Lesson 3 Linux Installation and Source Replacement

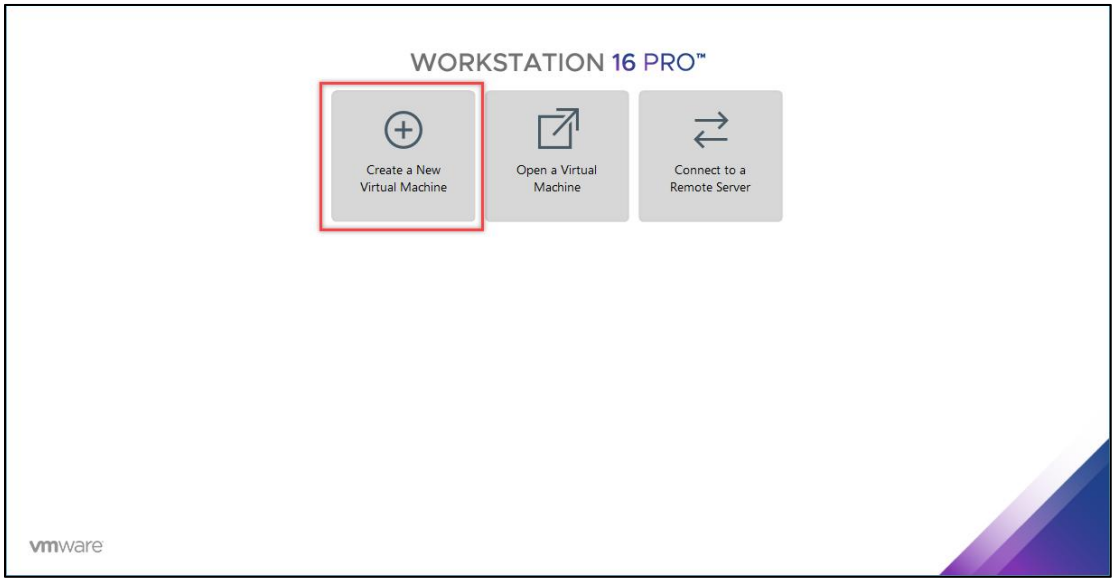
Note: choose the corresponding installation and configuration methods according to the virtual machine you have installed.

1. VMware Virtual Machine Installation and Configuration

1.1 Create New Virtual Machine

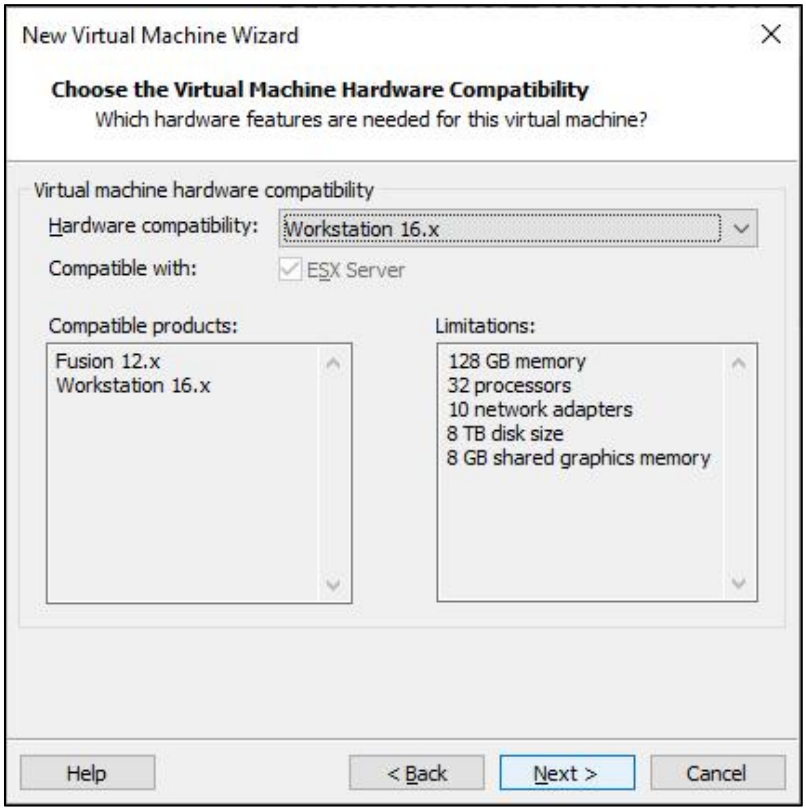
1) Extract Ubuntu image archive.

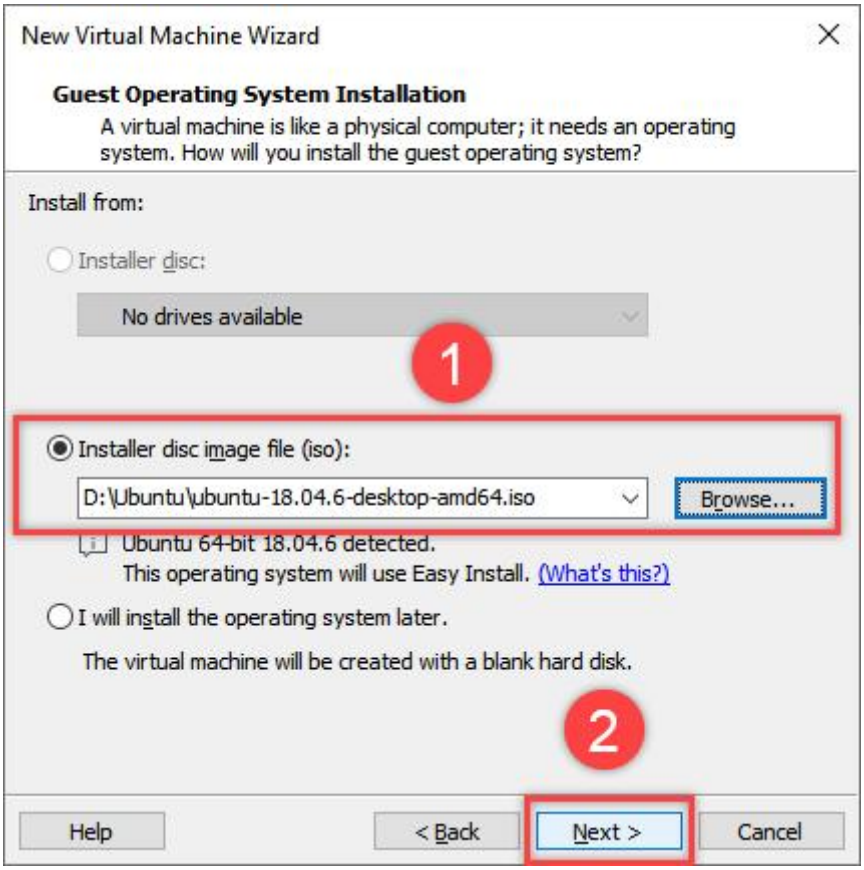
2) Open virtual machine. Click "**Create a New Virtual Machine**".

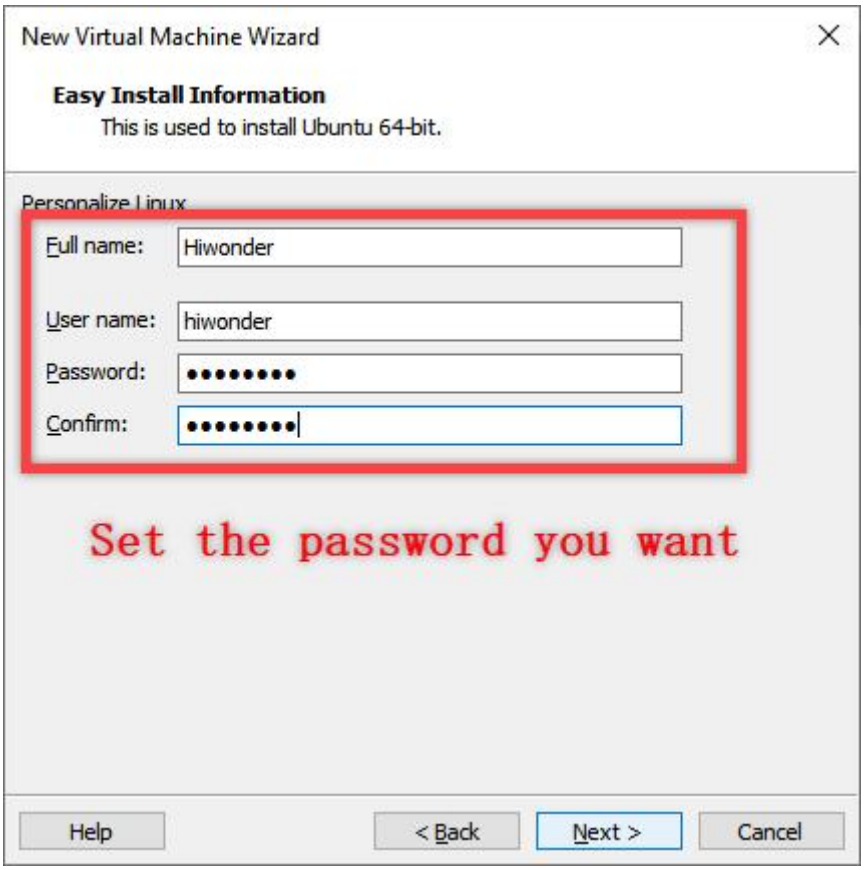


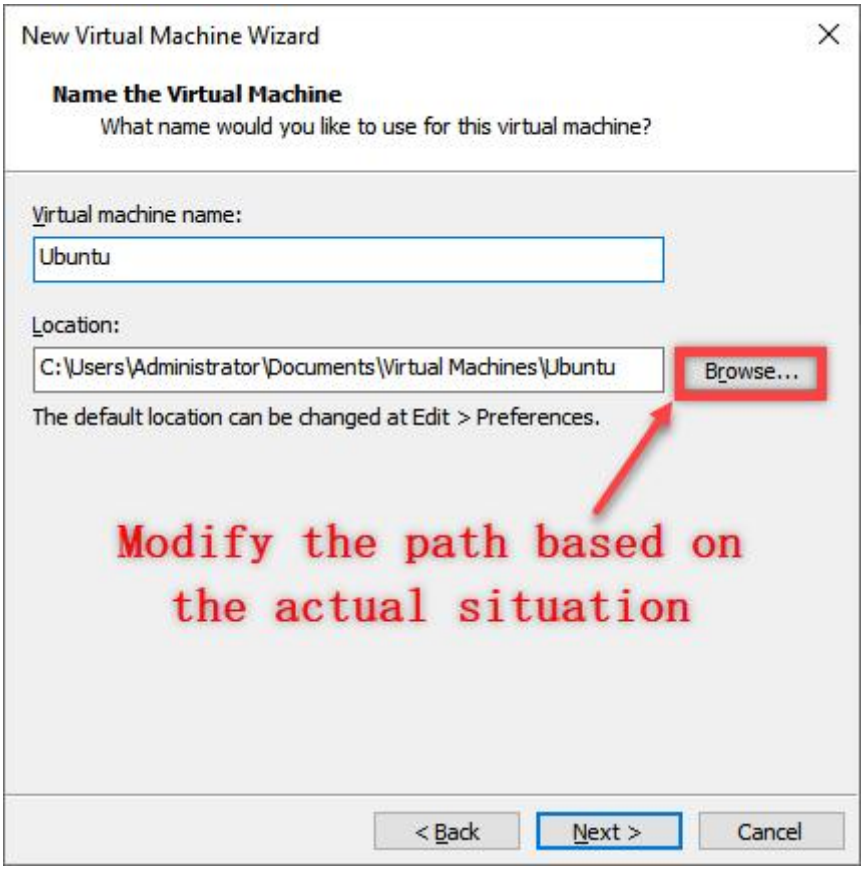
3) Next, click "**custom**" in the pop-up interface, and then click "**Next**". After that, operate in sequence according to the pictures below.

