

Oracle Database 19c RAC Installation on Oracle Linux 7.4 (VirtualBox on Windows)

by Biondi Septian S

Part 1 Setting Up VirtualBox, Network, DNS, Grid Pre Installation and Installation, Clusterware Verification

Prerequisites

- Notebook or PC with a minimum 16 GB of RAM
- Storage with 200 GB (SSD)
- VirtualBox 7.0 or later (<https://www.virtualbox.org/wiki/Downloads>)
- Oracle Linux 7.4 x86 64 bit
- Internet Connectivity
- Oracle SSO Account for downloading the softwares

Architecture

- Host OS: Windows 10
- Guest OS: Oracle Linux 7.4 x86 64 bit
- Nodes: **biz01**, **biz02**

- IP Address Lists:
Public IP
192.168.56.100 biz01
192.168.56.101 biz02

```
# Private IP
192.168.10.100 biz01-priv
192.168.10.101 biz02-priv
```

```
# Virtual IP
192.168.56.110 biz01-vip
192.168.56.111 biz02-vip
```

```
# SCAN IP
192.168.56.120 biz-scan
192.168.56.121 biz-scan
192.168.56.122 biz-scan
```

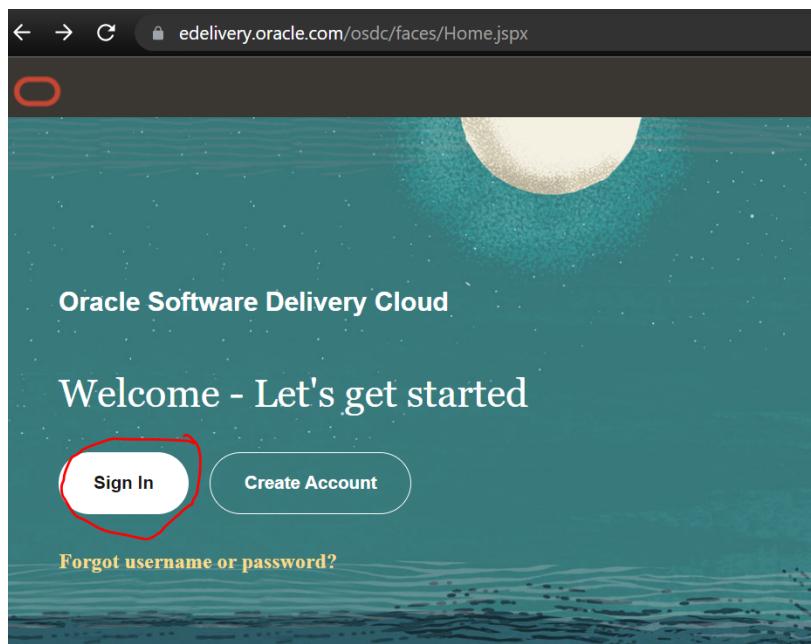
- Storage:
biz01: 30 GB
biz02: 30 GB
ASM1 (OCR): 40 GB
ASM2 (DATA): 7.5 GB
ASM3 (FRA): 7.5 GB
ASM4 (ACFS): 25 GB
- RAM:
biz01: 4096 MB
biz02: 4096 MB
- CPU:
biz01: 2 core
biz02: 2 core

Steps

1. Install VirtualBox 7.0

Just follow the default installation choices.

2. Download Oracle Linux 7.4 from <https://edelivery.oracle.com>



Oracle account sign in

Username
 i

Password
 i

Sign in

[Need help?](#)

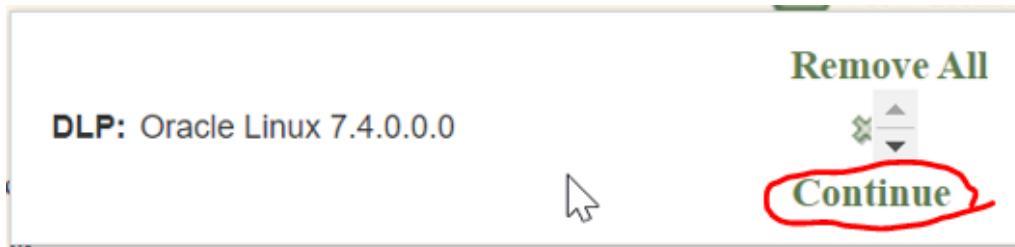
Oracle Software Delivery Cloud

- Choose a category and type in a search term or software title you would like to download.
- Select from the drop down results or click Search - you can also select one of our most Popular Downloads.
- A list of results will appear - additional filters will then be available to refine your search.
- Click on 'Select' next to the title you wish to download - the software will automatically be placed in your Download Queue where you will assign a place.
- Download Package (DLP): A collection of related Releases / Release (REL): A specific version of new functionality of a product**
- Still need help? Take our step-by-step Demo Tour or visit the FAQs.

All Categories ▼ Oracle Linux Search

- Oracle Linux
- Oracle Linux (Supplementary RDS)
- Oracle Linux (Supplementary – RDS)
- Oracle Linux 6 Virtual Machine Image for Openstack
- Oracle Linux 7 Virtual Machine Image for Openstack
- Oracle Linux Documentation
- Oracle Linux JeOS Templates
- Oracle Linux KVM Templates for Oracle Linux
- Oracle Linux Virtual Machine Image for Openstack
- Oracle Linux Virtual Machine Image for Openstack Documentation
- JeOS Oracle Linux
- Oracle OpenStack For Oracle Linux
- Oracle OpenStack For Oracle Linux Documentation

	DLP: Oracle Linux 9.0.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.7.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.6.0.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.5.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.4.0.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.3.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.2.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 8.1 (Oracle Linux)
	DLP: Oracle Linux 8.0 (Oracle Linux)
	DLP: Oracle Linux 7.9.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.8.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.7.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.6 (Oracle Linux)
	DLP: Oracle Linux 7.5.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.4.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.3.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.2.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.1.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 7.6 ARM (Oracle Linux)
	DLP: Oracle Linux 7.0.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 6.10 (Oracle Linux)
	DLP: Oracle Linux 6.9.0.0.0 (Oracle Linux)
	DLP: Oracle Linux 6.8.0.0.0 (Oracle Linux)



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To continue, select the Platform/Language for each individual Release. To remove an item from the Download Queue, please uncheck the box next to the title. Language Supplement Releases are optional; to include it where applicable, check the box next to the Release title and select your desired Language.

Back	Remove All	Continue			
<input checked="" type="checkbox"/> Download Queue	Terms and Restrictions	Platforms / Languages	Size	Published Date	Last Updated Date
<input checked="" type="checkbox"/> Oracle Linux 7.4.0.0.0	Oracle Standard Terms and Restrictions	x86 64 bit	14.1 GB	Sep 14, 2017	Sep 14, 2017
<input checked="" type="checkbox"/> Oracle Linux 7.4					
Back	Remove All	Continue			

We just need 1 ISO file for this, so just click on the **V921569-01.iso** below to download:

Back

View Digest Details WGET Options Restore Download

Oracle Linux 7.4.0.0.0

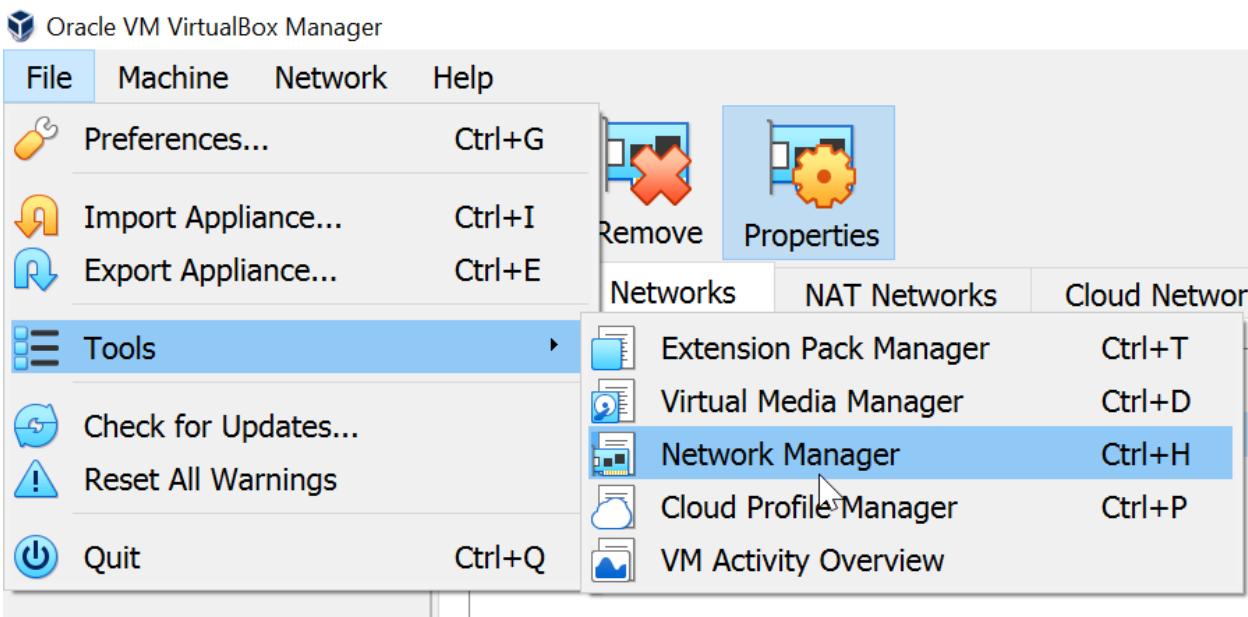
- Oracle Linux 7.4 for x86 64 bit
 - V921572-01.iso Oracle Linux Release 7 Update 4 Boot ISO image for x86 (64 bit), 461.0 MB
 - V921573-01.iso Oracle Linux Release 7 Update 4 UEK Boot ISO image for x86 (64 bit), 489.0 MB
 - V921570-01.iso Oracle Linux Release 7 Update 4 source DVD 1, 3.4 GB
 - V921571-01.iso Oracle Linux Release 7 Update 4 source DVD 2, 3.8 GB
 - V921569-01.iso** Oracle Linux Release 7 Update 4 for x86 (64 bit), 4.6 GB
 - V952636-01.zip Readme for Driver Update Disk, 1.1 KB
 - V952635-01.iso Driver Update Disk for Oracle Linux 7 x86_64, 3.8 MB
 - V974423-01.zip Oracle Container Services for use with Kubernetes 1.1.8, 713.1 MB
 - V975277-01.zip Oracle VirtIO Drivers Version for Microsoft Windows 1.1.2, 68.1 MB
 - V975279-01.zip Oracle Container Services for use with Kubernetes 1.1.9.1, 633.2 MB

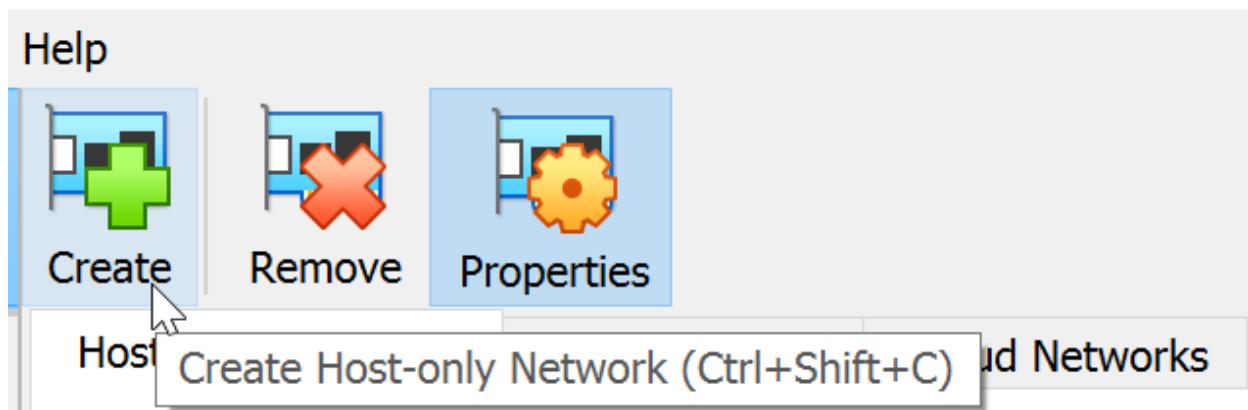
Total 10 distinct files Total Size 14.1 GB

NOTE: Some downloaded parts may be split into more than one file.

Back View Digest Details WGET Options Restore Download

3. Open the VirtualBox and Create a new Host-only Ethernet Adapter If It doesn't Exist





This will create a new Network like below:

Name	IPv4 Prefix	IPv6 Prefix	DHCP Server
VirtualBox Host-Only Ethernet Adapter	192.168.56.1/24		Enabled

Adapter **DHCP Server**

Configure Adapter Automatically
 Configure Adapter Manually

IPv4 Address: 192.168.56.1

IPv4 Network Mask: 255.255.255.0

IPv6 Address: fe80::7bfb:be25:bac6:134

IPv6 Prefix Length: 64

Host-only Networks NAT Networks Cloud Networks

Name	IPv4 Prefix	IPv6 Prefix	DHCP Server
VirtualBox Host-Only Ethernet Adapter	192.168.56.1/24		Enabled

Adapter DHCP Server

Enable Server

Server Address: 192.168.56.2
 Server Mask: 255.255.255.0
 Lower Address Bound: 192.168.56.100
 Upper Address Bound: 192.168.56.254

4. Create and Configure a New Virtual Machine

Virtual machine Name and Operating System

Please choose a descriptive name and destination folder for the new virtual machine. The name you choose will be used throughout VirtualBox to identify this machine. Additionally, you can select an ISO image which may be used to install the guest operating system.

Name: biz01 

Folder: C:\Users\Biondi\VirtualBox VMs

ISO Image: <not selected>

Edition:

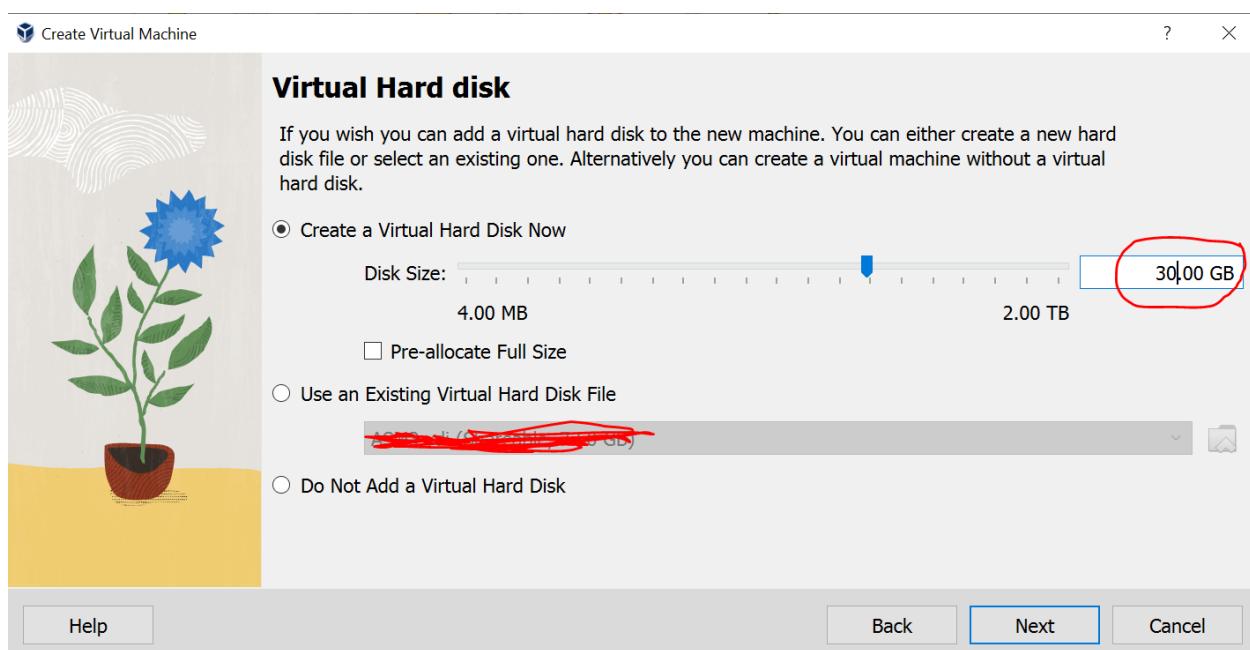
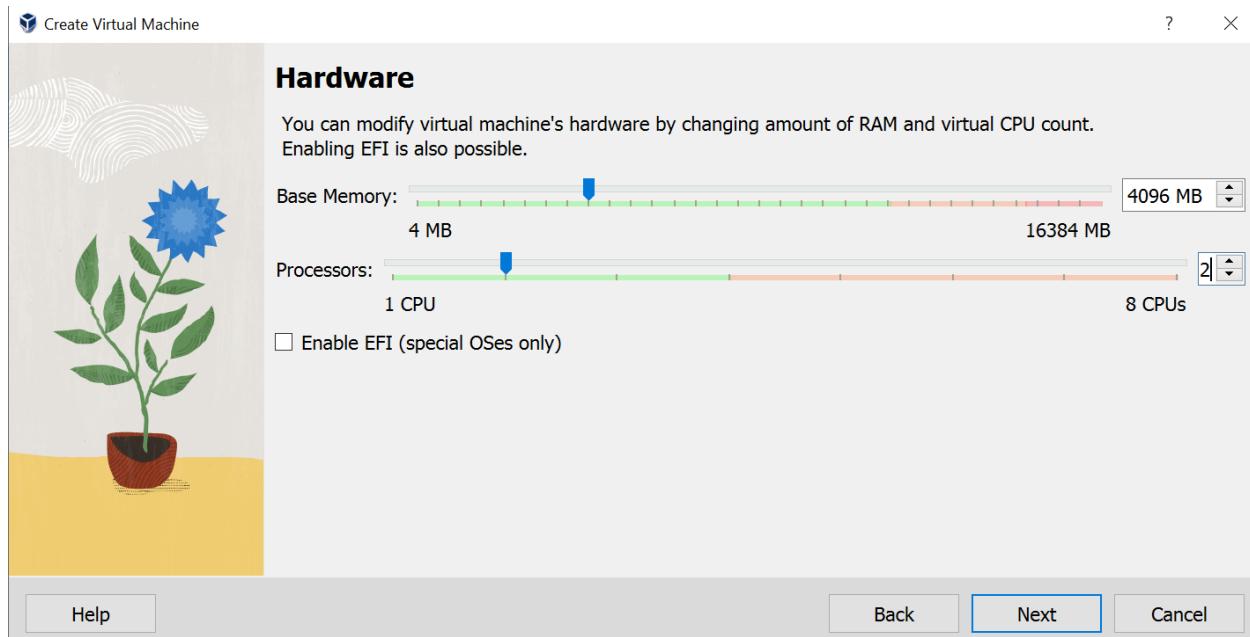
Type: Linux 

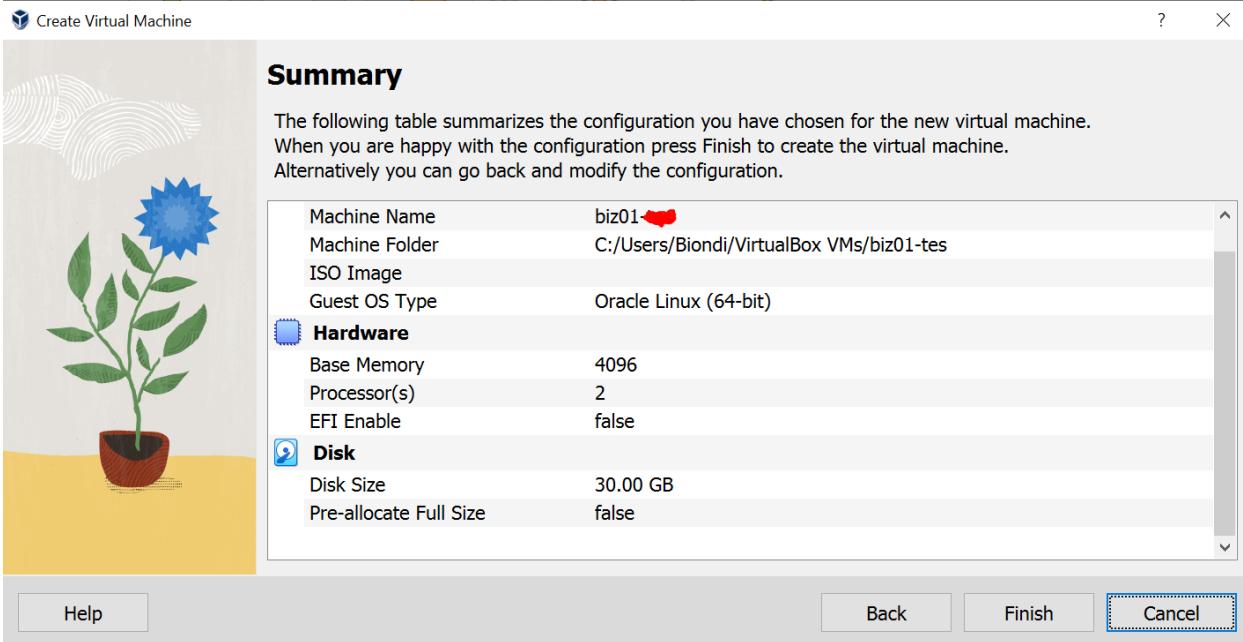
Version: Oracle Linux (64-bit) 

Skip Unattended Installation

 No ISO image is selected, the guest OS will need to be installed manually.

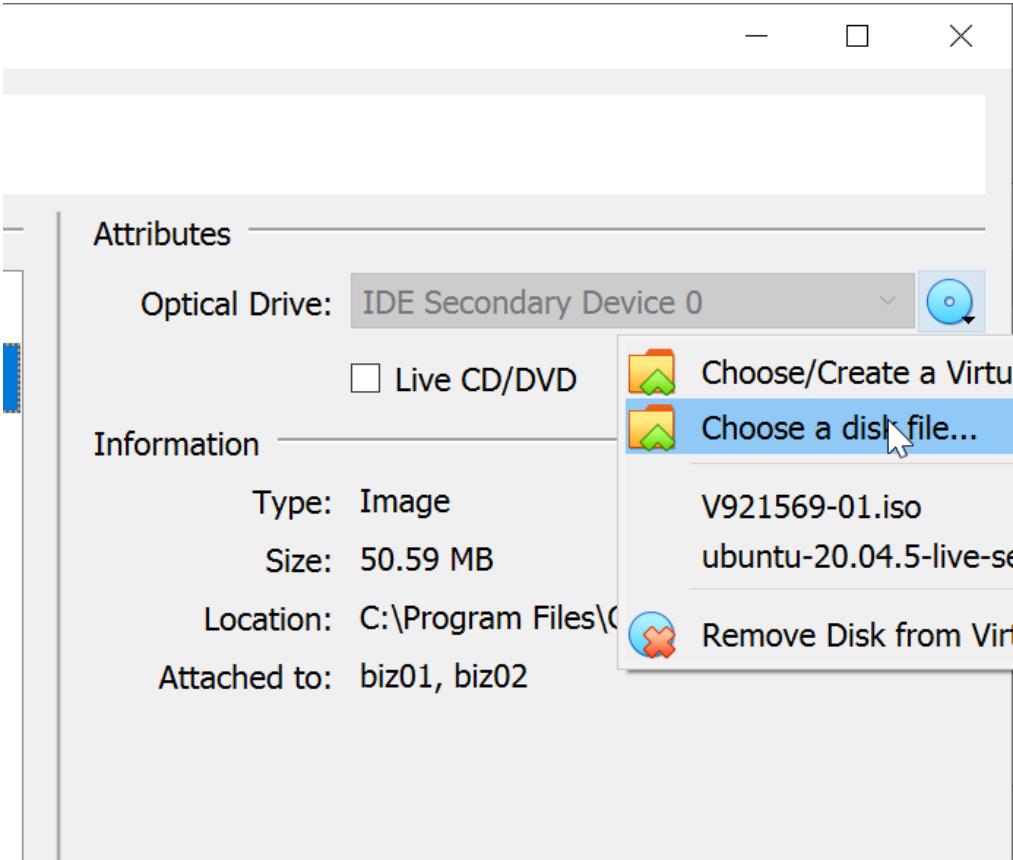
Expert Mode Back **Next** Cancel



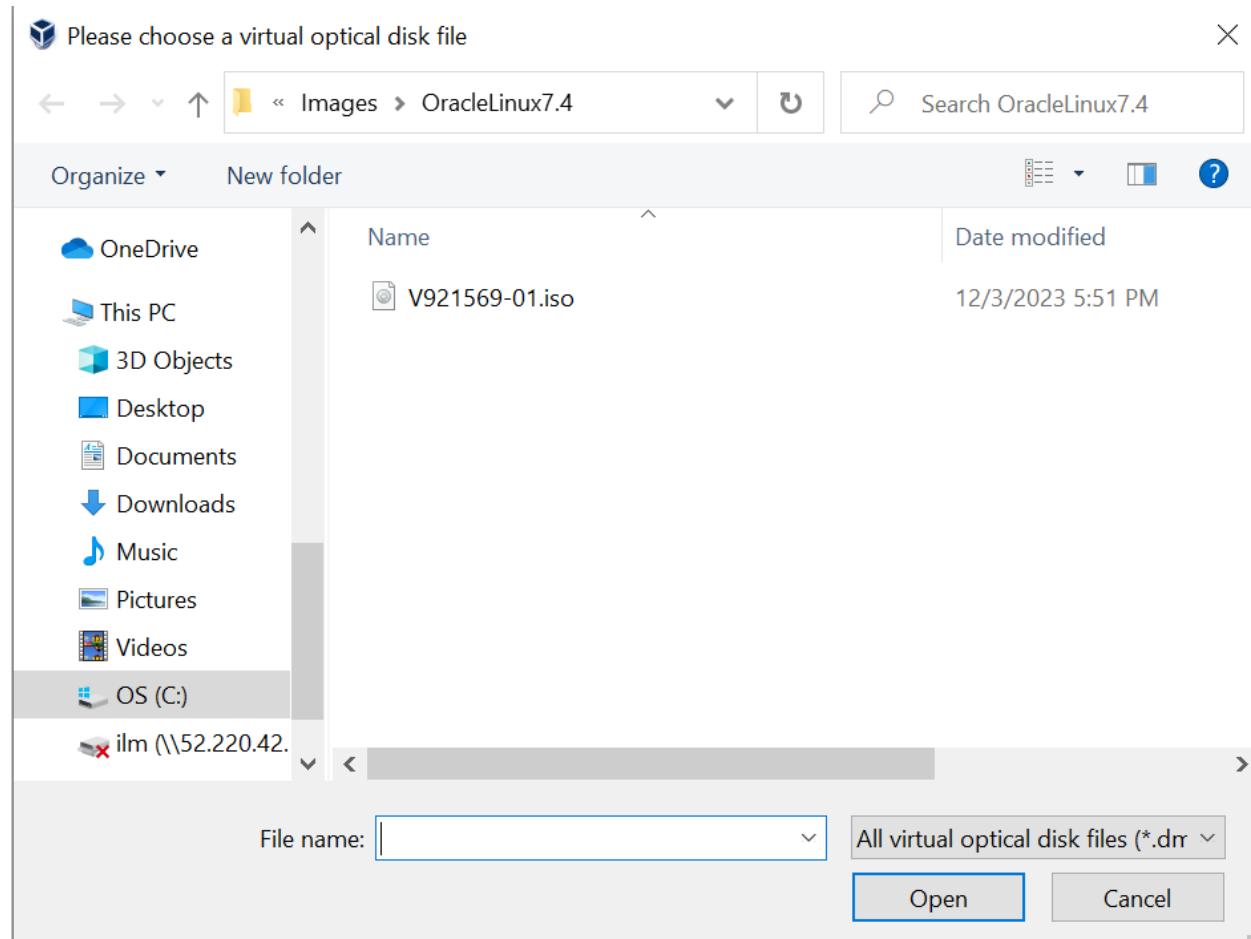


Wait 5-10 minutes until the creation of the VM finishes and the Virtual Machine will be in power off state.

Right Click on the new VM and click Settings.



