Ain Shams University
Faculty of Engineering

Lab Report 1

Installation of VMware Workstation 17 Player.

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

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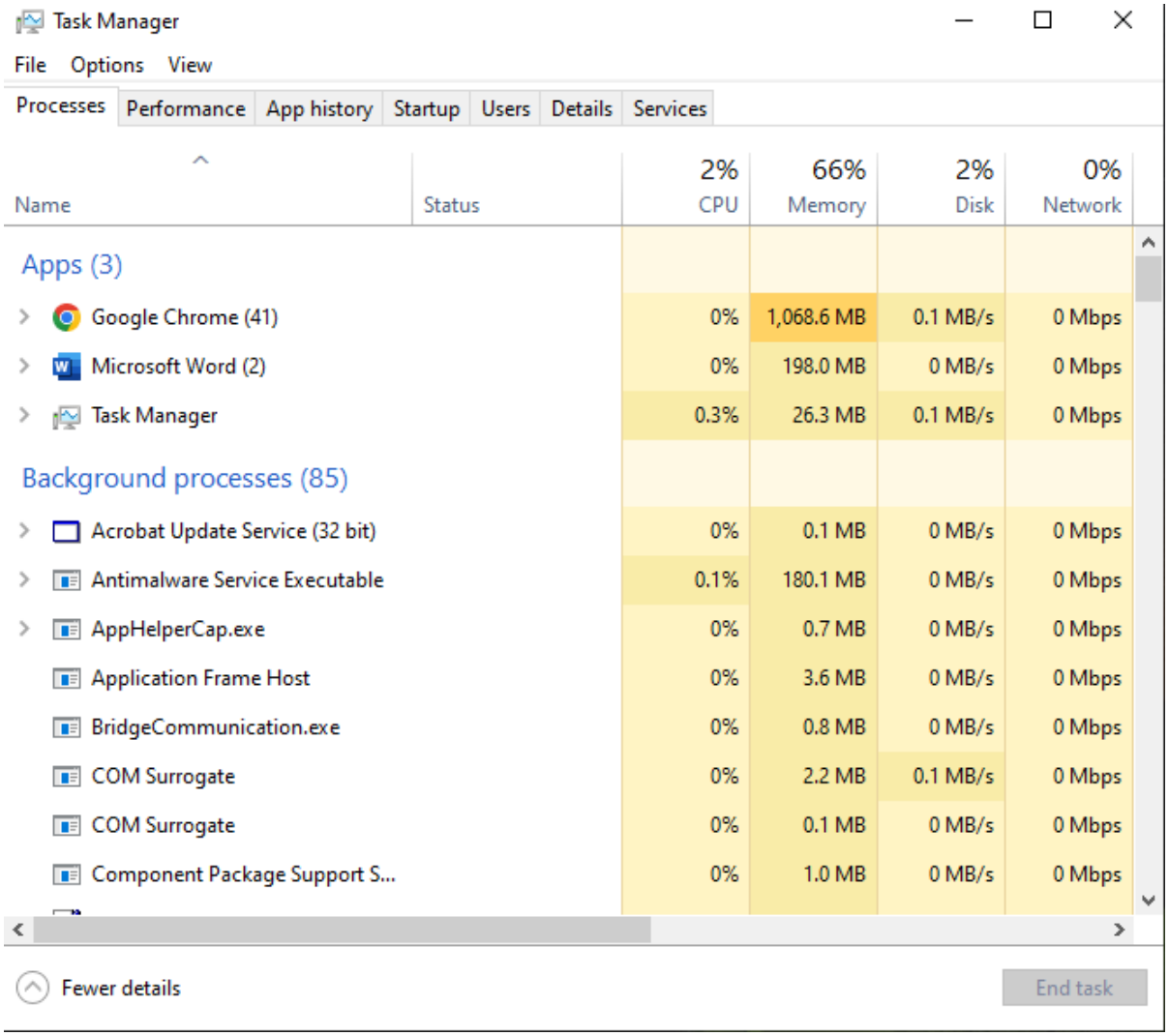
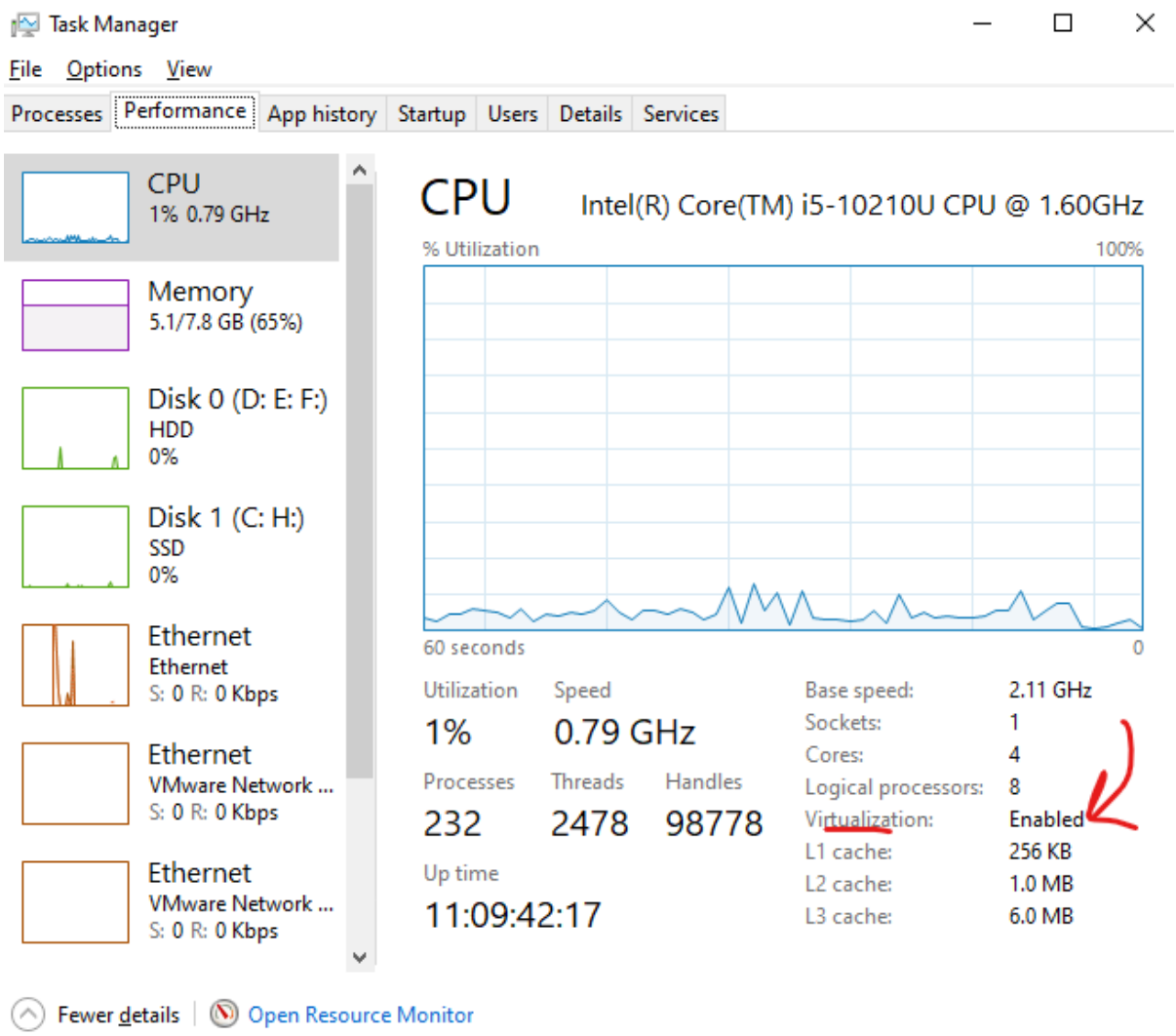
1. Check If Virtualization is Enabled

1.1 Open Task Manager



1.2 Open Performance Tab



2. Download VMware Workstation 17 Pro

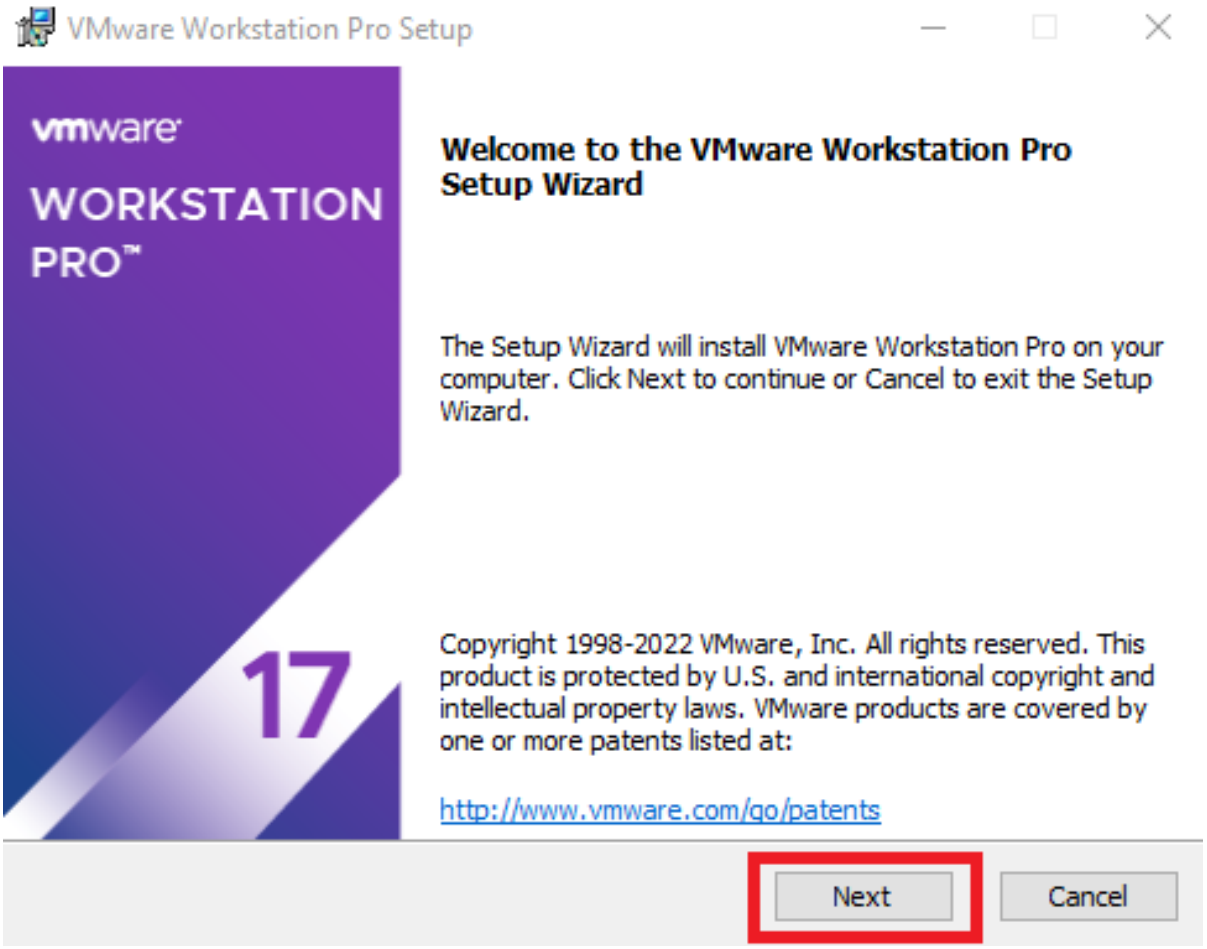
To download VMware Workstation Pro 17, visit the official VMware Workstation Pro page.

2.1 Download For Windows (or Linux if your OS is Linux)

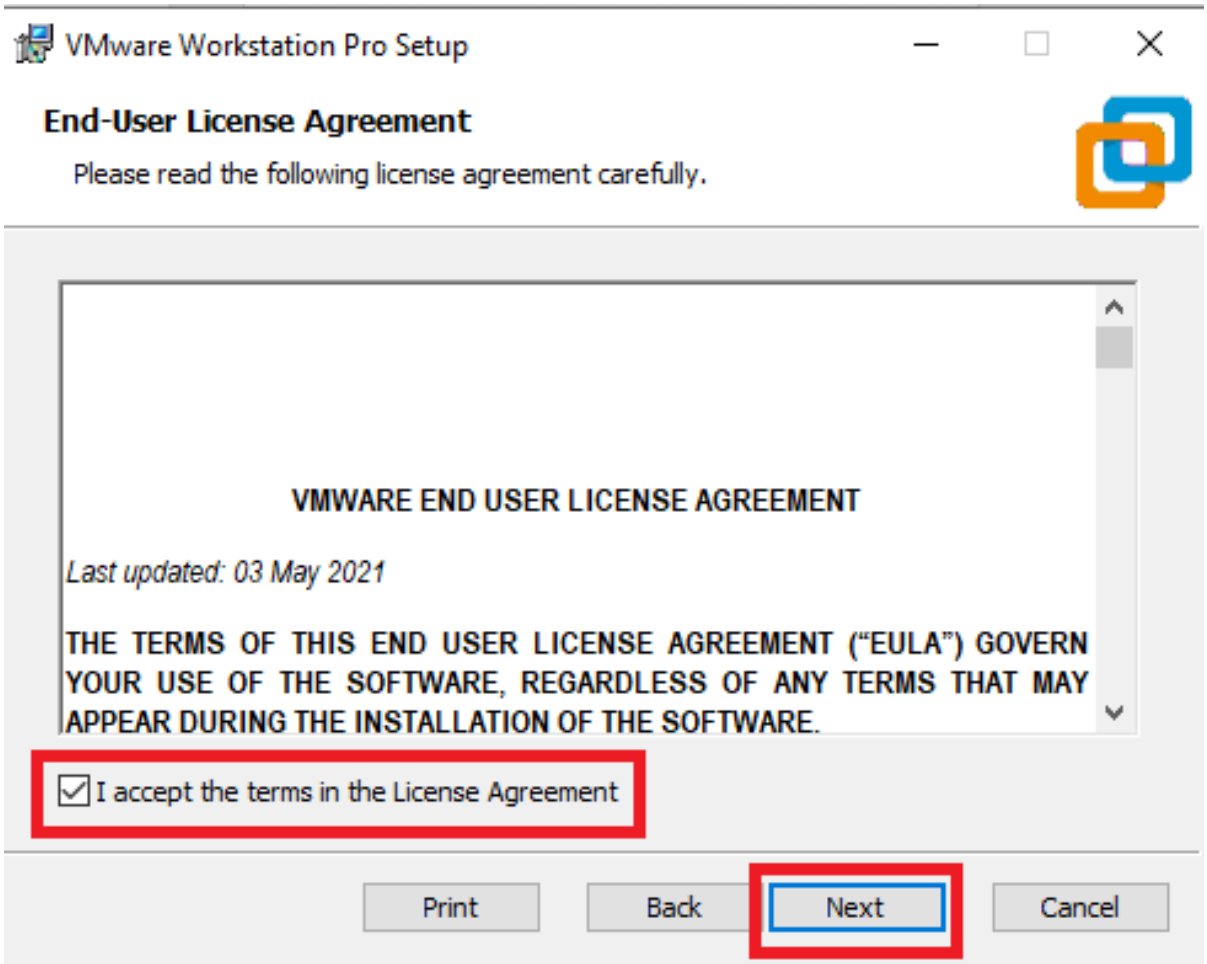
2.2 Click downloaded .exe file, Give authorization for installment.

3. Installation

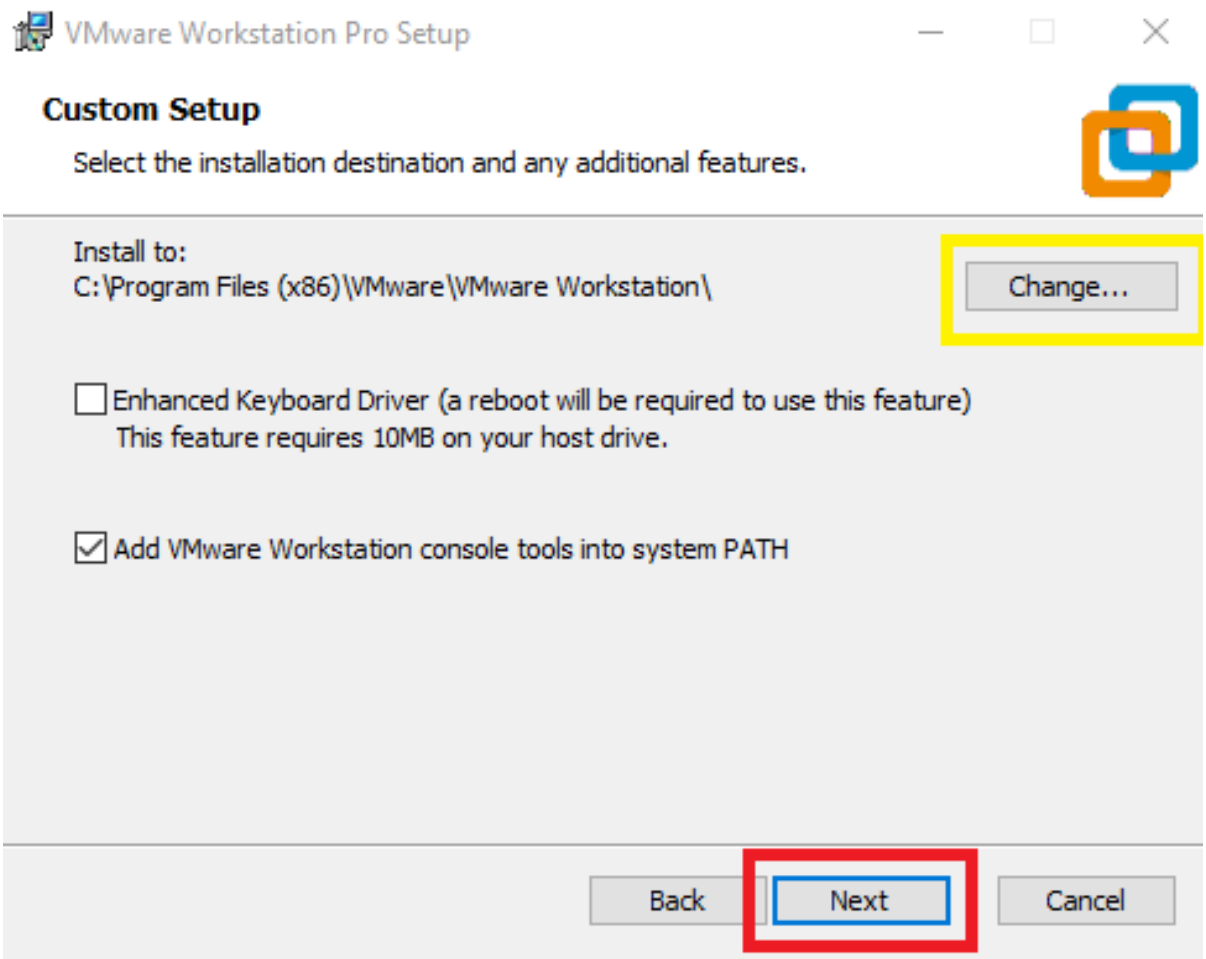
3.1 Click Next



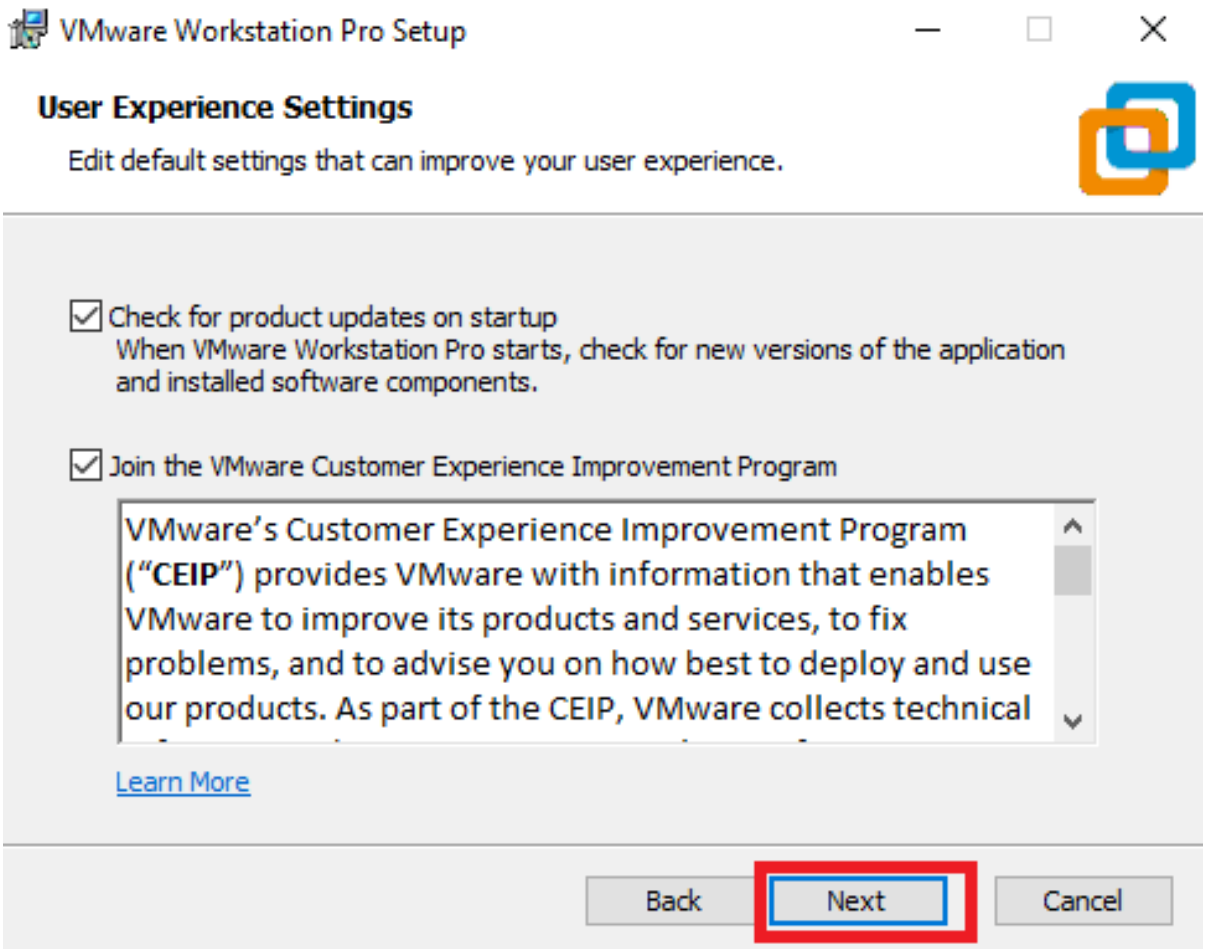
3.2 Accept License & Click Next



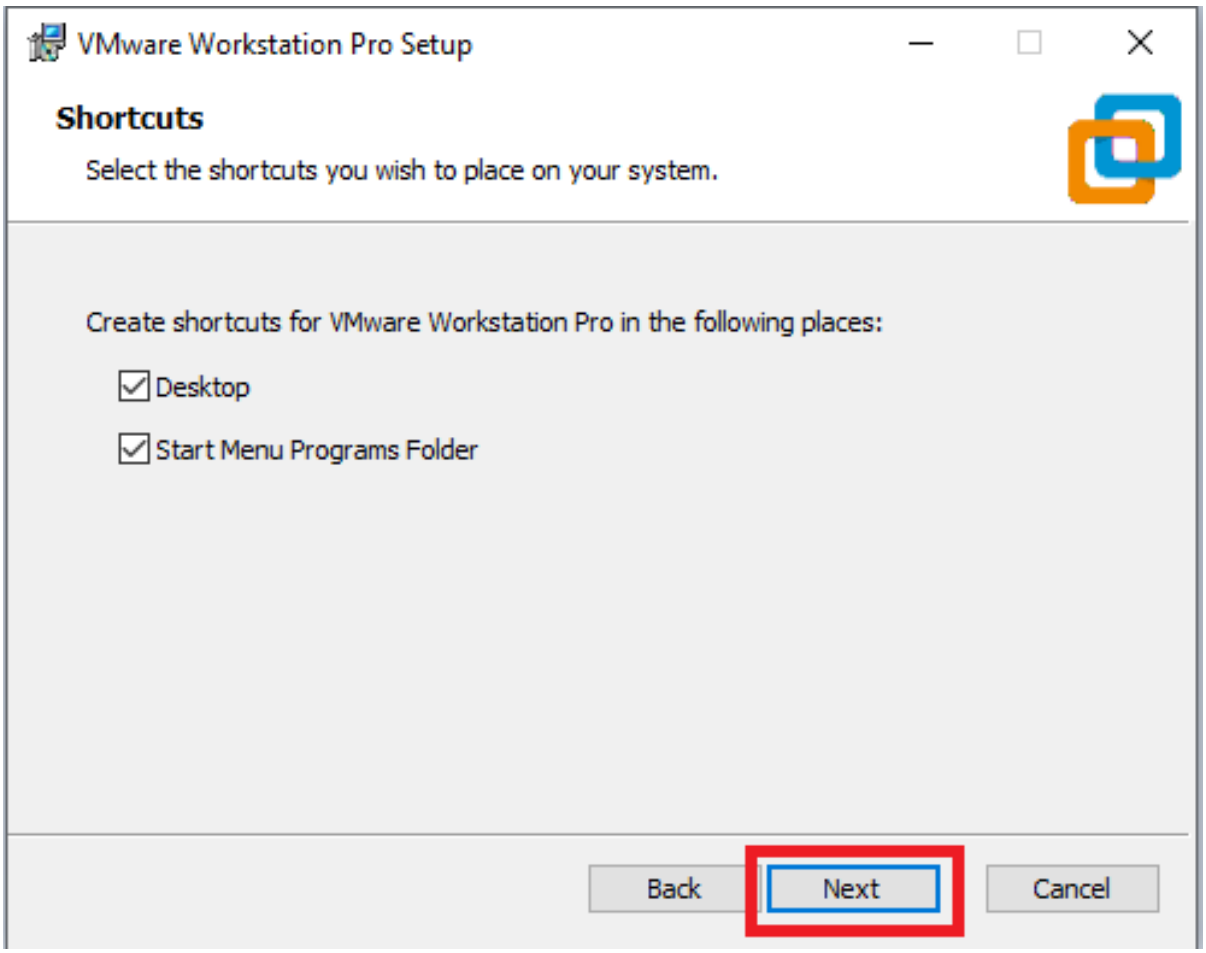
3.3 Change Installation Place (If needed) & Click Next



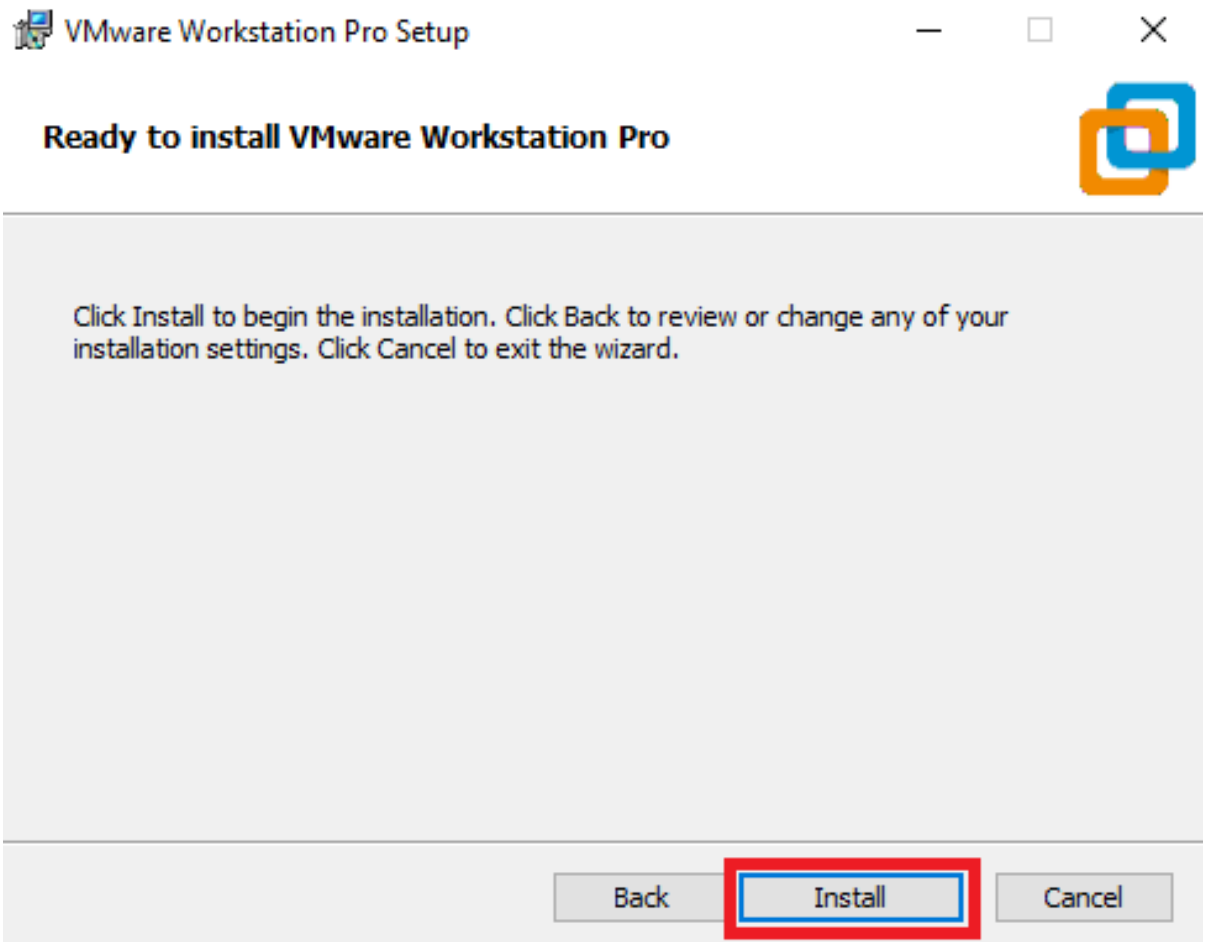
3.4 Click Next



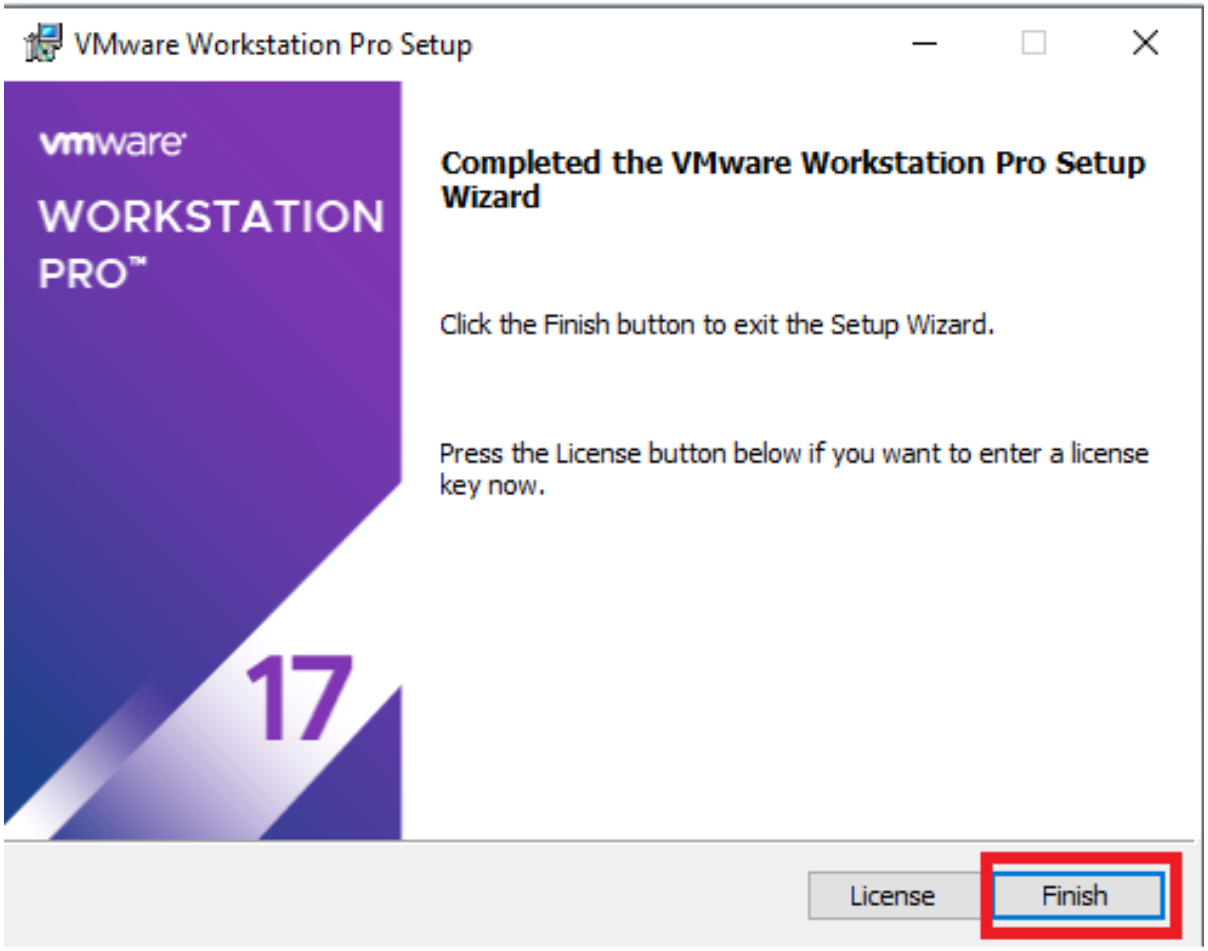
3.5 Click Next



3.6 Click Install

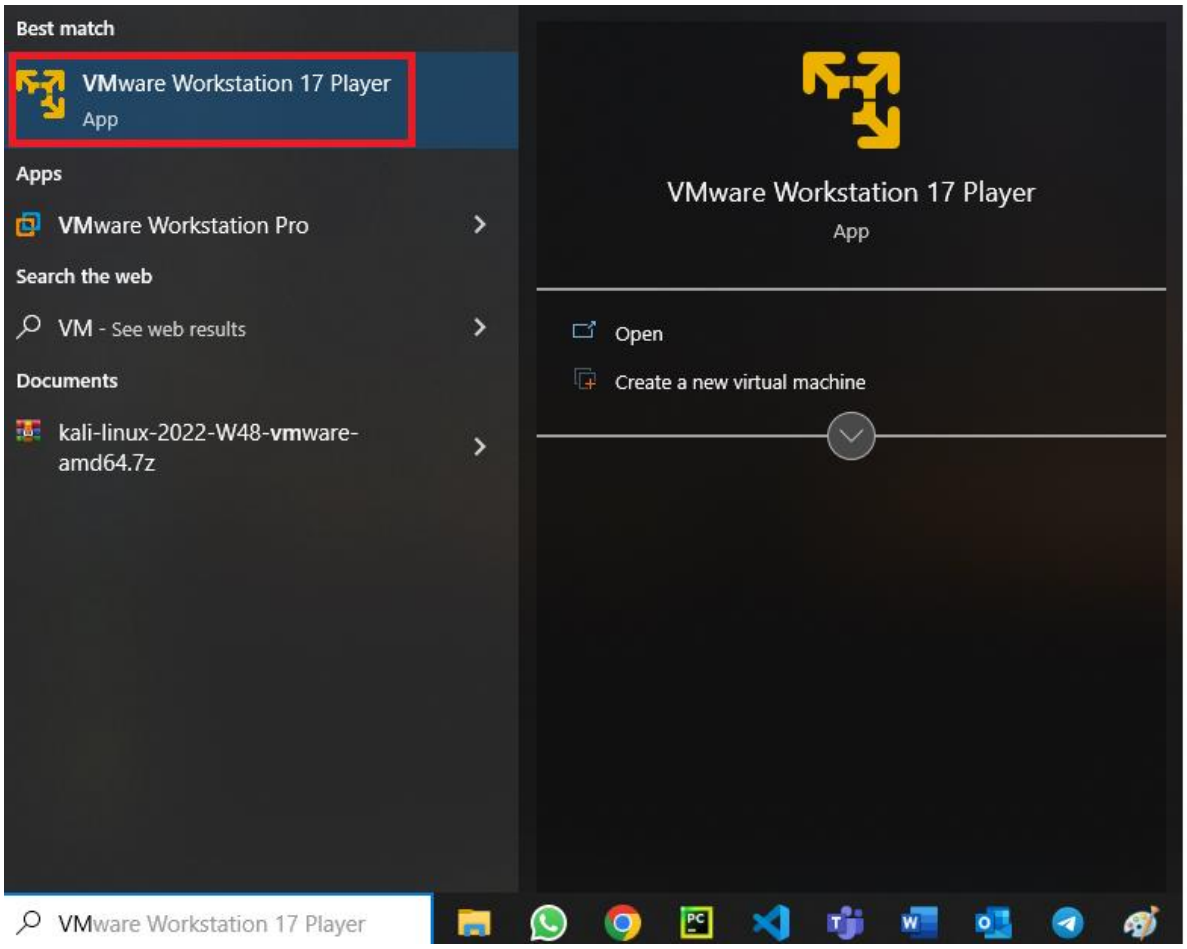


3.7 Click Finish

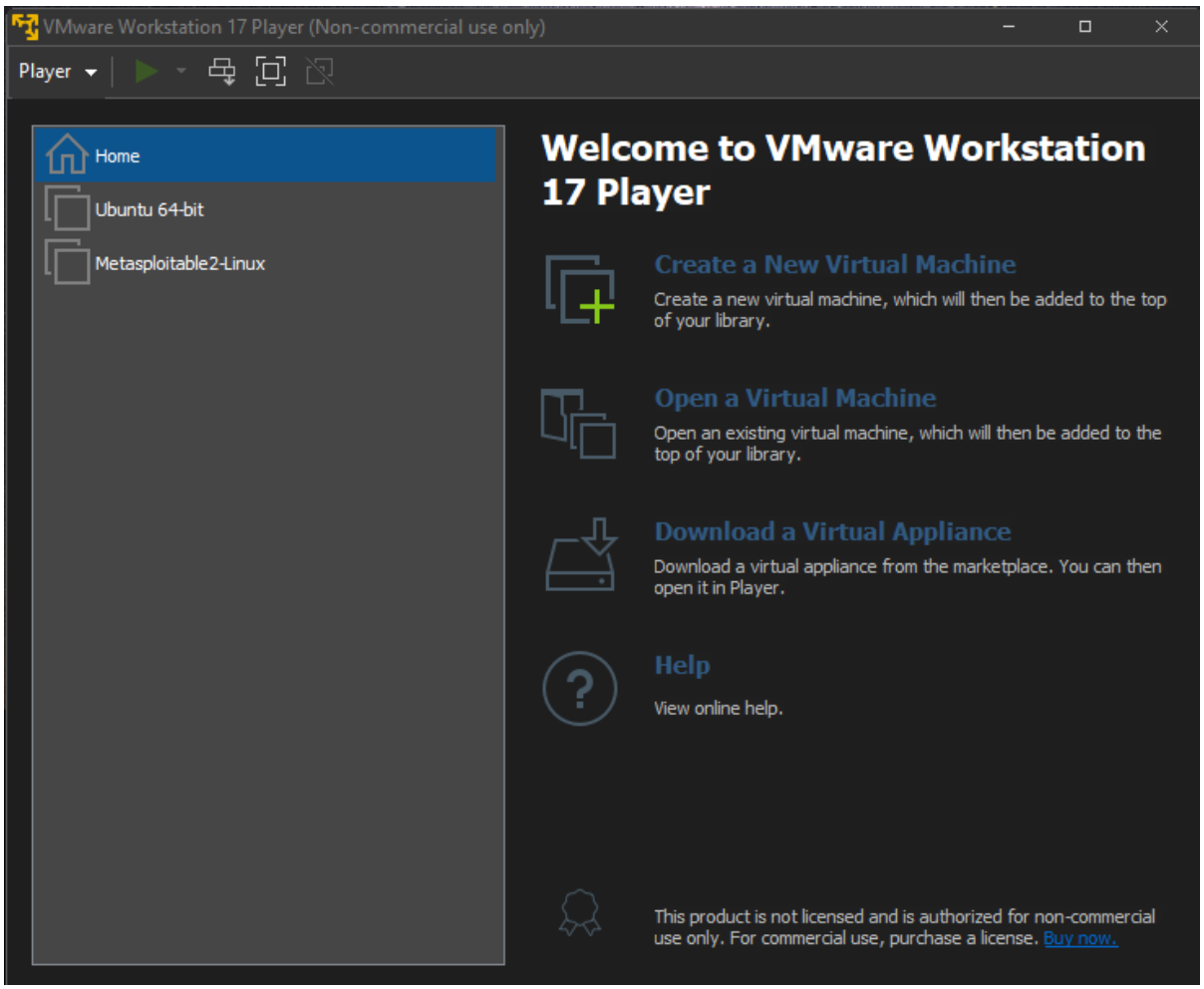


4. Opening VMware Workstation 17 Player

4.1 Search VMware Workstation 17 Player & Open it



4.2 VMware Workstation 17 Player Installed Successfully



Ain Shams University
Faculty of Engineering

Lab Report 2 & 3

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID: 1809799

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Select "Create a New Virtual Machine" 3

New virtual Machine Wizard pops up, Select 3rd choice and Click Next 4

We will install Ubuntu 18.04 LTS Version, So we select the below red boxes 5

Set name and the location of the installed OS and click Next 6

Set Size (Storage Metrices) according to your usage, choose 1st radio option then click Next. 7

Select to customize your hardware 8

Here you can set the Hardware Specs for the OS according to your usage. After you have finished select Close. 9

Select Finish. 10

Now you can find it on the player. 11

2. Install a Guest Operating System in a Virtual Machine 12

Firstly, we will download Ubuntu 18.04 ISO file from Ubuntu official website. Select link in red box. 12

Back to VMware Player, Select Red box 13

We will browse the downloaded ISO file for it to be the Disk Format to be installed. Then Click Ok. 14

Play the installed OS. 15

Ubuntu is running and ready for setup. 16

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Mount DVD 18

VMware installer.tar.gz is available. 19

After extracting installer, run the file vmware-install.pl. 20

It will ask several questions and input while installing VMware Tools. Allow the installer to keep the default options. The progress of the installation is shown below: 21