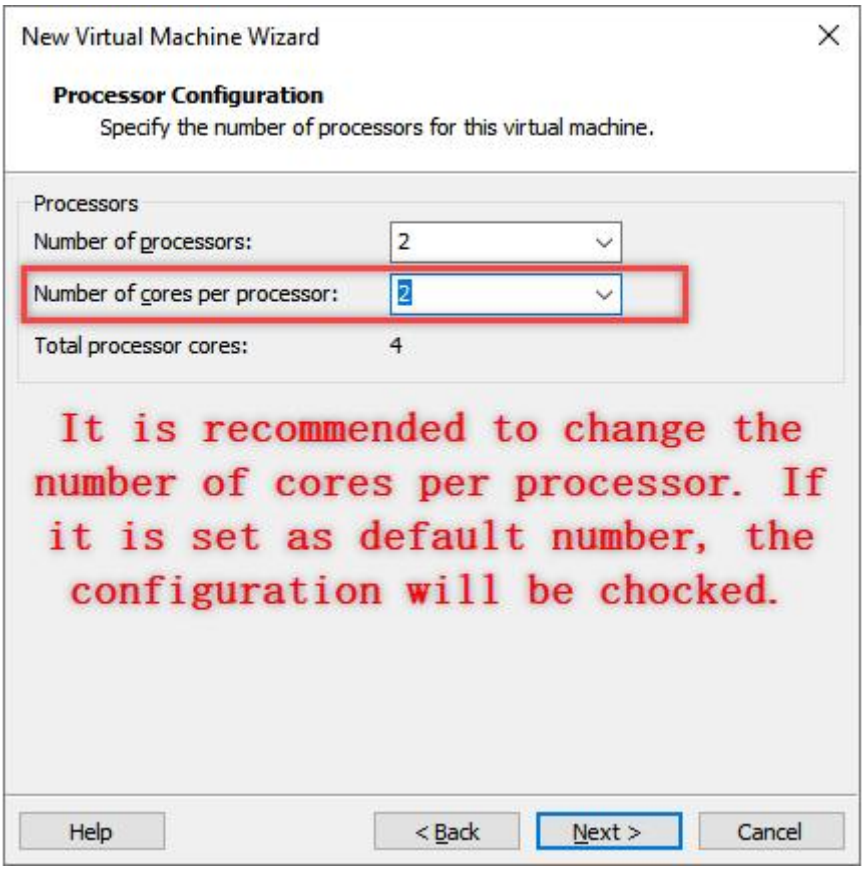

New Virtual Machine Wizard
VMWARE
WORKSTATION
PRO™
16
Welcome to the New Virtual Machine Wizard
What type of configuration do you want?
Typical (recommended)
Create a Workstation 16.x virtual machine in a few easy steps.
Custom (advanced)
Create a virtual machine with advanced options, such as a SCSI controller type, virtual disk type and compatibility with older VMware products.
Help
< Back
Next >
Cancel

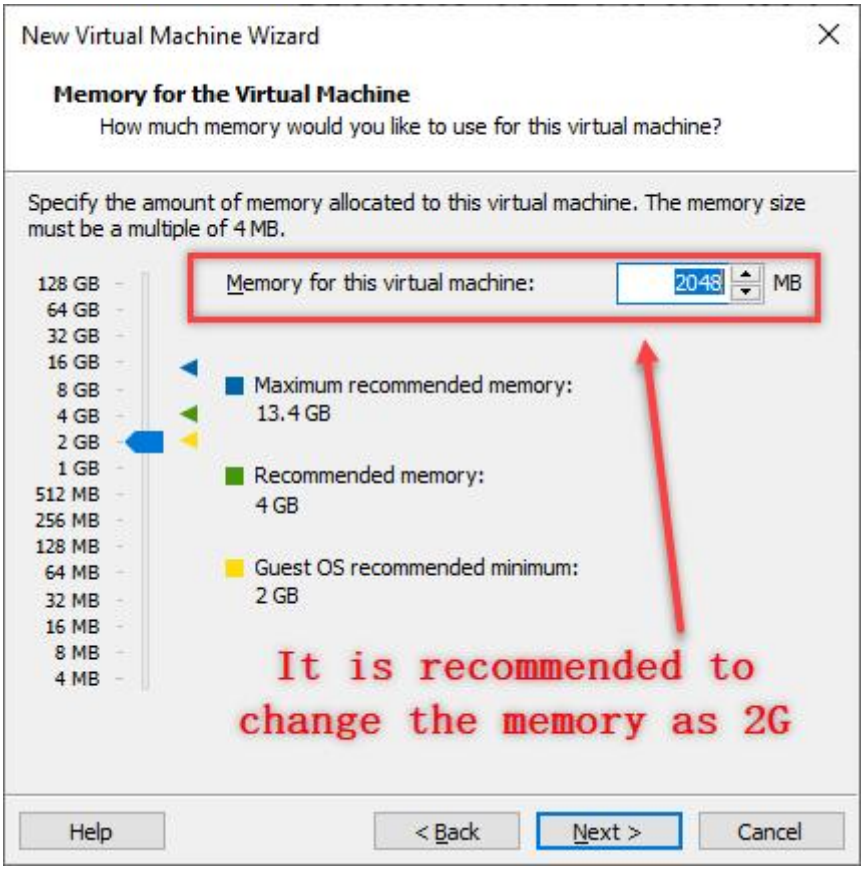

New Virtual Machine Wizard
Choose the Virtual Machine Hardware Compatibility
Which hardware features are needed for this virtual machine?
Virtual machine hardware compatibility
Hardware compatibility:
Workstation 16.x
Compatible with:
ESX Server
Compatible products:
Fusion 12.x
Workstation 16.x
Limitations:
128 GB memory
32 processors
10 network adapters
8 TB disk size
8 GB shared graphics memory
Help
< Back
Next >
Cancel

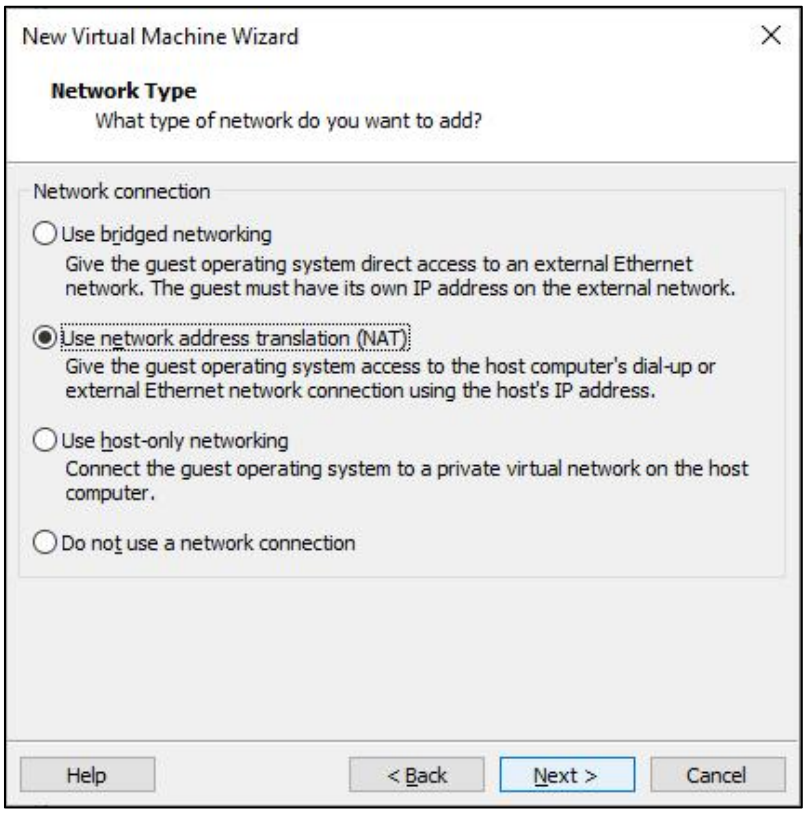

New Virtual Machine Wizard
Guest Operating System Installation
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?
Install from:
Installer disc:
No drives available
1
Installer disc image file (iso):
D:\Ubuntu\ubuntu-18.04.6-desktop-amd64.iso
Browse...
Ubuntu 64-bit 18.04.6 detected.
This operating system will use Easy Install. (What's this?)
I will install the operating system later.
The virtual machine will be created with a blank hard disk.
2
Help
< Back
Next >
Cancel

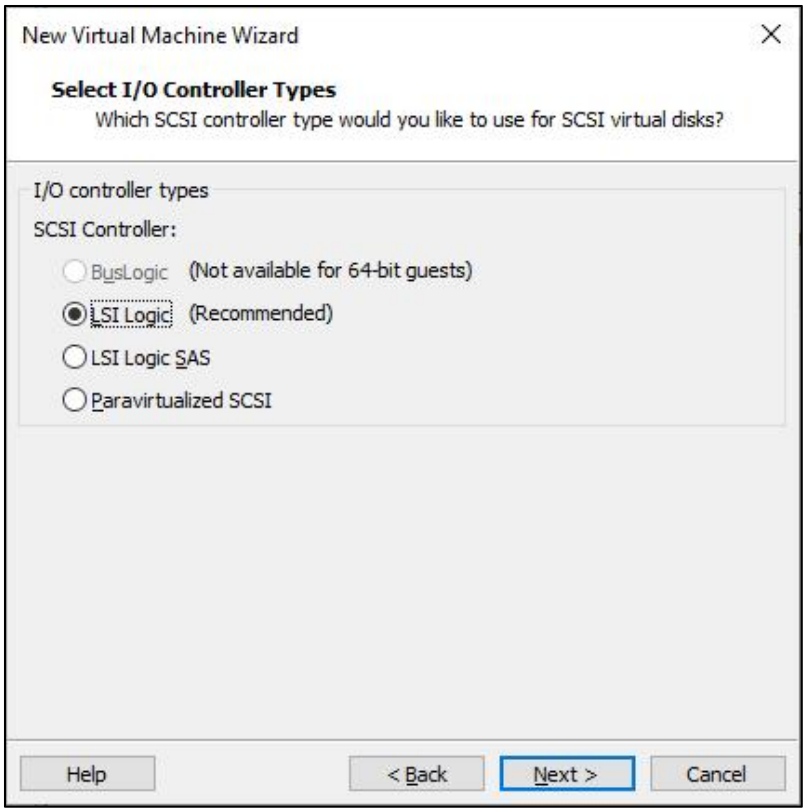

New Virtual Machine Wizard
Easy Install Information
This is used to install Ubuntu 64-bit.
Personalize Linux
Full name:
Hiwonder
User name:
hiwonder
Password:
Confirm:
Set the password you want
Help
< Back
Next >
Cancel

