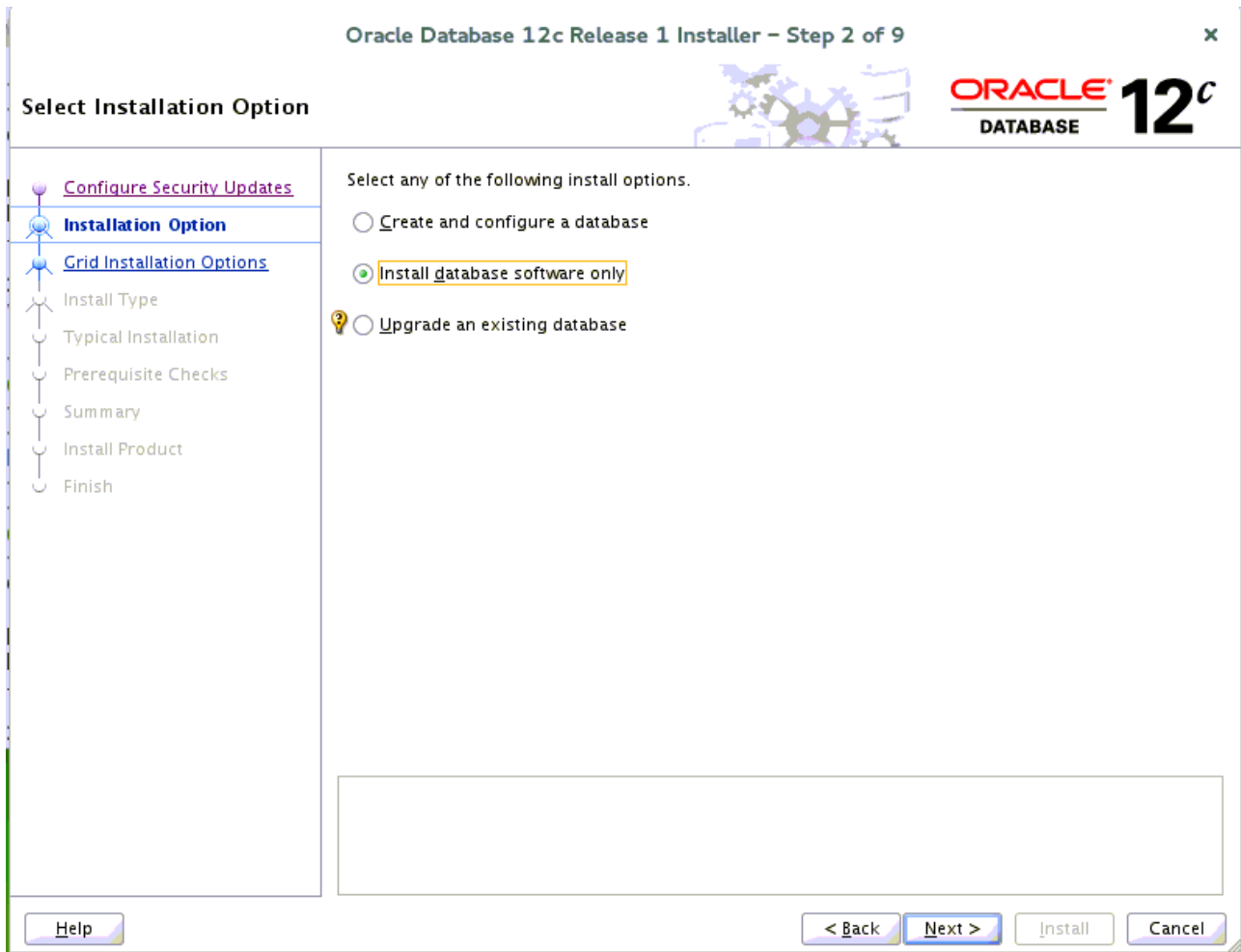
I wish to receive security updates via My Oracle Support.

My Oracle Support Password:

Help < Back Next > Install Cancel

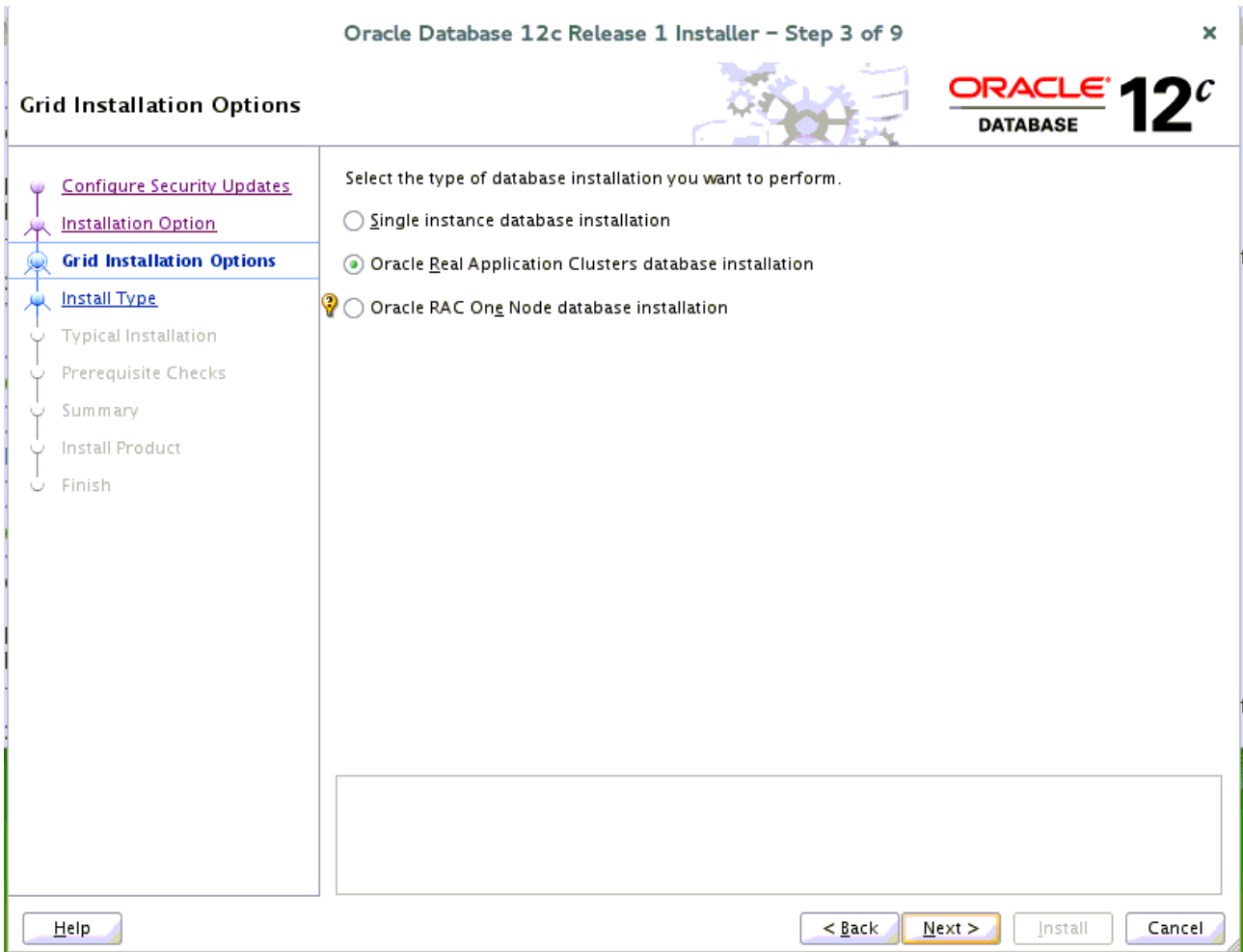
Provide your email address to be informed of security issues, then click **Next** to continue.

2). Select Installation Option.