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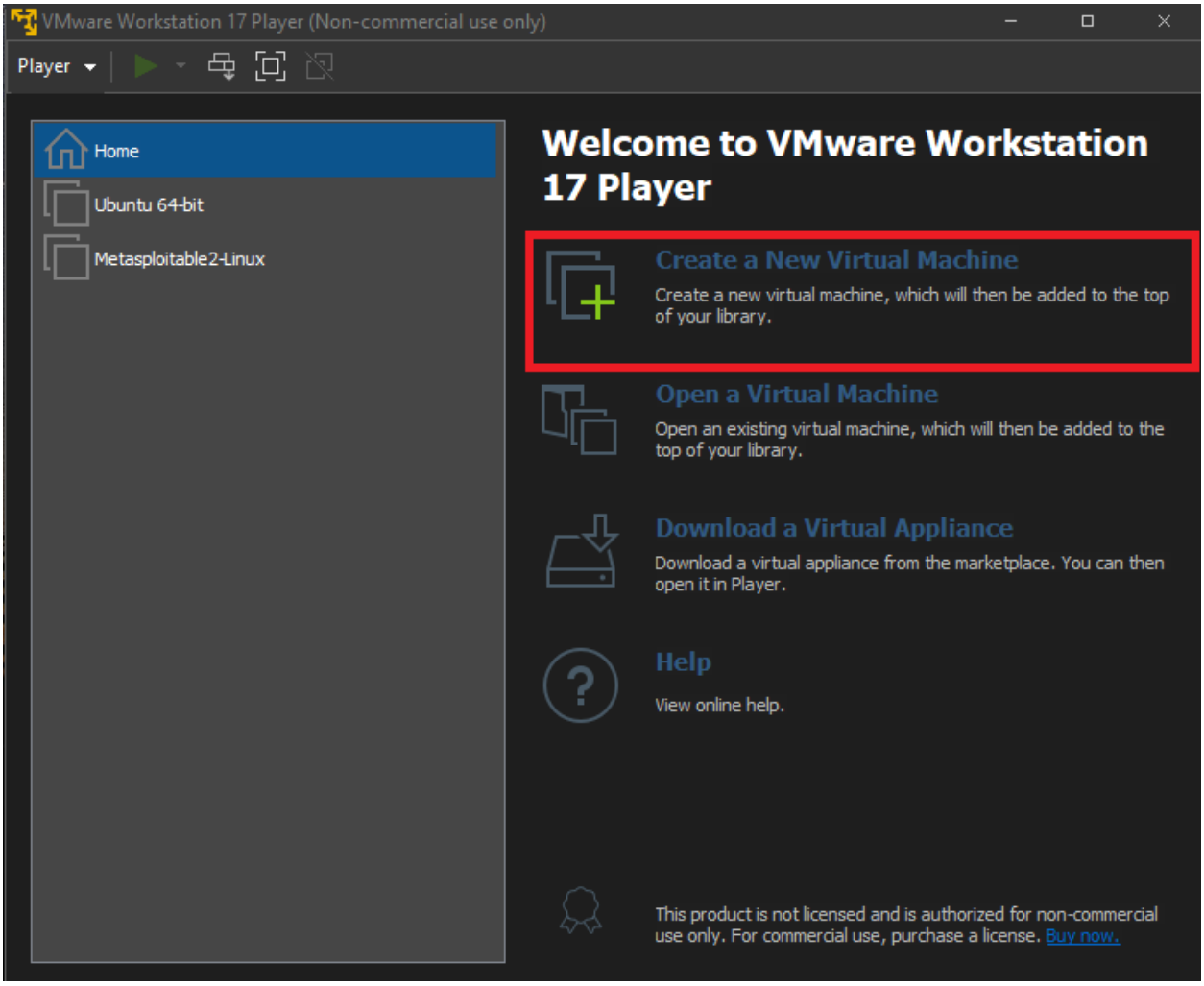
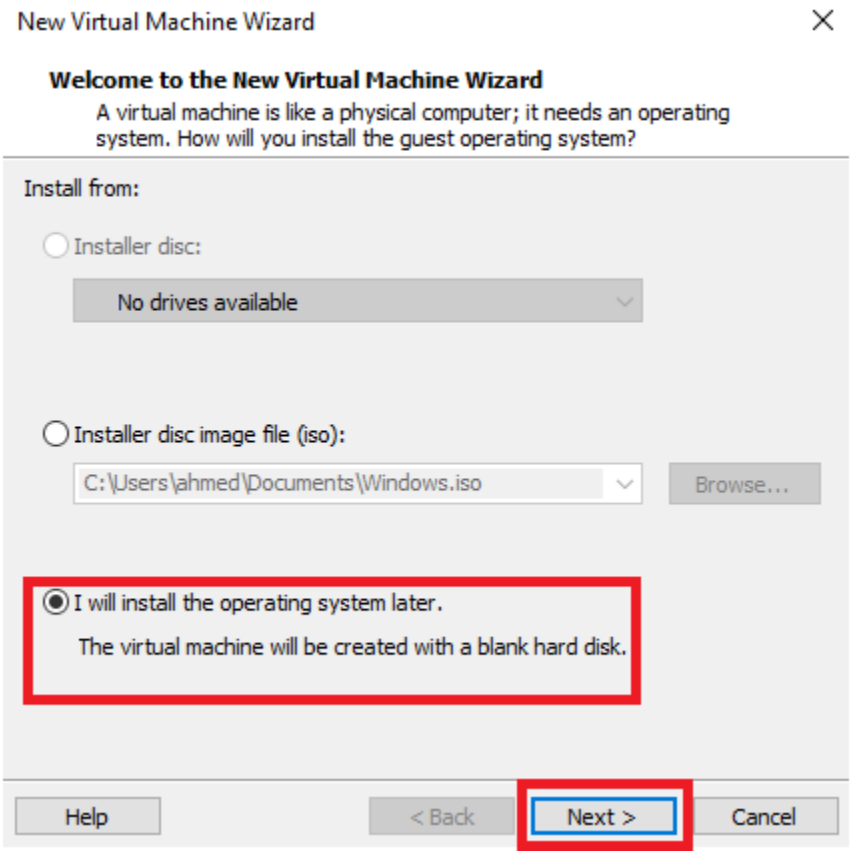
1. Create Virtual Machines

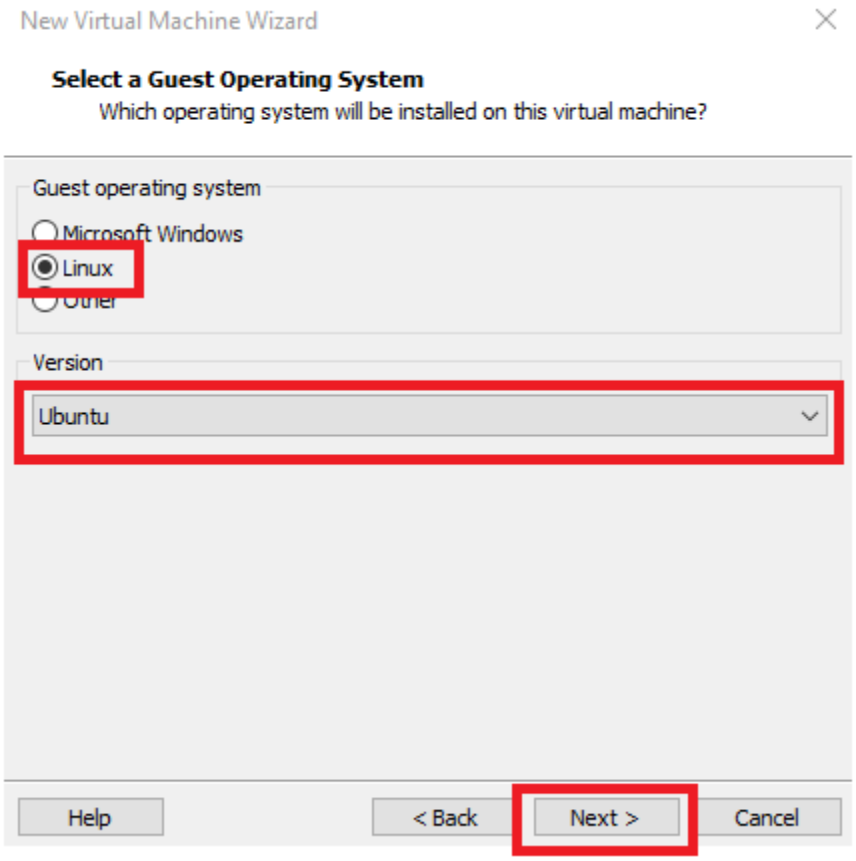
Select “Create a New Virtual Machine”



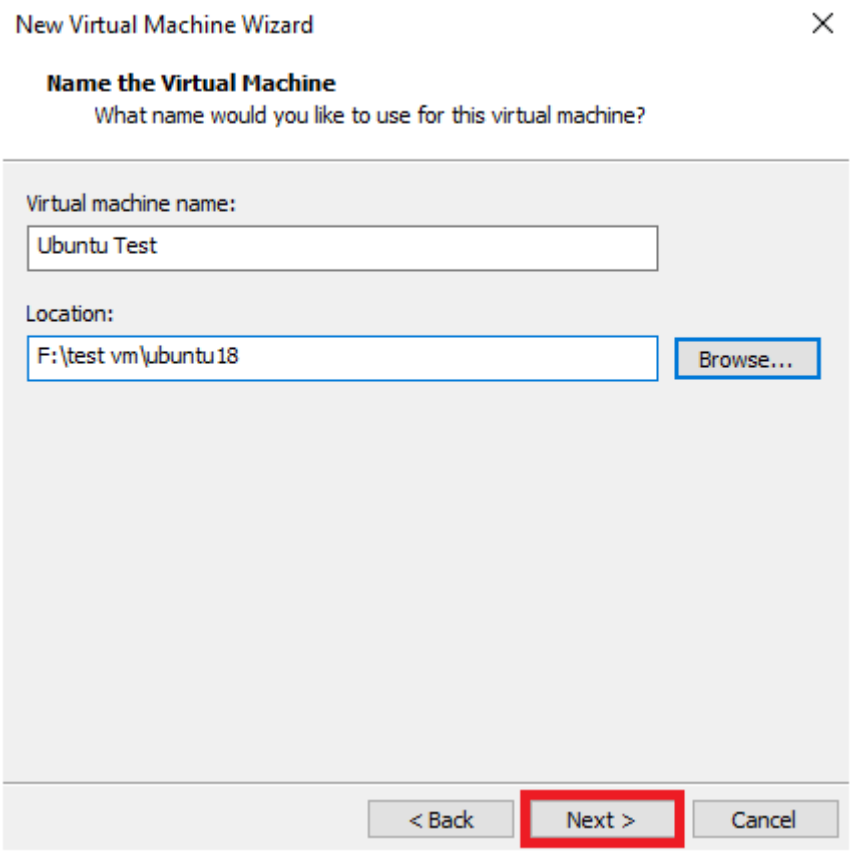
New virtual Machine Wizard pops up, Select 3rd choice and Click Next



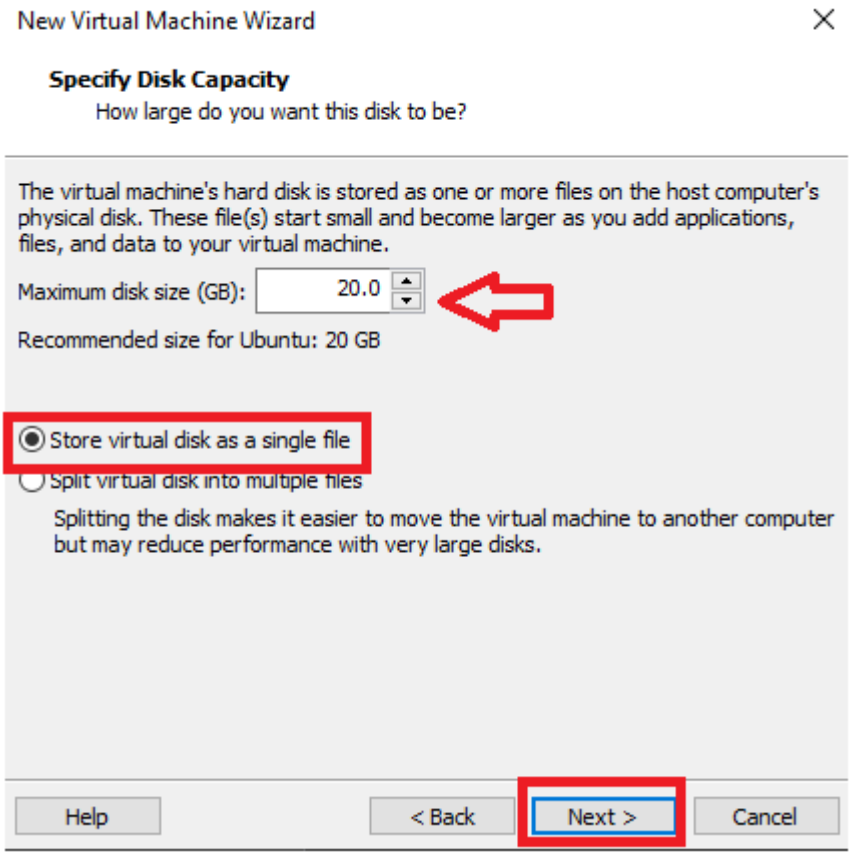
We will install Ubuntu 18.04 LTS Version, So we select the below red boxes



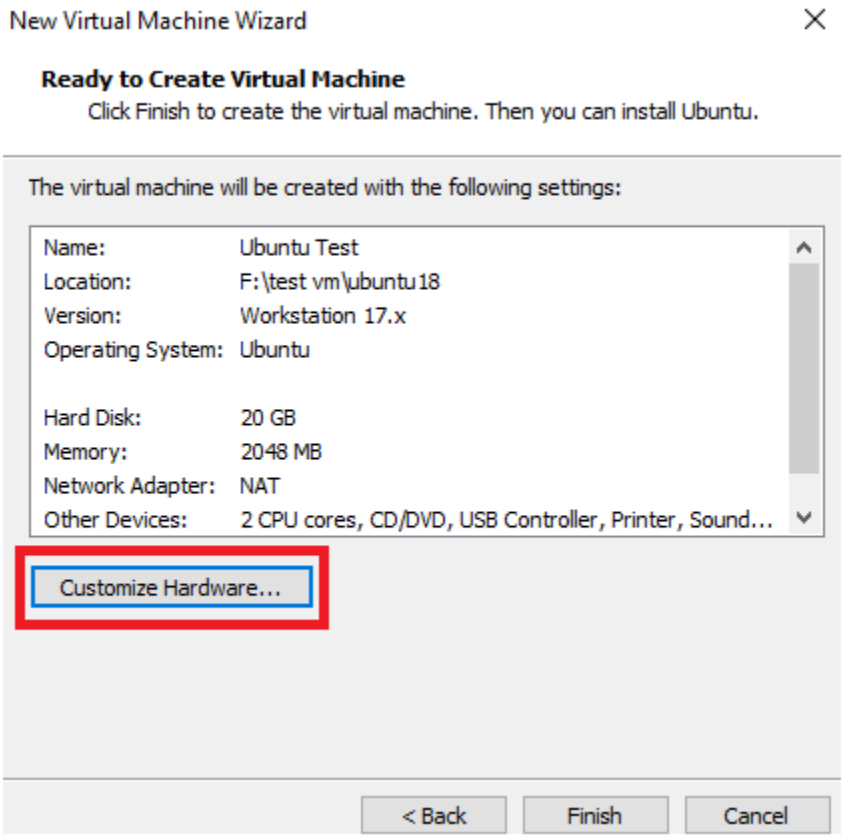
Set name and the location of the installed OS and click Next



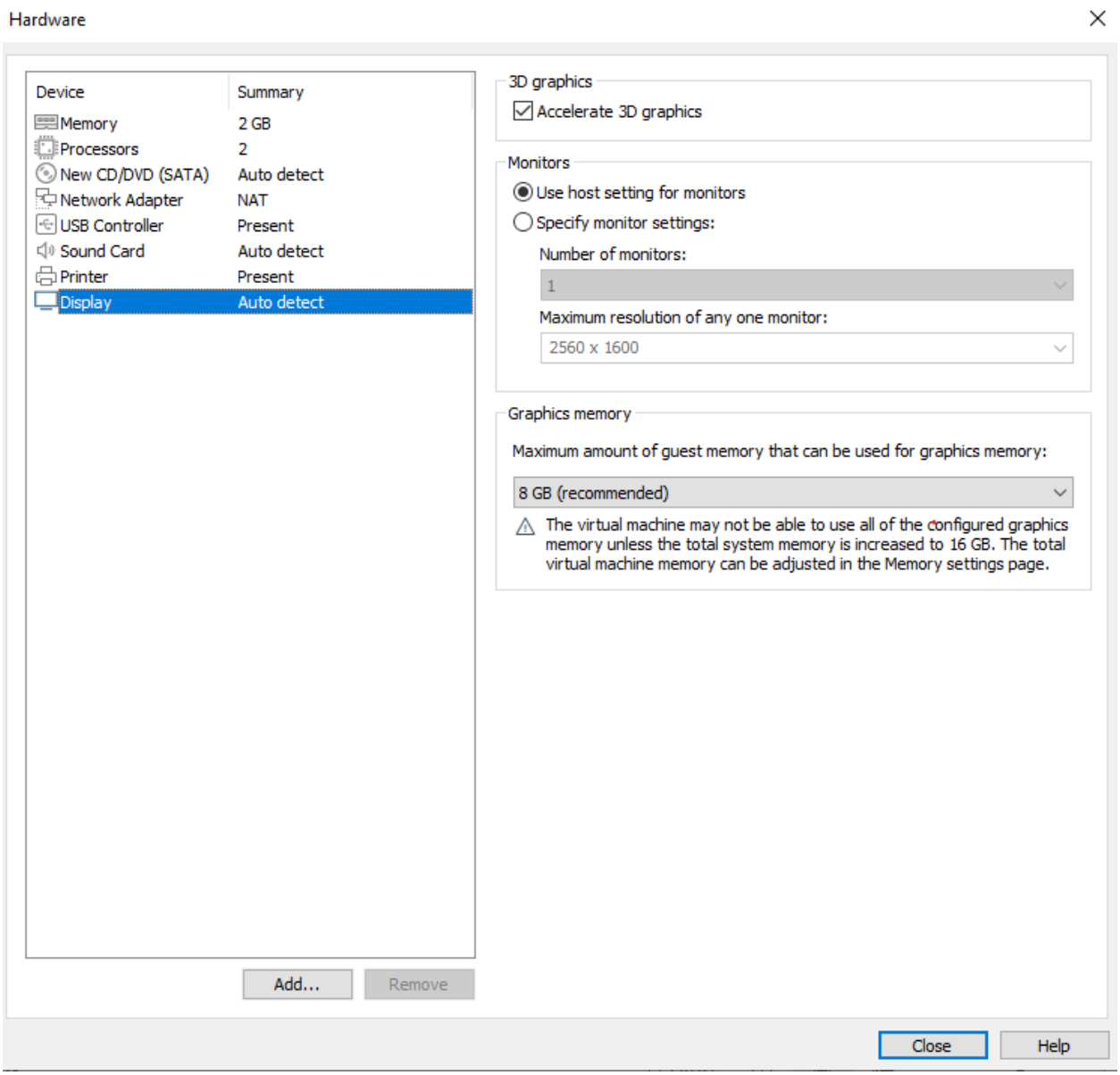
Set Size (Storage Metrices) according to your usage, choose 1st radio option then click Next.



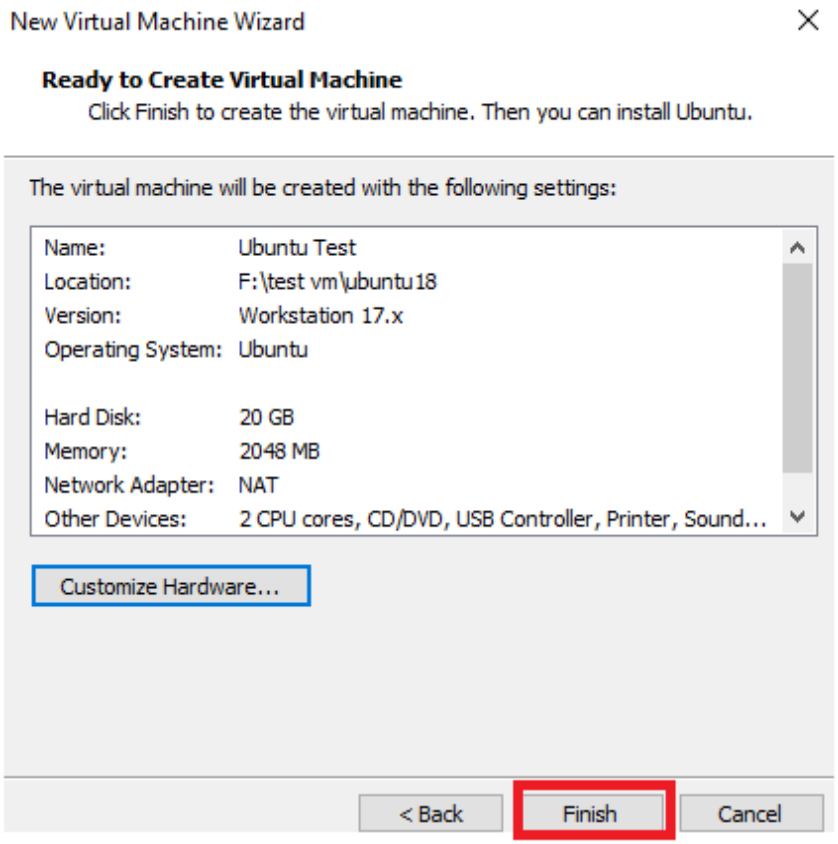
Select to customize your hardware



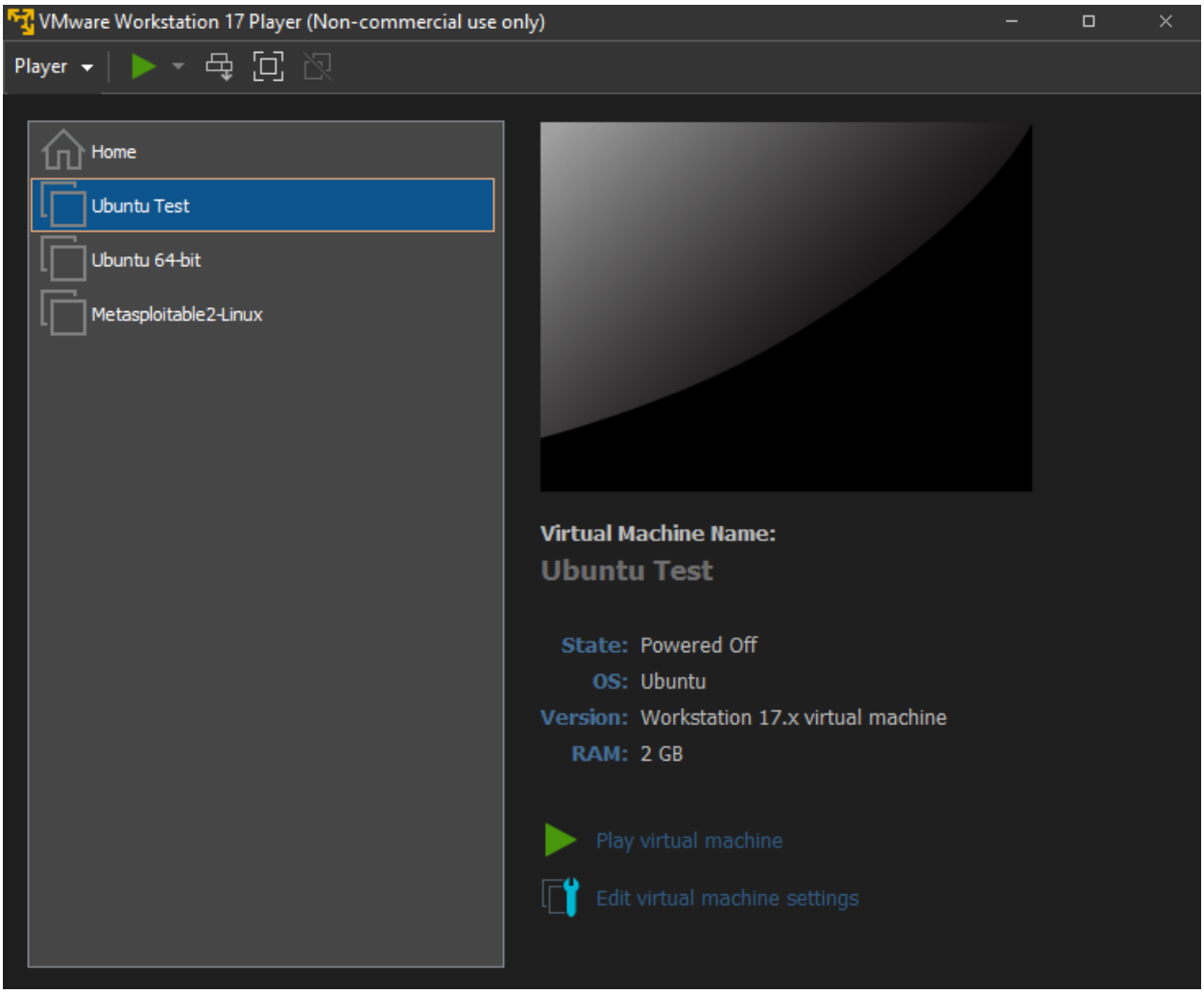
Here you can set the Hardware Specs for the OS according to your usage. After you have finished select Close.



Select Finish.

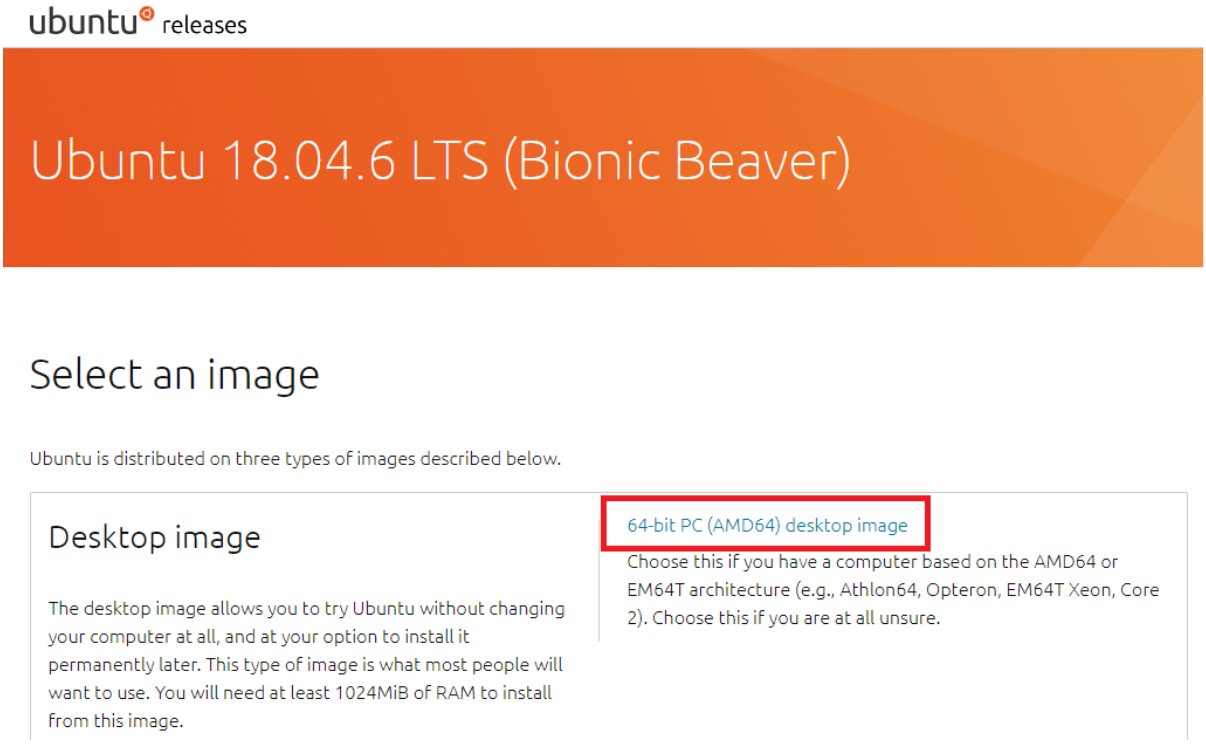


Now you can find it on the player.

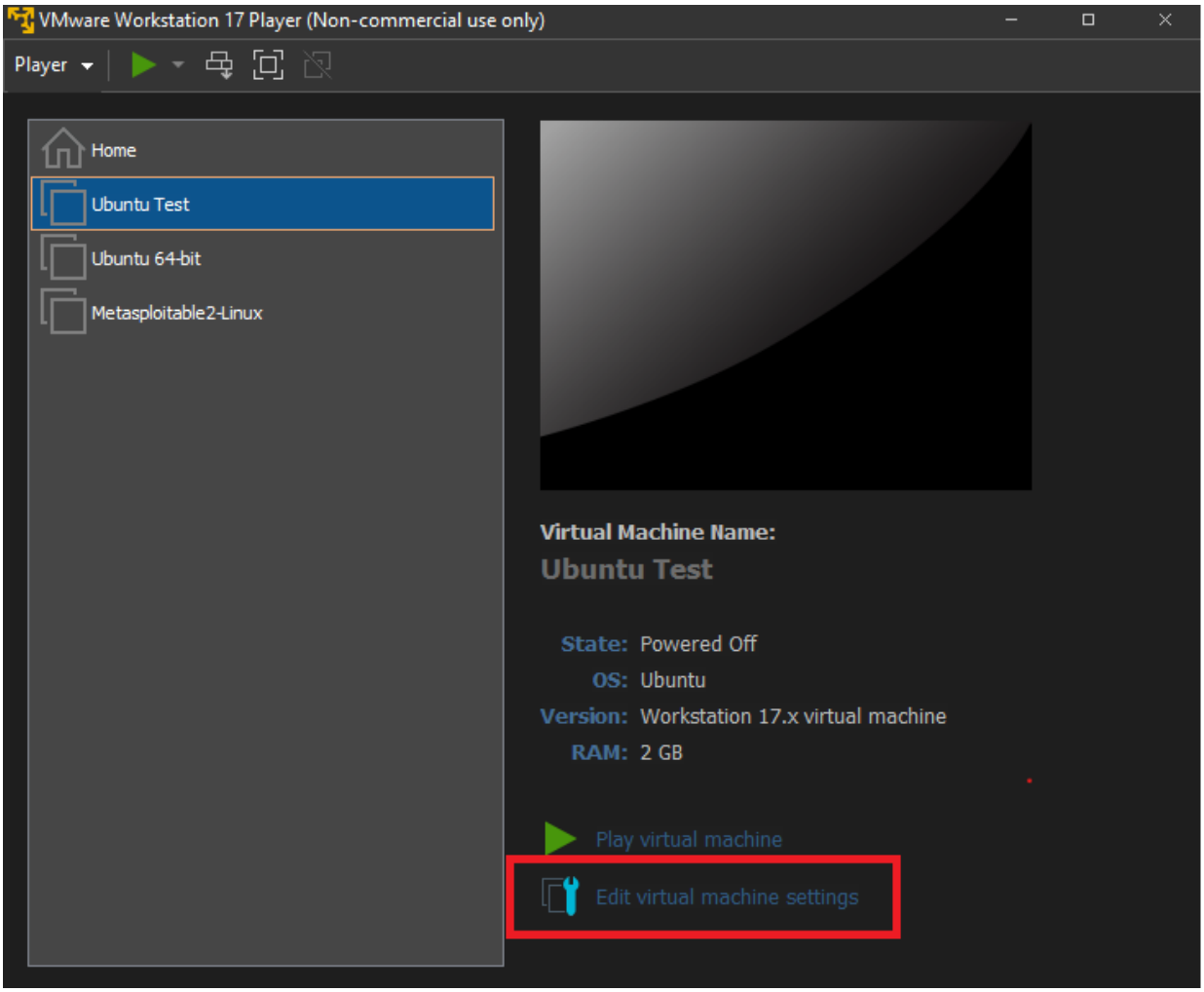


2. Install a Guest Operating System in a Virtual Machine

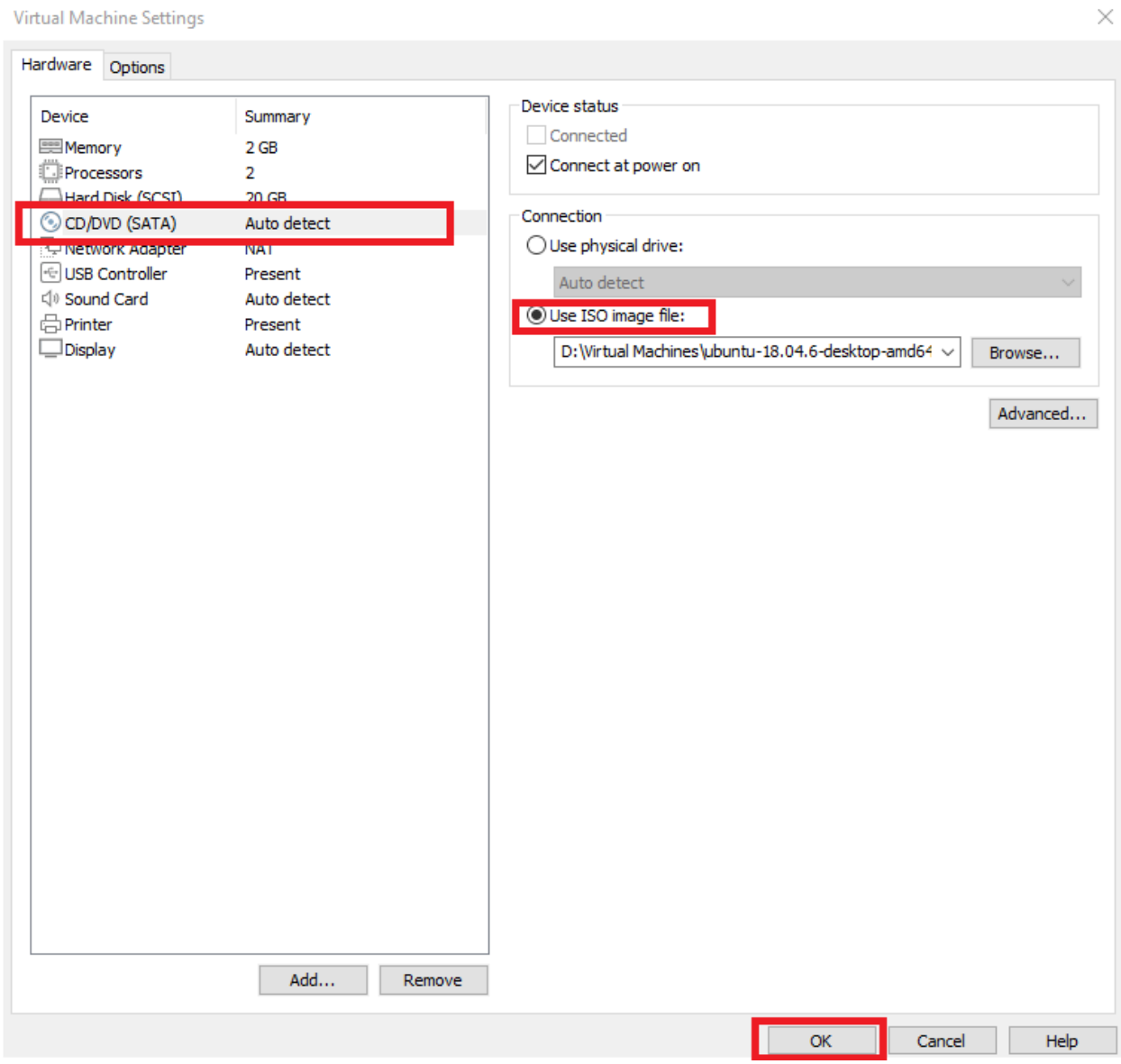
Firstly, we will download Ubuntu 18.04 ISO file from Ubuntu official website. Select link in red box.



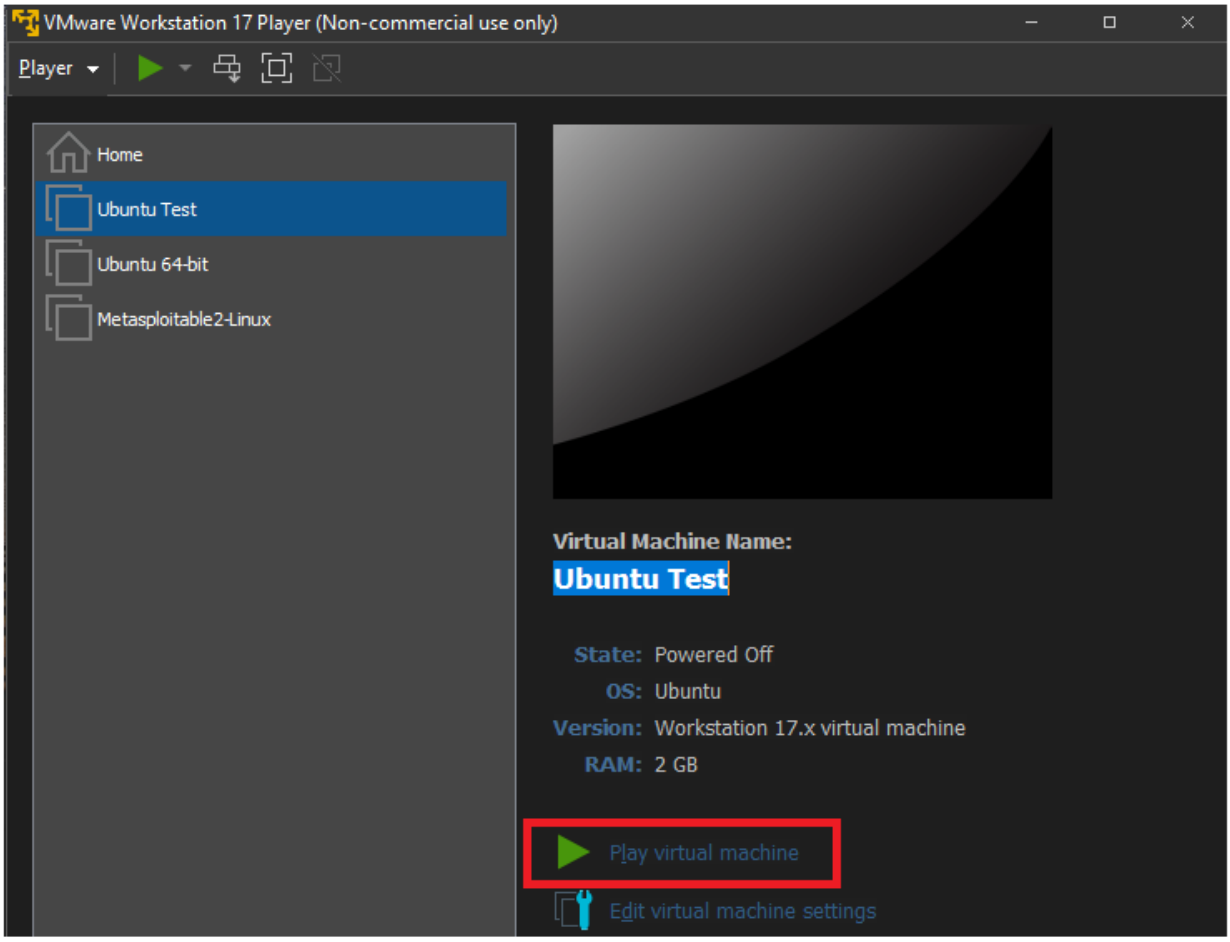
Back to VMware Player, Select Red box



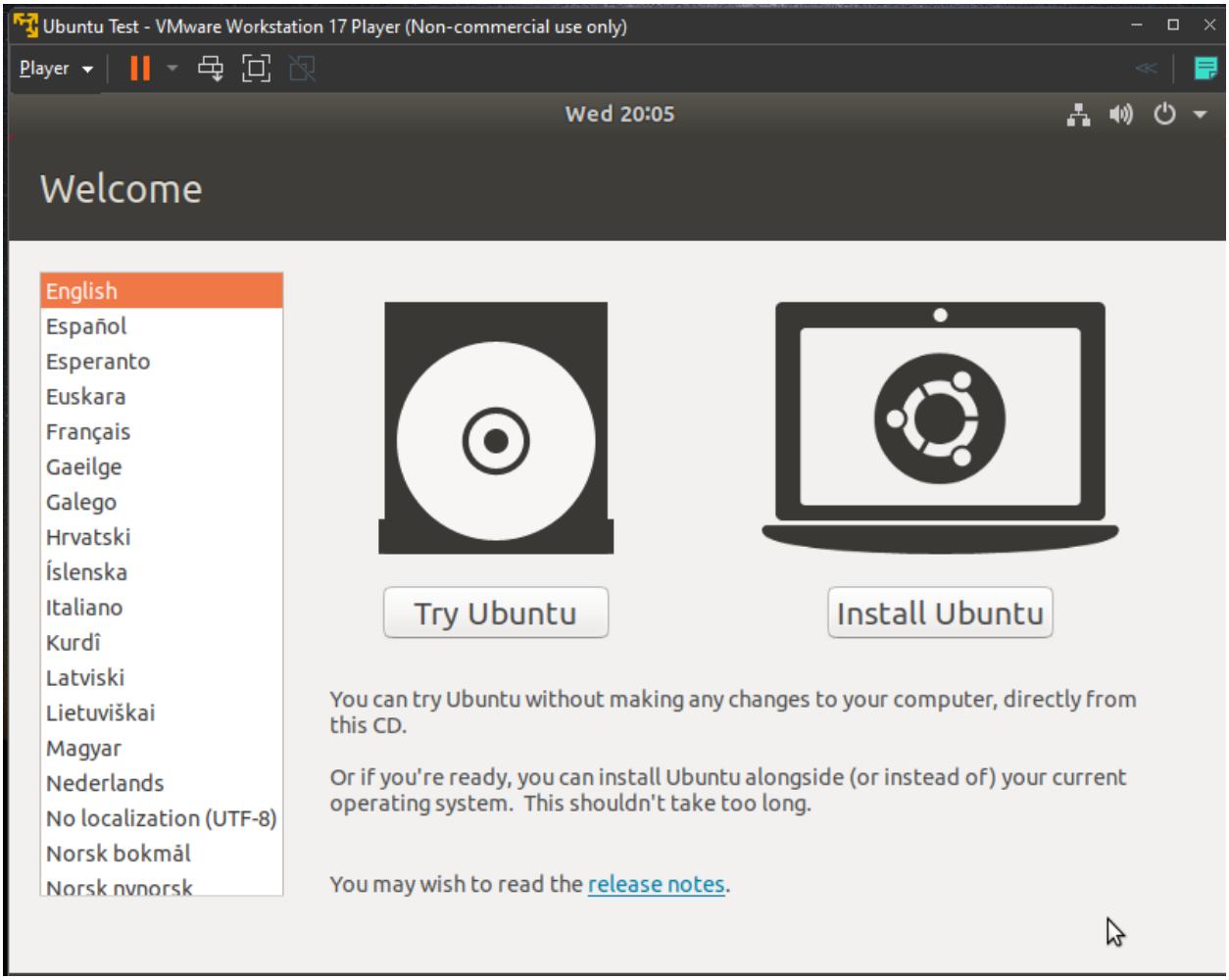
We will browse the downloaded ISO file for it to be the Disk Format to be installed. Then Click Ok.



Play the installed OS.



Ubuntu is running and ready for setup.