Load the Oracle Linux ISO file **V921569-01.iso** that we downloaded earlier in Step 2:

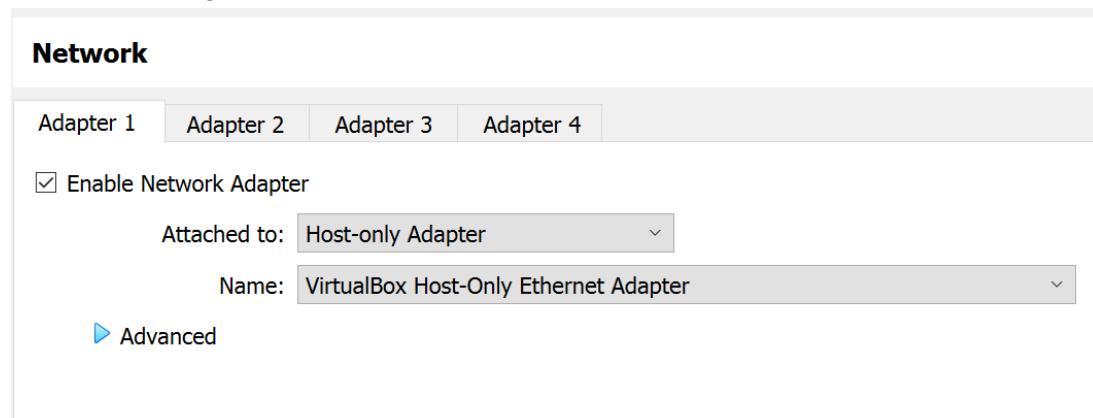


After that, go to the **Network**, and then configure 3 Network Adapters:

Adapter 1: Host-only

Adapter 2: Internal Network

Adapter 3: Bridged Adapter



Network

Adapter 1 Adapter 2 Adapter 3 Adapter 4

Enable Network Adapter

Attached to: Internal Network

Name: intnet

► Advanced

Network

Adapter 1 Adapter 2 Adapter 3 Adapter 4

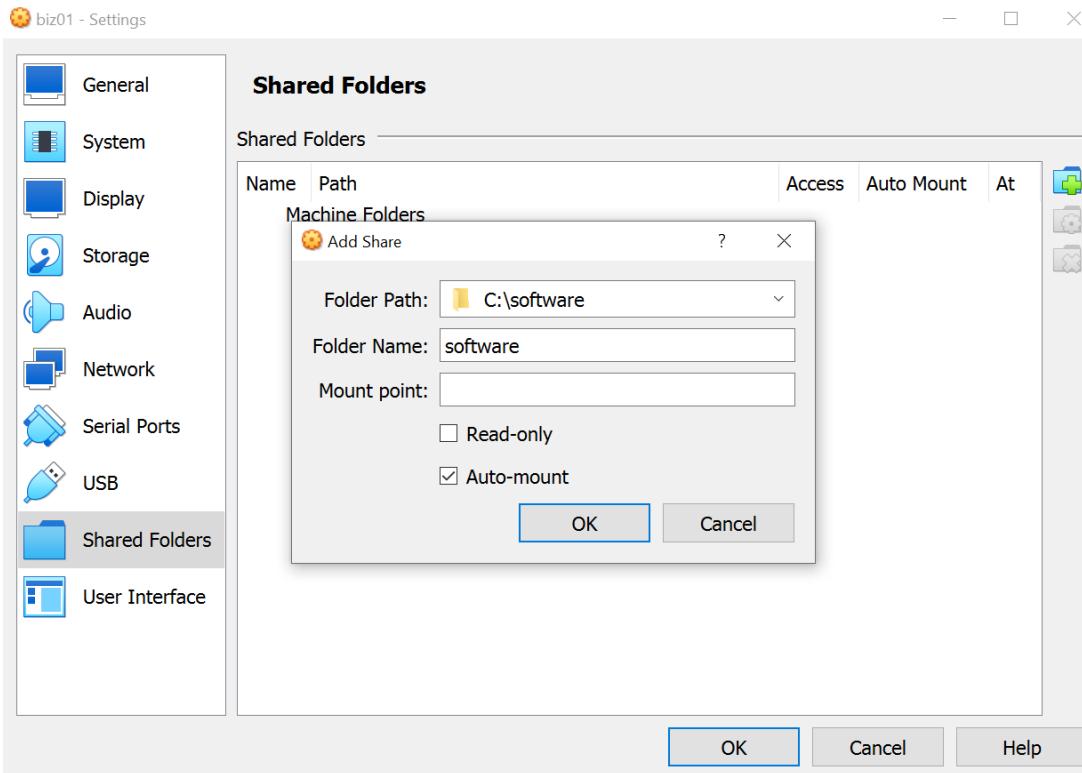
Enable Network Adapter

Attached to: Bridged Adapter

Name: Intel(R) Wireless-AC 9560 160MHz

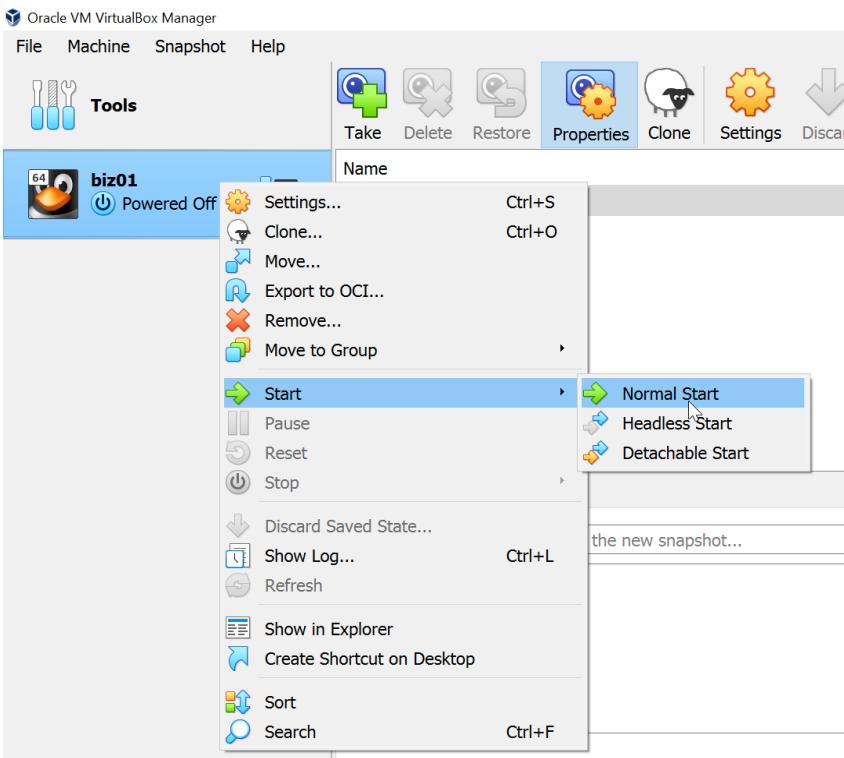
► Advanced

Configure **Shared Folders**, to share additional libraries and softwares, in this example I used my local directory **C:\software**:



5. Install the Oracle Linux Guest OS

Start the virtual machine:





This is the "WELCOME TO ORACLE LINUX 7.4." screen from the installation process. It features a sidebar on the left with the "ORACLE LINUX" logo and a penguin icon. The main area has a title "WELCOME TO ORACLE LINUX 7.4." and a question "What language would you like to use during the installation process?". Two dropdown menus are shown. The left one lists languages by name, and the right one lists English variants by name. At the bottom are "Quit" and "Continue" buttons, with a cursor pointing towards the "Continue" button.



INSTALLATION SUMMARY

ORACLE LINUX 7.4 INSTALLATION

us

Help!



LOCALIZATION



DATE & TIME
Asia/Jakarta timezone



KEYBOARD
English (US)



LANGUAGE SUPPORT
English (United States)

SOFTWARE



INSTALLATION SOURCE
Local media



SOFTWARE SELECTION
Minimal Install

SYSTEM



INSTALLATION DESTINATION



KDUMP



Kdump is enabled

Begin Installation

We won't touch your disks until you click 'Begin Installation'.

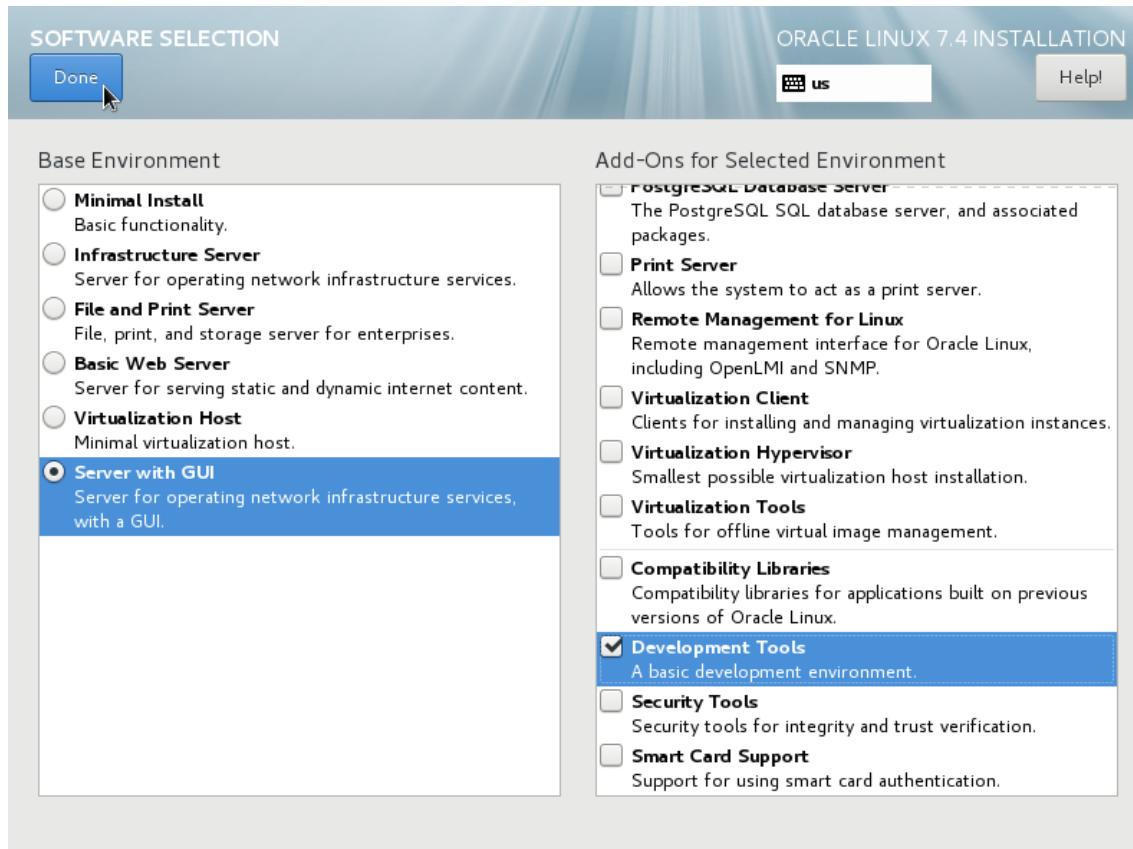


Please complete items marked with this icon before continuing to the next step.



Change Software Selection settings:

- Base Environment: Server with GUI
- Add-Ons: Development Tools



In **Network & Hostname**, configure the network as below:

(Host-only Network) enp0s3: Manual, IP: 192.168.56.100, Subnet Mask: 255.255.255.0, Gateway: 0.0.0.0

(Internal Network) enp0s8: Manual, IP: 192.168.10.100, Subnet Mask: 255.255.255.0, Gateway: 0.0.0.0

(Bridged Network) enp0s9: Automatic (DHCP)

Configure **enp0s3**:

NETWORK & HOST NAME**Done****ORACLE LINUX 7.4 INSTALLATION****Help**

Ethernet (enp0s3)
Intel Corporation 82540EM Gigabit Ethernet Controller (00:0c:29:08:00:27)

Ethernet (enp0s8)
Intel Corporation 82540EM Gigabit Ethernet Controller (00:0c:29:08:00:28)

Ethernet (enp0s9)
Intel Corporation 82540EM Gigabit Ethernet Controller (00:0c:29:08:00:29)

+ -



Hardware Address 08:00:27:E7:24:2B

Speed 1000 Mb/s

Subnet Mask 127.0.0.1

**Configure...**

Host name: localhost.localdomain

Apply

Current host name: localhost

**Click Configure...**

Editing enp0s3

Connection name: **enp0s3**

General **Ethernet** **802.1X Security** **DCB** **Proxy** **IPv4 Settings** **IPv6 Settings**

Automatically connect to this network when it is available

Connection priority for auto-activation: **0** **-** **+**

All users may connect to this network

Automatically connect to VPN when using this connection

Cancel **Save**

Editing enp0s3

Connection name: **enp0s3**

General Ethernet 802.1X Security DCB Proxy **IPv4 Settings** IPv6 Settings

Method: **Manual**

Addresses

Address	Netmask	Gateway
192.168.56.100	255.255.255.0	0.0.0.0

Add Delete

DNS servers:

Search domains:

DHCP client ID:

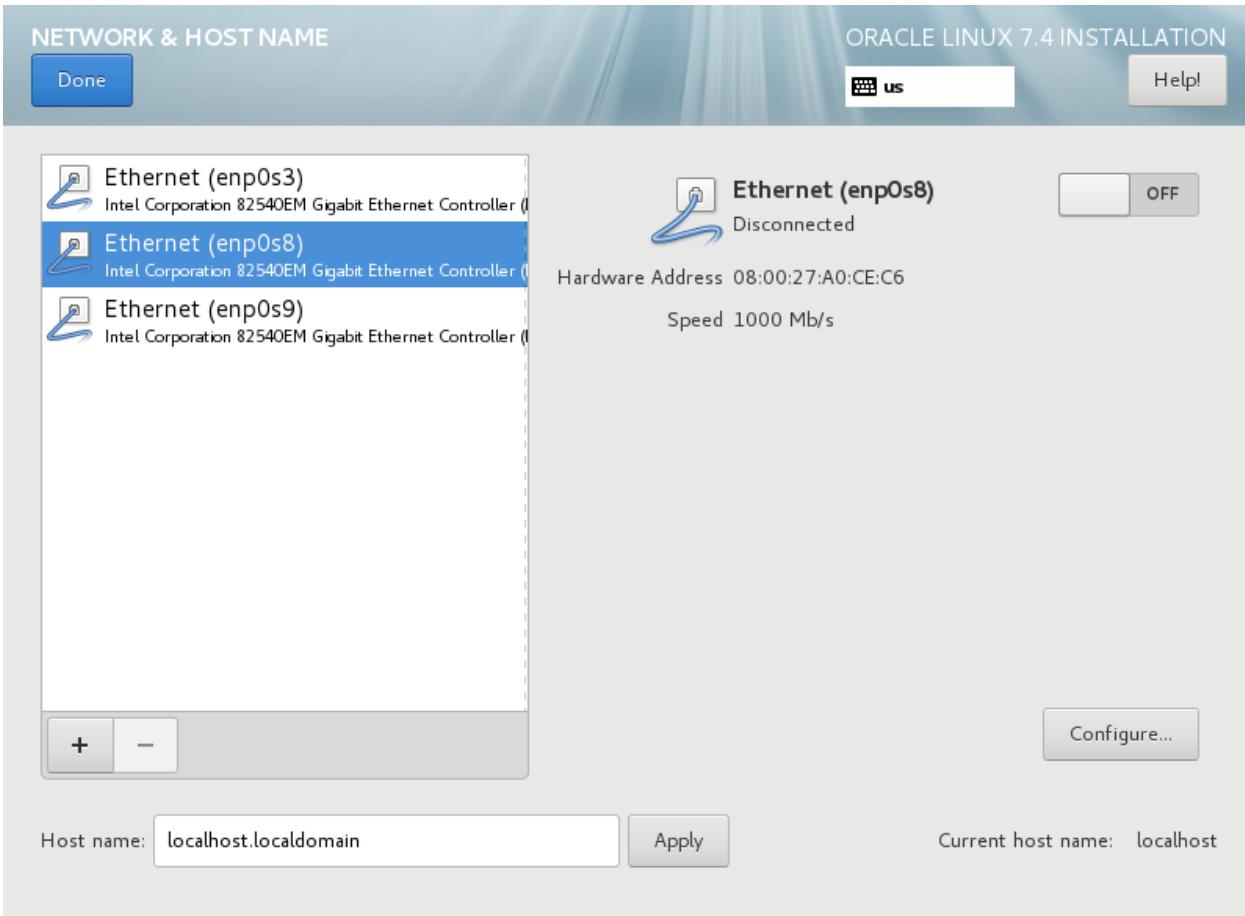
Require IPv4 addressing for this connection to complete

Routes...

Cancel Save

Click **Save**.

Configure similarly for **enp0s8**:



Click **Configure...**

Editing enp0s8

Connection name: enp0s8

General Ethernet 802.1X Security DCB Proxy IPv4 Settings IPv6 Settings

Automatically connect to this network when it is available

Connection priority for auto-activation: 0 - +

All users may connect to this network

Automatically connect to VPN when using this connection

▼

Cancel Save

Editing enp0s8

Connection name: enp0s8

General Ethernet 802.1X Security DCB Proxy **IPv4 Settings** IPv6 Settings

Method: Manual ▾

Addresses

Address	Netmask	Gateway
192.168.10.100	255.255.255.0	0.0.0.0

Add Delete

DNS servers:

Search domains:

DHCP client ID:

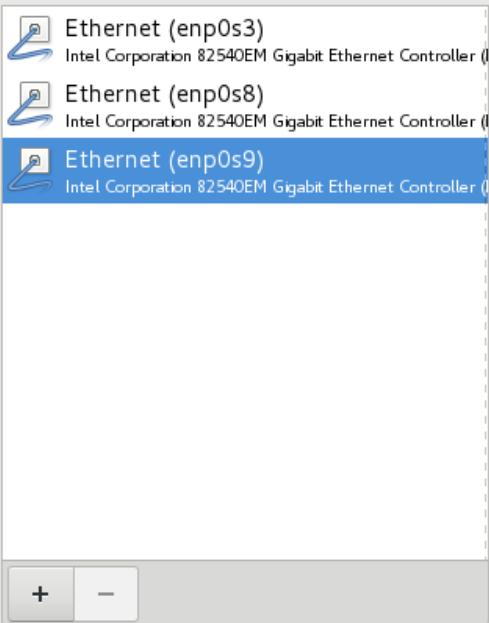
Require IPv4 addressing for this connection to complete

Routes...

Cancel Save

Click **Save**.

Configure **enp0s9** (provide connectivity to the internet, IP address will be obtained via DHCP):

NETWORK & HOST NAME**ORACLE LINUX 7.4 INSTALLATION****Done****Help!**

Ethernet (enp0s9)
Disconnected

[] OFF

Hardware Address 08:00:27:18:70:B8

Speed 1000 Mb/s

+ -

Configure...

Host name:

Apply

Current host name: localhost

Click Configure...

Editing enp0s9

Connection name: **enp0s9**

General Ethernet 802.1X Security DCB Proxy IPv4 Settings IPv6 Settings

Automatically connect to this network when it is available

Connection priority for auto-activation: **0** - +

All users may connect to this network

Automatically connect to VPN when using this connection

▼

Cancel Save

Editing enp0s9

Connection name: **enp0s9**

General Ethernet 802.1X Security DCB Proxy **IPv4 Settings** IPv6 Settings

Method: Automatic (DHCP) ▾

Additional static addresses

Address	Netmask	Gateway	
			Add
			Delete

Additional DNS servers:

Additional search domains:

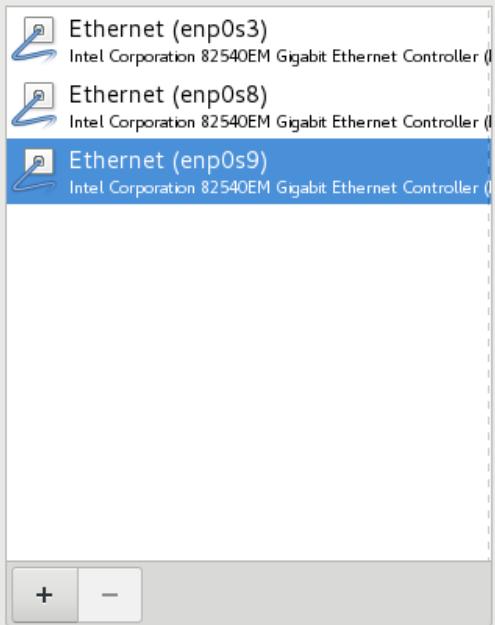
DHCP client ID:

Require IPv4 addressing for this connection to complete

Routes...

NETWORK & HOST NAME

ORACLE LINUX 7.4 INSTALLATION

[Done](#)[Help!](#)

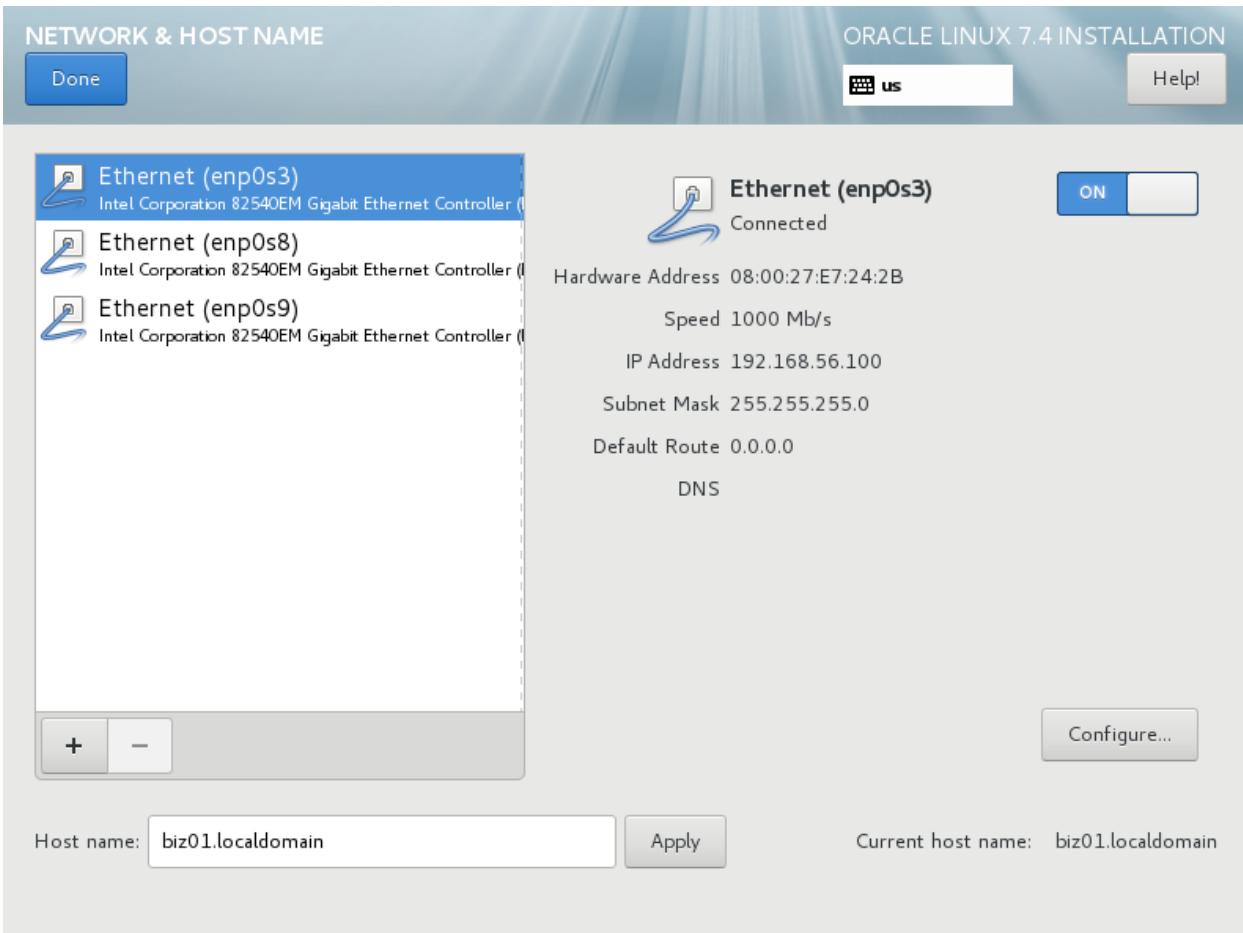
ON

Hardware Address 08:00:27:18:70:B8
Speed 1000 Mb/s
IP Address 192.168.18.243
Subnet Mask 255.255.255.0
Default Route 192.168.18.1
DNS 192.168.18.1

[Configure...](#)Host name: [Apply](#)

Current host name: localhost.localdomain

Enter the Host name: **biz01.localdomain**



Click **Done**.

Click **Installation Destination**:

INSTALLATION DESTINATION**Done****ORACLE LINUX 7.4 INSTALLATION**

us

Help!**Device Selection**

Select the device(s) you'd like to install to. They will be left untouched until you click on the main menu's "Begin Installation" button.

Local Standard Disks

15 GiB



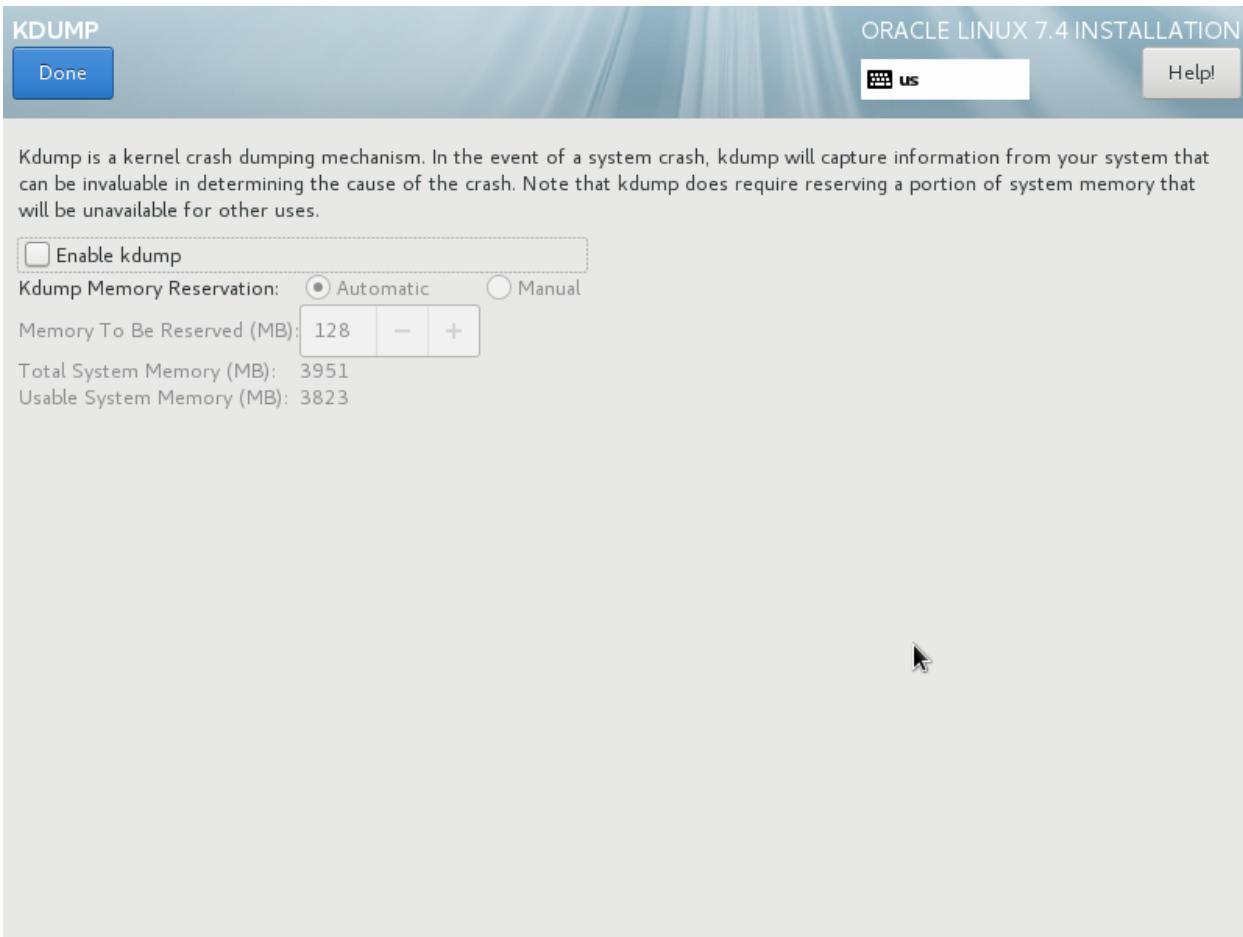
ATA VBOX HARDDISK

sda / 15 GiB free

*Disks left unselected here will not be touched.***Specialized & Network Disks****Add a disk...***Disks left unselected here will not be touched.***Other Storage Options****Partitioning**

- Automatically configure partitioning. I will configure partitioning.
 I would like to make additional space available.

[Full disk summary and boot loader...](#)1 disk selected; 15 GiB capacity; 15 GiB free [Refresh...](#)**Click Done.****Click KDUMP:**



Untick the **Enable kdump** (disable Kdump), Click **Done**.

Finally, the Installation Summary should look like this:



INSTALLATION SUMMARY

ORACLE LINUX 7.4 INSTALLATION

us

Help



DATE & TIME
Asia/Jakarta timezone



KEYBOARD
English (US)



LANGUAGE SUPPORT
English (United States)

SOFTWARE



INSTALLATION SOURCE
Local media



SOFTWARE SELECTION
Server with GUI

SYSTEM



INSTALLATION DESTINATION
Automatic partitioning selected



KDUMP
Kdump is disabled



NETWORK & HOST NAME
Connected: enp...enp0s3, enp0s9



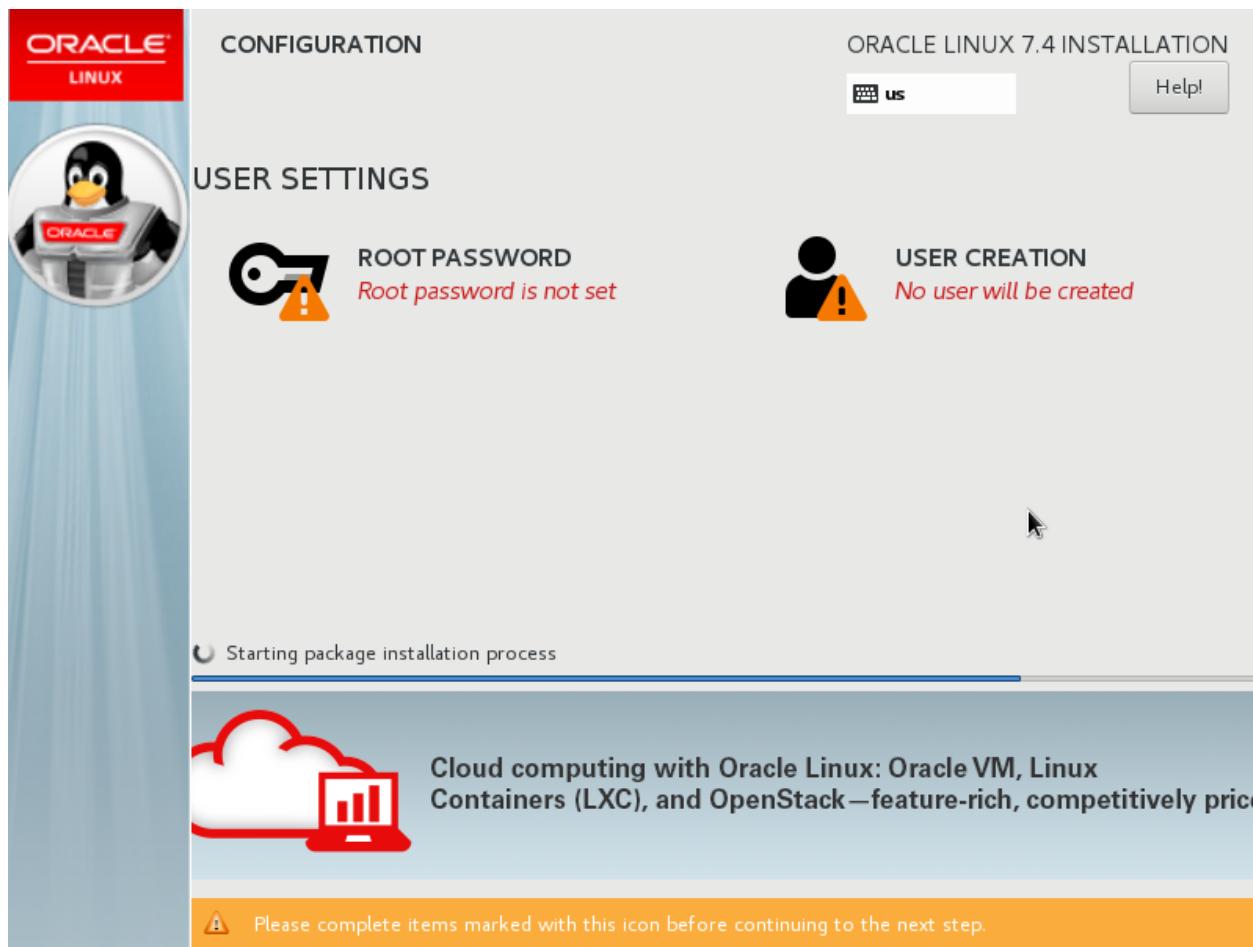
SECURITY POLICY
No profile selected

Quit

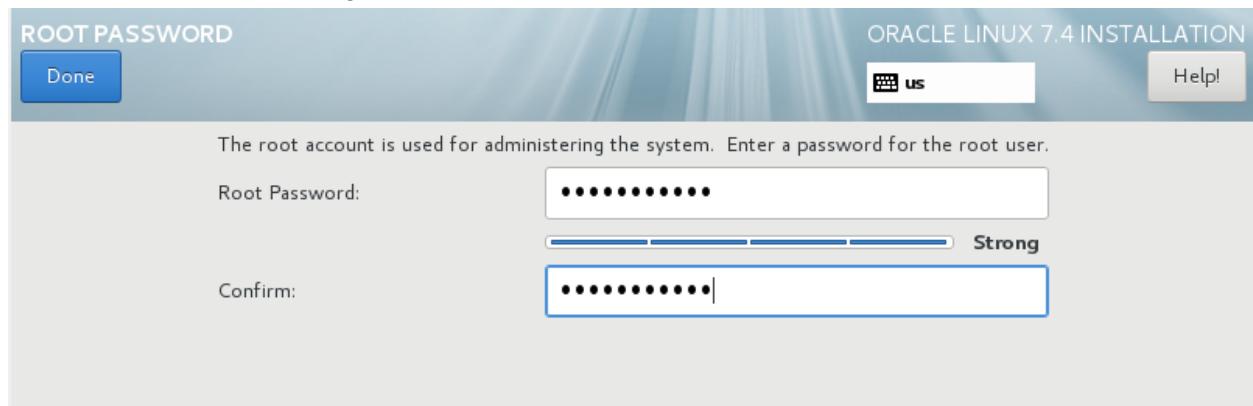
Begin Installation

We won't touch your disks until you click 'Begin Installation'.