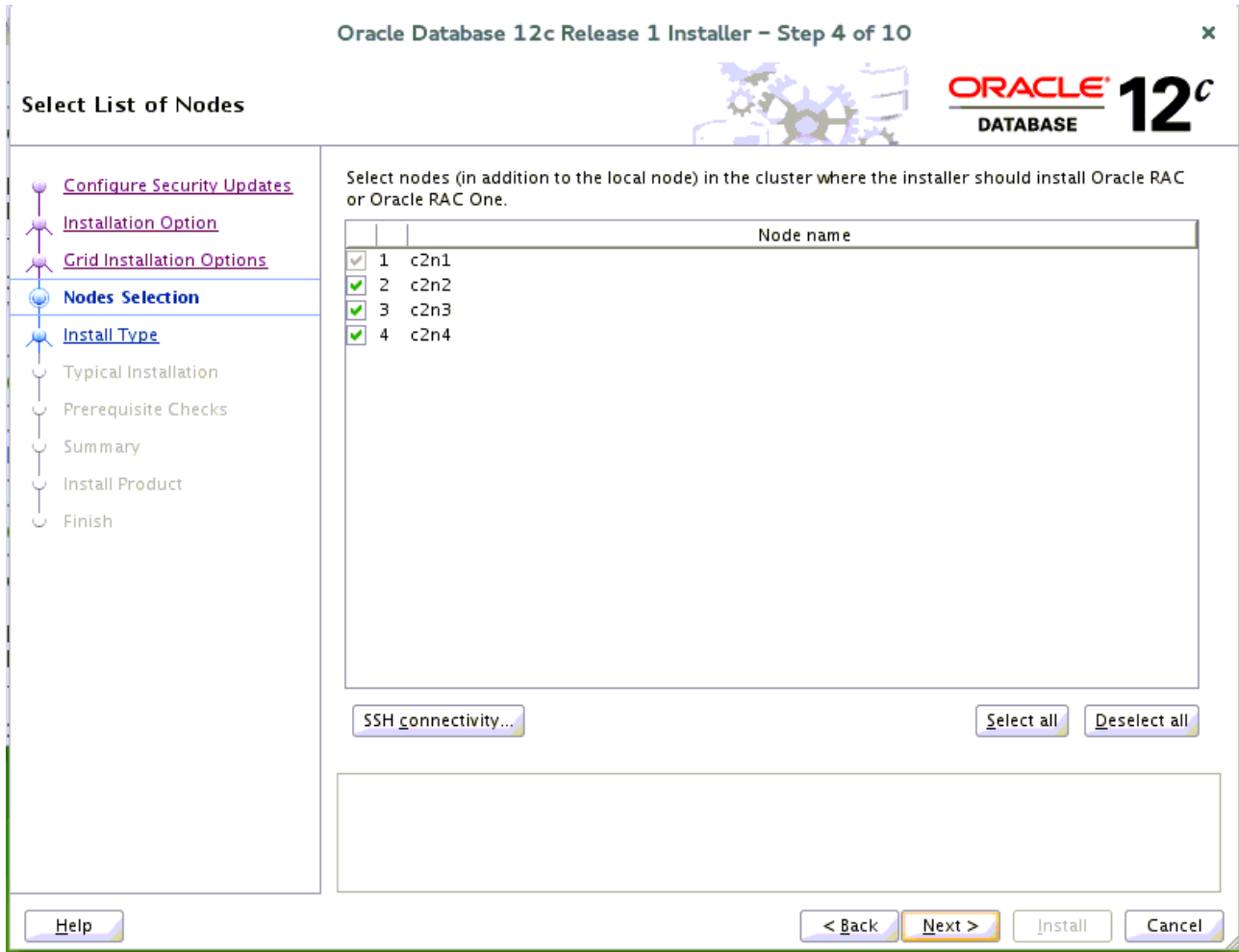
Choose option "Install database software only.", then click **Next** to continue.

3). Grid Installation Options.



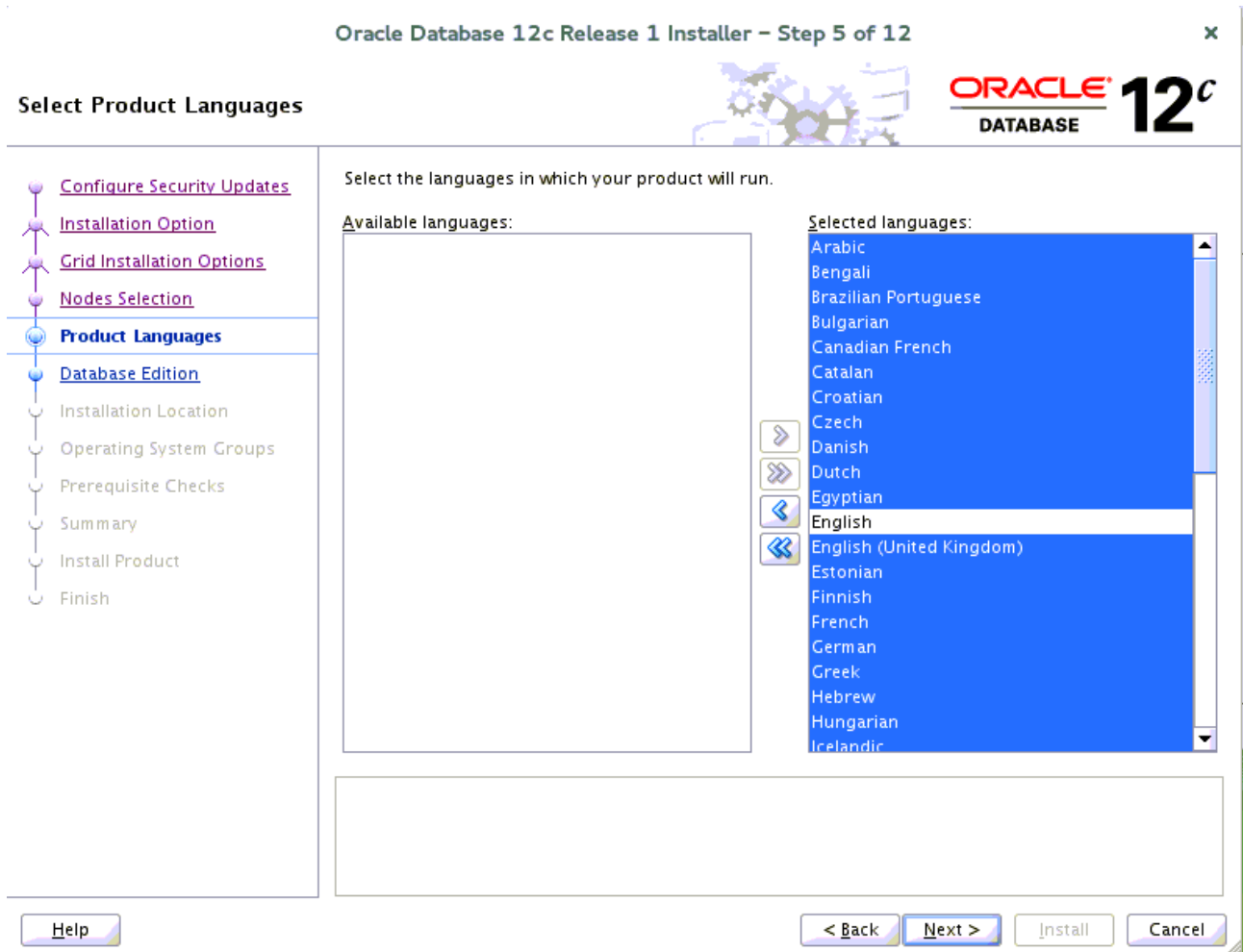
Choose option "Oracle Real Application Clusters database installation", then click **Next** to continue.

4). Select List of Nodes.