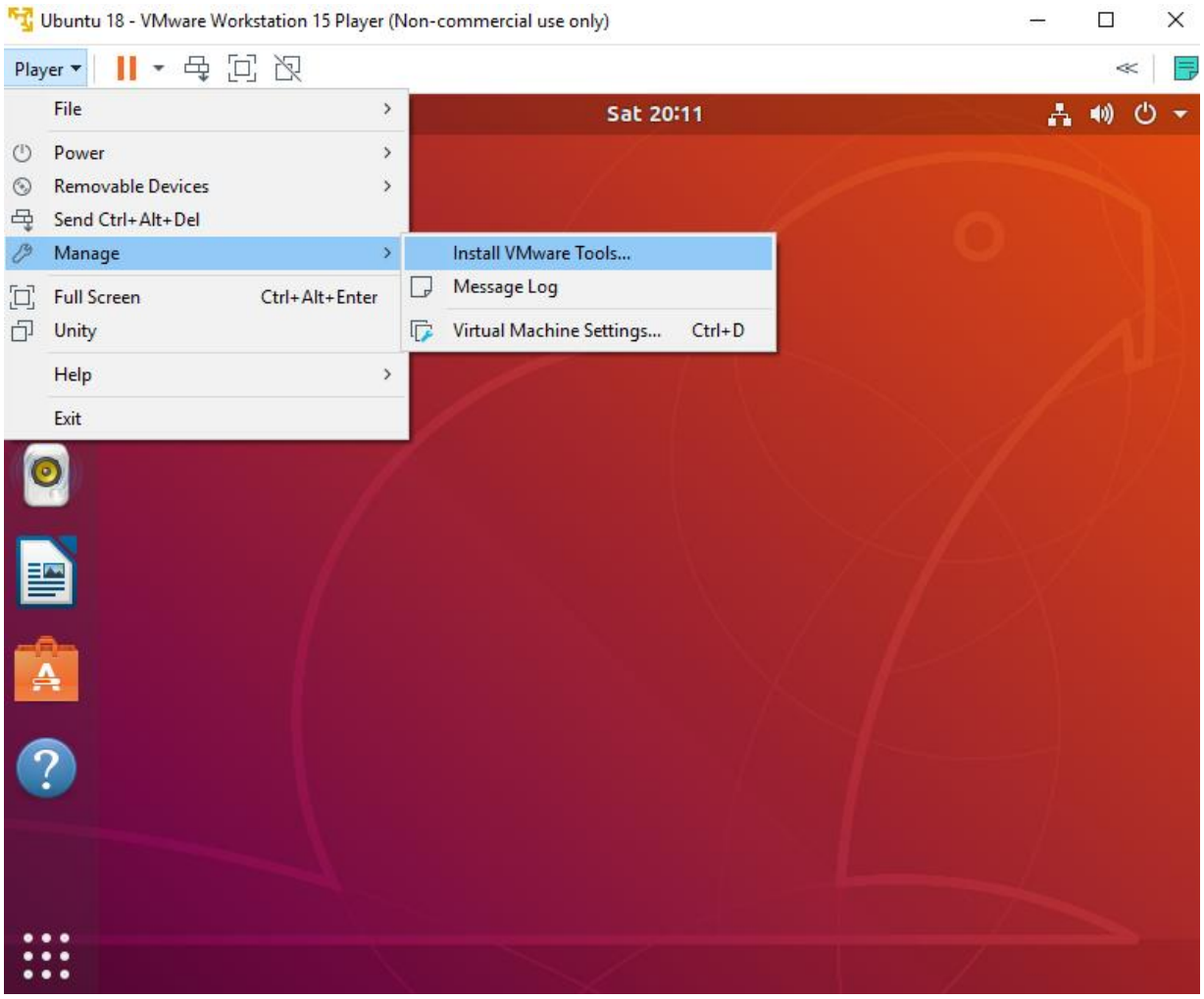


3. VMware tools on Ubuntu 18.04

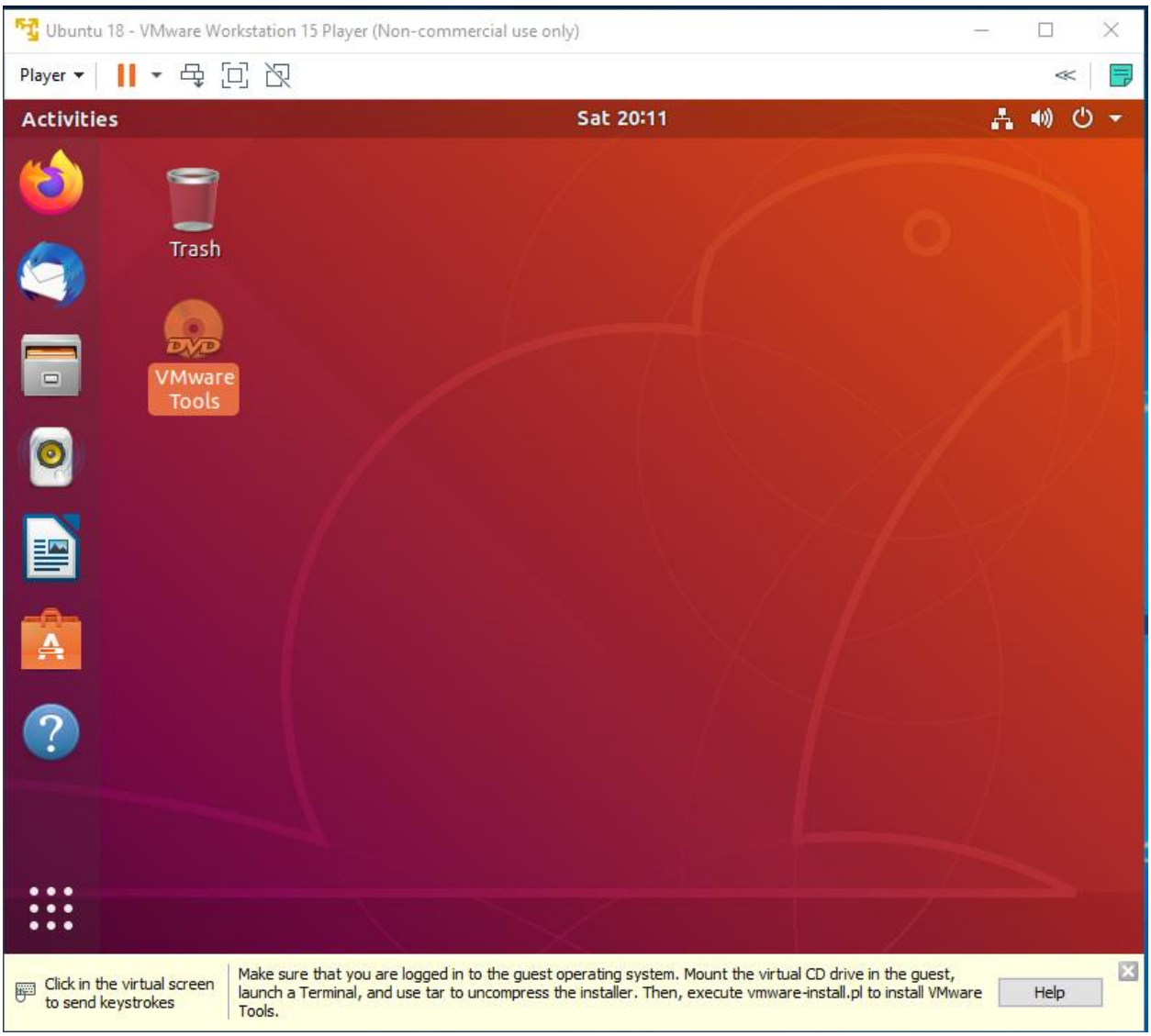
Note: I have Ubuntu and its VMware tools installed already and I will test it by copying a file from my Windows 10 to my Ubuntu 18.04, so below is steps of VMware tools installation from this site:

https://ubuntu.tutorials24x7.com/blog/how-to-install-vmware-tools-in-ubuntu-18-04-lts

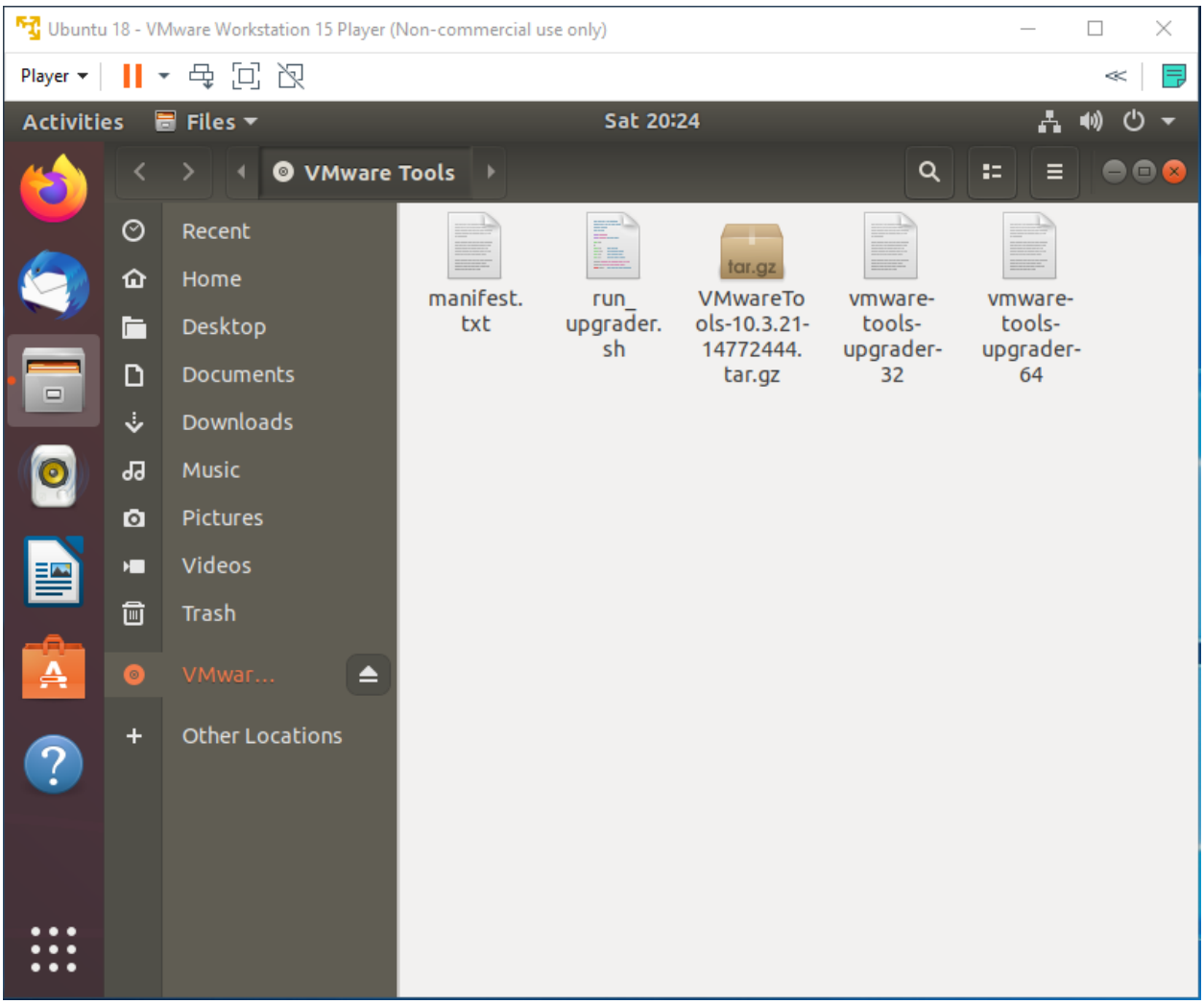
Player → Manage → Install VMware Tools



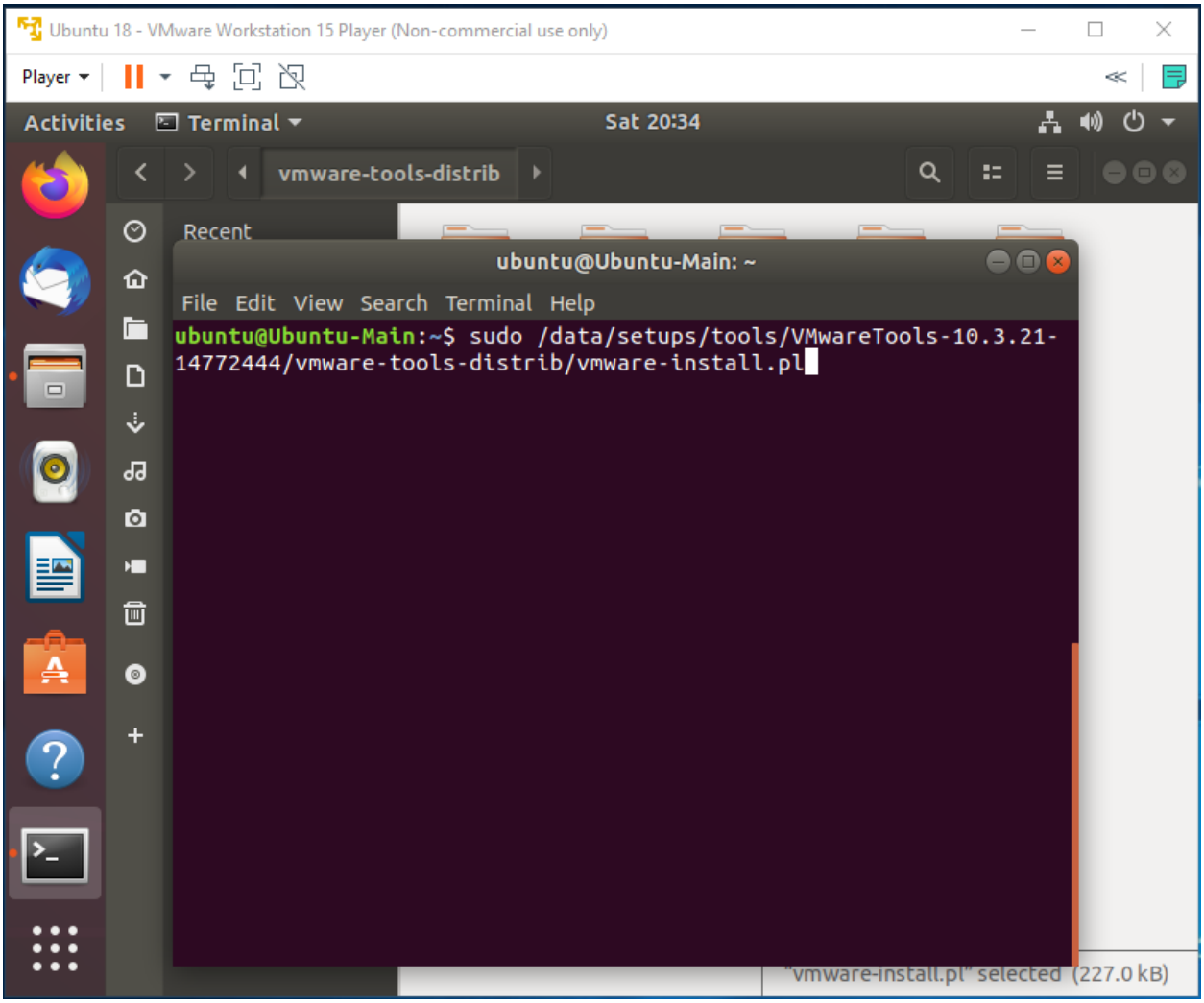
Mount DVD


Ubuntu 18 - VMware Workstation 15 Player (Non-commercial use only)
Player
Activities
Sat 20:11
Trash
VMware Tools
Click in the virtual screen to send keystrokes
Make sure that you are logged in to the guest operating system. Mount the virtual CD drive in the guest, launch a Terminal, and use tar to uncompress the installer. Then, execute vmware-install.pl to install VMware Tools.
Help

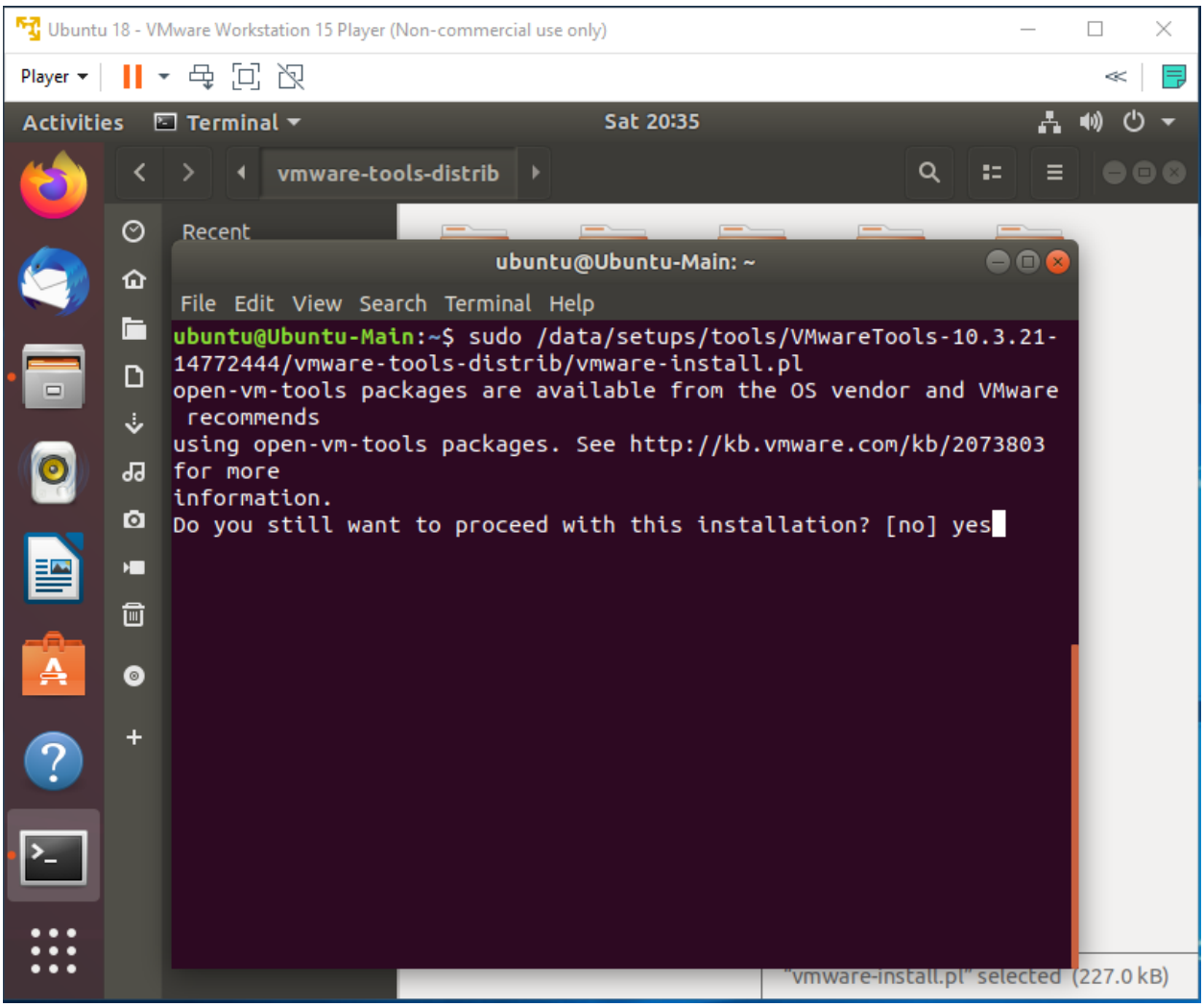
VMware installer.tar.gz is available.

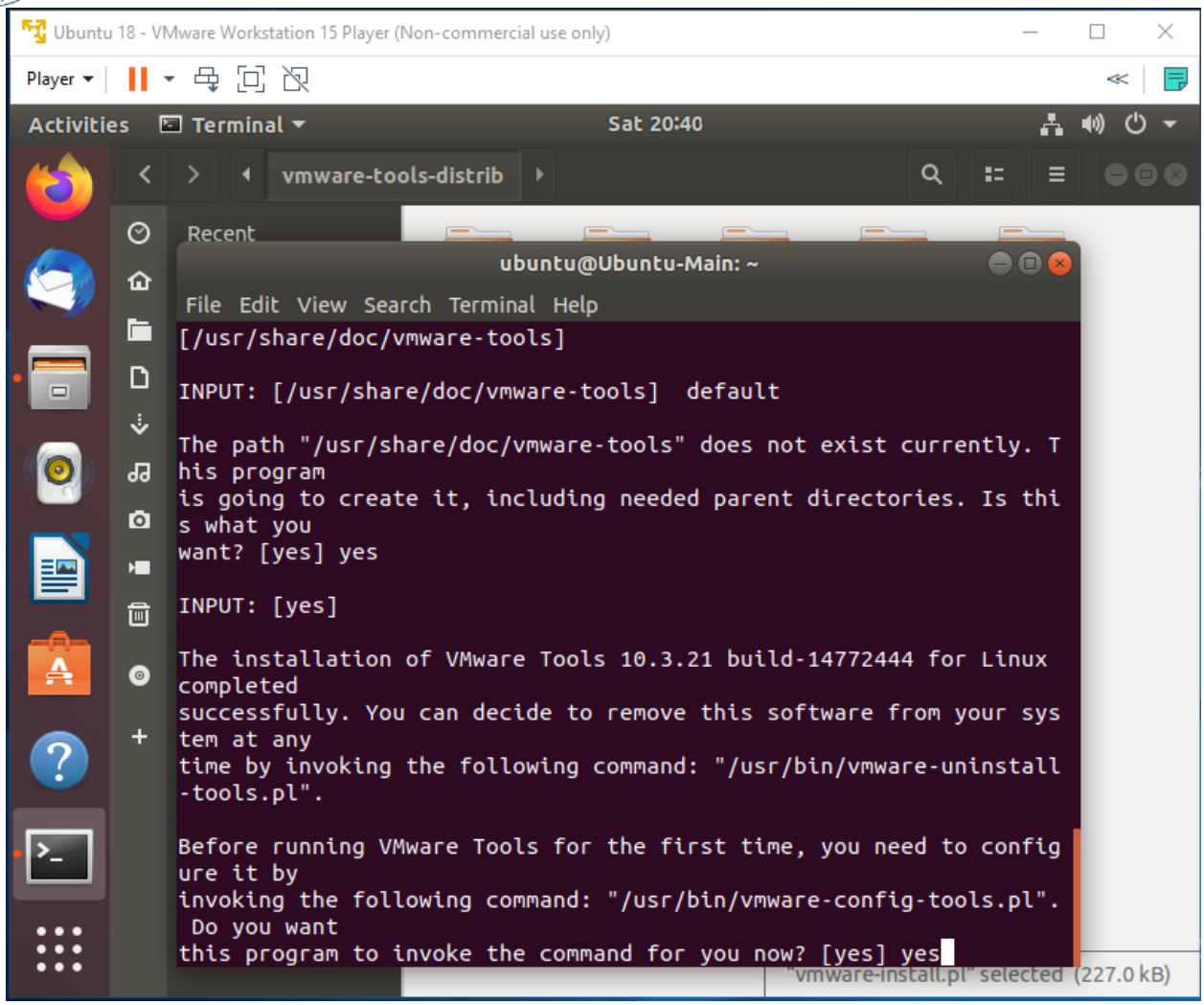


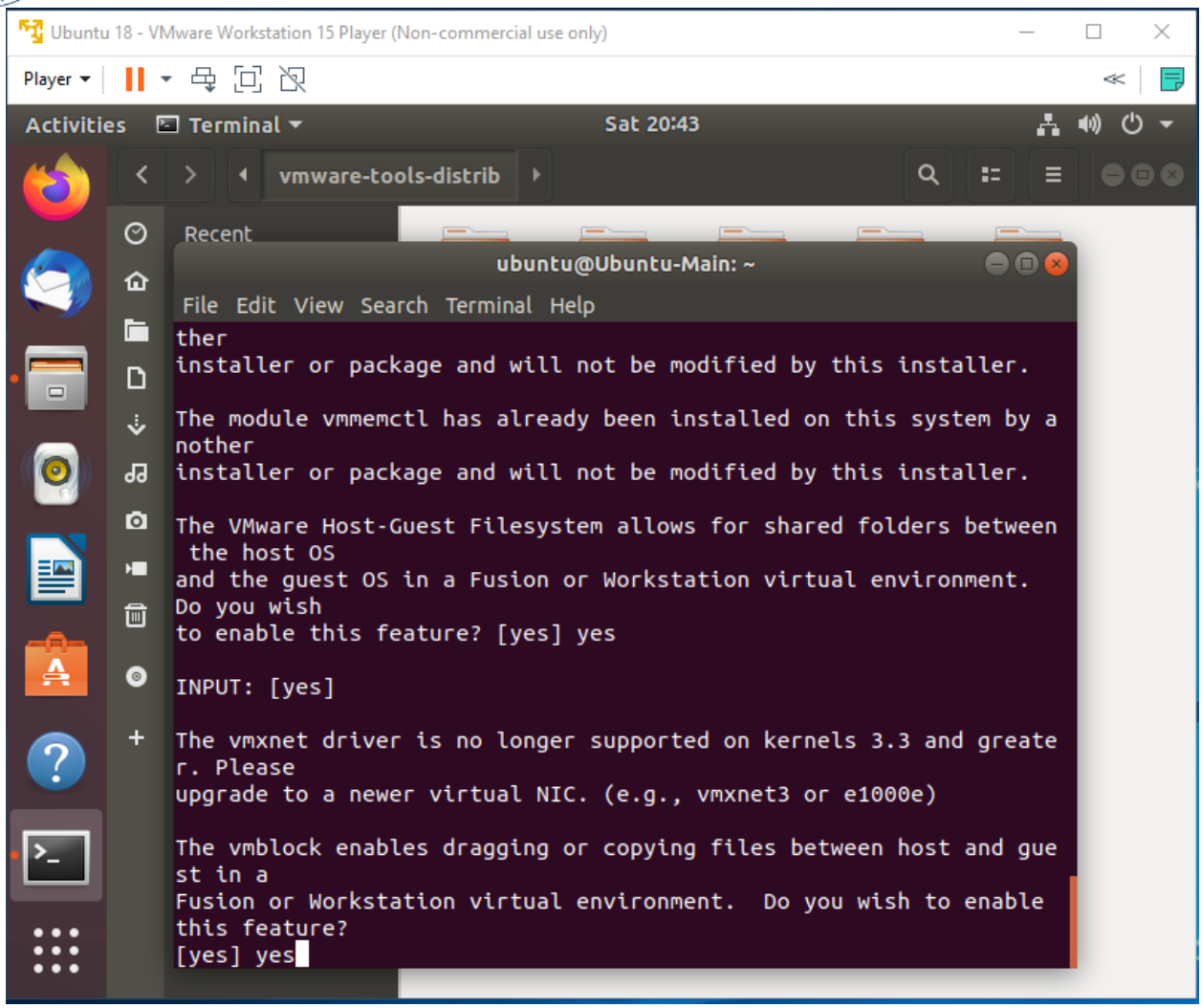
After extracting installer, run the file vmware-install.pl.

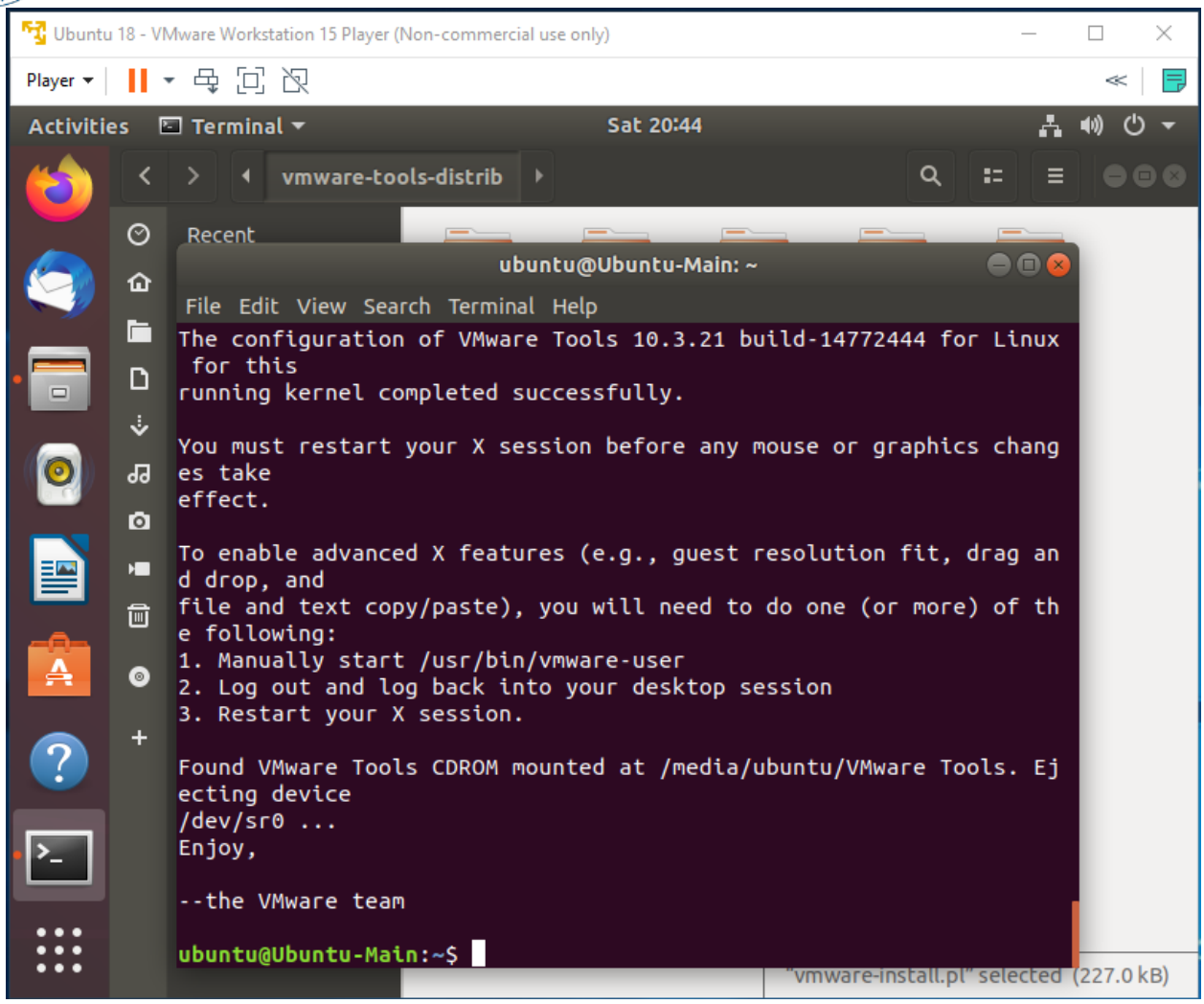


It will ask several questions and input while installing VMware Tools. Allow the installer to keep the default options. The progress of the installation is shown below:



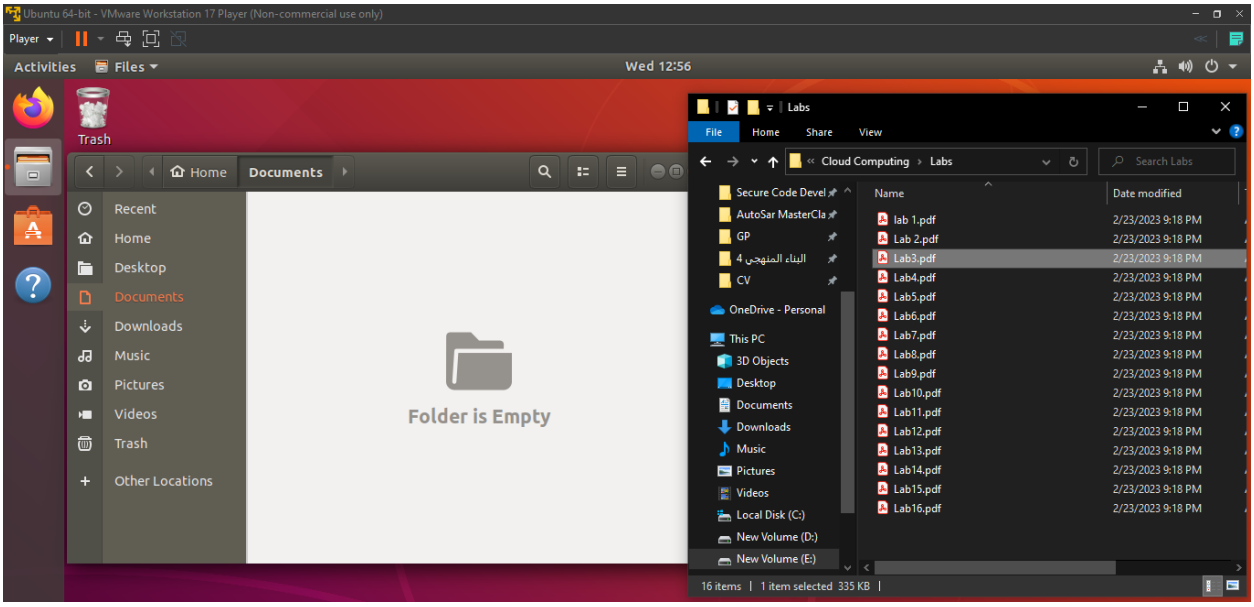

Ubuntu 18 - VMware Workstation 15 Player (Non-commercial use only)
Player
Activities
Terminal
Sat 20:40
vmware-tools-distrib
Recent
ubuntu@Ubuntu-Main: ~
File Edit View Search Terminal Help
[/usr/share/doc/vmware-tools]
INPUT: [/usr/share/doc/vmware-tools] default
The path "/usr/share/doc/vmware-tools" does not exist currently. This program
is going to create it, including needed parent directories. Is this what you
want? [yes] yes
INPUT: [yes]
The installation of VMware Tools 10.3.21 build-14772444 for Linux completed
successfully. You can decide to remove this software from your system at any
time by invoking the following command: "/usr/bin/vmware-uninstall-tools.pl".
Before running VMware Tools for the first time, you need to configure it by
invoking the following command: "/usr/bin/vmware-config-tools.pl". Do you want
this program to invoke the command for you now? [yes] yes
vmware-install.pl" selected (227.0 kB)

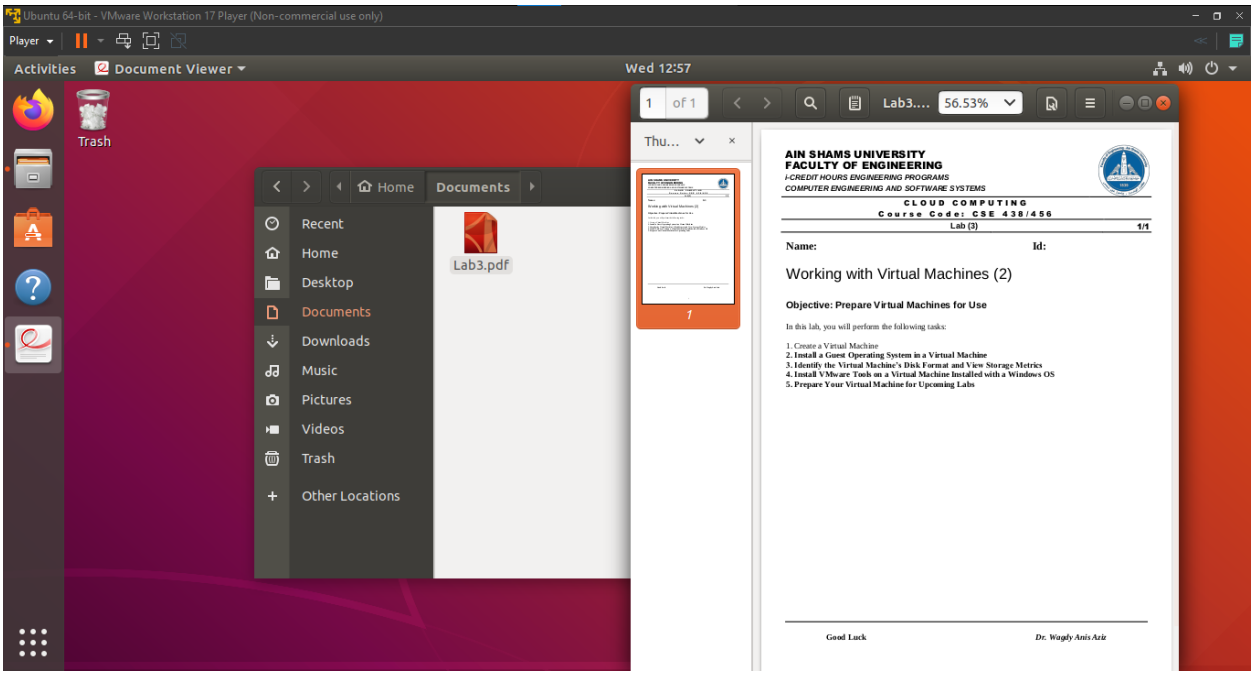

Ubuntu 18 - VMware Workstation 15 Player (Non-commercial use only)
Player
Activities
Terminal
Sat 20:43
vmware-tools-distrib
Recent
ubuntu@Ubuntu-Main: ~
File Edit View Search Terminal Help
ther
installer or package and will not be modified by this installer.
The module vmmemctl has already been installed on this system by a
nother
installer or package and will not be modified by this installer.
The VMware Host-Guest Filesystem allows for shared folders between
the host OS
and the guest OS in a Fusion or Workstation virtual environment.
Do you wish
to enable this feature? [yes] yes
INPUT: [yes]
The vmxnet driver is no longer supported on kernels 3.3 and greate
r. Please
upgrade to a newer virtual NIC. (e.g., vmxnet3 or e1000e)
The vmblock enables dragging or copying files between host and gue
st in a
Fusion or Workstation virtual environment. Do you wish to enable
this feature?
[yes] yes


Ubuntu 18 - VMware Workstation 15 Player (Non-commercial use only)
Player
Activities
Terminal
Sat 20:44
vmware-tools-distrib
Recent
ubuntu@Ubuntu-Main: ~
File Edit View Search Terminal Help
The configuration of VMware Tools 10.3.21 build-14772444 for Linux for this
running kernel completed successfully.
You must restart your X session before any mouse or graphics changes take
effect.
To enable advanced X features (e.g., guest resolution fit, drag and drop, and
file and text copy/paste), you will need to do one (or more) of the following:
1. Manually start /usr/bin/vmware-user
2. Log out and log back into your desktop session
3. Restart your X session.
Found VMware Tools CDROM mounted at /media/ubuntu/VMware Tools. Ejecting device
/dev/sr0 ...
Enjoy,
--the VMware team
ubuntu@Ubuntu-Main:~$
"vmware-install.pl" selected (227.0 kB)

4. Testing VMware tools on Ubuntu 18.04

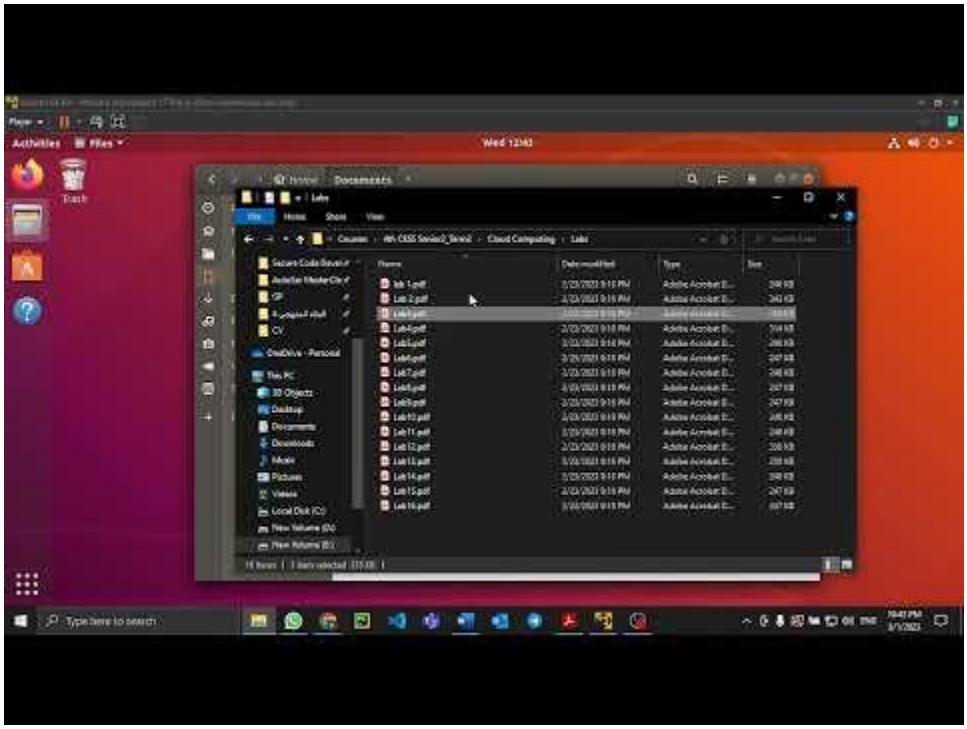
I will copy Lab3.pdf from File Explorer (Windows 10) to Files (Ubuntu)





Live Video showing copying the file from Windows 10 to Ubuntu

Click the image!



Ain Shams University
Faculty of Engineering

Lab Report 4

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID: 1809799

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1. Virtual Machine (Ubuntu 18.04) Files Location 3
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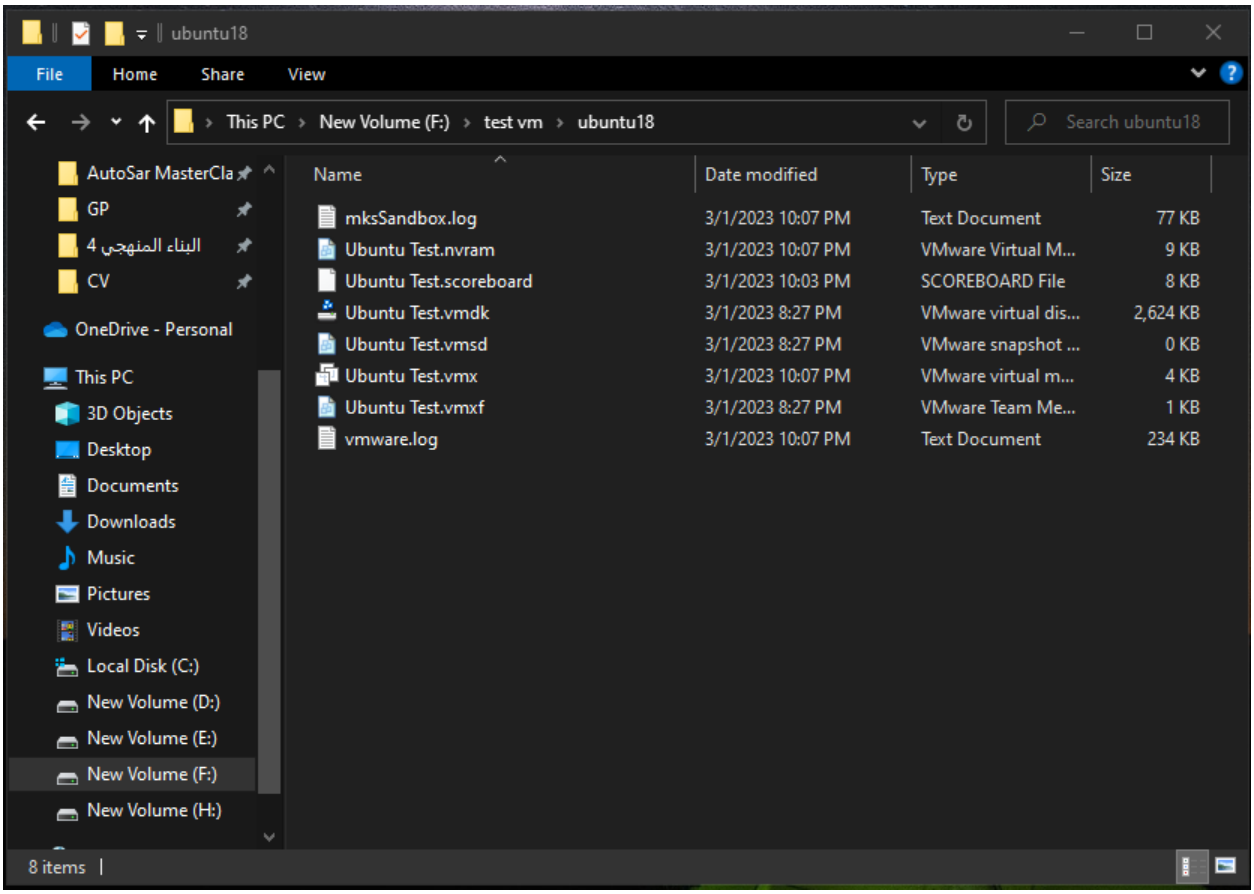
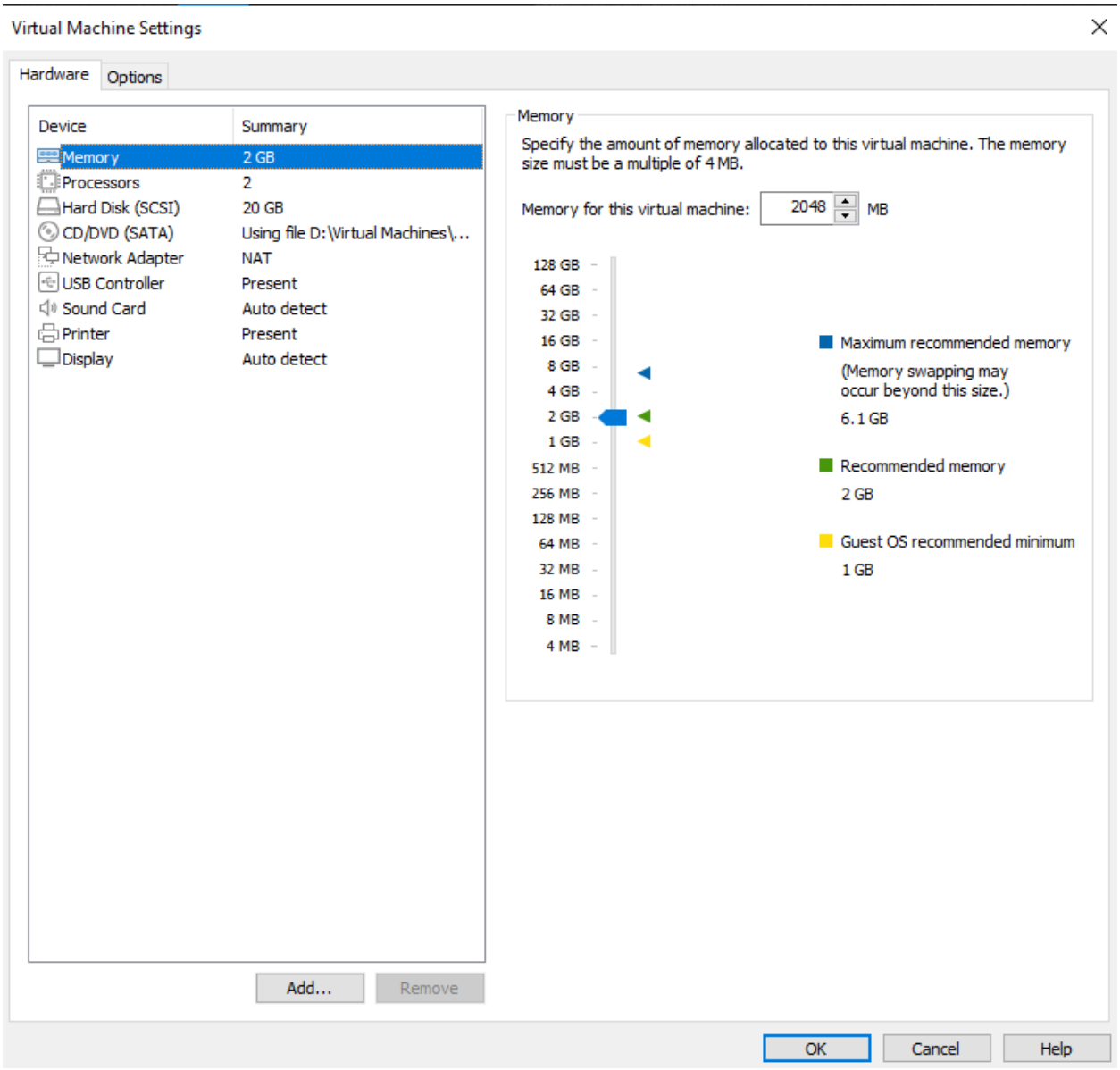
1. Virtual Machine (Ubuntu 18.04) Files Location



2. Virtual Machine Settings



Computer Engineering

& Software Systems

Ain Shams University
Faculty of Engineering

Lab Report 5

Snapshots

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

Objective: Prepare Virtual Machines for Use

In this lab, you will perform the following tasks:

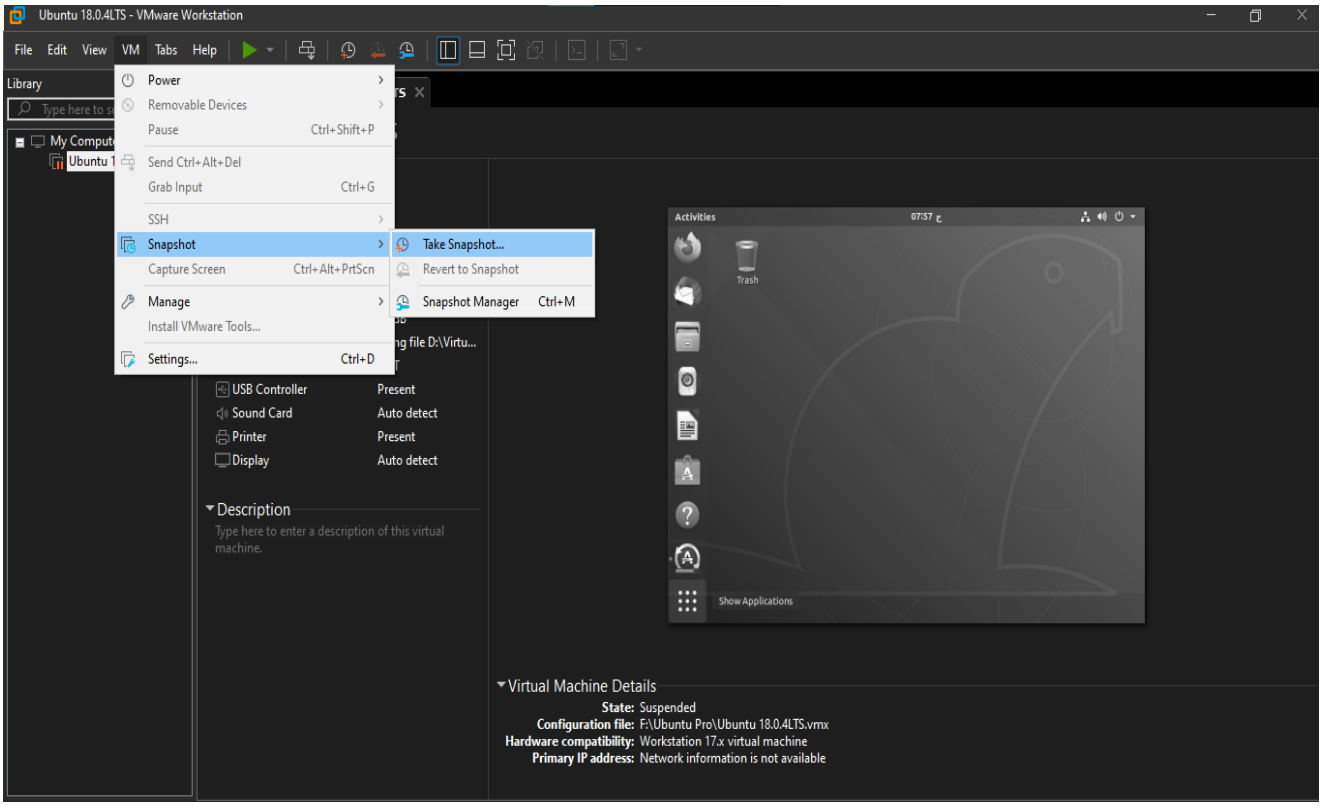
1. How to work with snapshots.
2. What files change when a snapshot is taken.