Click **Begin Installation**.



While installation is running, we can set the password for root, click **Root Password**:



Click **Done**.



CONFIGURATION

ORACLE LINUX 7.4 INSTALLATION



us

Help!



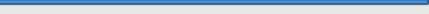
USER SETTINGS



ROOT PASSWORD
Root password is set



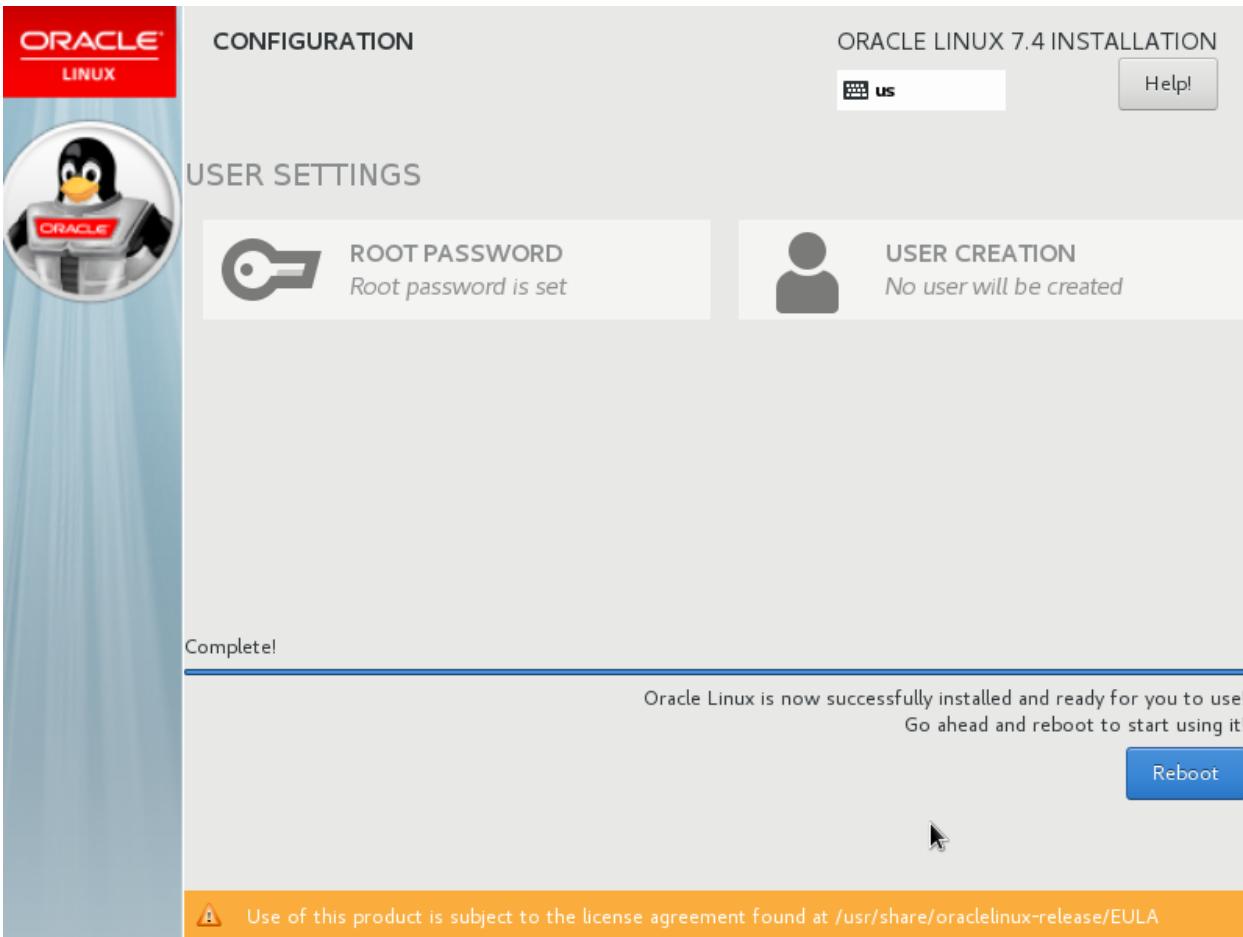
USER CREATION
No user will be created

Installing shared-mime-info (408/1363) 



**Hardware and Software
Engineered to Work Together**

Wait until Installation finishes.



Click **Reboot**.



INITIAL SETUP

ORACLE LINUX SERVER 7.4



Help!



LICENSING



LICENSE INFORMATION

License not accepted

SYSTEM



NETWORK & HOST NAME

Connected: en...np0s8, enp0s3

USER

Connected: enp0s9, enp0s8, enp0s3



USER CREATION

No user will be created

QUIT

FINISH CONFIGURATION



Please complete items marked with this icon before continuing to the next step.

Click **License Information**:

LICENSE INFORMATION

ORACLE LINUX SERVER 7.4

Done



Help!

License Agreement:

ORACLE LINUX LICENSE AGREEMENT

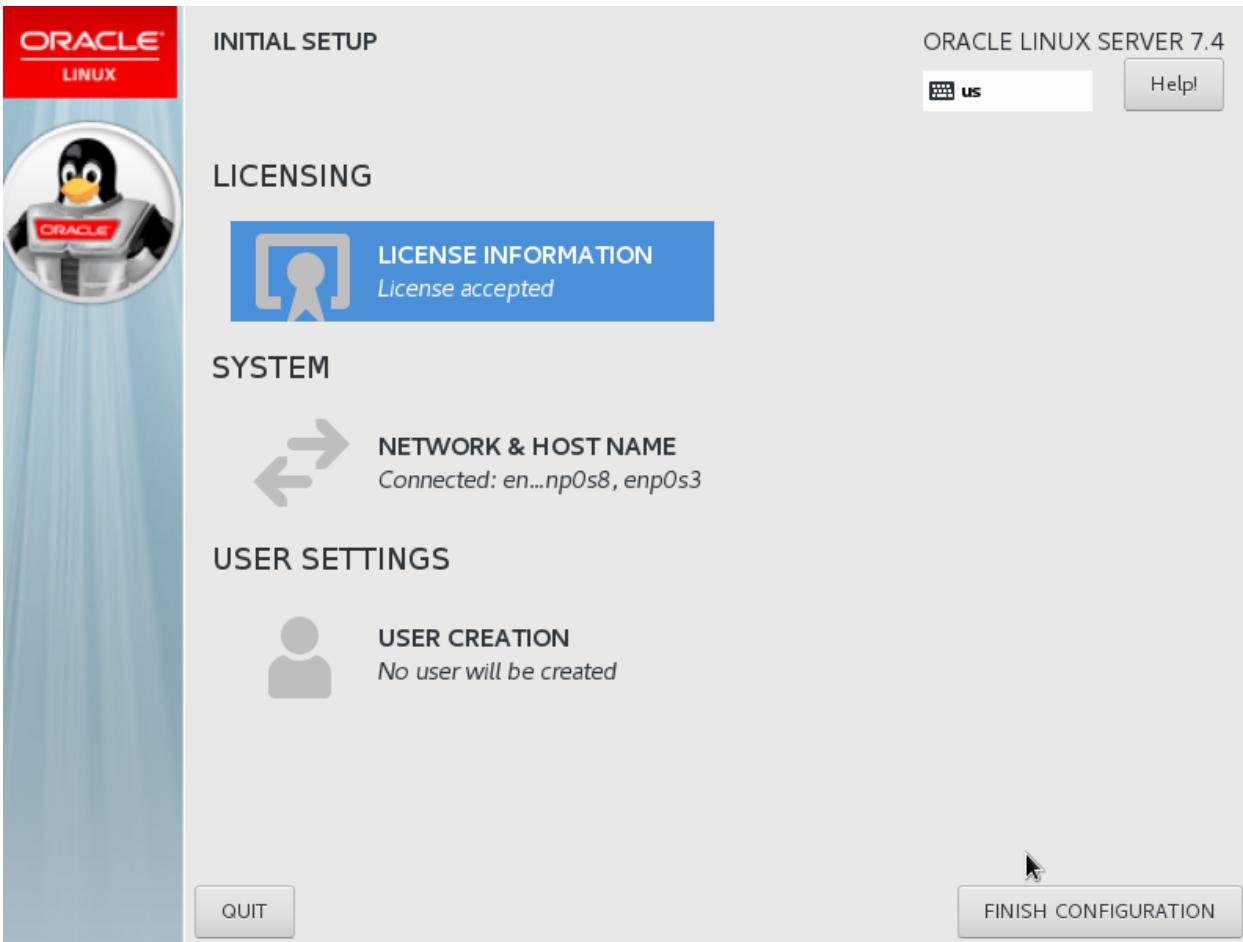
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I accept the license agreement.



Accept the license agreement and click **Done**.



Click **Finish Configuration**.

Welcome

Next

مرحباً

Deutsch	Deutschland
English ✓	United States
Español	España
Français	France
Русский	Российская Федерация
العربية	مصر
日本語	日本
汉语	中国
⋮	

Previous

Typing

Next

Typing

Select your keyboard layout or an input method.

Cameroon Multilingual (Dvorak)	Preview
Cameroon Multilingual (QWERTY)	Preview
English (Australian)	Preview
English (Cameroon)	Preview
English (Canada)	Preview
English (US) ✓	Preview
⋮	



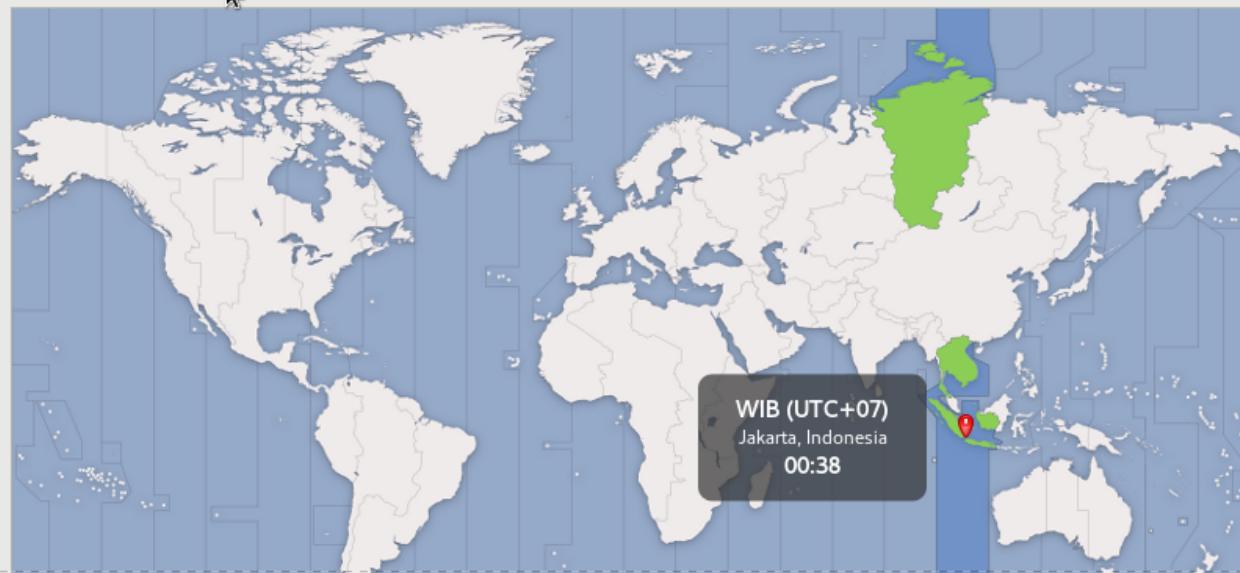
[Previous](#)

Time Zone

[Next](#)

Time Zone

The time zone will be set automatically if your location can be found. You can also search for a city to set it yourself.



Previous About You Next



About You

We need a few details to complete setup.

Full Name ✓

Username ✓

This will be used to name your home folder and can't be changed.

Previous Password Next

Set a Password

Be careful not to lose your password.

Password ✓
A green progress bar below the password field shows approximately 75% completion.
Adding more letters, numbers and punctuation will make the password stronger.

Confirm ✓



Ready to Go



You're ready to go!

[Start Using Oracle Linux Server](#)



6. Install VirtualBox Guest Addition

Logout from **oraadmin** and login to root:

Applications Places

Wed 00:47



Home



Trash



Ethernet (enp0s3) Conne...

Ethernet (enp0s8) Conne...

Ethernet (enp0s9) Conne...

0:30 Until Full (60 %)

oraadmin

Log Out

Account Settings



ORACLE
Linux



Wed 00:54

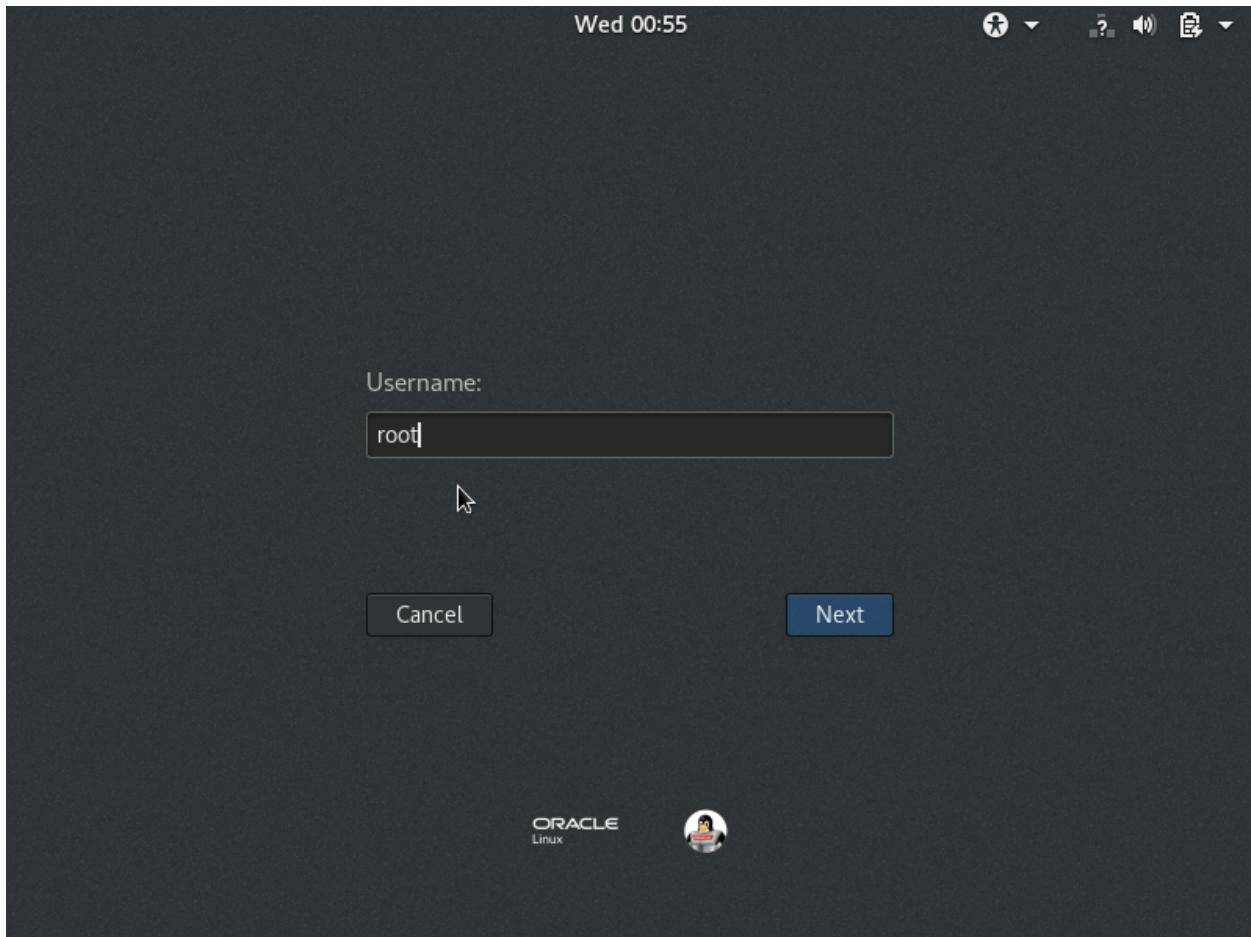


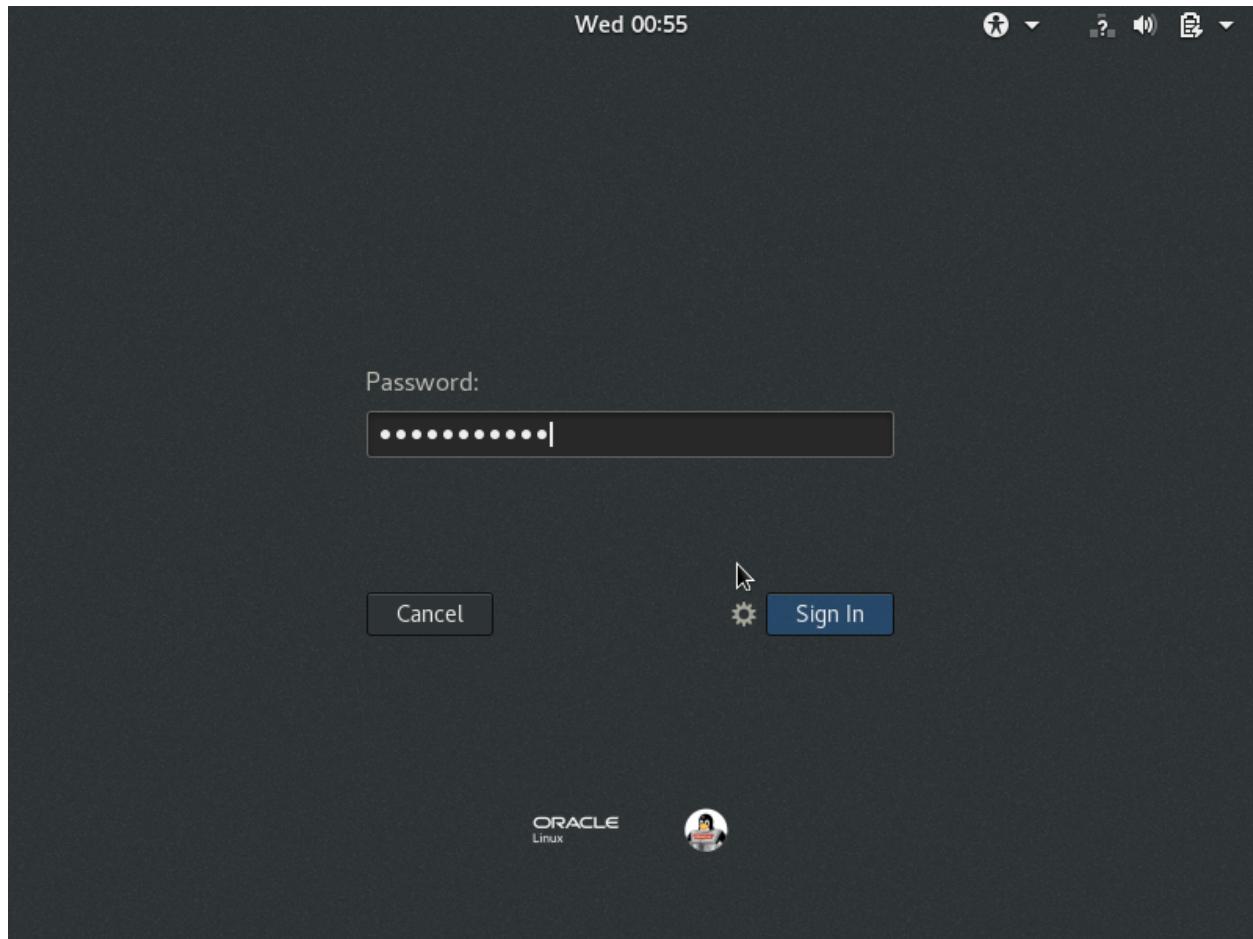
oraadmin

Not listed?

ORACLE
Linux

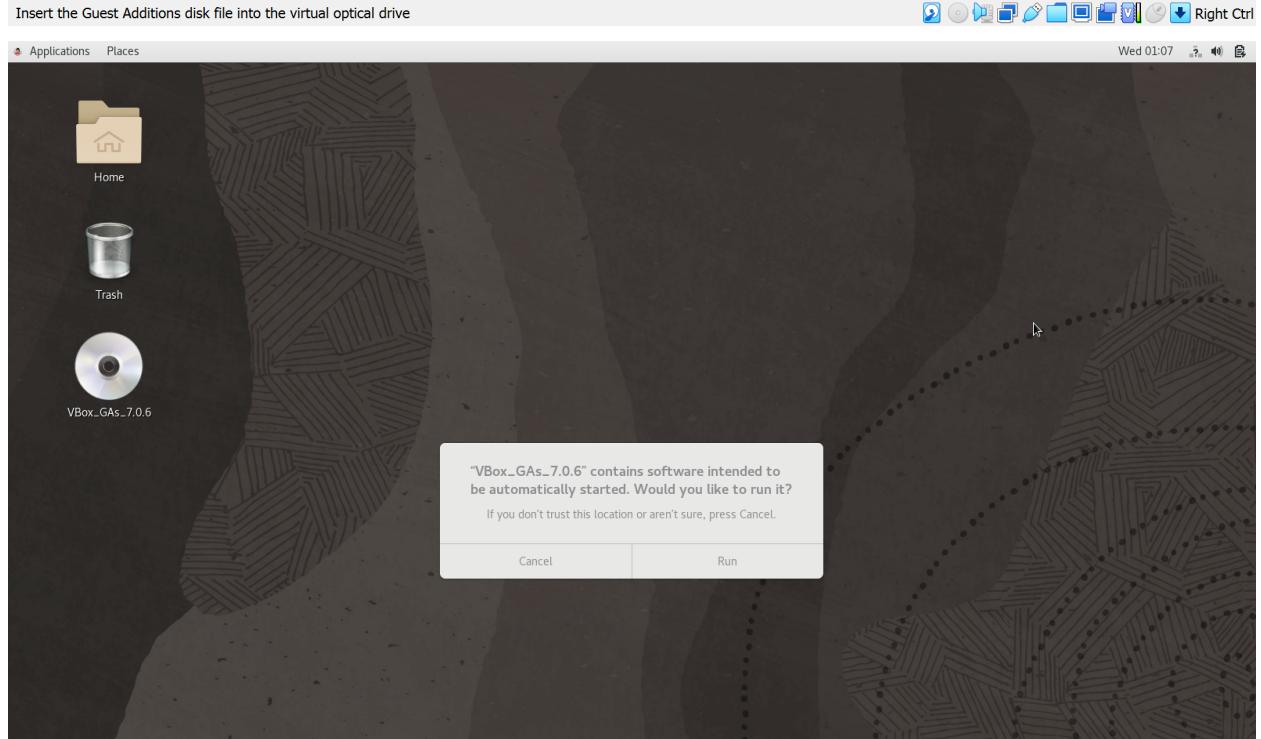
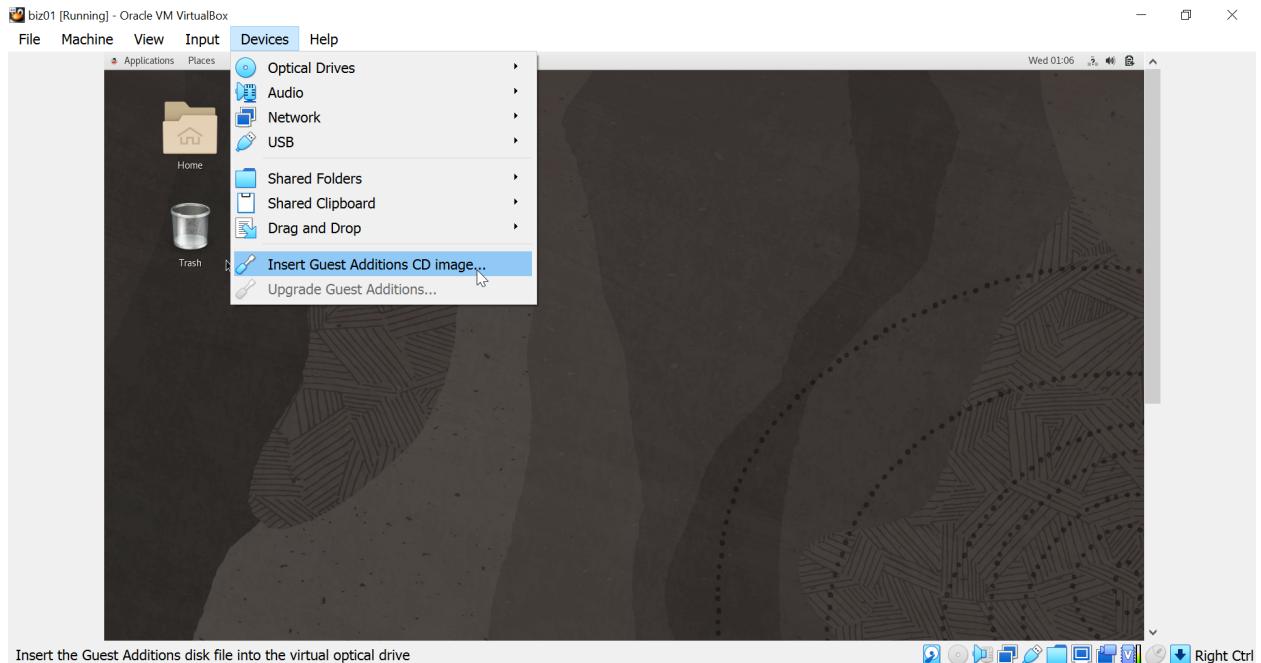