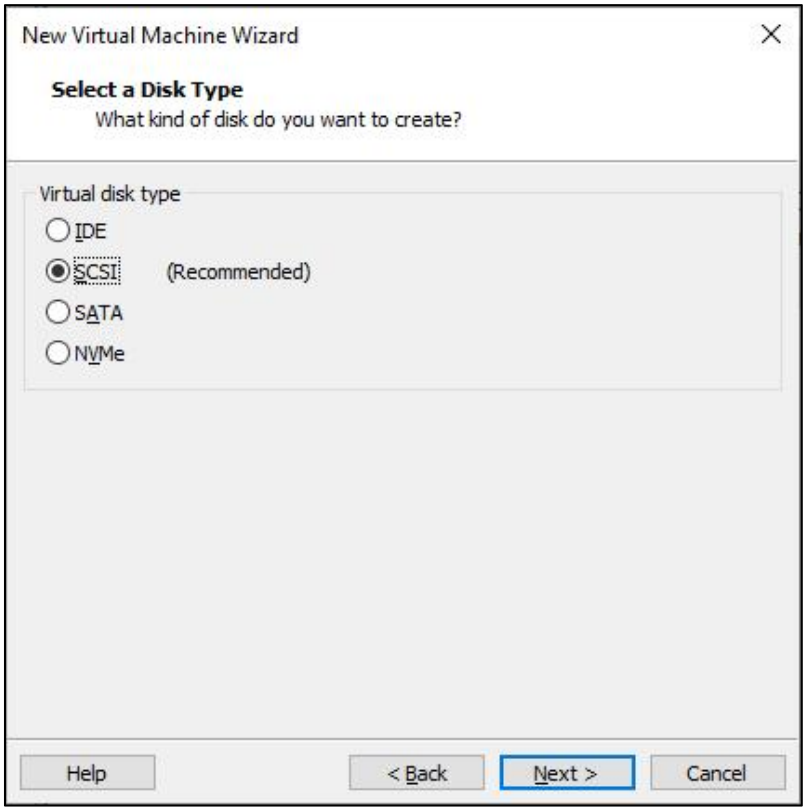

New Virtual Machine Wizard
Name the Virtual Machine
What name would you like to use for this virtual machine?
Virtual machine name:
Ubuntu
Location:
C:\Users\Administrator\Documents\Virtual Machines\Ubuntu
Browse...
The default location can be changed at Edit > Preferences.
Modify the path based on the actual situation
< Back
Next >
Cancel

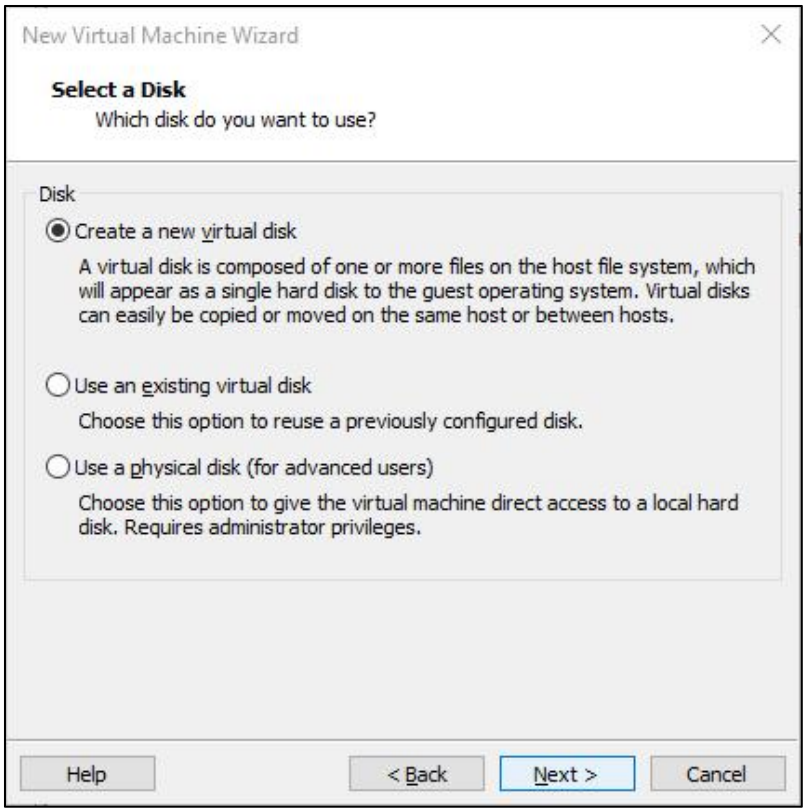

New Virtual Machine Wizard
Processor Configuration
Specify the number of processors for this virtual machine.
Processors
Number of processors:
2
Number of cores per processor:
2
Total processor cores:
4
It is recommended to change the number of cores per processor. If it is set as default number, the configuration will be chocked.
Help
< Back
Next >
Cancel

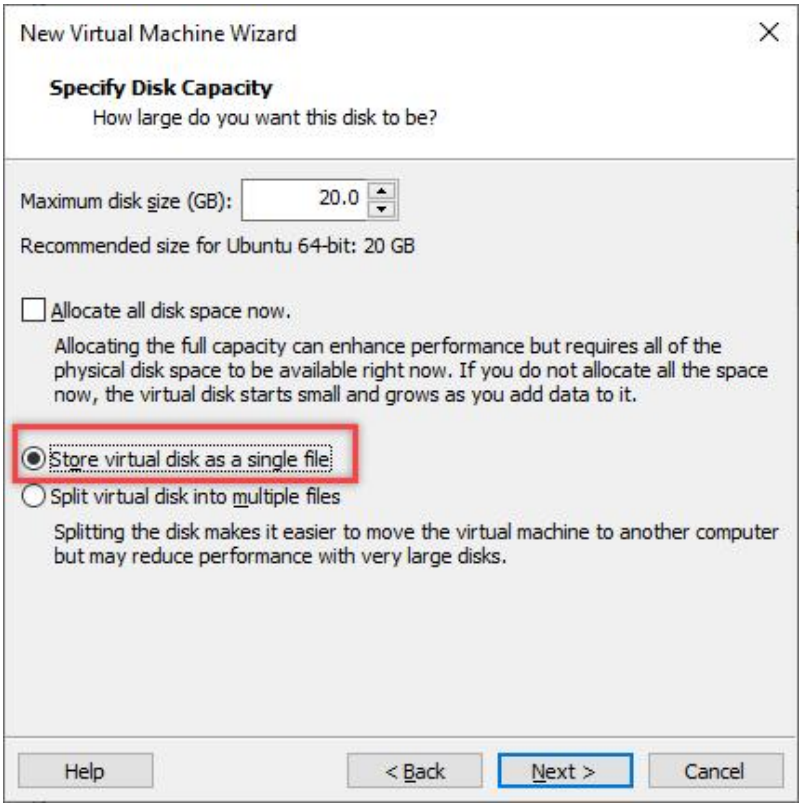

New Virtual Machine Wizard
Memory for the Virtual Machine
How much memory would you like to use for this virtual machine?
Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.
128 GB
64 GB
32 GB
16 GB
8 GB
4 GB
2 GB
1 GB
512 MB
256 MB
128 MB
64 MB
32 MB
16 MB
8 MB
4 MB
Memory for this virtual machine:
2048
MB
Maximum recommended memory:
13.4 GB
Recommended memory:
4 GB
Guest OS recommended minimum:
2 GB
It is recommended to change the memory as 2G
Help
< Back
Next >
Cancel

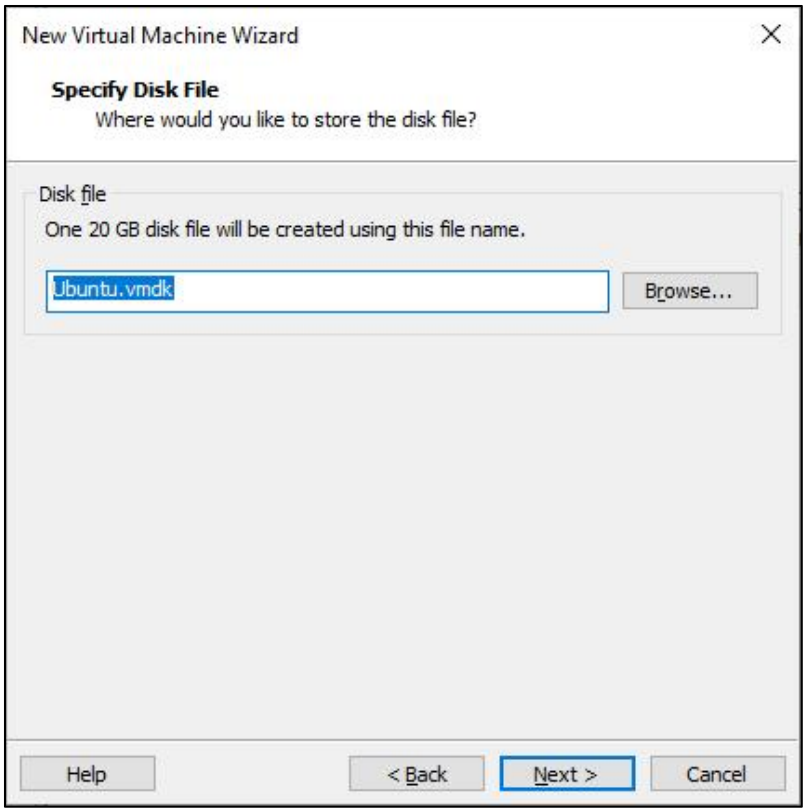

New Virtual Machine Wizard
Network Type
What type of network do you want to add?
Network connection
Use bridged networking
Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.
Use network address translation (NAT)
Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.
Use host-only networking
Connect the guest operating system to a private virtual network on the host computer.
Do not use a network connection
Help
< Back
Next >
Cancel