Lab Solution

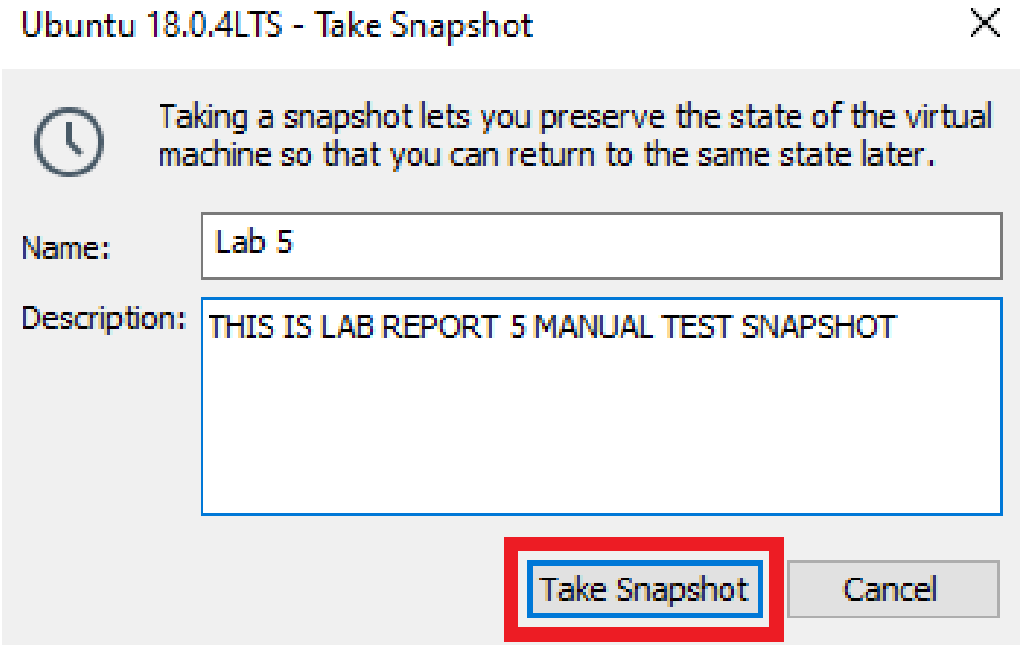
1. How to work with Snapshots

We will first learn how take a snapshot for a VM.

a) Open VMware Workstation
b) Hover over “VM” tab
c) Hover over “Snapshot”
d) Click on “Take Snapshot”

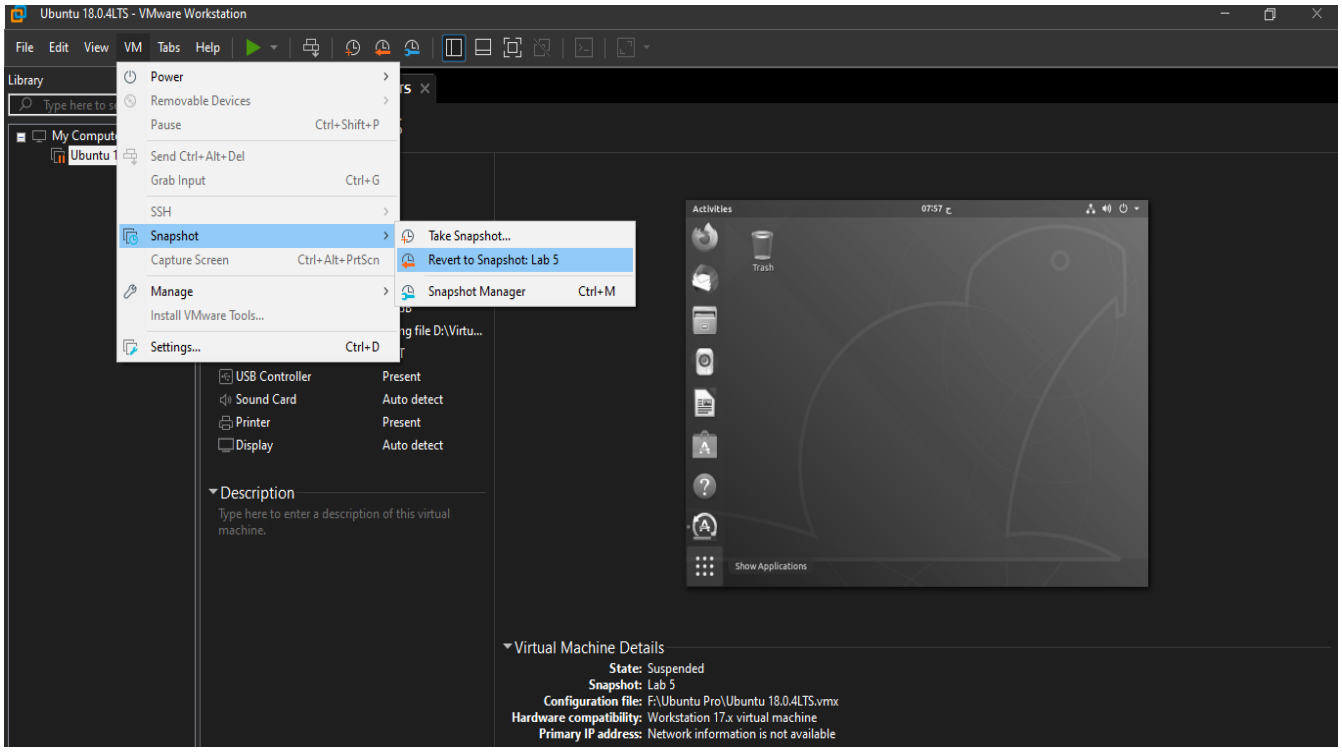


A small window will pop out to Name the Screenshot and write a description. Then click on “Take snapshot”.



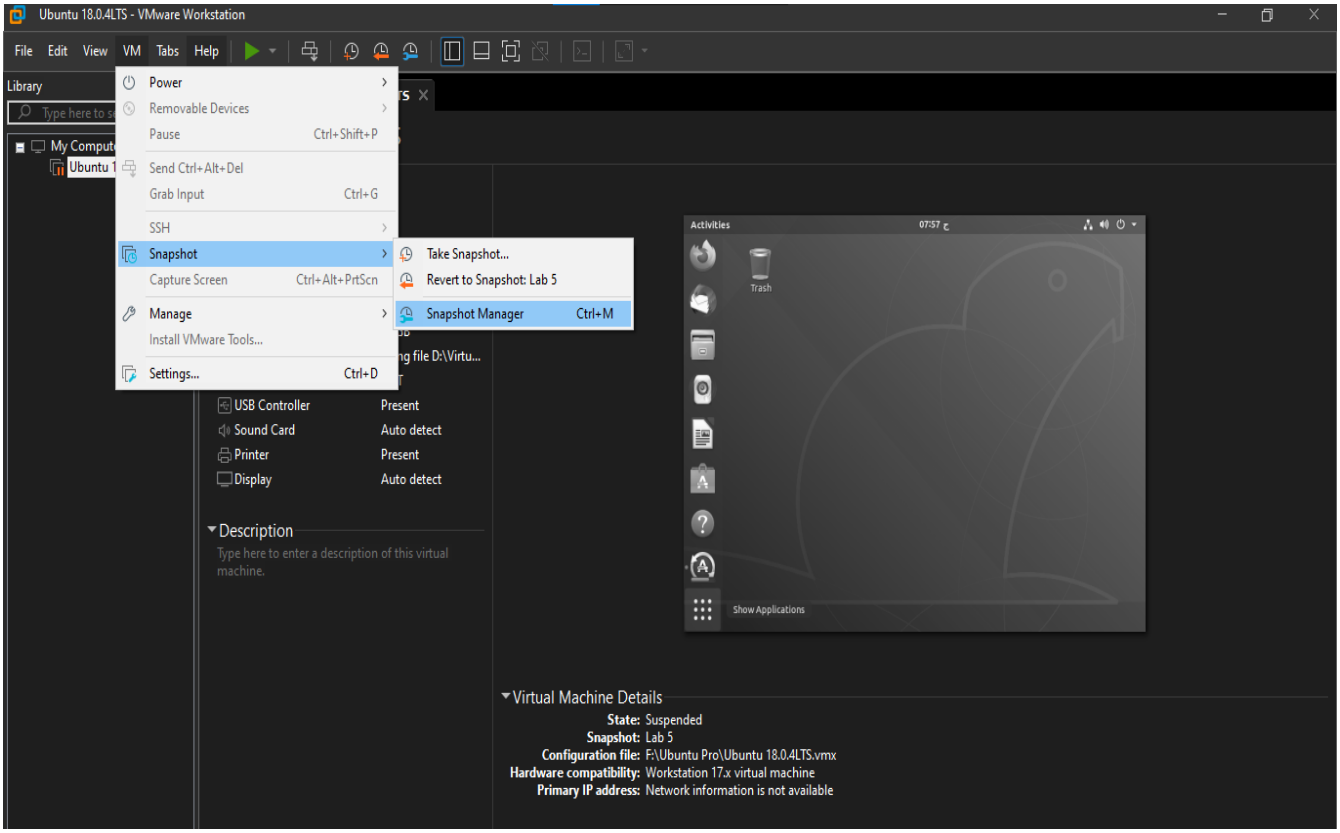
Now lets check where do we can get back to that screenshot when we want.

a) Hover over “VM” tab
b) Hover over “Snapshot”
c) Click on “Revert to Snapshot: Lab5”

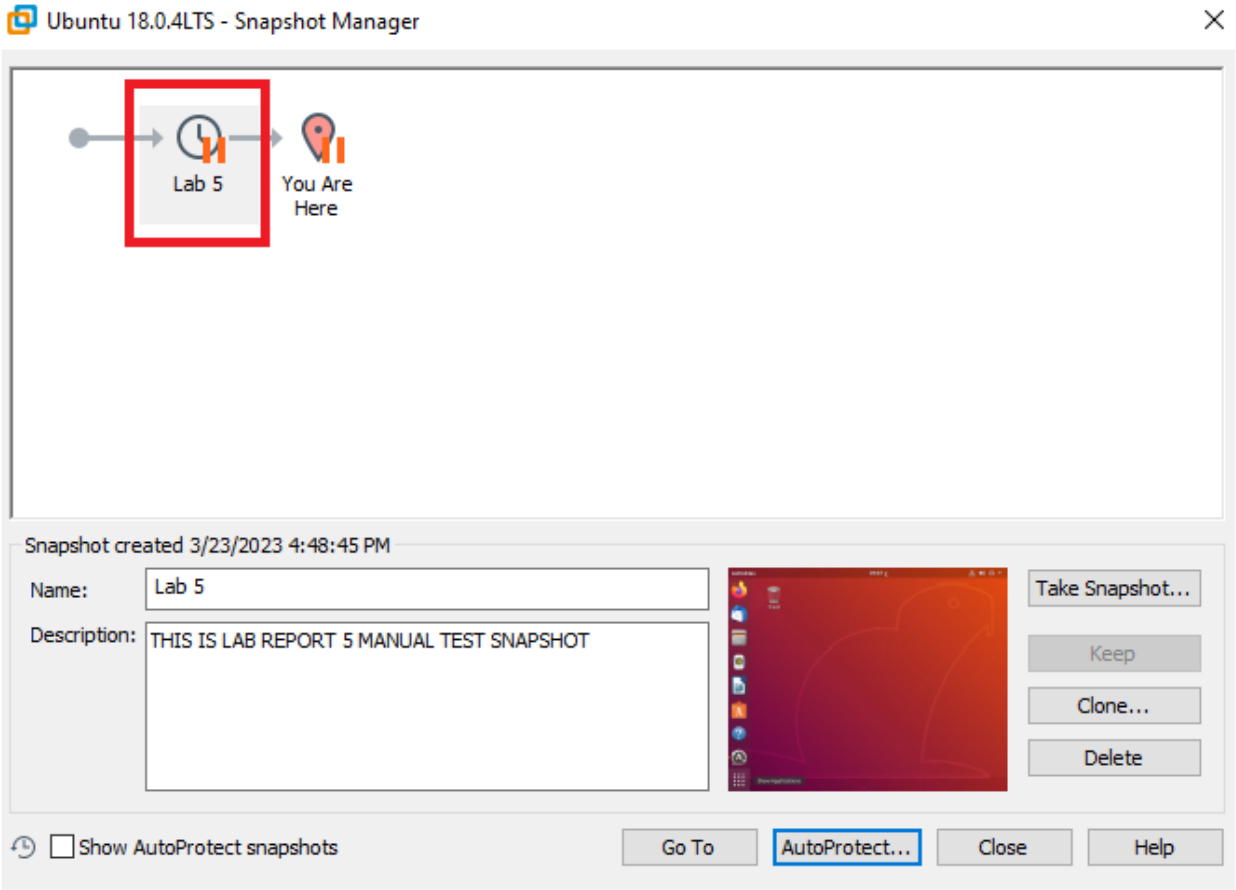


Another good window we want to explore is the “Snapshot manager”.

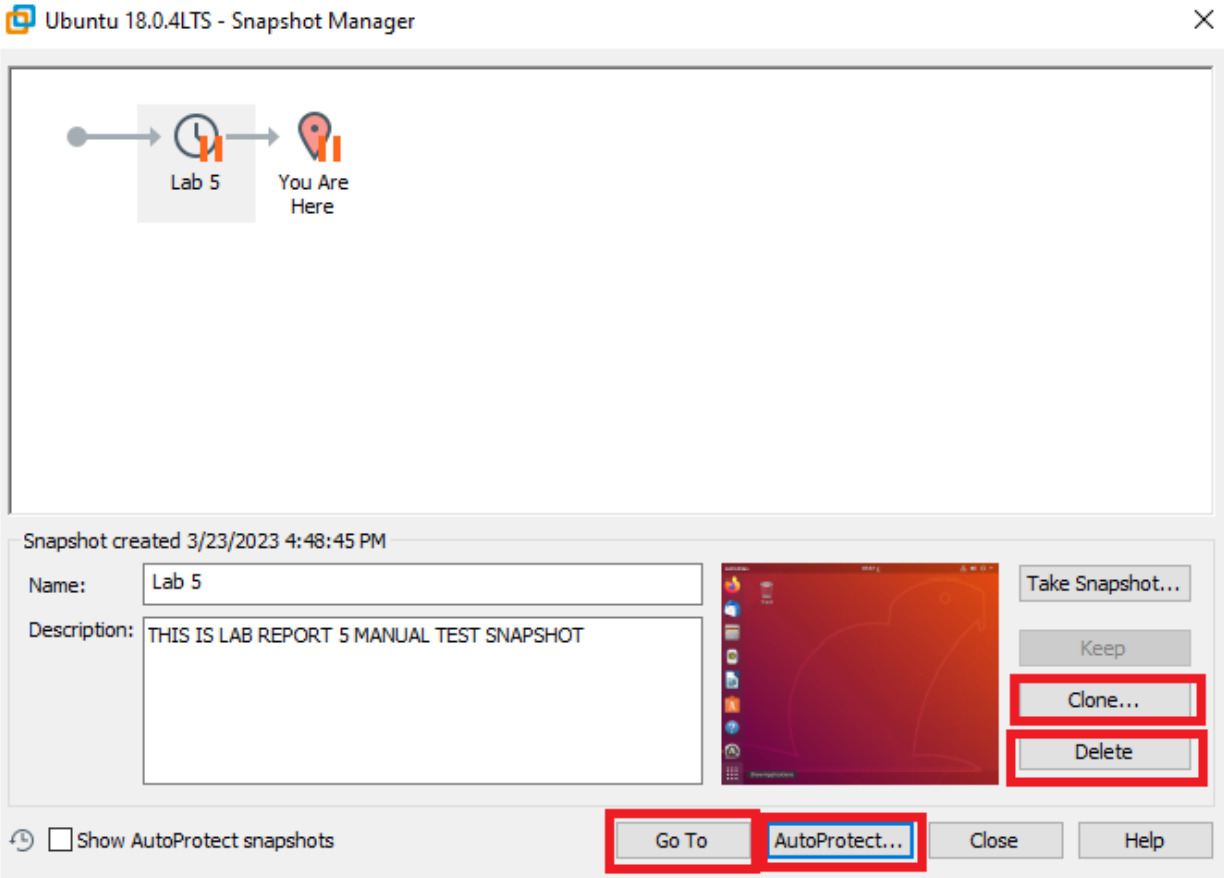
a) Hover over “VM” tab
b) Hover over “Snapshot”
c) Click on “Snapshot manager”



The “Snapshot Manager” window will appear. As we can see the Snapshot we created is before the original VM “You are here” to be able to revert back to the Snapshot when needed.



We will talk briefly about functionalities of buttons below.



1. Go to: Revert to the Snapshot
2. Clone: It will be discussed in a later lab
3. Delete: To delete the Snapshot
4. Auto Protect:
   It allows you to take snapshot of the VM at Regular intervals which you configure for the VM. So, in that you don't have to manually take the snapshot of the VM instead “Auto Protect” will take snapshot of the VM automatically on scheduled time.

2. What files change when a snapshot is taken.

A VM snapshot file consists of all the files stored on the storage devices of a virtual machine. Taking a snapshot creates files with extensions .vmdk, -delta.vmdk, .vmsd, and .vmsn, which are stored with the VM base files. The delta files are stored with the base VMDK file, which is stored in read-only mode to preserve its state. And VMSD and VMSN files are stored in the VM directory.

When you take a snapshot, the original VMDK file with the current disk state is preserved in read-only mode, and the guest OS can no longer make changes to it. Instead, a delta or a child disk file called delta.vmdk is created to which the guest OS can write.

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Lab Report 6

VM Clone

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

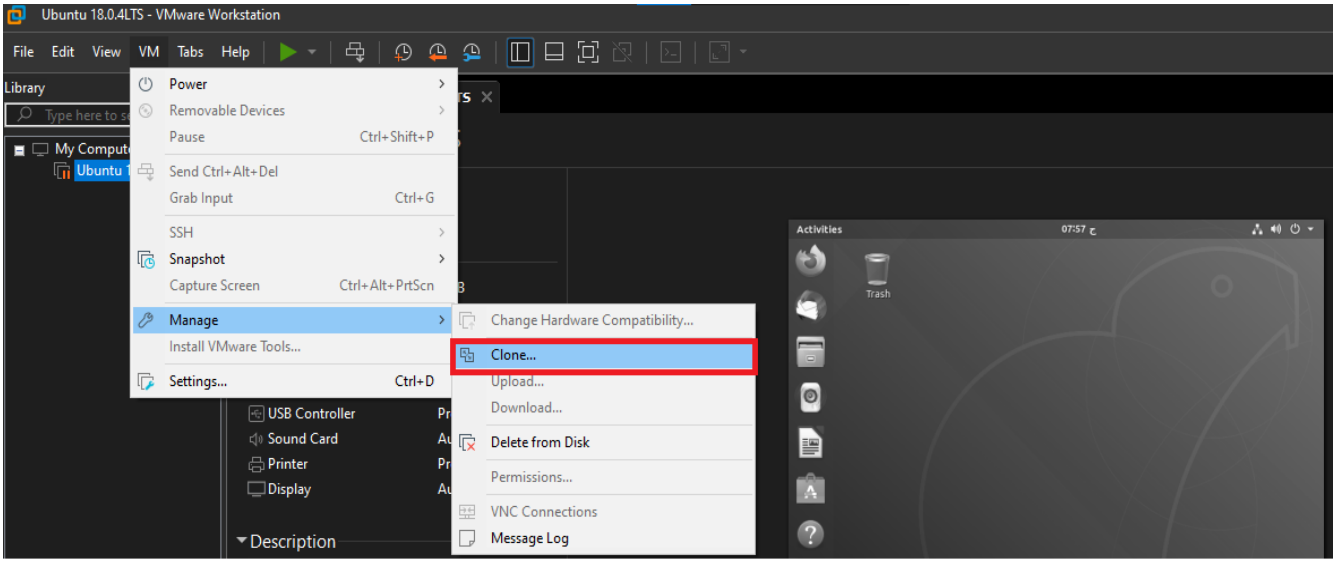
Objective: Virtual Machine Cloning

In this lab, you will perform the following tasks:

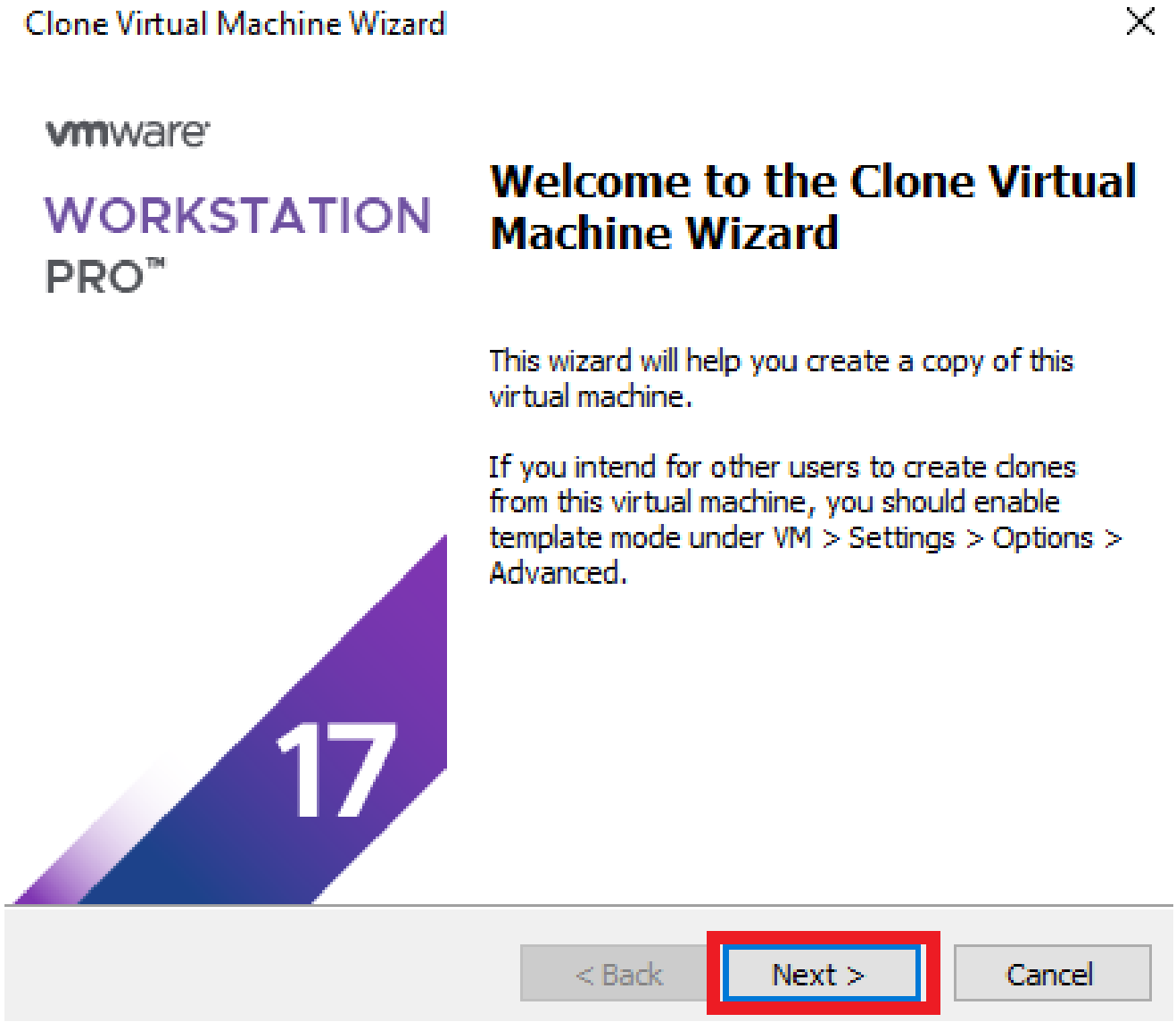
1. Create a linked VM clone.
2. Create a full VM clone.

We will first learn how to create a Clone till we reach the “Clone Type”

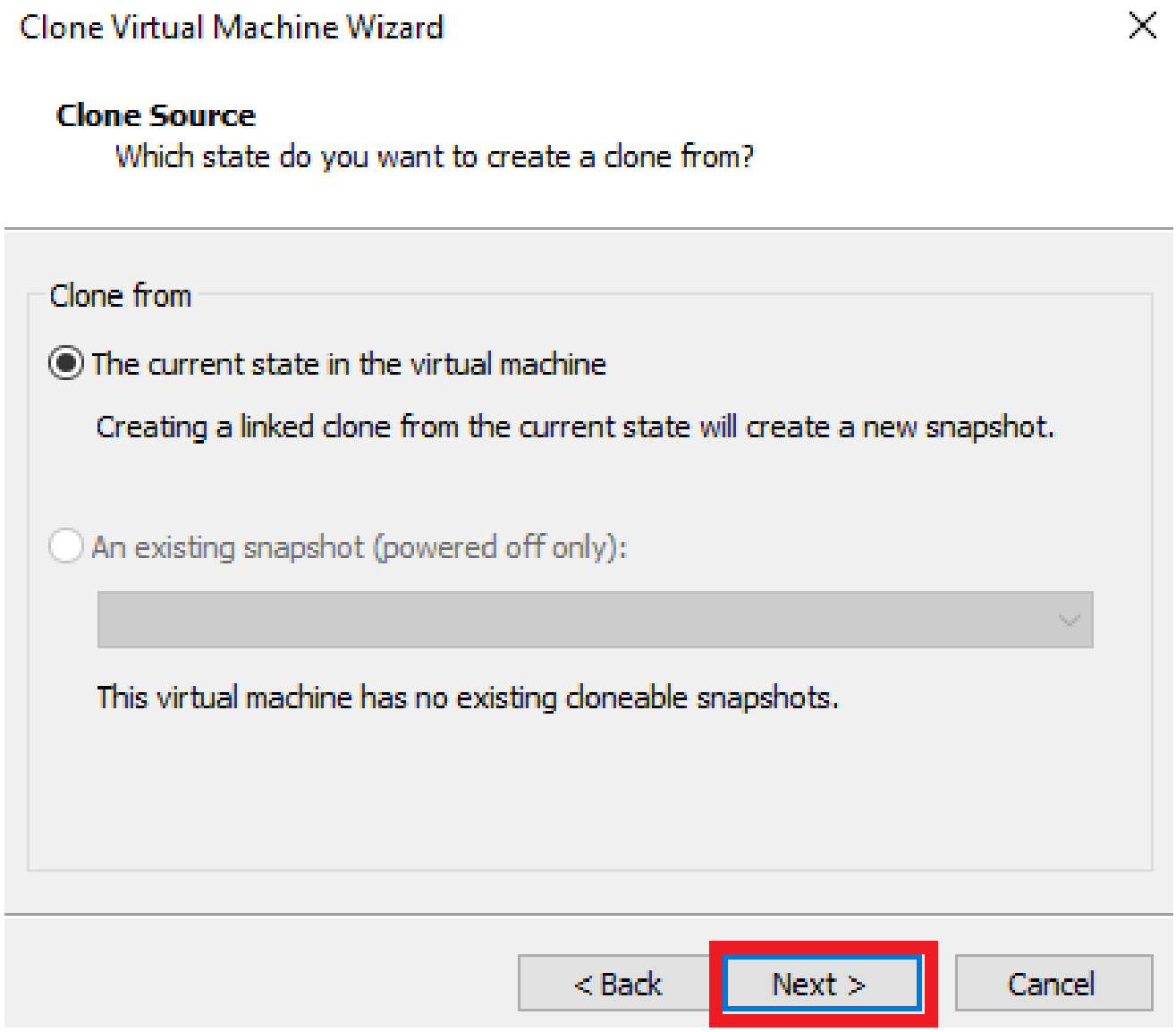
a) Open VMware Workstation
b) Select the VM needed to be clone
c) Hover over “VM” tab
d) Hover over “Manage”
e) Select “Clone” from the popped list.



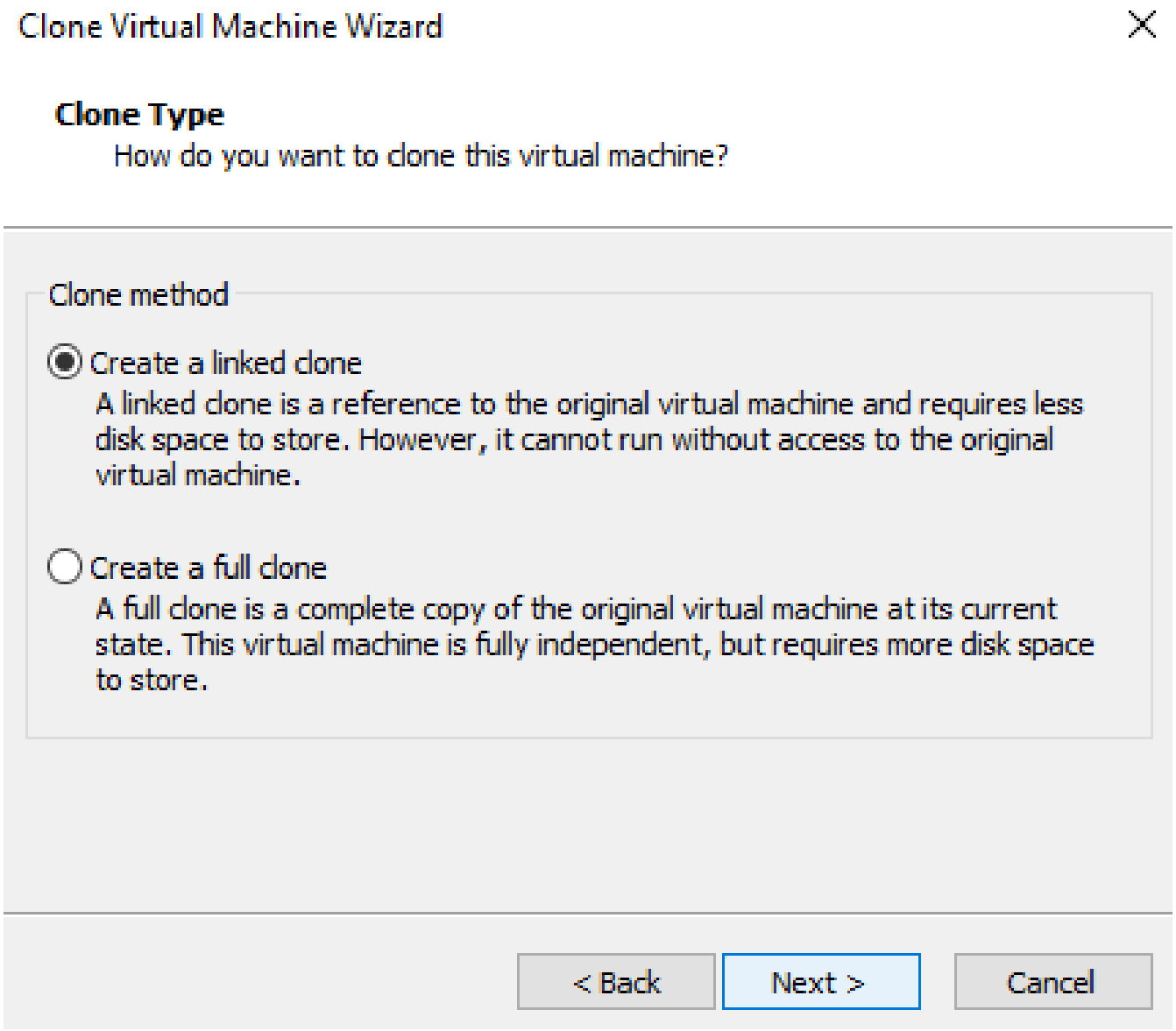
The “Clone VM Wizard” window pops up. Click “Next”.



We will choose the “Current State” as we don’t have Snapshots for this VM and Click “Next”.

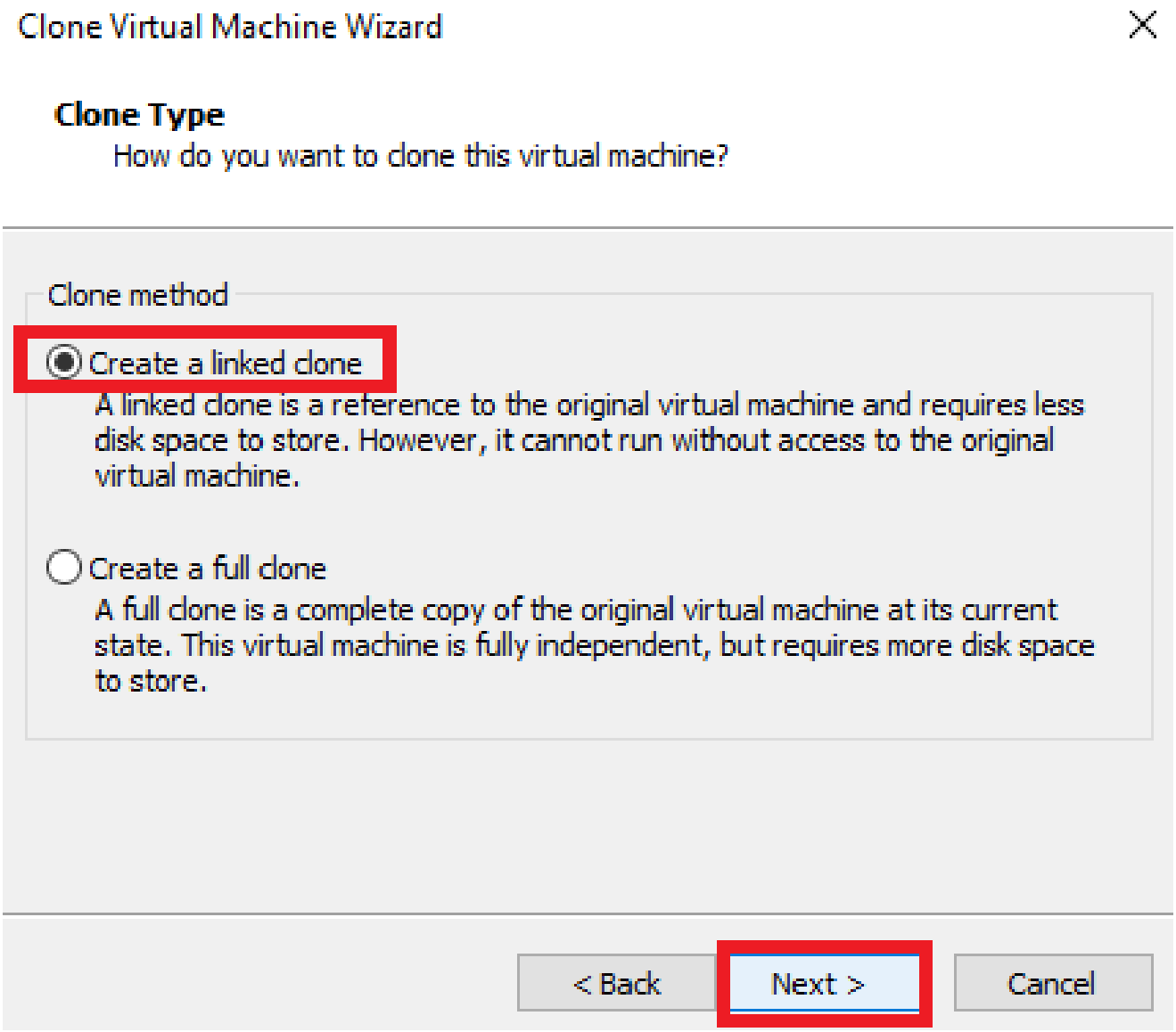


The window for “Clone Type” choice pops up. Now let’s try creating both types.

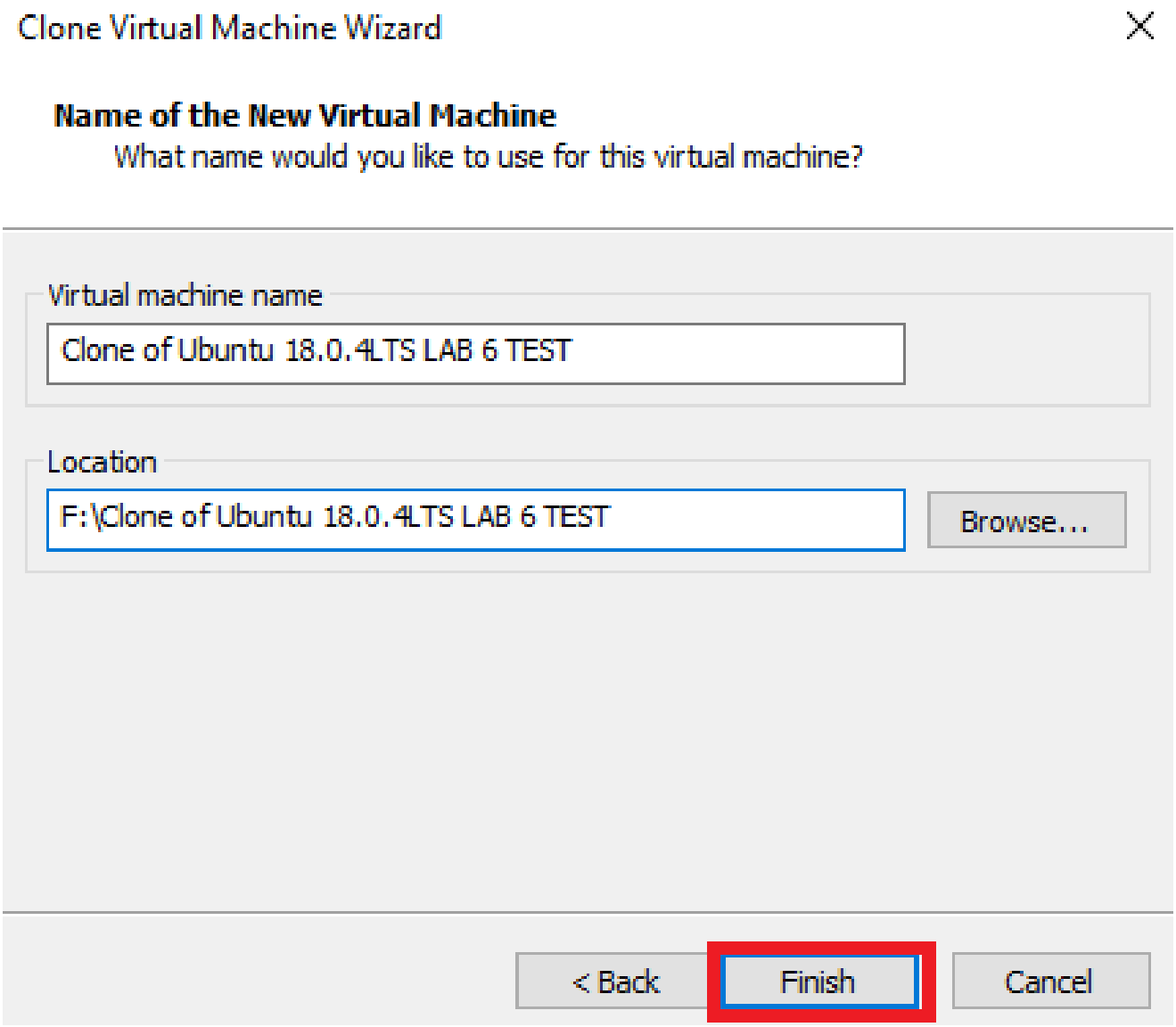


1. **Create a linked Clone.**

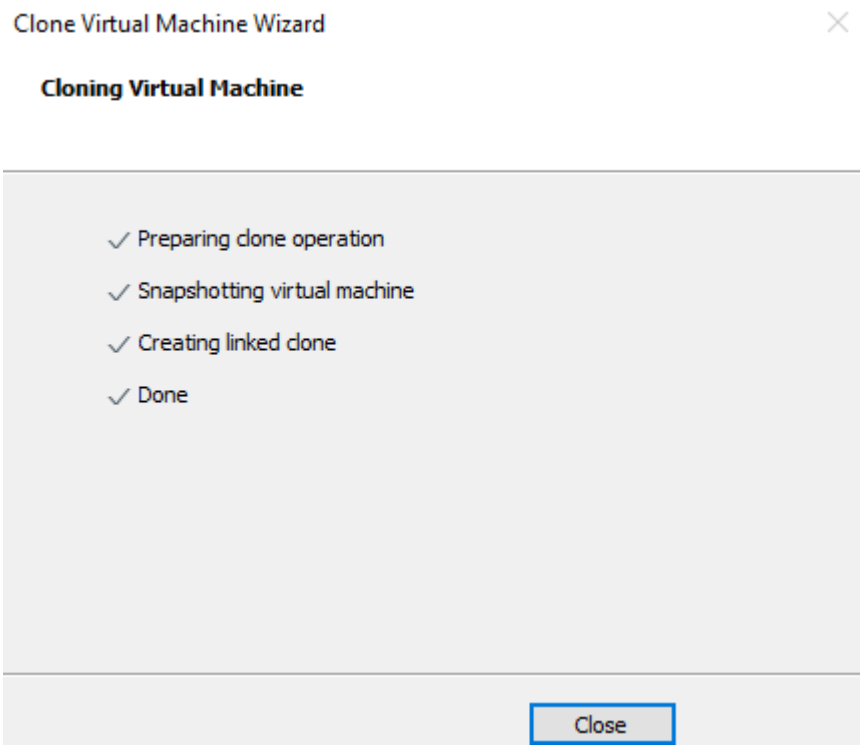
   Choose “Create a linked clone” then press “Next”.

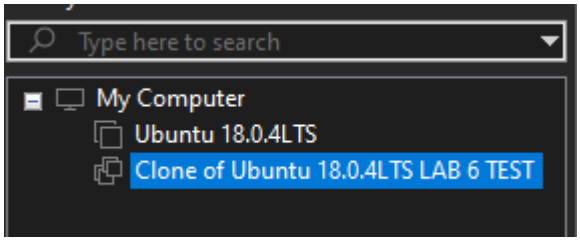


In this window, name your Clone and specify its location on your host machine.

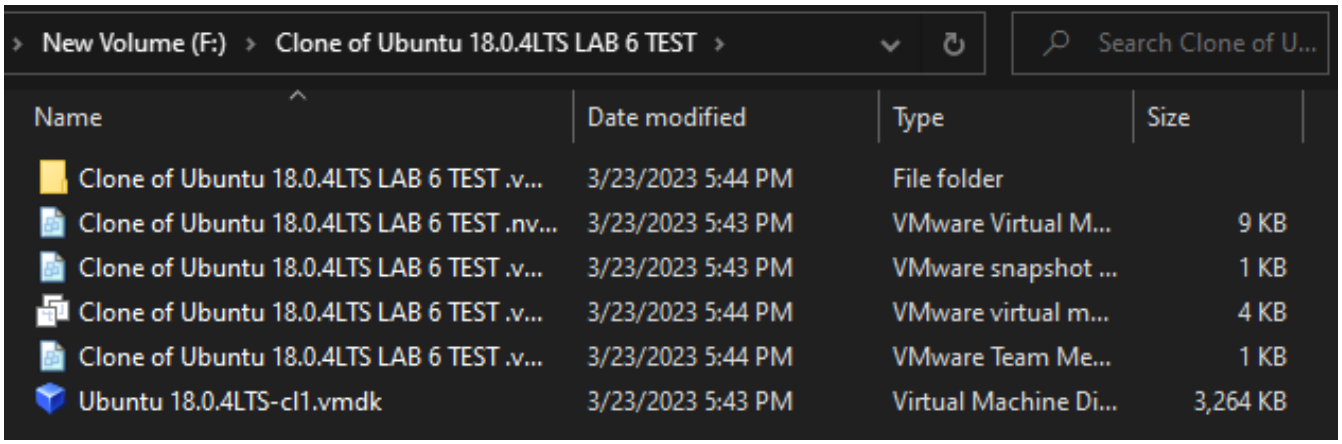


“Linked Clone” created successfully.