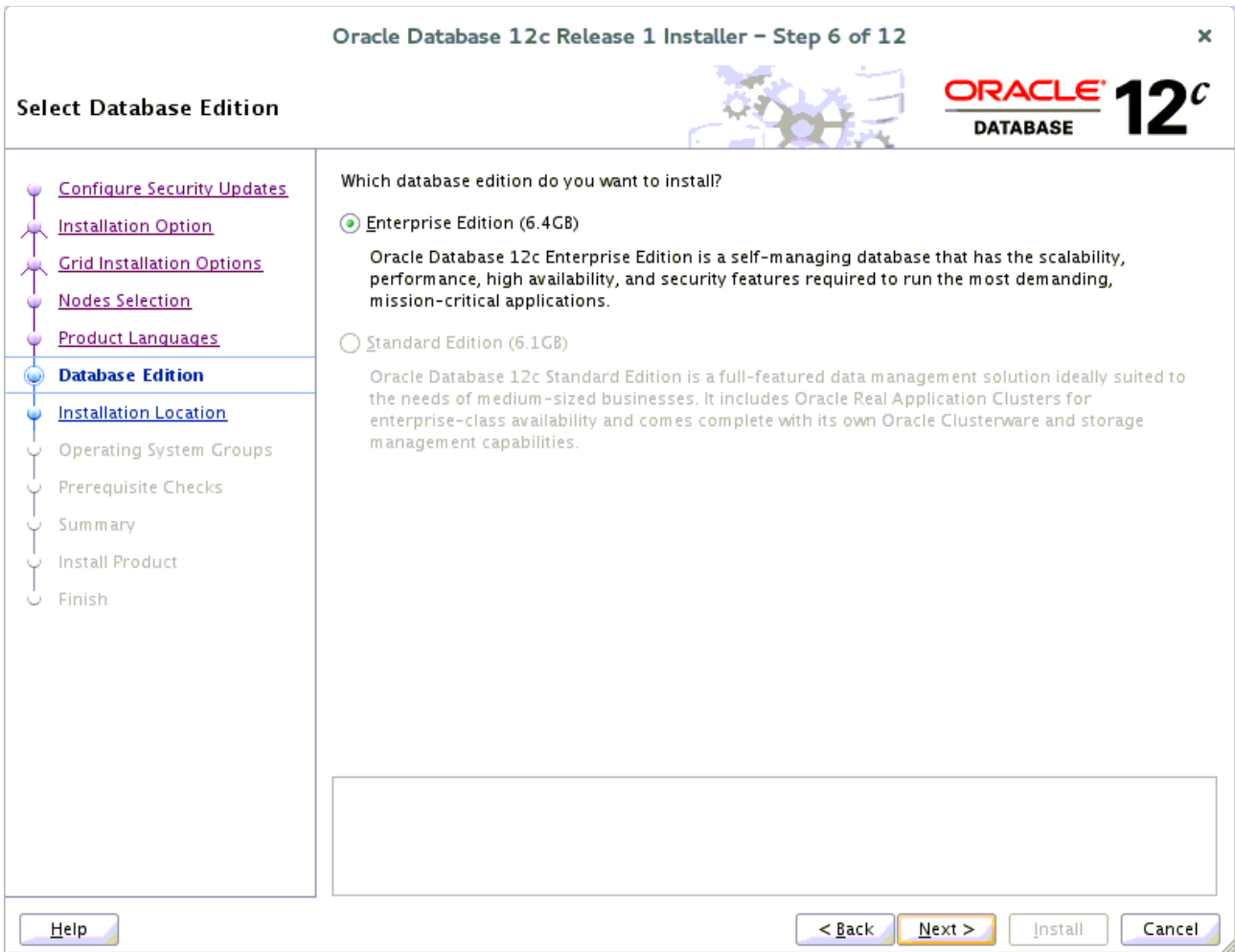
Select all nodes in the cluster, then click **Next** to continue.

5). Select Product Languages.



Select all languages, then click **Next** to continue.

6). Select Database Edition.



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

7). Specify Installation Location.

Oracle Database 12c Release 1 Installer – Step 7 of 12

Specify Installation Location

- Configure Security Updates
- Installation Option
- Grid Installation Options
- Nodes Selection
- Product Languages
- Database Edition
- Installation Location**
- Operating System Groups
- Prerequisite Checks
- Summary
- Install Product
- Finish

Specify a path to place all Oracle software and configuration-related files installed by this installation owner. This location is the Oracle base directory for the installation owner.

Oracle base:

Specify a location for storing Oracle database software files separate from database configuration files in the Oracle base directory. This software directory is the Oracle database home directory.

Software location:

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

8). Privileged Operating System groups.

Oracle Database 12c Release 1 Installer – Step 8 of 12

Privileged Operating System groups

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

Database Administrator (OSDBA) group:

Database Operator (OSOPER) group (Optional):

Database Backup and Recovery (OSBACKUPDBA) group:

Data Guard administrative (OSDGDBA) group:

Encryption Key Management administrative (OSKMDBA) group:

Navigation pane:

- Configure Security Updates
- Installation Option
- Grid Installation Options
- Nodes Selection
- Product Languages
- Database Edition
- Installation Location
- Operating System Groups**
- Prerequisite Checks
- Summary
- Install Product
- Finish

Buttons:

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

9). Perform Prerequisite Checks.

Oracle Database 12c Release 1 Installer – Step 9 of 12

ORACLE **12c**
DATABASE

Perform Prerequisite Checks

- [Configure Security Updates](#)
- [Installation Option](#)
- [Grid Installation Options](#)
- [Nodes Selection](#)
- [Product Languages](#)
- [Database Edition](#)
- [Installation Location](#)
- [Operating System Groups](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

Verification 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.

Ignore All

Checks	Status	Fixable
Checks		
Packages		
Package: libaio-0.3.104	Warning	No
Package: ksh-93t	Warning	No
Package: libstdc++33-3.3.3	Warning	No
Package: libstdc++43-devel-4.3.3_20081022	Warning	No
Package: libstdc++43-4.3.3_20081022	Warning	No
Package: libgcc43-4.3.3_20081022	Warning	No
/dev/shm mounted as temporary file system	Warning	No
Maximum locked memory check	Warning	Yes

This is a prerequisite condition to test whether the package "libaio-0.3.104" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

Perform Pre-Check as shown above; Click **Fix&Check Again** to recheck the system.

Oracle Database 12c Release 1 Installer – Step 9 of 12

ORACLE **12c**
DATABASE

Perform Prerequisite Checks

- [Configure Security Updates](#)
- [Installation Option](#)
- [Grid Installation Options](#)
- [Nodes Selection](#)
- [Product Languages](#)
- [Database Edition](#)
- [Installation Location](#)
- [Operating System Groups](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

Fixup Script

Some of the prerequisites have failed on the following nodes. Installer has generated a fixup script that needs to be run as a privileged user (root) on the listed nodes.

Script: /tmp/CVU_12.1.0.2.0_oracle/runfixup.sh

Nodes:

c2n1
c2n2
c2n3
c2n4

To execute the fixup script:

1. Open a terminal window
2. Login as "root"
3. Run the script
4. Return to this window and click "OK" to continue

This is a prerequisite condition to test whether the package "libaio-0.3.104" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

Follow the prompts, manual run Fixup Script as "root" user on each node, then click **OK**.

```
c2n1:~ # /tmp/CVU_12.1.0.2.0_oracle/runfixup.sh  
All Fix-up operations were completed successfully.
```

Oracle Database 12c Release 1 Installer – Step 9 of 12

Perform Prerequisite Checks

ORACLE 12c DATABASE

Verification Result Fixup Result

Fixup script has been executed. Review fixup execution result in the following table.

Checks	Status	Reboot Required
Maximum locked memory check	Successful	No

Check maximum locked memory setting on the system [\(more details\)](#)

Help < Back Next > Install Cancel

Perform Prerequisite Checks



- [Configure Security Updates](#)
- [Installation Option](#)
- [Grid Installation Options](#)
- [Nodes Selection](#)
- [Product Languages](#)
- [Database Edition](#)
- [Installation Location](#)
- [Operating System Groups](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

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.

Checks	Status	Fixable
Checks		
Packages		
Package: libaio-0.3.104	Ignored	No
Package: ksh-93t	Ignored	No
Package: libstdc++33-3.3.3	Ignored	No
Package: libstdc++43-devel-4.3.3_20081022	Ignored	No
Package: libstdc++43-4.3.3_20081022	Ignored	No
Package: libgcc43-4.3.3_20081022	Ignored	No
/dev/shm mounted as temporary file system	Ignored	No
Maximum locked memory check	Ignored	No

This is a prerequisite condition to test whether the package "libaio-0.3.104" is available on the system. [\(more details\)](#)

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

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

10). Summary.

The screenshot shows the Oracle Database 12c Release 1 Installer window at Step 10 of 12. The title bar reads "Oracle Database 12c Release 1 Installer - Step 10 of 12". The Oracle logo and "12c DATABASE" are visible in the top right. The main window is titled "Oracle Database 12c Release 1 Installer" and contains a tree view of settings. The "Global settings" section includes: "Disk space: required 6.4 GB available 487.77 GB [Edit]", "Source location: /opt/oracle/12102_21419221_SW/database/install/./stage/products.xml", "Database edition: Enterprise Edition (Install database software only) [Edit]", "Oracle base: /home/oracle/app [Edit]", "Software location: /home/oracle/app/product/12.1.0/dbhome_1 [Edit]", and "Privileged Operating System groups: dba (OSDBA), dba (OSBACKUPDBA), dba (OSDGDBA), dba (OSOPER) [Edit]". The "Grid Options" section includes "Cluster Nodes: c2n1, c2n2, c2n3, c2n4 [Edit]". A left-hand navigation pane shows a list of steps: "Configure Security Updates", "Installation Option", "Grid Installation Options", "Nodes Selection", "Product Languages", "Database Edition", "Installation Location", "Operating System Groups", "Prerequisite Checks", "Summary" (highlighted), "Install Product", and "Finish". At the bottom, there are buttons for "Help", "< Back", "Next >", "Install", and "Cancel". A "Save Response File..." button is also present.

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

11). Install Product.

Oracle Database 12c Release 1 Installer – Step 11 of 12

Install Product

Progress: 8%

Loading products. Please wait.