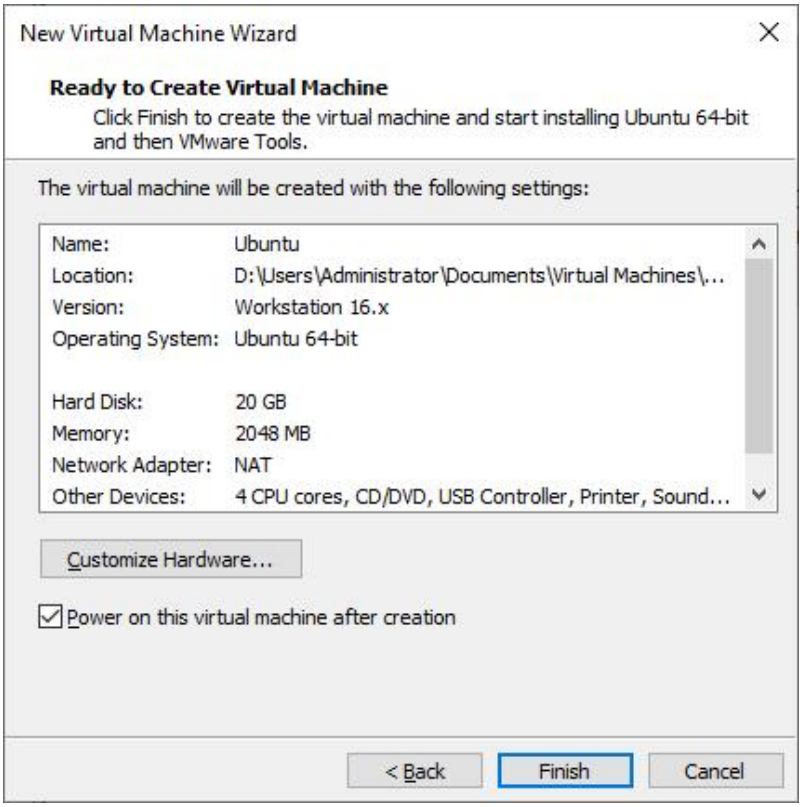

New Virtual Machine Wizard
Select I/O Controller Types
Which SCSI controller type would you like to use for SCSI virtual disks?
I/O controller types
SCSI Controller:
BusLogic (Not available for 64-bit guests)
LSI Logic (Recommended)
LSI Logic SAS
Paravirtualized SCSI
Help
< Back
Next >
Cancel


New Virtual Machine Wizard
Select a Disk Type
What kind of disk do you want to create?
Virtual disk type
IDE
SCSI (Recommended)
SATA
NVMe
Help
< Back
Next >
Cancel

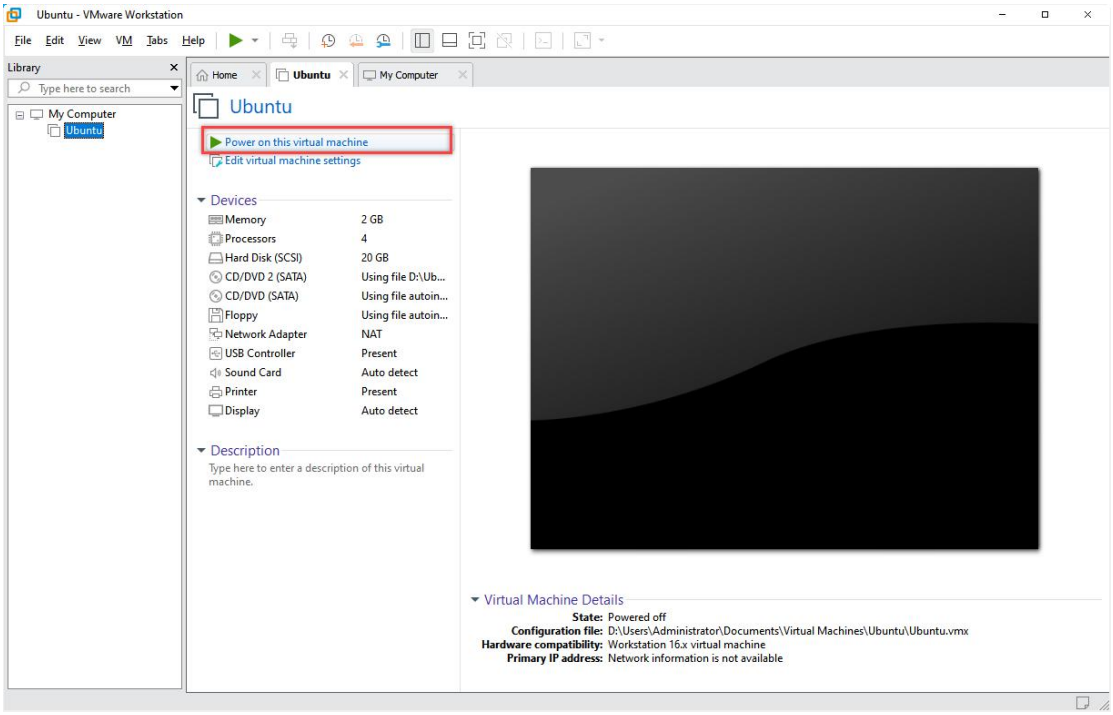

New Virtual Machine Wizard
Select a Disk
Which disk do you want to use?
Disk
Create a new virtual disk
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.
Use an existing virtual disk
Choose this option to reuse a previously configured disk.
Use a physical disk (for advanced users)
Choose this option to give the virtual machine direct access to a local hard disk. Requires administrator privileges.
Help
< Back
Next >
Cancel

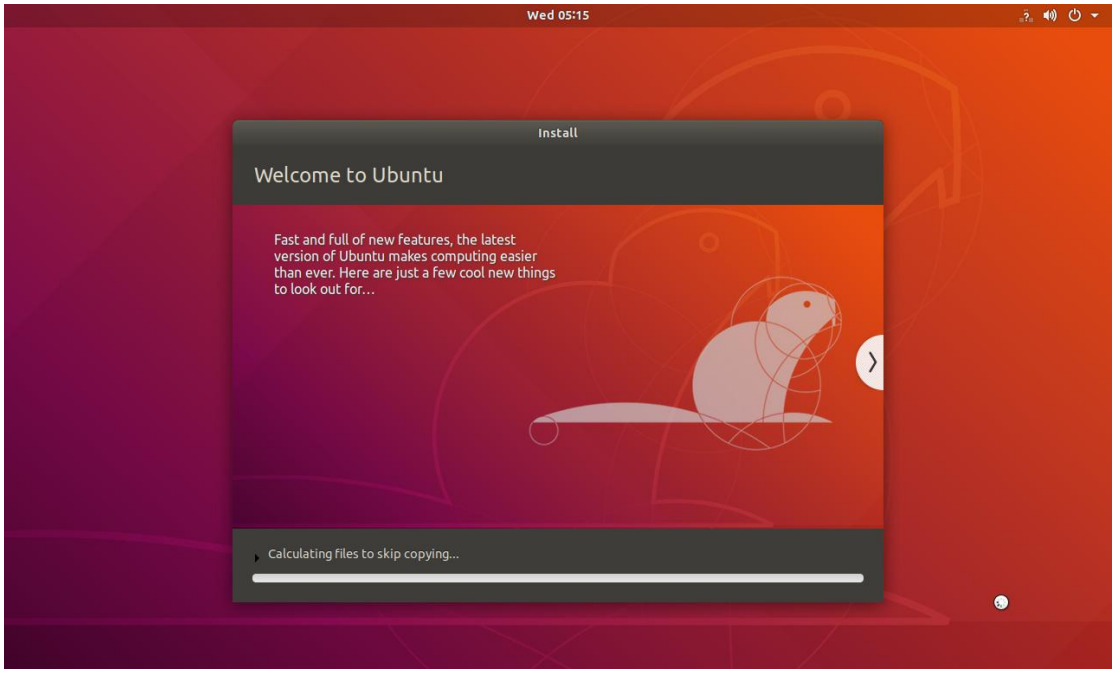

New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
Maximum disk size (GB):
20.0
Recommended size for Ubuntu 64-bit: 20 GB
Allocate all disk space now.
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel



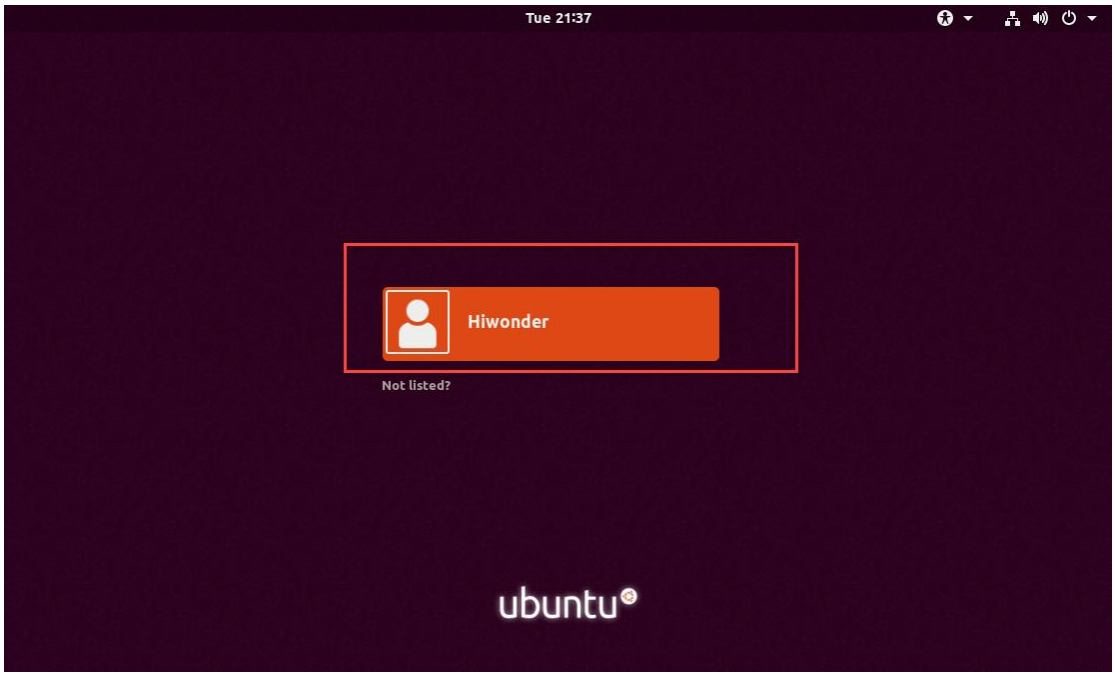


4) After configuration, the interface should look like this.