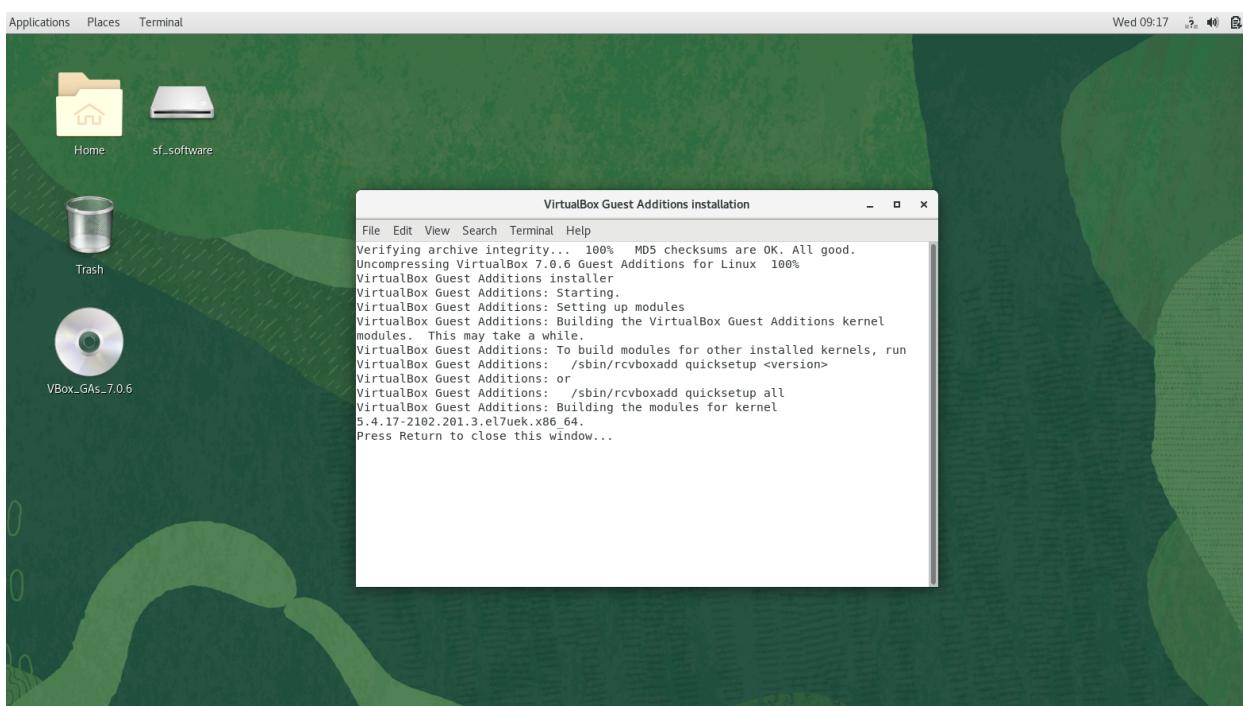
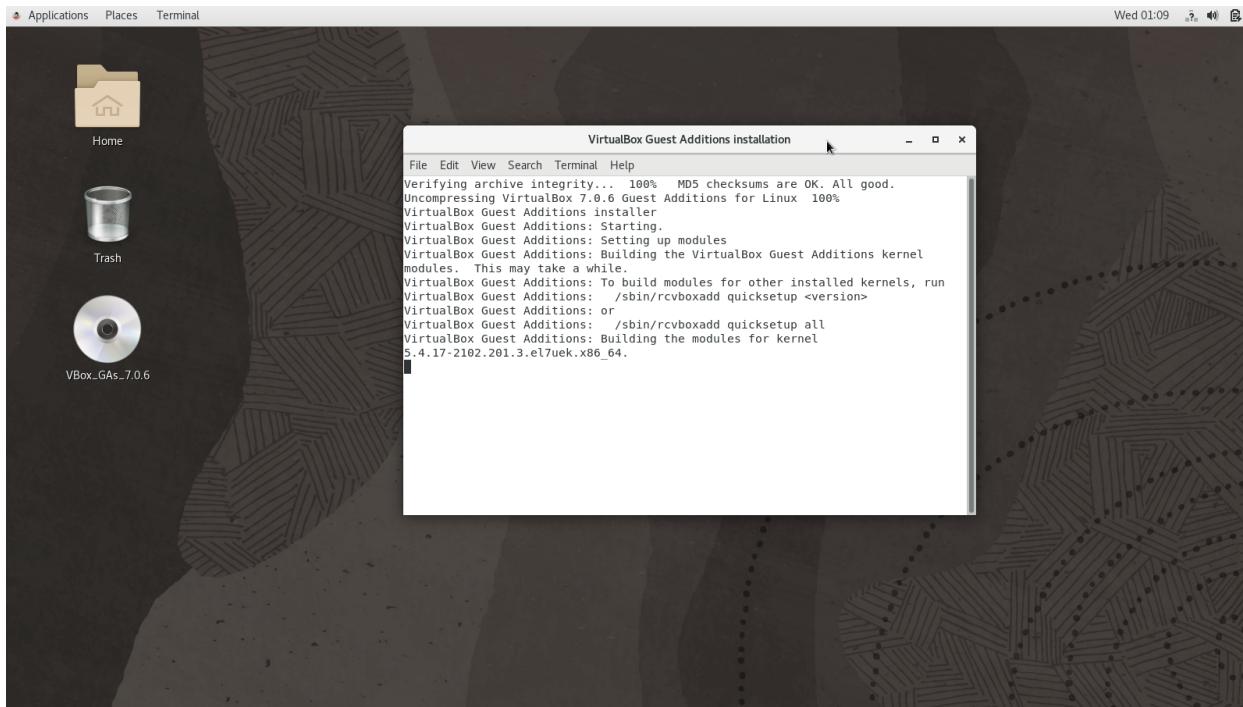




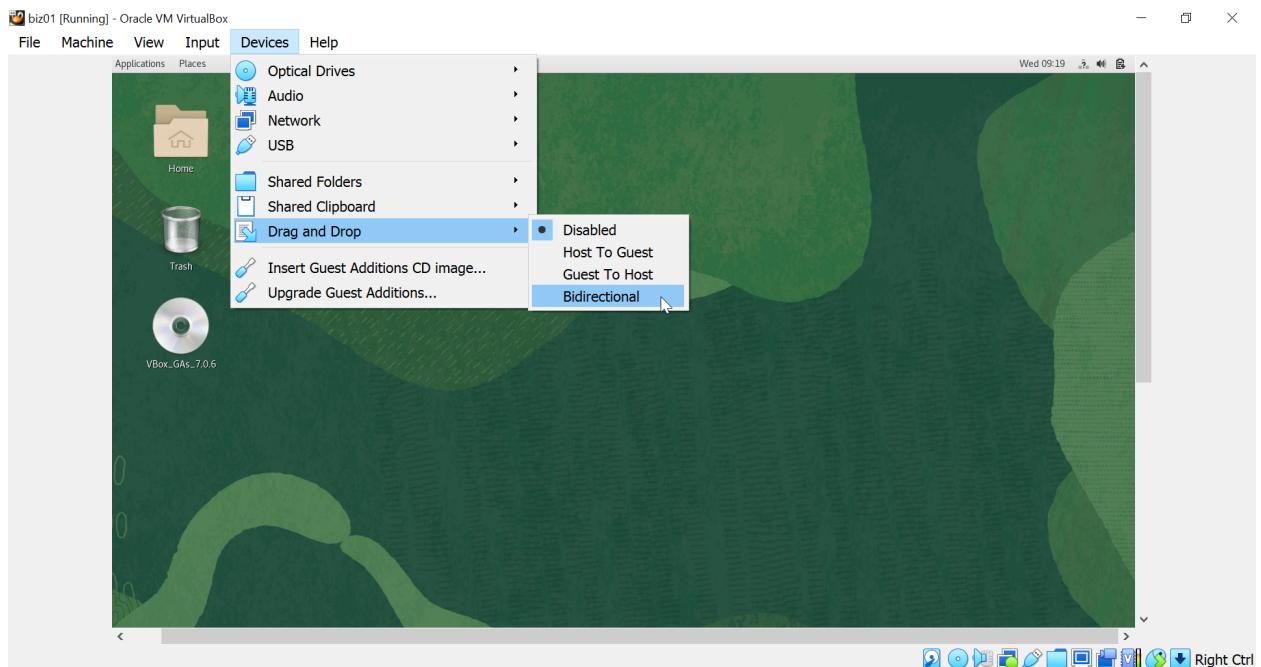
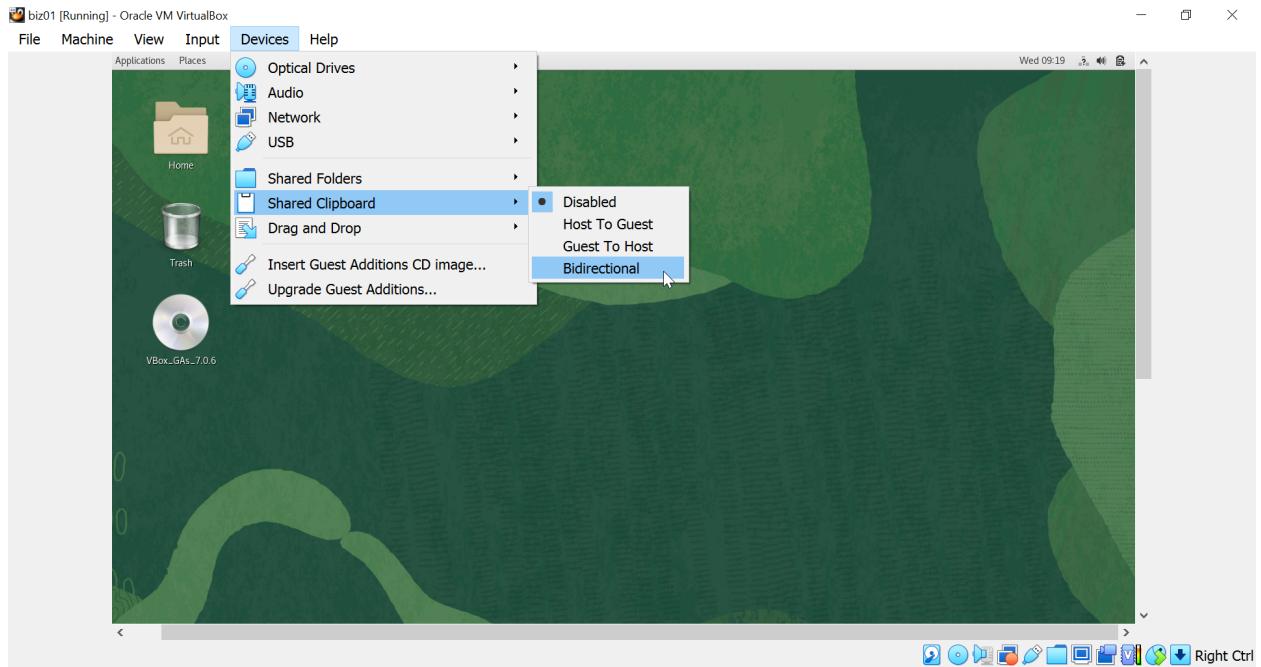
Click **Sign In**.

Now, exit from virtual machine screen by pressing Host (default: **Right Ctrl**) button, and access menu Devices -> Insert Guest Additions CD Image...

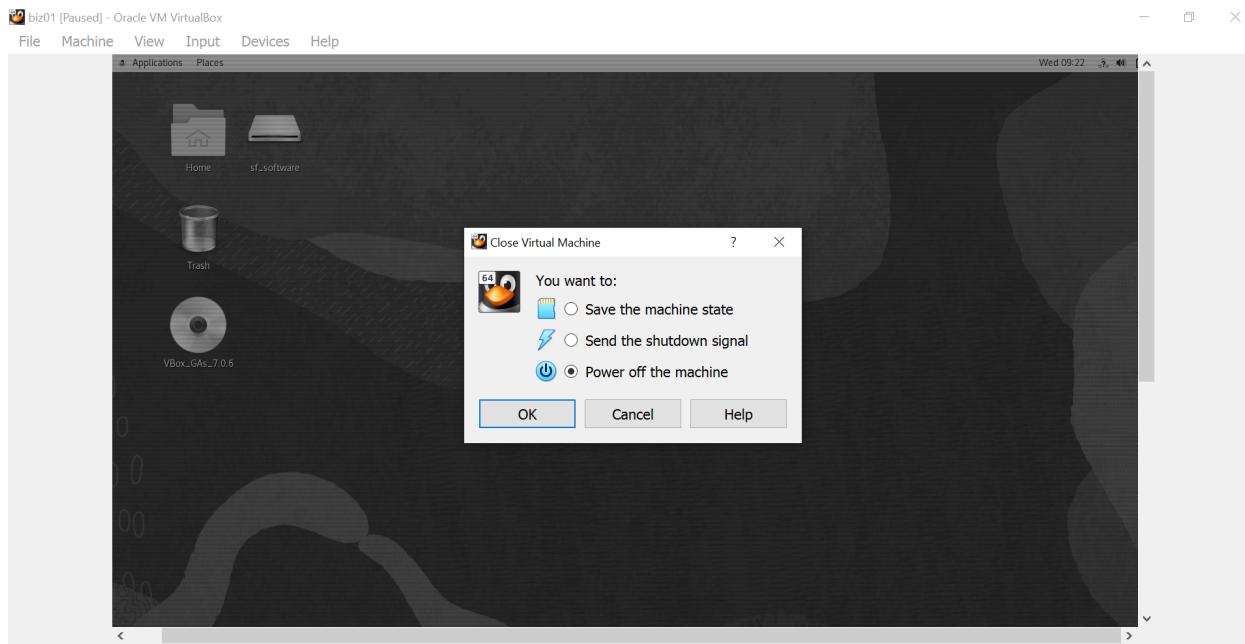




Set both **Shared Clipboard** and **Drag and Drop** in the VirtualBox Devices menu to **Bidirectional**.



Power off the machine for now and restart the VM:

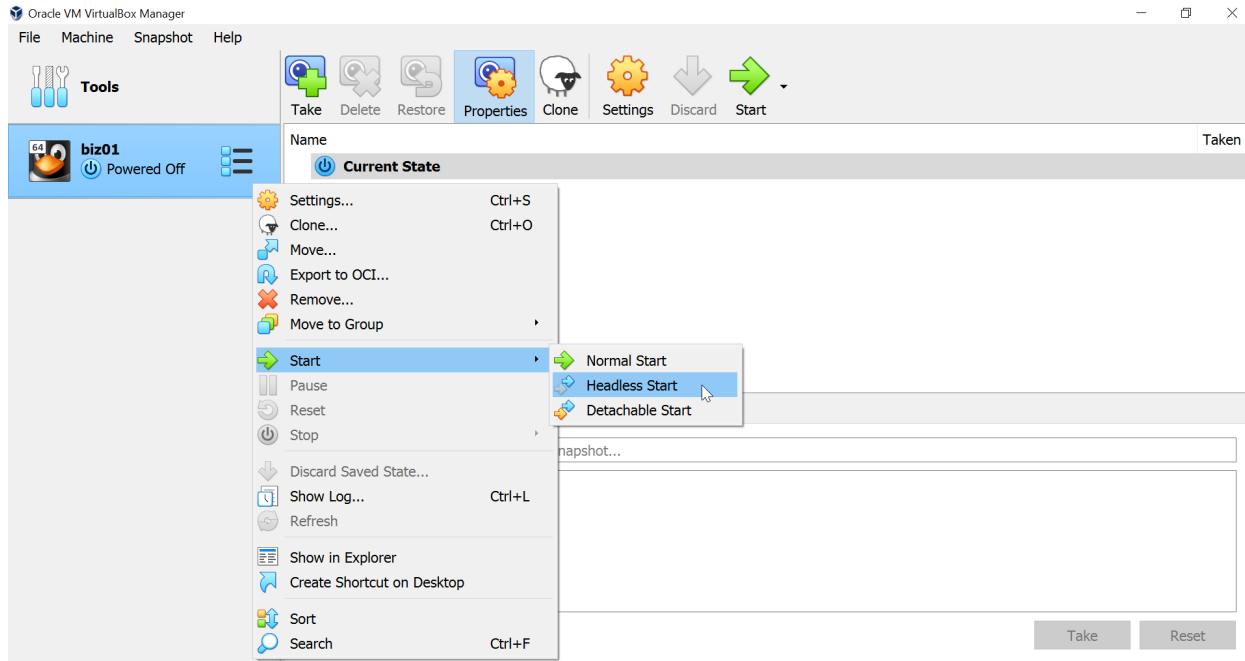


7. Preconfigure Node biz01 for Grid Infrastructure Installation

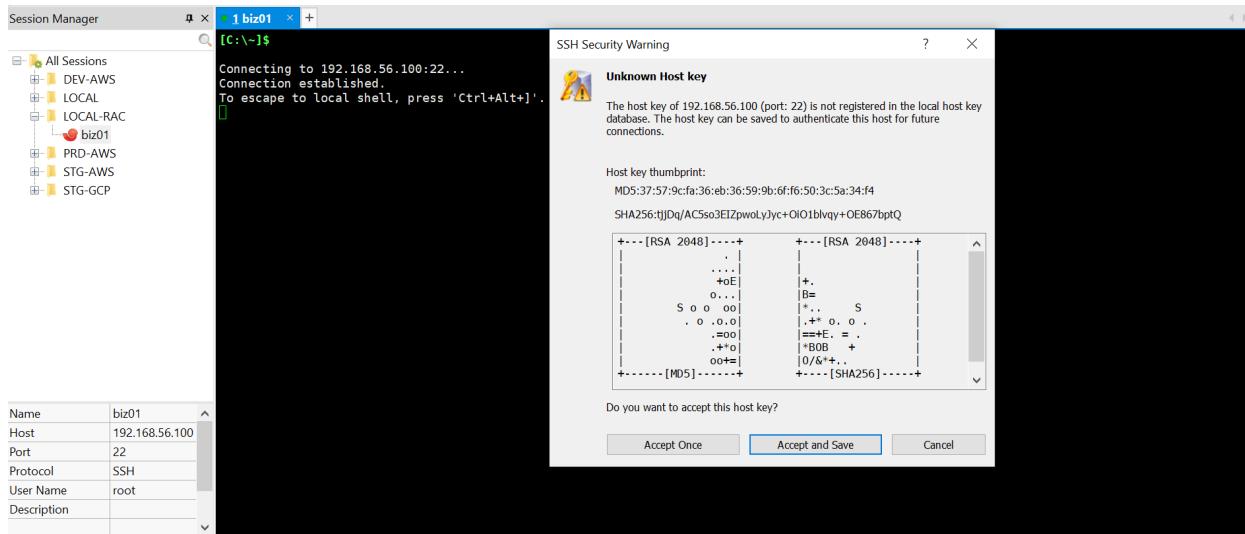
From this point onward until the end of Preconfigure Node biz02, I'll use script only without GUI on Guest VM to speed things up.

I use Xshell as my SSH client tool. You can use any tool which works for you.

In the VirtualBox, start the Virtual Machine Headless:



SSH into the virtual machine with IP address we setup earlier (192.168.56.100):



Update Kmod and Kmod-libs Package Using YUM:

```
[root@biz01 ~]# yum install kmod
```

....

....

Updated:

```
kmod.x86_64 0:20-28.0.3.el7
```

Complete!

```
[root@biz01 ~]# yum install kmod-libs
```

....

....

Updated:

```
kmod-libs.x86_64 0:20-28.0.3.el7
```

Complete!

Install The oracle-database-server-preinstall-19c Using YUM:

```
[root@biz01 ~]# yum install oracle-database-preinstall-19c -y
```

....

....

Installed:

```
oracle-database-preinstall-19c.x86_64 0:1.0-3.el7
```

Dependency Installed:

```
compat-libcap1.x86_64 0:1.10-7.el7          ksh.x86_64 0:20120801-144.0.1.el7_9
```

```
libaio-devel.x86_64 0:0.3.109-13.el7
```

Complete!

Install The Asmlib Package Support:

```
[root@biz01 ~]# yum install oracleasm-support
```

....

....

Installed:

```
oracleasm-support.x86_64 0:2.1.11-2.el7
```

Complete!

Download and Install Asmlib Package For Oracle Linux 7:

```
[root@biz01 ~]# cd /media/sf_software/
```

```
[root@biz01 sf_software]# ll
```

```
total 2821496
```

```
-rwxrwx---. 1 root vboxsf 20684 Mar 4 14:32 oracleasmlib-2.0.15-1.el7.x86_64.rpm
```

```
-rwxrwx---. 1 root vboxsf 2889184573 Mar 12 15:29 V982068-01.zip
```

```
[root@biz01 sf_software]# rpm -ivh oracleasmlib-2.0.15-1.el7.x86_64.rpm
```

Create Oracle Grid User:

```
[root@biz01 sf_software]# id oracle
```

```
uid=54321(oracle) gid=54321(oinstall)
```

```
groups=54321(oinstall),54322(dba),54323(oper),54324(backupdba),54325(dgdba),54326(kmdba),54330(racd  
ba)
```

```
[root@biz01 sf_software]# /usr/sbin/groupadd -g 54331 asmadmin
```

```
[root@biz01 sf_software]# /usr/sbin/groupadd -g 54332 asmdba
```

```
[root@biz01 sf_software]# /usr/sbin/groupadd -g 54333 asmoper
```

```
[root@biz01 sf_software]# /usr/sbin/useradd -g oinstall -G asmdba,dba,asmadmin,asmoper,vboxsf grid
```

Configure Oracle ASM Lib:

```
[root@biz01 sf_software]# /usr/sbin/oracleasm configure -i
```

```
Configuring the Oracle ASM library driver.
```

This will configure the on-boot properties of the Oracle ASM library driver. The following questions will determine whether the driver is loaded on boot and what permissions it will have. The current values will be shown in brackets ('[]'). Hitting <ENTER> without typing an answer will keep that current value. Ctrl-C will abort.

```
Default user to own the driver interface []: grid
```

```
Default group to own the driver interface []: asmadmin
Start Oracle ASM library driver on boot (y/n) [n]: y
Scan for Oracle ASM disks on boot (y/n) [y]:
Writing Oracle ASM library driver configuration: done
[root@biz01 sf_software]# /usr/sbin/oracleasm init
Creating /dev/oracleasm mount point: /dev/oracleasm
Loading module "oracleasm": oracleasm
Configuring "oracleasm" to use device physical block size
Mounting ASMLib driver filesystem: /dev/oracleasm
```

```
[root@biz01 sf_software]# /usr/sbin/oracleasm status
Checking if ASM is loaded: yes
Checking if /dev/oracleasm is mounted: yes
```

Create Directory for Grid Infrastructure:

```
[root@biz01 sf_software]# cd /
[root@biz01 /]# mkdir -p u01/app
[root@biz01 /]# cd /u01
[root@biz01 u01]# chown grid:oinstall app
```

Modify Group Membership of Oracle User:

```
[root@biz01 u01]# /usr/sbin/usermod -g oinstall -G asmdba,dba,asmadmin,vboxsf oracle
[root@biz01 u01]# id oracle
uid=54321(oracle) gid=54321(oinstall)
groups=54321(oinstall),986(vboxsf),54322(dba),54331(asmadmin),54332(asdba)
```

Set Password of Grid and Oracle User:

```
[root@biz01 u01]# passwd grid
Changing password for user grid.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[root@biz01 u01]# passwd oracle
Changing password for user oracle.
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: all authentication tokens updated successfully.
```

Configure Hosts File:

```
[root@biz01 u01]# nano /etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
```

```
::1      localhost localhost.localdomain localhost6 localhost6.localdomain6
192.168.56.100 biz01.localdomain biz01
192.168.56.101 biz02.localdomain biz02
192.168.10.100 biz01-priv.localdomain biz01-priv
192.168.10.101 biz02-priv.localdomain biz02-priv
192.168.56.110 biz01-vip.localdomain biz01-vip
192.168.56.111 biz02-vip.localdomain biz02-vip
```

Disable SELINUX:

```
[root@biz01 u01]# nano /etc/selinux/config
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#   enforcing - SELinux security policy is enforced.
#   permissive - SELinux prints warnings instead of enforcing.
#   disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINUXTYPE= can take one of three values:
#   targeted - Targeted processes are protected,
#   minimum - Modification of targeted policy. Only selected processes are protected.
#   mls - Multi Level Security protection.
```

Stop and Disable Firewalld:

```
[root@biz01 u01]# systemctl stop firewalld
[root@biz01 u01]# systemctl disable firewalld
Removed symlink /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
```

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- REL: Oracle Database Grid Infrastructure 18.0.0.0.0
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<input checked="" type="checkbox"/> Oracle Database Grid Infrastructure 19.3.0.0.0 for Linux x86-64				Download
<input checked="" type="checkbox"/> V982068-01.zip	Oracle Database Grid Infrastructure 19.3.0.0.0 for Linux x86-64, 2.7 GB			
Total 1 distinct files Total Size 2.7 GB				
NOTE: Some downloaded parts may be split into more than one file.				
Back	View Digest Details	WGET Options	Restore	Download

Click on **V982068-01.zip** to download the file. On the shared folder we created earlier at **C:\software**, create subfolder inside it named **Linux_x64_1930_grid_installer**. Save the file there.

Using Windows Explorer, create subfolder **cv\rpm** inside **C:\software\Linux_x64_1930_grid_installer**.

And then open the file **V982068-01.zip** that we downloaded. Head to the **cv\rpm**, copy file **cvuqdisk-1.0.10-1.rpm**:

Name	Type
cvuqdisk-1.0.10-1.rpm	RPM File

Go to the **C:\software\Linux_x64_1930_grid_installer\cv\rpm**, and then paste the file there:

	«	software	»	Linux_x64_1930_grid_installer	»	cv	»	rpm	▼
^									
Name					Date modified				
cvuqdisk-1.0.10-1.rpm					13/3/2019 9:25 AM				

Install the CVUQDISK Package

```
[root@biz01 u01]# cd /media/sf_software/Linux_x64_1930_grid_installer/cv/rpm
[root@biz01 rpm]# ls
cvuqdisk-1.0.10-1.rpm
[root@biz01 rpm]# rpm -ivh cvuqdisk-1.0.10-1.rpm
Preparing... ################################ [100%]
Using default group oinstall to install package
Updating / installing...
1:cvuqdisk-1.0.10-1 ################################ [100%]
```

Configure DNS Server using DNSMASQ:

Create file /etc/bizdns for storing our RAC Cluster DNS configuration:

```
[root@biz01 rpm]# nano /etc/bizdns
192.168.56.120 biz-scan.localdomain biz-scan
192.168.56.121 biz-scan.localdomain biz-scan
192.168.56.122 biz-scan.localdomain biz-scan
```

Then, edit /etc/dnsmasq.conf to include the /etc/bizdns file:

```
[root@biz01 rpm]# nano /etc/dnsmasq.conf
addn-hosts=/etc/bizdns
```

Start and Enable DNSMASQ Service:

```
[root@biz01 rpm]# systemctl start dnsmasq
[root@biz01 rpm]# systemctl enable dnsmasq
Created symlink from /etc/systemd/system/multi-user.target.wants/dnsmasq.service to
/usr/lib/systemd/system/dnsmasq.service.
[root@biz01 rpm]# systemctl status dnsmasq
● dnsmasq.service - DNS caching server.
   Loaded: loaded (/usr/lib/systemd/system/dnsmasq.service; enabled; vendor preset: disabled)
   Active: failed (Result: exit-code) since Mon 2023-03-13 09:16:26 WIB; 35s ago
```

Main PID: 7840 (code=exited, status=2)

```
Mar 13 09:16:26 biz01.localdomain systemd[1]: Started DNS caching server..  
Mar 13 09:16:26 biz01.localdomain systemd[1]: Starting DNS caching server....  
Mar 13 09:16:26 biz01.localdomain dnsmasq[7840]: dnsmasq: failed to create listening socket for port  
53: Address already in use  
Mar 13 09:16:26 biz01.localdomain systemd[1]: dnsmasq.service: main process exited, code=exited,  
status=2/INVALIDARGUMENT  
Mar 13 09:16:26 biz01.localdomain systemd[1]: Unit dnsmasq.service entered failed state.  
Mar 13 09:16:26 biz01.localdomain systemd[1]: dnsmasq.service failed.
```

If we find error above when starting the dnsmasq, it means the port is already in use. We should check the netstat to find what is using the port:

```
[root@biz01 rpm]# netstat -tulpn
```

Active Internet connections (only servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State	PID/Program name
tcp	0	0	0.0.0.0:111	0.0.0.0:*	LISTEN	1/systemd
tcp	0	0	192.168.122.1:53	0.0.0.0:*	LISTEN	1550/dnsmasq
tcp	0	0	0.0.0.0:22	0.0.0.0:*	LISTEN	1375/sshd
tcp	0	0	127.0.0.1:631	0.0.0.0:*	LISTEN	1373/cupsd
tcp	0	0	127.0.0.1:25	0.0.0.0:*	LISTEN	1628/master
tcp	0	0	127.0.0.1:6010	0.0.0.0:*	LISTEN	1920/sshd: root@pts
tcp6	0	0	:::111	:::*	LISTEN	1/systemd
tcp6	0	0	:::22	:::*	LISTEN	1375/sshd
tcp6	0	0	::1:631	:::*	LISTEN	1373/cupsd
tcp6	0	0	::1:25	:::*	LISTEN	1628/master
tcp6	0	0	::1:6010	:::*	LISTEN	1920/sshd: root@pts
udp	0	0	192.168.122.1:53	0.0.0.0:*		1550/dnsmasq
udp	0	0	0.0.0.0:67	0.0.0.0:*		1550/dnsmasq
udp	0	0	0.0.0.0:68	0.0.0.0:*		986/dhclient
udp	0	0	0.0.0.0:53726	0.0.0.0:*		687/avahi-daemon: r
udp	0	0	0.0.0.0:13067	0.0.0.0:*		986/dhclient
udp	0	0	0.0.0.0:5353	0.0.0.0:*		687/avahi-daemon: r
udp6	0	0	::1988	:::*		986/dhclient

We found out that the existing dnsmasq is already using the port 53 using Local Address 192.168.122.1.

```
[root@biz01 rpm]# ifconfig -a
```

```
virbr0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500  
        inet 192.168.122.1 netmask 255.255.255.0 broadcast 192.168.122.255  
              ether 52:54:00:2e:e8:7b txqueuelen 0 (Ethernet)  
                    RX packets 0 bytes 0 (0.0 B)  
                    RX errors 0 dropped 0 overruns 0 frame 0
```

```
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

It turns out to be the bridged adapter of the virtual machine that is used to communicate with the host machine. To setup this RAC cluster, we need to replace this dnsmasq with the config from the one we setup privately above, therefore we need to kill the existing dnsmasq process by 192.168.122.1:

```
[root@biz01 rpm]# netstat -tulpn
```

Active Internet connections (only servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State	PID/Program name
tcp	0	0	0.0.0.0:111	0.0.0.0:*	LISTEN	1/systemd
tcp	0	0	192.168.122.1:53	0.0.0.0:*	LISTEN	1550/dnsmasq

```
[root@biz01 rpm]# kill -9 1550
```

Start again the DNSMASQ Service:

```
[root@biz01 rpm]# systemctl start dnsmasq
[root@biz01 rpm]# systemctl status dnsmasq
```

- dnsmasq.service - DNS caching server.

 Loaded: loaded (/usr/lib/systemd/system/dnsmasq.service; enabled; vendor preset: disabled)

 Active: active (running) since Mon 2023-03-13 10:22:51 WIB; 9s ago

 Main PID: 11481 (dnsmasq)

 CGroup: /system.slice/dnsmasq.service
 └─11481 /usr/sbin/dnsmasq -k

```
Mar 13 10:22:51 biz01.localdomain systemd[1]: Started DNS caching server..
Mar 13 10:22:51 biz01.localdomain systemd[1]: Starting DNS caching server....
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: started, version 2.76 cachesize 150
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: compile time options: IPv6 GNU-getopt DBus
no-i18n IDN DHCP DHCPv6 no-Lua TFTP no-conntrack... inotify
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: reading /etc/resolv.conf
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: using nameserver 192.168.18.1#53
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: read /etc/hosts - 8 addresses
Mar 13 10:22:51 biz01.localdomain dnsmasq[11481]: read /etc/bizdns - 3 addresses
Hint: Some lines were ellipsized, use -l to show in full.
```

Now, edit Resolver to use the localhost as nameserver:

```
[root@biz01 rpm]# nano /etc/resolv.conf
# Generated by NetworkManager
search localdomain
nameserver 127.0.0.1
```

Verify the SCAN using nslookup:

```
[root@biz01 rpm]# nslookup biz-scan
Server: 127.0.0.1
Address: 127.0.0.1#53
```

