

# AppDynamics Student Practice Lab

▶ Linux Operating System Installation

# Linux Operating System Installation

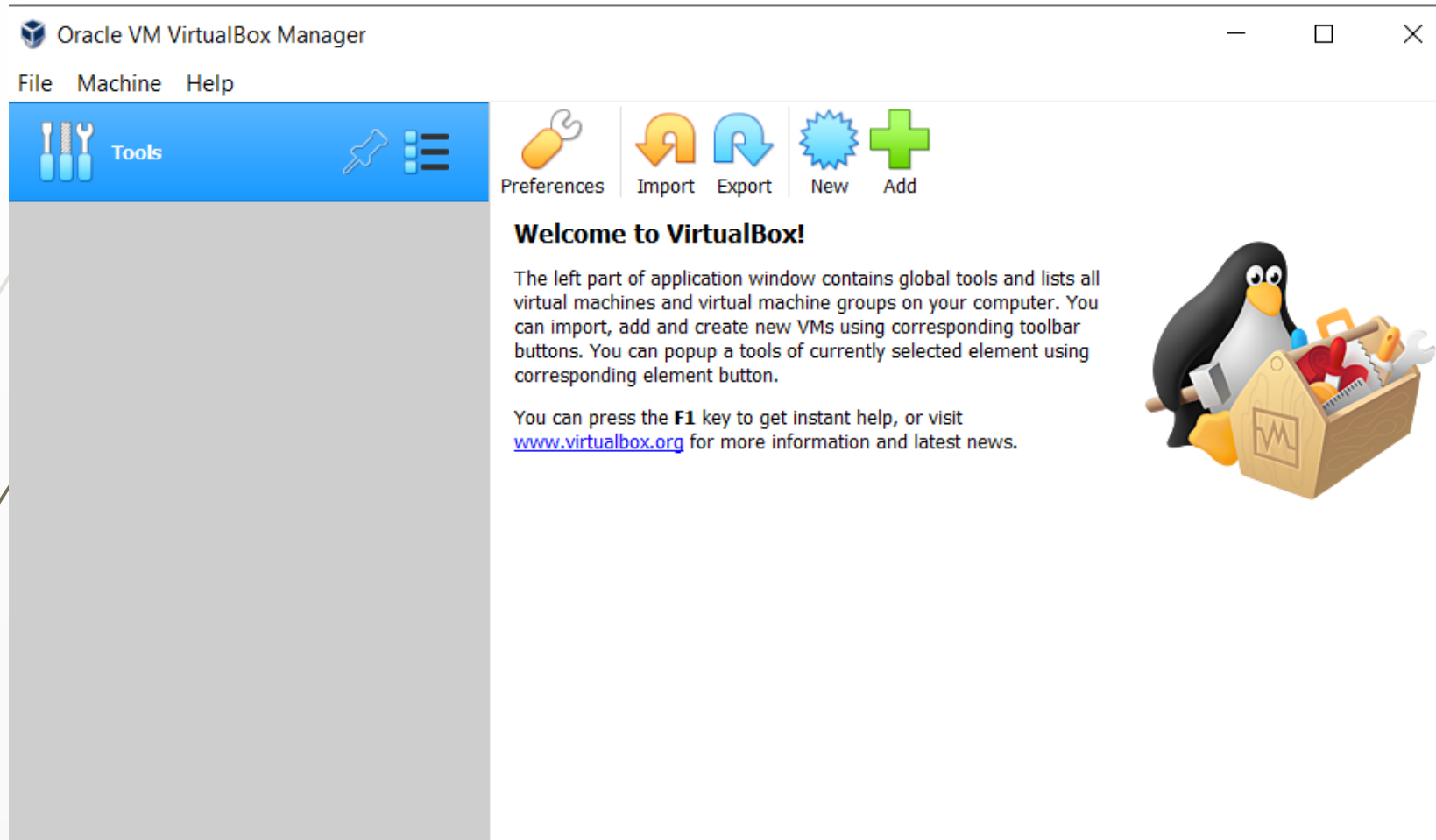
- Centos 7 Operating, 4GB Ram , 20GB HDD, 2 CPU Core
- VMWare Workstation or VirtualBox and centos 7 ISO file
- Download and install virtualbox from <https://www.virtualbox.org/wiki/Downloads> by selecting the download for windows. Select your OS bit like 64Bit

Use google to download centos 7 (full OS and not minimal)  
[http://ftp.iij.ad.jp/pub/linux/centos-vault/7.1.1503/isos/x86\\_64/](http://ftp.iij.ad.jp/pub/linux/centos-vault/7.1.1503/isos/x86_64/)

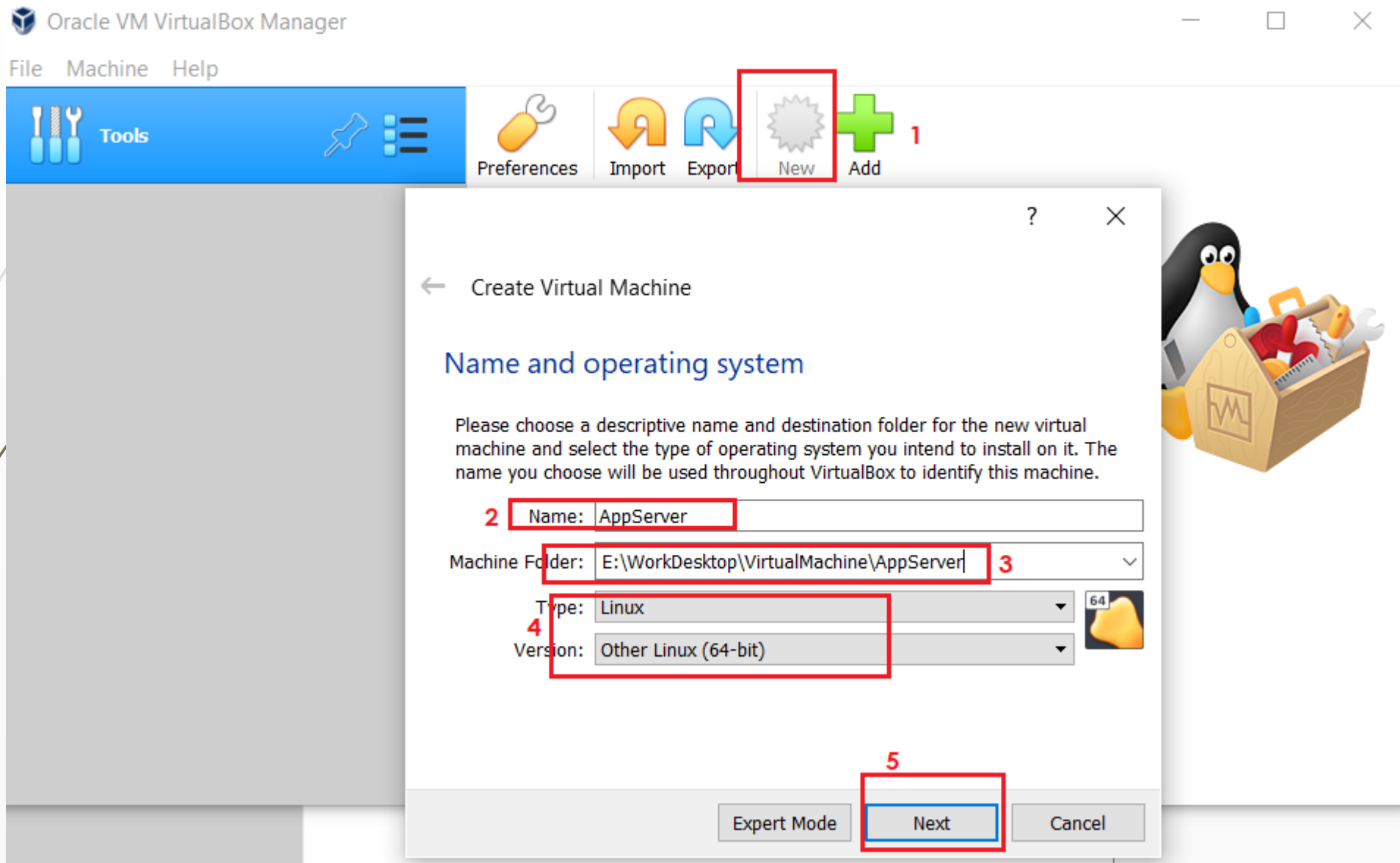
This step by step assumes installation on VirtualBox running on Windows laptop but can also serve for other operating systems guide.

# Oracle Virtual Box – Creating New Operating System

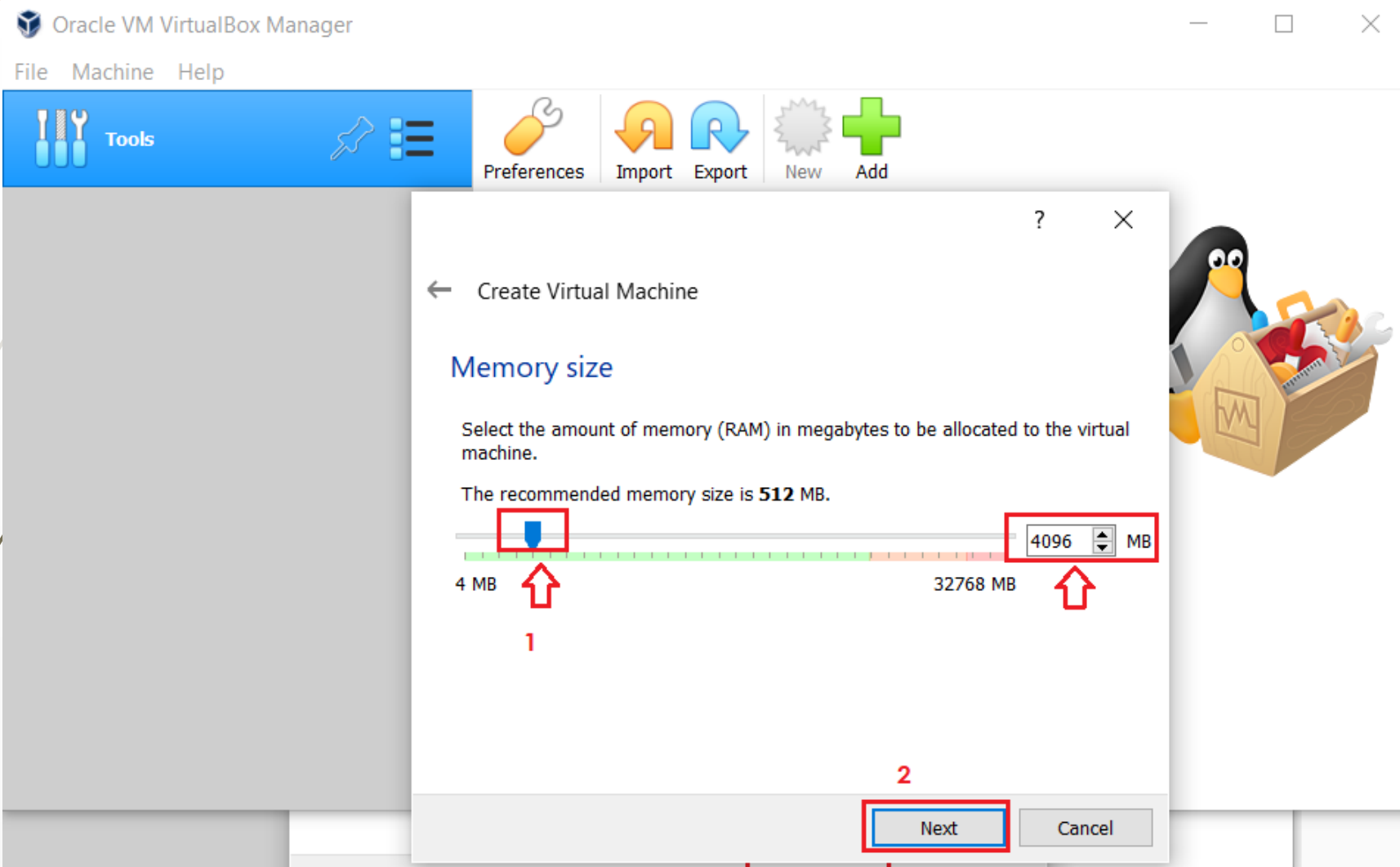
Follow the instructions to create a new virtual machine



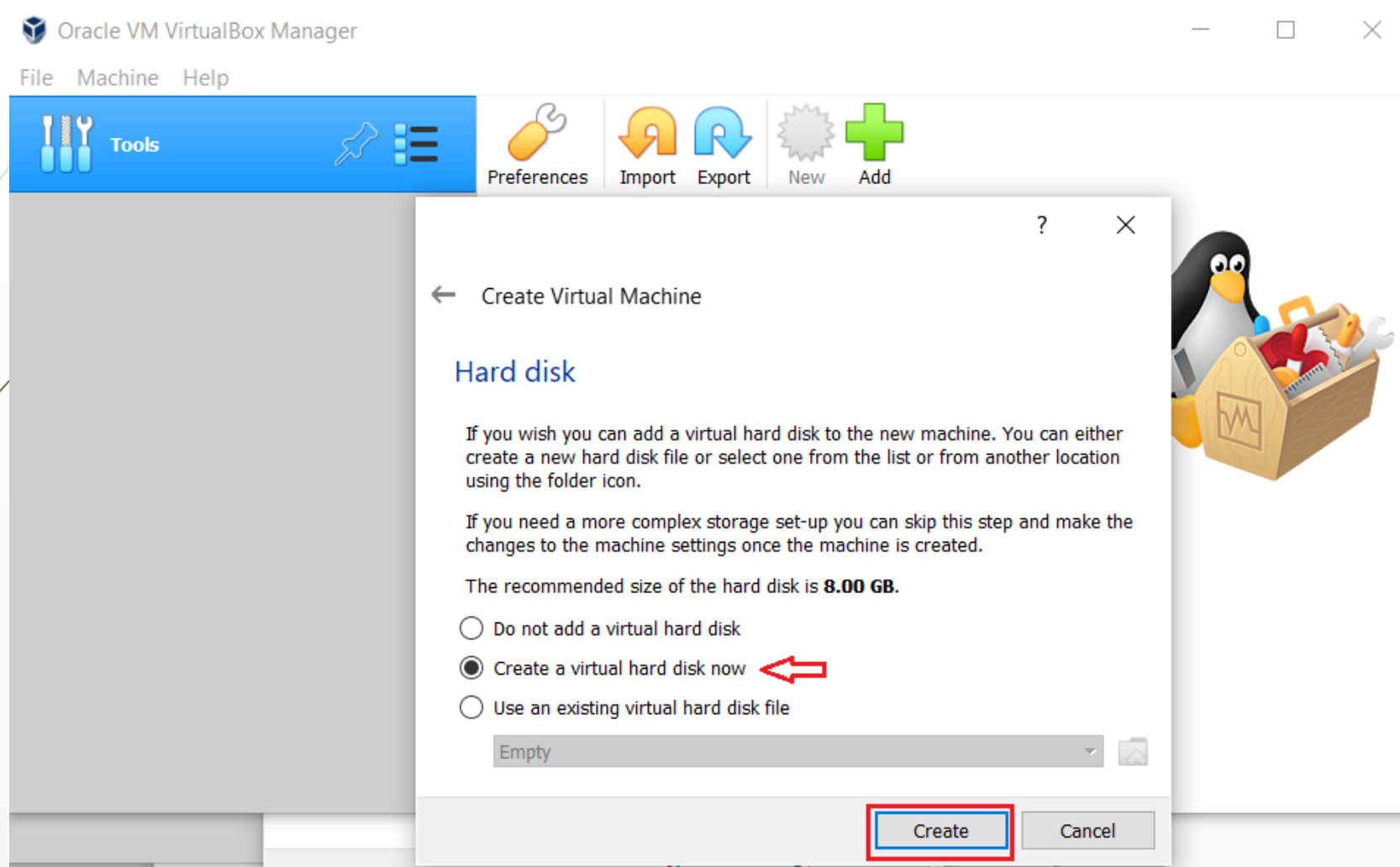
Give a name to your VM, select installation directory, select OS version type as Other Linux (64-bit) and click next.