Status:

- Oracle Database installation (In Progress)
 - Prepare (Succeeded)
 - Copy files (Pending)
 - Link binaries (Pending)
 - Setup (Pending)
 - Perform remote operations (Pending)
- Setup Oracle Base (Pending)
- Update Inventory (Pending)
- Execute Root Scripts (Pending)

Buttons: Details, Retry, Skip

Bottom bar: ORACLE DATABASE 12c

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

Oracle Database 12c Release 1 Installer – Step 11 of 12

Install Product

Progress: 95%

Saving Cluster Inventory

Execute Configuration scripts

The following configuration scripts need to be executed as the "root" user in each new cluster node. Each script in the list below is followed by a list of nodes.

Scripts to be executed:

Number	Script Location	Nodes
1	/home/oracle/app/product/12.1.0/dbhome_1/root.sh	c2n1,c2n2,c2n3,c2n4

To execute the configuration scripts:

1. Open a terminal window
2. Log in as "root"
3. Run the scripts in each cluster node
4. Return to this window and click "OK" to continue

Buttons: Help, OK

Bottom bar: ORACLE DATABASE 12c

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

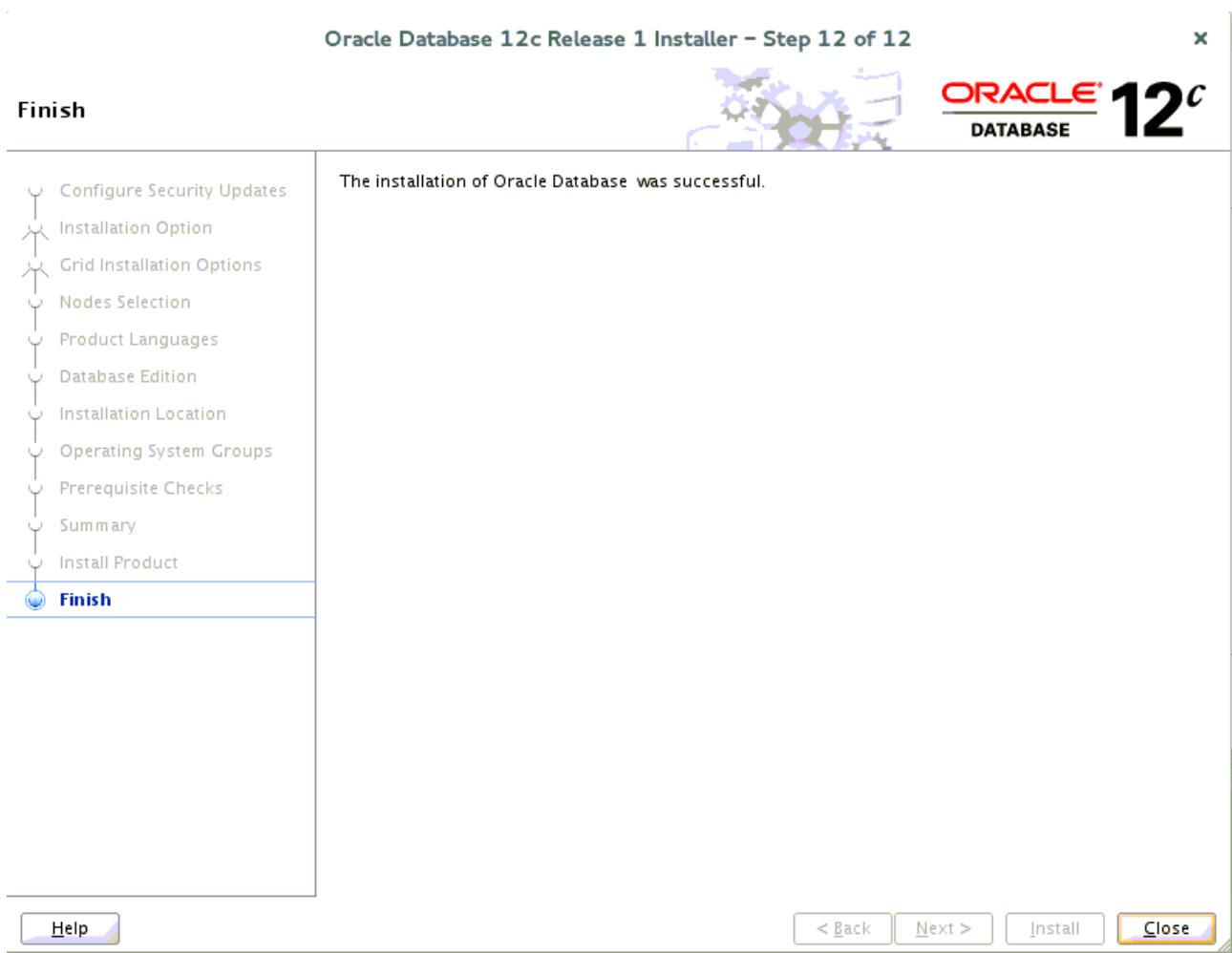
Execute **root.sh** as the "root" user in each cluster node, then click **OK** to continue.

```
c2n1:~ # /home/oracle/app/product/12.1.0/dbhome_1/root.sh
Performing root user operation.

The following environment variables are set as:
ORACLE_OWNER= oracle
ORACLE_HOME= /home/oracle/app/product/12.1.0/dbhome_1

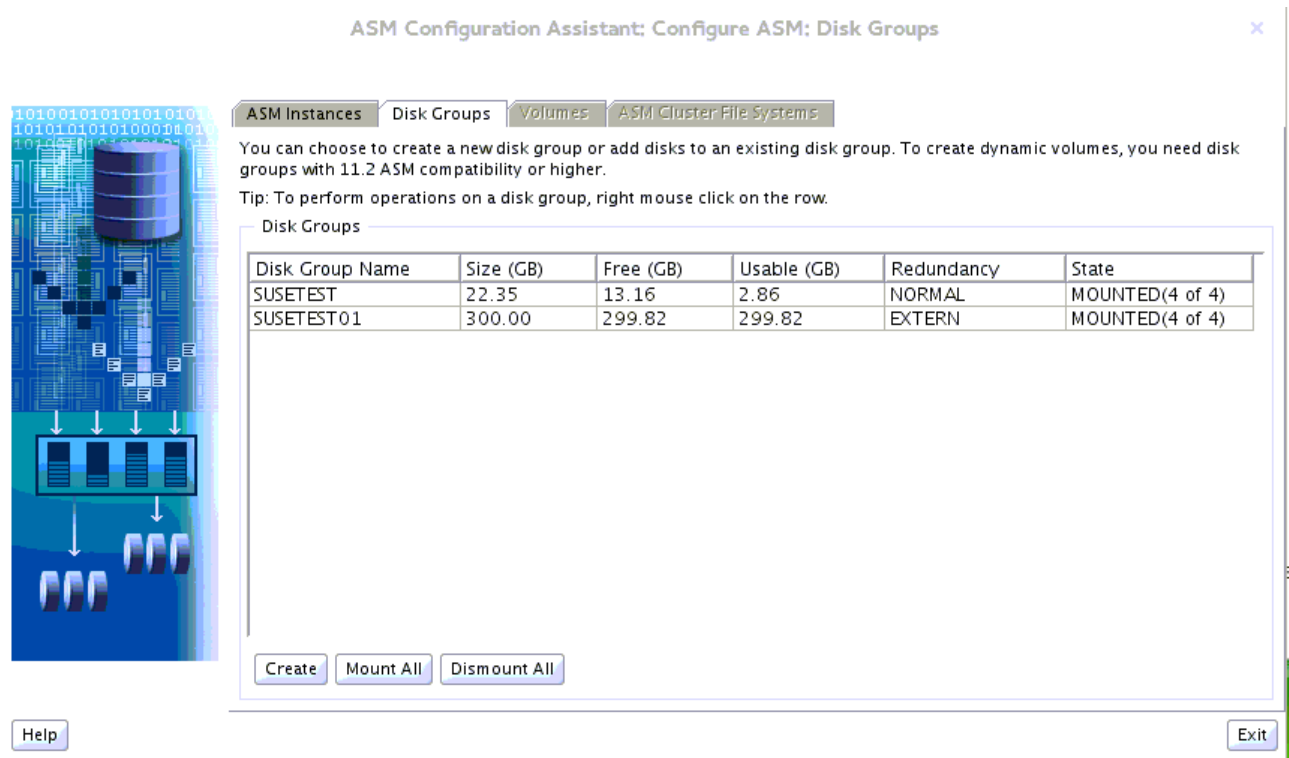
Enter the full pathname of the local bin directory: [/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

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.
```