```
Name:      biz-scan.localdomain
Address: 192.168.56.122
Name:      biz-scan.localdomain
Address: 192.168.56.120
Name:      biz-scan.localdomain
Address: 192.168.56.121
```

Protect Resolver Config File by making it immutable:

```
[root@biz01 ~]# chattr +i /etc/resolv.conf
```

Set Resources Limits for Oracle and Grid

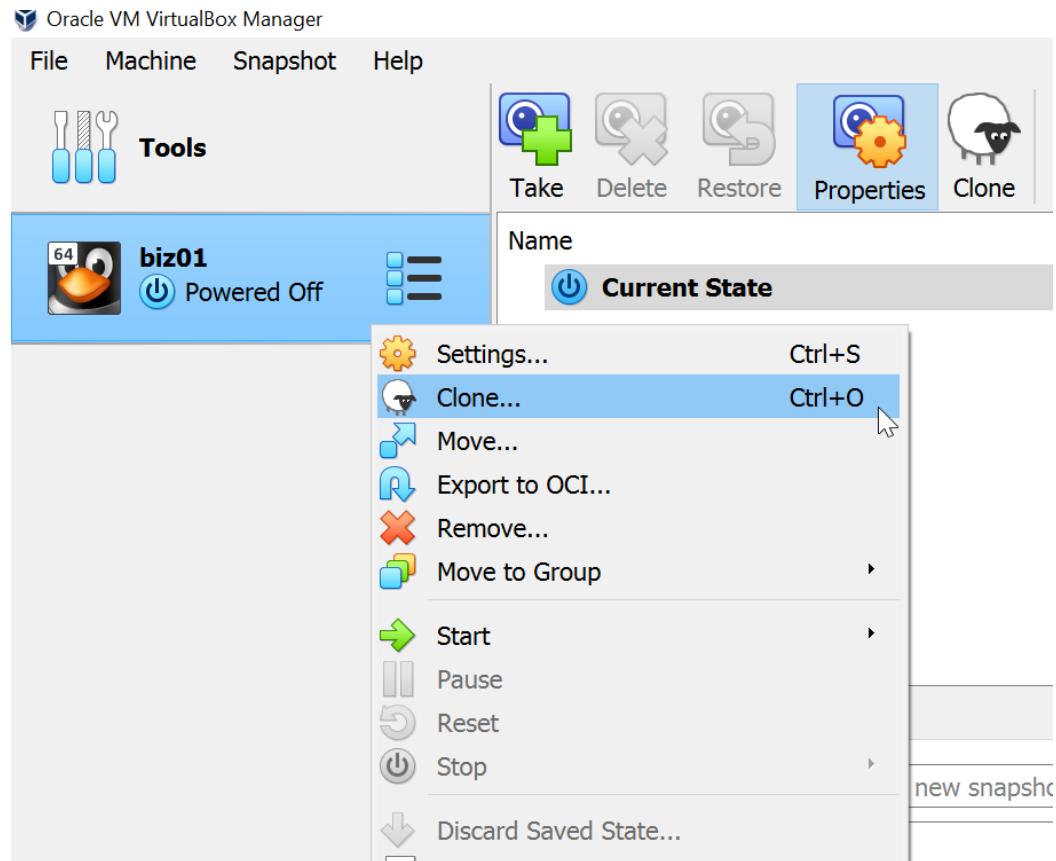
```
[root@biz01 ~]# nano /etc/security/limits.conf
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 1024
oracle hard nofile 65536
grid soft nproc 2047
grid hard nproc 16384
grid soft nofile 1024
grid hard nofile 65536
```

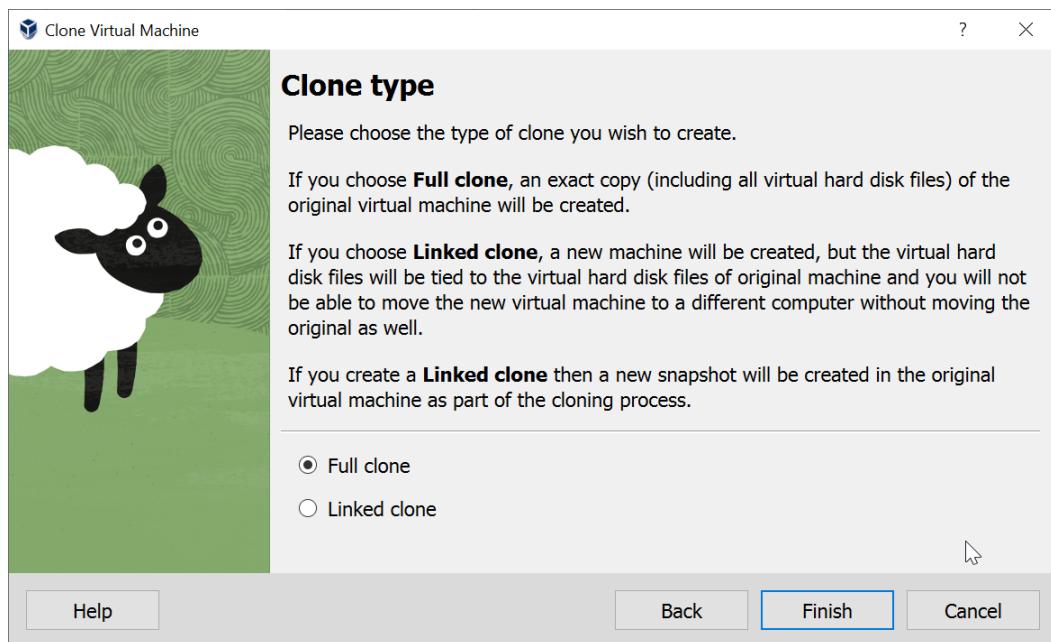
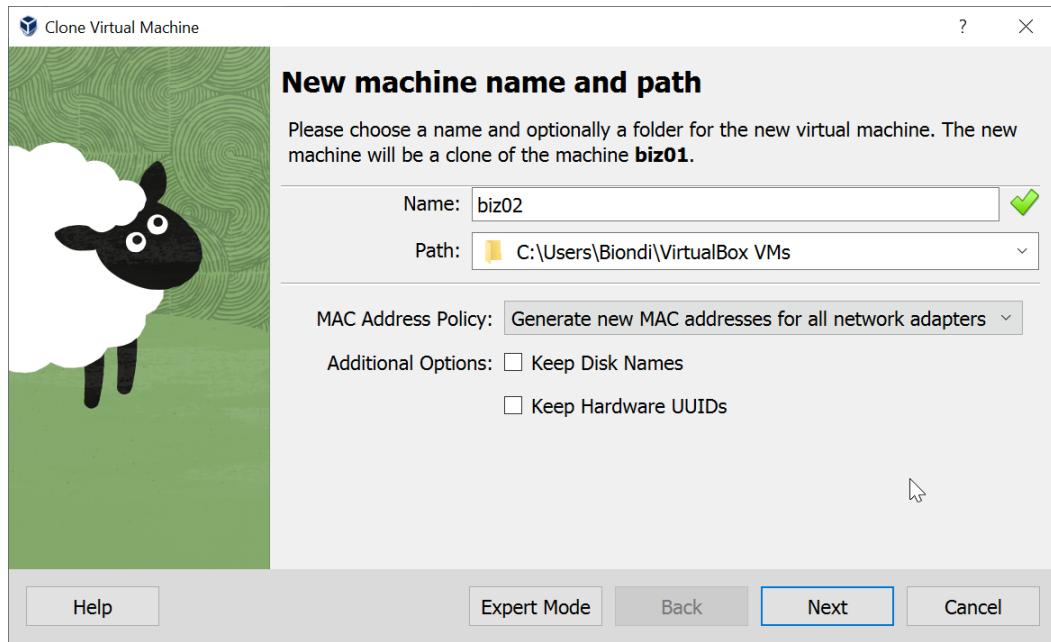
Create Additional Swap File 4 GB

```
[root@biz01 ~]# dd if=/dev/zero of=/swapfile bs=1024 count=4194304
4194304+0 records in
4194304+0 records out
4294967296 bytes (4.3 GB) copied, 10.4623 s, 411 MB/s
[root@biz01 ~]# chmod 0600 /swapfile
[root@biz01 ~]# mkswap /swapfile
Setting up swapspace version 1, size = 4194300 KiB
no label, UUID=7d987e1c-a58e-46f1-9044-7fb759e2cac7
[root@biz01 ~]# swapon /swapfile
[root@biz01 ~]# nano /etc/fstab
/swapfile      swap      swap  defaults      0 0
```

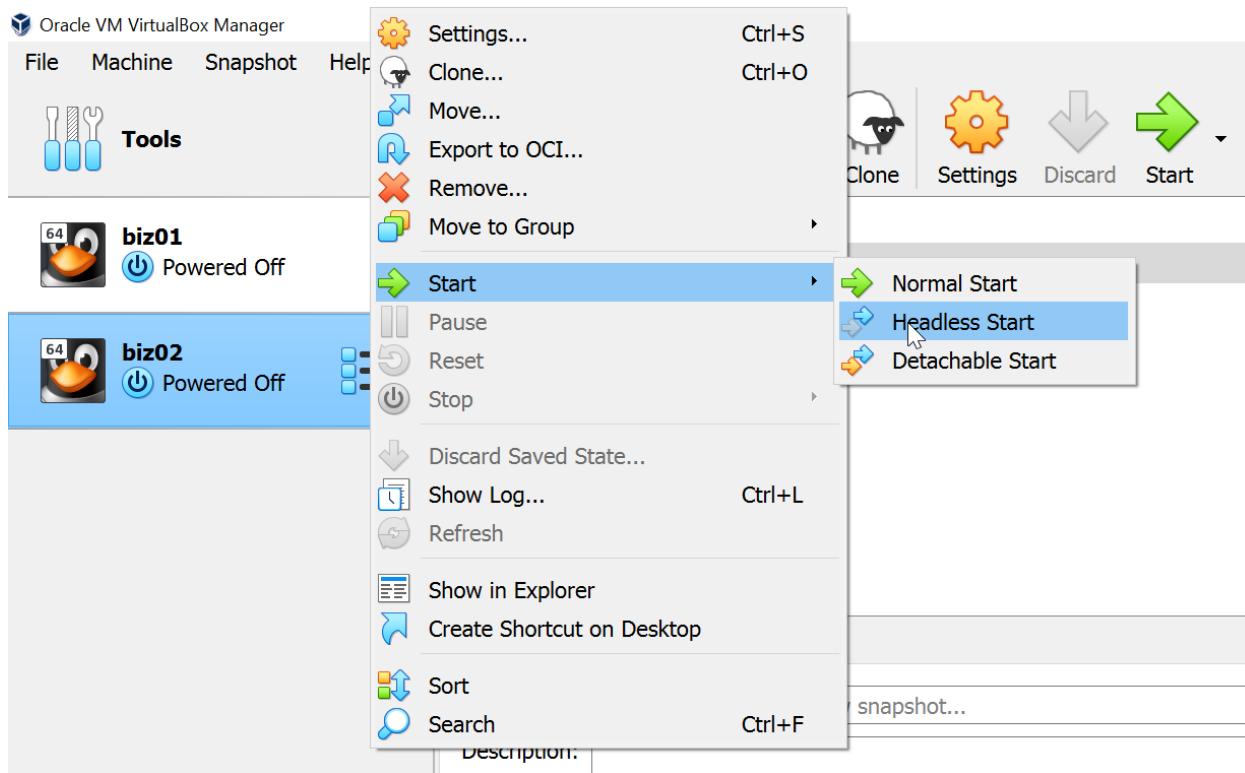
8. Shutdown the Virtual Machine **biz01** to Prepare for Cloning
9. Preconfigure Node **biz02** for Grid Infrastructure Installation

Clone VM.





Start Node biz02, Change Hostname and Network Scripts



Change Hostname:

```
[root@biz01 ~]# nano /etc/hostname  
biz02.localdomain  
[root@biz01 ~]# systemctl restart systemd-hostnamed  
[root@biz01 ~]# hostname  
biz02.localdomain
```

Identify Network Scripts for 2 Adapters Handling Public IP and Private IP:

```
[root@biz01 ~]# cd /etc/sysconfig/network-scripts  
[root@biz01 network-scripts]# ls -ltr ifcfg*  
-rw-r--r--. 1 root root 254 May  3 2017 ifcfg-lo  
-rw-r--r--. 1 root root 298 Mar 12 19:55 ifcfg-enp0s9  
-rw-r--r--. 1 root root 330 Mar 12 19:55 ifcfg-enp0s8  
-rw-r--r--. 1 root root 330 Mar 12 19:55 ifcfg-enp0s3
```

For Each Script (ifcfg-enp0s8, ifcfg-enp0s3), Change IPADDR Value and Delete UUID Line:

```
[root@biz01 network-scripts]# nano ifcfg-enp0s3  
TYPE=Ethernet  
PROXY_METHOD=none  
BROWSER_ONLY=no  
BOOTPROTO=none
```

```
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=enp0s3
DEVICE=enp0s3
ONBOOT=yes
IPADDR=192.168.56.101
PREFIX=24
IPV6_PRIVACY=no
```