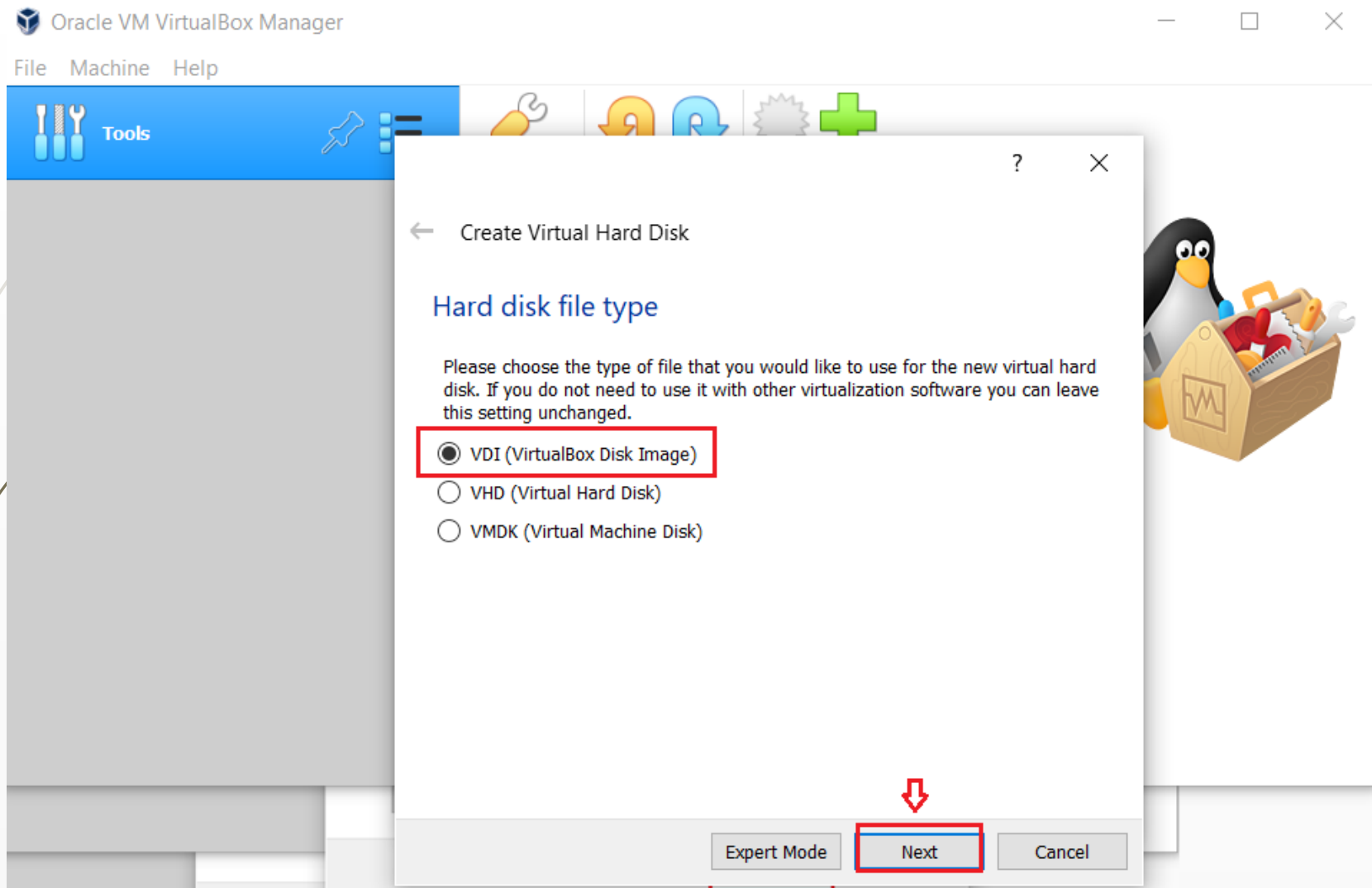
Use the slider to select 4096 (4GB) as your RAM Size and click next



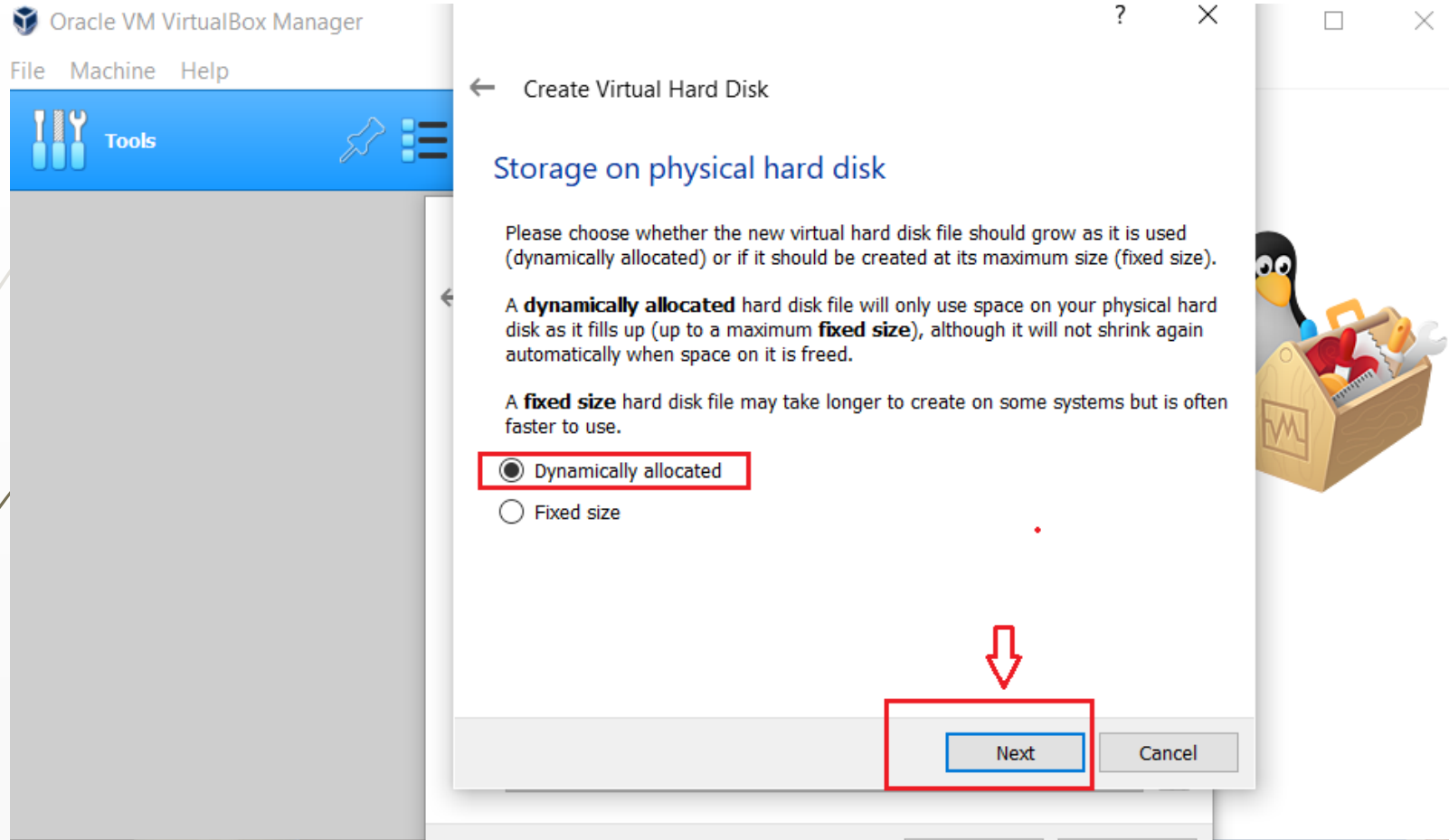
Select Create a virtual hard disk drive and click next