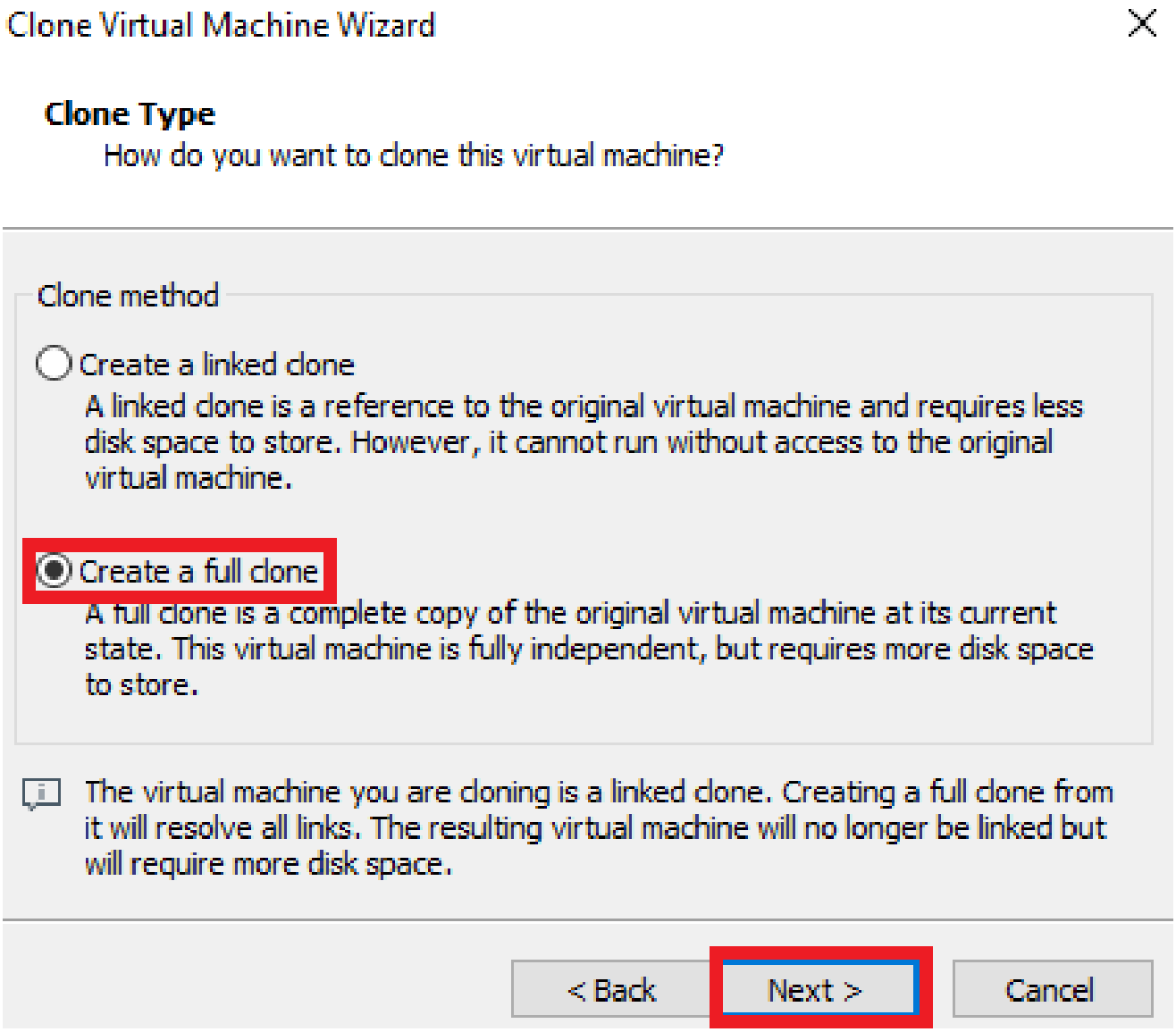


Clone’s Location on Host Device.

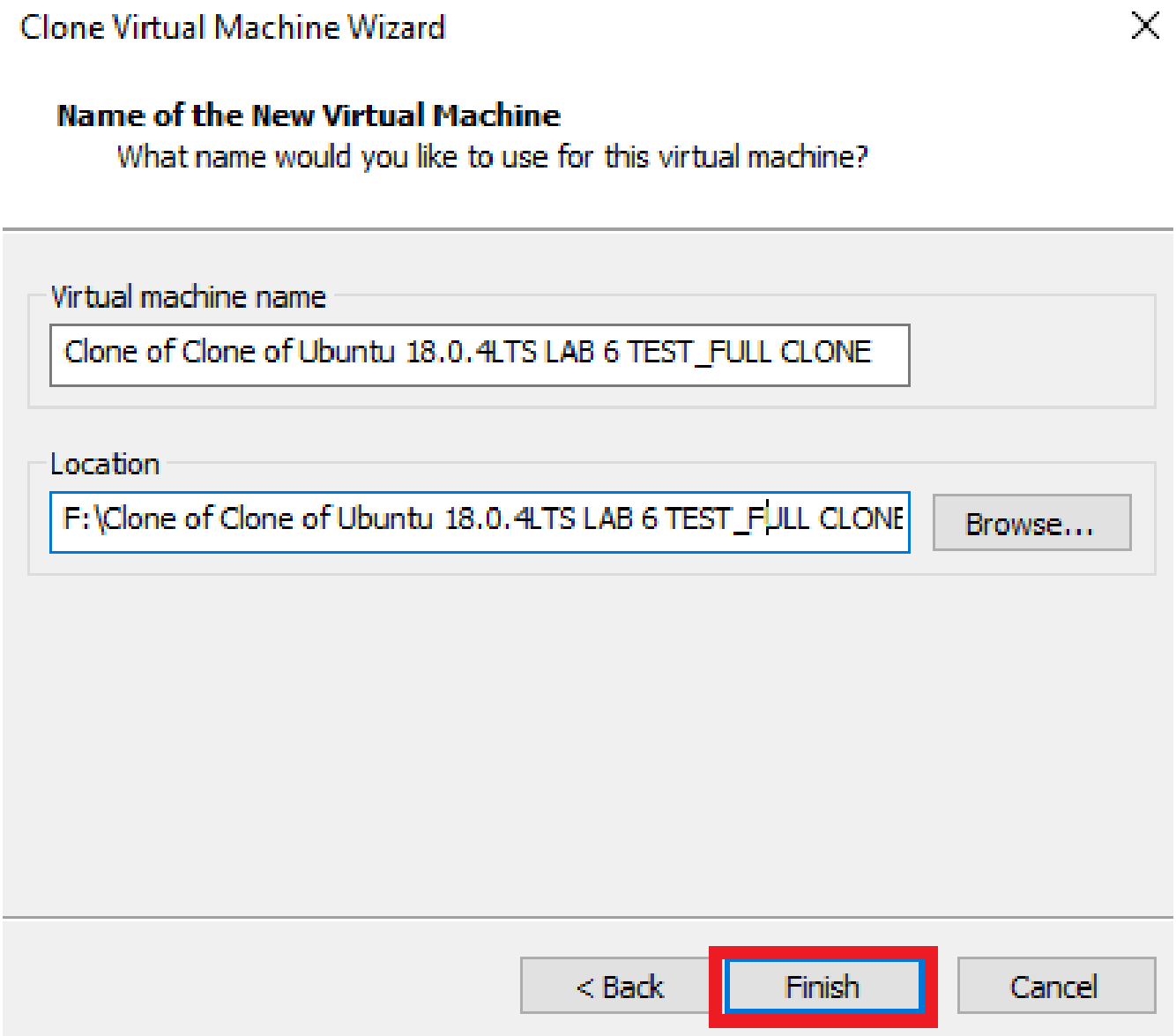


2. **Create a Full VM Clone.**

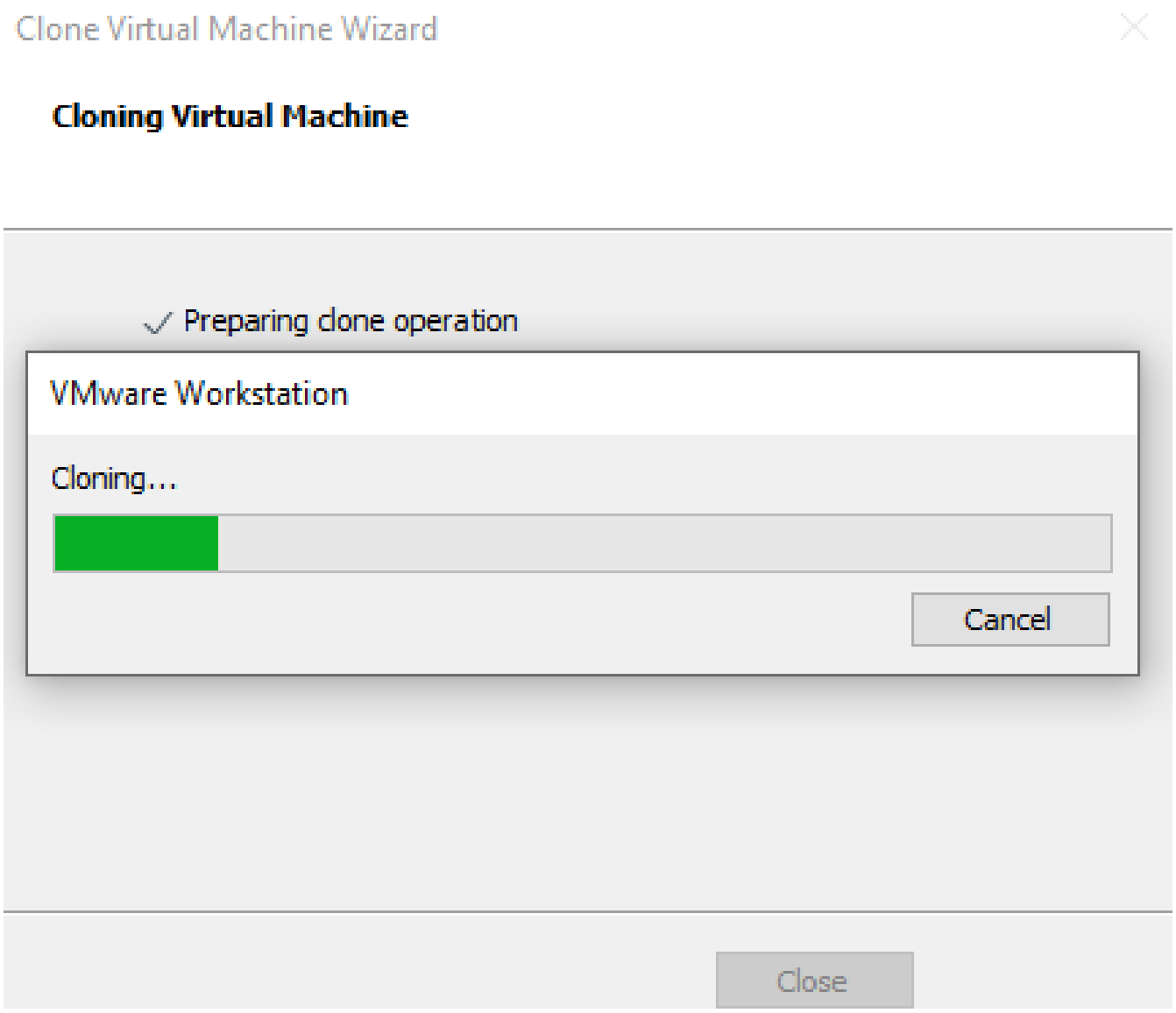
Back to “Clone VM wizard” in the window of choosing “Clone Type”.
Choose “Create full clone” and press “Next”.



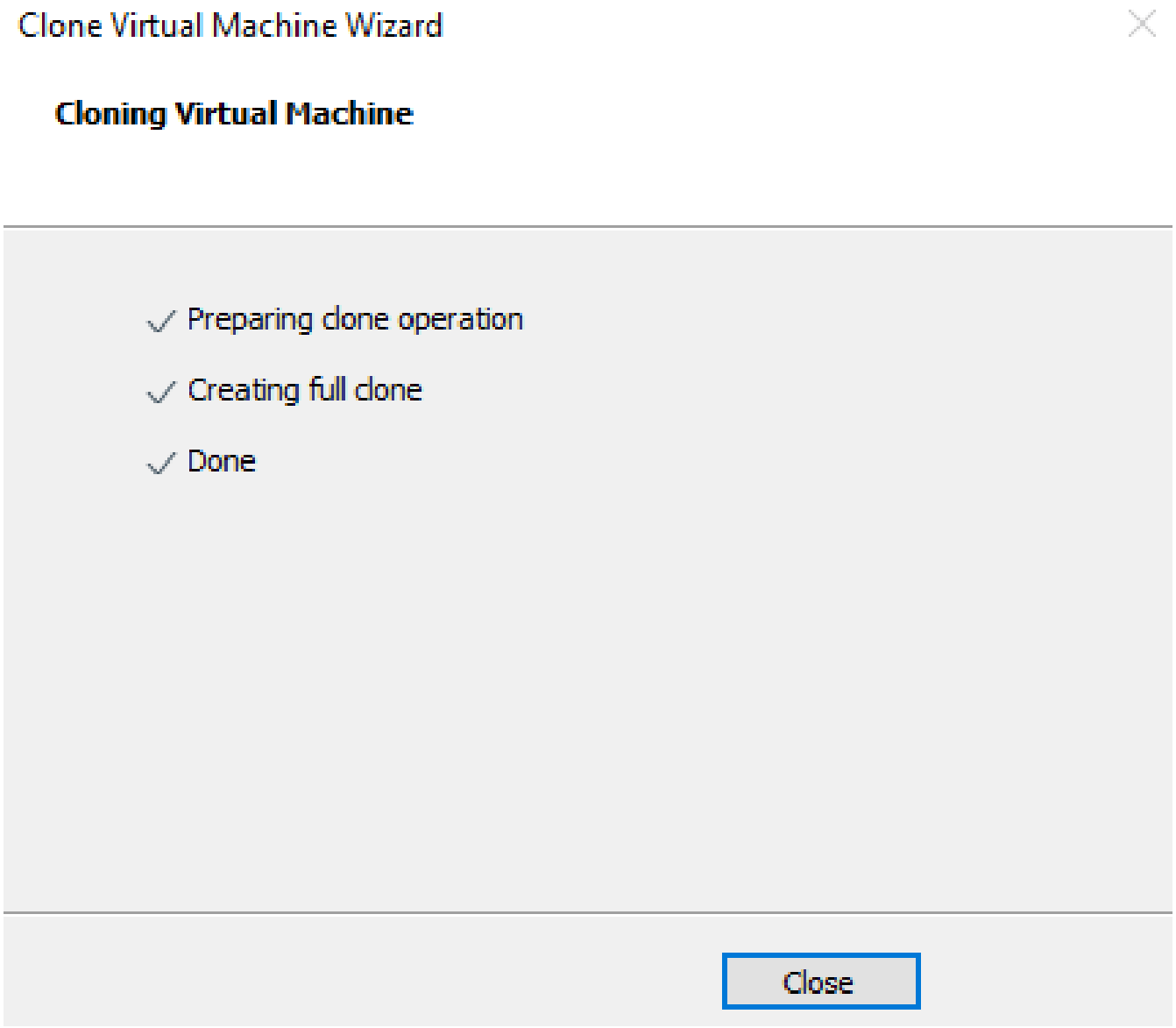
Write the clone's name ,specify its location and click Finish.



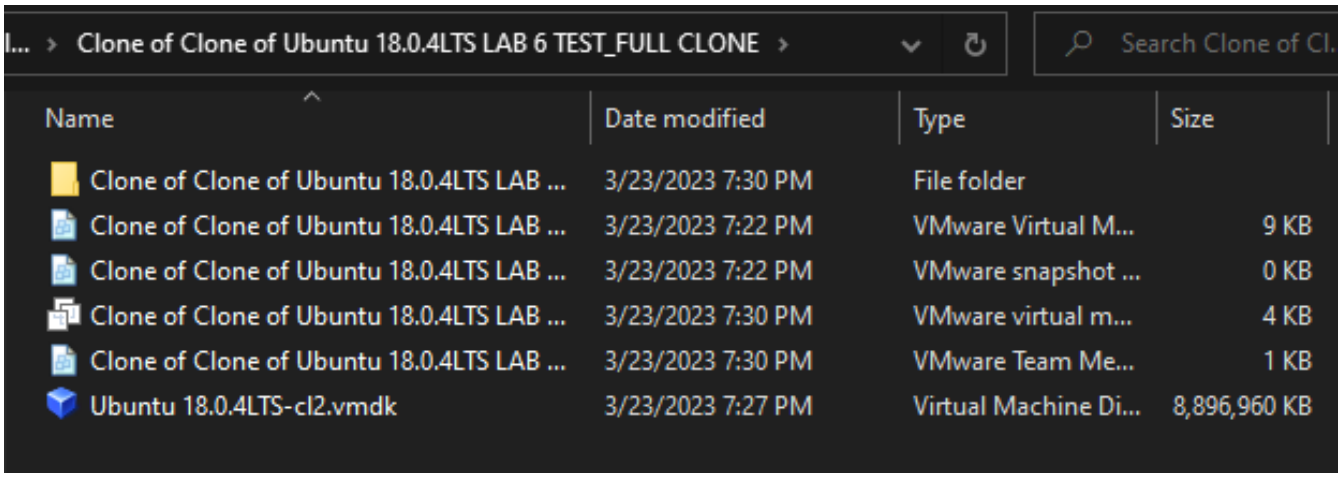
Cloning…


Clone Virtual Machine Wizard
Cloning Virtual Machine
Preparing clone operation
VMware Workstation
Cloning…
Cancel
Close

Full clone created.



Full Clone’s location on Host Device.



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Lab Report 7

Virtual Machine Networking (1)

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

Objective: Virtual Machine Networking (1)

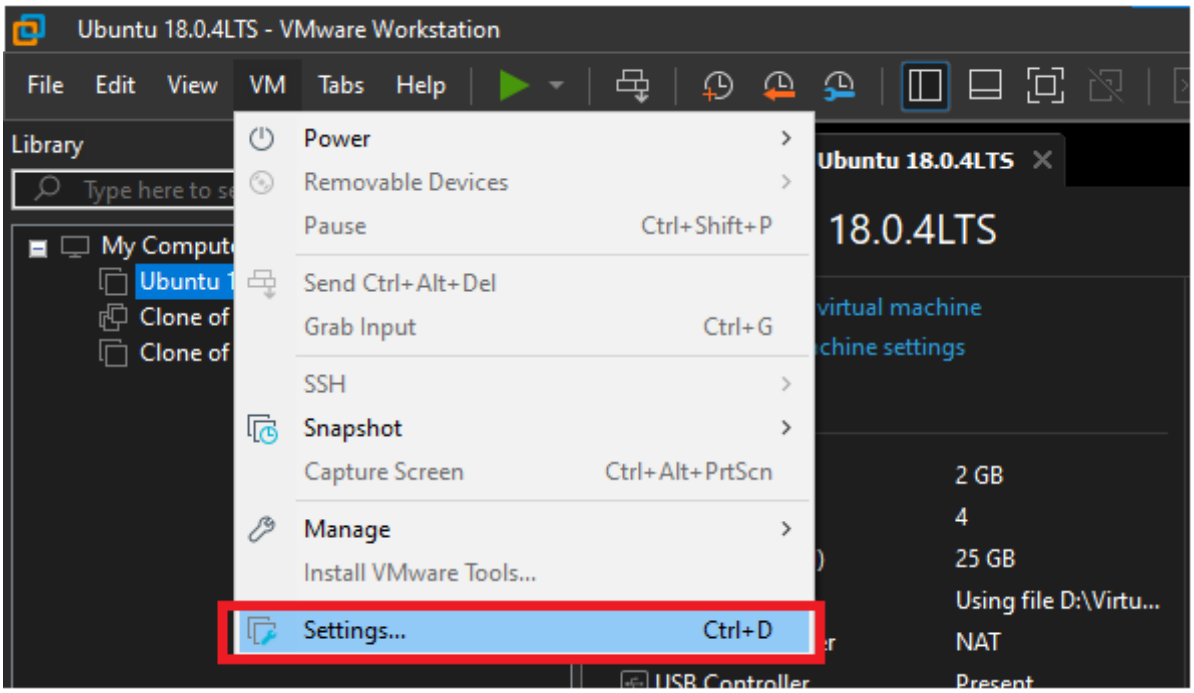
In this lab, you will perform the following tasks:

1. Identify different network types available in the Workstation environment.
2. Show how to setup a new vmnet.

1. Identify different network types available in the Workstation environment.

We need to follow the below steps to find the different network types VMware Workstation offers:

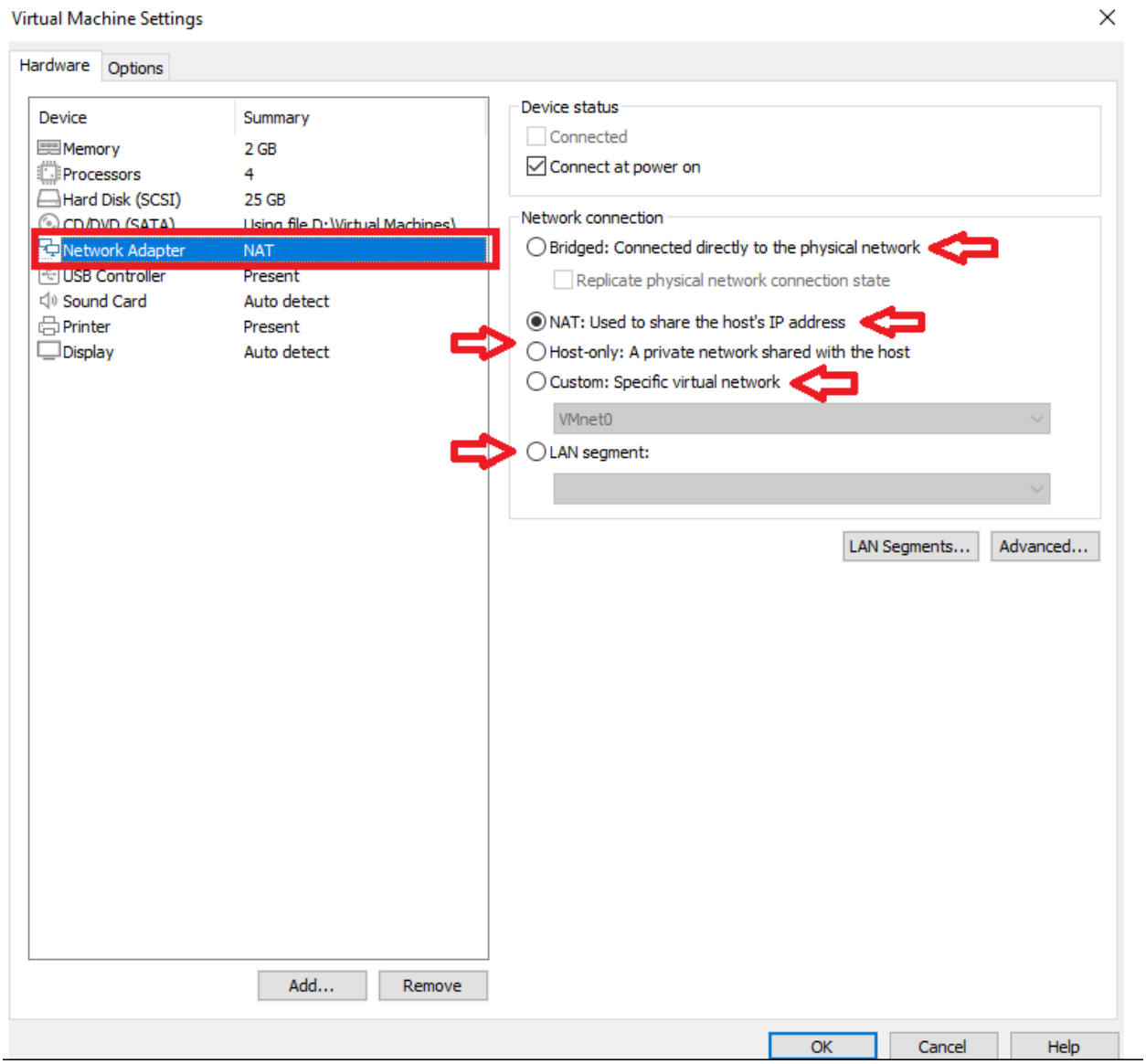
a) Open VMware Workstation
b) Hover over “VM” tab
c) Select “Settings” from the list



The “Virtual Machine Settings” window will appear.

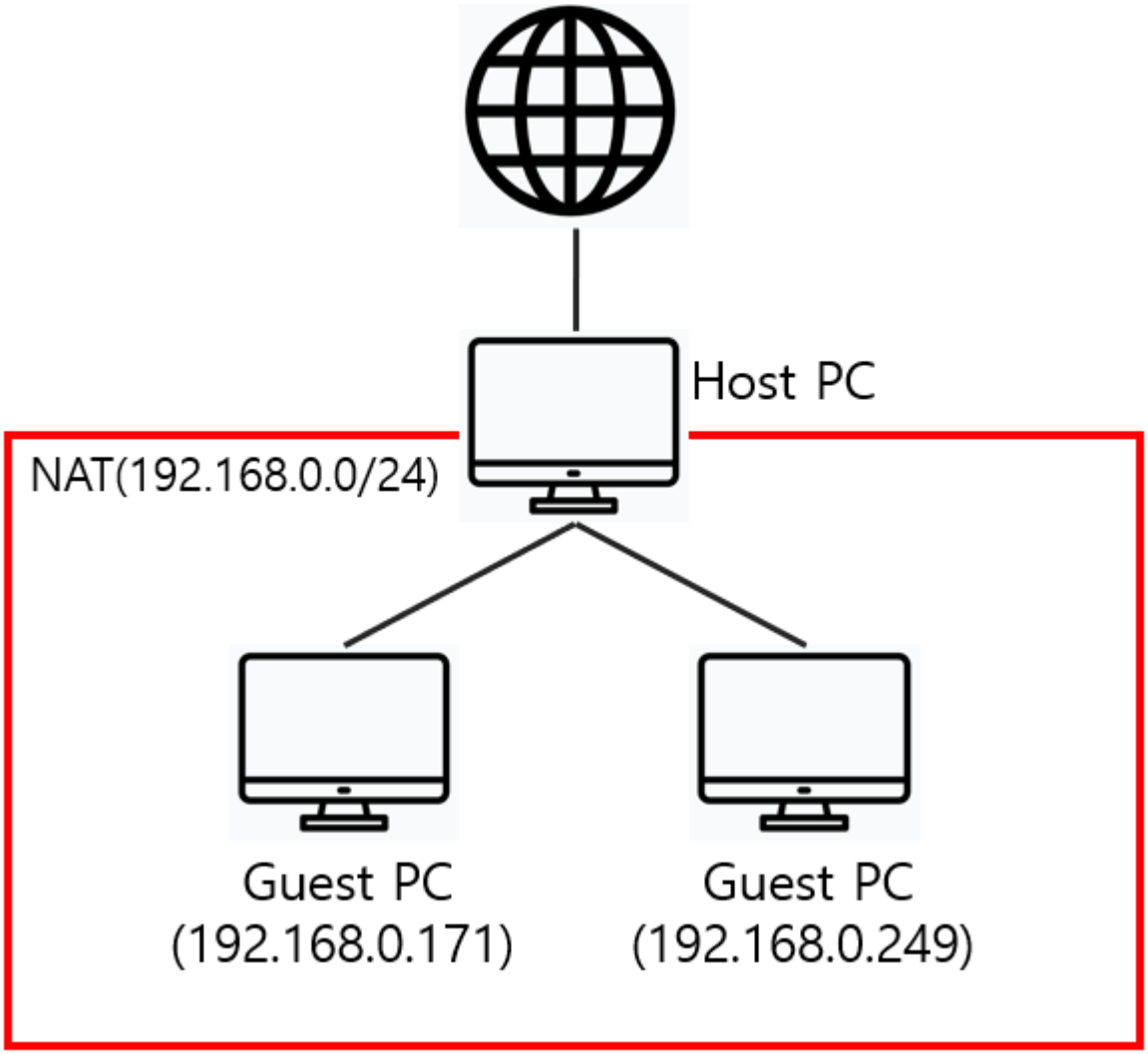
Select “Network Adapter”. Under “Network Connection” we see multiple Network types such as: Bridged, NAT (Network Address Translation), Host-Only, Custom and LAN segment.

We will discuss each one in the report.



A. Network Address Translation (NAT)

In NAT, the virtual machine & the Host device share same network identity. However, virtual machine can't be seen by any device outside this network, so the virtual machine's traffic isn't sniffed. Also NAT, converts Private IP addresses to Public ones, like what is shown below Guest PCs (VMs) get IP addresses from NAT IP address.

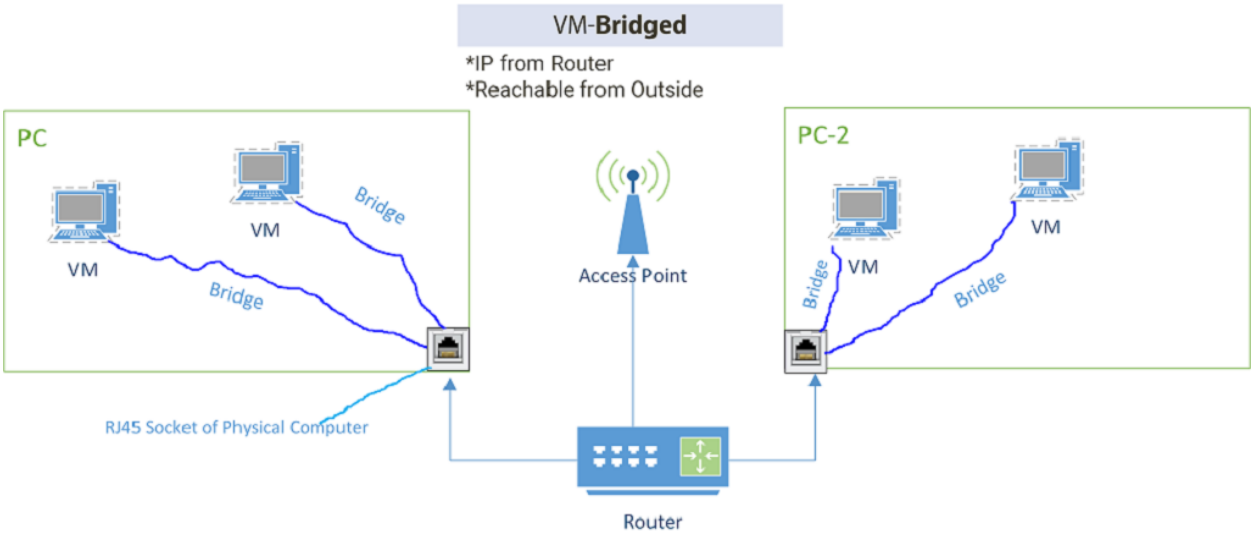


B. Bridged

In Bridged network, our virtual machine has direct access to an outside Ethernet network.

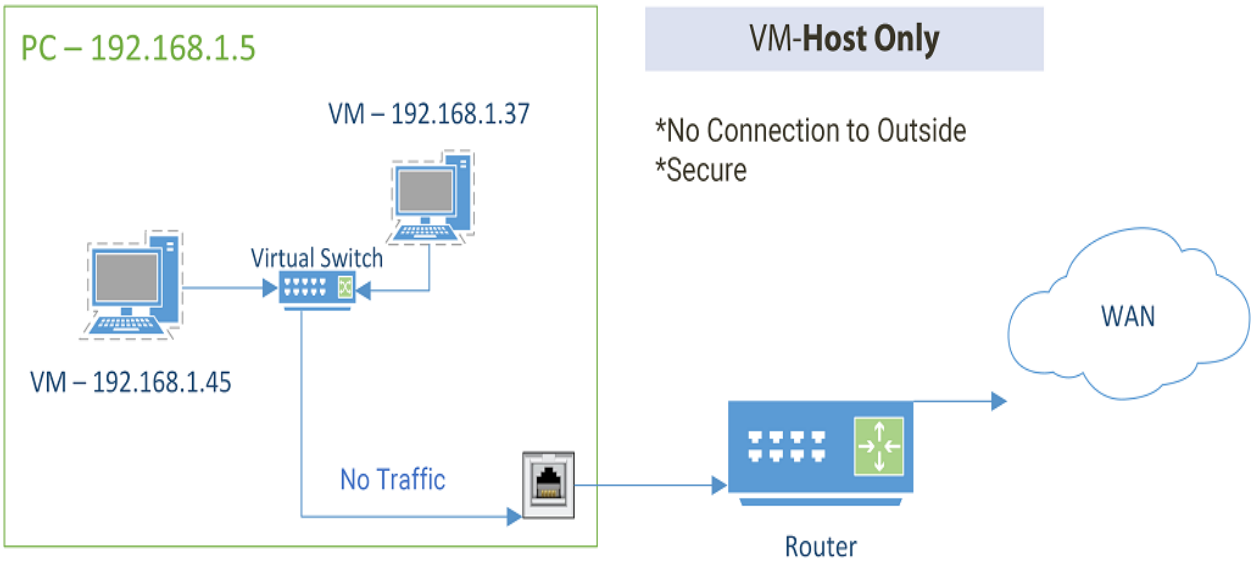
The DHCP server which is Dynamic Host Configuration Protocol (DHCP) is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

So, our virtual machine gets an IP address from DHCP server of Network which is our Router or Firewall.



C. Host-Only

This network provides a network connection between both the Host device and the Virtual Machine, with the aid of a Virtual Network Adapter (Switch) which should be visible to the Host OS. **If you want to establish an isolated and secure virtual network Host-Only is recommended.**



D. Custom Network

Since it's custom, so its secure like Host-Only. However, in the Host-Only a virtual switch is used to connect all virtual machines to each other. While the Custom Network is separate from physical and other virtual networks.

E. LAN Segment

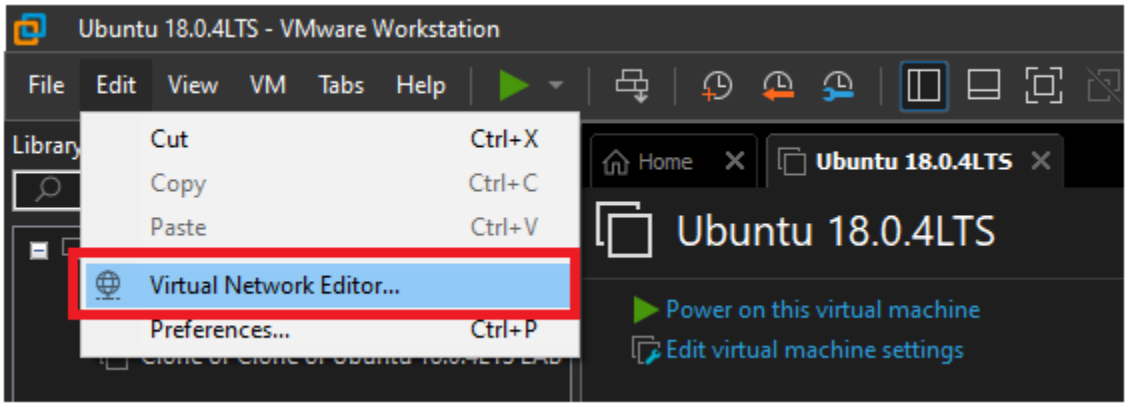
It's a private network used by other virtual machines and shared by them. A LAN segment is needed in network performance analysis or when virtual machine is needed to be isolated.

2. Setting up a new VMnet.

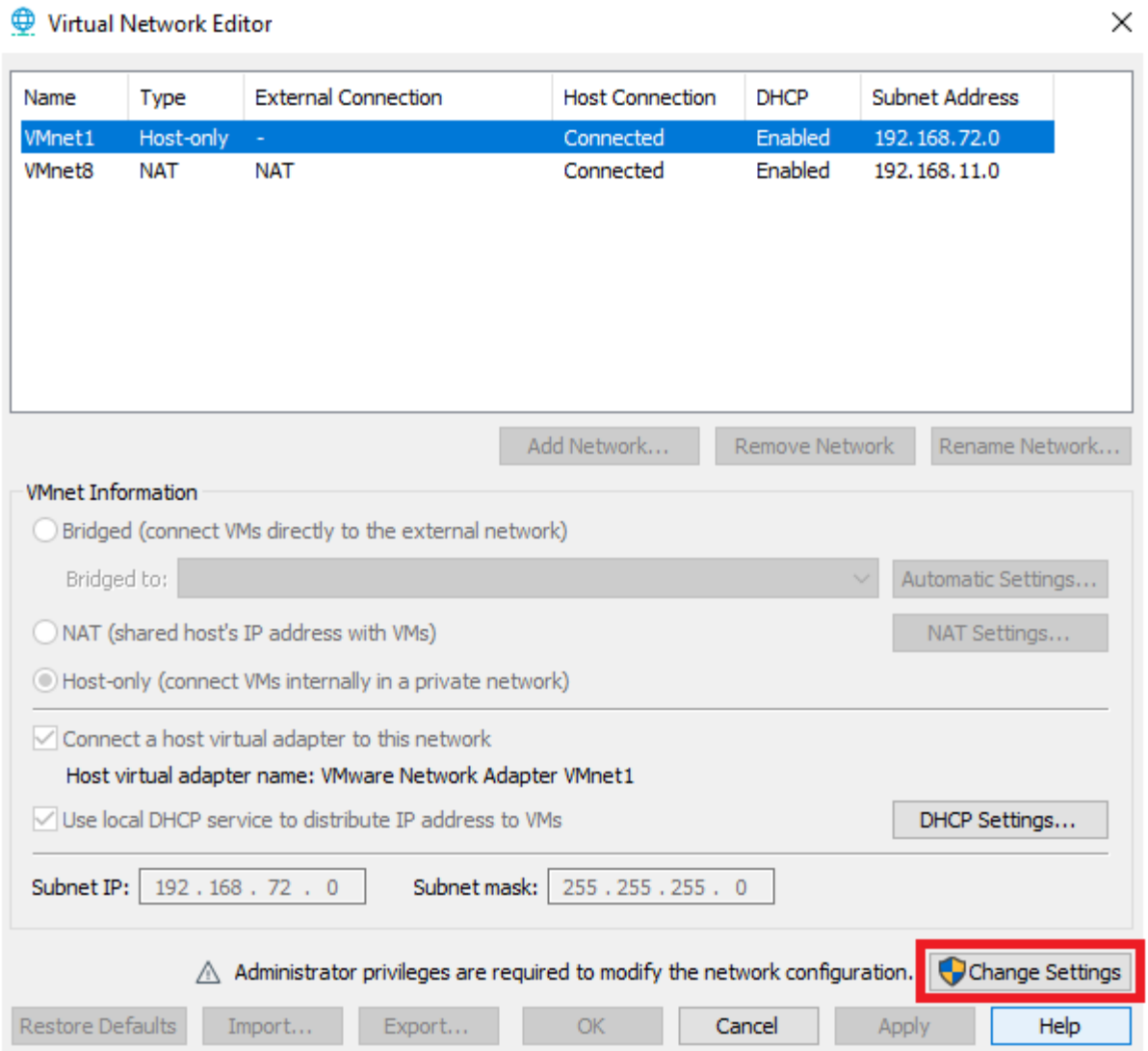
a) Hover over “Edit” tab

b) Select “Virtual Network Editor”

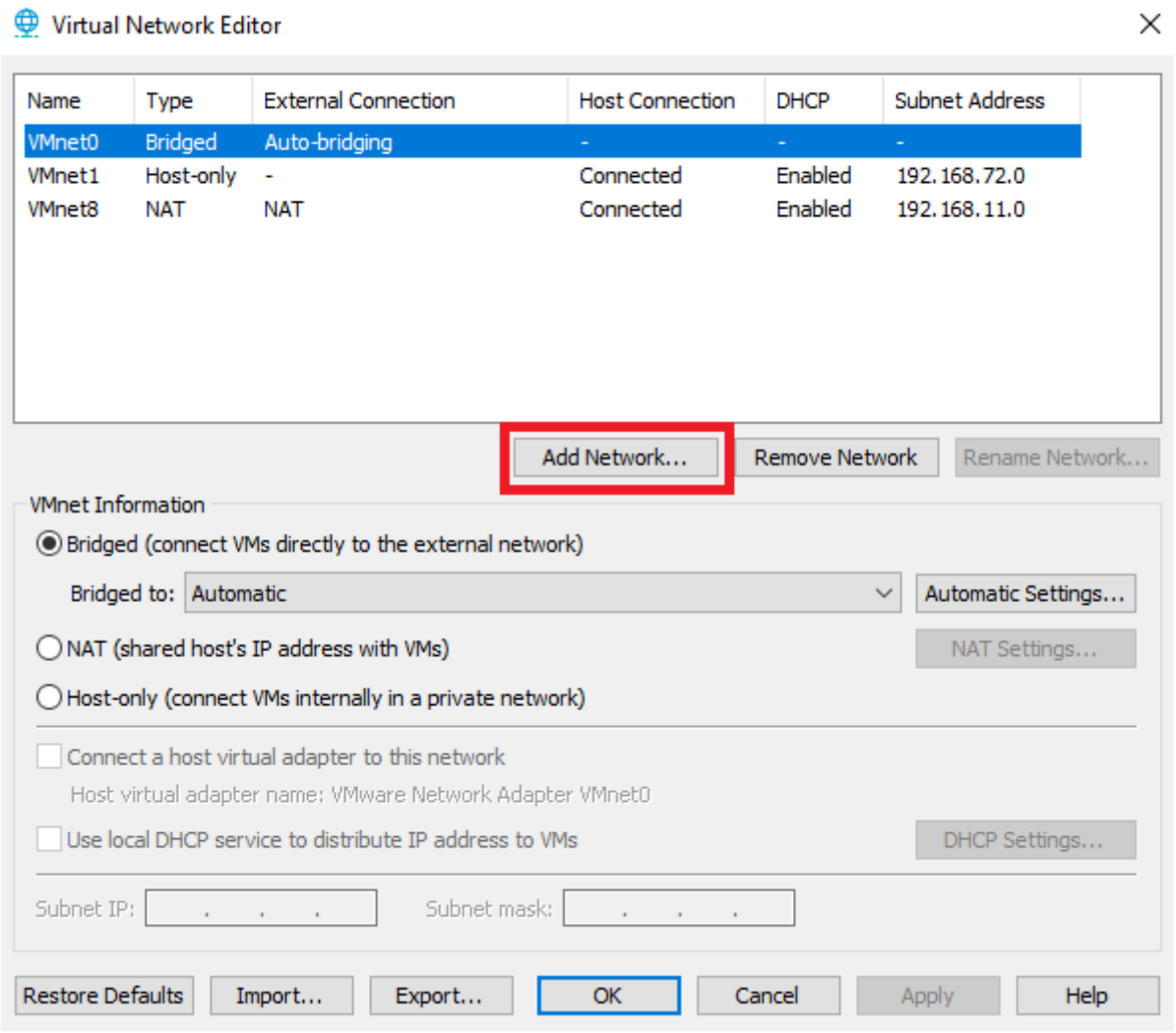
Virtual Network Editor window pops up



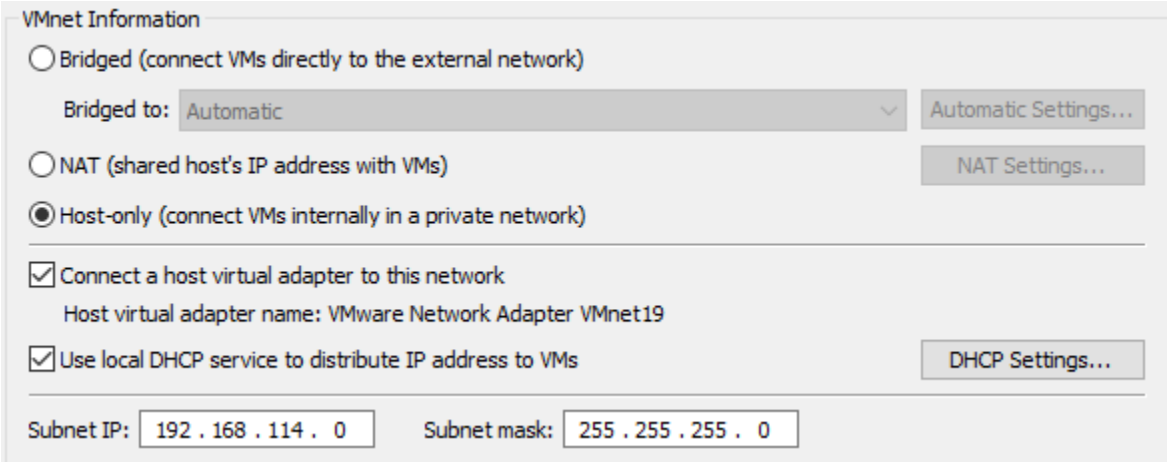
Give user control by clicking red box.