```
[root@biz01 network-scripts]# nano ifcfg-enp0s8
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=enp0s8
DEVICE=enp0s8
ONBOOT=yes
IPADDR=192.168.10.101
PREFIX=24
IPV6_PRIVACY=no
```

10. Shutdown the Virtual Machine biz02

11. Create Shared Disks for ASM

Create 4 Disks

Disks Size:

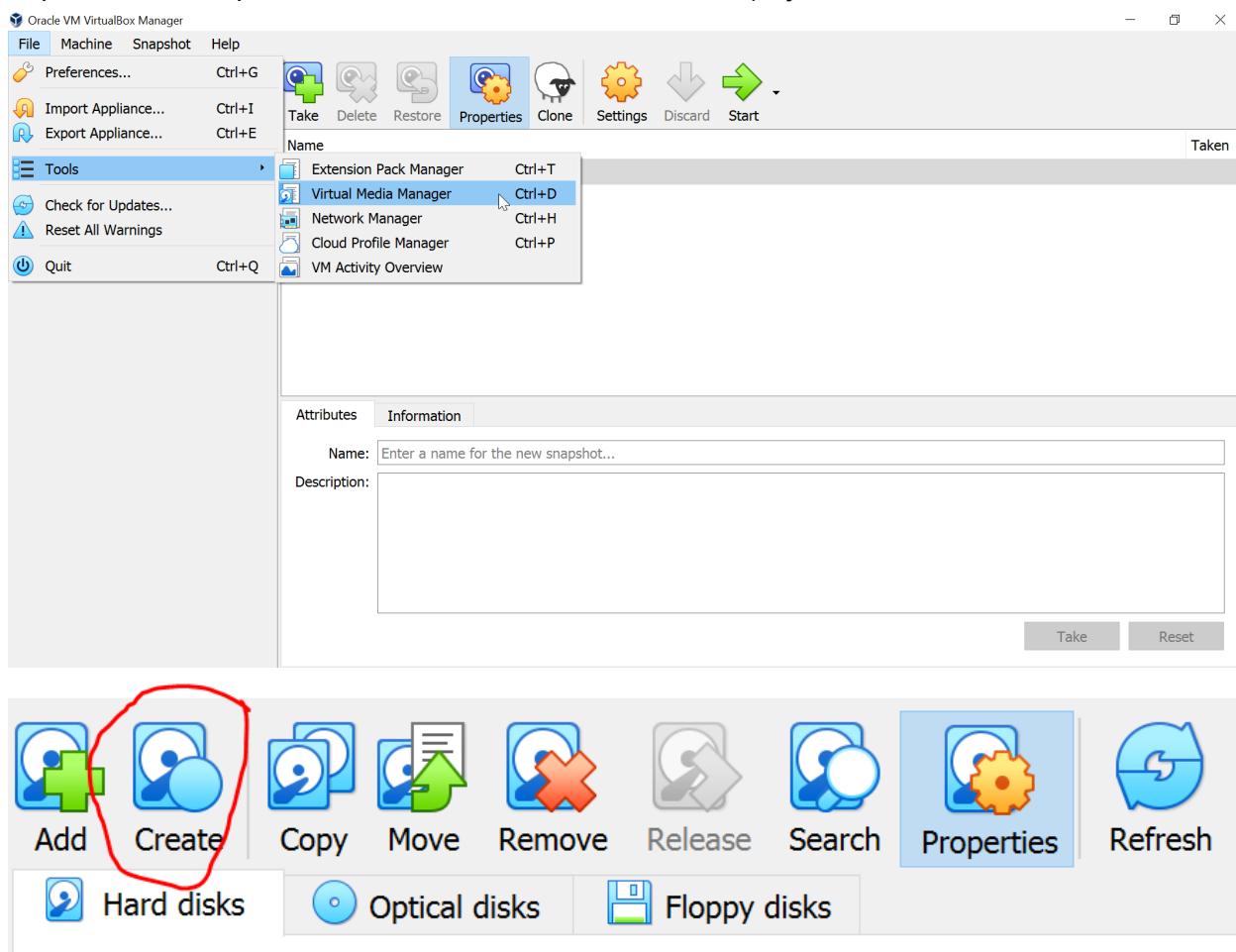
ASM1: 40 GB

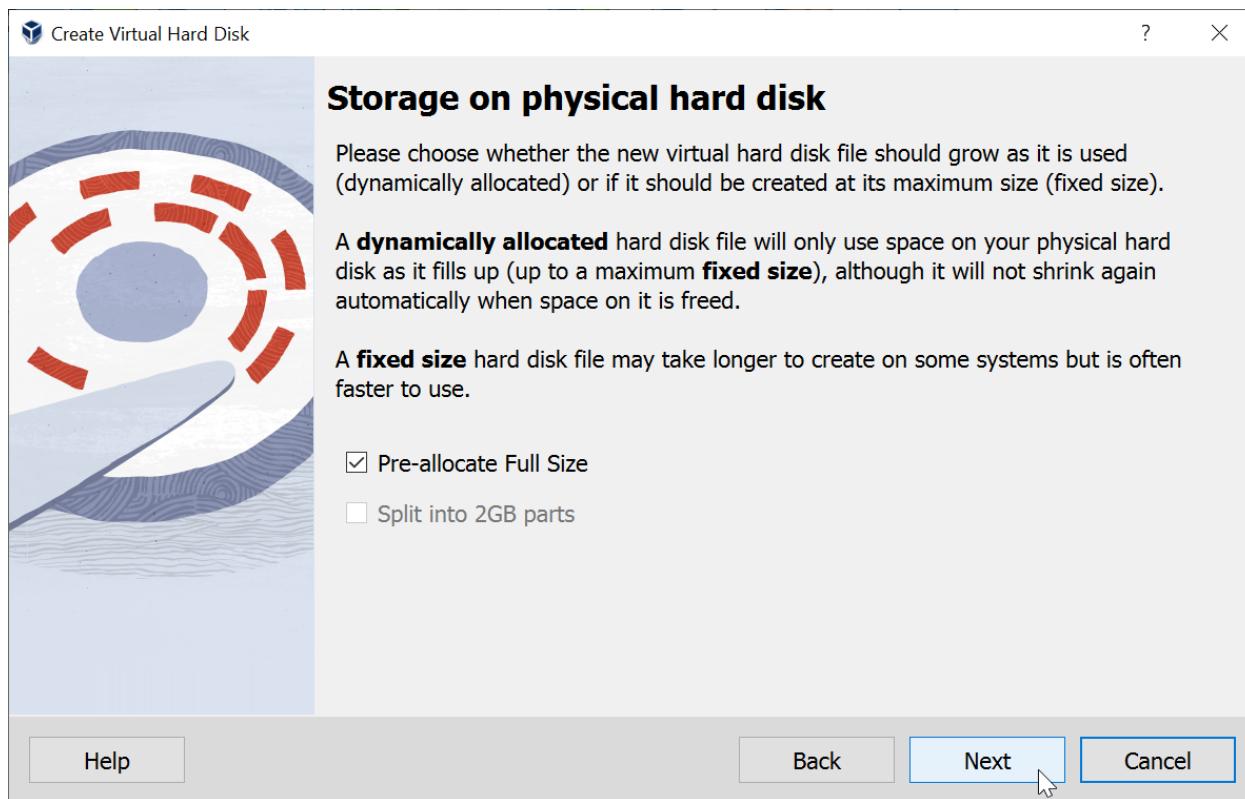
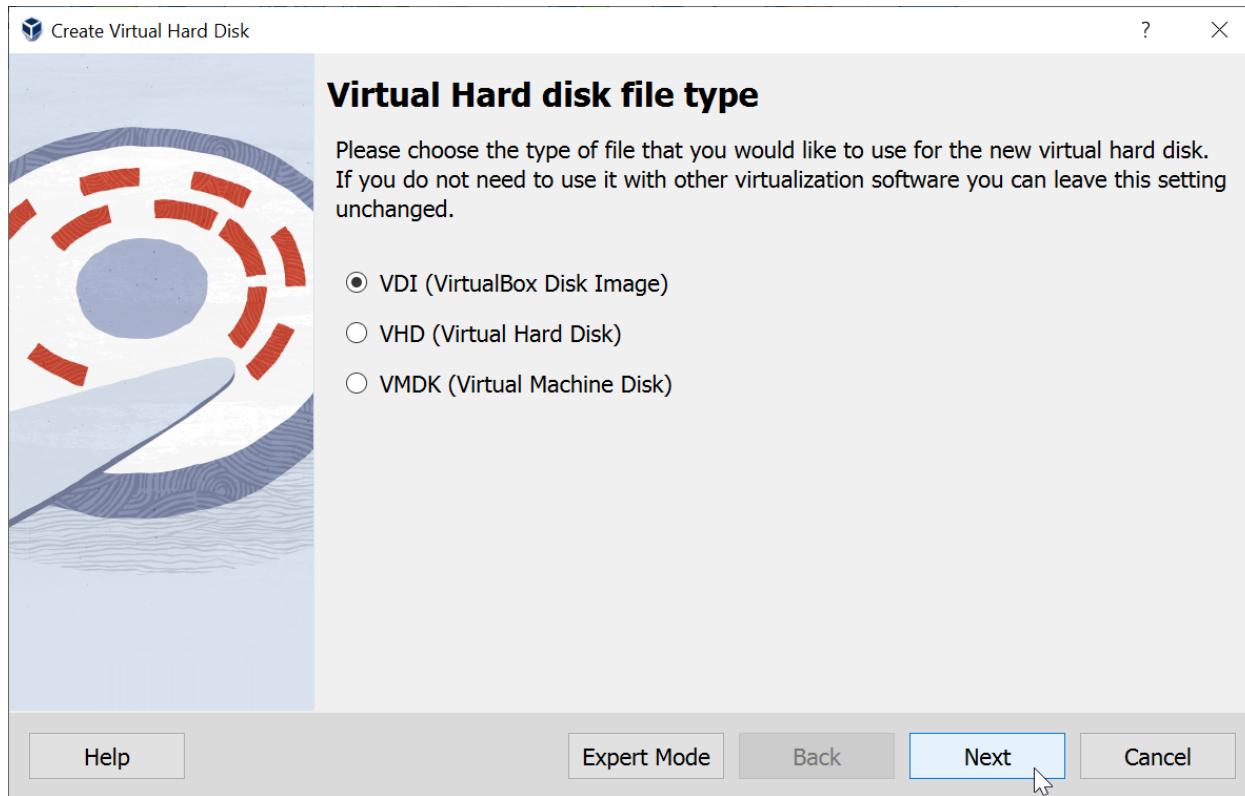
ASM2: 7.5 GB

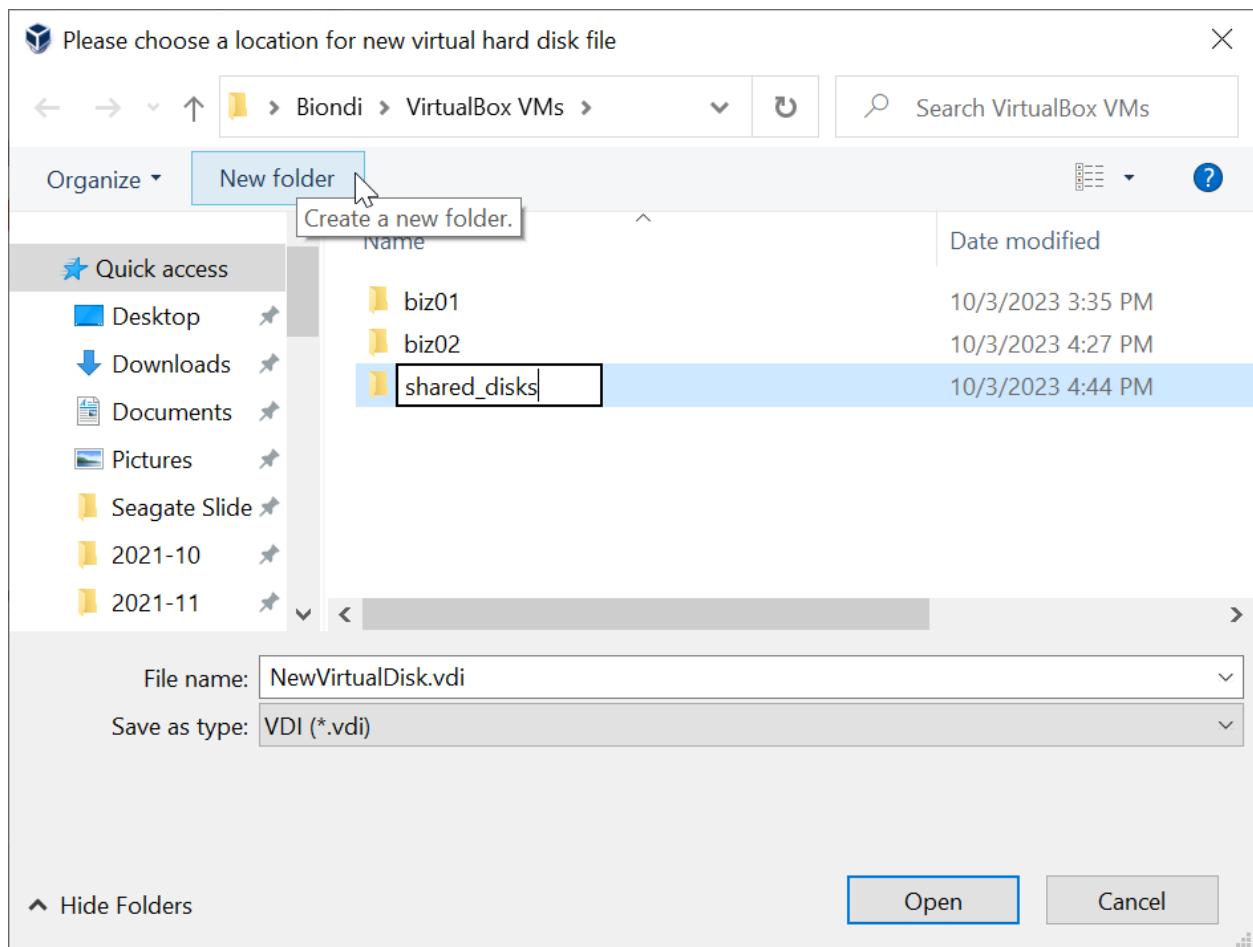
ASM3: 7.5 GB

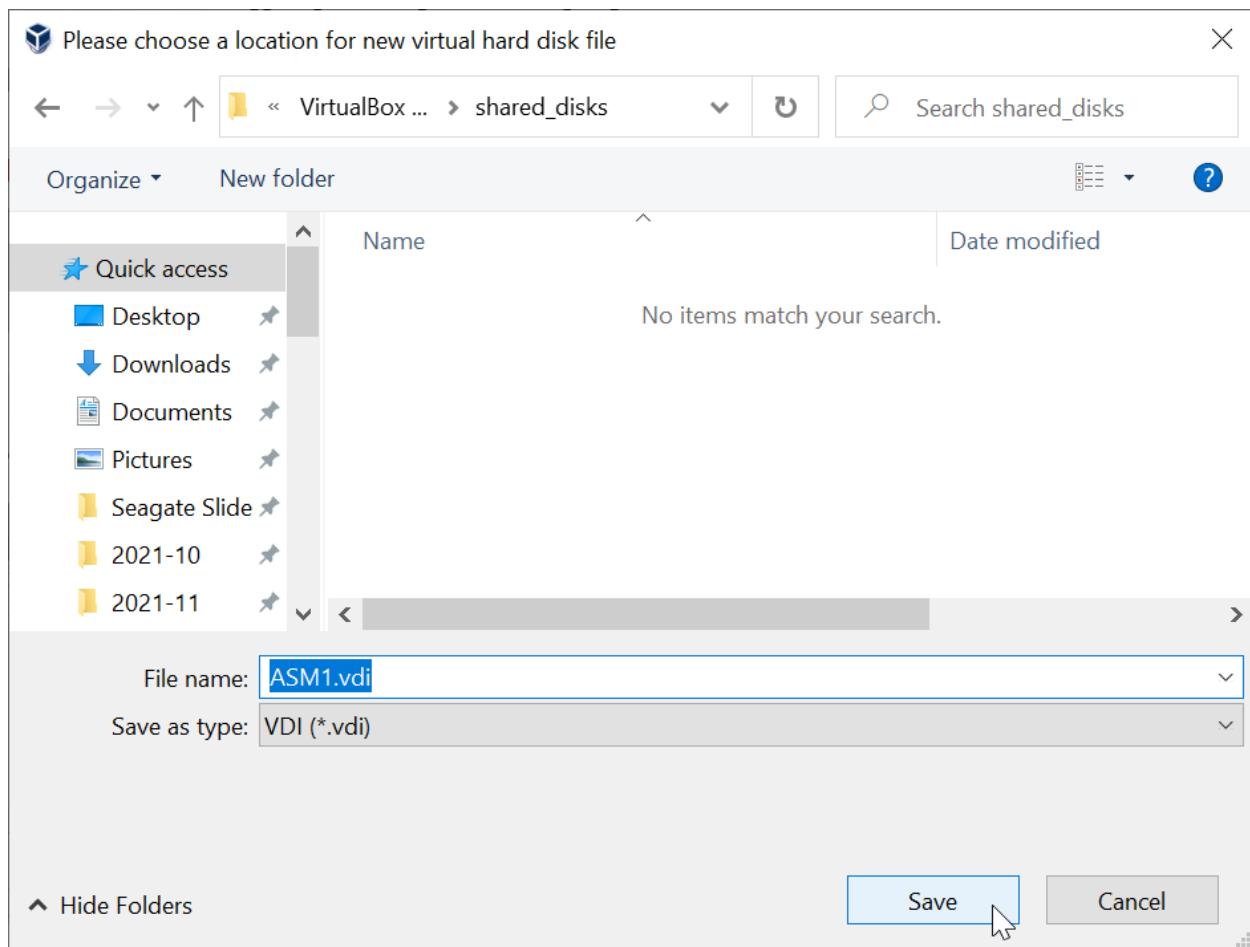
ASM4: 25 GB

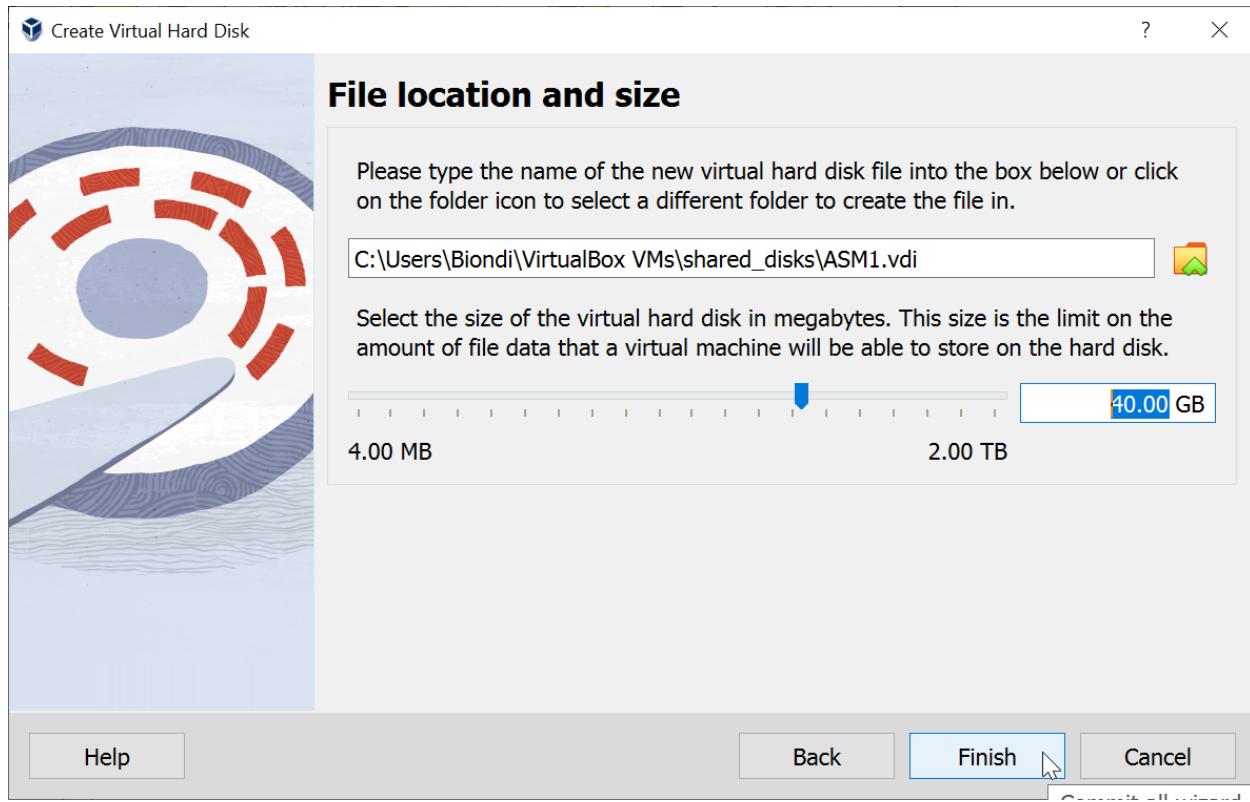
Repeat Below Steps for ASM1, ASM2, ASM3, and ASM4 (adjusted with the name and size above):



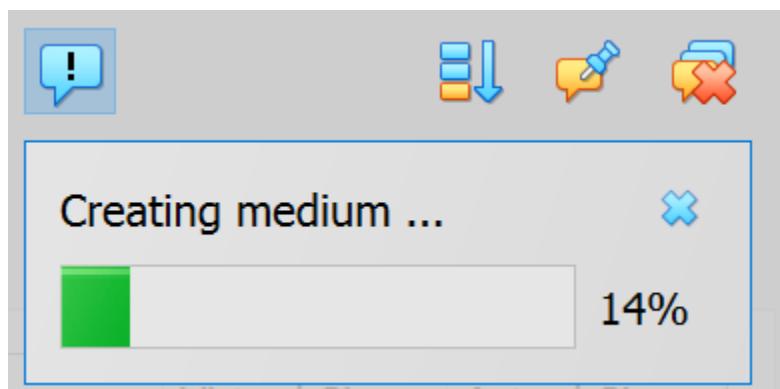




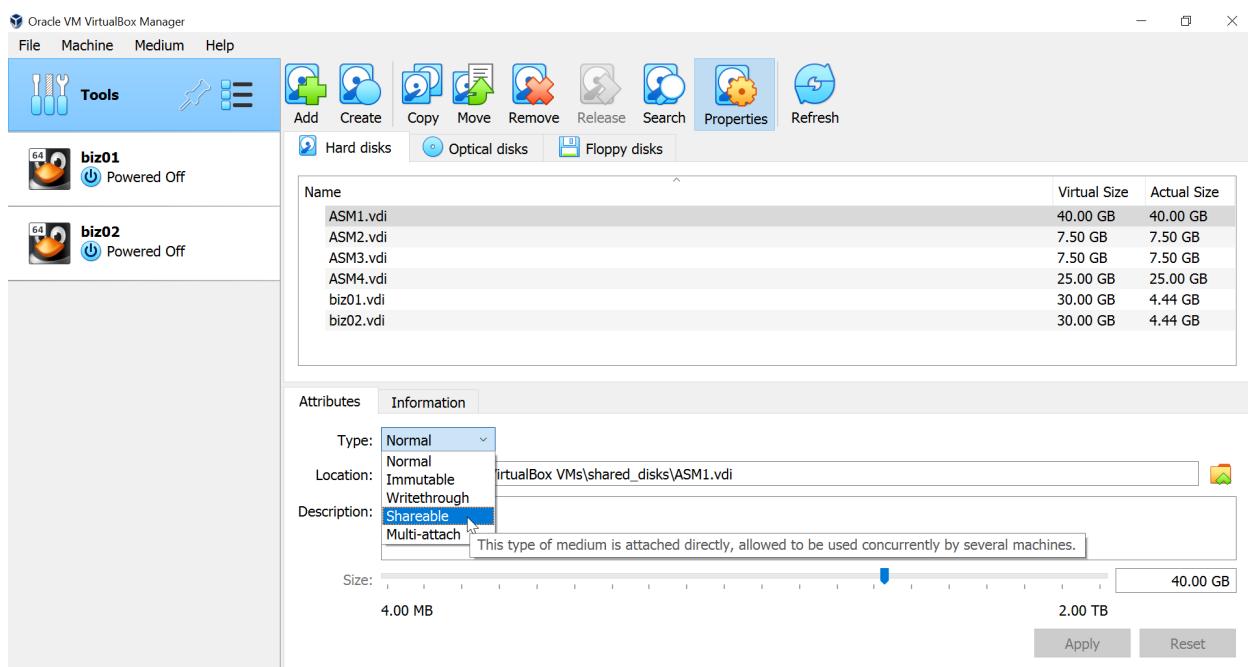
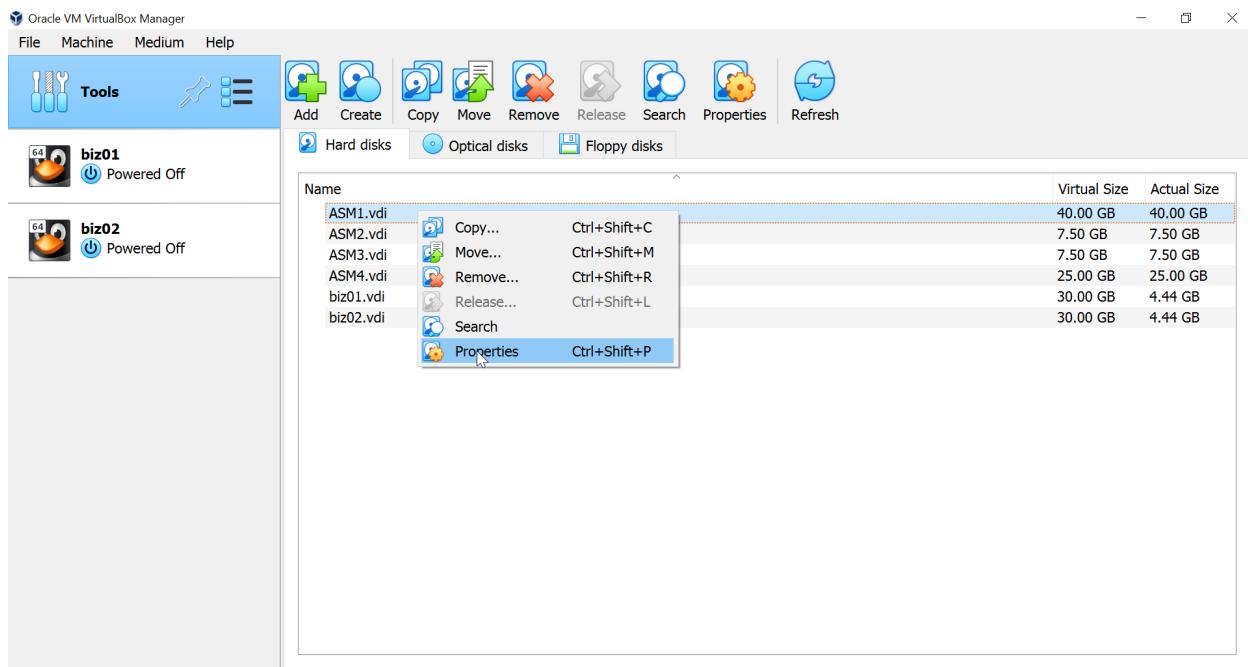




Click **Finish** and wait until the creation of the disk finishes.



Make the disks shareable



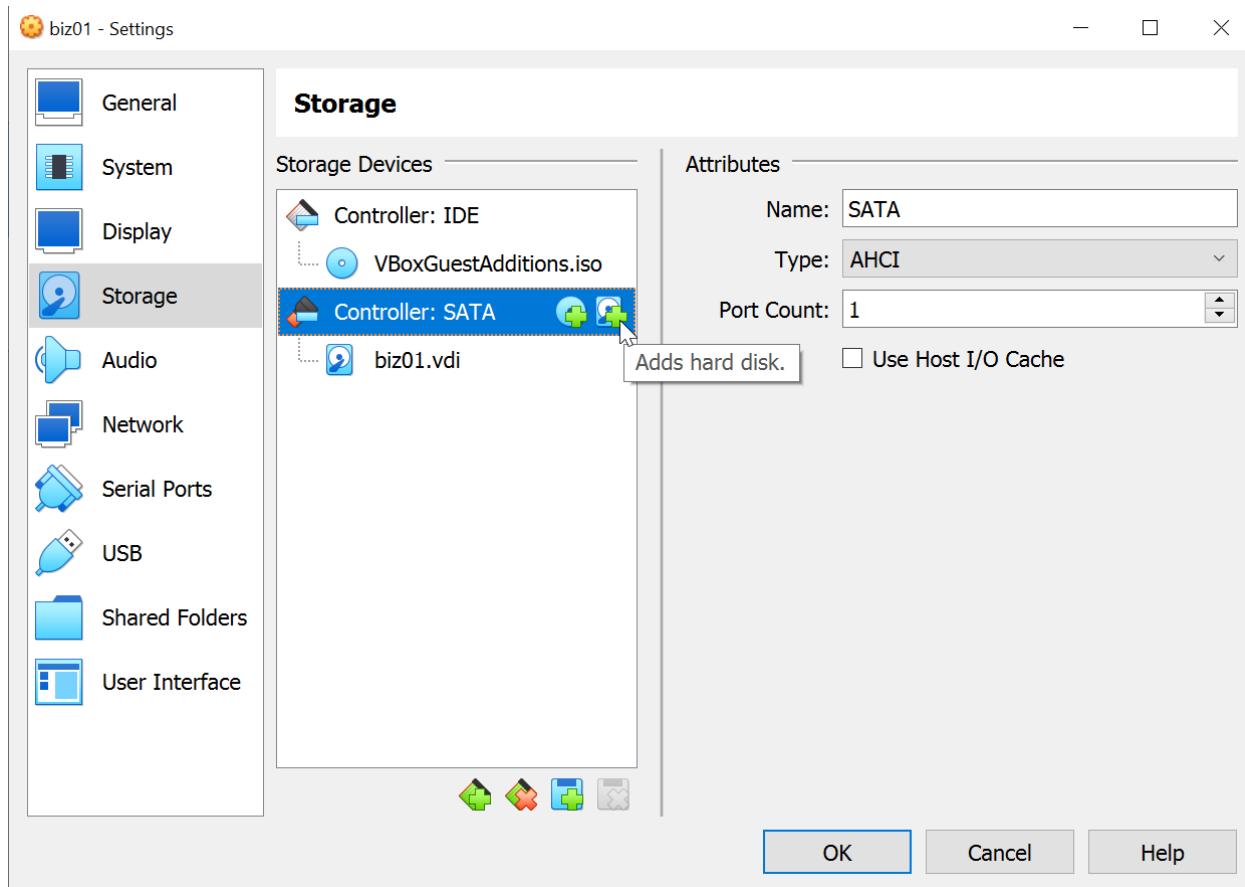
Click **Apply**.

Attach The Disks to biz01

Right Click on VM biz01, then click Settings.

Go to the Storage section.

Repeat 2 steps in the 2 images below for ASM1.vdi until ASM4.vdi:



biz01 - Hard Disk Selector

Medium Selector

Add Create Refresh

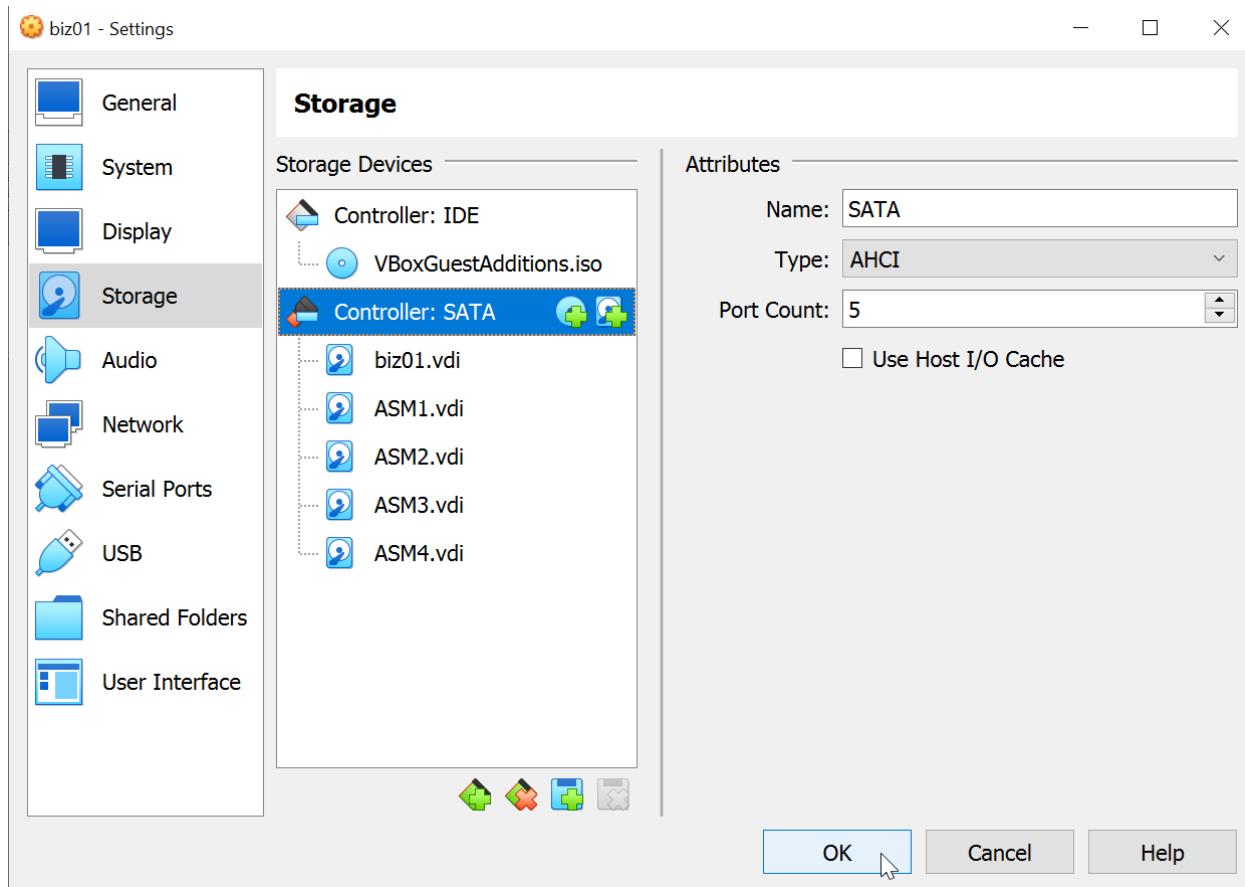
Name	Virtual Size	Actual Size
Attached		
biz01.vdi	30.00 GB	4.44 GB
biz02.vdi	30.00 GB	4.44 GB
Not Attached		
ASM1.vdi	40.00 GB	40.00 GB
ASM2.vdi	7.50 GB	7.50 GB
ASM3.vdi	7.50 GB	7.50 GB
ASM4.vdi	25.00 GB	25.00 GB

Search By Name

Choose Cancel

The screenshot shows a Windows-style application window titled "biz01 - Hard Disk Selector". At the top are standard window controls: a minimize button, a maximize button, and a close button. Below the title bar is a header labeled "Medium Selector". Underneath is a toolbar with three icons: "Add" (a blue square with a green plus sign), "Create" (a blue square with a white gear and a blue circle), and "Refresh" (a blue square with a circular arrow). The main area is a table with three columns: "Name", "Virtual Size", and "Actual Size". The table has two sections: "Attached" and "Not Attached". The "Attached" section contains two entries: "biz01.vdi" (30.00 GB, 4.44 GB) and "biz02.vdi" (30.00 GB, 4.44 GB). The "Not Attached" section contains four entries: "ASM1.vdi" (40.00 GB, 40.00 GB), "ASM2.vdi" (7.50 GB, 7.50 GB), "ASM3.vdi" (7.50 GB, 7.50 GB), and "ASM4.vdi" (25.00 GB, 25.00 GB). The "ASM1.vdi" row is highlighted with a blue background, indicating it is selected. At the bottom left is a search bar with the placeholder "Search By Name" and a dropdown arrow. To the right of the search bar are two small blue icons. At the bottom right are two buttons: "Choose" (highlighted with a blue border) and "Cancel".

After that, the storage should look like below:



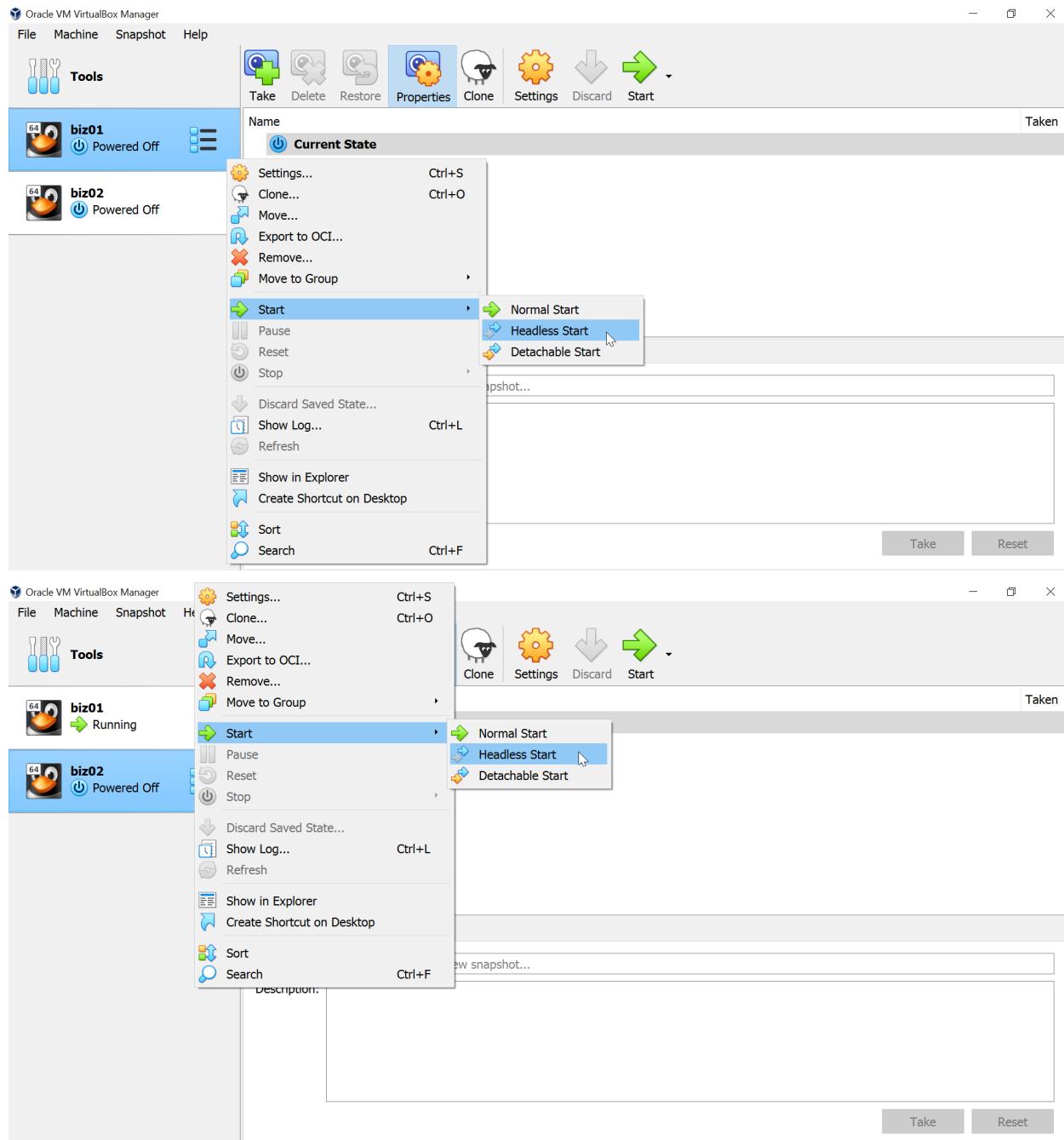
Click **OK**.

Attach The Disks to biz02

Repeat the steps in **Attach The Disks to biz01** for biz02.

12. Configure ASM Disks

Start VM biz01 and biz02



Check Disk Partitions

```
[root@biz01 ~]# fdisk -l
```

Disk /dev/sda: 32.2 GB, 32212254720 bytes, 62914560 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Disk identifier: 0x000a0bd1

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	2048	2099199	1048576	83	Linux
/dev/sda2		2099200	62914559	30407680	8e	Linux LVM

Disk /dev/sdb: 42.9 GB, 42949672960 bytes, 83886080 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sdd: 8053 MB, 8053063680 bytes, 15728640 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sdc: 8053 MB, 8053063680 bytes, 15728640 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sde: 26.8 GB, 26843545600 bytes, 52428800 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mapper/ol_biz01-root: 27.9 GB, 27913093120 bytes, 54517760 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

```
Disk /dev/mapper/ol_biz01-swap: 3221 MB, 3221225472 bytes, 6291456 sectors  
Units = sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

Format Disks

```
[root@biz01 ~]# fdisk /dev/sdb  
Welcome to fdisk (util-linux 2.23.2).
```

```
Changes will remain in memory only, until you decide to write them.  
Be careful before using the write command.
```

```
Device does not contain a recognized partition table  
Building a new DOS disklabel with disk identifier 0x09a79bd1.
```

```
Command (m for help): n
```

```
Partition type:
```

```
 p primary (0 primary, 0 extended, 4 free)  
 e extended
```

```
Select (default p):
```

```
Using default response p
```

```
Partition number (1-4, default 1):
```

```
First sector (2048-83886079, default 2048):
```

```
Using default value 2048
```

```
Last sector, +sectors or +size{K,M,G} (2048-83886079, default 83886079):
```

```
Using default value 83886079
```

```
Partition 1 of type Linux and of size 40 GiB is set
```

```
Command (m for help): w
```

```
The partition table has been altered!
```

```
Calling ioctl() to re-read partition table.
```

```
Syncing disks.
```

```
[root@biz01 ~]# fdisk /dev/sdc
```

```
Welcome to fdisk (util-linux 2.23.2).
```

```
Changes will remain in memory only, until you decide to write them.  
Be careful before using the write command.
```

```
Device does not contain a recognized partition table
```

```
Building a new DOS disklabel with disk identifier 0xe0c2b618.
```

Command (m for help): **n**

Partition type:

 p primary (0 primary, 0 extended, 4 free)

 e extended

Select (default p):

Using default response p

Partition number (1-4, default 1):

First sector (2048-15728639, default 2048):

Using default value 2048

Last sector, +sectors or +size{K,M,G} (2048-15728639, default 15728639):

Using default value 15728639

Partition 1 of type Linux and of size 7.5 GiB is set

Command (m for help): **w**

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

[root@biz01 ~]# **fdisk /dev/sdd**

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.

Be careful before using the write command.

Device does not contain a recognized partition table

Building a new DOS disklabel with disk identifier 0x25610d14.

Command (m for help): **n**

Partition type:

 p primary (0 primary, 0 extended, 4 free)

 e extended

Select (default p):

Using default response p

Partition number (1-4, default 1):

First sector (2048-15728639, default 2048):

Using default value 2048

Last sector, +sectors or +size{K,M,G} (2048-15728639, default 15728639):

Using default value 15728639

Partition 1 of type Linux and of size 7.5 GiB is set

Command (m for help): **w**

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

```
[root@biz01 ~]# fdisk /dev/sde
```

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.

Be careful before using the write command.

Device does not contain a recognized partition table

Building a new DOS disklabel with disk identifier 0x55b531ce.