Select Create a virtual hard disk drive as VDI and click next

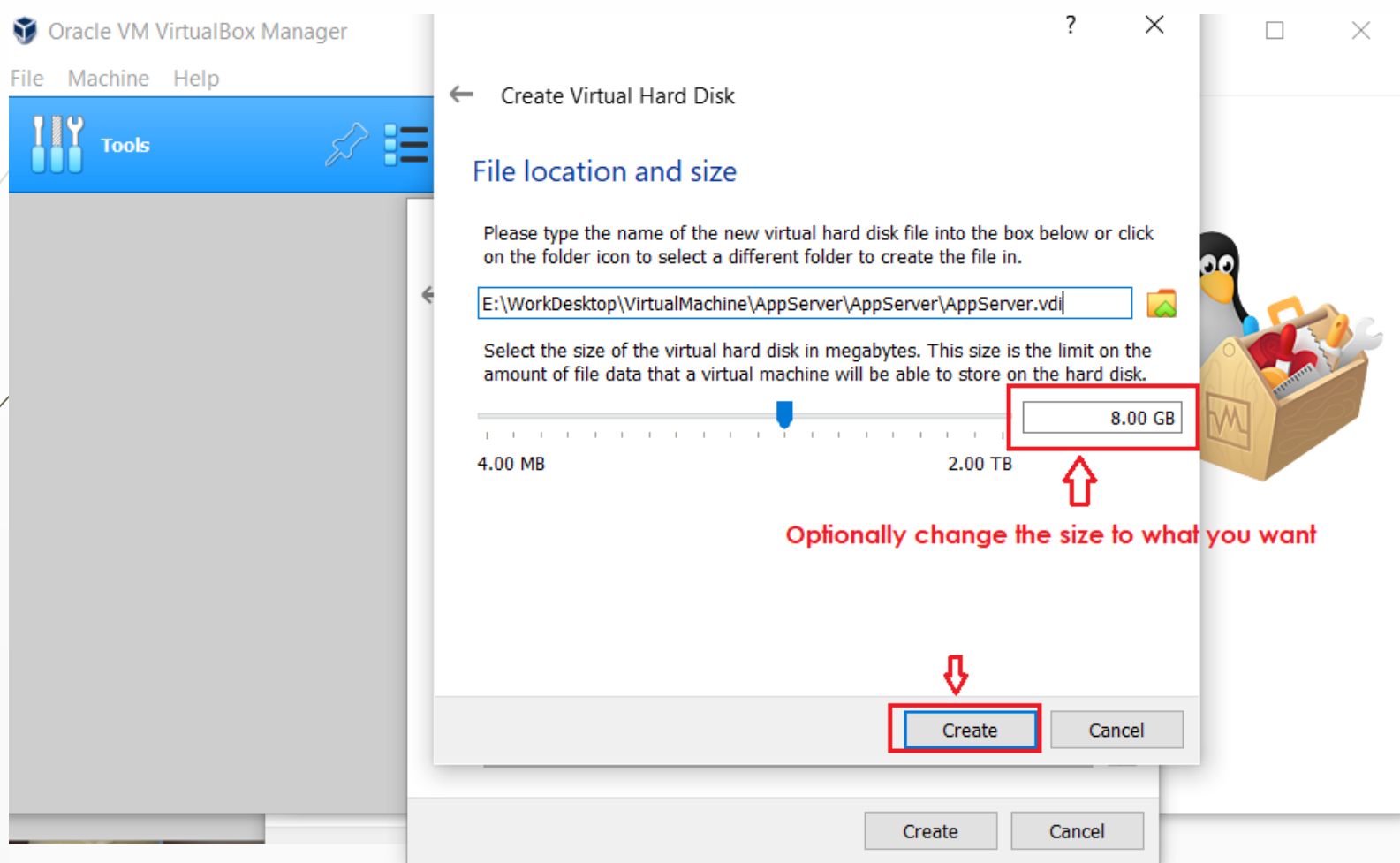


Select Dynamically allocated and click next

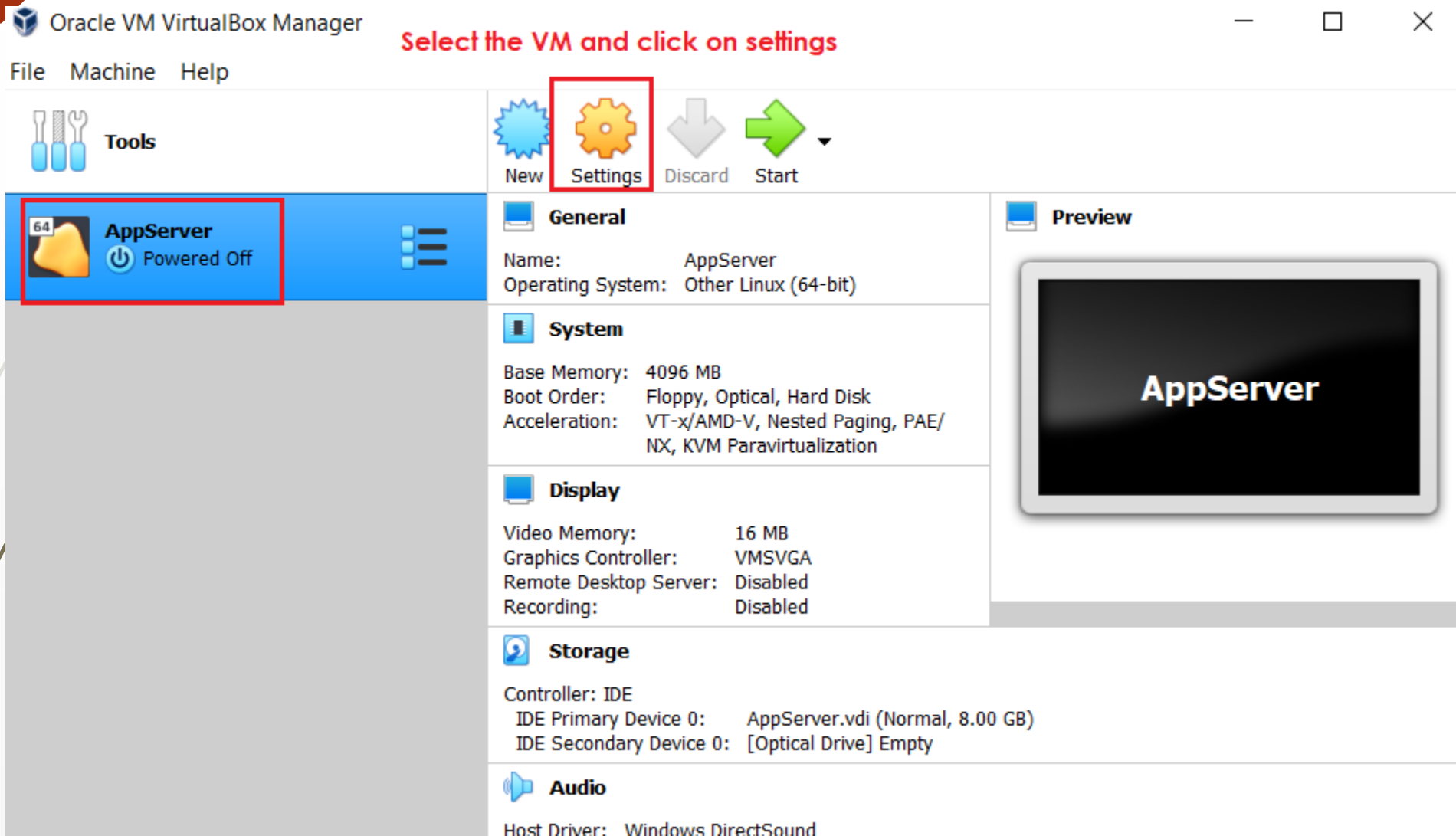




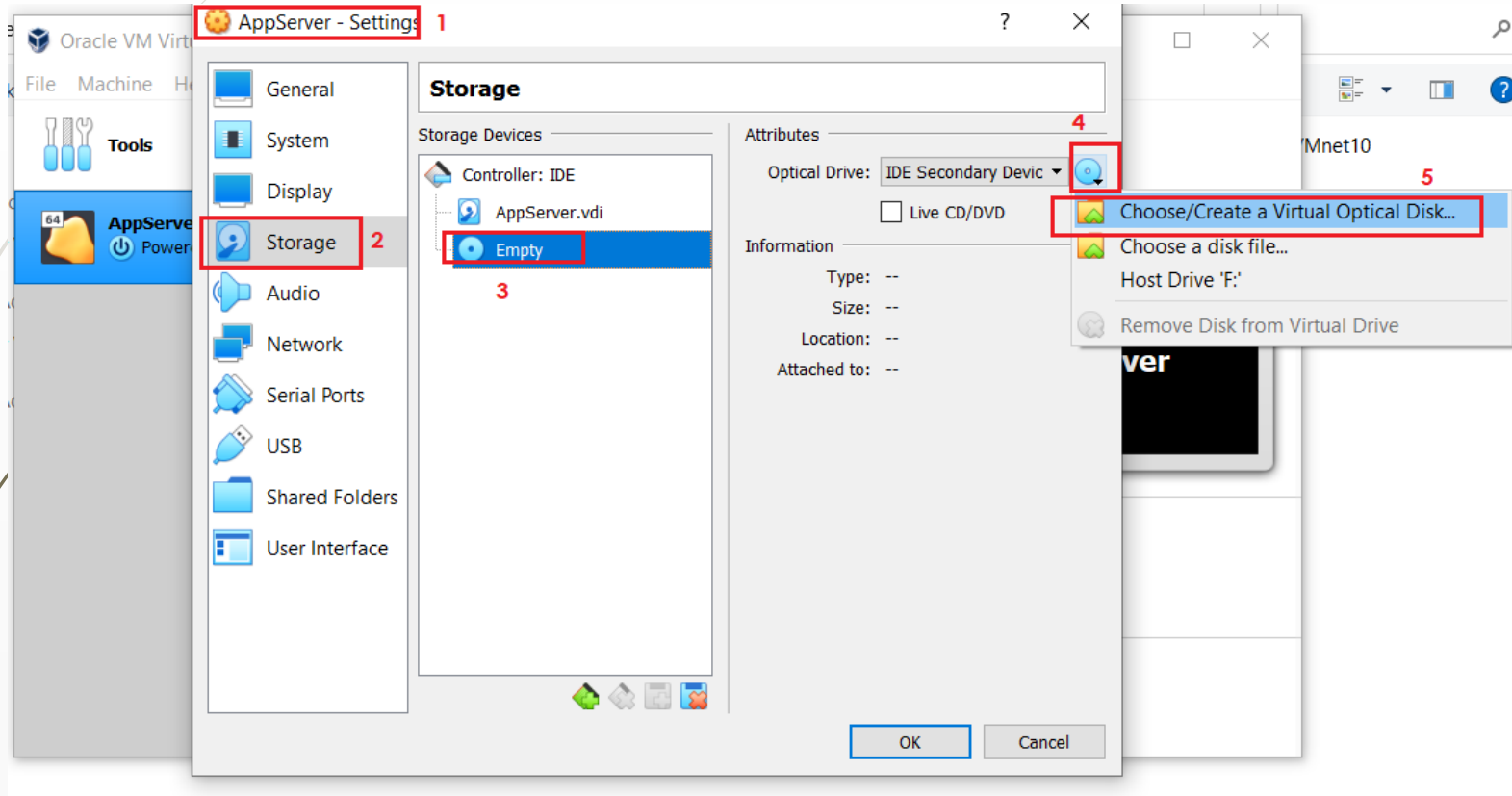
Select the size of your virtual machine. **8GB** should be fine for Lab Application server. You will require more size if you are installing AppDynamics controller (80GB and above). Click Create.



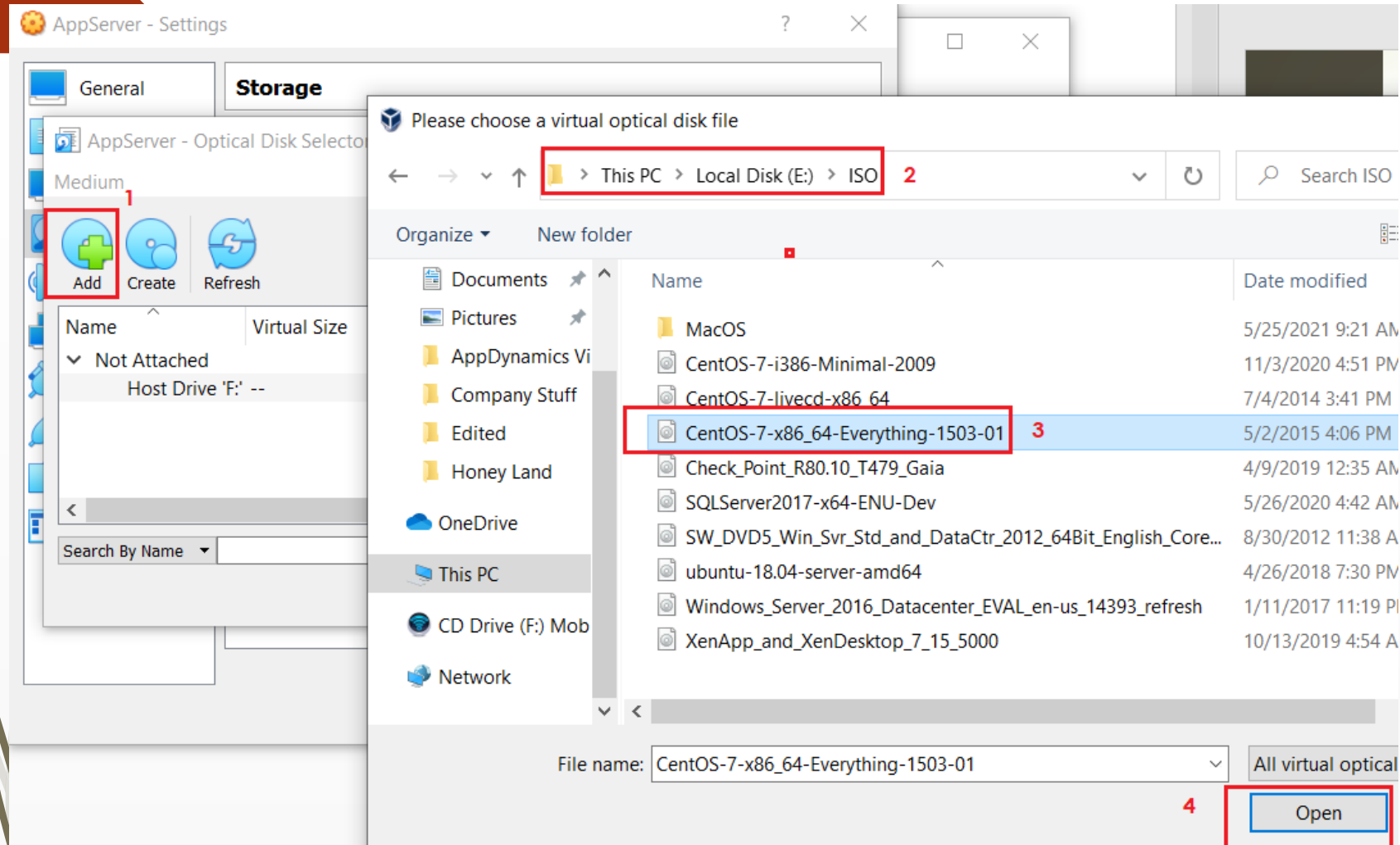
Modify the virtual machine settings by selecting the VM and settings



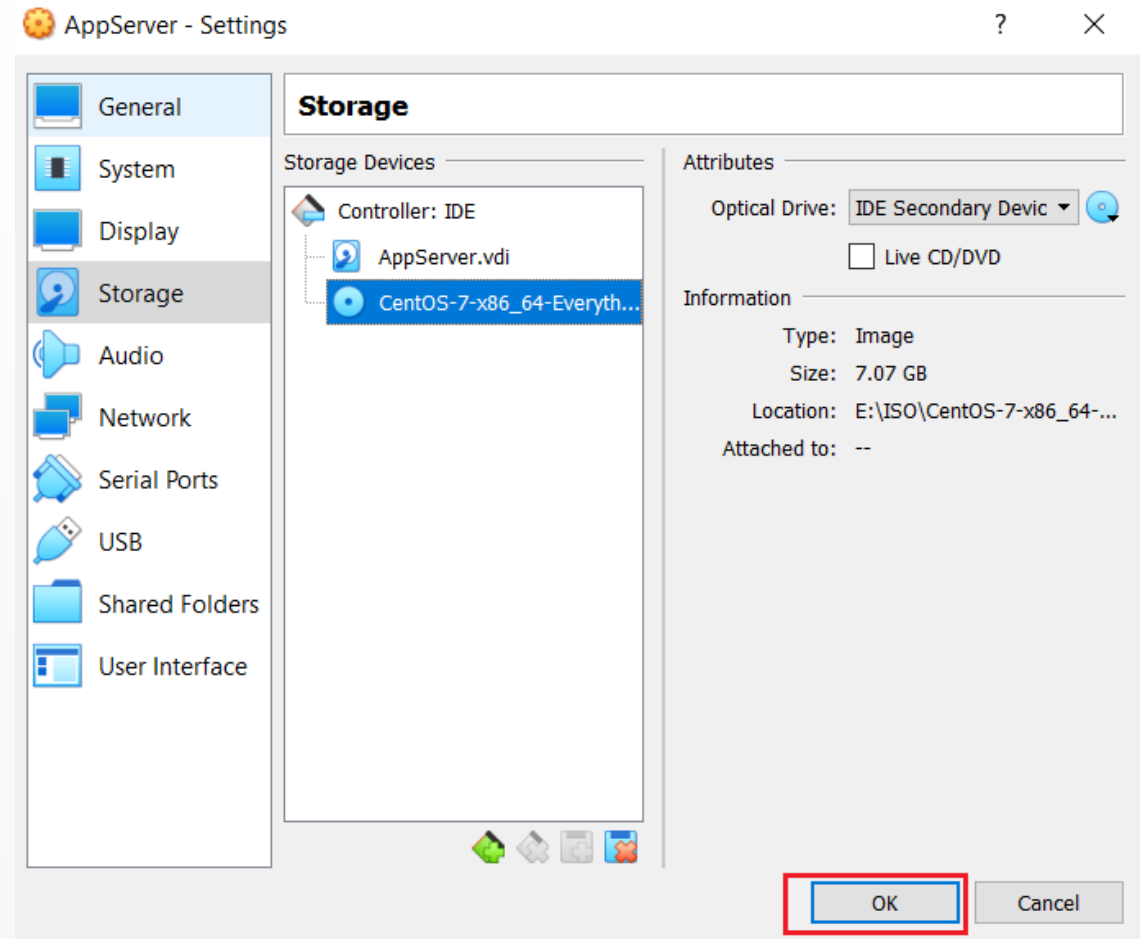
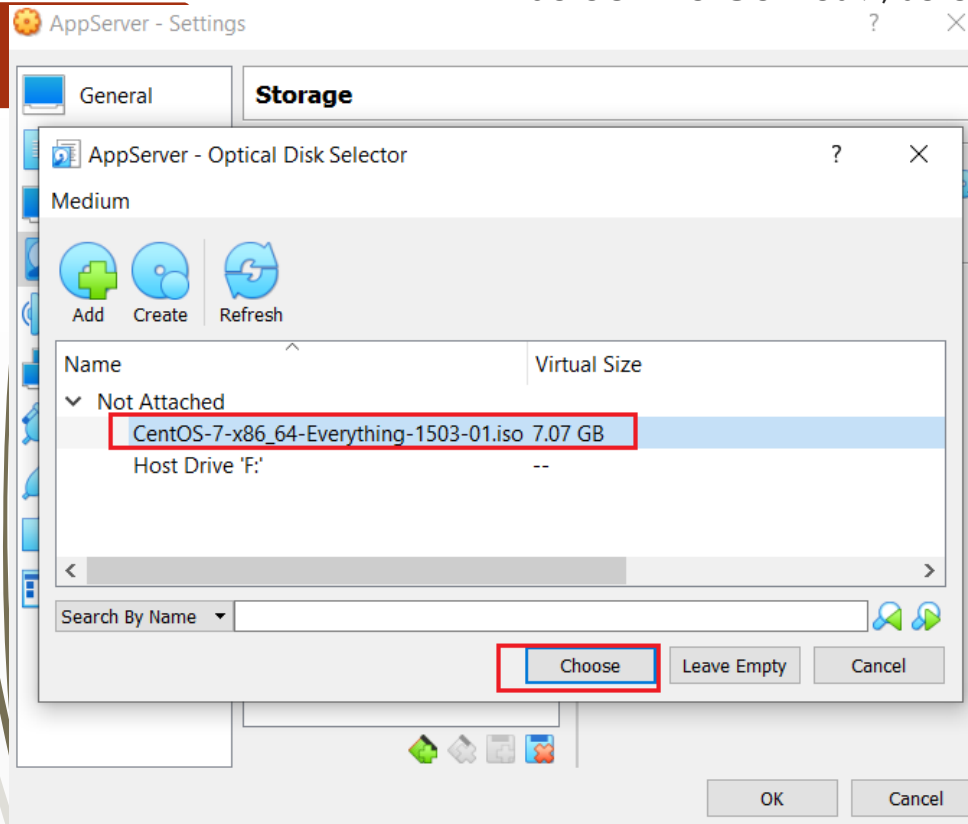
Connect the downloaded Centos 7 ISO file to virtual machine to begin installation by selecting settings > storage and follow the steps below. Select **Choose/Create a Virtual Optical Disk** and browse to location of the centos 7 ISO file.



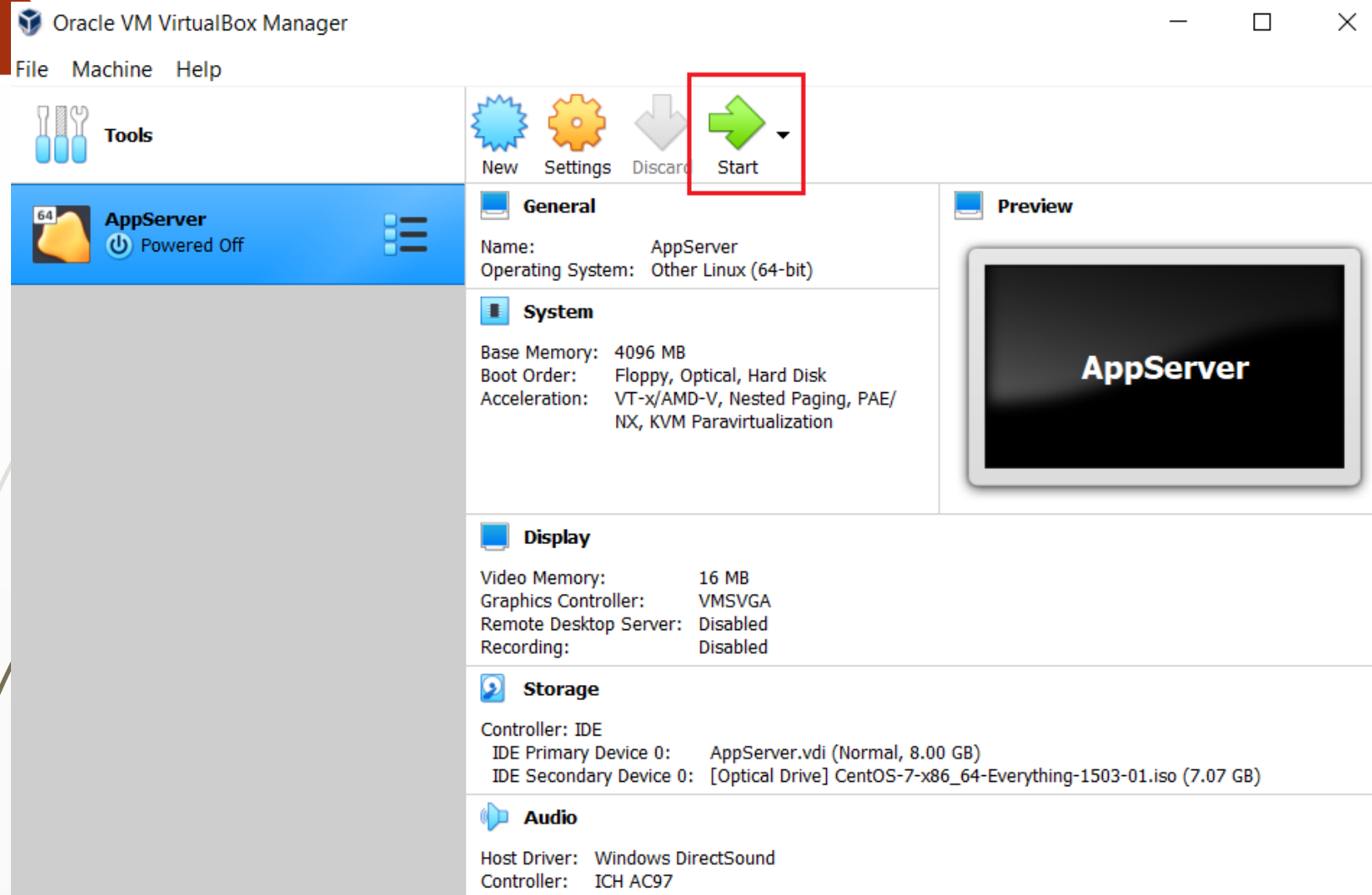
Select the Centos 7 ISO file and click open