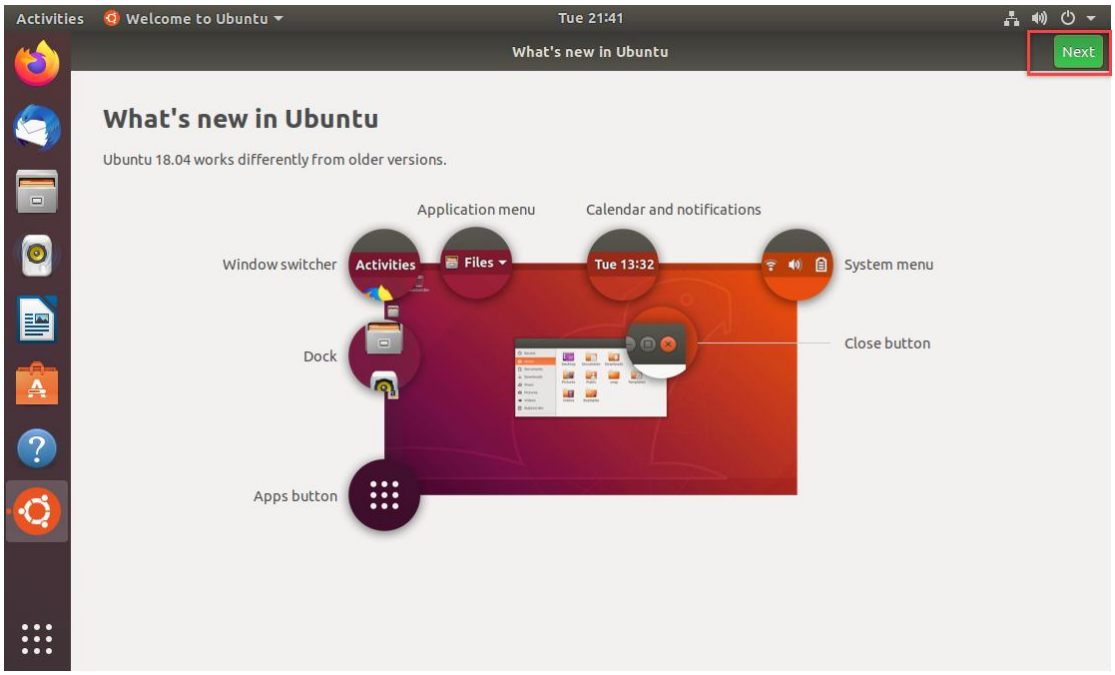


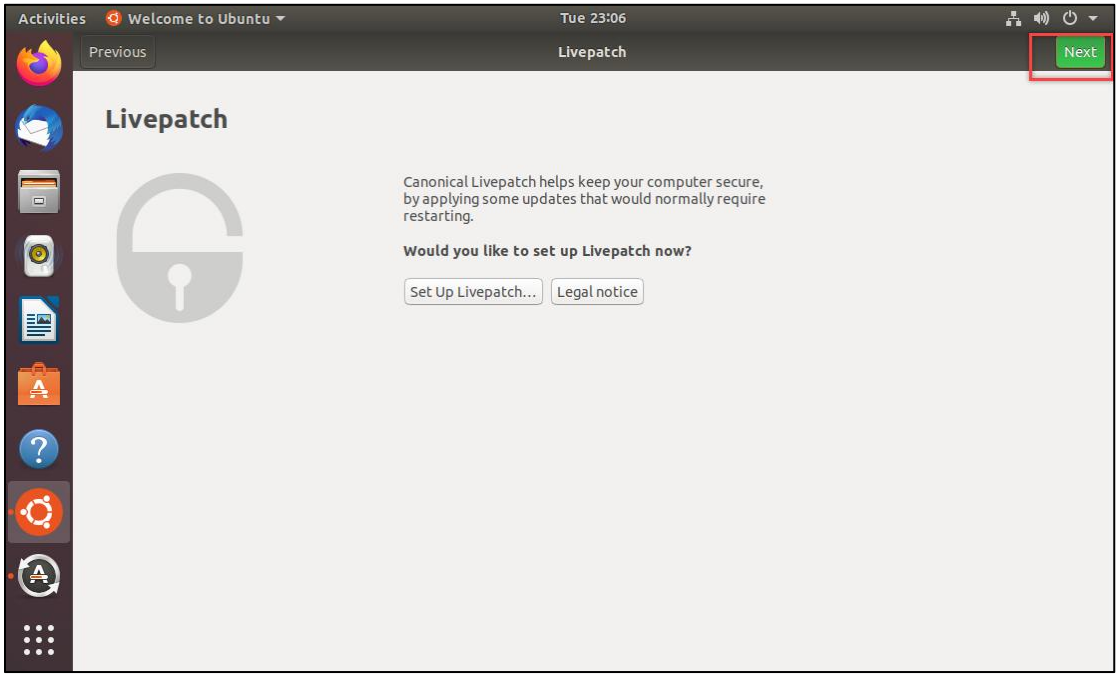


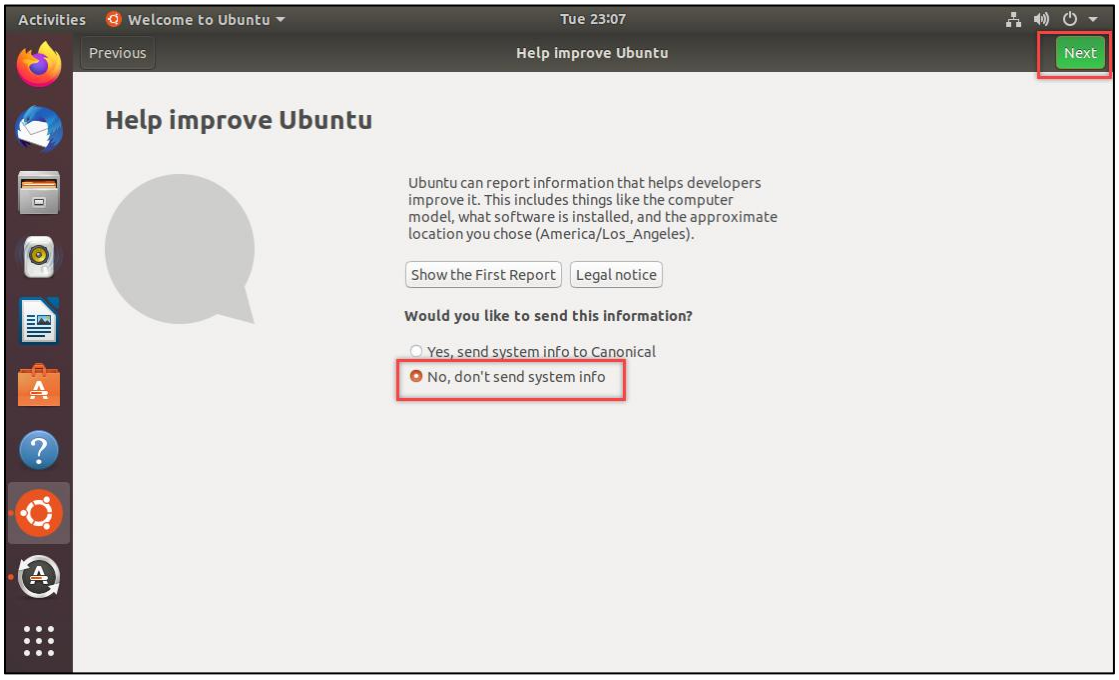
5) After installation, enter the password to login the system desktop. And follow the pictures to operate.

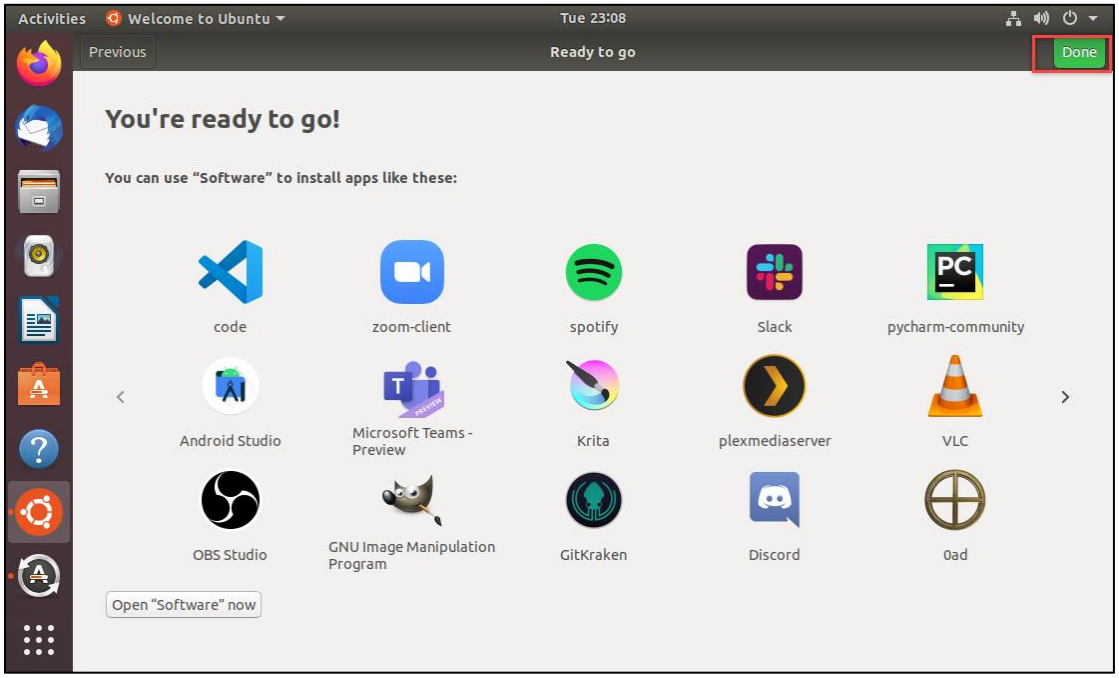

Tue 21:37
Hiwonder
Not listed?
ubuntu


Tue 21:39
Hiwonder
Password:
Cancel
Sign In
Input the password you set before
ubuntu


Activities
Welcome to Ubuntu
Tue 21:41
What's new in Ubuntu
Next
What's new in Ubuntu
Ubuntu 18.04 works differently from older versions.
Application menu
Calendar and notifications
Window switcher
Activities
Files
Tue 13:32
System menu
Dock
Close button
Apps button


Activities
Welcome to Ubuntu
Tue 23:06
Previous
Livepatch
Next
Livepatch
Canonical Livepatch helps keep your computer secure, by applying some updates that would normally require restarting.
Would you like to set up Livepatch now?
Set Up Livepatch...
Legal notice





1.2 Replace Source

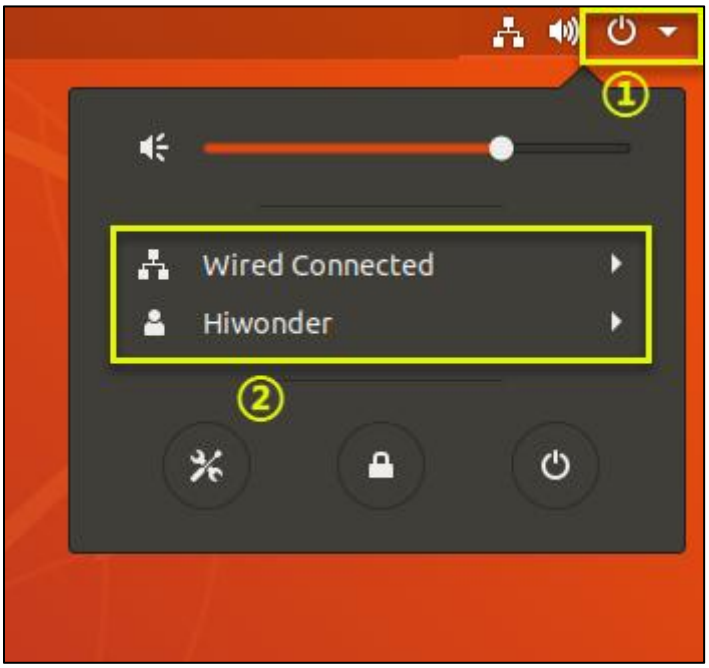
Note: this step matters. Please don't skip this step! Otherwise, it will fail to download installation package due to network error.