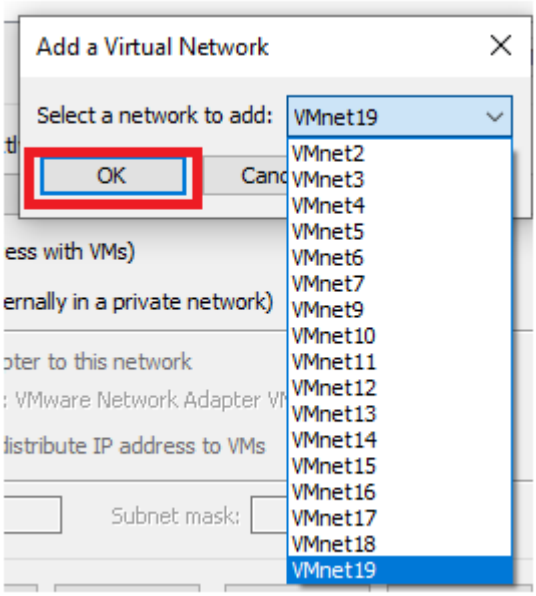
Add a new VMnet by pressing “Add network”.



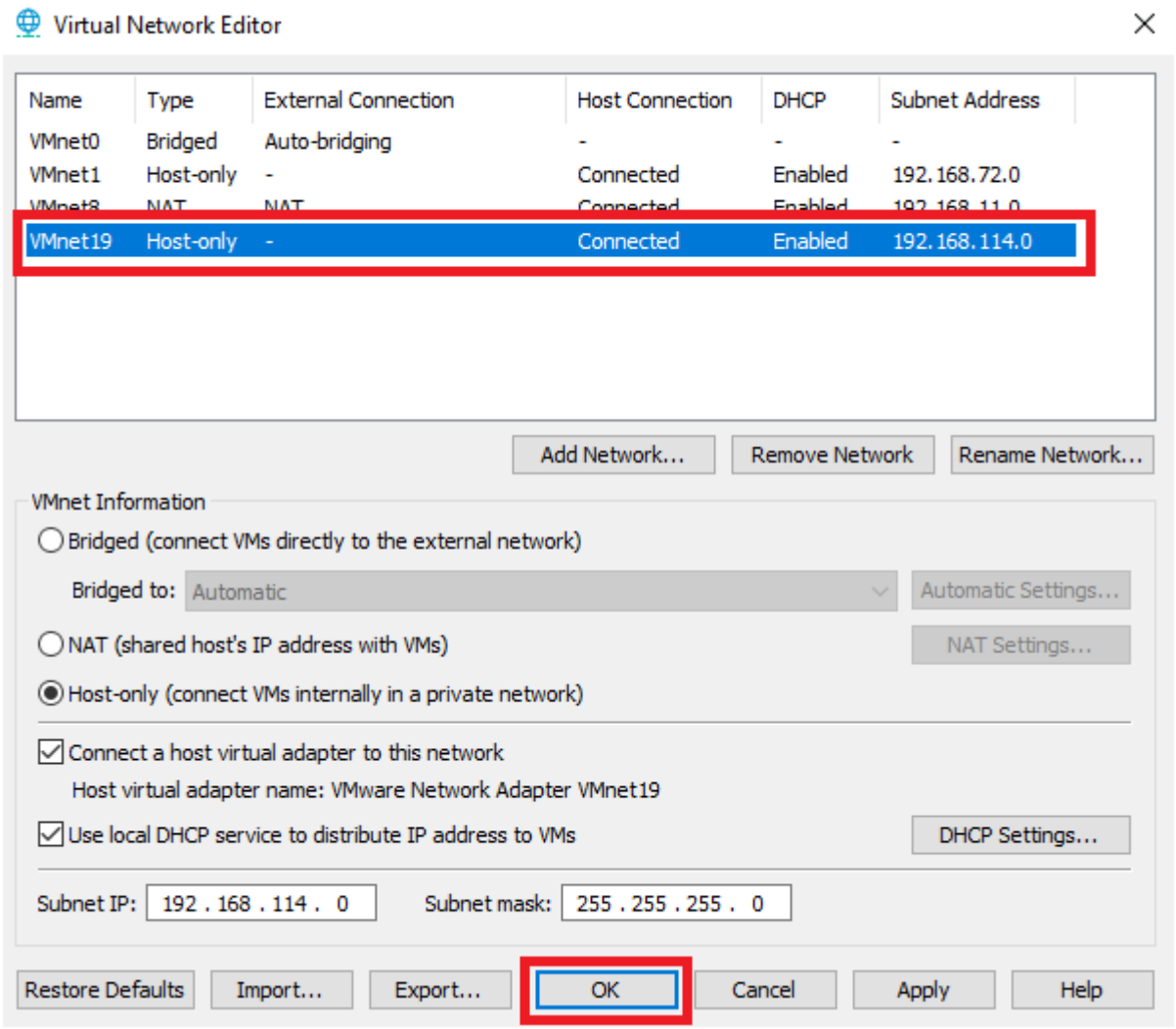
Choose your VMnet Information.



From the below window, choose from VMnets in the drop down list. Then press "OK".



VMnet created, press “OK” to close window.



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Lab Report 8

Virtual Machine Networking (2)

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

Objective: Virtual Machine Networking (1)

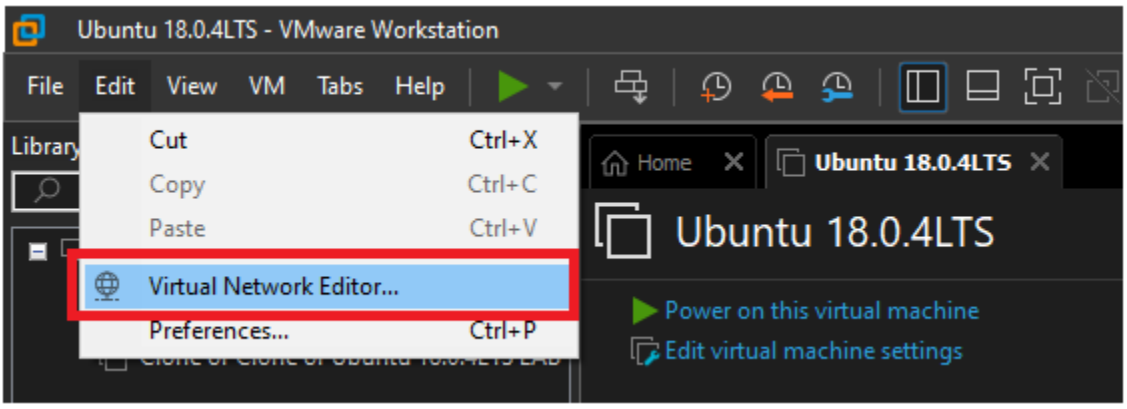
In this lab, you will perform the following tasks:

1. Set up NAT rules.
2. Set up DHCP.

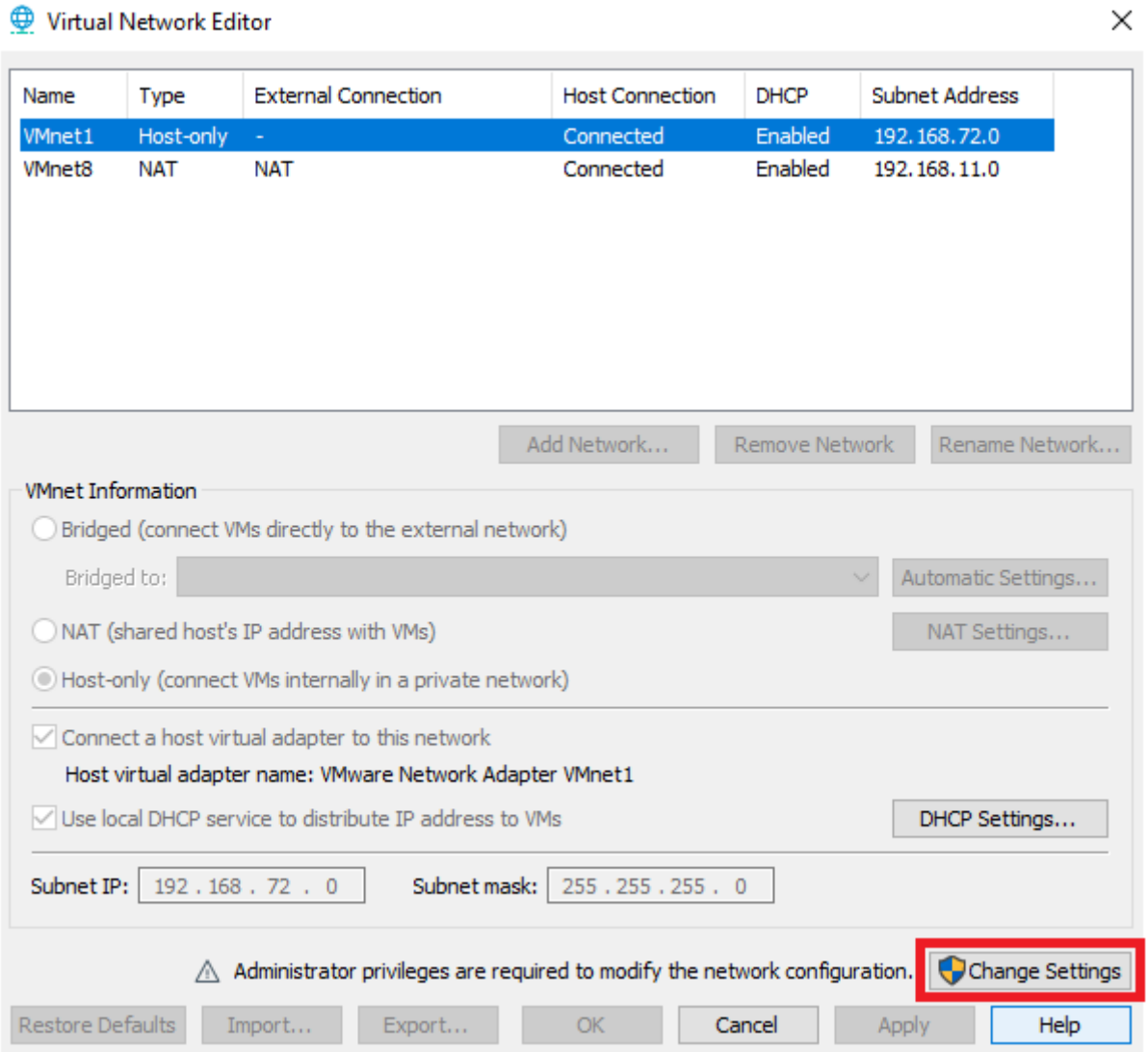
1. Set up NAT rules.

a) Open VMware
b) Hover over “Edit” tab
c) Select “Virtual Network Editor”

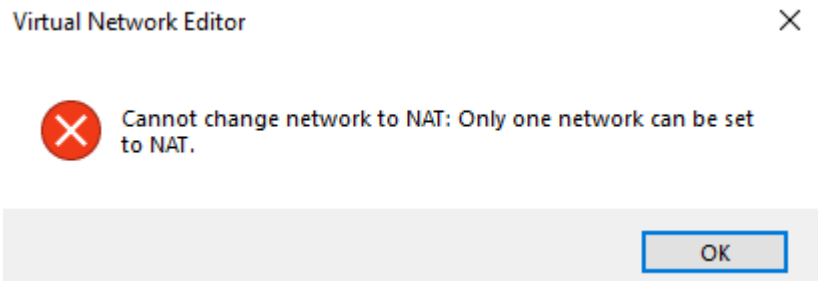
Virtual Network Editor window pops up



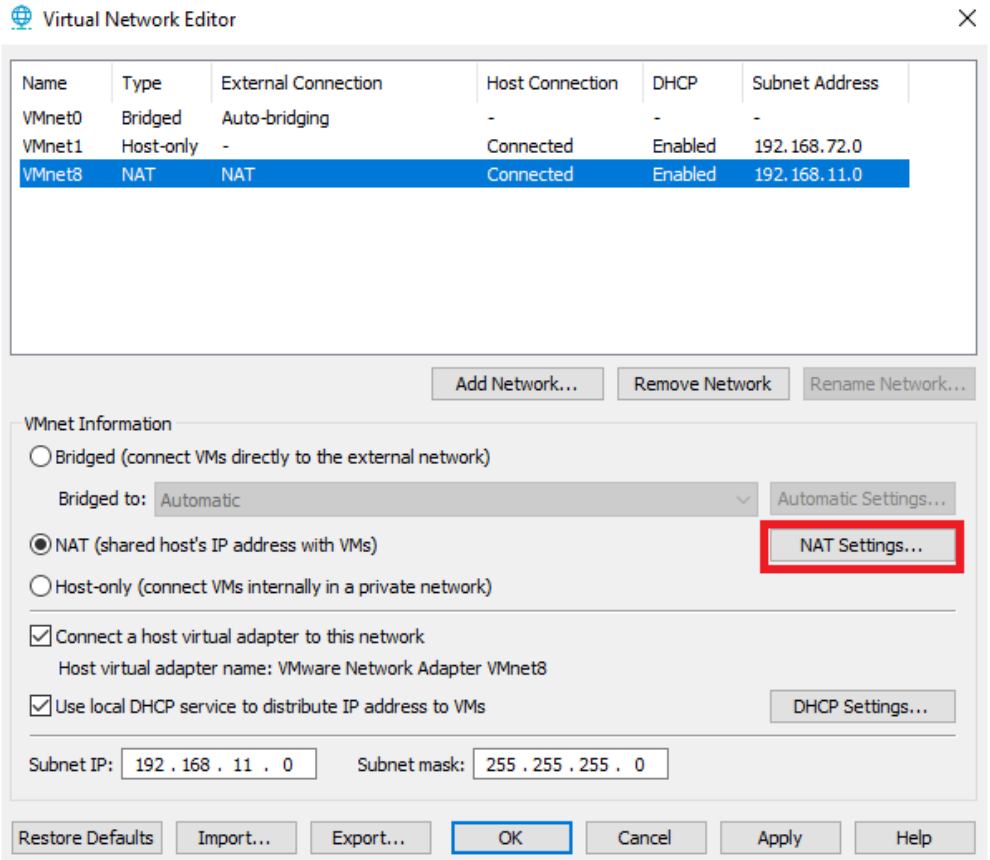
Give user control by clicking red box.



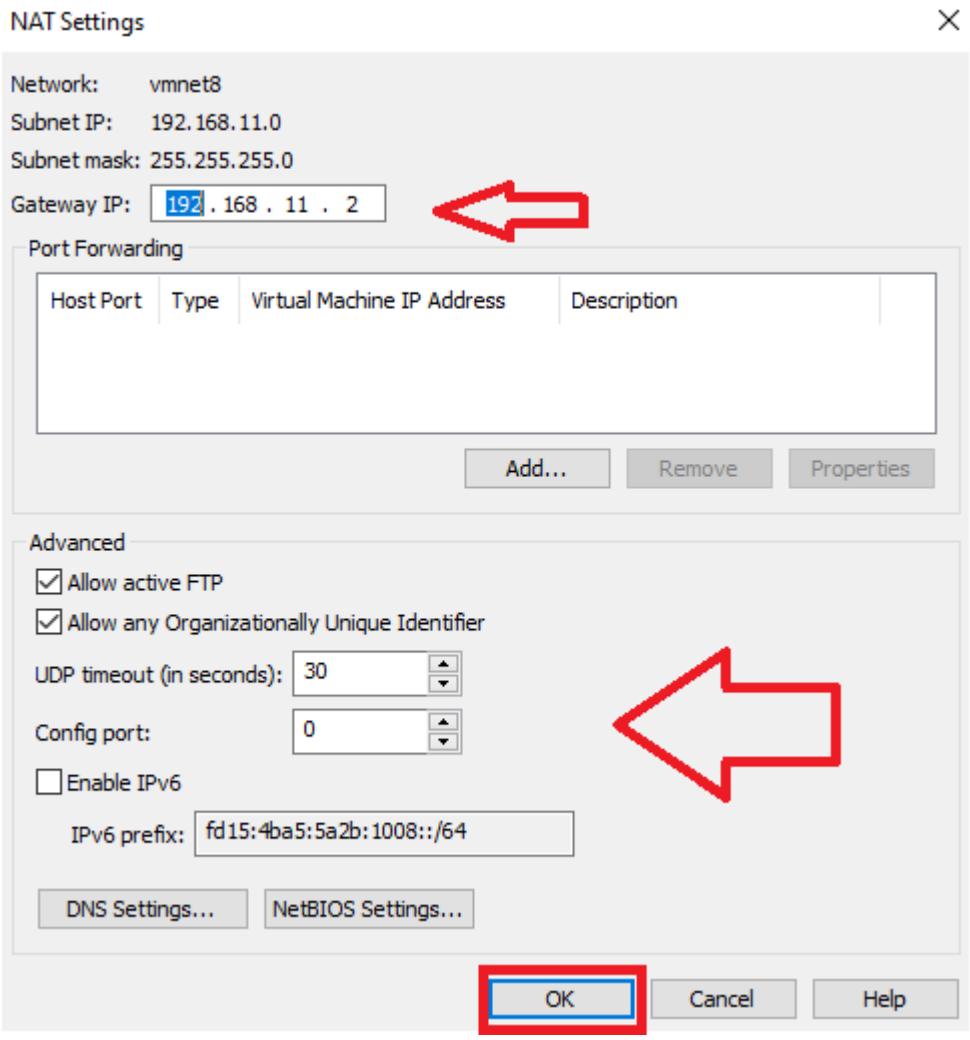
Since VMnet8 is the default Network and the only network that can be created as “NAT”



So, you can change its “NAT Settings” from button below.

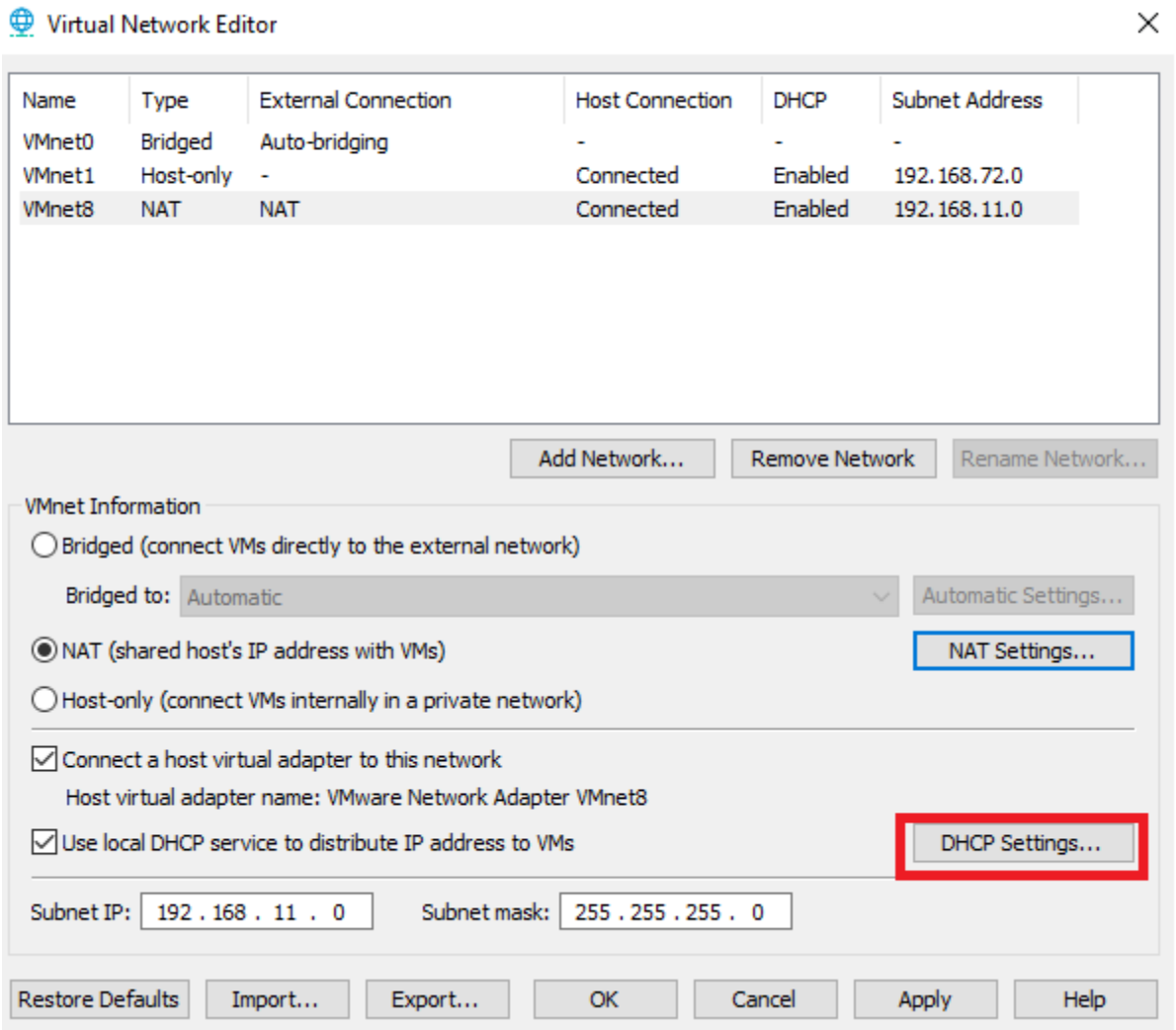


Set your edits below, then press “OK” to save edits.

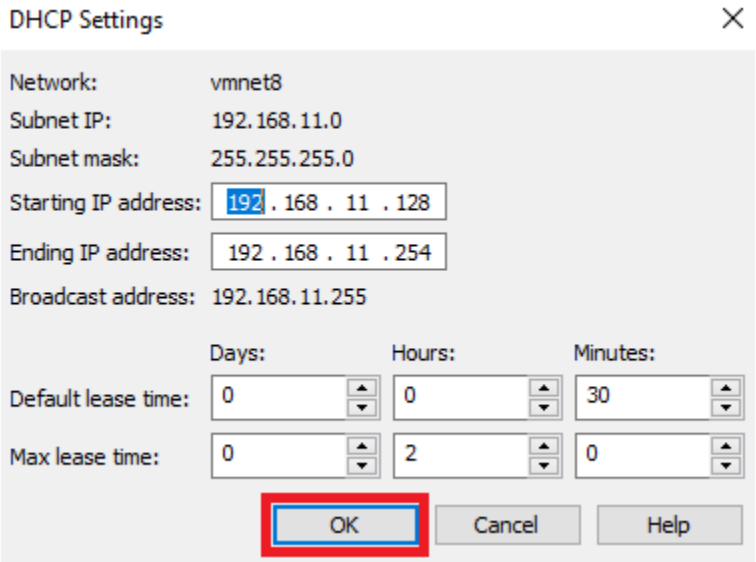


2. Set up DHCP.

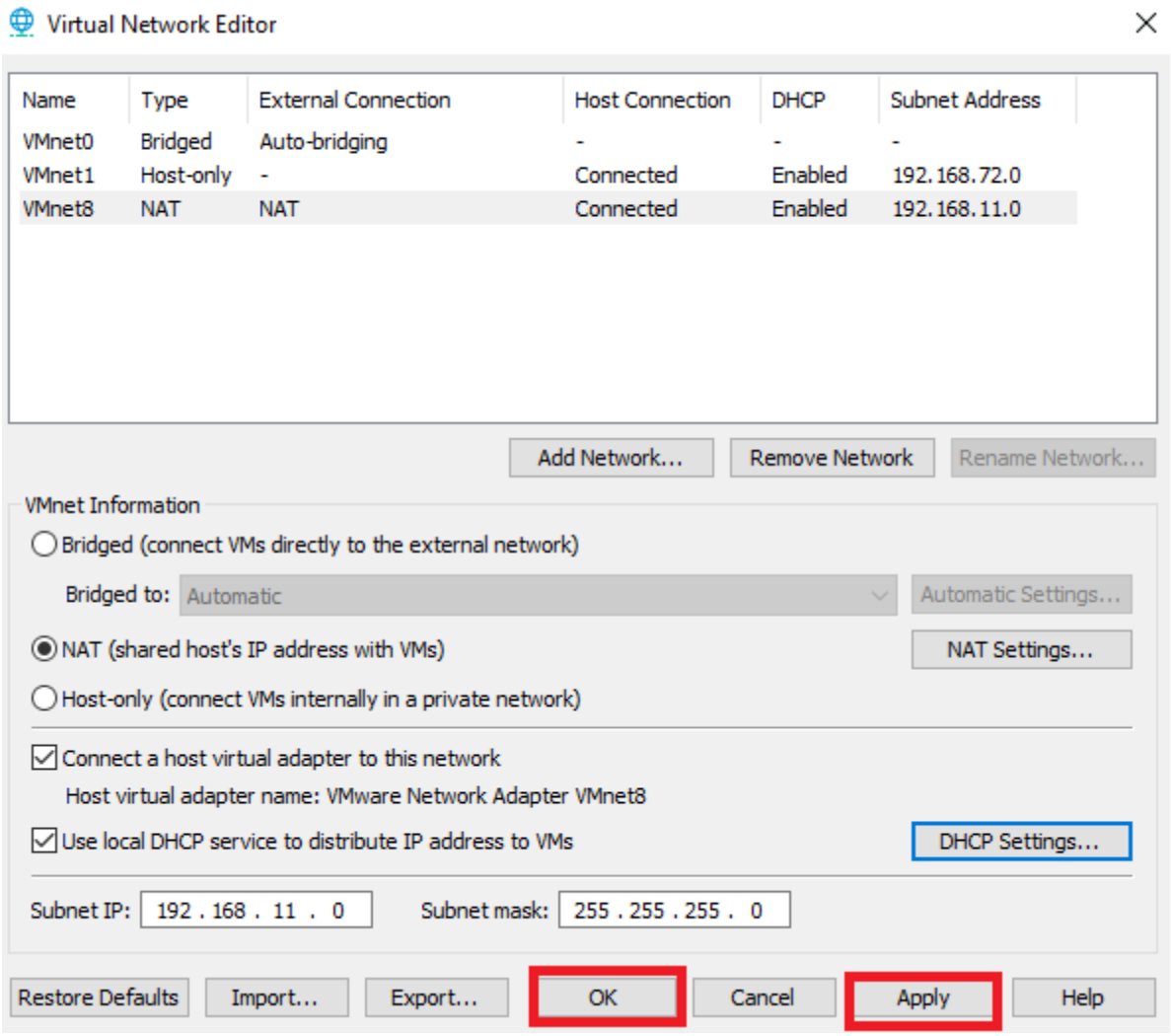
Back to “Virtual Network Editor” window. Select “DHCP settings”.



Make your edits, then Click “OK”.

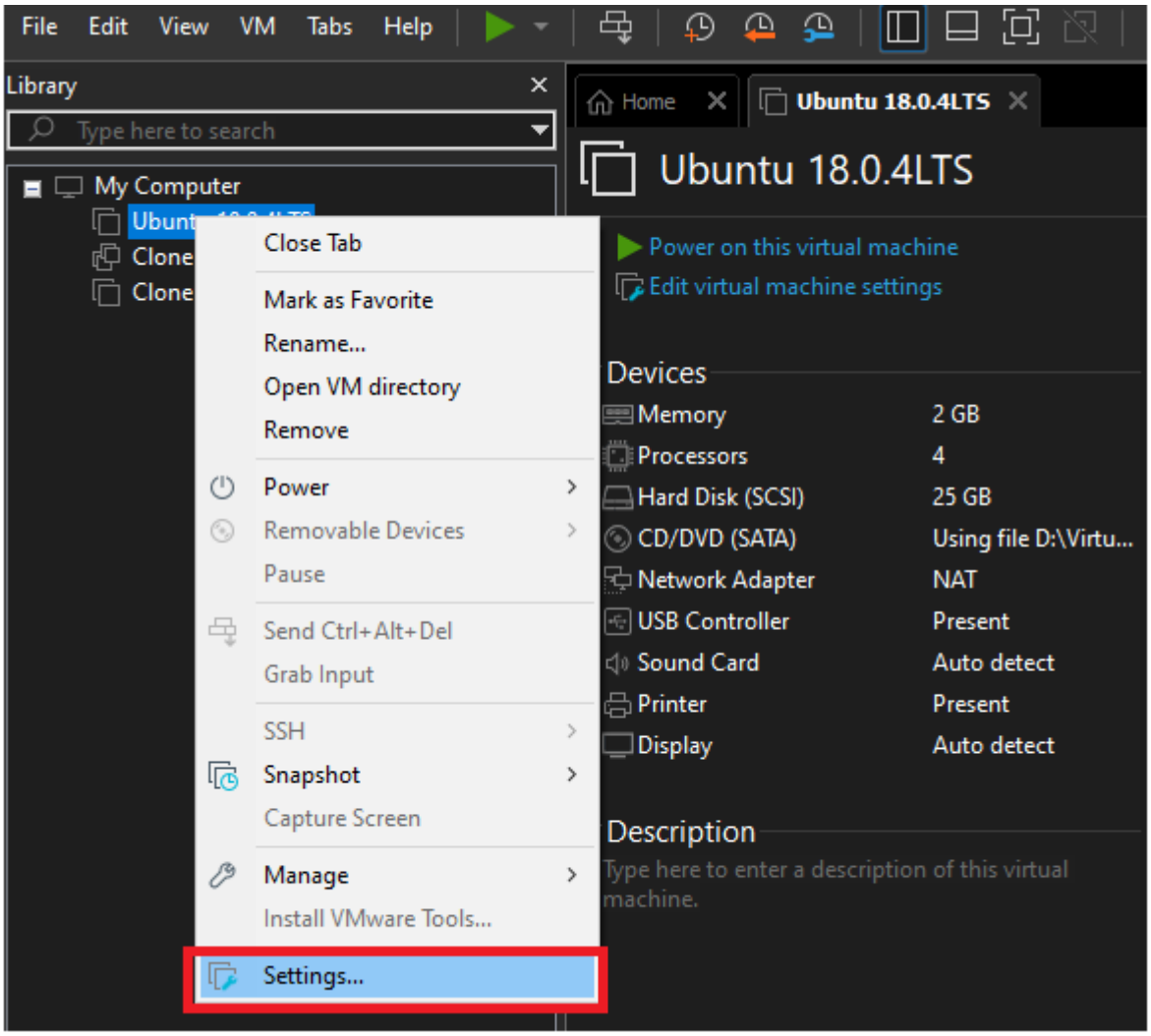


Click “Apply”, then “OK” to confirm NAT & DHCP settings edits.



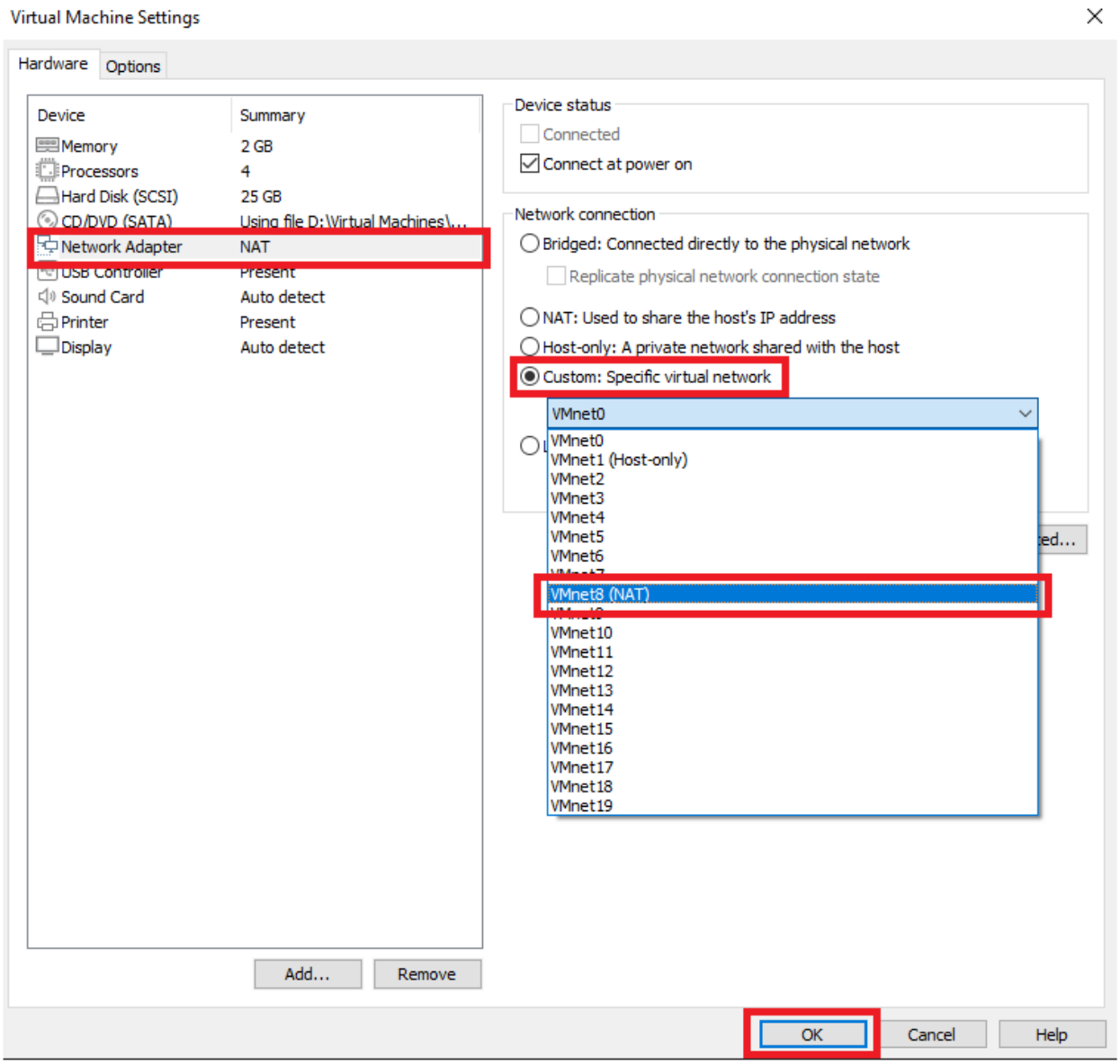
Now let's set our VM with VMnet8 that we edited.

a) Right click on a VM.
b) Click on "Settings" from the drop down menu.

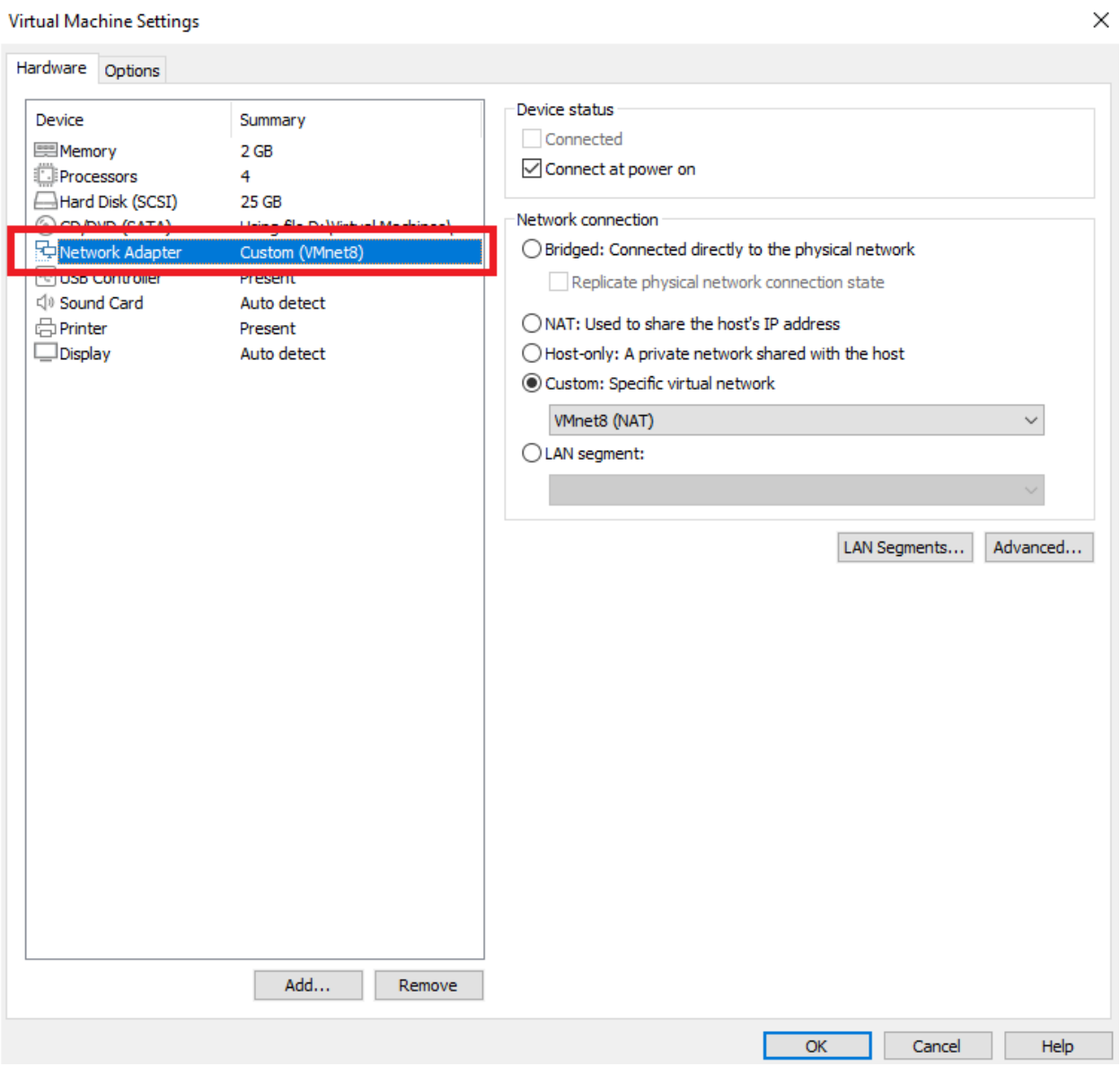


From “Virtual Machine Settings” window

a) Click on “Network Adapter”
b) Choose “Custom”
c) From the drop down menu, Choose VMnet8 (NAT)
d) Click “OK”



VMnet8 (NAT) chosen Successfully.



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Lab Report 9

Virtual Machine Networking (3)

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

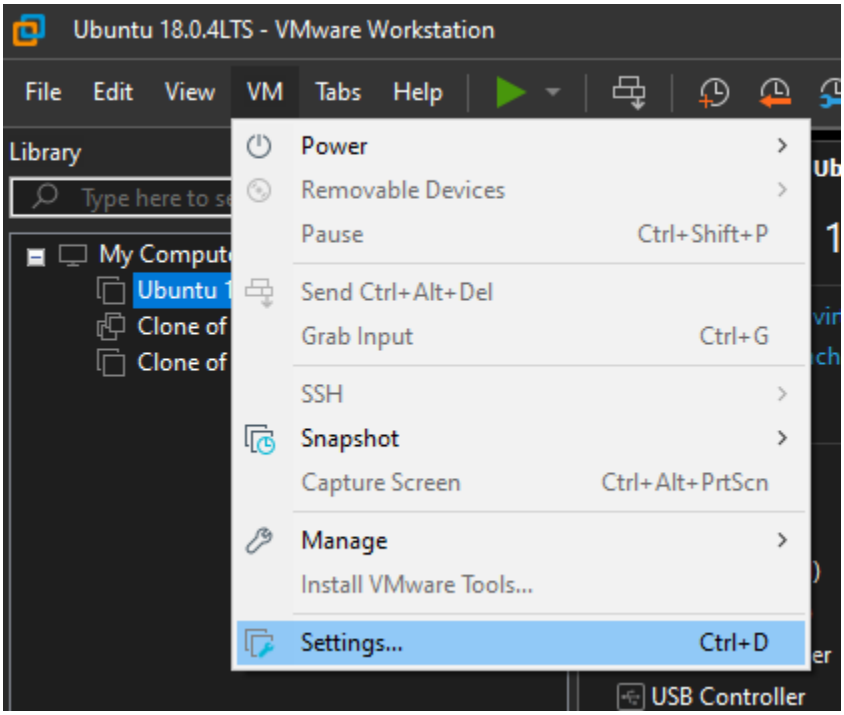
Objective: Virtual Machine Networking (3)

In this lab, you will perform the following tasks:

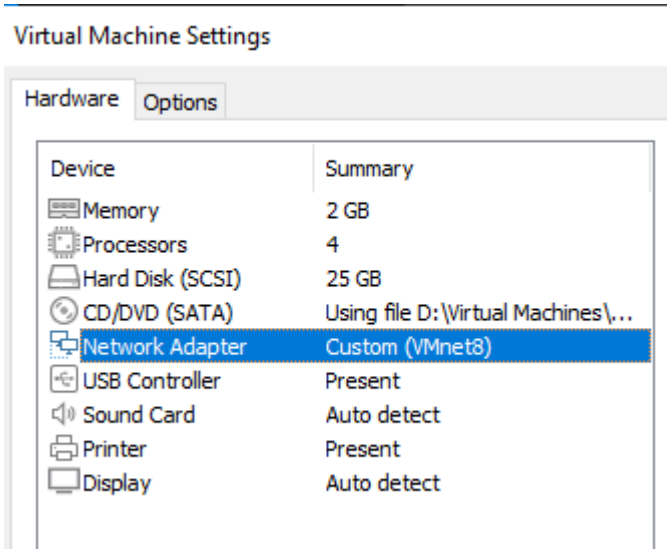
1. Show LAN Segments.
2. Show Adapter Settings (Bandwidth & Packet Loss).

1. Show/Create LAN Segments

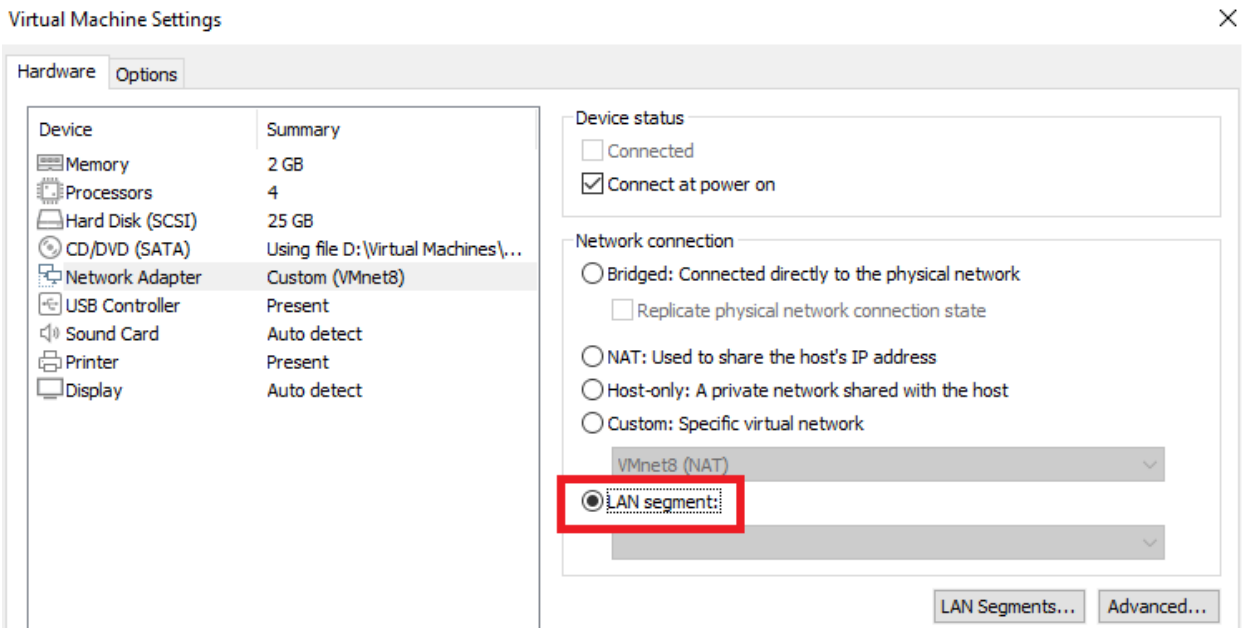
1. Select the virtual machine (Ubuntu 18.04 selected) and select VM >> Settings.



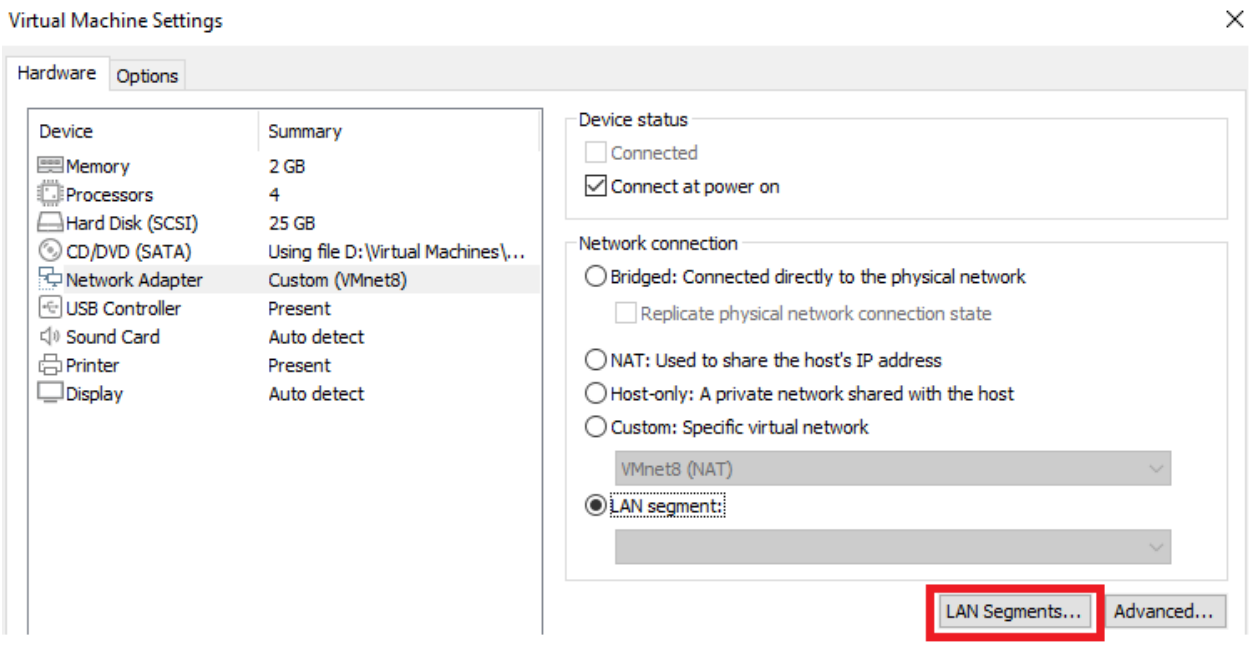
2. On the Hardware tab, select Network Adapter.