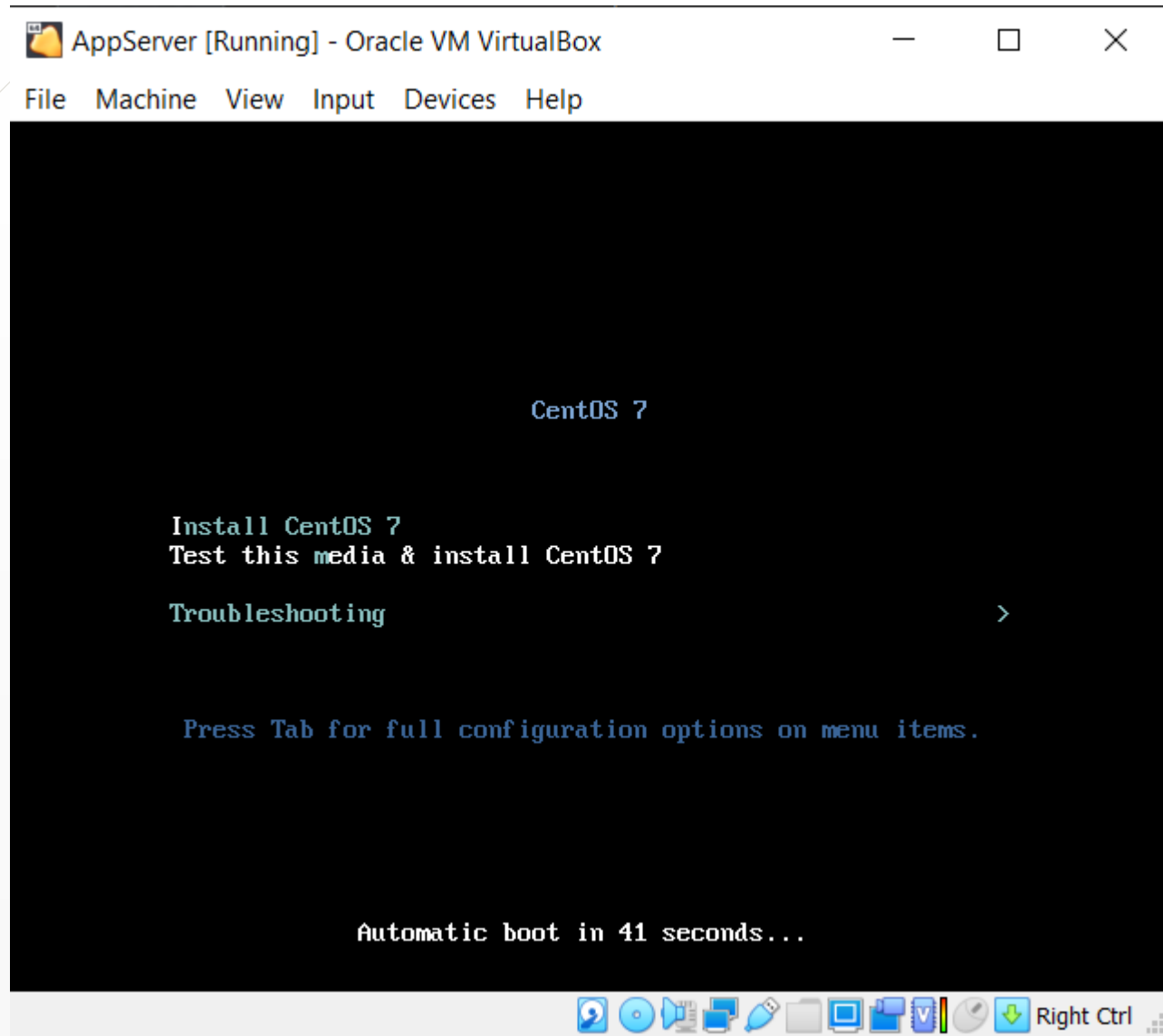
Select the Centos 7, select "choose" and click ok



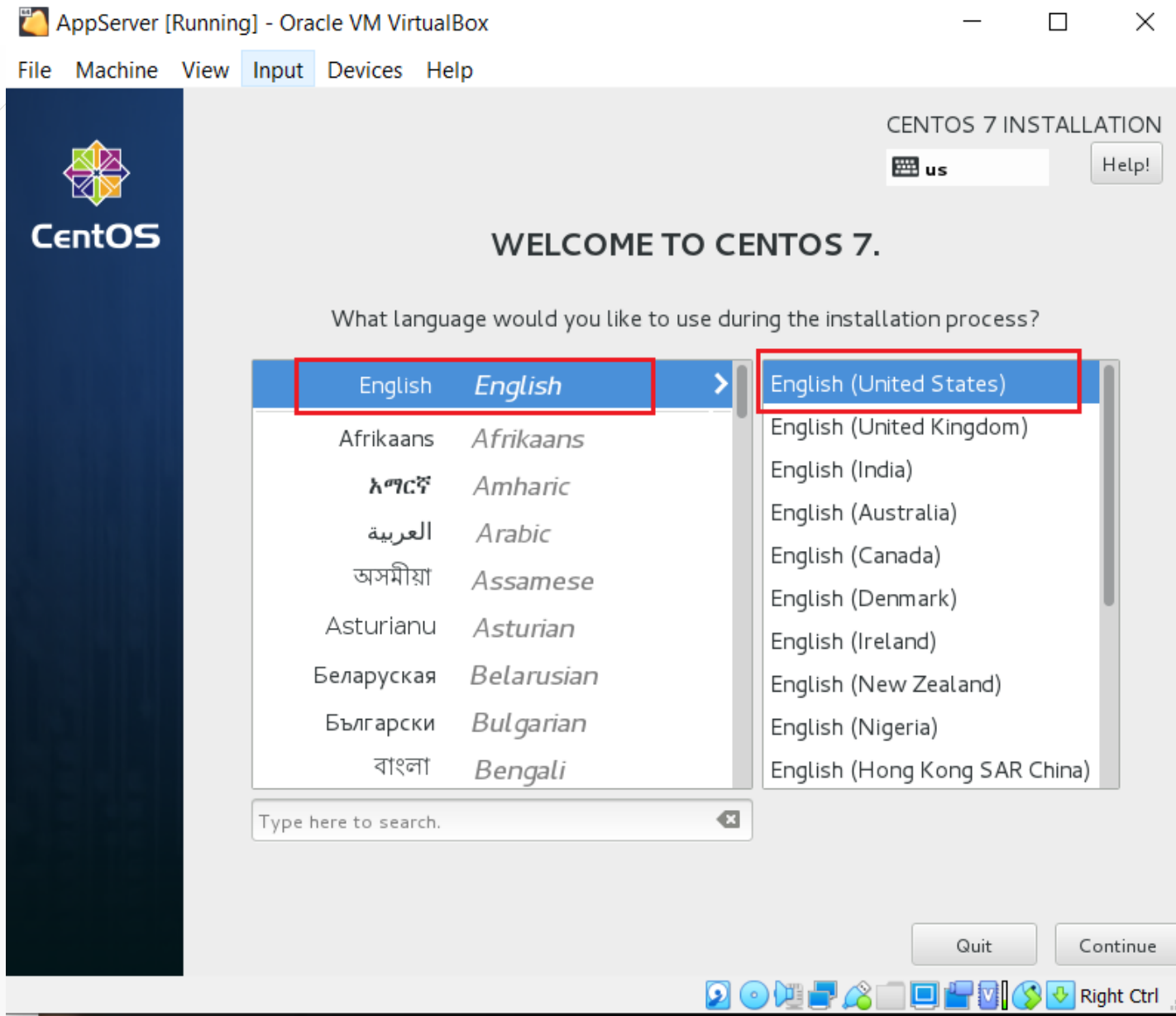
Select "Start" to begin installation



Select Install Centos 7 and press enter



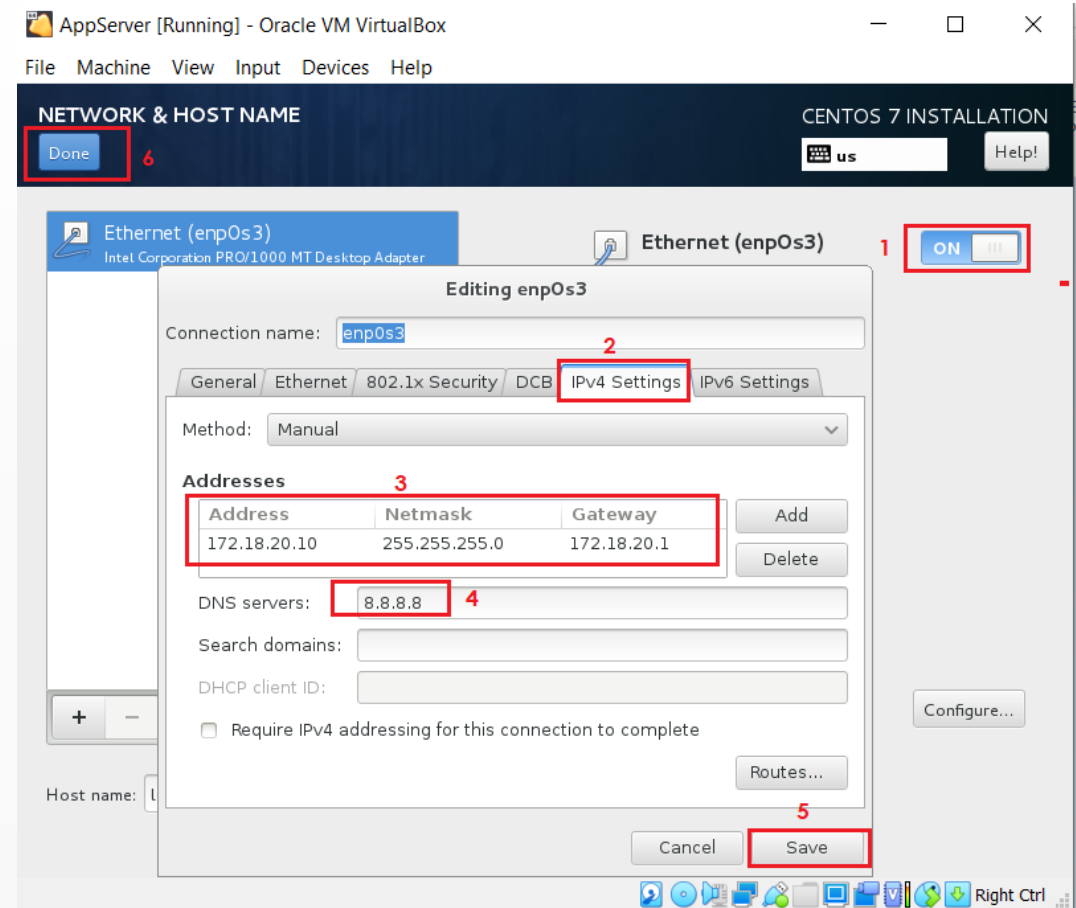
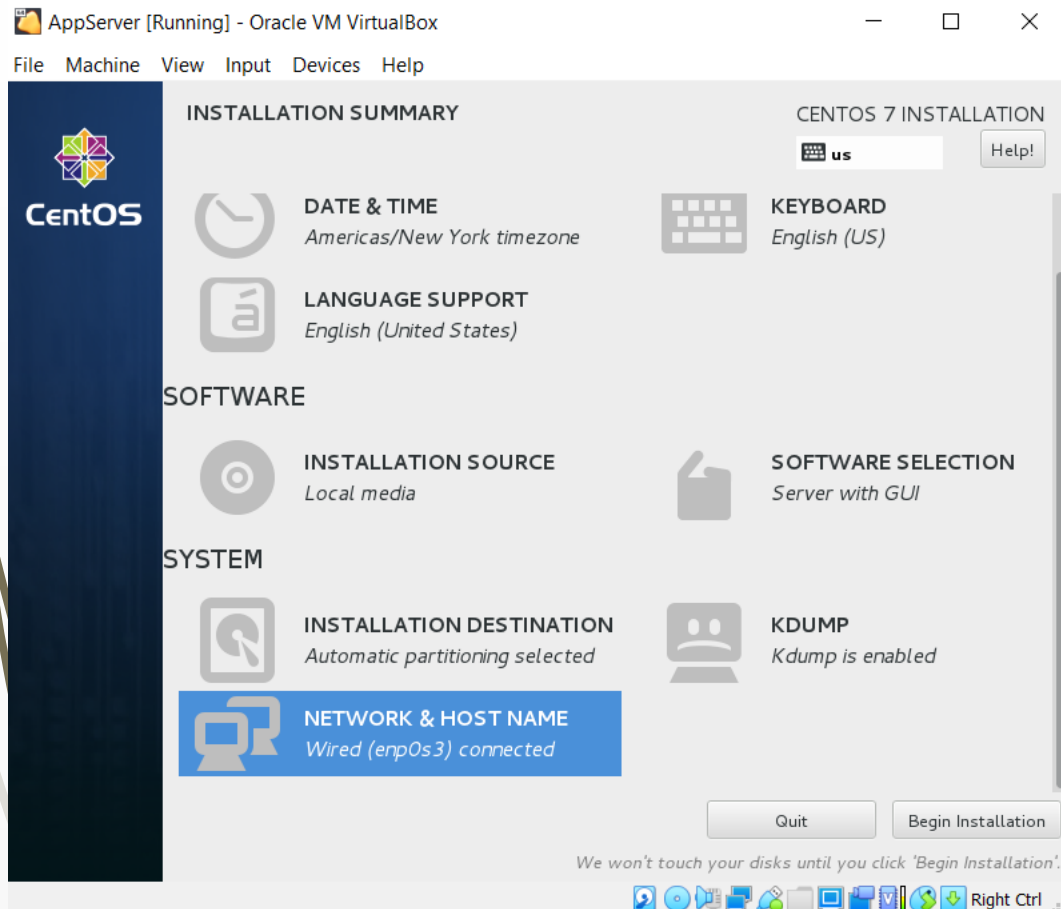
Select English or your language and click continue