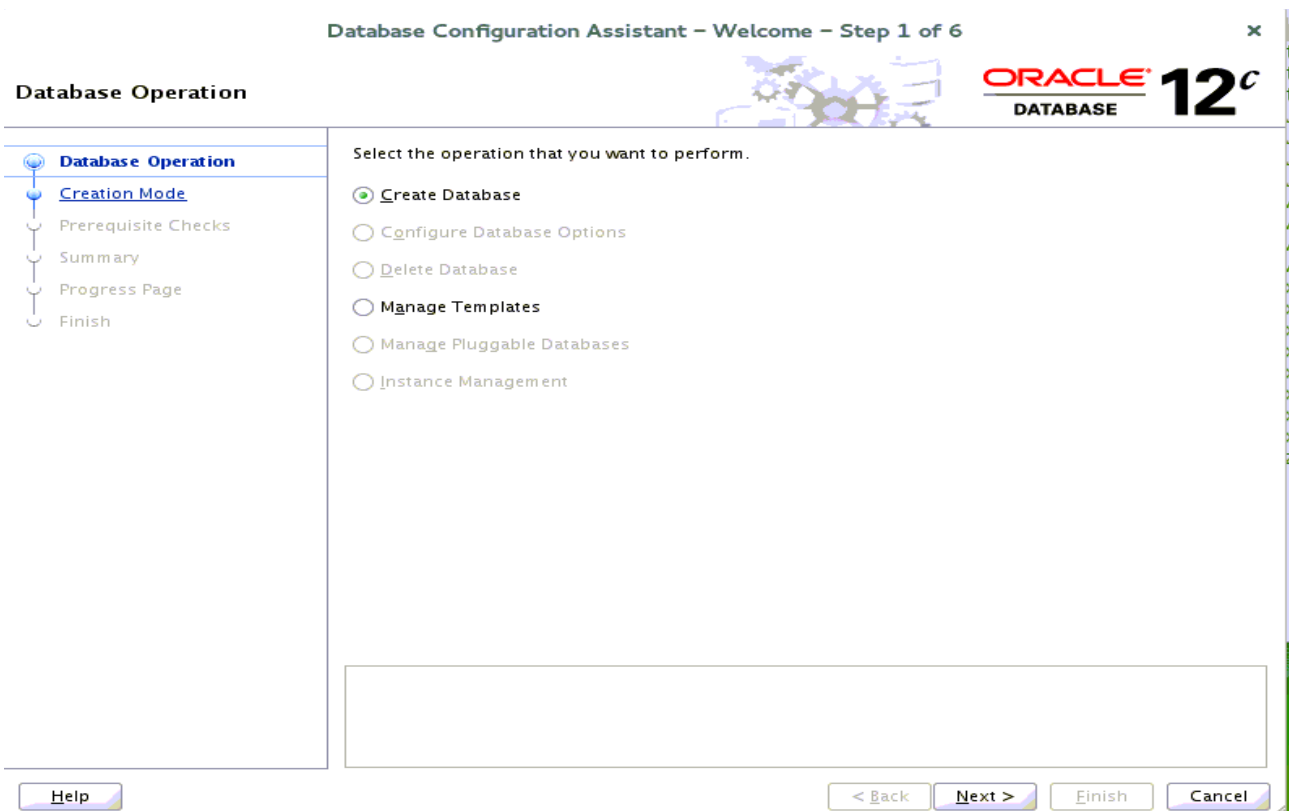
The installation of Oracle Database is finished, click **Close** to dismiss the screen.

1-3. Use ASMCA to create ASM disk group for datafile storage.



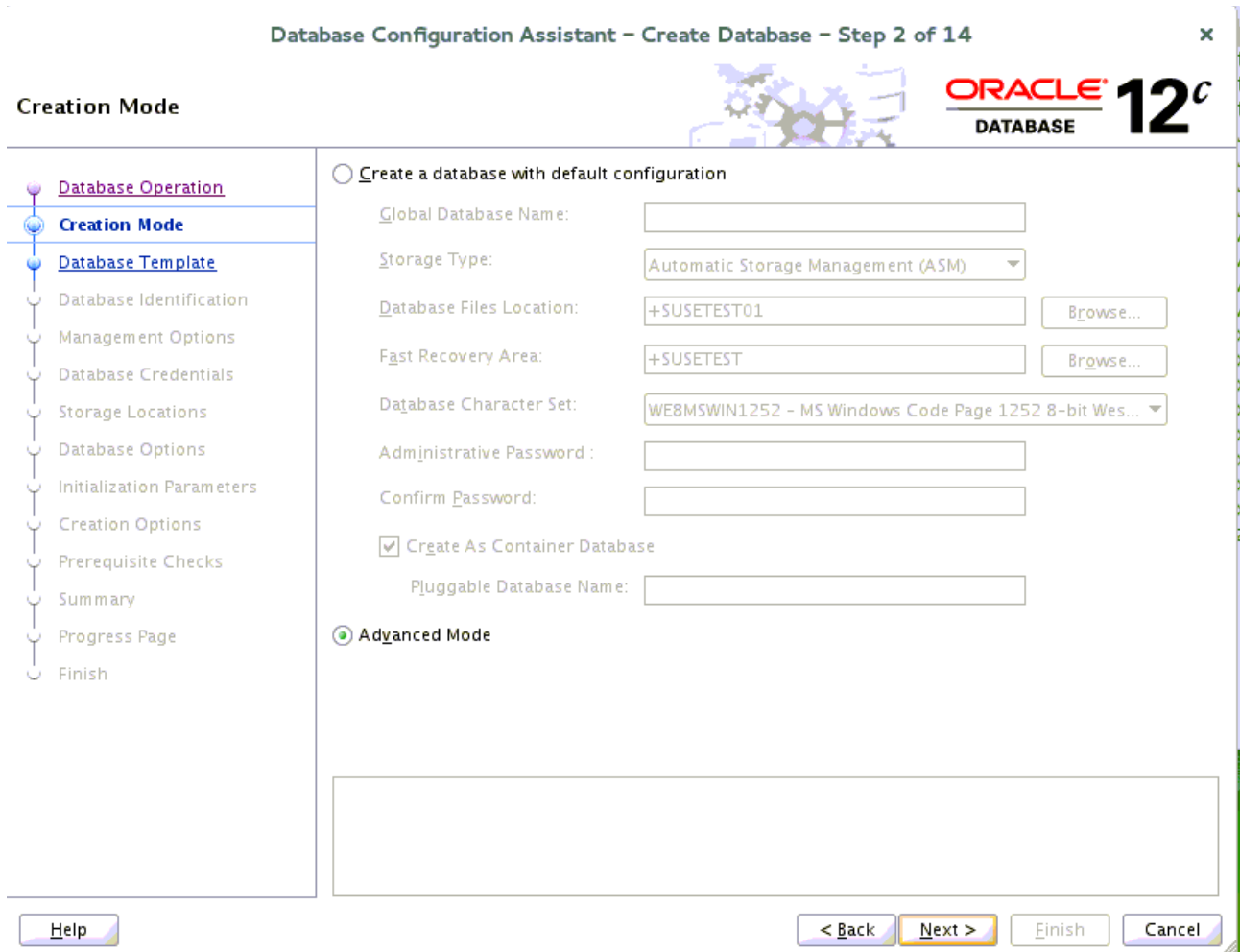
1-4. Using DBCA to create Oracle RAC 12.1.0.2 DB.

1). Database Operation.



Choose option "Create Database", then click Next to continue.


2). Creation Mode.



Choose option "Advanced Mode", then click Next to continue.

3). Database Template.

Database Configuration Assistant – Create Database – Step 3 of 14 x

ORACLE
DATABASE 12^c

Database Template

- Database Operation
- Creation Mode
- Database Template**
- Database Identification
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Select the type of database you want to configure.

Database Type:

Configuration Type:

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

Select a template for your database.

Select	Template	Includes Datafiles
<input checked="" type="radio"/>	General Purpose or Transaction Processing	Yes
<input type="radio"/>	Custom Database	No
<input type="radio"/>	Data Warehouse	Yes

[Show Details...](#)

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

Select the type of database you want to configure, then click **Next** to continue.

4). Database Identification.

Database Configuration Assistant – Create Database – Step 4 of 15 x

ORACLE **12^c**
DATABASE

Database Identification

- Database Operation
- Creation Mode
- Database Template
- Database Identification**
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Provide the identifier information required to access the database uniquely. An Oracle database is uniquely identified by a Global Database Name, typically of the form "name.domain".

Global Database Name:

Create As Container Database

Creates a database container for consolidating multiple databases into a single database and enables database virtualization. A container database (CDB) can have zero or more pluggable databases (PDB).

Create an Empty Container Database

Create a Container Database with one or more PDBs

Number of PDBs:

PDB Name:


Fill in **Global Database Name** as shown above, then click **Next** to continue.

(**Note:** Oracle Database 12C supports Container Database, you also can create CDB depend on your needs.)