Source functions as APP Store on iOS and Android, where users can download and update.

Ubuntu's default software download server is officially designated. If the files is downloaded slowly or error occurs during downloading, you can switch the software server to other source for downloading.

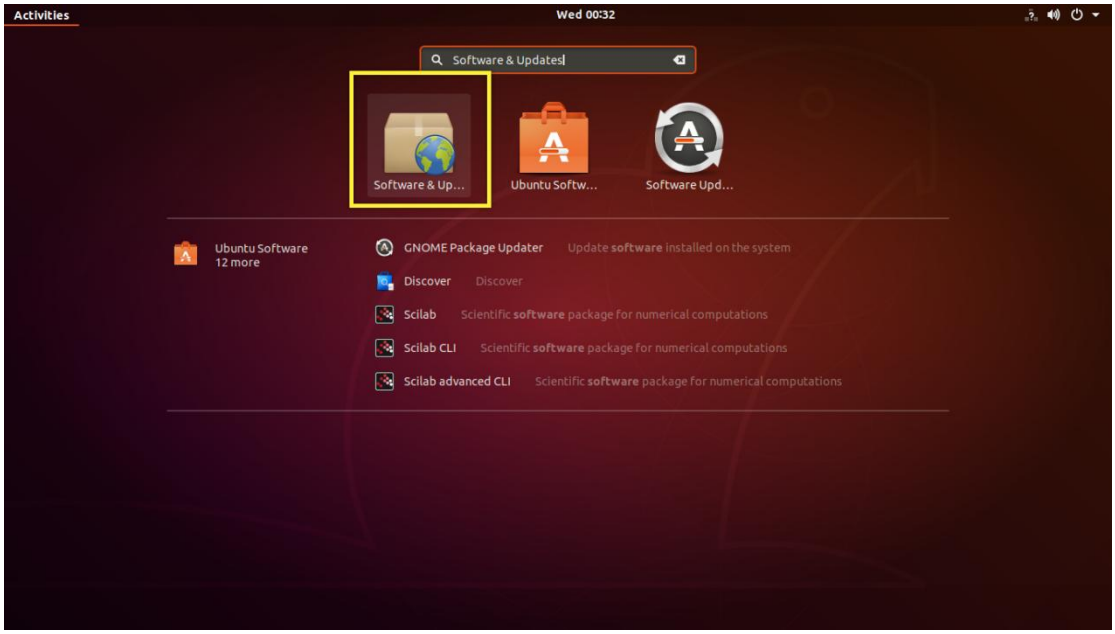
Take changing into aliyun for example. And you can select the appropriate source based on your country or region.

1) Firstly, check network connection.

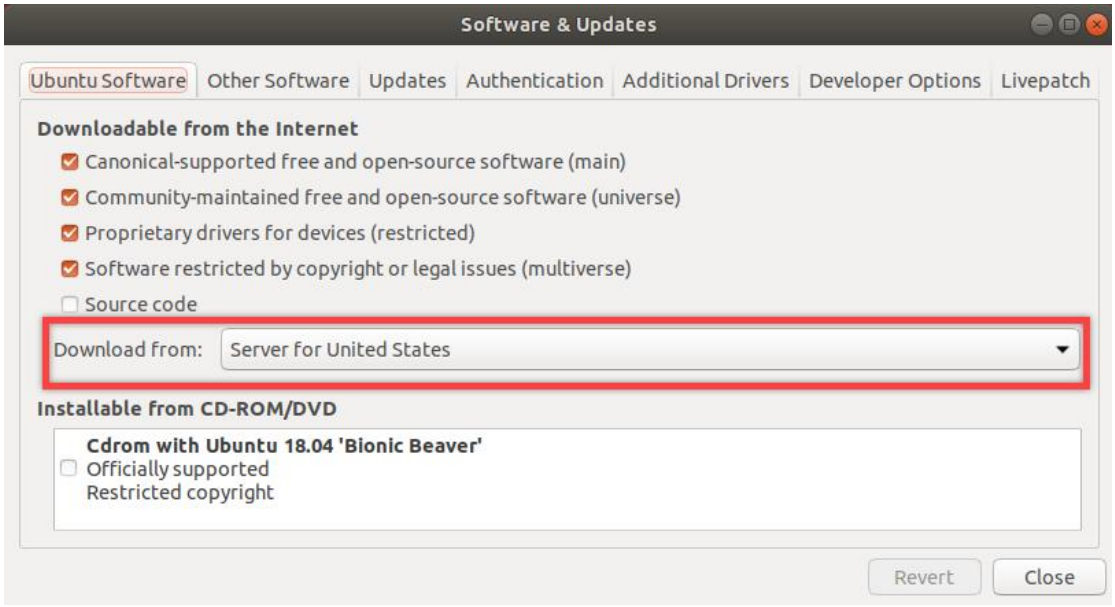


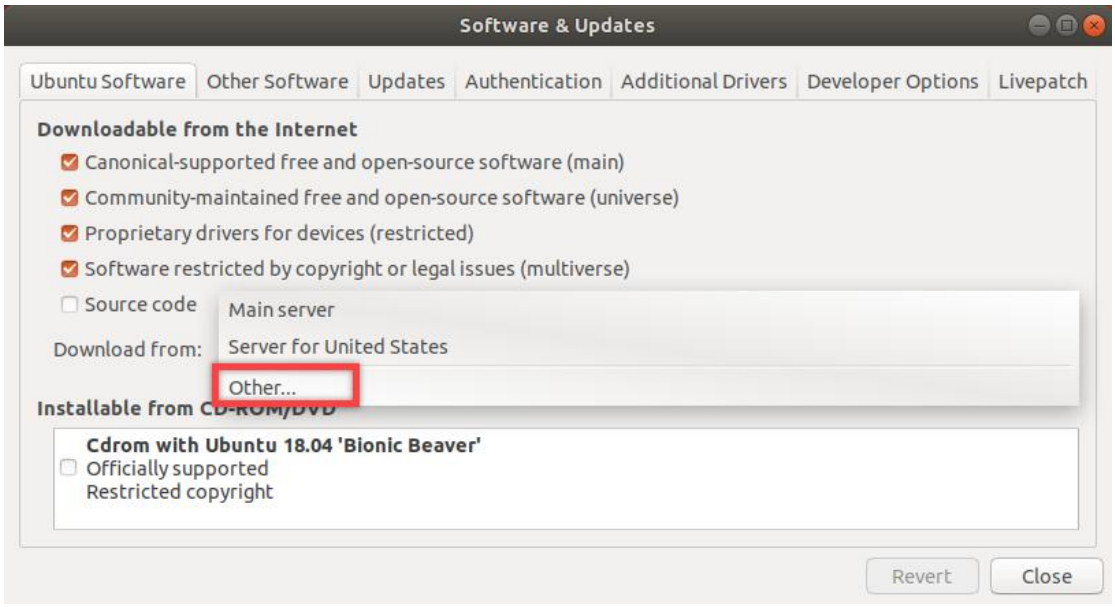
2) click the button at bottom left corner, and then input "**setting**" in input field.

3) Then, search "**software and update**", and double click the icon to open.

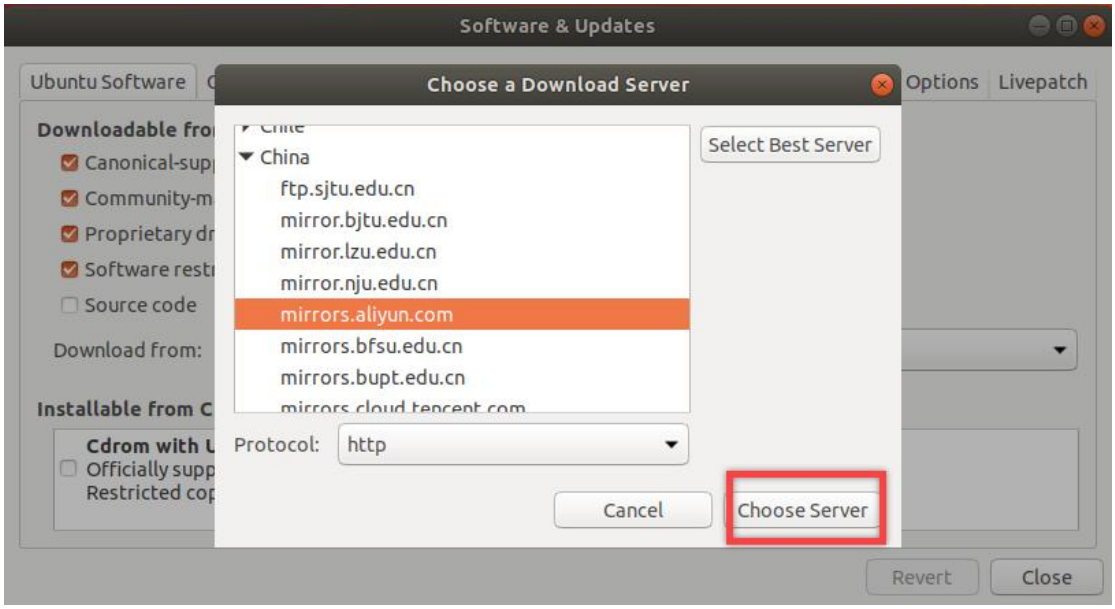


4) After opening, click "**Download from->Other**".





5) Scroll the list to find “**mirrors.aliyun.com**” server.