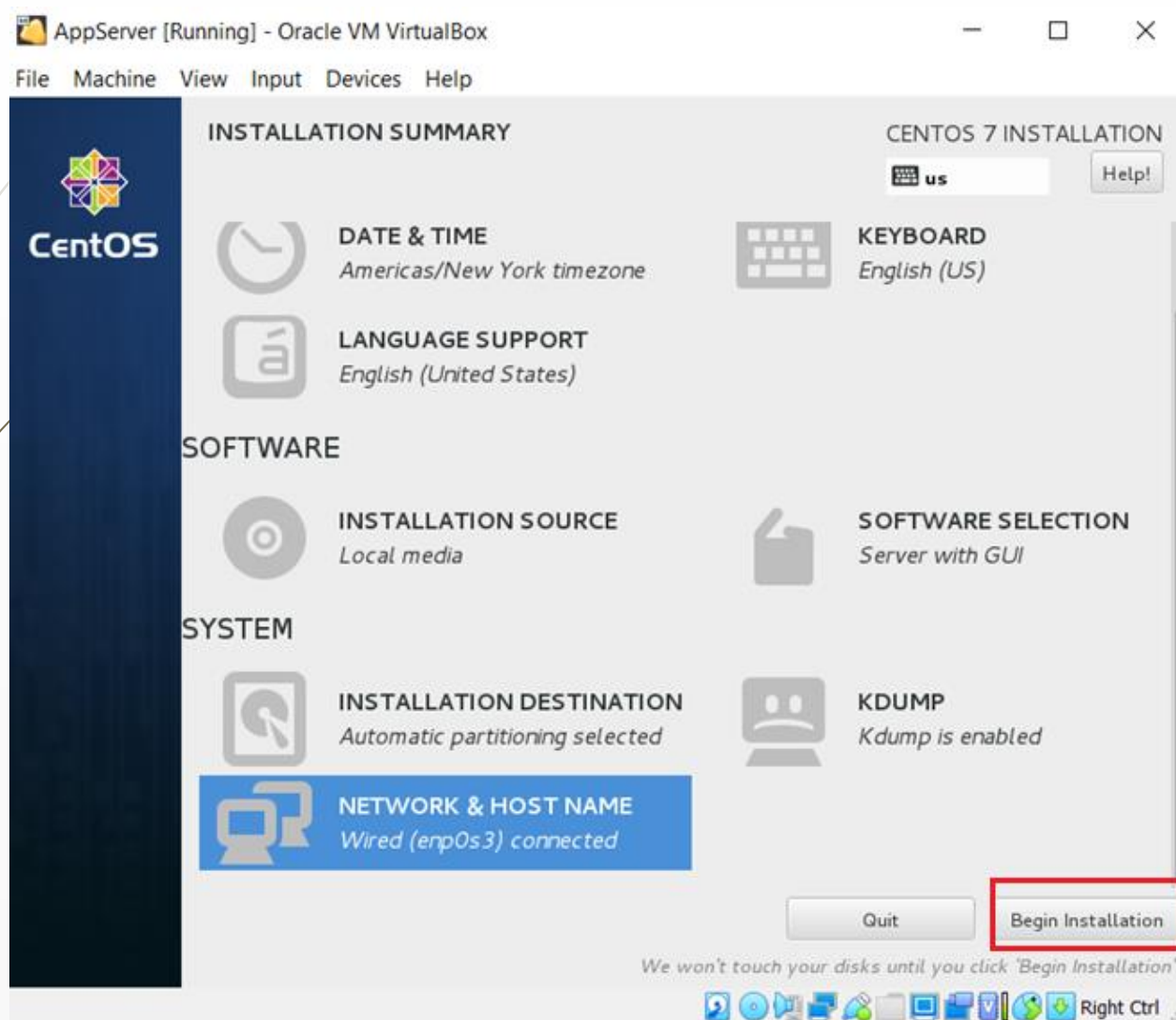


Select your **keyboard** option, **Date and Time**, Installation source to be **local media** (your ISO file)

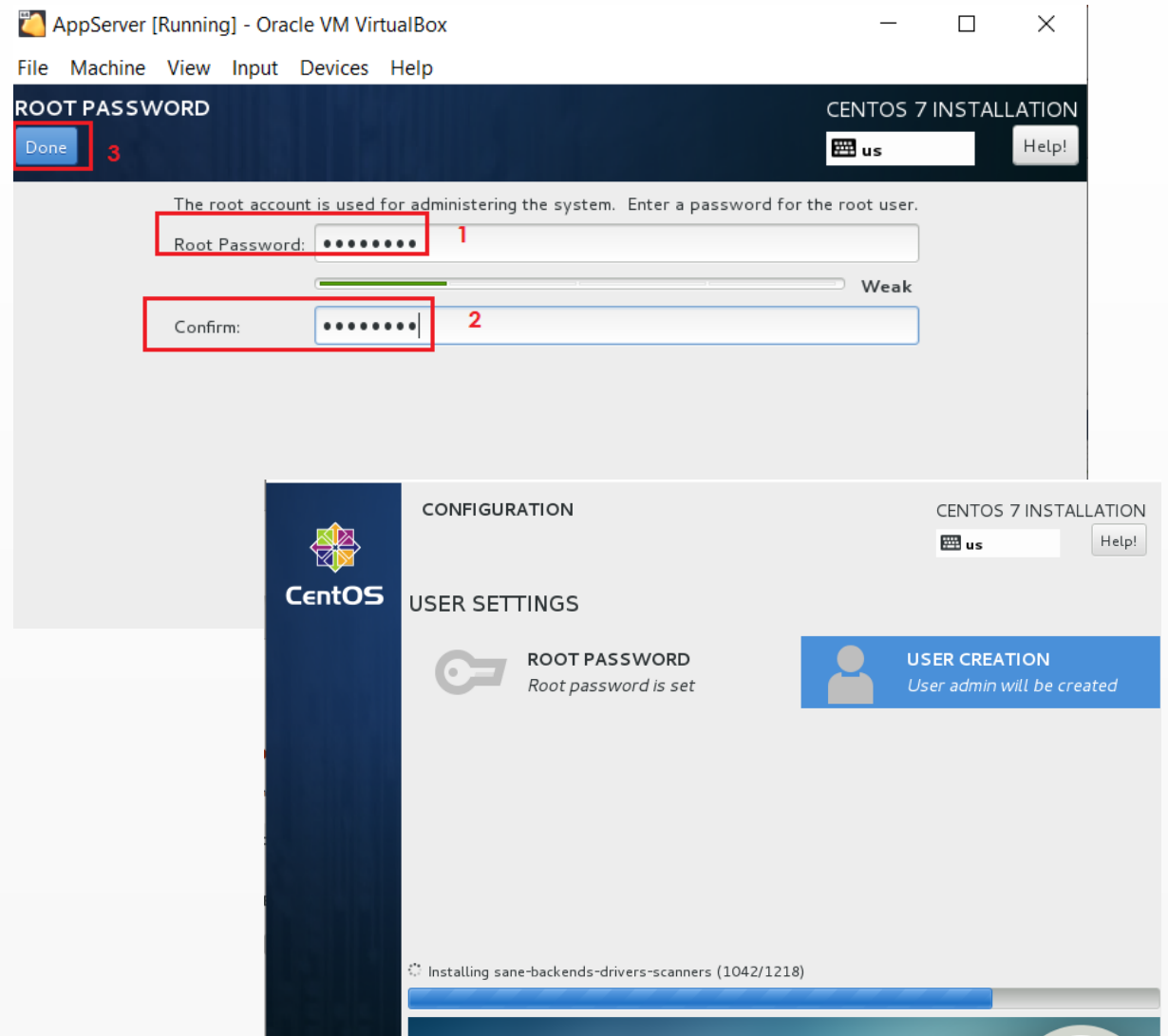
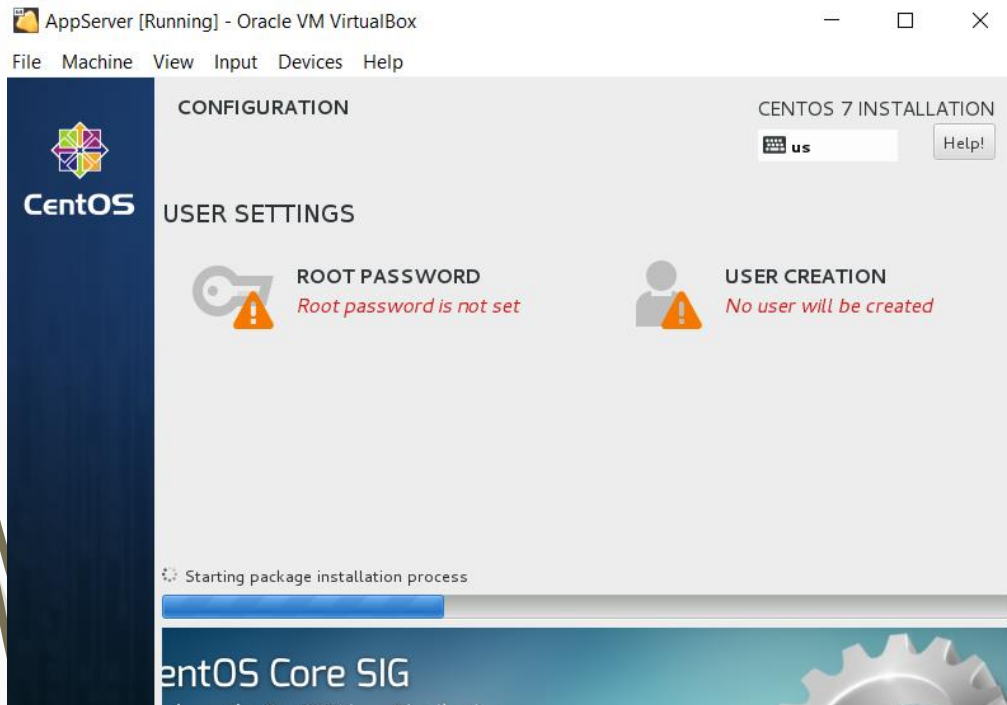
Also select Installation destination and select **Automatic Partitioning**. Note for production installation you may need to choose **manual partitioning** to give you more control. Ensure your software Selection is with **Server with GUI** (if you are not used to linux command line). Lastly click on the network and modify to suite your own network. See “ **Network and Hostname Screen**” below for example. Click save when you are done



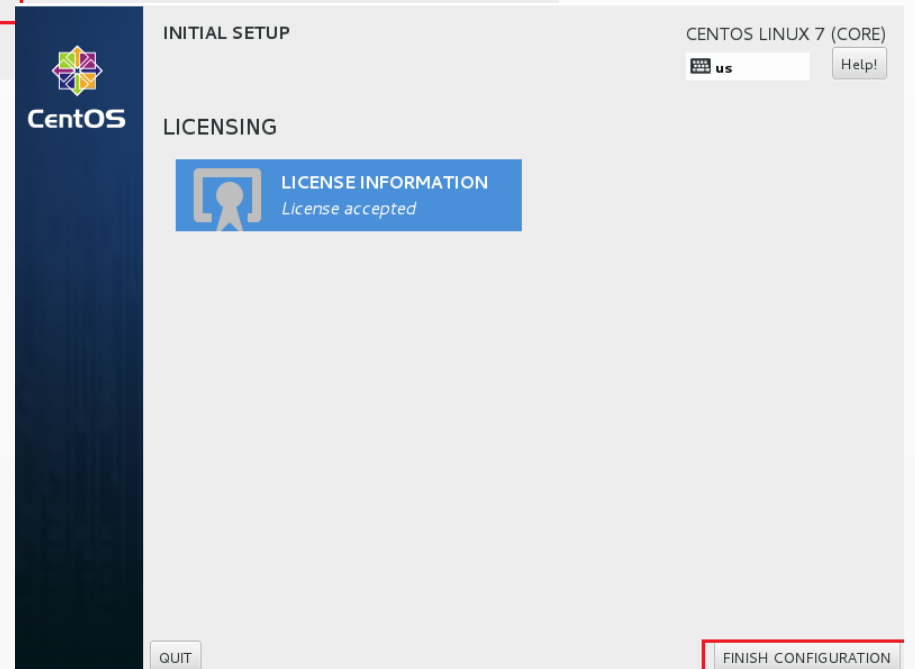
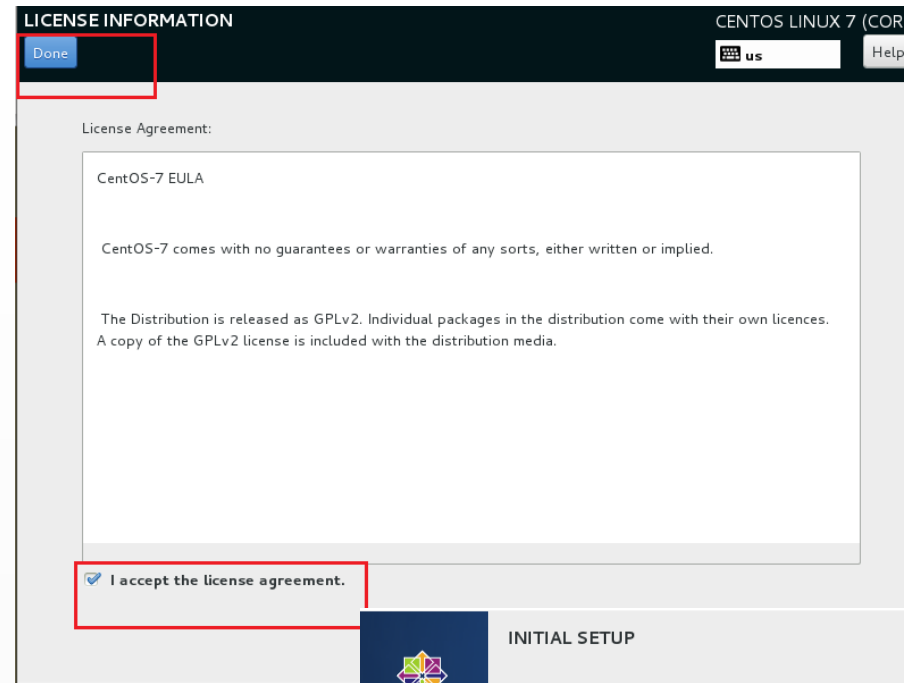
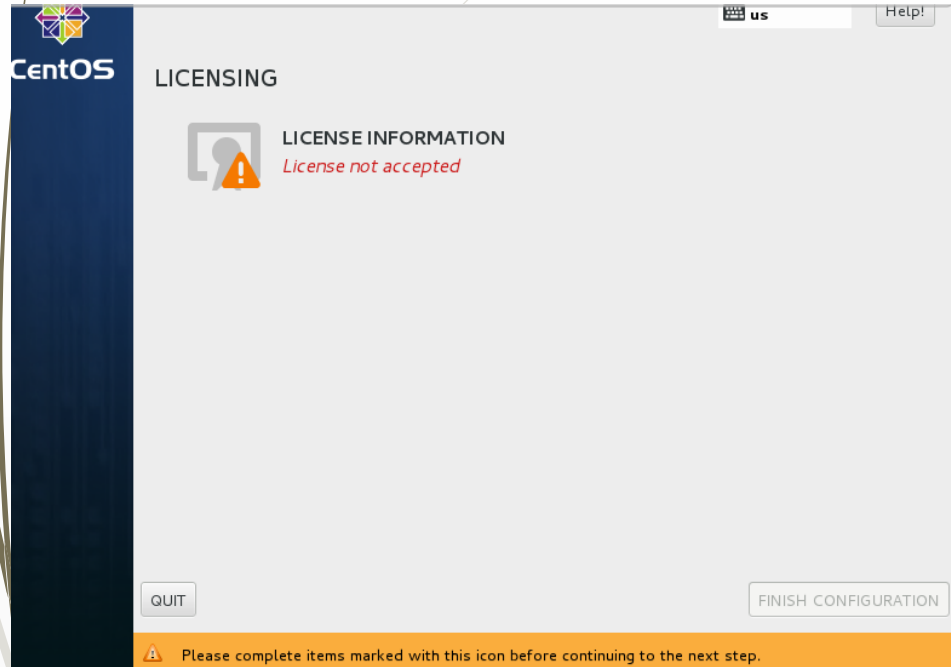
Your screen should look like this when you are done with no error flags. Click Begin Installation to start installation