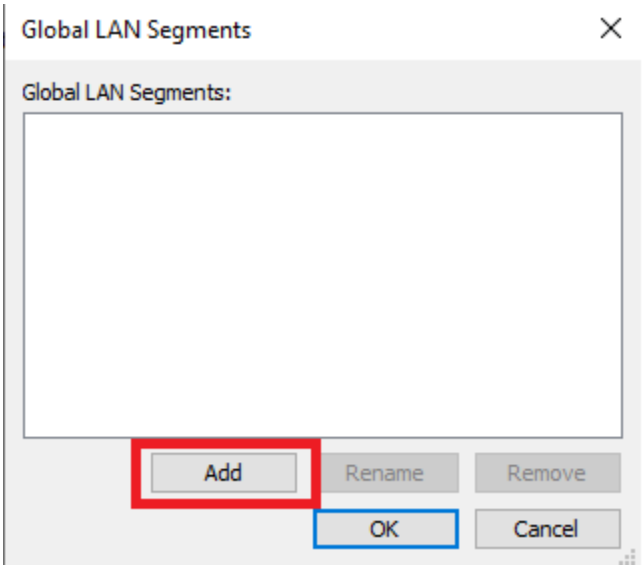
3. Click LAN Segments radio button.



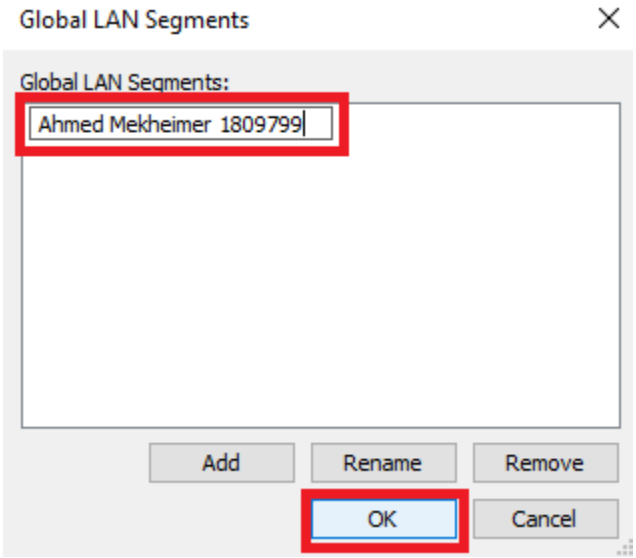
4. Click LAN Segments.



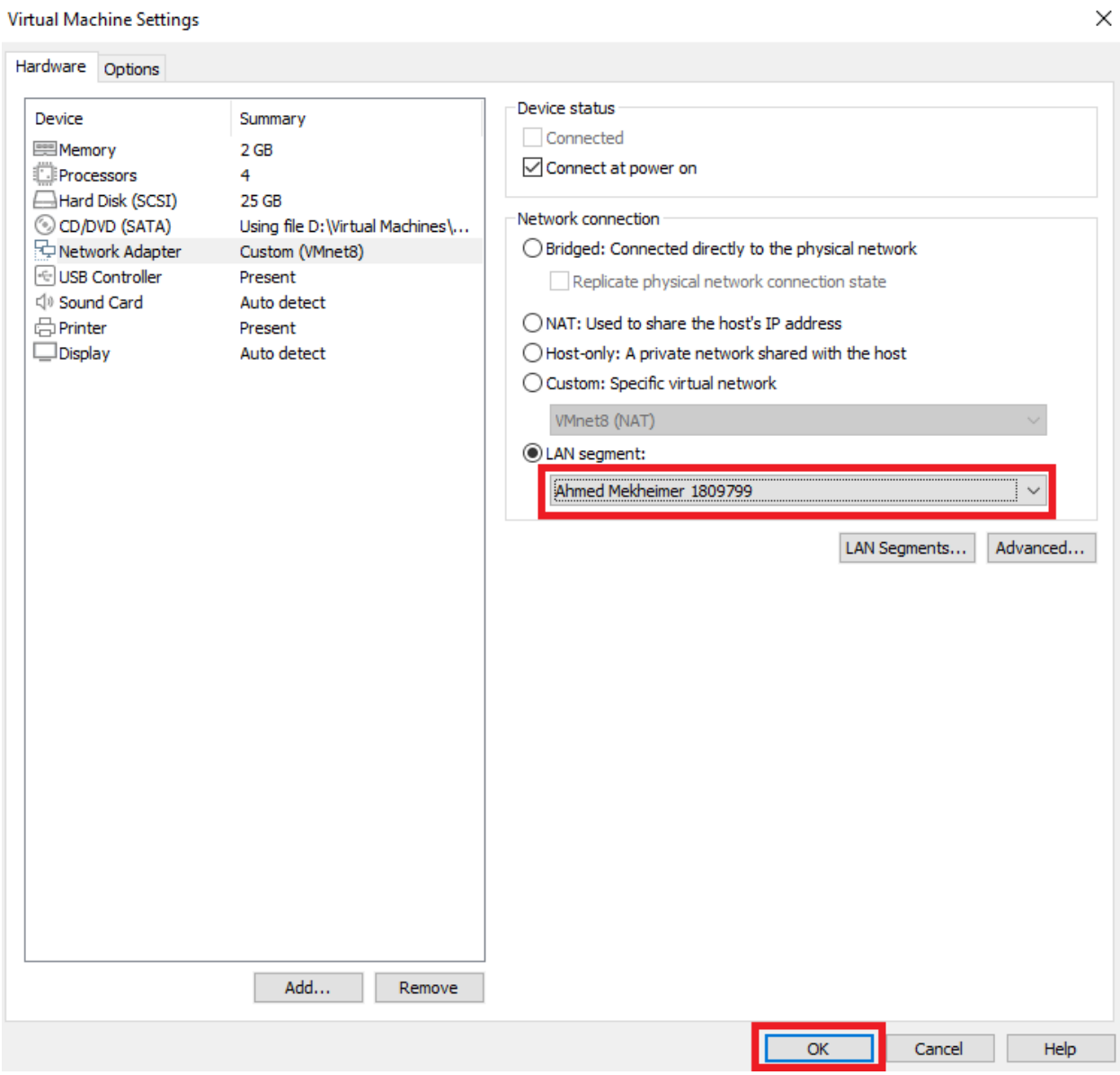
5. Click Add.



6. Type a name for the LAN segment and click OK.

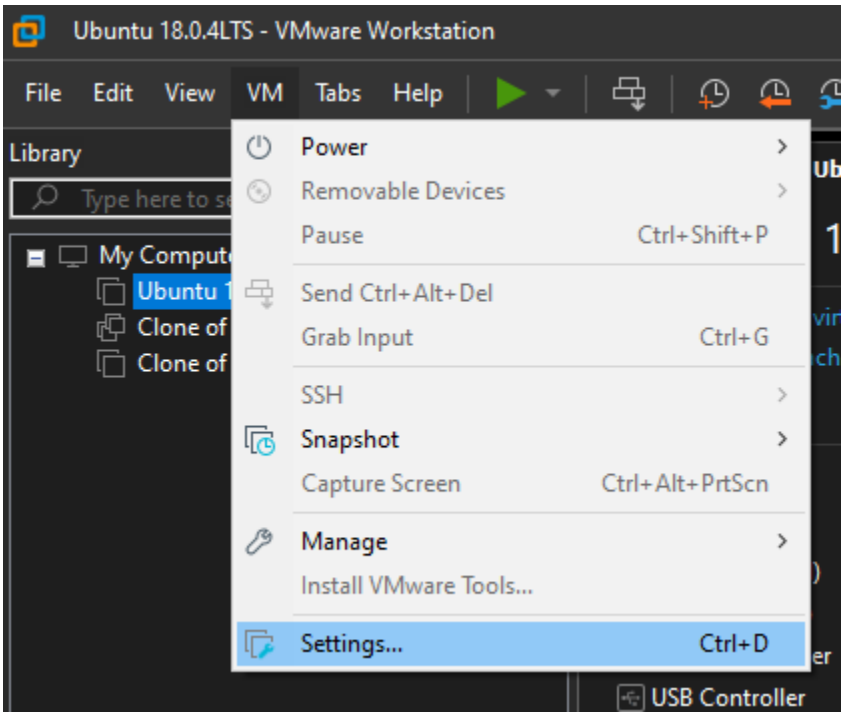


7. Choose LAN segment we created from dropdown menu, then Click OK.

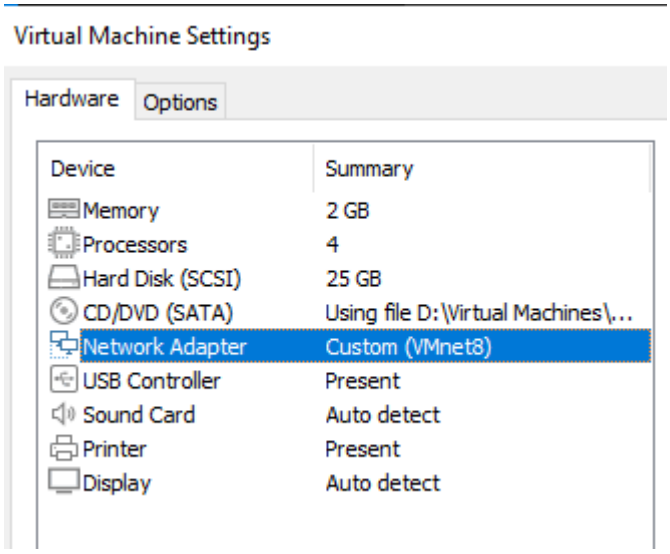


2. Show Adapter Settings

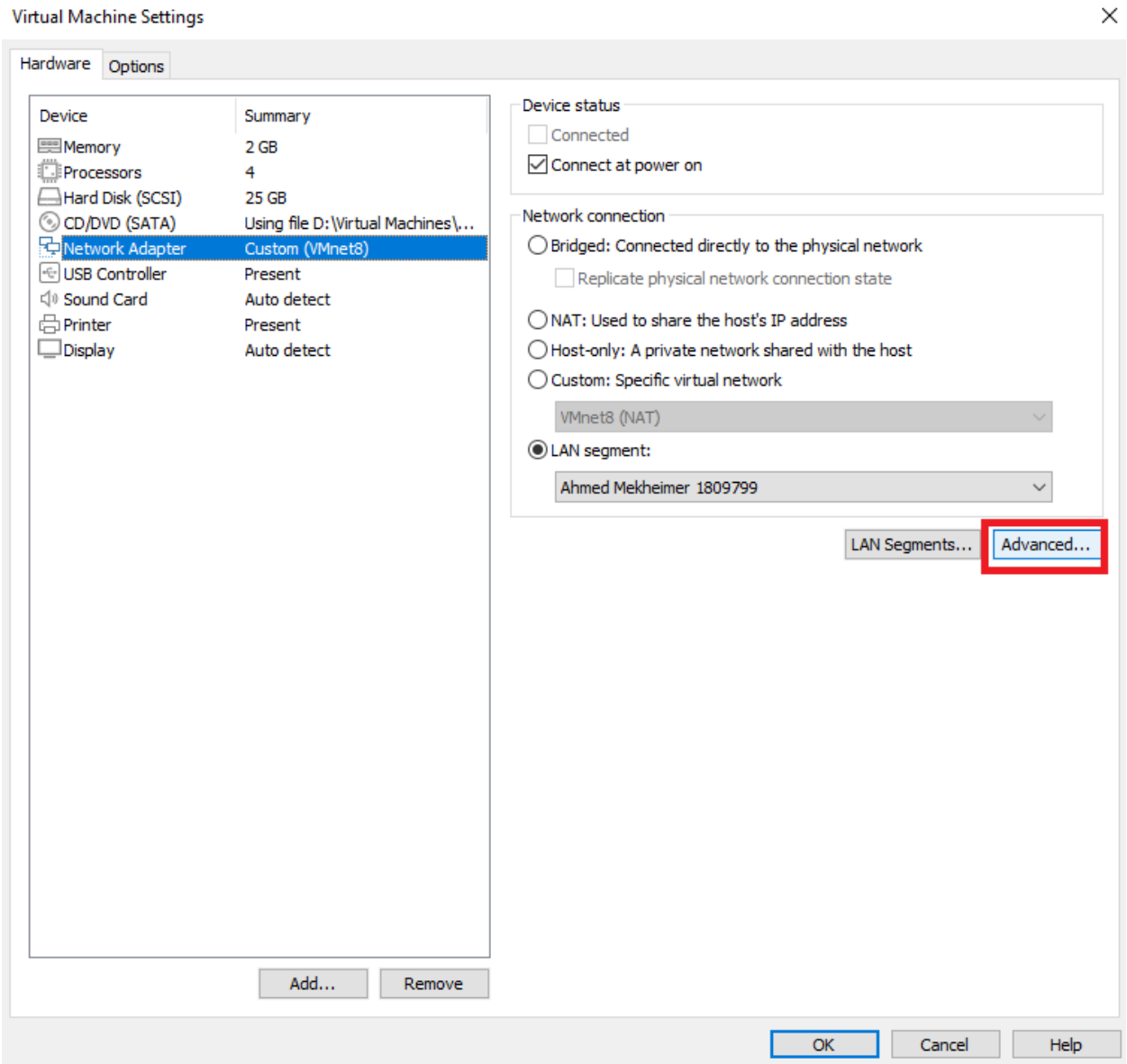
1. Select the virtual machine (Ubuntu 18.04 selected) and select VM >> Settings.



2. On the Hardware tab, select Network Adapter.



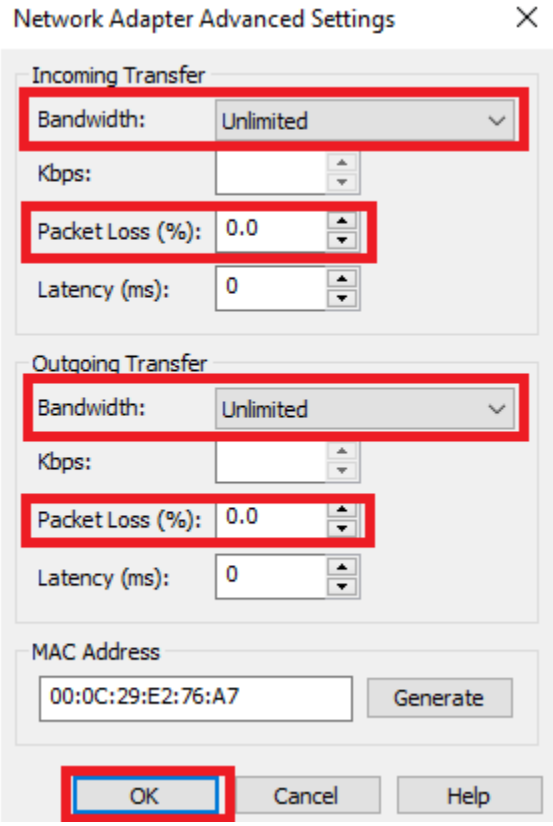
3. Click Advanced.



4. Network Adapter Advanced Settings window.

You can use it to limit the bandwidth, specify the acceptable packet loss percentage, and create network latency for incoming and outgoing data transfers for a virtual machine.

After you finish your configurations, click OK.



Computer Engineering &
Software Systems

Ain Shams University
Faculty of Engineering

Lab Report 10

Using Templates and Clones

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

Objective: Using Templates and Clones

In this lab, you will perform the following tasks:

1. Create a Virtual Machine Template
2. Create Customization Specifications
3. Deploy a Virtual Machine from a Template
4. Clone a Powered-On Virtual Machine

VM Template & its Usage

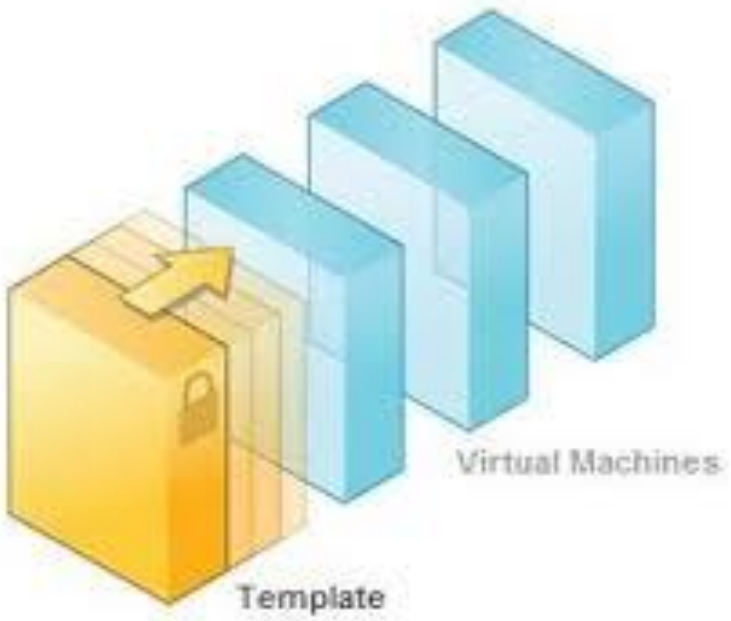
- A virtual machine template is a main copy of a virtual machine (with baseline and factory settings) that can be used to create and provision new virtual machines.

- It can serve as a basis for the creation of multiple clones.

- It is not possible to generate a Template from a running VM.

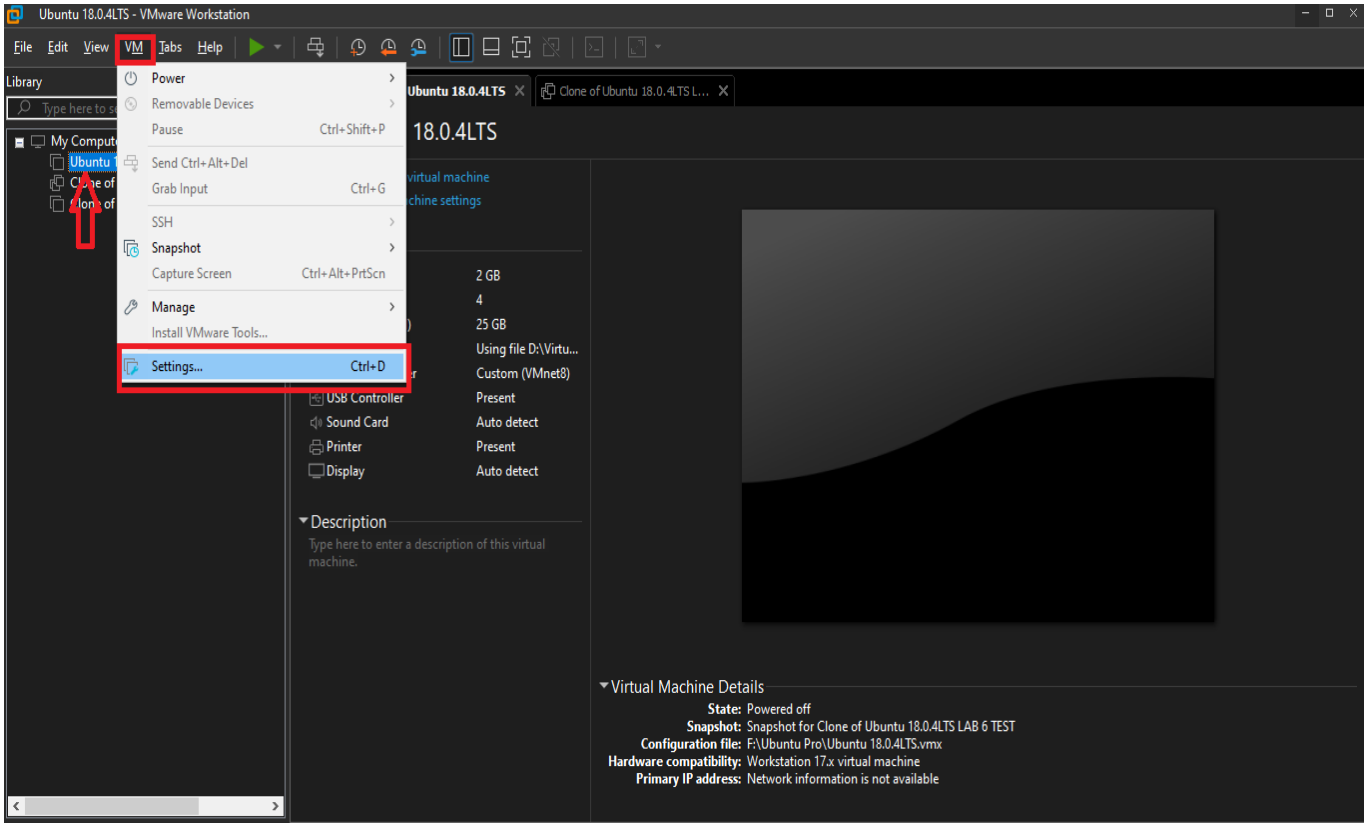
- VM templates are used when you need to deploy many VMs and ensure that they are consistent and standardized.

- Moving between different setup is easy with VM template.

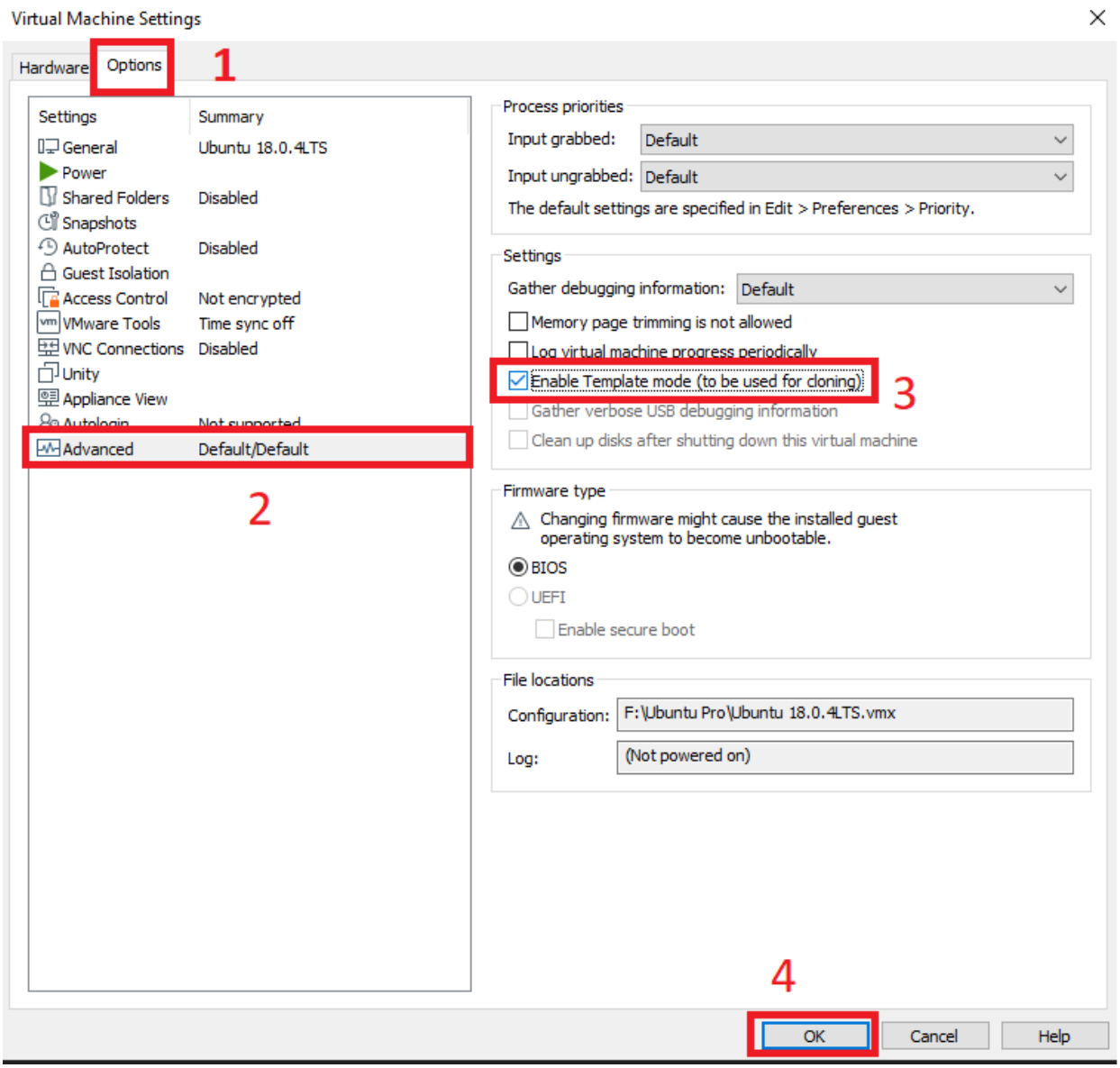


1. Create a Virtual Machine Template

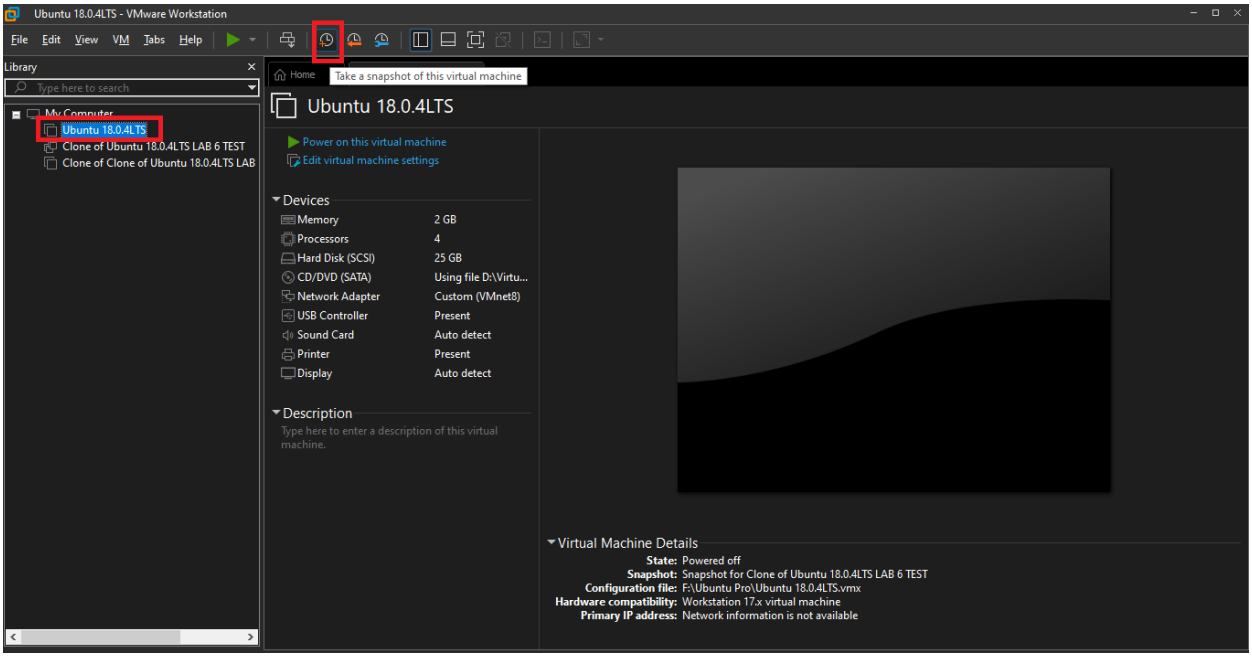
1. Select Virtual Machine, Select ‘VM’ tab, Select ‘Settings’



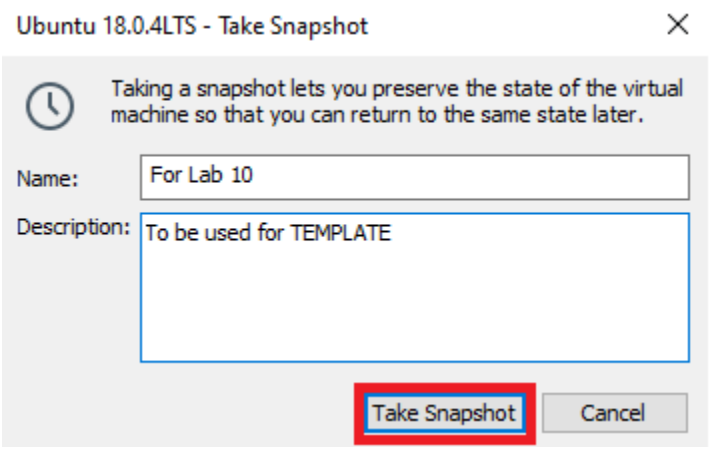
2. Select ‘Options’ tab, the ‘Advanced, then Checkmark ‘Enable Template Mode(to be used for cloning), then Click OK.



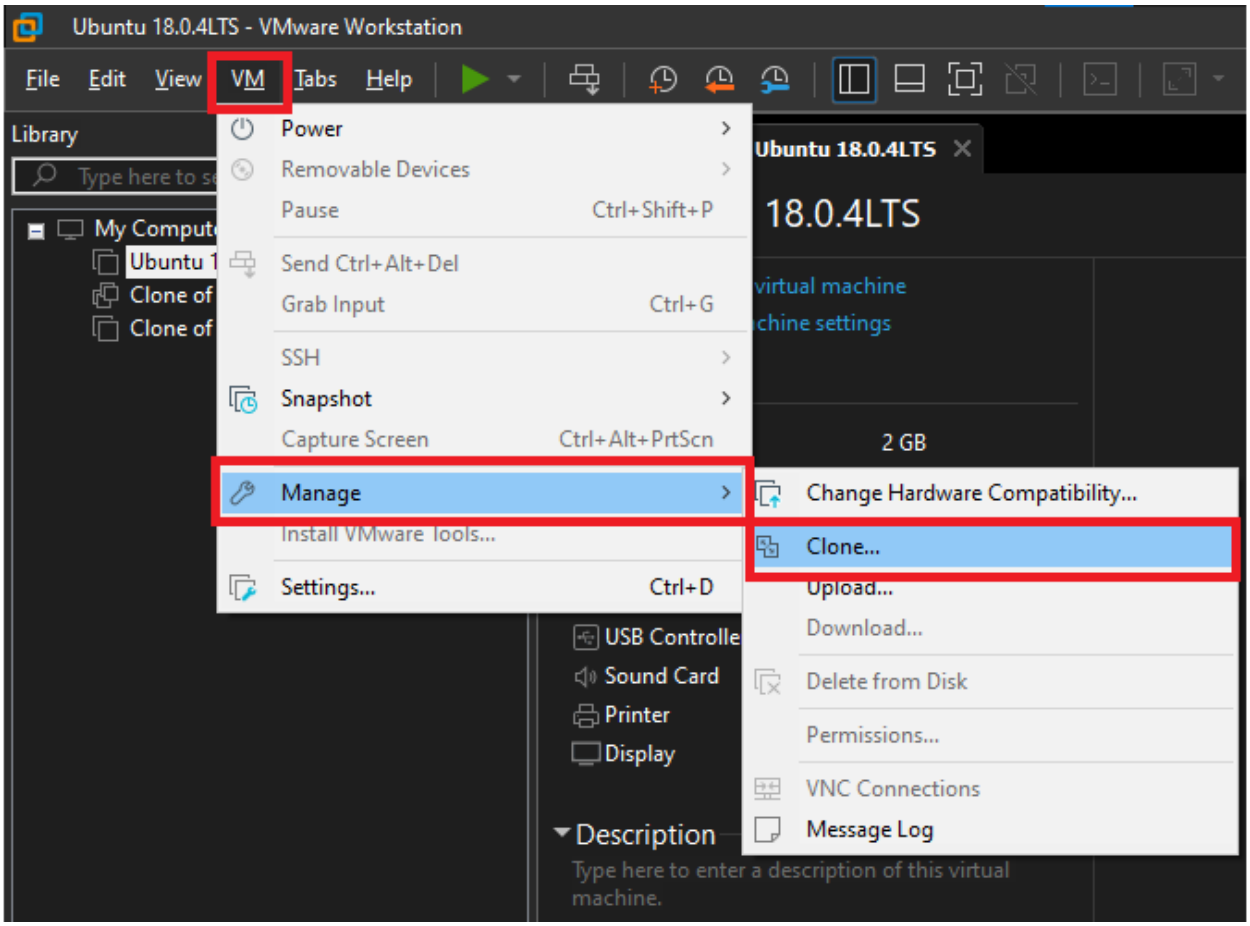
3. Take a Snapshot for the VM



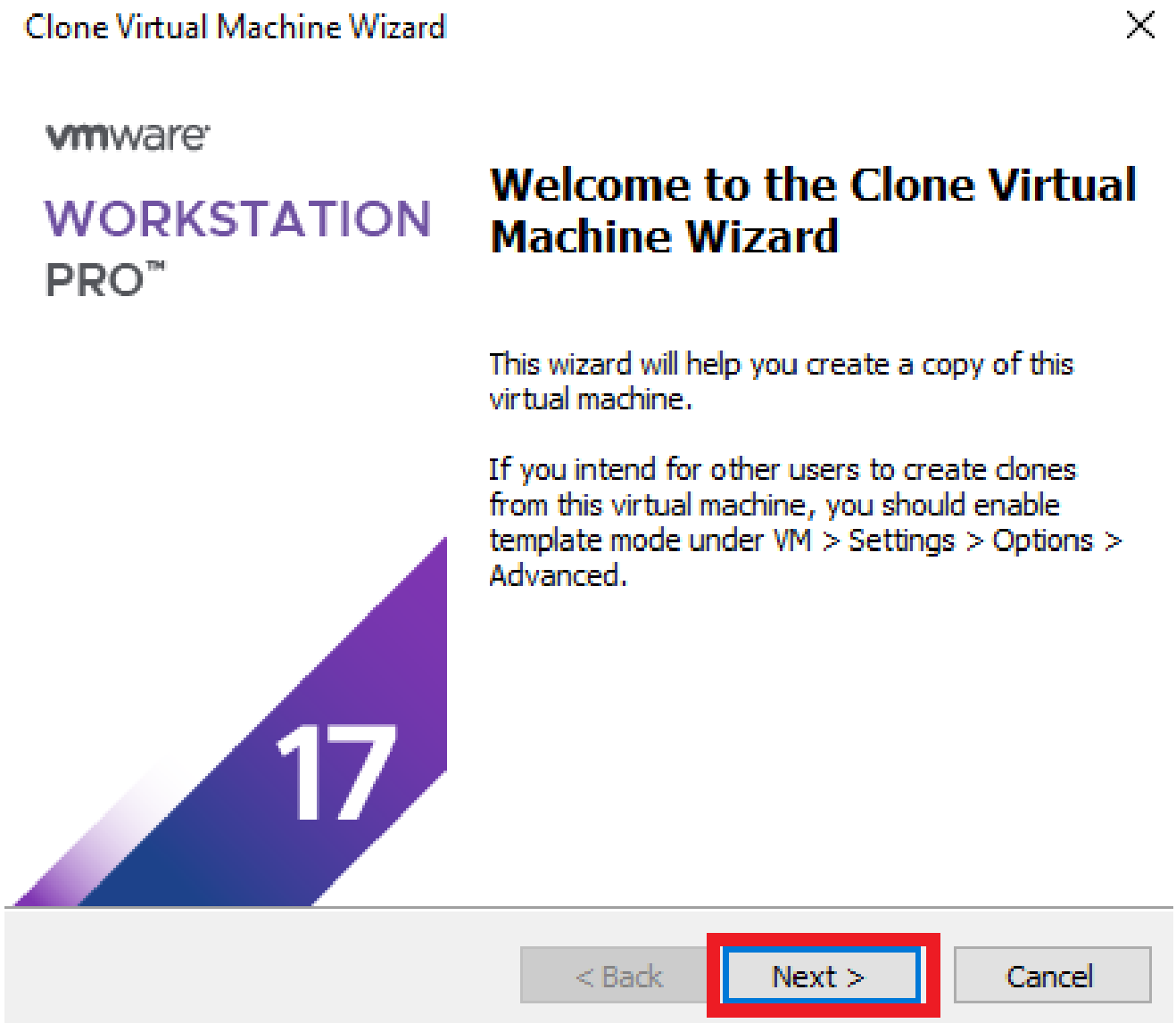
4. Name the Snapshot and click “Take Snapshot”.



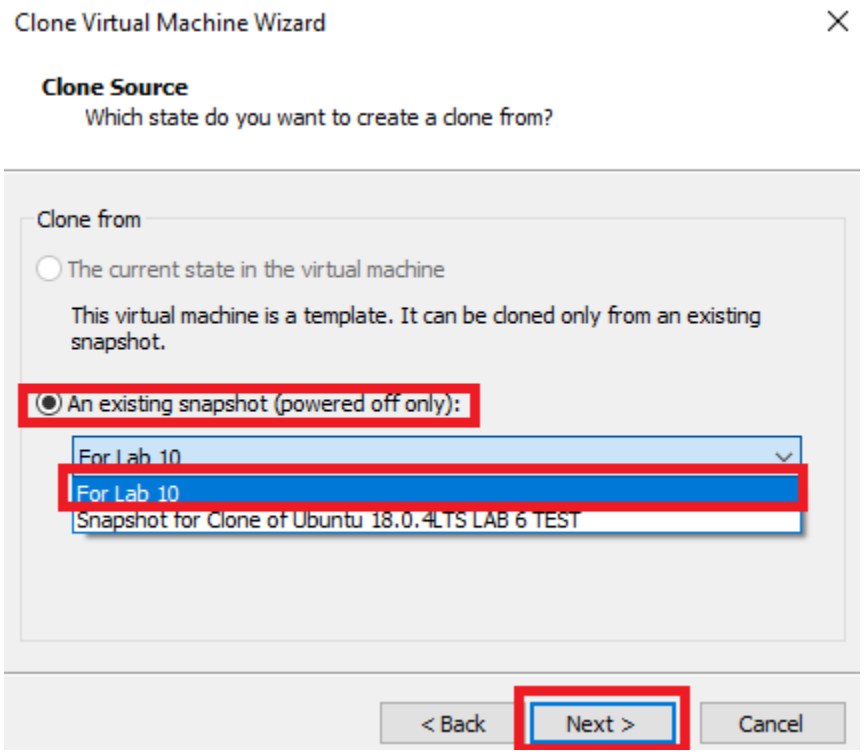
5. Selecting the wanted Virtual Machine:
   Hover on 'VM' Tab
   Hover on 'Manage'
   Click 'Clone'



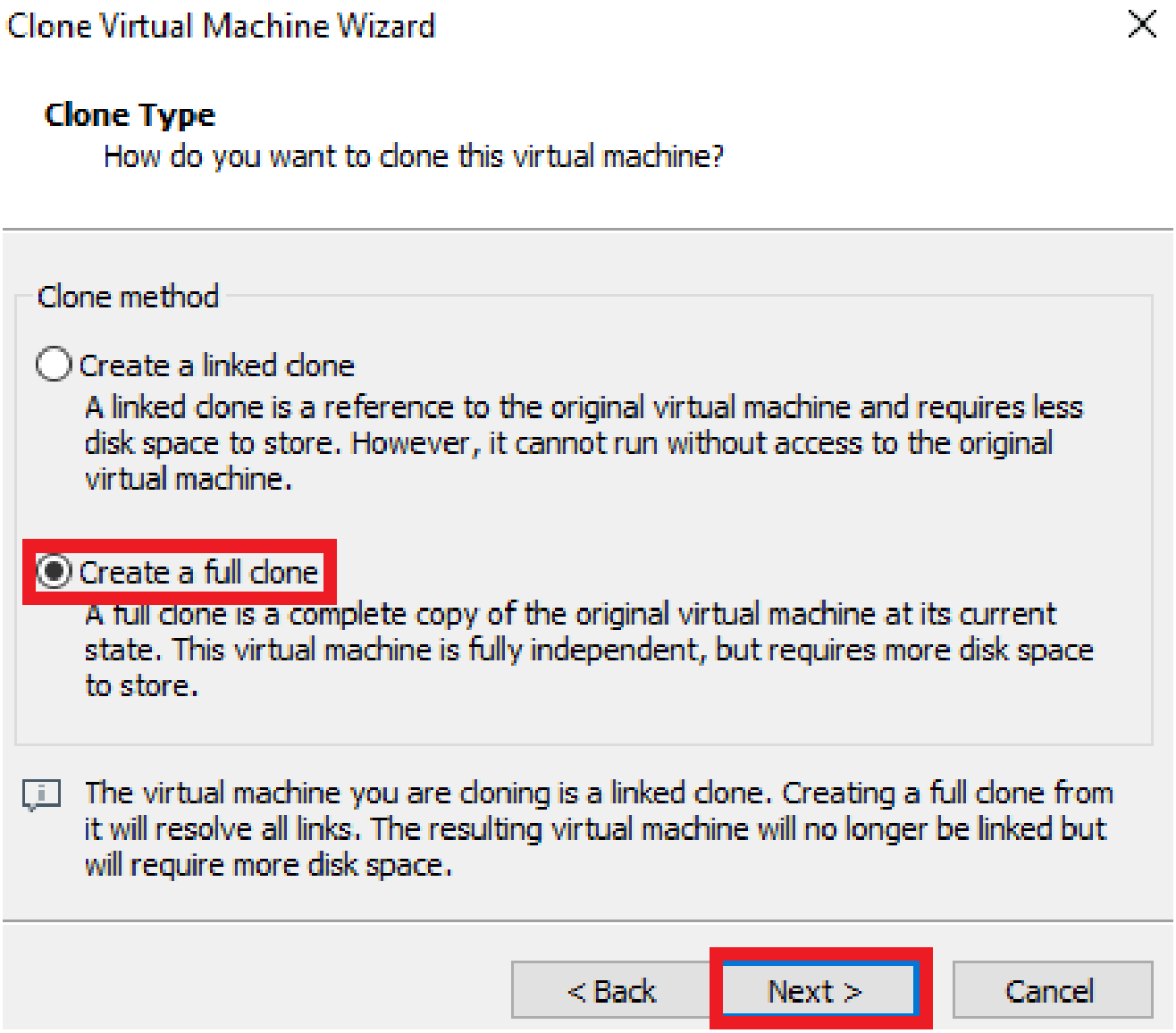
6. The “Clone VM Wizard” window pops up. Click “Next”.



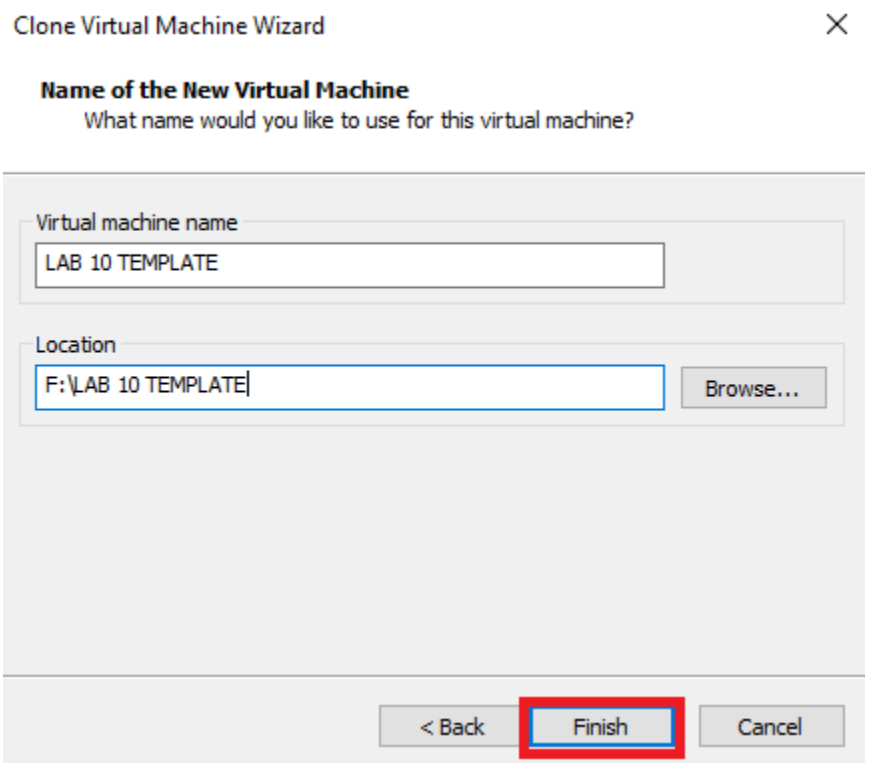
7. Select “An Existing Snapshot”, then Select the Snapshot we just created, then Click Next.