Command (m for help): **n**

Partition type:

 p primary (0 primary, 0 extended, 4 free)

 e extended

Select (default p):

Using default response p

Partition number (1-4, default 1):

First sector (2048-52428799, default 2048):

Using default value 2048

Last sector, +sectors or +size{K,M,G} (2048-52428799, default 52428799):

Using default value 52428799

Partition 1 of type Linux and of size 25 GiB is set

Command (m for help): **w**

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

List Block Devices

```
[root@biz01 ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	30G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	29G	0	part	
└─ol_biz01-root	249:0	0	26G	0	lvm	/
└─ol_biz01-swap	249:1	0	3G	0	lvm	[SWAP]
sdb	8:16	0	40G	0	disk	
└─ sdb1	8:17	0	40G	0	part	
sdc	8:32	0	7.5G	0	disk	
└─ sdc1	8:33	0	7.5G	0	part	
sdd	8:48	0	7.5G	0	disk	
└─ sdd1	8:49	0	7.5G	0	part	
sde	8:64	0	25G	0	disk	

```
└─sde1      8:65  0  25G  0 part
sr0        11:0   1 50.6M  0 rom
```

Create ASM Disks

```
[root@biz01 ~]# /usr/sbin/oracleasm createdisk ASM1 /dev/sdb1
Writing disk header: done
Instantiating disk: done
[root@biz01 ~]# /usr/sbin/oracleasm createdisk ASM2 /dev/sdc1
Writing disk header: done
Instantiating disk: done
[root@biz01 ~]# /usr/sbin/oracleasm createdisk ASM3 /dev/sdd1
Writing disk header: done
Instantiating disk: done
[root@biz01 ~]# /usr/sbin/oracleasm createdisk ASM4 /dev/sde1
Writing disk header: done
Instantiating disk: done
[root@biz01 ~]# /usr/sbin/oracleasm scandisks
Reloading disk partitions: done
Cleaning any stale ASM disks...
Scanning system for ASM disks...
[root@biz01 ~]# /usr/sbin/oracleasm listdisks
ASM1
ASM2
ASM3
ASM4
```

Scan and List ASM Disks Also on biz02

```
[root@biz01 ~]# ssh root@biz02
The authenticity of host 'biz02 (192.168.56.101)' can't be established.
ECDSA key fingerprint is SHA256:JfJ8SNV6T5VNORhw2aUPTy2f0lcdSfF7fA2bJCurlvg.
ECDSA key fingerprint is MD5:12:d9:74:e7:82:84:e6:57:28:d8:cc:aa:01:f0:53:1f.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'biz02,192.168.56.101' (ECDSA) to the list of known hosts.
root@biz02's password:
Last login: Mon Mar 13 12:22:46 2023 from 192.168.56.1
[root@biz02 ~]# /usr/sbin/oracleasm scandisks
Reloading disk partitions: done
Cleaning any stale ASM disks...
Scanning system for ASM disks...
Instantiating disk "ASM2"
Instantiating disk "ASM4"
Instantiating disk "ASM1"
```

```
Instantiating disk "ASM3"
[root@biz02 ~]# /usr/sbin/oracleasm listdisks
ASM1
ASM2
ASM3
ASM4
[root@biz02 ~]# exit
logout
Connection to biz02 closed.
```

13. Installation of Oracle Grid Infrastructure 19c

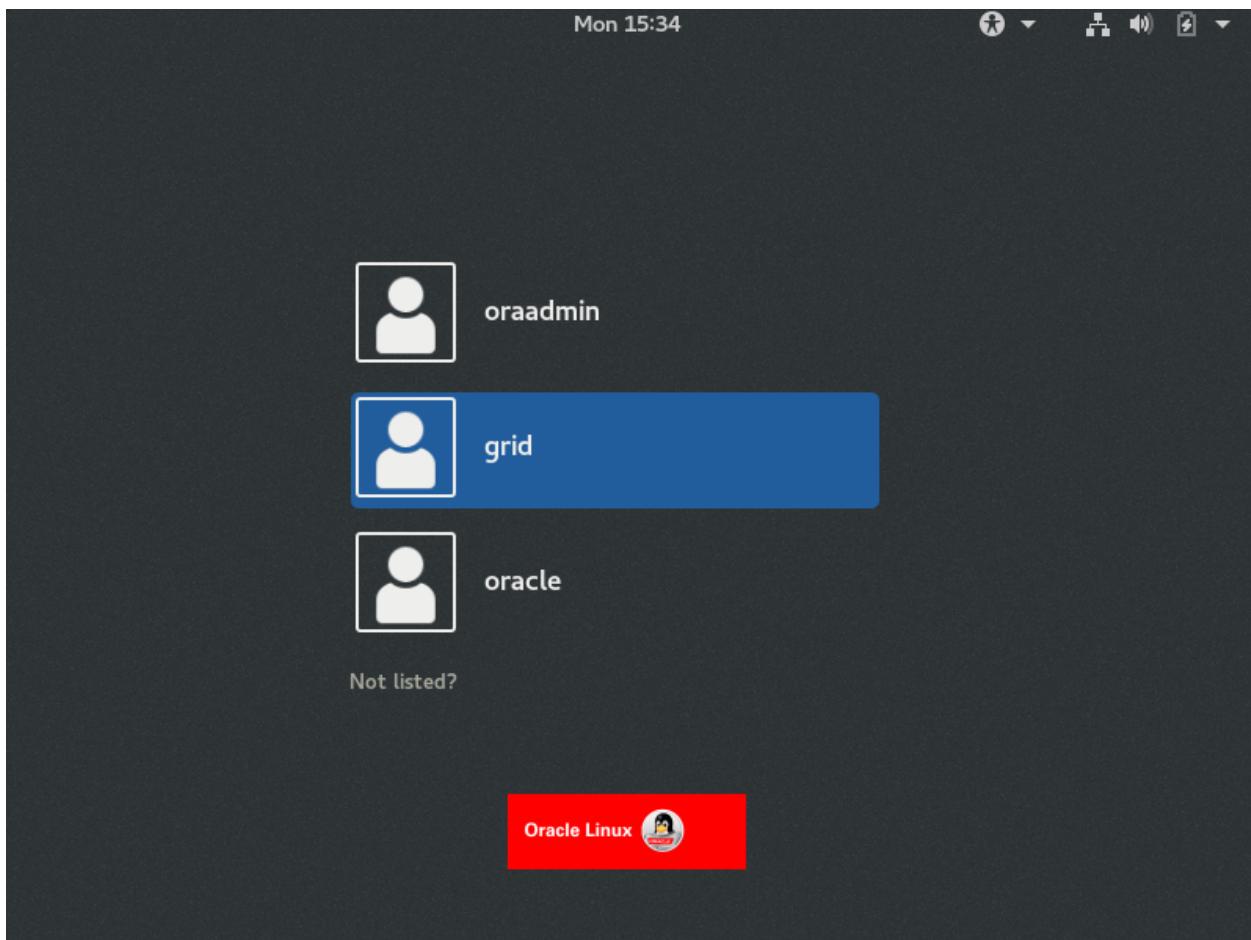
Here I will use GUI of Oracle Linux again to do the installation of Oracle Grid Infrastructure. Basically, it could be done without GUI using the Silent Installation, but in this guide I'll use the GUI method.

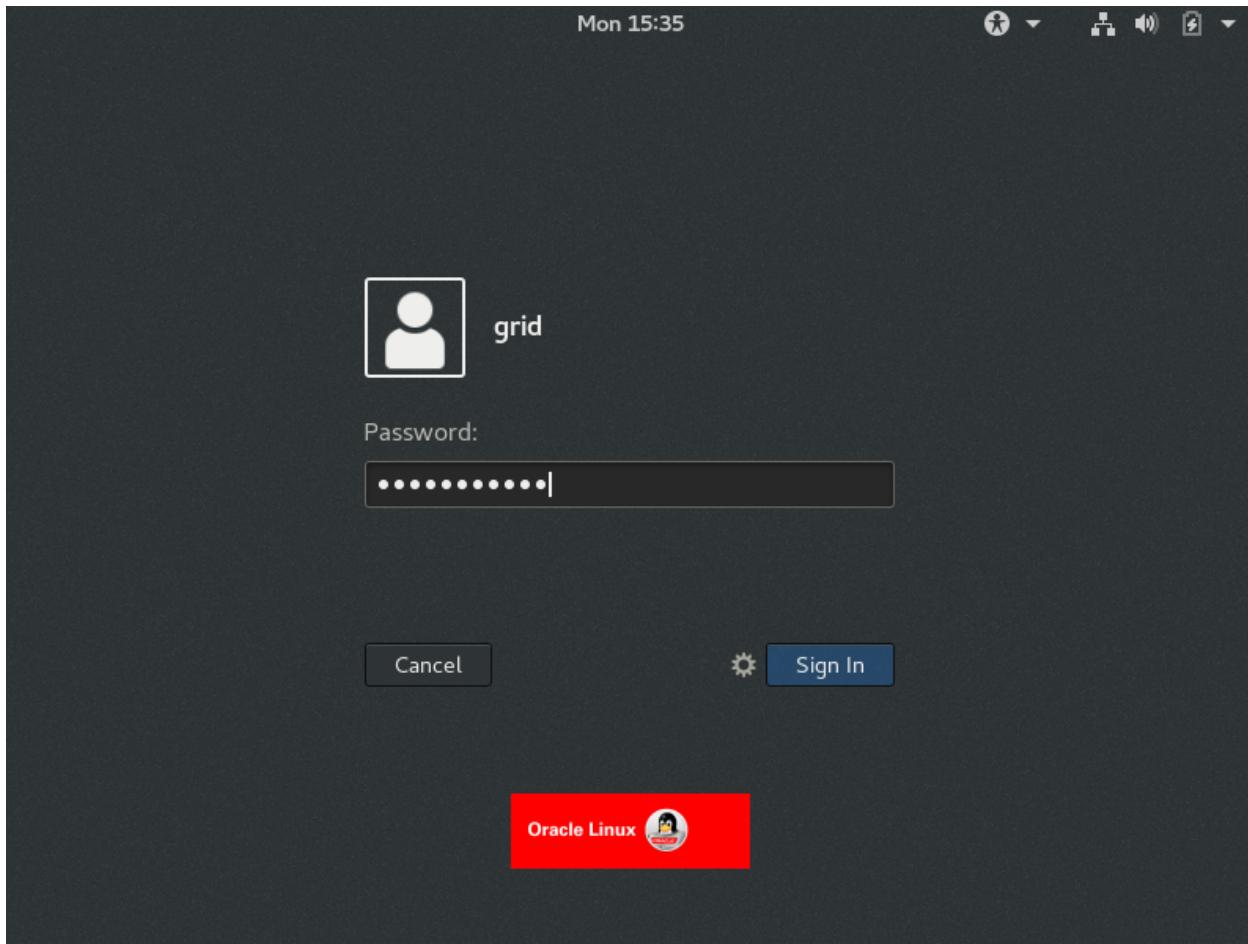
Create Directory for Grid Infrastructure Home on biz01 and biz02

```
[root@biz01 ~]# su - grid
[grid@biz01 ~]$ mkdir -p /u01/app/19.3.0/grid
[grid@biz01 ~]$ ssh grid@biz02
The authenticity of host 'biz02 (192.168.56.101)' can't be established.
ECDSA key fingerprint is SHA256:JfJ8SNV6T5VNORhw2aUPTy2f0lcdSfF7fA2bJCurlvg.
ECDSA key fingerprint is MD5:12:d9:74:e7:82:84:e6:57:28:d8:cc:aa:01:f0:53:1f.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'biz02,192.168.56.101' (ECDSA) to the list of known hosts.
grid@biz02's password:
[grid@biz02 ~]$ mkdir -p /u01/app/19.3.0/grid
[grid@biz02 ~]$ exit
logout
Connection to biz02 closed.
```

Unzip Oracle 19c Grid Infrastructure Installer Into The Directory Created

Logout root and login as user **grid**:





Click Sign In and open Terminal.

Go to the shared folder directory which we downloaded the Grid Installer into before.

```
[grid@biz01 ~]$ cd /media/sf_software
[grid@biz01 sf_software]$ cd Linux_x64_1930_grid_installer/
[grid@biz01 Linux_x64_1930_grid_installer]$ ll
total 2821472
drwxrwx--- 1 root vboxsf      0 Mar 13 09:08 cv
-rwxrwx--- 1 root vboxsf 2889184573 Mar 12 15:29 V982068-01.zip
[grid@biz01 Linux_x64_1930_grid_installer]$ unzip V982068-01.zip -d /u01/app/19.3.0/grid/
....
....
finishing deferred symbolic links:
/u01/app/19.3.0/grid/bin/lbuilder -> ../../nls/lbuilder/lbuilder
/u01/app/19.3.0/grid/lib/libocci.so -> libocci.so.19.1
/u01/app/19.3.0/grid/lib/libagtsh.so -> libagtsh.so.1.0
/u01/app/19.3.0/grid/lib/libodm19.so -> libodmd19.so
/u01/app/19.3.0/grid/lib/libclntsh.so -> libclntsh.so.19.1
/u01/app/19.3.0/grid/lib/libjavavm19.a -> ../../java/jdk/jdk8/lib/libjavavm19.a
```

```
/u01/app/19.3.0/grid/javavm/lib/jce.jar -> ../../javavm/jdk/jdk8/lib/jce.jar
/u01/app/19.3.0/grid/lib/libocci.so.18.1 -> libocci.so
/u01/app/19.3.0/grid/jdk/bin/ControlPanel -> jcontrol
/u01/app/19.3.0/grid/javavm/admin/cbp.jar -> ../../javavm/jdk/jdk8/admin/cbp.jar
/u01/app/19.3.0/grid/lib/libclntshcore.so -> libclntshcore.so.19.1
/u01/app/19.3.0/grid/lib/libclntsh.so.12.1 -> libclntsh.so
/u01/app/19.3.0/grid/lib/libclntsh.so.18.1 -> libclntsh.so
/u01/app/19.3.0/grid/lib/libclntsh.so.11.1 -> libclntsh.so
/u01/app/19.3.0/grid/lib/libclntsh.so.10.1 -> libclntsh.so
/u01/app/19.3.0/grid/jdk/jre/bin/ControlPanel -> jcontrol
/u01/app/19.3.0/grid/javavm/admin/libjtcjt.so -> ../../javavm/jdk/jdk8/admin/libjtcjt.so
/u01/app/19.3.0/grid/javavm/admin/classes.bin -> ../../javavm/jdk/jdk8/admin/classes.bin
/u01/app/19.3.0/grid/javavm/admin/lfclasses.bin -> ../../javavm/jdk/jdk8/admin/lfclasses.bin
/u01/app/19.3.0/grid/javavm/lib/security/cacerts -> ../../javavm/jdk/jdk8/lib/security/cacerts
/u01/app/19.3.0/grid/javavm/lib/sunjce_provider.jar -> ../../javavm/jdk/jdk8/lib/sunjce_provider.jar
/u01/app/19.3.0/grid/javavm/lib/security/README.txt ->
../../../../javavm/jdk/jdk8/lib/security/README.txt
/u01/app/19.3.0/grid/javavm/lib/security/java.security -> ../../javavm/jdk/jdk8/lib/security/java.security
/u01/app/19.3.0/grid/jdk/jre/lib/amd64/server/libjsig.so -> ./libjsig.so
```

Execute Grid Setup