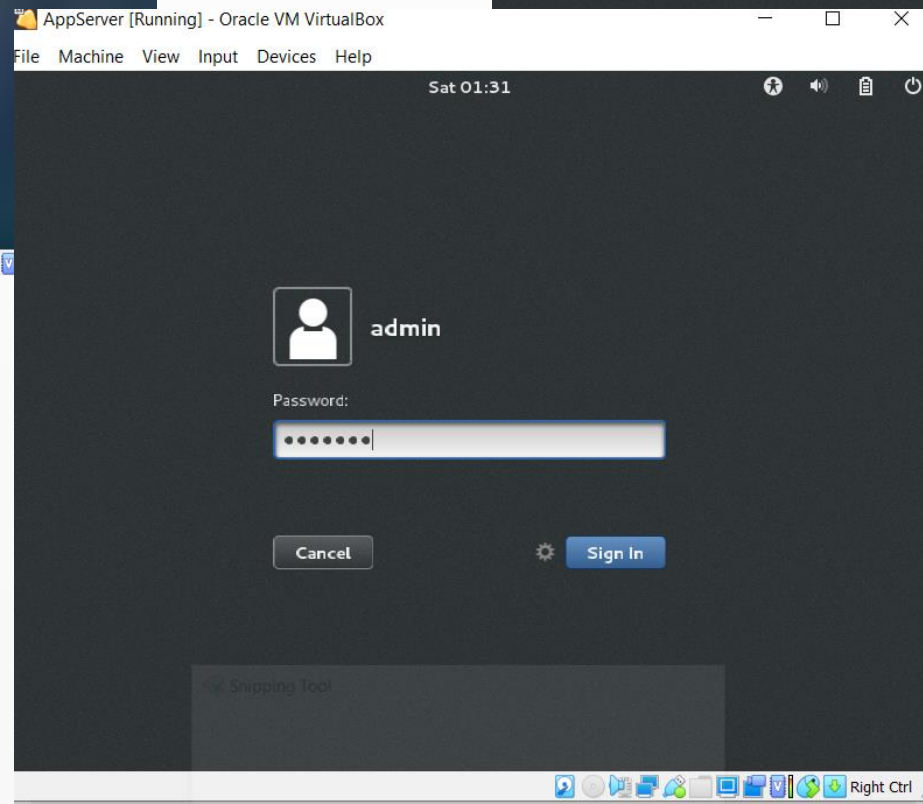
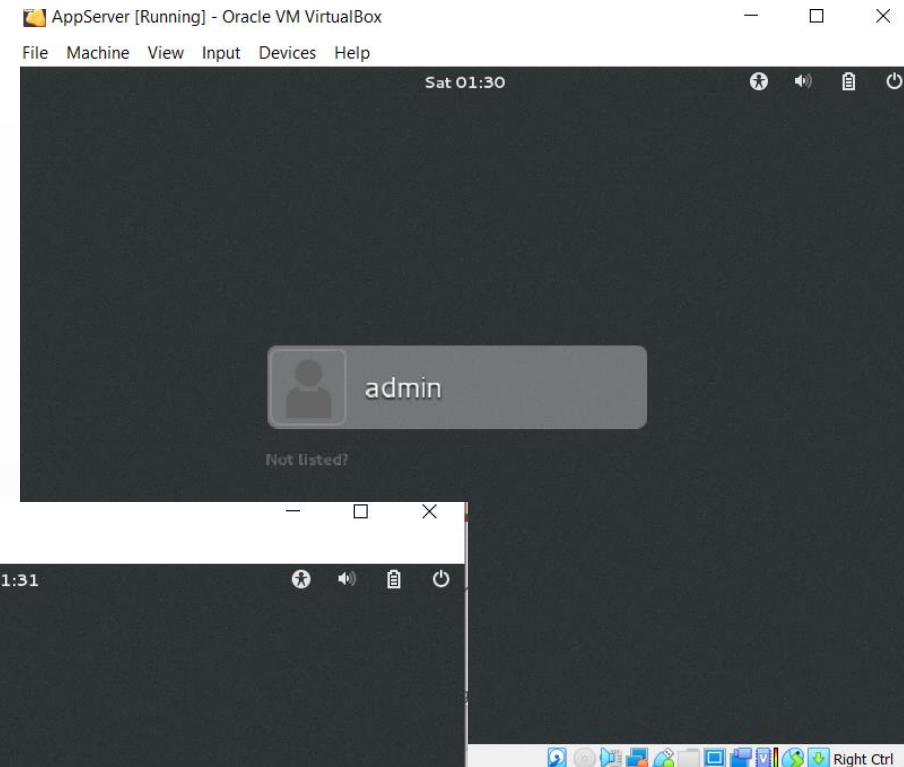
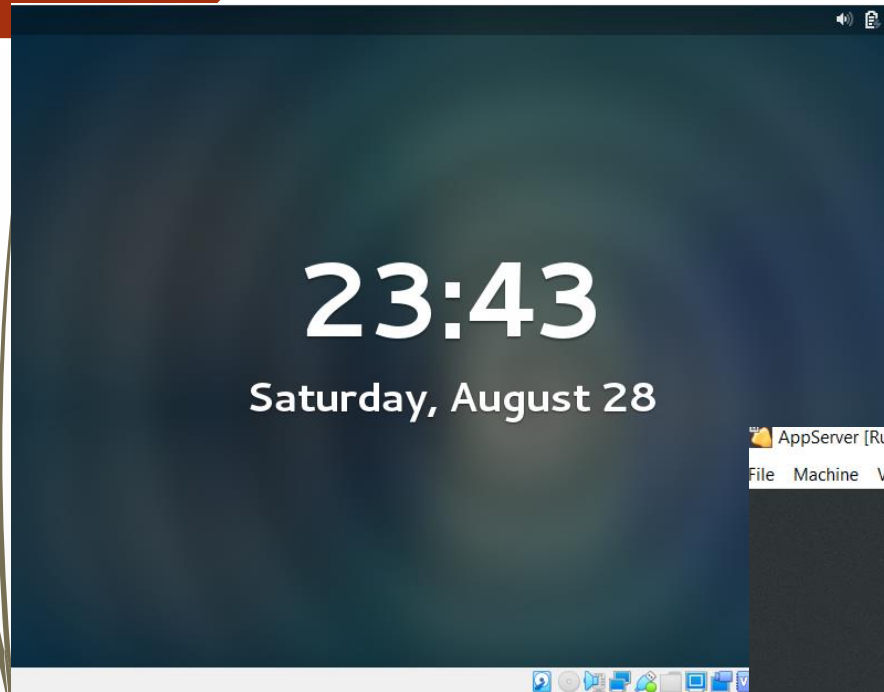
Select the **Root password** and type in password for the root. Also select User creation and create the first user for the linux server aside from root. I have used **admin** in my example, but it can be anything you choose



Click on Licensing Information and accept the license agreement and select finish configuration.



Your centos 7 server will power cycle and present you to login screen. Click on admin to login. If the VM locks after some time of working just click the mouse, hold and drag up the screen to see the login page



Note that after oracle VirtualBox installation, the installation would have created **one** Host-Only network under your windows network connections. This is what your virtual machine will connect to. I am using two connection. You can create additional connections. I created a second **Network #3** because I intend to use it to connect to the internet

The image shows a composite of three screenshots illustrating the setup of a second host-only network in Oracle VM VirtualBox.

**Top Left Screenshot:** Shows the 'VirtualBox Host-Only Network #2' window, which is 'Enabled'. Below it, the 'VirtualBox Host-Only Ethernet Adapter #2' is listed.

**Bottom Left Screenshot:** Shows the 'Network Connections' window in Windows. Under the 'Ethernet' tab, 'Network cable unplugged' is shown for the Realtek PCIe GBE Family Controller. Below this, 'VirtualBox Host-Only Network #3' is shown as 'Enabled', with its corresponding 'VirtualBox Host-Only Ethernet Adapter #3' listed below it. This section is highlighted with a red box.

**Right Screenshot:** Shows the 'Oracle VM VirtualBox Manager' interface. The 'File' menu is open, and 'Host Network Manager...' is selected (highlighted with a red box and a red '2'). The 'Host Network Manager' window is open, displaying a table of existing networks:

Name	IPv4 Address/Mask	IPv6 Address/Mask	DHCP Server
VirtualBox Host-Only Ethernet Adapter #2	172.18.20.1/24		<input type="checkbox"/> Enable
VirtualBox Host-Only Ethernet Adapter #3	169.254.1.72/16		<input type="checkbox"/> Enable

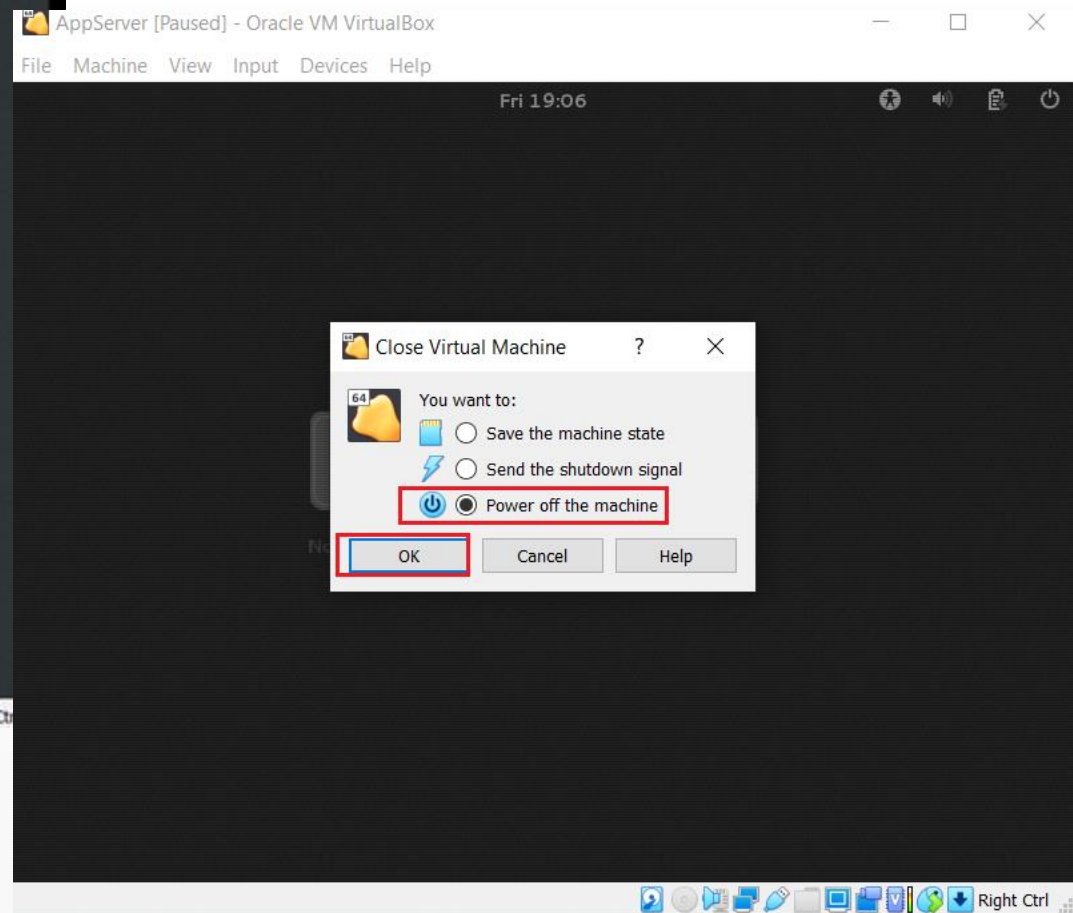
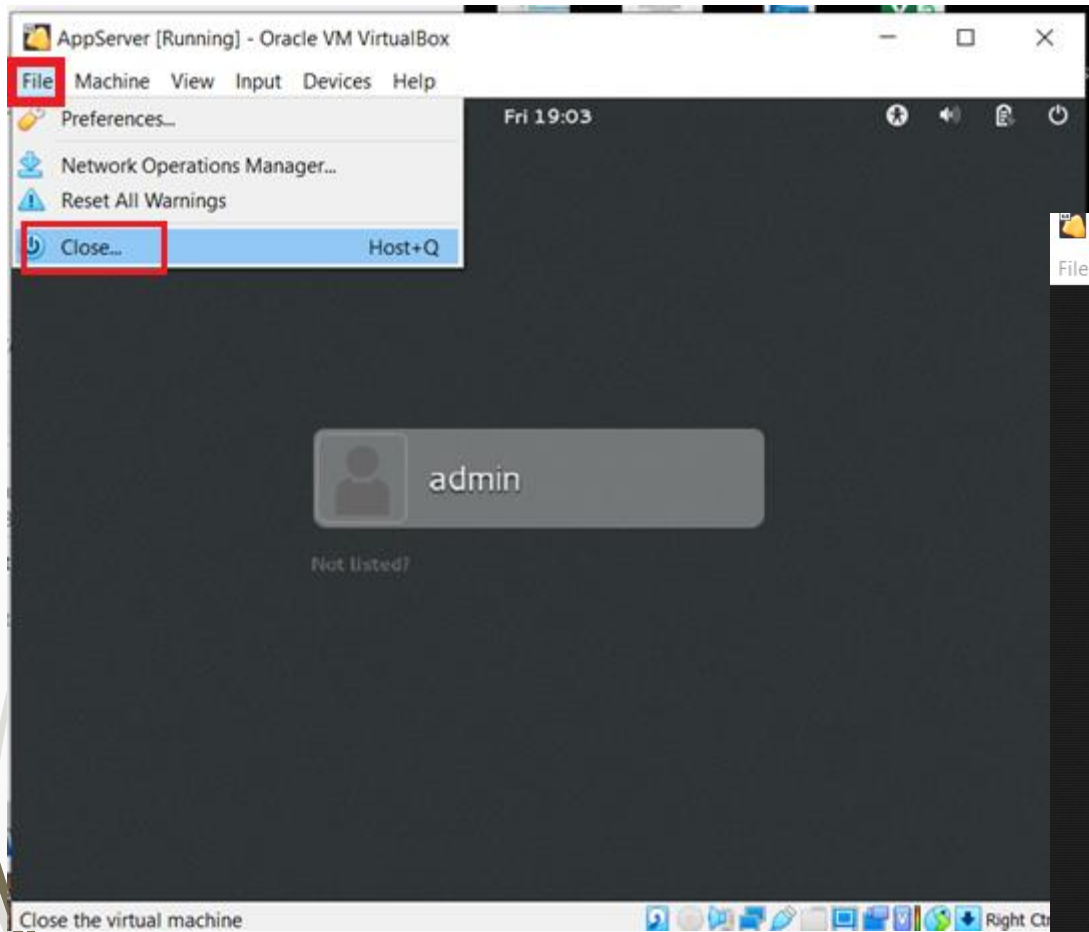
Below the table, the 'Properties' tab for 'VirtualBox Host-Only Ethernet Adapter #3' is selected, showing the 'Configure Adapter Manually' options:

- IPv4 Address: 172.18.20.1
- IPv4 Network Mask: 255.255.255.0
- IPv6 Address: fe80::c0bc:a6f7:aaef:5383
- IPv6 Prefix Length: 64