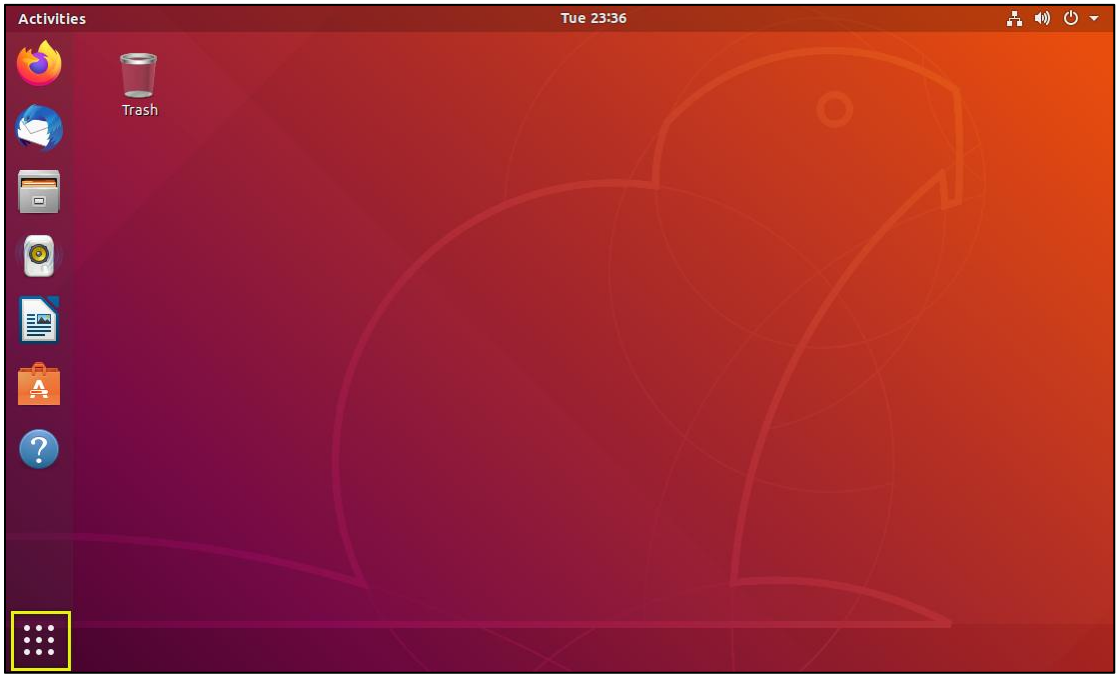
6) If you are not sure which server is suitable, you can click "**Select Best Server**".

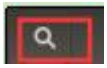
After selection, you are required to input the set password.

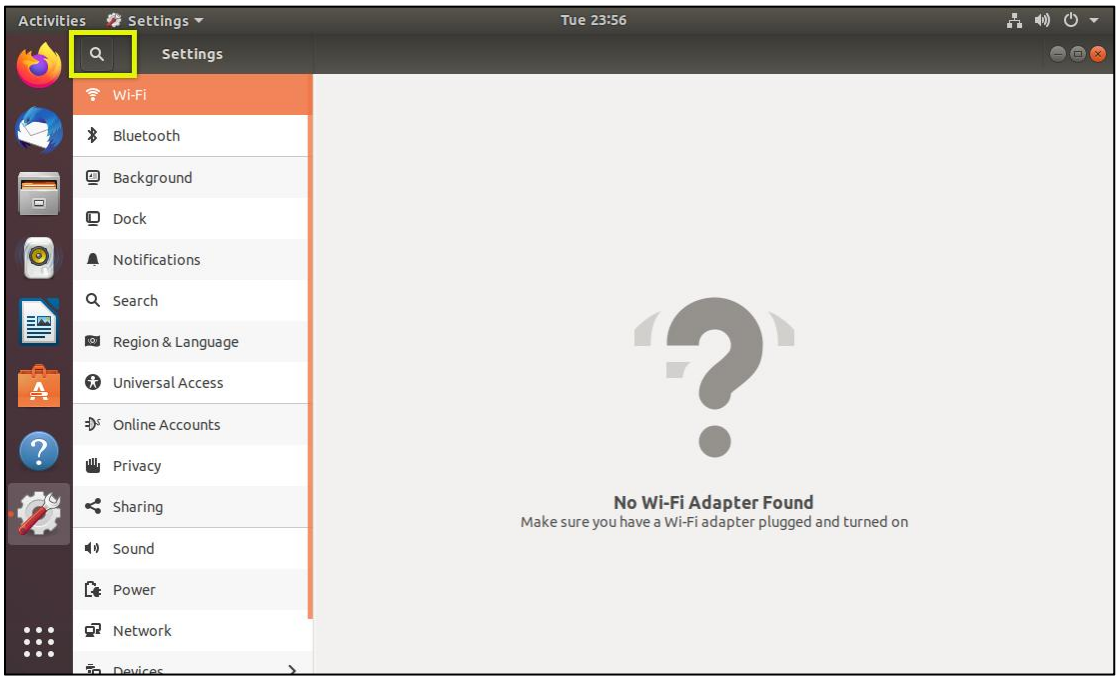
1.3 Modify Resolution

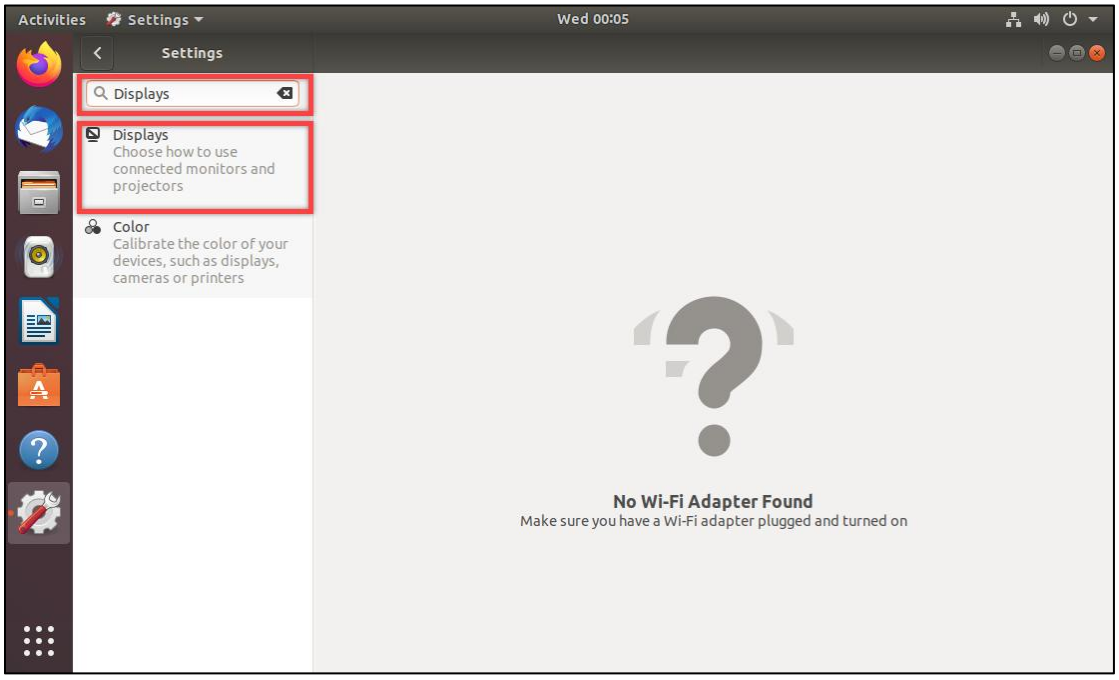
If you need to change the display resolution, you can follow the following steps to operate.

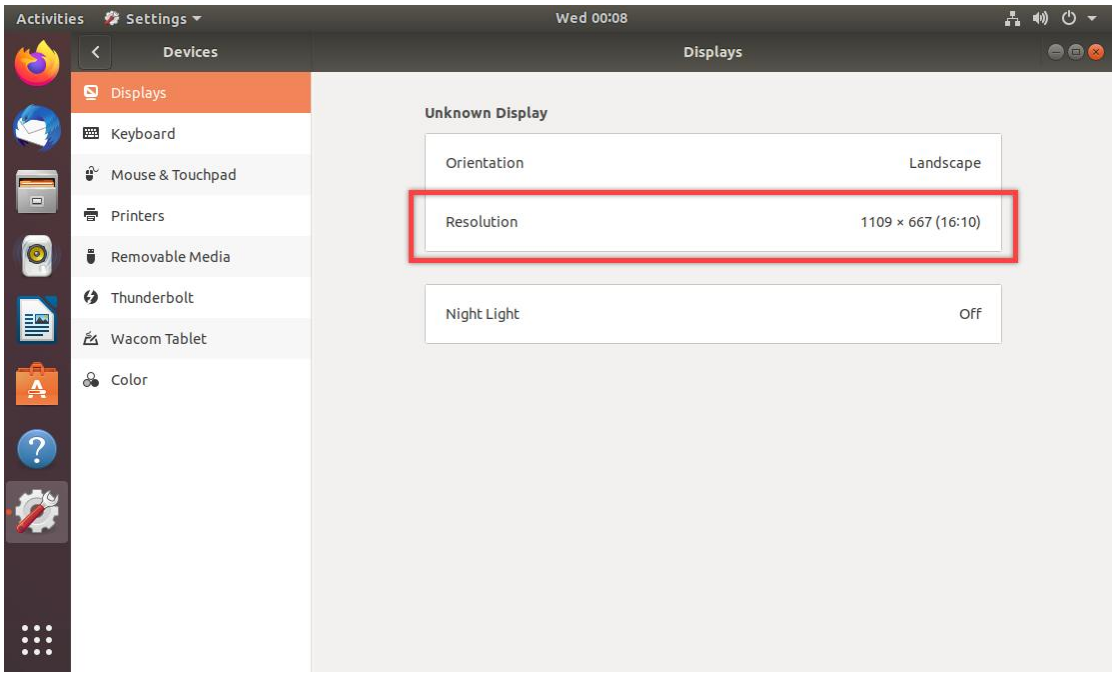
1) Click the button at the bottom left corner, and then input "**setting**" in the input field.



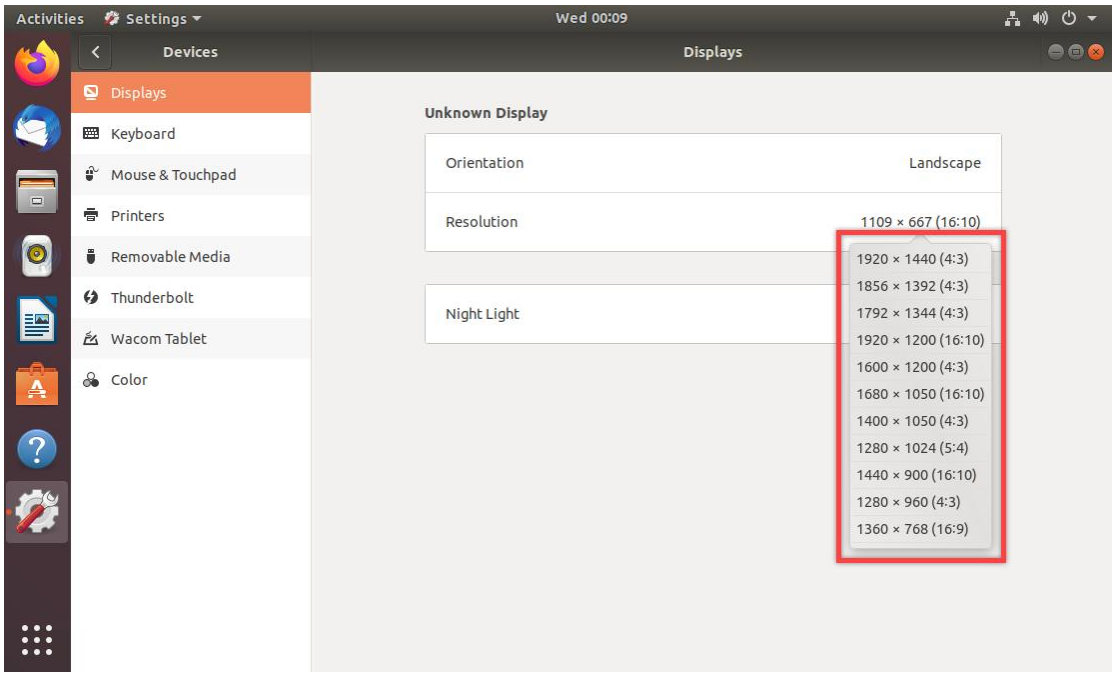
2) Double click the setting icon, and then click  and input "**Display**".