5). Database Placement.

Database Configuration Assistant – Create Database – Step 5 of 15 x

Database Placement



ORACLE
DATABASE **12c**

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement**
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Server Pools

Server pool is a group of servers that collectively work together to host database workload.
Select the Server pool from existing list or specify the detail of new Server pool to be used by database.

Create New Server pool for this database

Server pool Name Cardinality

Use Existing Server pool for this database


Select	Server Pool Name	Cardinality	Category

Help< BackNext >FinishCancel

Server Pools info as shown above, click **Next** to continue.

6). Management Options.

Database Configuration Assistant – Create Database – Step 6 of 15 x




Management Options

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options**
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Specify the management options for the database.

Run Cluster Verification Utility (CVU) Checks Periodically

 Configure Enterprise Manager (EM) Database Express

EM Database Express Port:

Register with Enterprise Manager (EM) Cloud Control

OMS Host:

OMS Port:


EM Admin Username:

EM Admin Password:

Specify the management options for the database, then click **Next** to continue.

7). Database Credentials.

Database Configuration Assistant – Create Database – Step 7 of 15 x



Database Credentials

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials**
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

For security reasons, you must specify passwords for the following user accounts in the new database.

Use Different Administrative Passwords

User Name	Password	Confirm Password
SYS		
SYSTEM		
DBSNMP		

Use the Same Administrative Password for All Accounts


Password:

Confirm Password:

Specify administrative password for DB users, then click **Next** to continue.

8). Storage Locations.

Database Configuration Assistant – Create Database – Step 8 of 15 x



Storage Locations

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations**
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Database files Storage Type: Automatic Storage Management (ASM) ▼

Use Database File Locations from Template

Use Common Location for All Database Files

File Location: +SUSETEST01 Browse...

Use Oracle-Managed Files Multiplex Redo Logs and Control Files...

Choose the recovery options for the database.

Recovery files Storage Type: Automatic Storage Management (ASM) ▼

Specify Fast Recovery Area

Fast Recovery Area: +SUSETEST01 Browse...

Fast Recovery Area Size: 5535 MB ▼

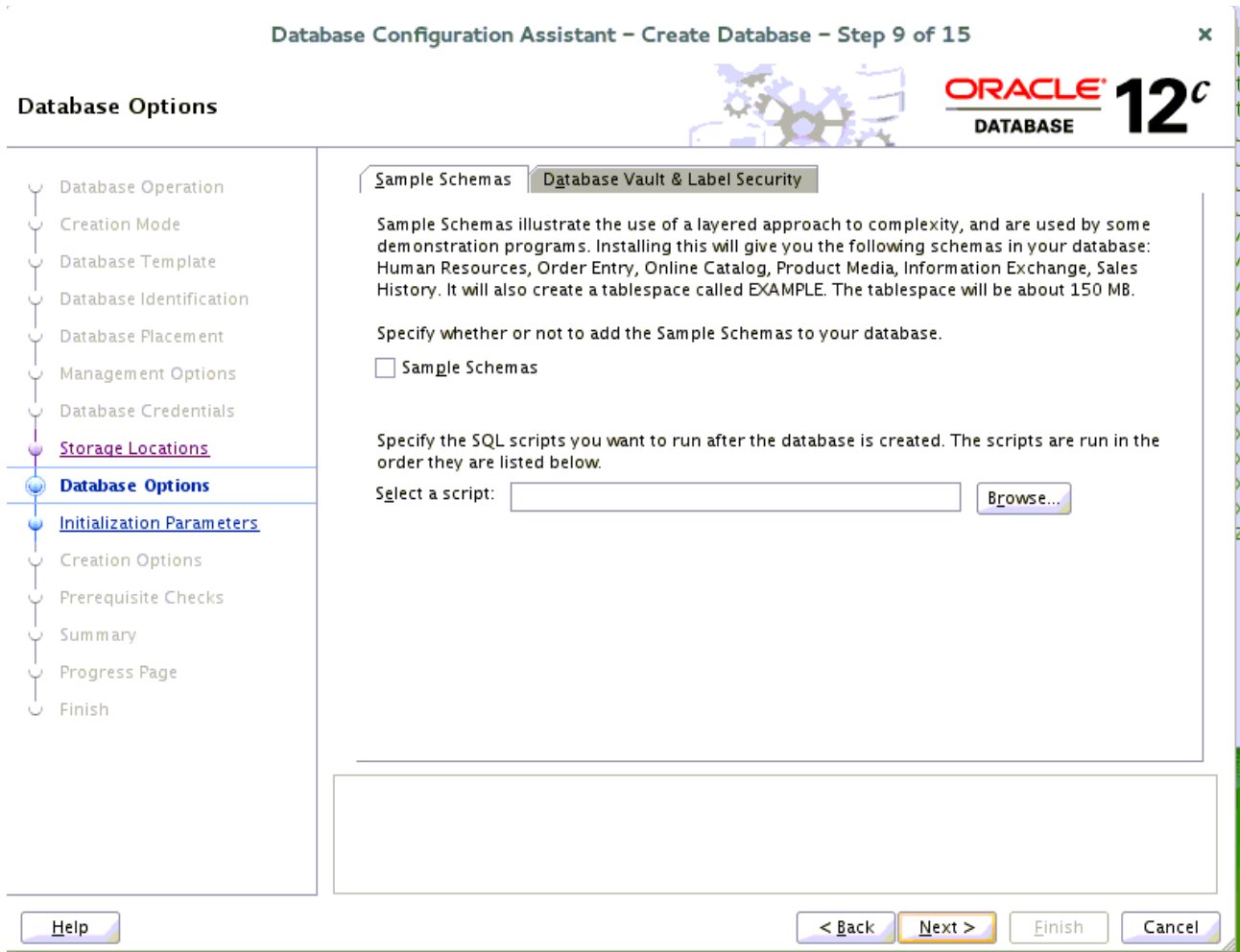
Enable Archiving Edit Archive Mode Parameters

File Location Variables...

Help < Back Next > Finish Cancel

Specify database files storage information as shown above, then click **Next** to continue.

9). Database Options.



According to your needs to specify whether or not to add the schemas to your database, then click **Next** to continue.

10). Initialization Parameters.

Database Configuration Assistant – Create Database – Step 10 of 15

Initialization Parameters

Memory Sizing Character Sets Connection Mode

Typical Settings

Memory Size (SGA and PGA): 19494 MB

Percentage: 30%

250 MB 64180 MB

Use Automatic Memory Management

Show Memory Distribution...