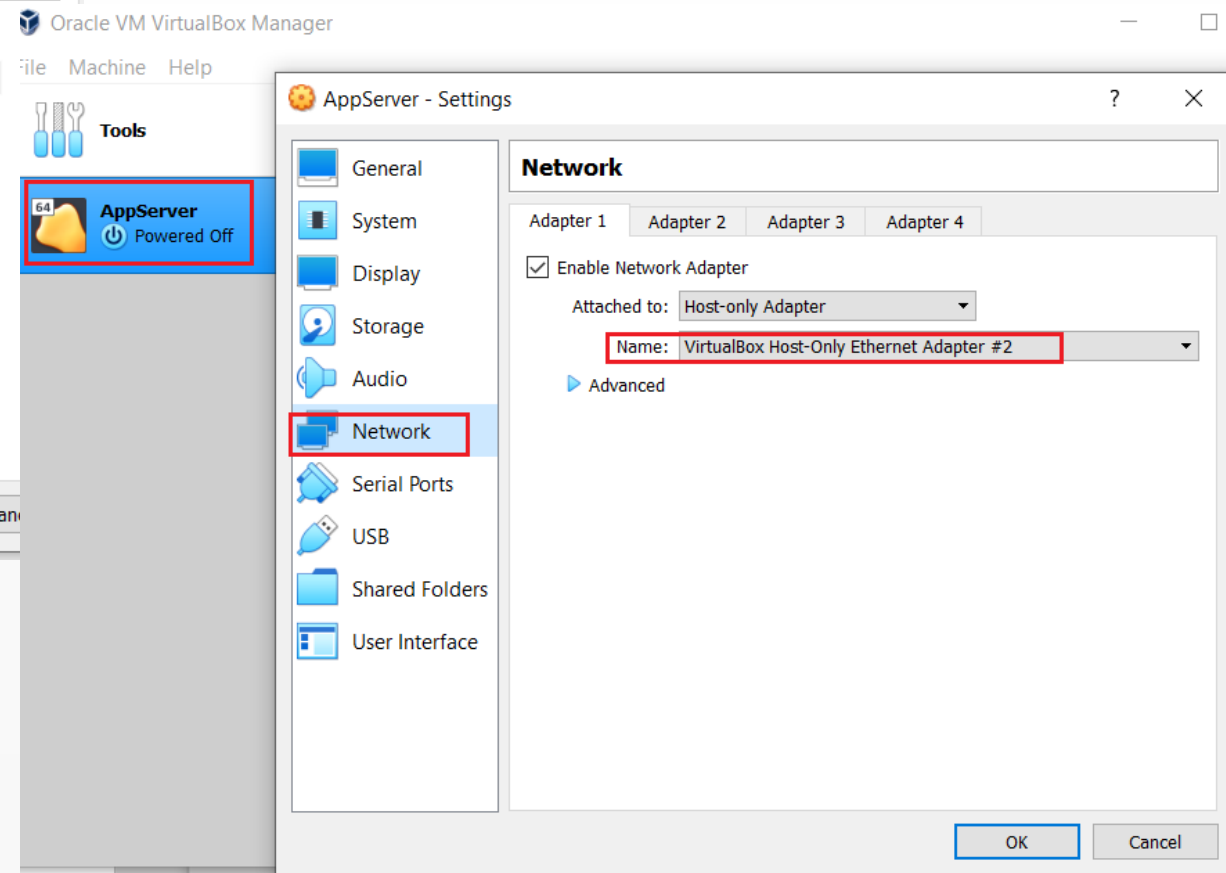
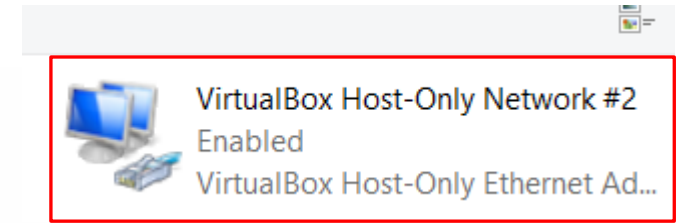
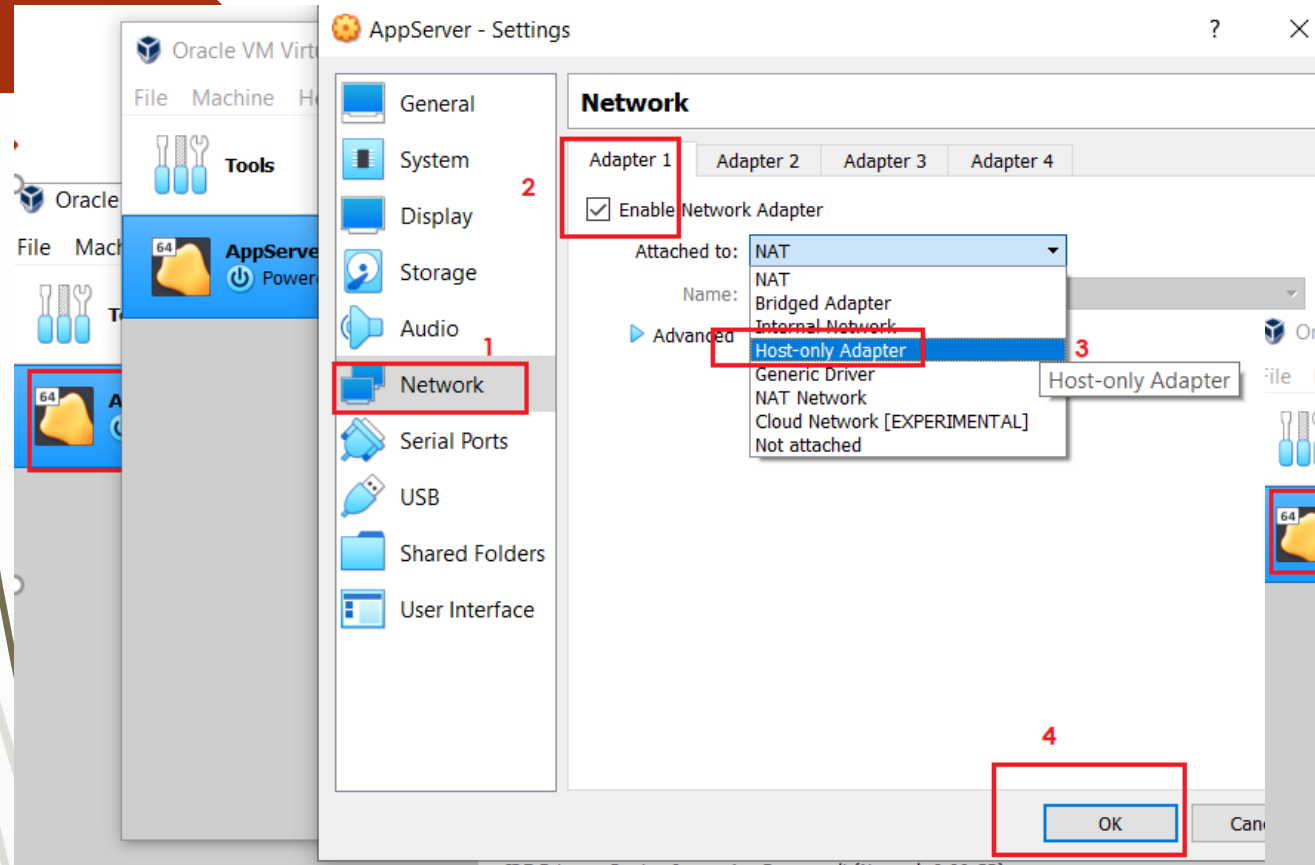
The 'Apply' button is visible at the bottom right of the 'Host Network Manager' window.



Select File, close and Power off the machine to shutdown the VM to modify the network settings

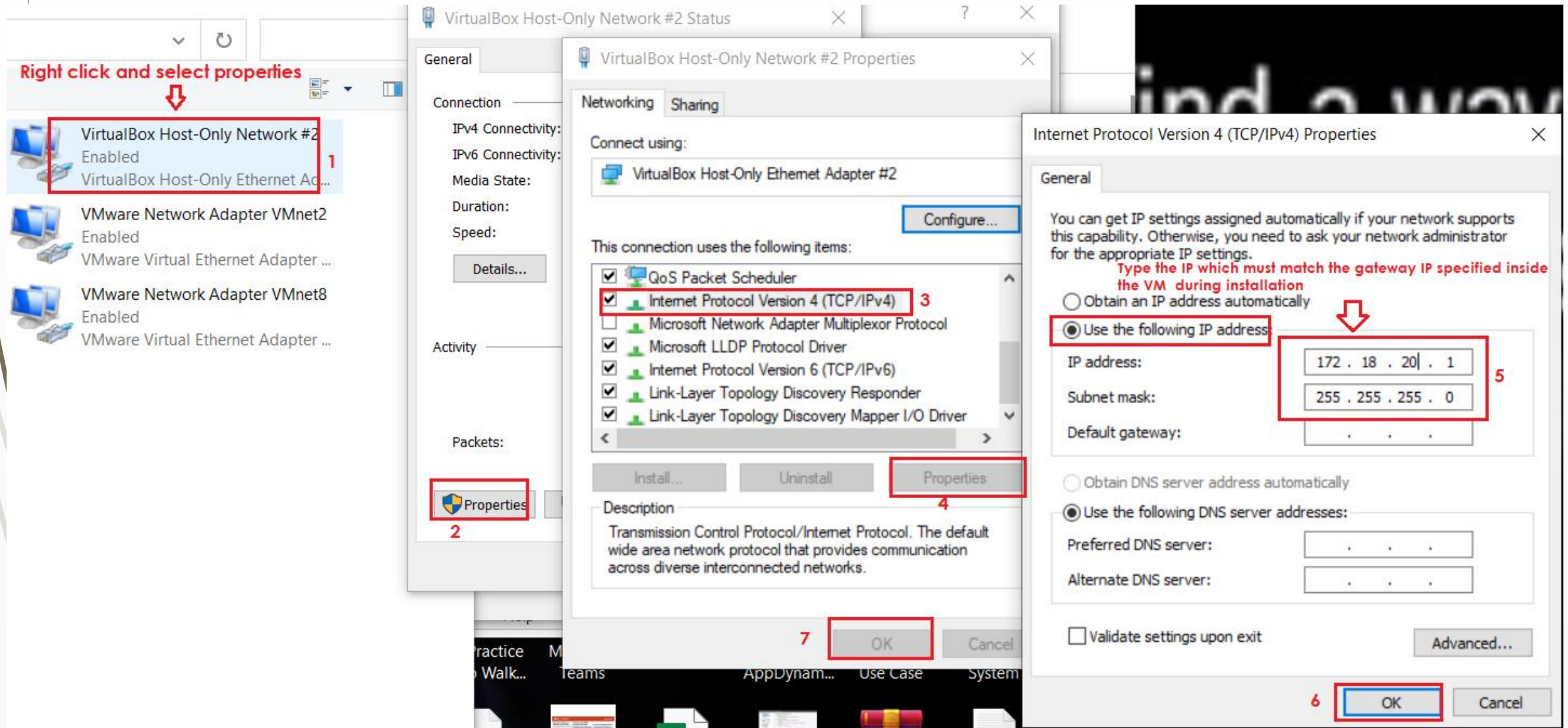


To interact with your virtual machine from your laptop, you need to select Host-only adapter. In my case #2  
Click okay and power on the machine again to test





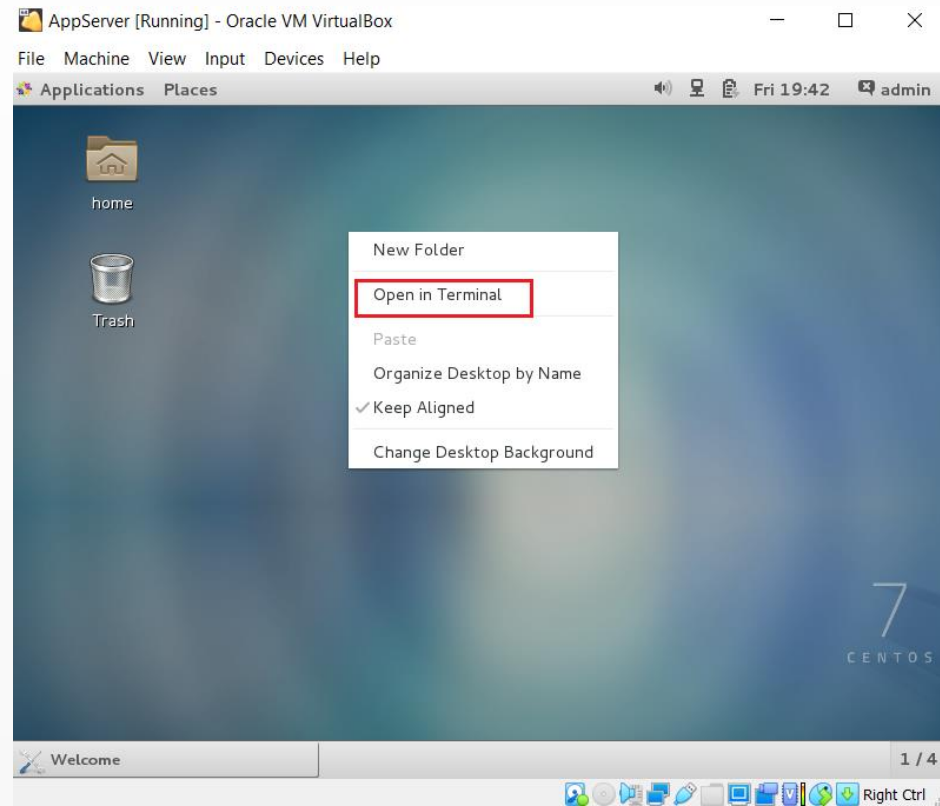
Modify the virtual network of your laptop (this will be removed later) to serve as the gateway of your linux virtual machine



## Centos 7 Post installation tasks

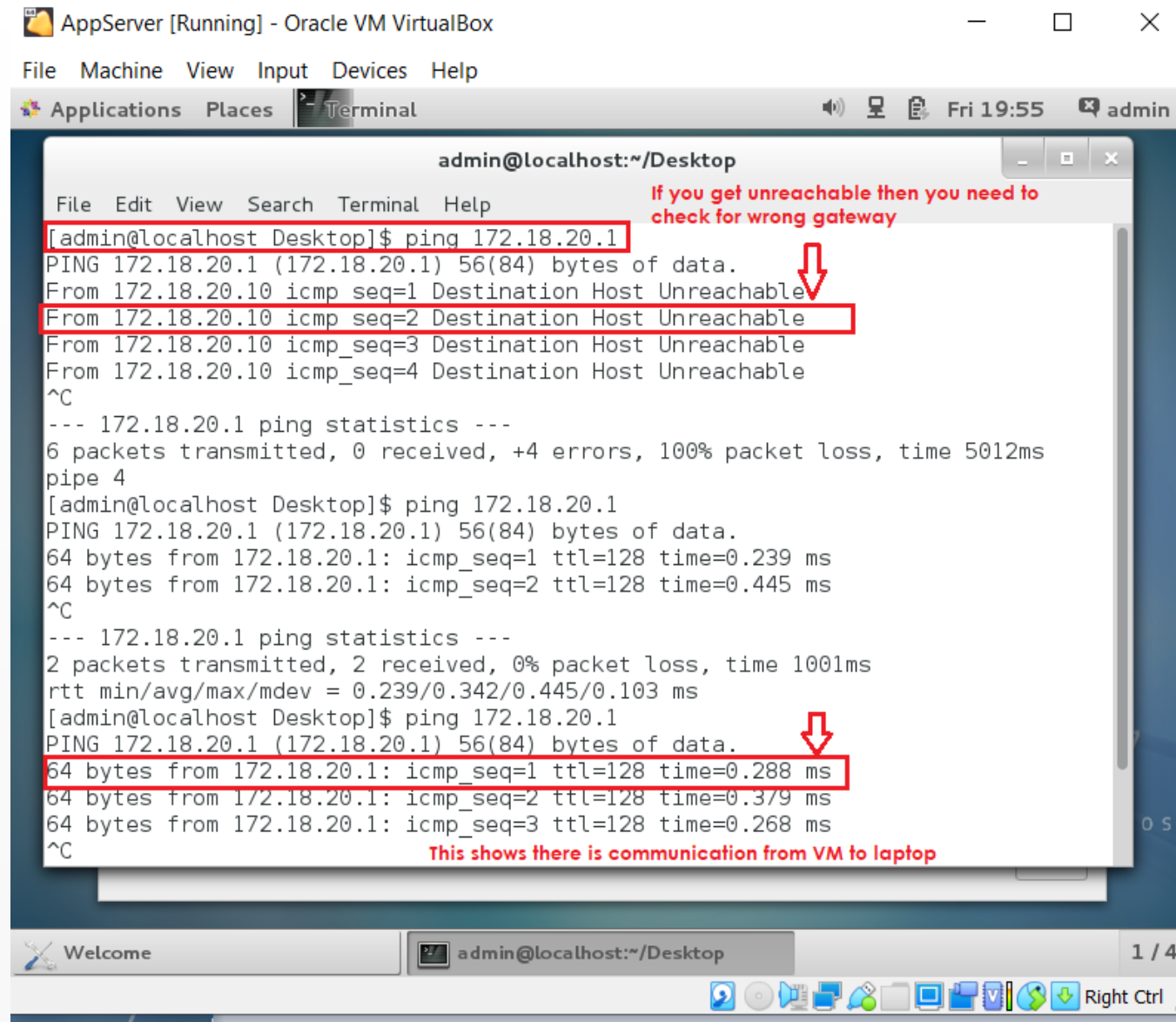
- Ensure firewalld and Selinux are disabled
- Ensure you can connect via SSH and WinSCP
- Ensure the virtual machine can reach the internet
- Ensure you can resolve DNS names

Logon to the virtual machine. Right click on the desktop and select Open Terminal