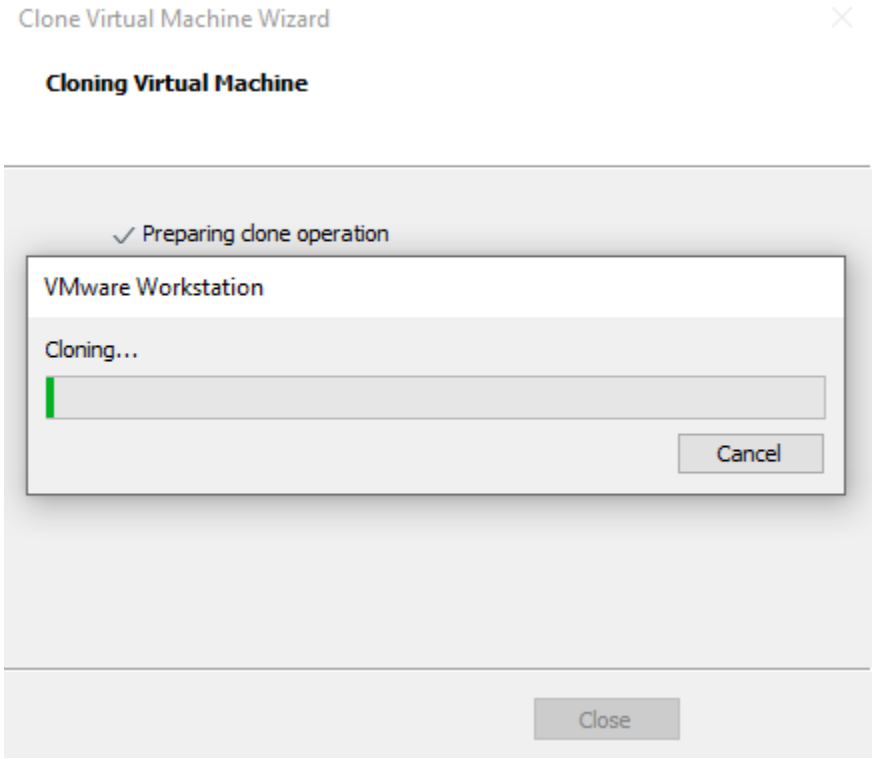
8. Choose “Create full clone” and press “Next”.



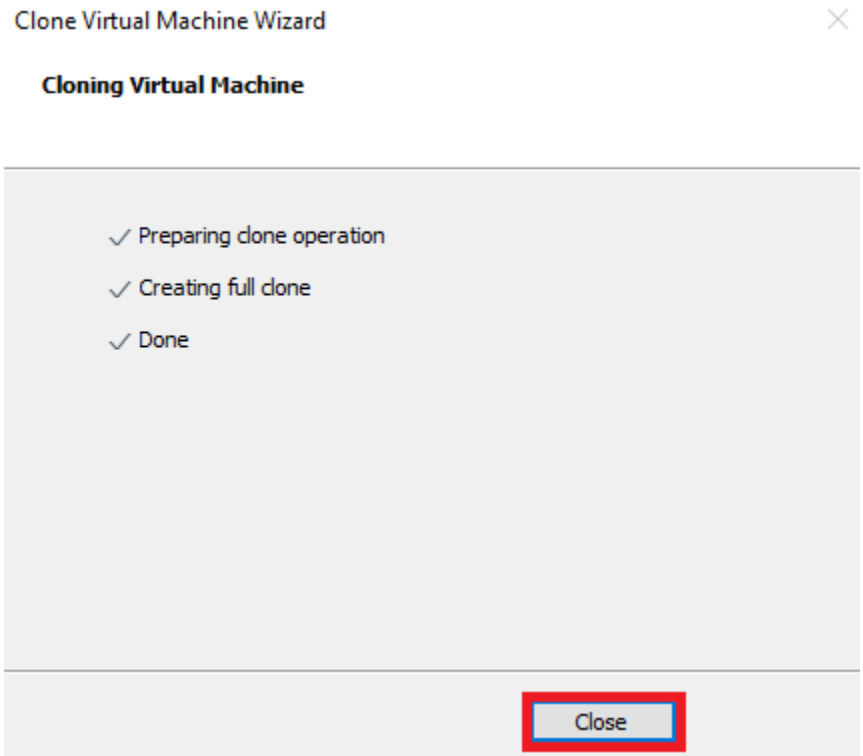
9. Name it, specify where it is saved and Click Finish.



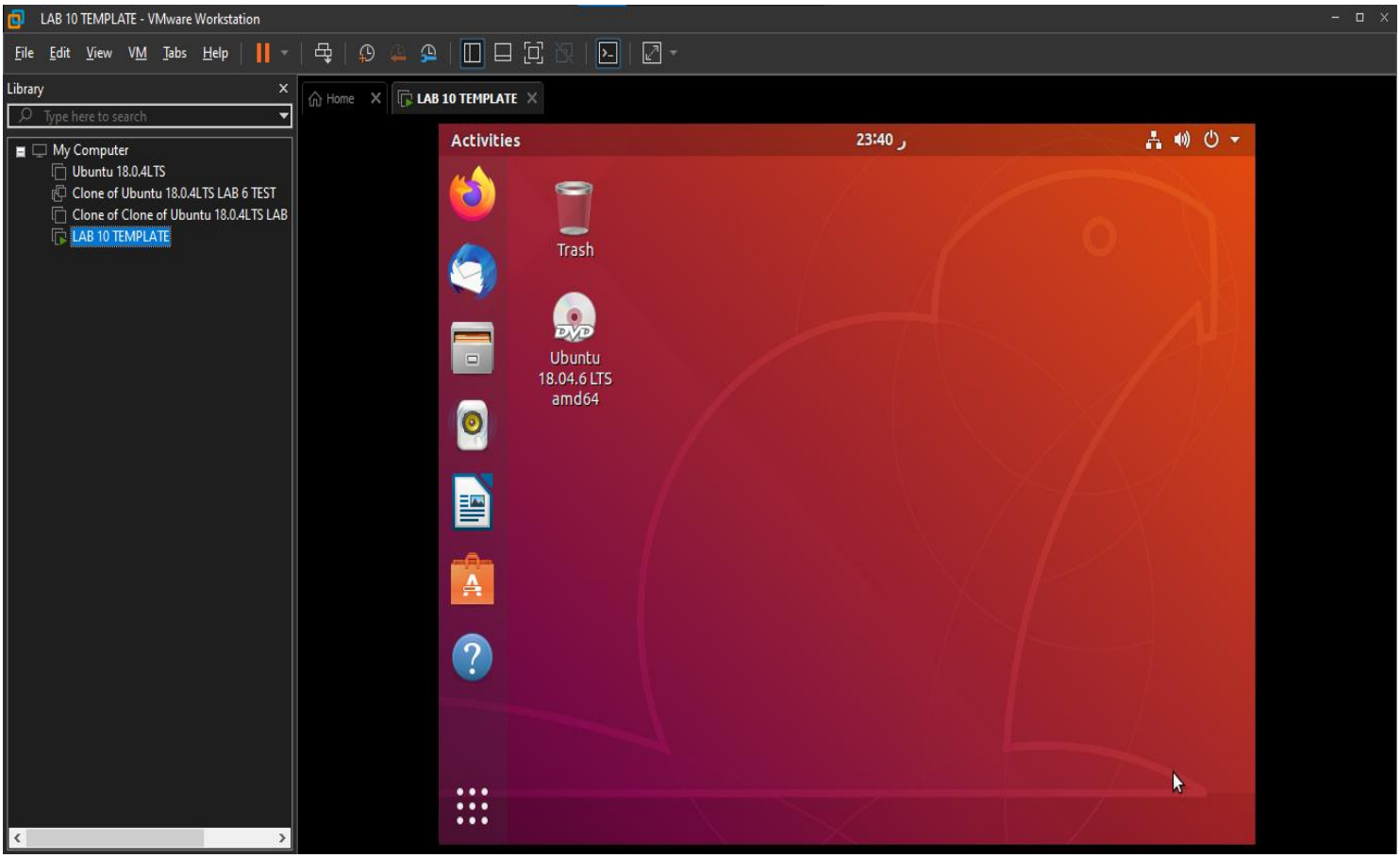
10. Cloning…



11. Clone Created Successfully, Click Close.



12. VM is Ready and can be Powered On



Computer Engineering &
Software Systems

Ain Shams University
Faculty of Engineering

Lab Report 11

Using Templates and Clones

Under Supervision of

Dr. Wagdy Anis Aziz

Submitted By:

Ahmed Khaled Saad Ali Mekheimer
ID : 1809799

Objective: Using Templates and Clones

In this lab, you will perform the following tasks:

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3. Deploy a Virtual Machine from a Template
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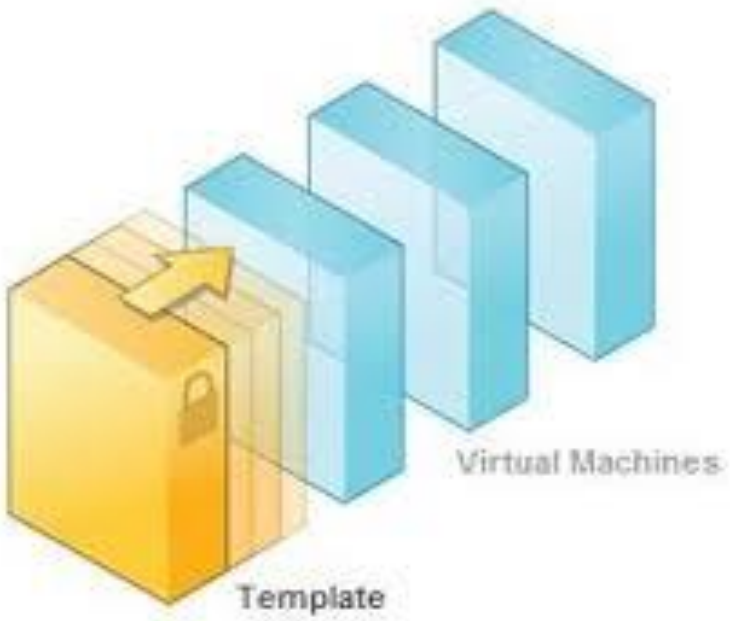
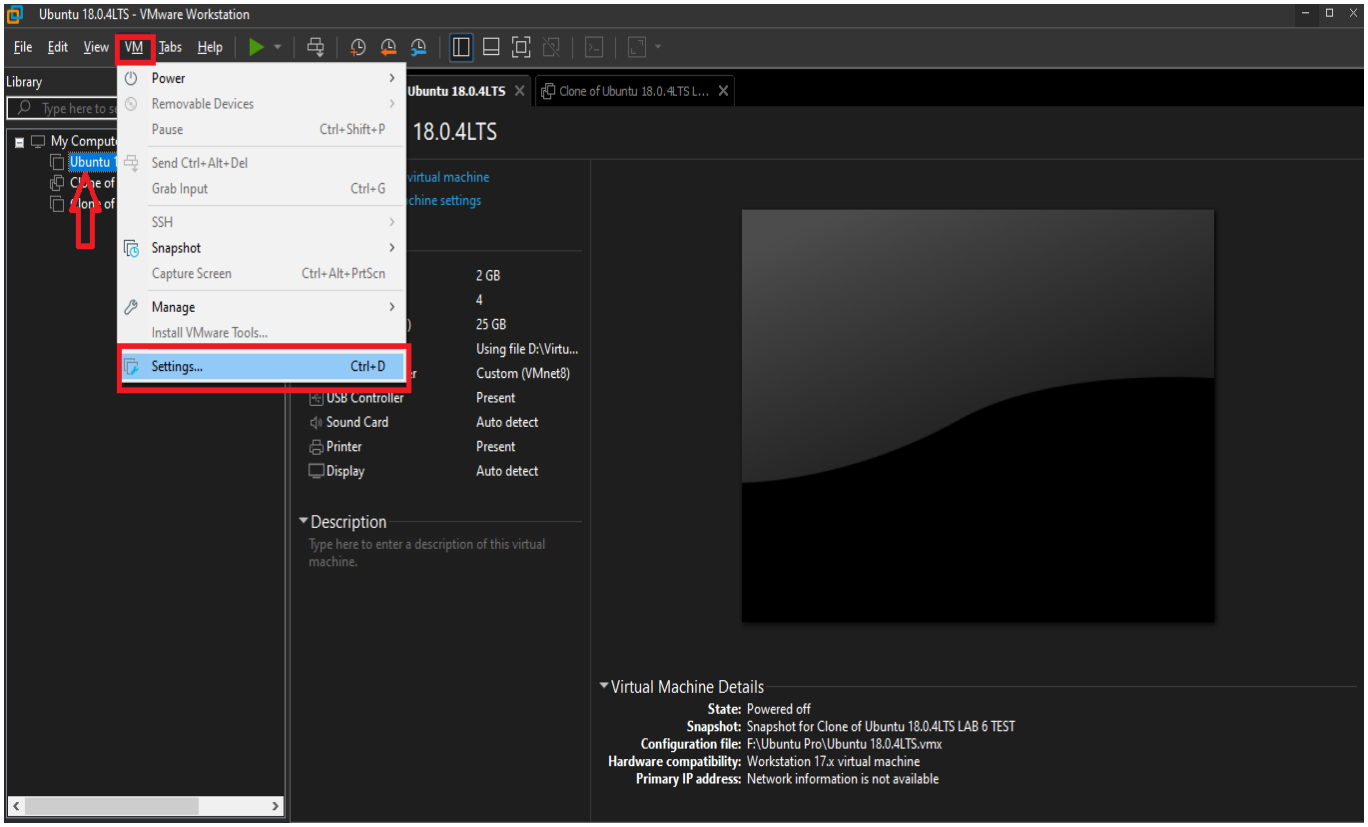
- VM templates are used when you need to deploy many VMs and ensure that they are consistent and standardized.

- Moving between different setup is easy with VM template.

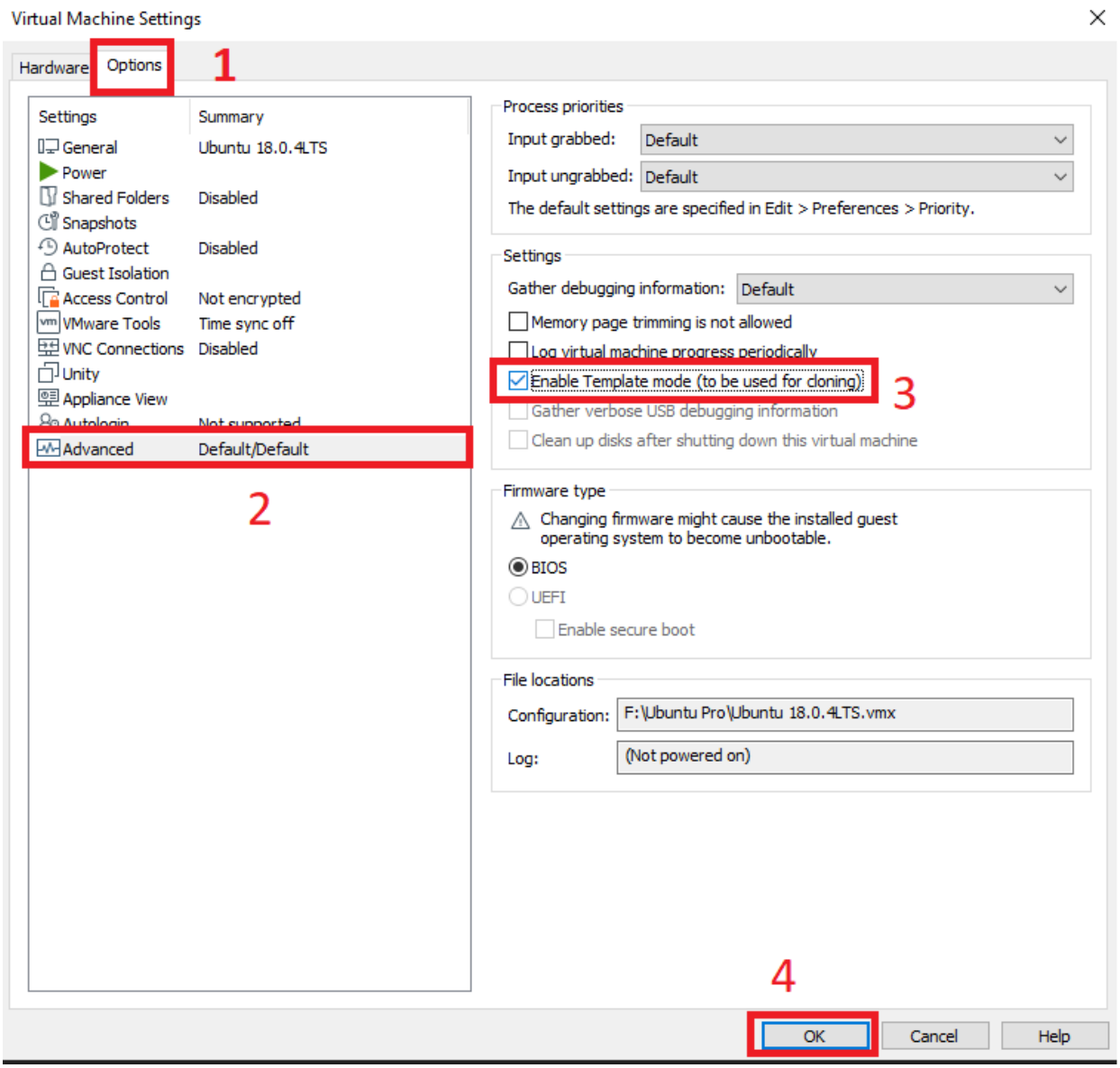


1. Create a Virtual Machine Template

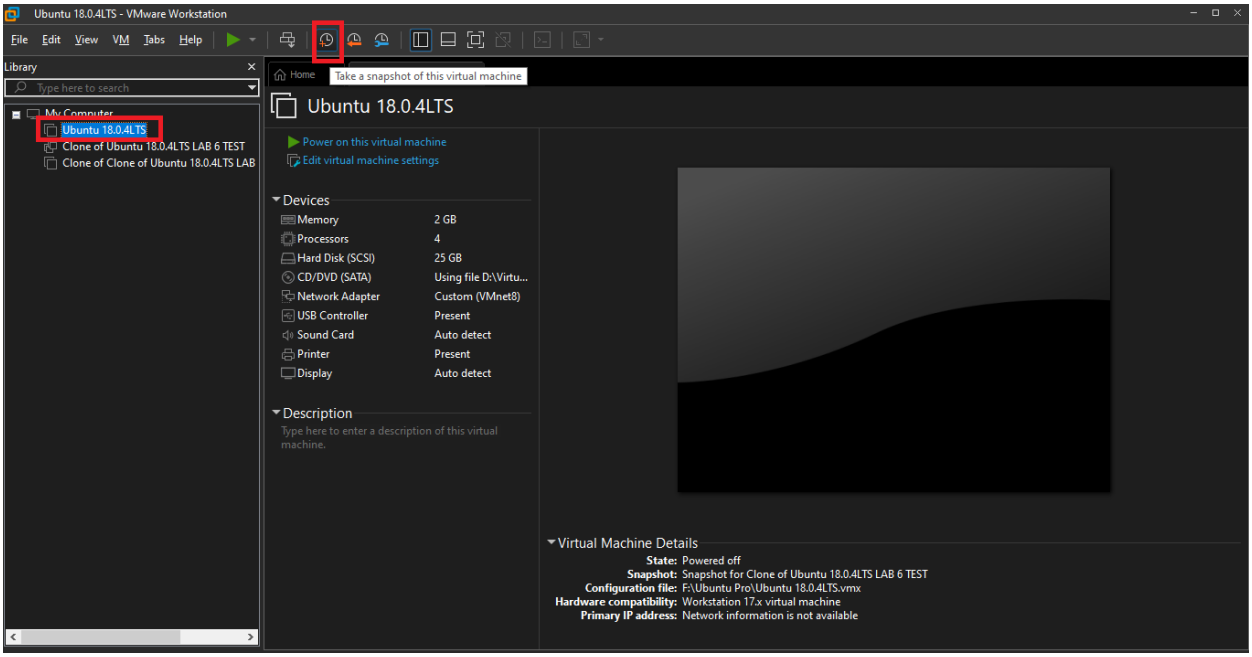
1. Select Virtual Machine, Select ‘VM’ tab, Select ‘Settings’



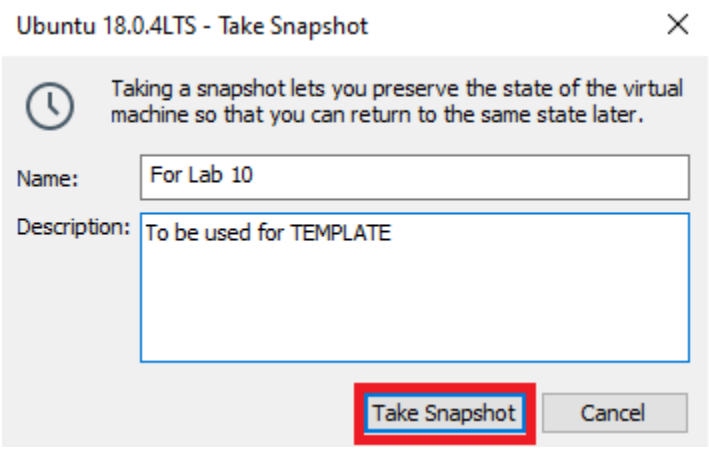
2. Select ‘Options’ tab, the ‘Advanced, then Checkmark ‘Enable Template Mode(to be used for cloning), then Click OK.



3. Take a Snapshot for the VM



4. Name the Snapshot and click “Take Snapshot”.



5. Selecting the wanted Virtual Machine:
   Hover on 'VM' Tab
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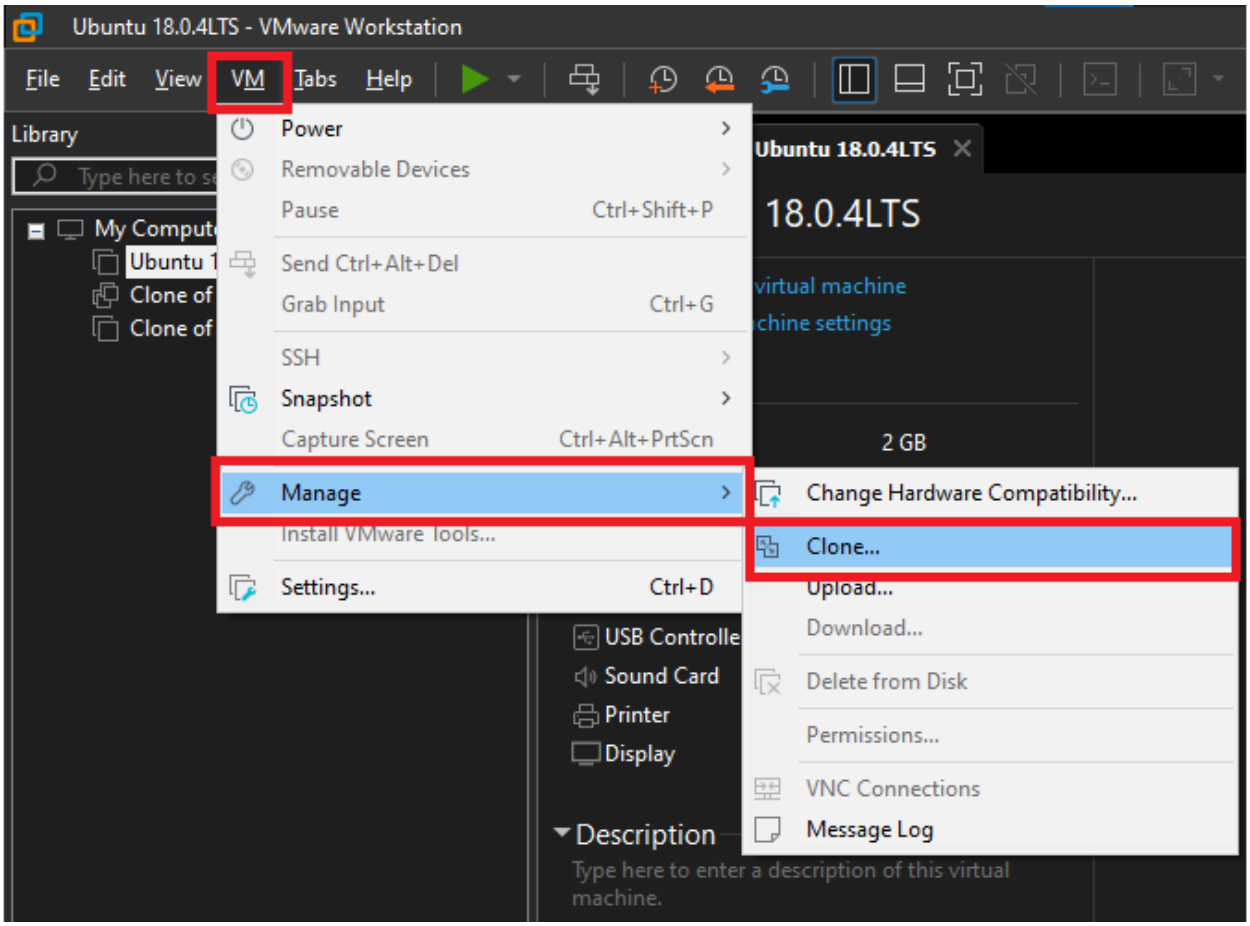
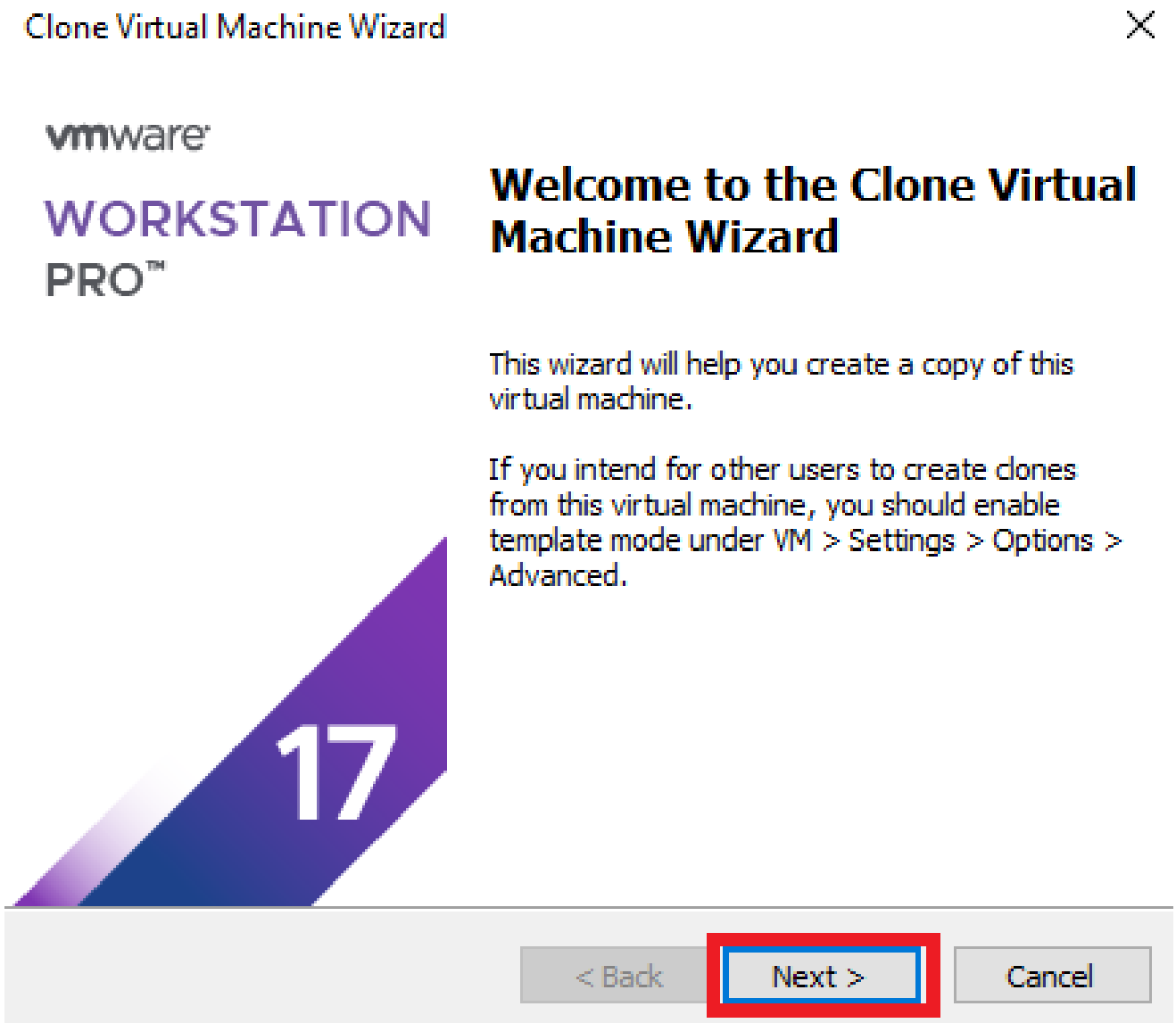
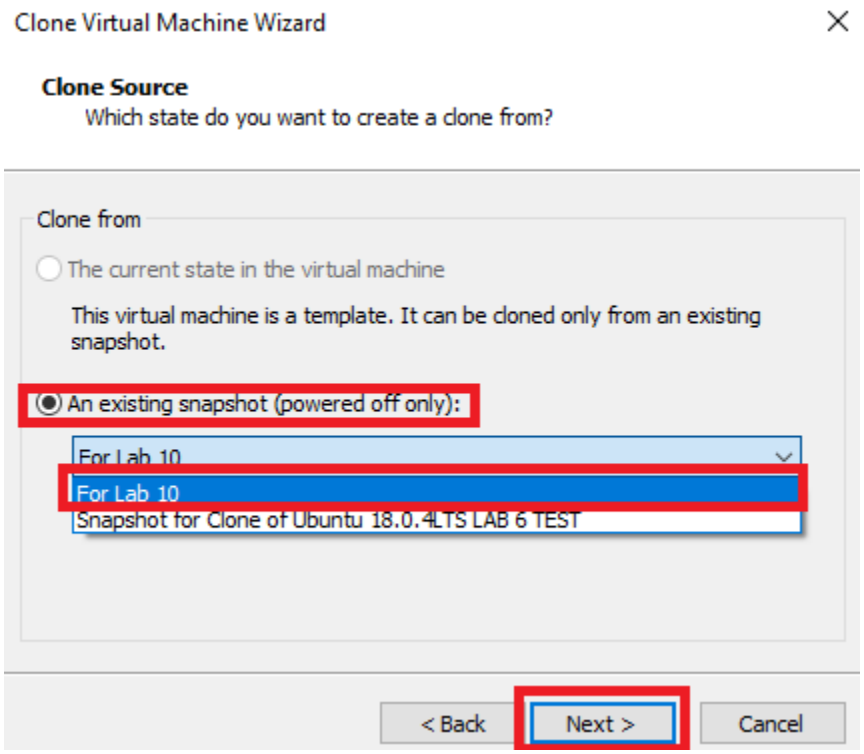
   Click 'Clone'



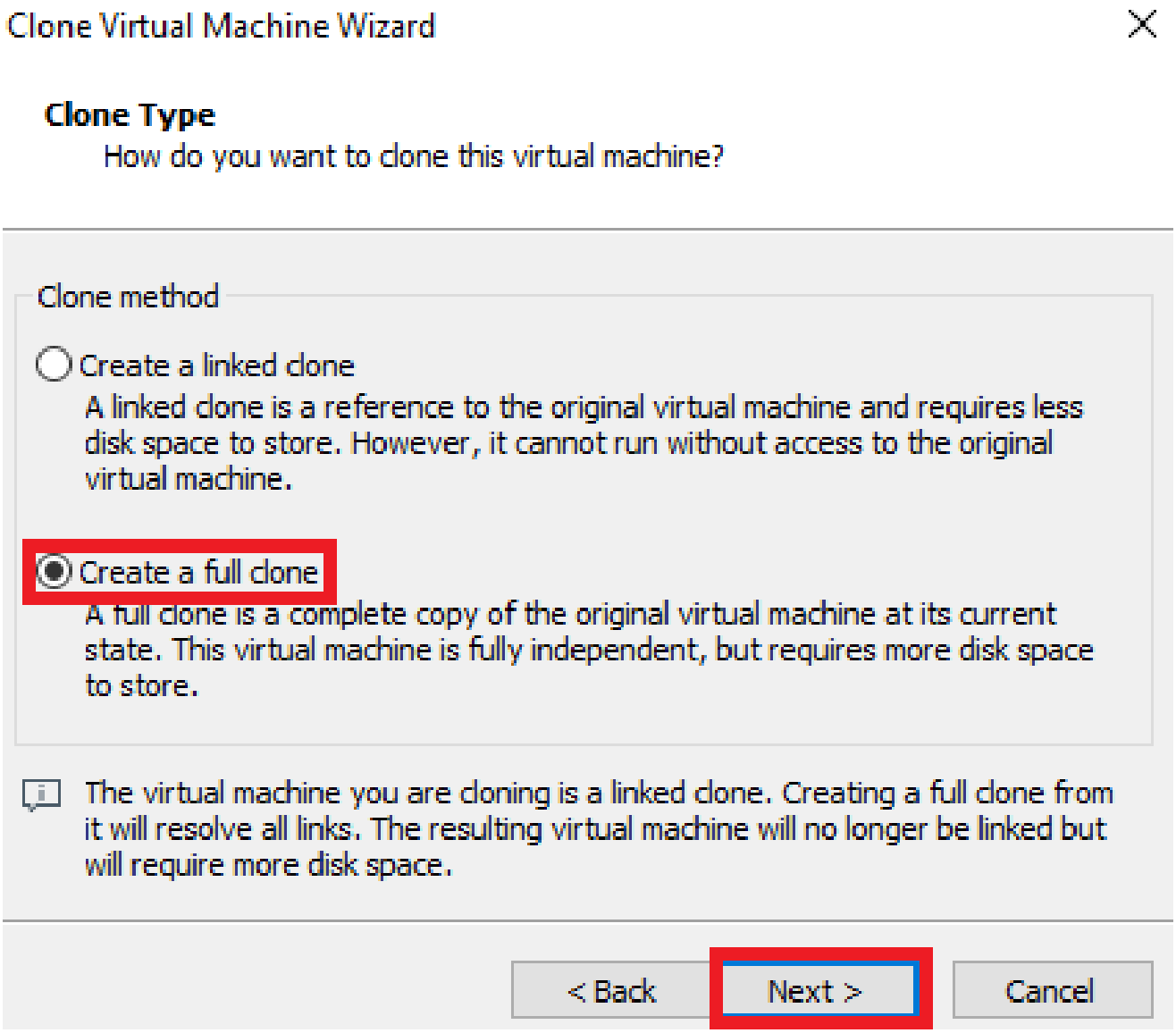
6. The “Clone VM Wizard” window pops up. Click “Next”.



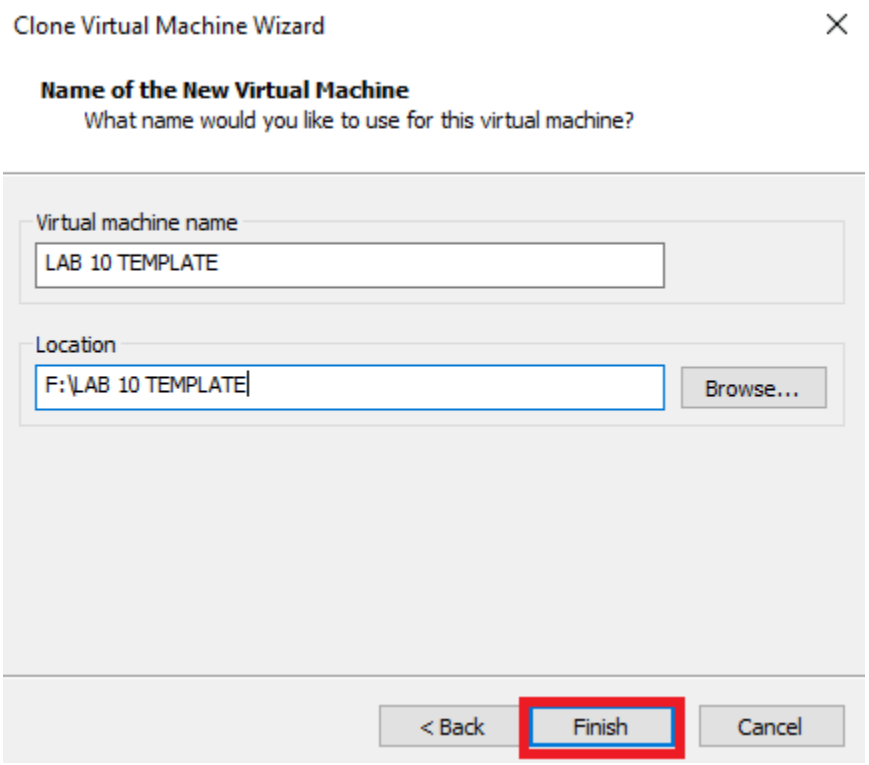
7. Select “An Existing Snapshot”, then Select the Snapshot we just created, then Click Next.



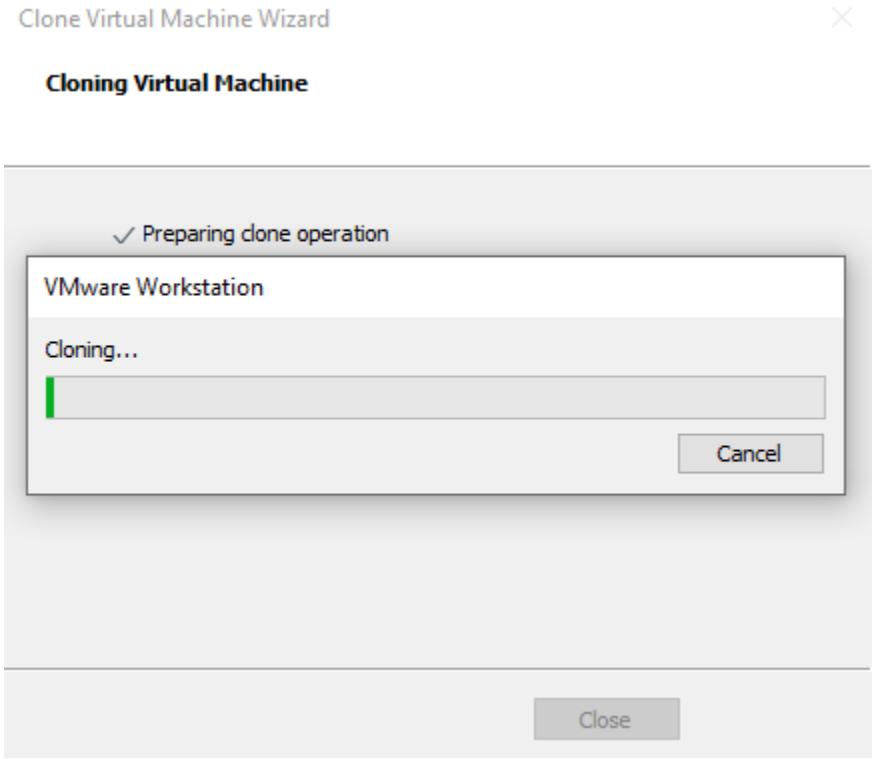
8. Choose “Create full clone” and press “Next”.



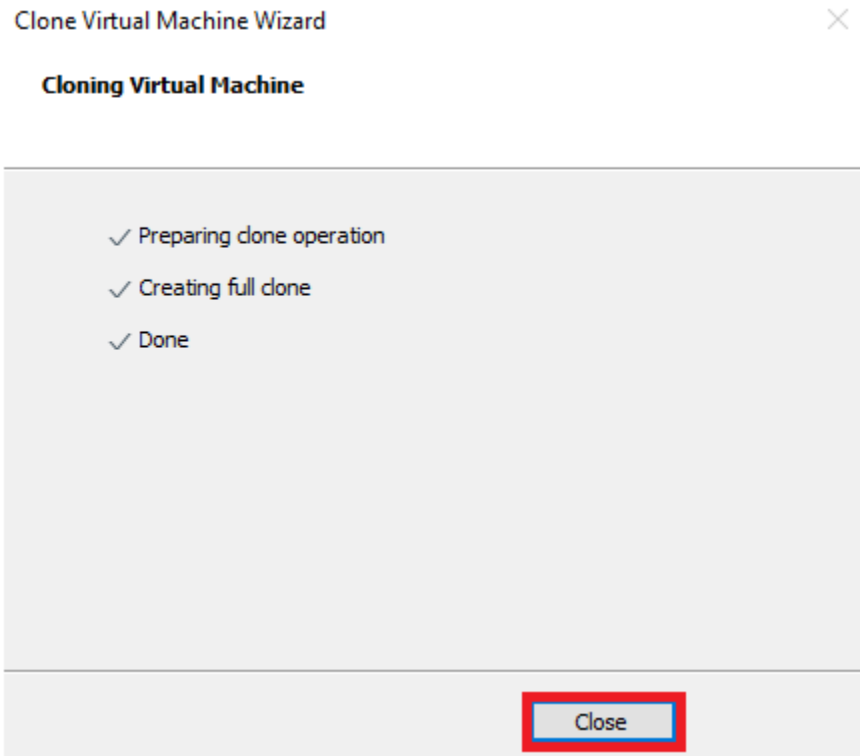
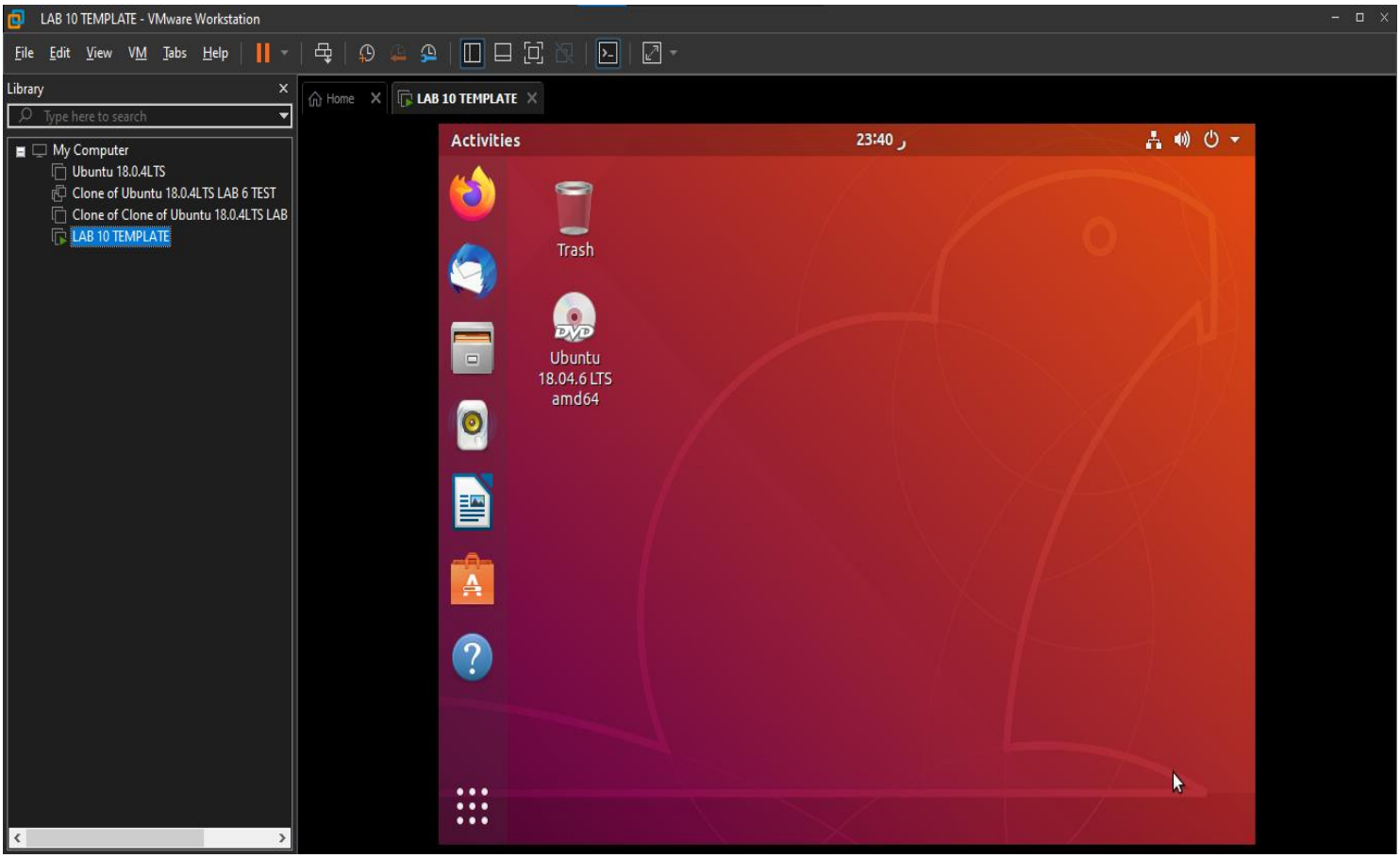
9. Name it, specify where it is saved and Click Finish.



10. Cloning…



11. Clone Created Successfully, Click Close.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