Custom Settings

Memory Management: Automatic Shared Memory Management

SGA Size: 19,230 M Bytes

PGA Size: 6,410 M Bytes

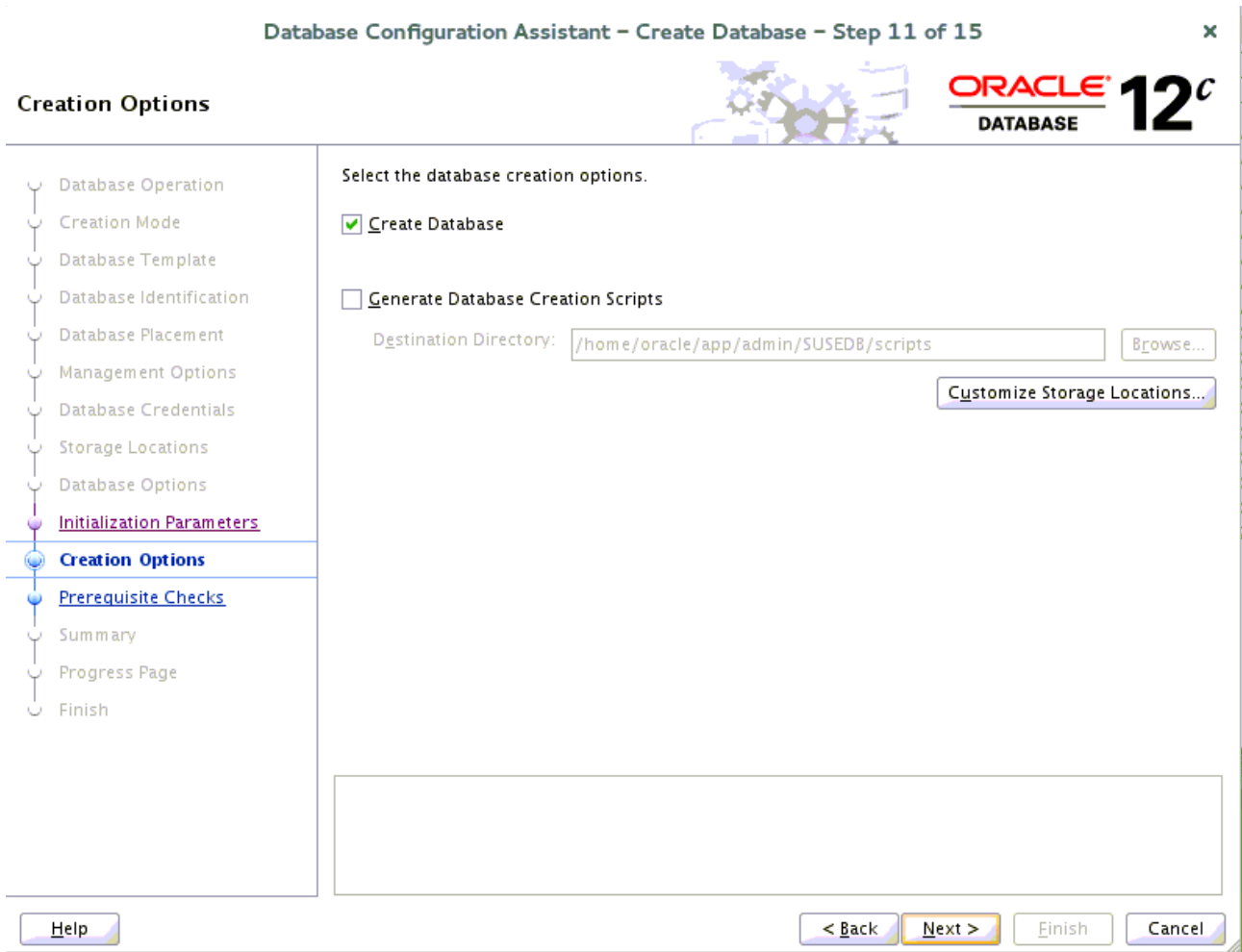
Total Memory for Oracle: 25640 MB

All Initialization Parameters...

Help < Back Next > Finish Cancel

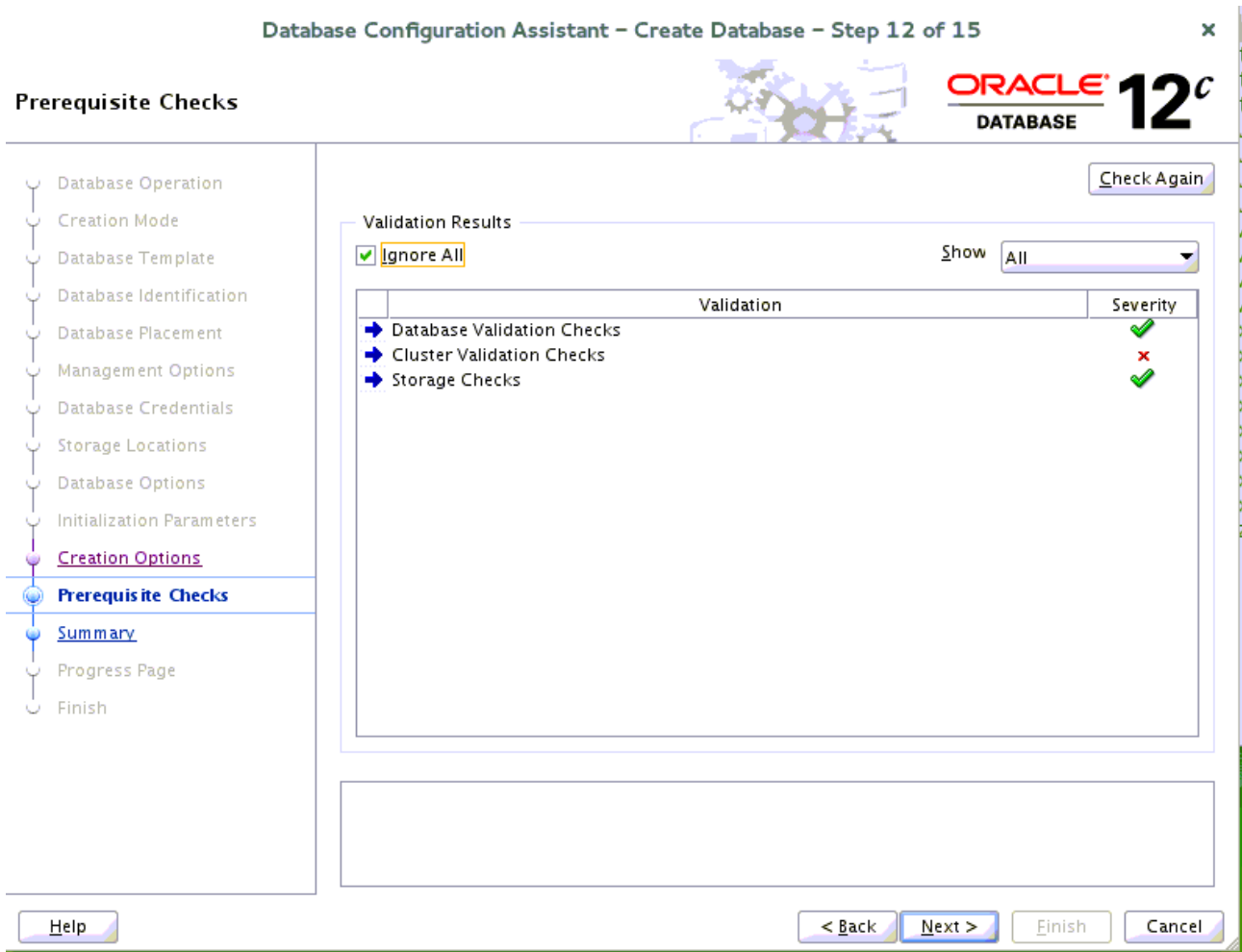
Choose option "Typical Settings" and adjust parameters to meet your requirements, then click **Next** to continue.

11). Creation Options.



Select the database creation options as shown above, then click **Next** to continue.

12). Prerequisite Checks.



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

13). Summary.

Database Configuration Assistant - Create Database - Step 13 of 15

Summary

Database Configuration Assistant: Summary

Create Database - Summary

Database Configuration Summary

Global Database Name: SUSEDDB
Database Configuration Type: Policy-Managed Cluster Database
Create Server Pool: susepool
Cardinality: 4
Create As Container Database: No
Storage Type: Automatic Storage Management (ASM)
Memory Configuration Type: Automatic Shared Memory Management
Template Name: General Purpose or Transaction Processing

Database Configuration Details

Database Components

Component	Selected
Oracle JVM	true
Oracle Text	true
Oracle Multimedia	true
Oracle OLAP	true

Help < Back Next > Finish Cancel

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

14). Progress Page.

Database Configuration Assistant – Create Database – Step 14 of 15

Progress Page

Clone database "SUSED8" creation in progress...