## Centos 7 Post installation tasks

- Ensure the virtual machine can reach the gateway IP – 172.18.20.1



AppServer [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Fri 19:55 admin

```
admin@localhost:~/Desktop
File Edit View Search Terminal Help
[admin@localhost Desktop]$ ping 172.18.20.1
PING 172.18.20.1 (172.18.20.1) 56(84) bytes of data.
From 172.18.20.10 icmp seq=1 Destination Host Unreachable
From 172.18.20.10 icmp seq=2 Destination Host Unreachable
From 172.18.20.10 icmp seq=3 Destination Host Unreachable
From 172.18.20.10 icmp seq=4 Destination Host Unreachable
^C
--- 172.18.20.1 ping statistics ---
6 packets transmitted, 0 received, +4 errors, 100% packet loss, time 5012ms
pipe 4
[admin@localhost Desktop]$ ping 172.18.20.1
PING 172.18.20.1 (172.18.20.1) 56(84) bytes of data.
64 bytes from 172.18.20.1: icmp_seq=1 ttl=128 time=0.239 ms
64 bytes from 172.18.20.1: icmp_seq=2 ttl=128 time=0.445 ms
^C
--- 172.18.20.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 0.239/0.342/0.445/0.103 ms
[admin@localhost Desktop]$ ping 172.18.20.1
PING 172.18.20.1 (172.18.20.1) 56(84) bytes of data.
64 bytes from 172.18.20.1: icmp_seq=1 ttl=128 time=0.288 ms
64 bytes from 172.18.20.1: icmp_seq=2 ttl=128 time=0.379 ms
64 bytes from 172.18.20.1: icmp_seq=3 ttl=128 time=0.268 ms
^C
```

If you get unreachable then you need to check for wrong gateway

This shows there is communication from VM to laptop

Welcome admin@localhost:~/Desktop 1 / 4

Right Ctrl

## Centos 7 Post installation tasks

- Ensure firewalld and Selinux is disabled
- Ensure you can connect via SSH and WinSCP

Logon to the virtual machine. Right click on the desktop and select Open Terminal

```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]#  
[root@localhost ~]# systemctl status firewalld check firewall status  
firewalld.service - firewalld - dynamic firewall daemon  
Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled)  
Active: active (running) since Fri 2021-09-03 19:37:19 WAT; 23min ago  
Main PID: 607 (firewalld)  
CGroup: /system.slice/firewalld.service  
└─607 /usr/bin/python -Es /usr/sbin/firewalld --nofork --nopid  
  
Sep 03 19:37:19 localhost.localdomain systemd[1]: Started firewalld - dynamic...  
Hint: Some lines were ellipsized, use -l to show in full.  
[root@localhost ~]# systemctl stop firewalld stop firewall  
[root@localhost ~]#  
[root@localhost ~]# systemctl disable firewalld Disable firewall  
rm '/etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service'  
rm '/etc/systemd/system/basic.target.wants/firewalld.service'  
[root@localhost ~]#  
[root@localhost ~]# systemctl status firewalld confirm firewall is disabled  
firewalld.service - firewalld - dynamic firewall daemon  
Loaded: loaded (/usr/lib/systemd/system/firewalld.service; disabled)  
Active: inactive (dead)  
  
Sep 03 19:37:17 localhost.localdomain systemd[1]: Starting firewalld - dynami...  
Sep 03 19:37:19 localhost.localdomain systemd[1]: Started firewalld - dynamic...
```

root@localhost:~

```
login as: root  
root@172.18.20.10's password:  
Last login: Fri Sep 3 20:00:28 2021  
[root@localhost ~]#
```

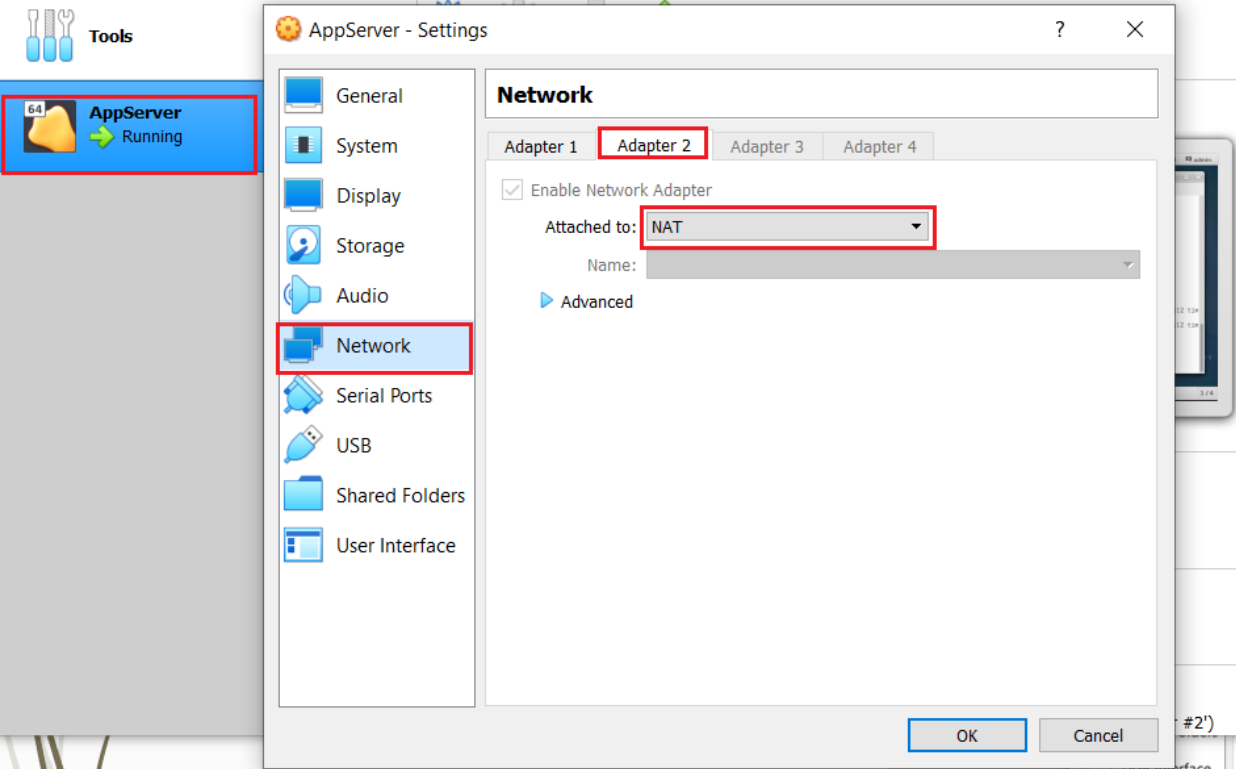
## Centos 7 Post installation tasks

- Ensure the virtual machine can reach the internet
- Ensure you can resolve DNS names

Logon to the virtual machine. Right click on the desktop and select Open Terminal  
Assign the VM second adapter to NAT and click OK.

Oracle VM VirtualBox Manager

File Machine Help



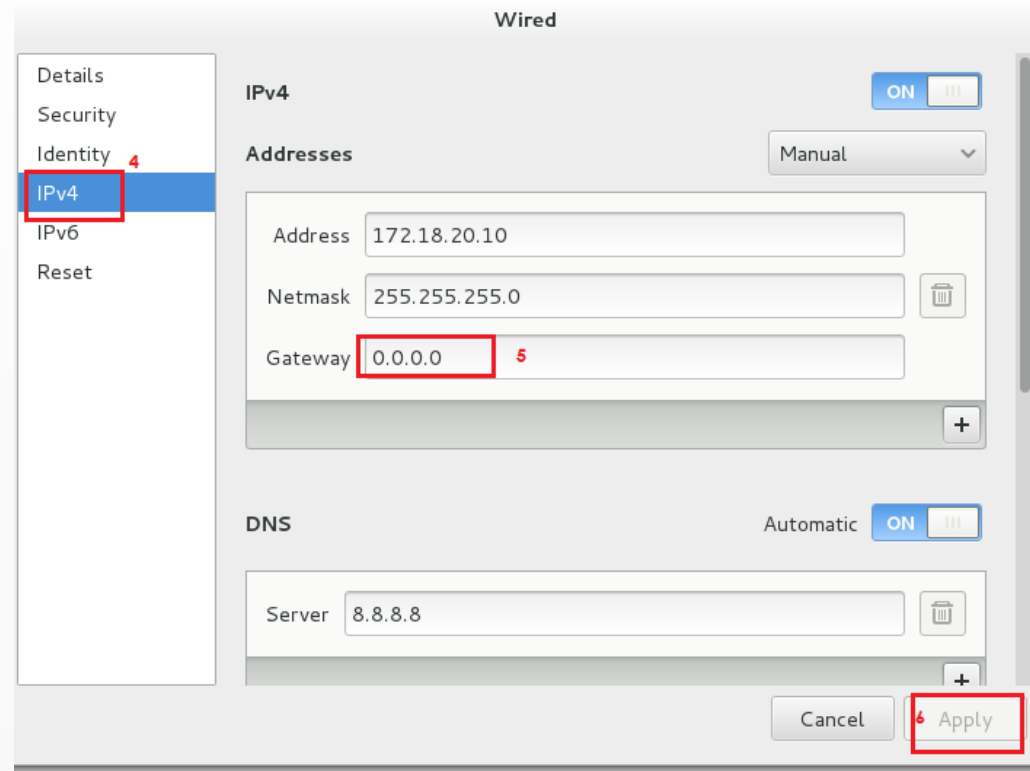
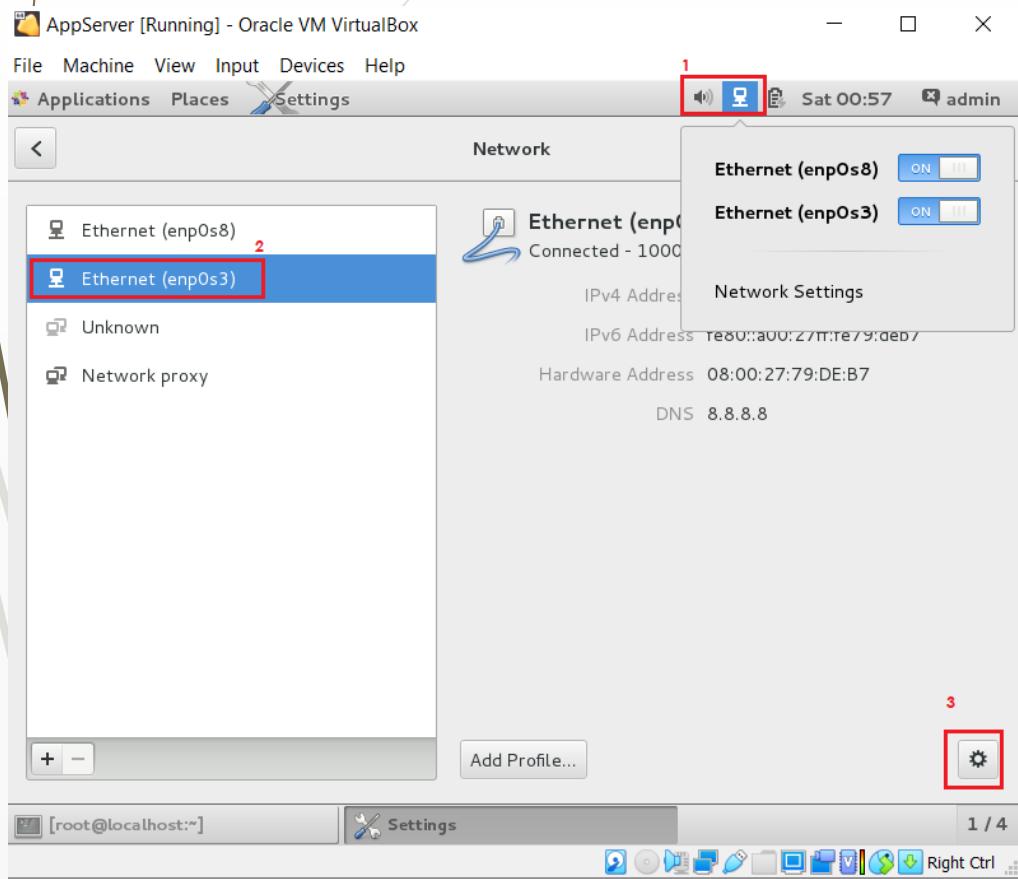
```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]#  
[root@localhost ~]# check that you have a second ip address on the second network interface  
root@localhost ~]# ip a  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN  
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host lo  
        valid_lft forever preferred_lft forever  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft forever  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP  
   qlen 1000  
    link/ether 08:00:27:79:de:b7 brd ff:ff:ff:ff:ff:ff  
    inet 172.18.20.10/24 brd 172.18.20.255 scope global enp0s3  
        valid_lft forever preferred_lft forever  
    inet6 fe80::a00:27ff:fe79:deb7/64 scope link  
        valid_lft forever preferred_lft forever  
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP  
   qlen 1000  
    link/ether 08:00:27:f3:c1:18 brd ff:ff:ff:ff:ff:ff  
    inet 10.0.3.15/24 brd 10.0.3.255 scope global dynamic enp0s8  
        valid_lft 83328sec preferred_lft 83328sec  
    inet6 fe80::a00:27ff:fef3:c118/64 scope link  
        valid_lft forever preferred_lft forever  
[root@localhost ~]#
```



## Centos 7 Post installation tasks

- Ensure the virtual machine can reach the internet
- Ensure you can resolve DNS names

Modify NIC1 (host only network) and **remove the gateway** by typing 0.0.0.0. This will allow the virtual machine to use the NAT Network as the gateway since we want our VM to reach the internet.



## Centos 7 Post installation tasks

- Ensure the virtual machine can reach the internet
- Ensure you can resolve DNS names

Use **ping** to check you can reach the internet and resolve DNS names

```
root@localhost:~  
File Edit View Search Terminal Help  
valid_lft forever preferred_lft forever  
inet6 ::1/128 scope host  
valid_lft forever preferred_lft forever  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP  
qlen 1000  
link/ether 08:00:27:79:de:b7 brd ff:ff:ff:ff:ff:ff  
inet 172.18.20.10/24 brd 172.18.20.255 scope global enp0s3  
valid_lft forever preferred_lft forever  
inet6 fe80::a00:27ff:fe79:deb7/64 scope link  
valid_lft forever preferred_lft forever  
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP  
qlen 1000  
link/ether 08:00:27:f3:c1:18 brd ff:ff:ff:ff:ff:ff  
inet 10.0.3.15/24 brd 10.0.3.255 scope global dynamic enp0s8  
valid_lft 83328sec preferred_lft 83328sec  
inet6 fe80::a00:27ff:fef3:c118/64 scope link  
valid_lft forever preferred_lft forever  
[root@localhost ~]# ip route check that the second network is used to reach the internet  
default via 10.0.3.2 dev enp0s8 proto static metric 100  
10.0.3.0/24 dev enp0s8 proto kernel scope link src 10.0.3.15 metric 100  
172.18.20.0/24 dev enp0s3 proto kernel scope link src 172.18.20.10 metric 100  
[root@localhost ~]#  
[root@localhost ~]#
```

```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# ping 8.8.8.8 Use the command "ping 8.8.8.8" without quote to check you can reach the internet  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=115 time=28.8 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=115 time=24.5 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=115 time=33.5 ms Valid response  
^C  
--- 8.8.8.8 ping statistics --- Use CNTRL C on keyboard to stop the ping  
3 packets transmitted, 3 received, 0% packet loss, time 2011ms  
rtt min/avg/max/mdev = 24.588/28.994/33.536/3.659 ms  
[root@localhost ~]#  
[root@localhost ~]# ping google.com check you resolve DNS names like google.com  
PING google.com (216.58.215.238) 56(84) bytes of data:  
64 bytes from zrh11s02-in-f14.1e100.net (216.58.215.238): icmp_seq=1 ttl=112 time=124 ms  
64 bytes from zrh11s02-in-f14.1e100.net (216.58.215.238): icmp_seq=2 ttl=112 time=128 ms  
64 bytes from zrh11s02-in-f14.1e100.net (216.58.215.238): icmp_seq=3 ttl=112 time=121 ms valid responses  
^C  
--- google.com ping statistics ---  
3 packets transmitted, 3 received, 0% packet loss, time 2004ms  
rtt min/avg/max/mdev = 121.323/124.811/128.814/3.106 ms  
[root@localhost ~]#
```



The End