```
[grid@biz01 Linux_x64_1930_grid_installer]$ cd /u01/app/19.3.0/grid
[grid@biz01 grid]$ export DISPLAY=:0.0
[grid@biz01 grid]$ ./gridSetup.sh
Launching Oracle Grid Infrastructure Setup Wizard...
```



Select Configuration Option

Configuration Option

- Cluster Configuration
- Operating System Groups
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Select an option to configure the software. The wizard will register the home in the central inventory and then perform the selected configuration.

- Configure Oracle Grid Infrastructure for a New Cluster
- Configure Oracle Grid Infrastructure for a Standalone Server (Oracle Restart)
- Upgrade Oracle Grid Infrastructure
-
- Set Up Software Only

Help

< Back

Next >

Install

Cancel

Select Cluster Configuration

- [Configuration Option](#)
- Cluster Configuration**
- [Operating System Groups](#)
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

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](#)

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[Install](#)

[Cancel](#)

Grid Plug and Play Information

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

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.

 Create Local SCANCluster Name: SCAN Name: SCAN Port:  Use Shared SCANSCAN Client Data: Configure GNS Configure nodes Virtual IPs as assigned by the Dynamic Networks Create a new GNSGNS VIP Address: GNS Sub Domain: Use Shared GNSGNS Client Data:

Cluster Node Information

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

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain

[SSH connectivity...](#)[Use Cluster Configuration File...](#)[Add...](#)[Edit...](#)[Remove](#) [Back](#) [Next >](#)[Install](#)[Cancel](#)[Help](#)

Add Cluster Node Information

X

Add a single node

Specify the name for the public host name. If you want to configure virtual host name manually, then you will be prompted for the virtual IP address.

Public Hostname:

Virtual Hostname:

Add a range of nodes

Specify the node range expression for the required nodes. You can use the following patterns to build the expression: Constant strings such as "myhostname", single character ranges such as "[a-z]" and multi-character sequences such as "[ab|cd|..]".

Public Hostname Expression:

Virtual Hostname Suffix:

Nodes to be generated: 0

OK

Cancel

Cluster Node Information

- [Configuration Option](#)
- [Cluster Configuration](#)
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- Cluster Node Information**
- [Network Interface Usage](#)
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- [Create Grid Infrastructure Manager](#)
- [Grid Infrastructure Management](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Operating System Groups](#)
- [Installation Location](#)
- [Root script execution](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)
- [Finish](#)

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain
biz02.localdomain	biz02-vip.localdomain

[SSH connectivity...](#)[Use Cluster Configuration File...](#)[Add...](#)[Edit...](#)[Remove](#)[**< Back**](#)[**Next >**](#)[Install](#)[Cancel](#)[Help](#)

Cluster Node Information

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- Cluster Node Information**
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- [Create Grid Infrastructure Manager](#)
- [Grid Infrastructure Management](#)
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- [Installation Location](#)
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- [Install Product](#)
- [Finish](#)

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain
biz02.localdomain	biz02-vip.localdomain

[SSH connectivity...](#)[Use Cluster Configuration File...](#)[Add...](#)[Edit...](#)[Remove](#)OS Username: OS Password: Reuse private and public keys existing in the user home[Test](#)[Setup](#)[Help](#)[< Back](#)[Next >](#)[Install](#)[Cancel](#)

Oracle Grid Infrastructure 19c Installer - Step 4 of 17

19^c ORACLE[®]
Grid Infrastructure

Cluster Node Information

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

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain
biz02.localdomain	biz02-vip.localdomain



Establishing SSH connectivity between the selected nodes. This may take several minutes.
Please wait...

[SSH connectivity...](#)

[Use Cluster Configuration File...](#)

[Add...](#)

[Edit...](#)

[Remove](#)

OS Username:

OS Password:

Reuse private and public keys existing in the user home

[Test](#)

[Setup](#)

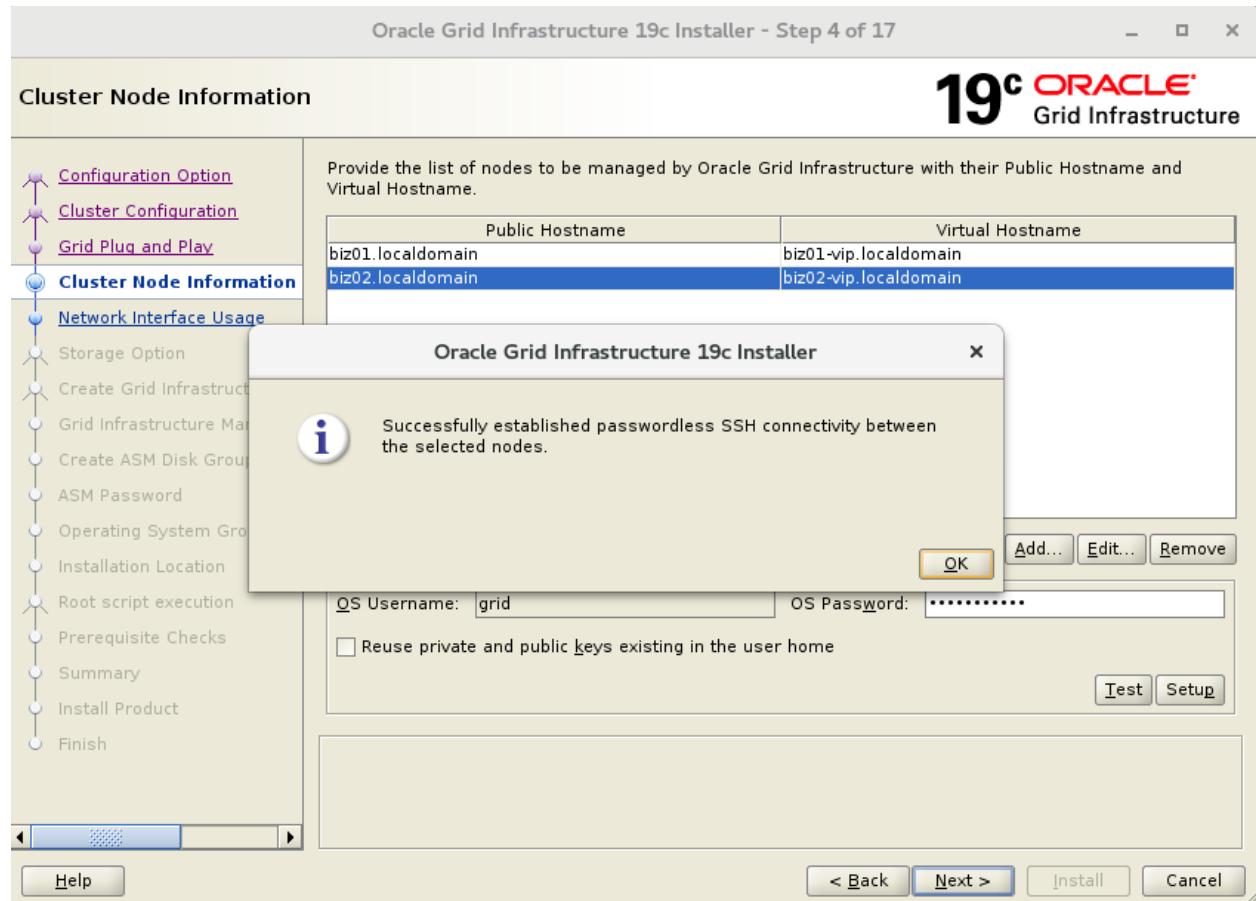
[Help](#)

[< Back](#)

[Next >](#)

[Install](#)

[Cancel](#)



Oracle Grid Infrastructure 19c Installer - Step 4 of 17

19^c ORACLE[®]
Grid Infrastructure

Cluster Node Information

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

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain
biz02.localdomain	biz02-vip.localdomain



Validating node readiness

[SSH connectivity...](#)

[Use Cluster Configuration File...](#)

[Add...](#)

[Edit...](#)

[Remove](#)

OS Username:

OS Password:

Reuse private and public keys existing in the user home

[Test](#)

[Setup](#)

[Help](#)

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Oracle Grid Infrastructure 19c Installer - Step 4 of 17

19^c ORACLE[®]
Grid Infrastructure

Cluster Node Information

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

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

Public Hostname	Virtual Hostname
biz01.localdomain	biz01-vip.localdomain
biz02.localdomain	biz02-vip.localdomain



Validating Public And Private Interfaces Across Cluster Nodes

[SSH connectivity...](#)[Use Cluster Configuration File...](#)[Add...](#)[Edit...](#)[Remove](#)OS Username: OS Password: Reuse private and public keys existing in the user home[Test](#)[Setup](#)[Help](#)[< Back](#)[Next >](#)[Install](#)[Cancel](#)

Specify Network Interface Usage

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

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

Interface Name	Subnet	Use for
enp0s3	192.168.56.0	Public
enp0s8	192.168.10.0	ASM & Private
enp0s9	192.168.18.0	Do Not Use
virbr0	192.168.122.0	Do Not Use

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

Storage Option Information

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

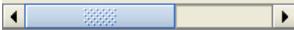
You can place Oracle Cluster Registry (OCR) files and voting disk files on Oracle ASM storage, or on a file system.

[Use Oracle Flex ASM for storage](#)

Choose this option to configure OCR and voting disks on ASM storage. ASM instance will be configured on reduced number of cluster nodes.

[Use Shared File System](#)

Choose this option to configure OCR and voting disk files on an existing shared file system.

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

Create Grid Infrastructure Management Repository O...

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

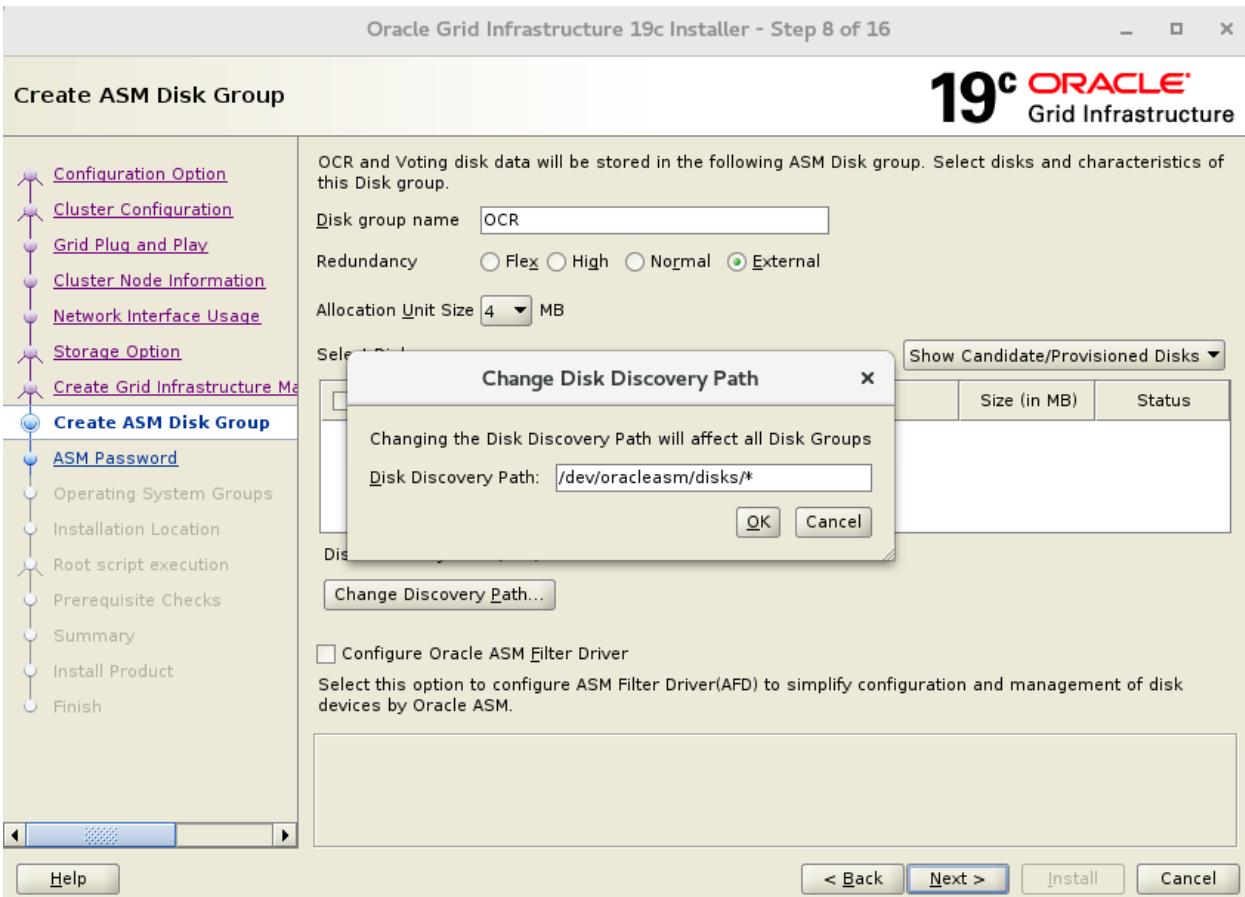
The Grid Infrastructure Management Repository is an essential component for complete operation of the Autonomous Health Framework, that offers enhanced real time diagnostics and performance management, and Rapid Homes Provisioning for patching. The components that depend on the repository in whole or in part are Cluster Health Advisor, Cluster Health Monitor, QoS Management, Rapid Homes Provisioning and Cluster Activity Log. It is best practice to install this option and failure to do so could compromise timely resolution of issues as well as available functionality for patching.

Configure Grid Infrastructure Management Repository

- Yes
 No

< Back **Next >** Install Cancel

Help



Create ASM Disk Group

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

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

Select Disks

Show Candidate/Provisioned Disks ▾

	Disk Path	Size (in MB)	Status
<input checked="" type="checkbox"/>	/dev/oracleasm/disks/ASM1	40959	Provisioned
<input type="checkbox"/>	/dev/oracleasm/disks/ASM2	5119	Provisioned
<input type="checkbox"/>	/dev/oracleasm/disks/ASM3	5119	Provisioned
<input type="checkbox"/>	/dev/oracleasm/disks/ASM4	12287	Provisioned

Disk Discovery Path: '/dev/oracleasm/disks/*'

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.

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Specify ASM Password

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

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	<input type="text"/>	<input type="text"/>
ASMSNMP	<input type="text"/>	<input type="text"/>

Use same passwords for these accounts

Specify Password: Confirm Password:

Messages:

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

< Back **Next >** Install Cancel

Help

Failure Isolation Support

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure Manager](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- Failure Isolation**
- [Management Options](#)
 - Operating System Groups
 - Installation Location
 - Root script execution
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 - 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](#)

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[Install](#)

[Cancel](#)

Specify Management Options

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure Manager](#)
- [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.

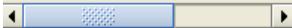
Register with Enterprise Manager (EM) Cloud Control

OMS host:

OMS port:

EM Admin User Name:

EM Admin Password:



< Back **Next >** Install Cancel

Privileged Operating System Groups

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

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

Oracle ASM Administrator (OSASM) Group

asmadmin ▾

Oracle ASM DBA (OSDBA for ASM) Group

asmdba ▾

Oracle ASM Operator (OSOPER for ASM) Group (Optional)

asmoper ▾

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Install

Cancel

Specify Installation Location

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure Manager](#)
- [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 base. The Oracle base directory for the Oracle Grid Infrastructure installation is the location where diagnostic and administrative logs, and other logs associated with Oracle ASM and Oracle Clusterware are stored. This location would also contain files pertaining to the configuration of Oracle Clusterware.

Oracle base:

This software directory is the Oracle Grid Infrastructure home directory.

Software location: /u01/app/19.3.0/grid

Help

< Back

Next >

Install

Cancel

Create Inventory

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure](#)
- [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](#)

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: /u01/app/oralnventory

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

oralnventory Group Name: oinstall

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

Root script execution configuration

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

Automatically run configuration scripts

Use "root" user credential
Password : [.....]

Use sudo
Program path : /usr/bin/sudo Browse...
User name : grid
Password :

< Back Next > Install Cancel

Perform Prerequisite Checks

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

Verifying that the target environment meets minimum installation and configuration requirements for products you have selected. This can take time. Please wait.

24%

Checking OS Kernel Version ...

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

Perform Prerequisite Checks

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.

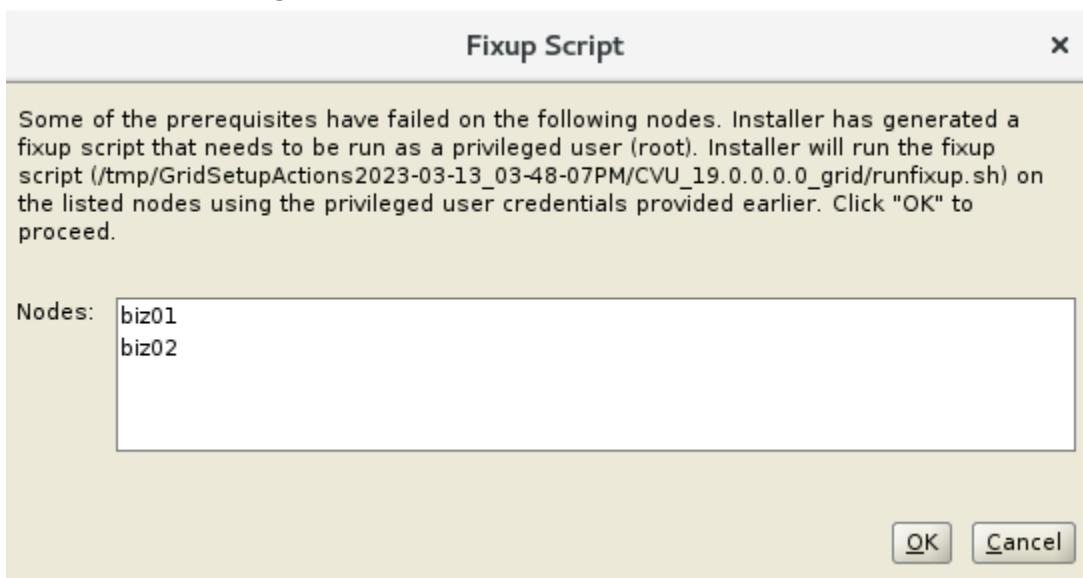
Checks	Status	Fixable
Physical Memory	Warning	No
Soft Limit: maximum stack size	Failed	Yes
Daemon "avahi-daemon" not configured and running	Warning	Yes
[Network Time Protocol (NTP)]		
Network Time Protocol (NTP)	Failed	No

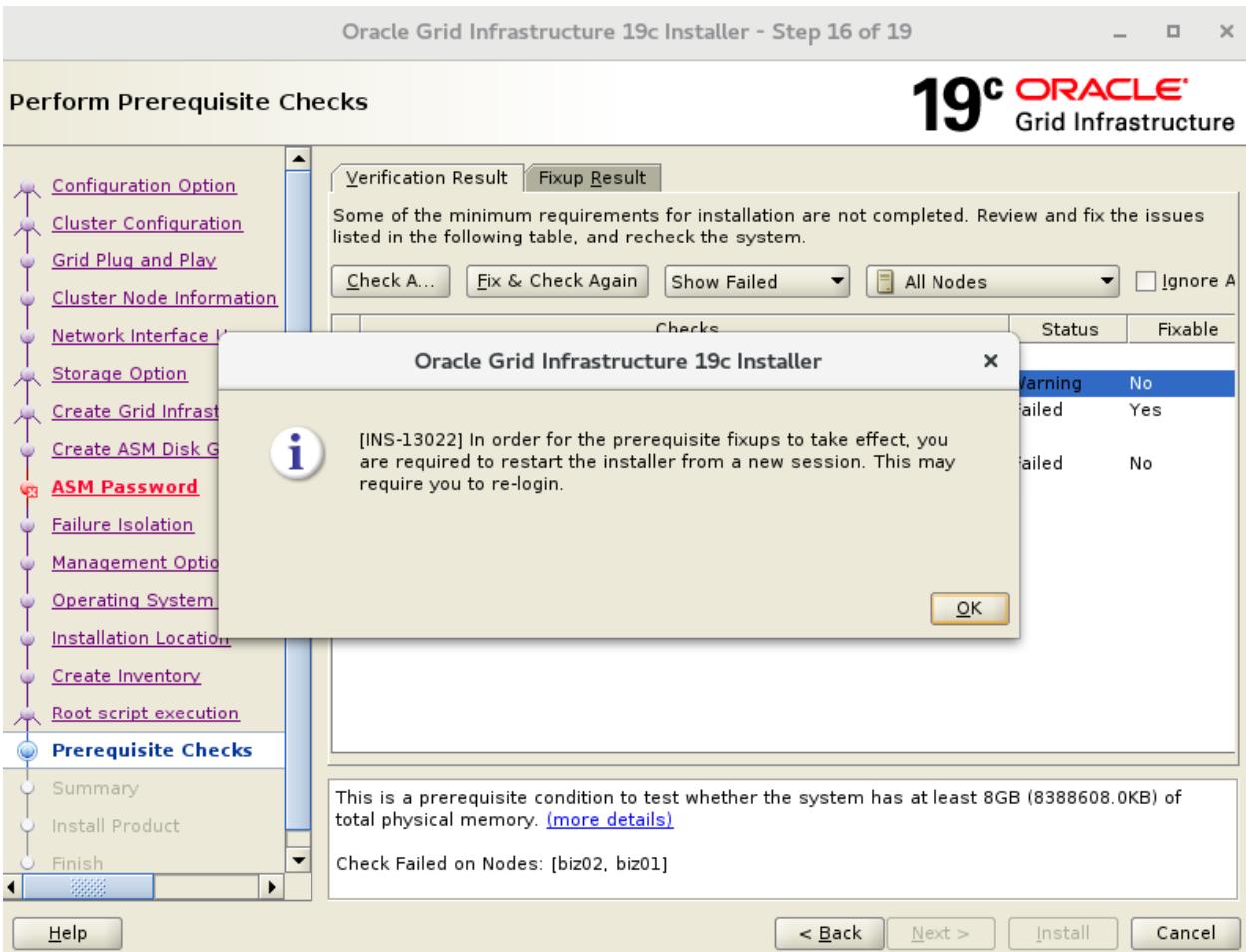
This is a prerequisite condition to test whether the system has at least 8GB (8388608.0KB) of total physical memory. ([more details](#))

Check Failed on Nodes: [biz02, biz01]

Help < Back Next > **Install** **Cancel**

Click **Fix & Check Again**.





Click **OK**, and cancel the installer.

Logout from grid and then login to grid again and execute `gridSetup.sh` again, follow the steps above until Prerequisite Checks again:

Perform Prerequisite Checks

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 A...	Fix & Check Again	Show Failed	All Nodes	Ignore All	
Checks	Status	Fixable			
Physical Memory	Warning	No			
[Network Time Protocol (NTP)]	Failed	No			
Network Time Protocol (NTP)					

This is a prerequisite condition to test whether the system has at least 8GB (8388608.0KB) of total physical memory. ([more details](#))

Check Failed on Nodes: [biz02, biz01]

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

Physical memory gave Warning because we just use 4096 MB RAM in each node.

I gave it low because it's just for testing. We could ignore it.

Network Time Protocol (NTP) gave Failed because we don't use NTP. We could ignore it.

Tick on the box **Ignore All**:

Perform Prerequisite Checks

- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure](#)
- [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 A...	Fix & Check Again	Show Failed	All Nodes	<input checked="" type="checkbox"/> Ignore A
Checks	Status	Fixable		
Checks	Ignored	No		
Physical Memory	Ignored	No		
[Network Time Protocol (NTP)]				
Network Time Protocol (NTP)	Ignored	No		

This is a prerequisite condition to test whether the system has at least 8GB (8388608.0KB) of total physical memory. [\(more details\)](#)

Check Failed on Nodes: [biz02, biz01]

< Back **Next >** Install Cancel

Help

Summary

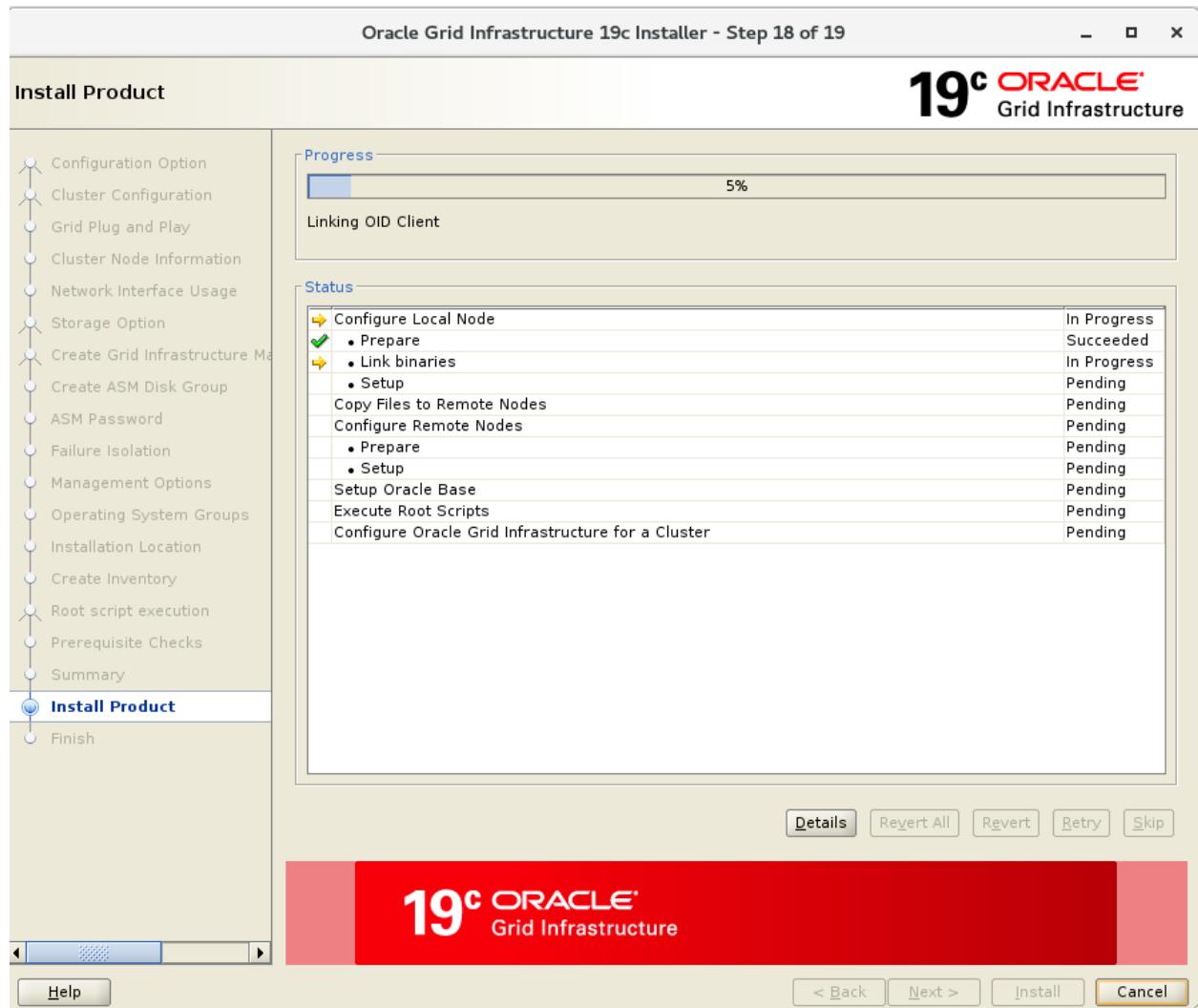
- [Configuration Option](#)
- [Cluster Configuration](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create Grid Infrastructure Manager](#)
- [Create ASM Disk Group](#)
- ASM Password**
- [Failure Isolation](#)
- [Management Options](#)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

- [Install Product](#)
- [Finish](#)

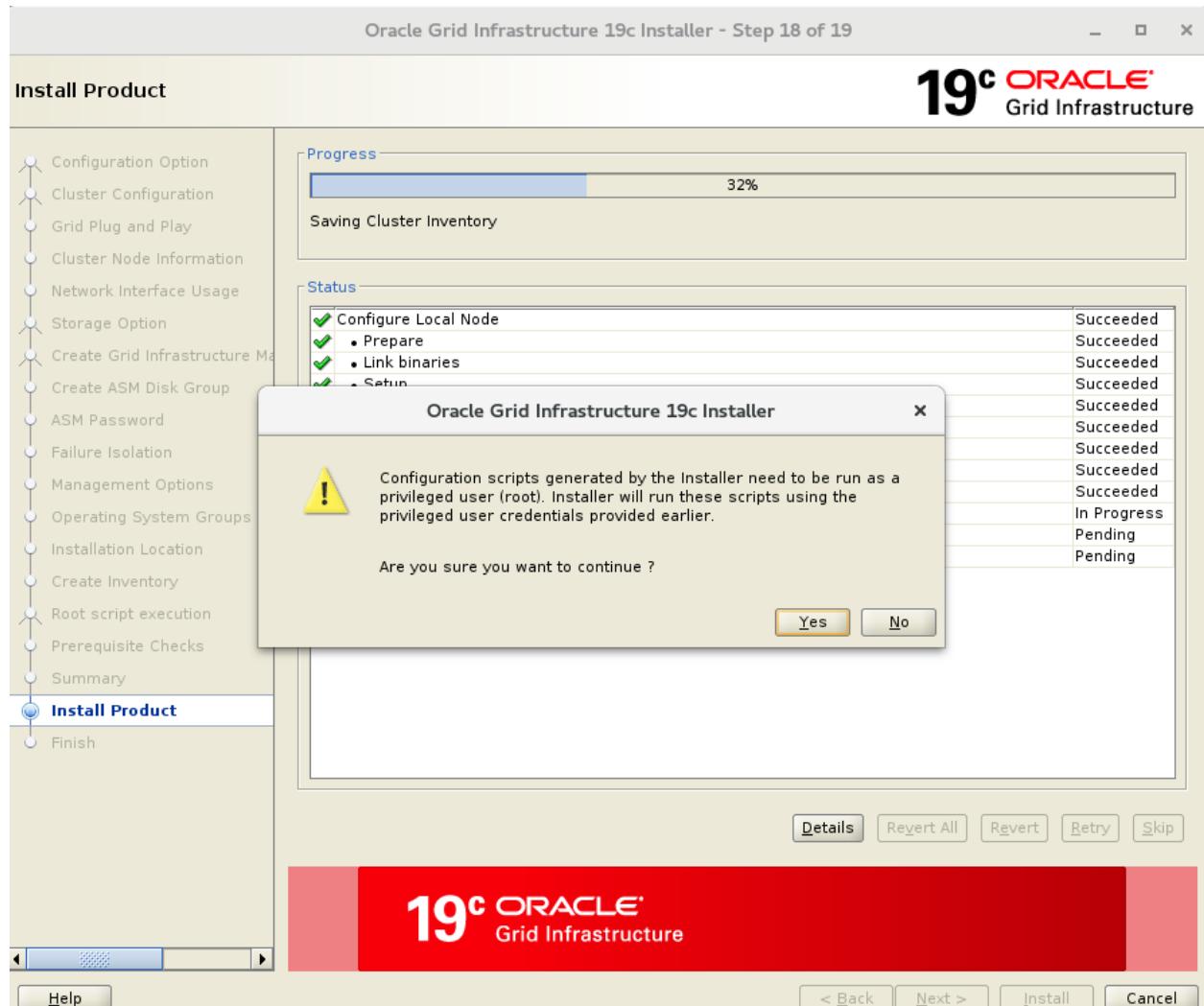
Oracle Grid Infrastructure 19c Installer

- Global Settings**
 - Config Option: Configure Oracle Grid Infrastructure for a New Cluster [[Edit](#)]
 - Oracle base for Oracle Grid Infrastructure: /u01/app/grid [[Edit](#)]
 - Grid home: /u01/app/19.3.0/grid
 - Privileged Operating System Groups: asmdba (OSDBA), asmoper (OSOPER), asmadmin (OSASM) [[Edit](#)]
 - Root script execution configuration: Root user credential [[Edit](#)]
- Inventory information**
 - Inventory location: /u01/app/oralInventory [[Edit](#)]
 - Central inventory (oralInventory) group: oinstall [[Edit](#)]
- Management information**
 - Management method: None [[Edit](#)]
- Grid Infrastructure Settings**
 - Cluster Configuration: Standalone Cluster [[Edit](#)]
 - Cluster Name: biz-cluster [[Edit](#)]
 - Hub nodes: biz01,biz02 [[Edit](#)]
 - SCAN Type: Local SCAN
 - Single Client Access Name (SCAN): biz-scan [[Edit](#)]
 - SCAN Port: 1521 [[Edit](#)]
 - Public Interface(s): enp0s3 [[Edit](#)]
 - ASM & Private Interface(s): enp0s8 [[Edit](#)]
- Storage Information**
 - Storage Type: Oracle ASM [[Edit](#)]
 - Configure ASM Filter Driver: false [[Edit](#)]
 - ASM Disk Group: OCR [[Edit](#)]
 - Storage Redundancy: EXTERNAL [[Edit](#)]
 - Disks Selected: /dev/oracleasm/disks/ASM1 [[Edit](#)]

[Save Response File...](#)[< Back](#) [Next >](#) [Install](#) [Cancel](#)[Help](#)

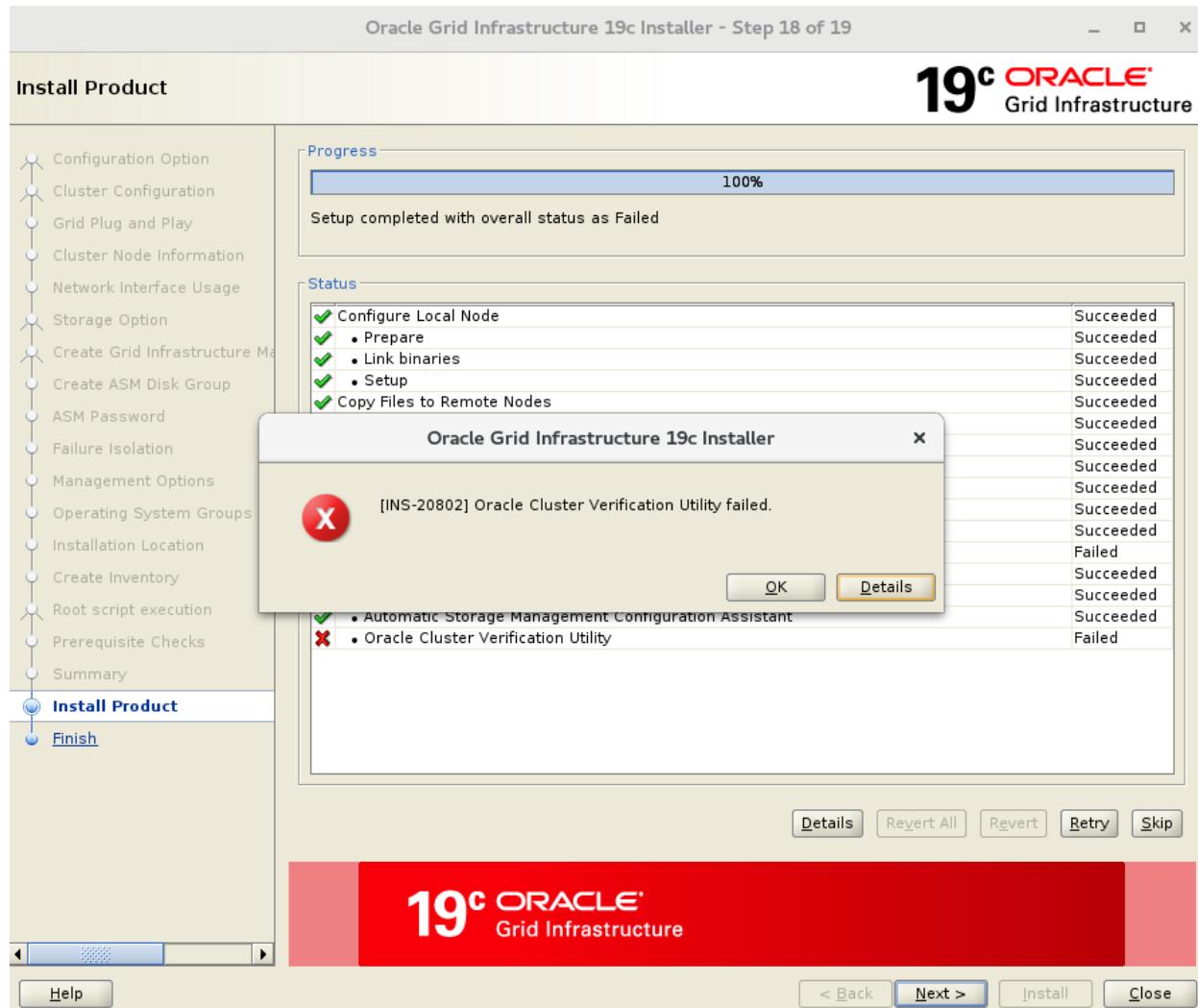


Wait until the installer finishes.

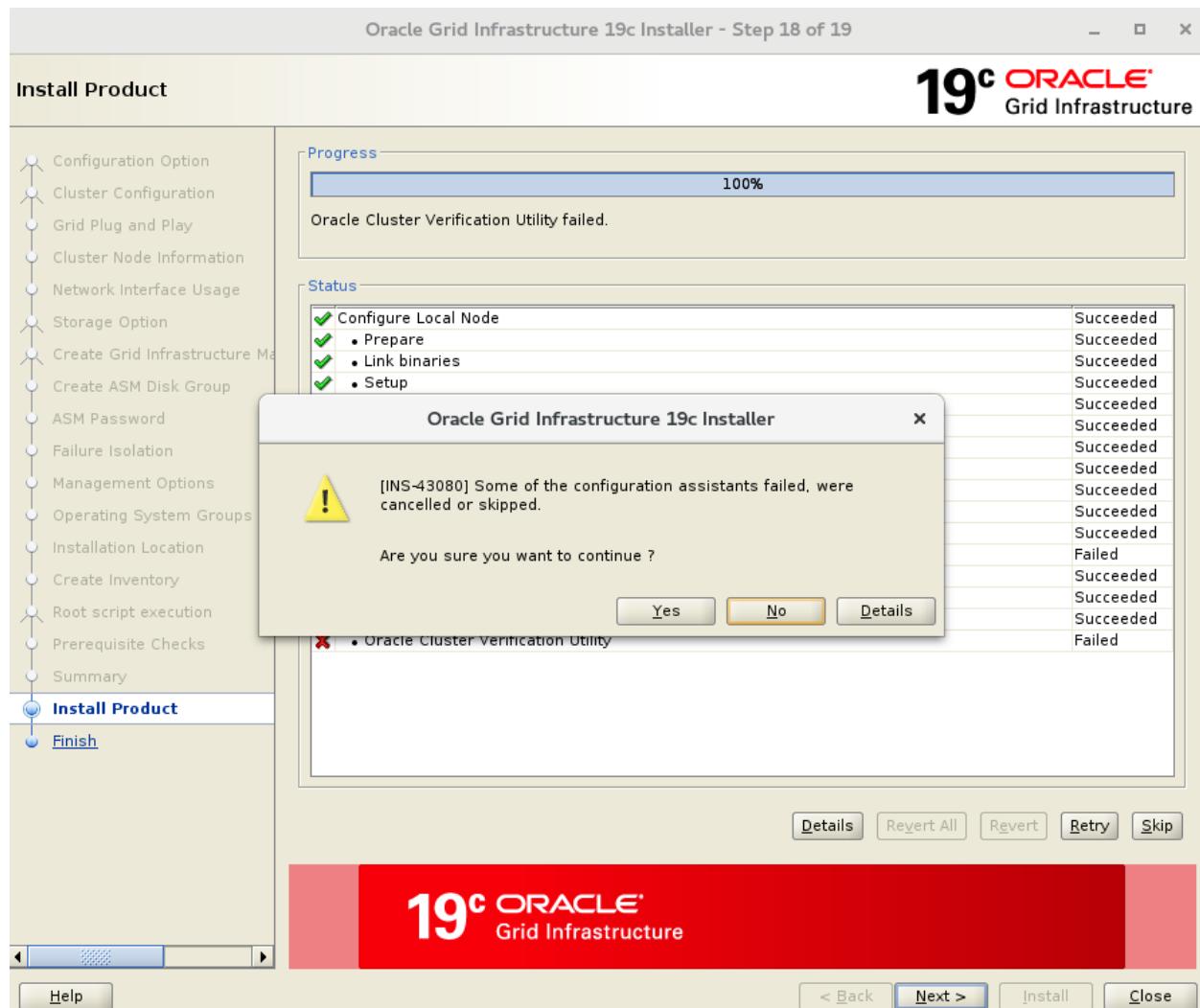


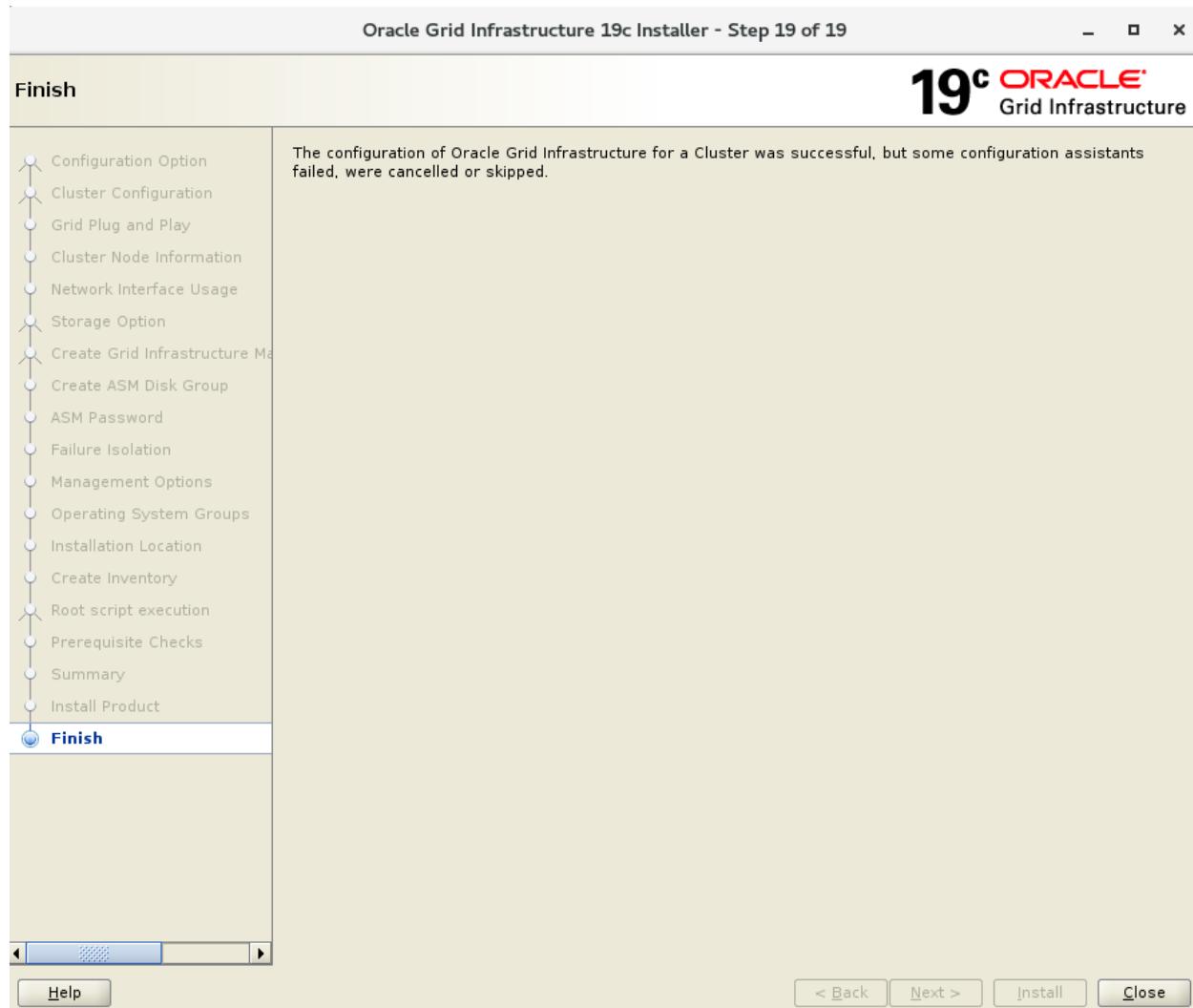
We can see the progress of root script execution by examining alert.log file:

```
[grid@biz01 ~]$ cd /u01/app/grid/diag/crs/biz01/crs/trace/
[grid@biz01 trace]$ ls -ltr alert*
-rw-rw--- 1 grid oinstall 105 Mar 13 17:10 alert.log
[grid@biz01 trace]$ tail -f alert.log
2023-03-13 17:10:09.747 [CLSECHO(16920)]CLSRSC-0567: Beginning Oracle Grid Infrastructure
configuration.
2023-03-13 17:11:29.128 [OCRCONFIG(20827)]CRS-2101: The OLR was formatted using version 4.
2023-03-13 17:11:33.965 [CLSCFG(20844)]CRS-4750: Multicast is enabled.
2023-03-13 17:11:56.287 [OHASD(21601)]CRS-8500: Oracle Clusterware OHASD process is starting
with operating system process ID 21601
2023-03-13 17:11:56.481 [OHASD(21601)]CRS-0714: Oracle Clusterware Release 19.0.0.0.0.
2023-03-13 17:11:56.496 [OHASD(21601)]CRS-2112: The OLR service started on node biz01.
2023-03-13 17:11:56.559 [OHASD(21601)]CRS-1301: Oracle High Availability Service started on node
biz01.
```



Ignore this Oracle Cluster Verification Utility failure. It's because of the same reason as before installing the grid cluster. Just click OK and then click Next.





14. Verify Cluster After Installation

```
[grid@biz01 grid]$ cd /u01/app/19.3.0/grid/bin
[grid@biz01 bin]$ ./crsctl check cluster -all
*****
biz01:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
biz02:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
```

```
[grid@biz01 bin]$ ./crsctl stat res -t
```

Name	Target	State	Server	State details
<hr/>				
Local Resources				
ora.LISTENER.lsnr				
	ONLINE	ONLINE	biz01	STABLE
	ONLINE	ONLINE	biz02	STABLE
ora.chad				
	ONLINE	ONLINE	biz01	STABLE
	ONLINE	ONLINE	biz02	STABLE
ora.net1.network				
	ONLINE	ONLINE	biz01	STABLE
	ONLINE	ONLINE	biz02	STABLE
ora.ons				
	ONLINE	ONLINE	biz01	STABLE
	ONLINE	ONLINE	biz02	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	biz01	STABLE
	OFFLINE	OFFLINE	biz02	STABLE
<hr/>				
Cluster Resources				
ora.ASMNET1LSNR_ASM.lsnr(ora.asmgroup)				
1	ONLINE	ONLINE	biz01	STABLE
2	ONLINE	ONLINE	biz02	STABLE
3	OFFLINE	OFFLINE		STABLE
ora.LISTENER_SCAN1.lsnr	1	ONLINE	ONLINE	biz02 STABLE
ora.LISTENER_SCAN2.lsnr	1	ONLINE	ONLINE	biz01 STABLE
ora.LISTENER_SCAN3.lsnr	1	ONLINE	ONLINE	biz01 STABLE
ora.OCR.dg(ora.asmgroup)	1	ONLINE	ONLINE	biz01 STABLE
	2	ONLINE	ONLINE	biz02 STABLE
	3	OFFLINE	OFFLINE	
ora.asm(ora.asmgroup)	1	ONLINE	ONLINE	biz01 Started,STABLE
	2	ONLINE	ONLINE	biz02 Started,STABLE
	3	OFFLINE	OFFLINE	
ora.asmnet1.asmnetwork(ora.asmgroup)	1	ONLINE	ONLINE	biz01 STABLE

2	ONLINE	ONLINE	biz02	STABLE
3	OFFLINE	OFFLINE		STABLE
ora.biz01.vip				
1	ONLINE	ONLINE	biz01	STABLE
ora.biz02.vip				
1	ONLINE	ONLINE	biz02	STABLE
ora.cvu				
1	ONLINE	ONLINE	biz01	STABLE
ora.qosmserver				
1	ONLINE	ONLINE	biz01	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	biz02	STABLE
ora.scan2.vip				
1	ONLINE	ONLINE	biz01	STABLE
ora.scan3.vip				
1	ONLINE	ONLINE	biz01	STABLE

grid@biz01 bin]\$./ocrcheck

Status of Oracle Cluster Registry is as follows :

```

Version          :      4
Total space (kbytes)   :  491684
Used space (kbytes)    :  84360
Available space (kbytes) :  407324
ID              : 1278676108
Device/File Name     : +OCR
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

[grid@biz01 bin]\$./crsctl query css votedisk

## STATE	File Universal Id	File Name	Disk group
----------	-------------------	-----------	------------

1. ONLINE	39a05292eb214f6dbf93074486e6b7dd	(/dev/oracleasm/disks/ASM1)	[OCR]
Located 1 voting disk(s).			

Command to Shutdown The Cluster

As root user, alternately execute this command on both nodes (biz01, biz02):

```
[root@biz01 ~]# cd /u01/app/19.3.0/grid/bin
```

```
[root@biz01 bin]# ./crsctl stop crs -f
```

....

....

CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'biz01' has completed

CRS-4133: Oracle High Availability Services has been stopped.

```
[root@biz02 ~]# cd /u01/app/19.3.0/grid/bin
```

```
[root@biz02 bin]# ./crsctl stop crs -f
```

....

....

CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'biz02' has completed

CRS-4133: Oracle High Availability Services has been stopped.