85%

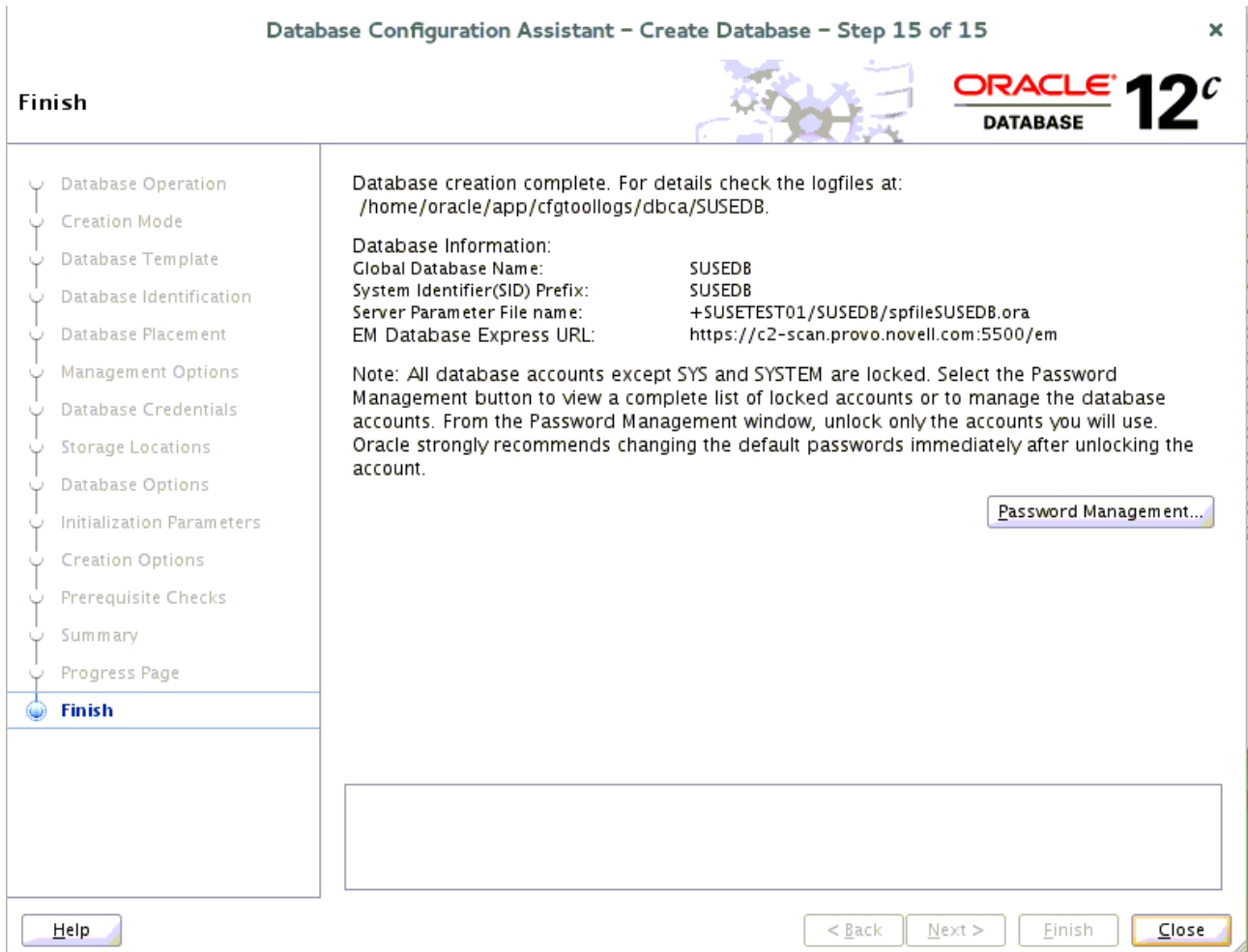
Steps	Status
✓ Copying database files	Finished
✓ Creating and starting Oracle instance	Finished
✓ Creating cluster database views	Finished
⌚ Completing Database Creation	In Progress

Activity Log Alert Log

Help < Back Next > Finish Cancel

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

15). Finish.



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

1-5. Post-Install Checks.

1). Verify database status and configuration.

```
oracle@c2n1:~> export ORACLE_HOME=/home/oracle/app/product/12.1.0/dbhome_1
oracle@c2n1:~> /home/oracle/app/product/12.1.0/dbhome_1/bin/srvctl status database -d susedb
```

```
Instance SUSEDDB_1 is running on node c2n2
Instance SUSEDDB_2 is running on node c2n3
Instance SUSEDDB_3 is running on node c2n4
Instance SUSEDDB_4 is running on node c2n1
```

```
oracle@c2n1:~> /home/oracle/app/product/12.1.0/dbhome_1/bin/srvctl config database -d susedb -a
```

```
Database unique name: SUSEDDB
Database name: SUSEDDB
Oracle home: /home/oracle/app/product/12.1.0/dbhome_1
Oracle user: oracle
Spfile: +SUSETEST01/SUSEDDB/PARAMETERFILE/spfile.274.908484433
Password file: +SUSETEST01/SUSEDDB/PASSWORD/pwdsusedb.256.908484093
Domain:
Start options: open
Stop options: immediate
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools: susepool
Disk Groups: SUSETEST01
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:
Configured nodes:
Database is policy managed
```

```
oracle@c2n1:~> /home/grid/bin/crsctl stat res -t
```

Name	Target	State	Server	State details
Local Resources				
ora.LISTENER.lsnr				
	ONLINE	ONLINE	c2n1	STABLE
	ONLINE	ONLINE	c2n2	STABLE
	ONLINE	ONLINE	c2n3	STABLE
	ONLINE	ONLINE	c2n4	STABLE
ora.SUSETEST.dg				
	ONLINE	ONLINE	c2n1	STABLE
	ONLINE	ONLINE	c2n2	STABLE
	ONLINE	ONLINE	c2n3	STABLE
	ONLINE	ONLINE	c2n4	STABLE
ora.SUSETEST01.dg				

	ONLINE	ONLINE	c2n1	STABLE
	ONLINE	ONLINE	c2n2	STABLE
	ONLINE	ONLINE	c2n3	STABLE
	ONLINE	ONLINE	c2n4	STABLE
ora.asm				
	ONLINE	ONLINE	c2n1	Started,STABLE
	ONLINE	ONLINE	c2n2	Started,STABLE
	ONLINE	ONLINE	c2n3	Started,STABLE
	ONLINE	ONLINE	c2n4	Started,STABLE
ora.net1.network				
	ONLINE	ONLINE	c2n1	STABLE
	ONLINE	ONLINE	c2n2	STABLE
	ONLINE	ONLINE	c2n3	STABLE
	ONLINE	ONLINE	c2n4	STABLE
ora.ons				
	ONLINE	ONLINE	c2n1	STABLE
	ONLINE	ONLINE	c2n2	STABLE
	ONLINE	ONLINE	c2n3	STABLE
	ONLINE	ONLINE	c2n4	STABLE

Cluster Resources

ora.LISTENER_SCAN1.lsnr				
1	ONLINE	ONLINE	c2n4	STABLE
ora.LISTENER_SCAN2.lsnr				
1	ONLINE	ONLINE	c2n3	STABLE
ora.LISTENER_SCAN3.lsnr				
1	ONLINE	ONLINE	c2n1	STABLE
ora.MGMTLSNR				
1	ONLINE	ONLINE	c2n1	169.254.38.57 10.1.1
				.1,STABLE
ora.c2n1.vip				
1	ONLINE	ONLINE	c2n1	STABLE
ora.c2n2.vip				
1	ONLINE	ONLINE	c2n2	STABLE
ora.c2n3.vip				
1	ONLINE	ONLINE	c2n3	STABLE
ora.c2n4.vip				
1	ONLINE	ONLINE	c2n4	STABLE
ora.cvu				
1	ONLINE	ONLINE	c2n1	STABLE
ora.mgmtldb				
1	ONLINE	ONLINE	c2n1	Open,STABLE
ora.oc4j				
1	ONLINE	ONLINE	c2n1	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	c2n4	STABLE
ora.scan2.vip				
1	ONLINE	ONLINE	c2n3	STABLE
ora.scan3.vip				
1	ONLINE	ONLINE	c2n1	STABLE
ora.susedb.db				
1	ONLINE	ONLINE	c2n2	Open,STABLE
2	ONLINE	ONLINE	c2n3	Open,STABLE
3	ONLINE	ONLINE	c2n4	Open,STABLE
4	ONLINE	ONLINE	c2n1	Open,STABLE

2). Verify Oracle Enterprise Manager.

EM Express - Database Home - Mozilla Firefox

EM Express - Databa... x

https://c2-scan.provo.novell.com:5500/em/shell#/dbhome/show_regions

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ORACLE Enterprise Manager Database Express 12c Help SYS Log Out

SUSEDDB (12.1.0.2.0 RAC) Configuration Storage Security Performance

Database Home Page Refreshed 10:13:56 PM GMT-0600 Auto Refresh 1 Minute

Status

Up Time 1 day, 1 hour, 25 minutes, 8 seconds

Type RAC - 4 instance(s) up

Version 12.1.0.2.0 Enterprise Edition

Database Name SUSEDDB

Platform Name Linux x86 64-bit

Archiver Stopped

Performance

Activity Class Services Instances

Incidents - Last 24 Hours

Ins...	Time	Inc...	Pr...	Error
No Incidents				

Resources

Host CPU

Active Sessions

Memory

Data Storage

Running Jobs

Ins...	Owner	Name	Ela...	Started
No Running Jobs				

SQL Monitor - Last Hour (20 max)

Status	Duration	T...	ID	User	Parallel	Database ...	SQL Text
	4.0s		cnphq355f5rah	SYS			DECLARE j

Additional Comments

- *Edit CV_ASSUME_DISTID=SUSE11 parameter in database/stage/cvu/cv/admin/cvu_config & grid/stage/cvu/cv/admin/cvu_config*
- *Apply Patch 20737462 to address CVU issues relating to lack of reference data*
- *Install libcap1 (libcap2 libraries are installed by default); i.e. libcap1-1.10-59.61.x86_64 & libcap1-32bit-1.10-59.61.x86_64*
- *ksh is replaced by mksh; e.g. mksh-50-2.13.x86_64*
- *libaio has been renamed to libaio1 (i.e. libaio1-0.3.109-17.15.x86_64); ensure that libaio1 is installed*
- *OUI may be invoked with -ignoreSysPreqs to temporarily workaround ongoing CVU check failures*

SuSE ISV Engineering Team
April 13, 2016
<https://www.suse.com>