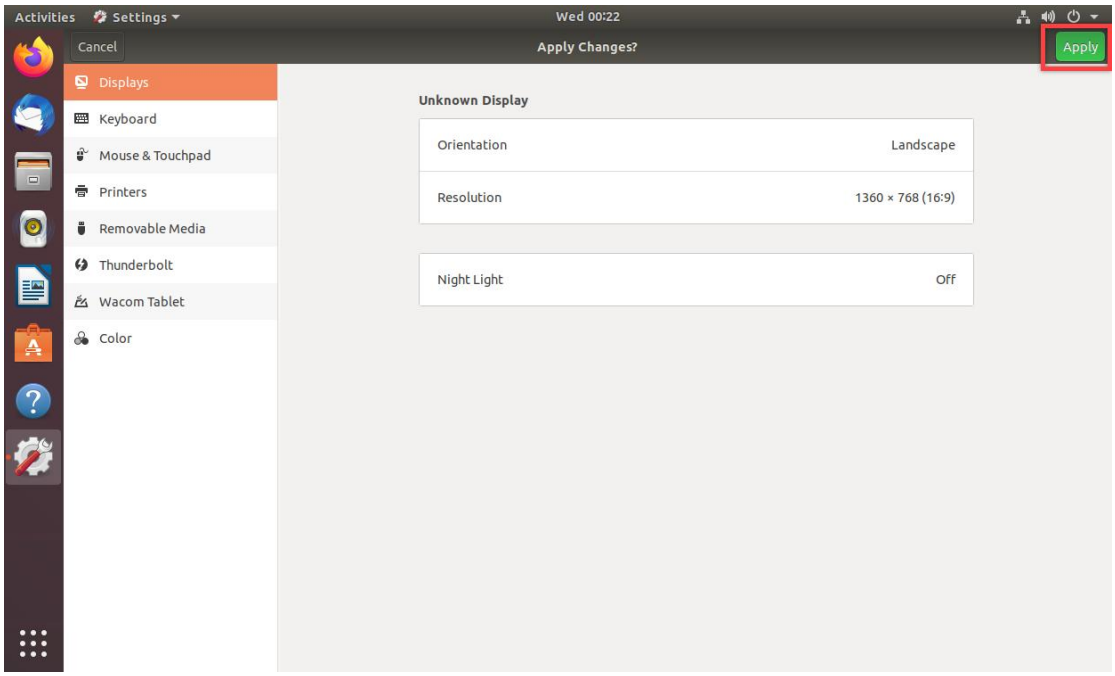




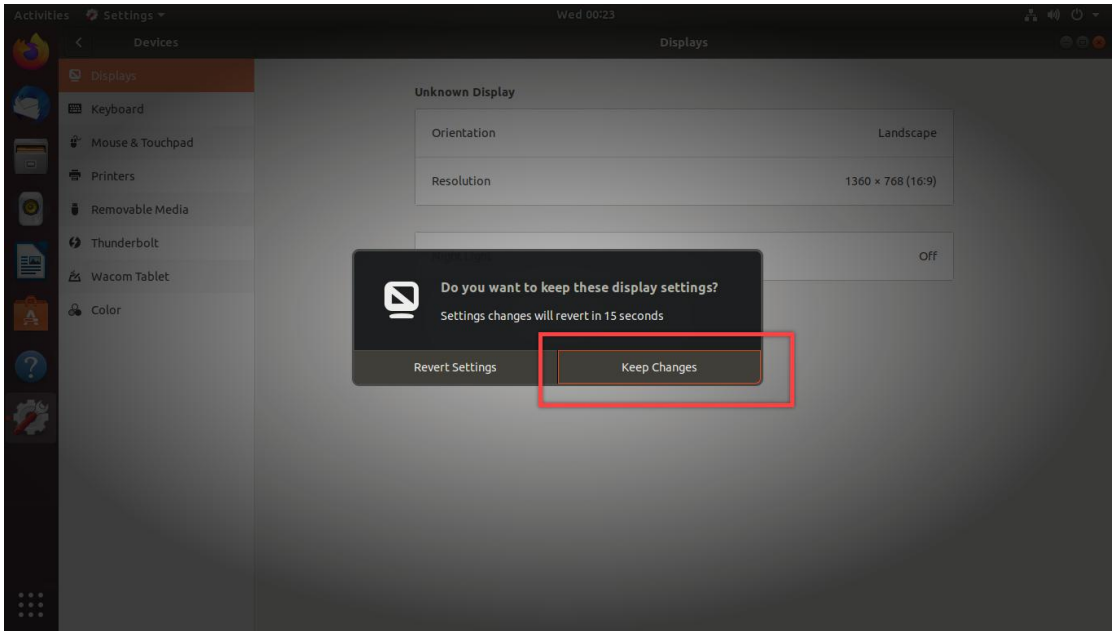


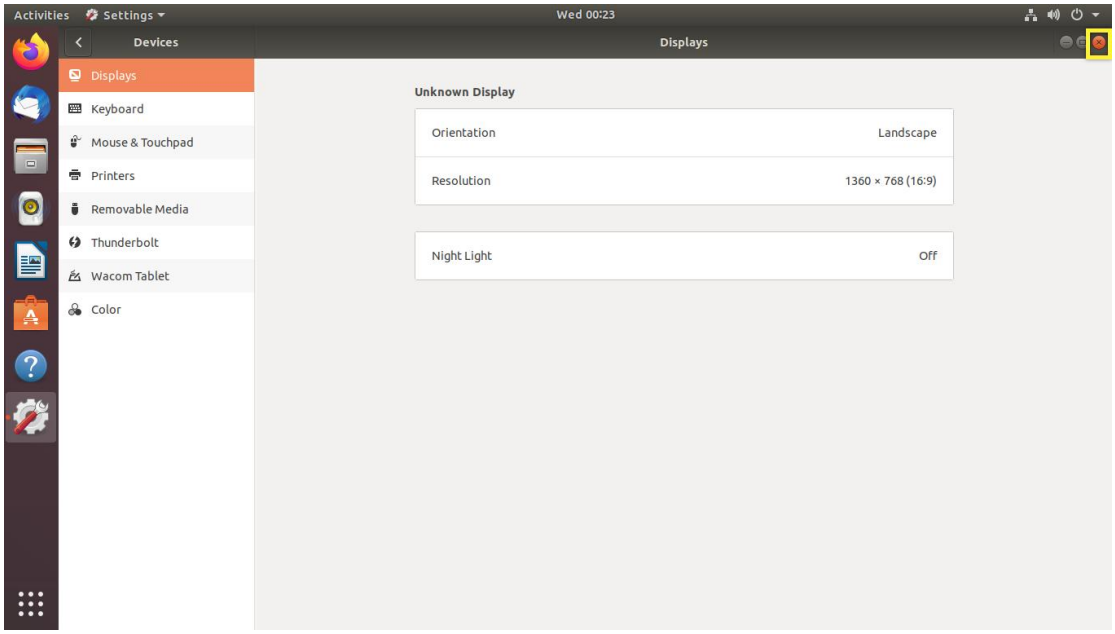
3) You can select the resolution you want, and then follow the pop-up instructions to complete modification.

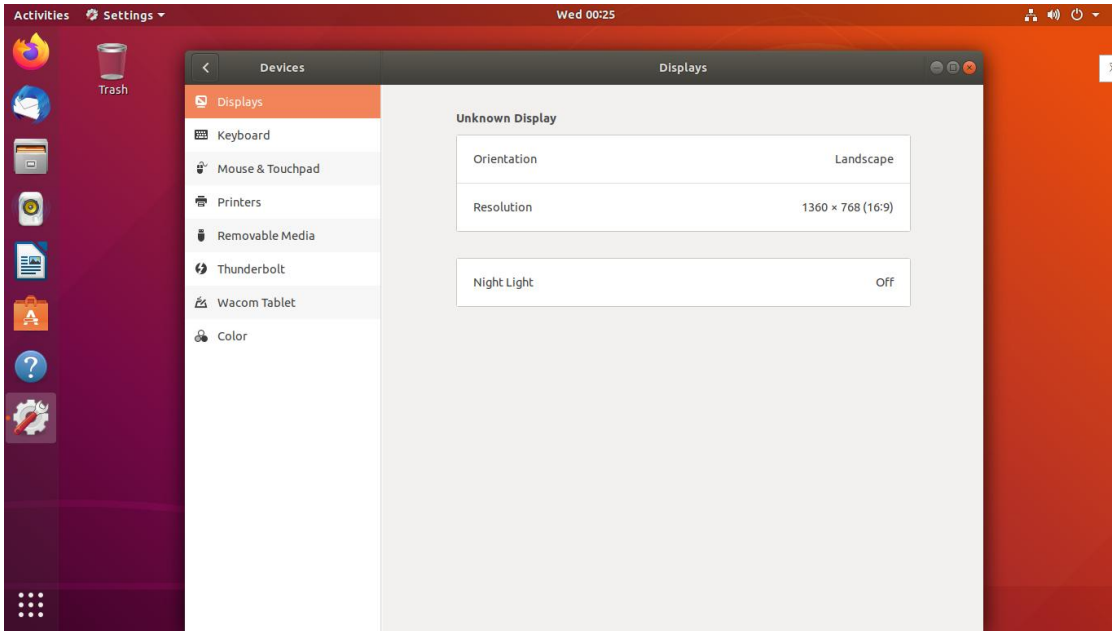




4) After modification, the display effect is as follow.


Activities
Settings
Wed 00:23
Devices
Displays
Displays
Keyboard
Mouse & Touchpad
Printers
Removable Media
Thunderbolt
Wacom Tablet
Color
Unknown Display
Orientation
Landscape
Resolution
1360 × 768 (16:9)
Off
Do you want to keep these display settings?
Settings changes will revert in 15 seconds
Revert Settings
Keep Changes


Activities
Settings
Wed 00:23
Devices
Displays
Displays
Keyboard
Mouse & Touchpad
Printers
Removable Media
Thunderbolt
Wacom Tablet
Color
Unknown Display
Orientation
Landscape
Resolution
1360 × 768 (16:9)
Night Light
Off



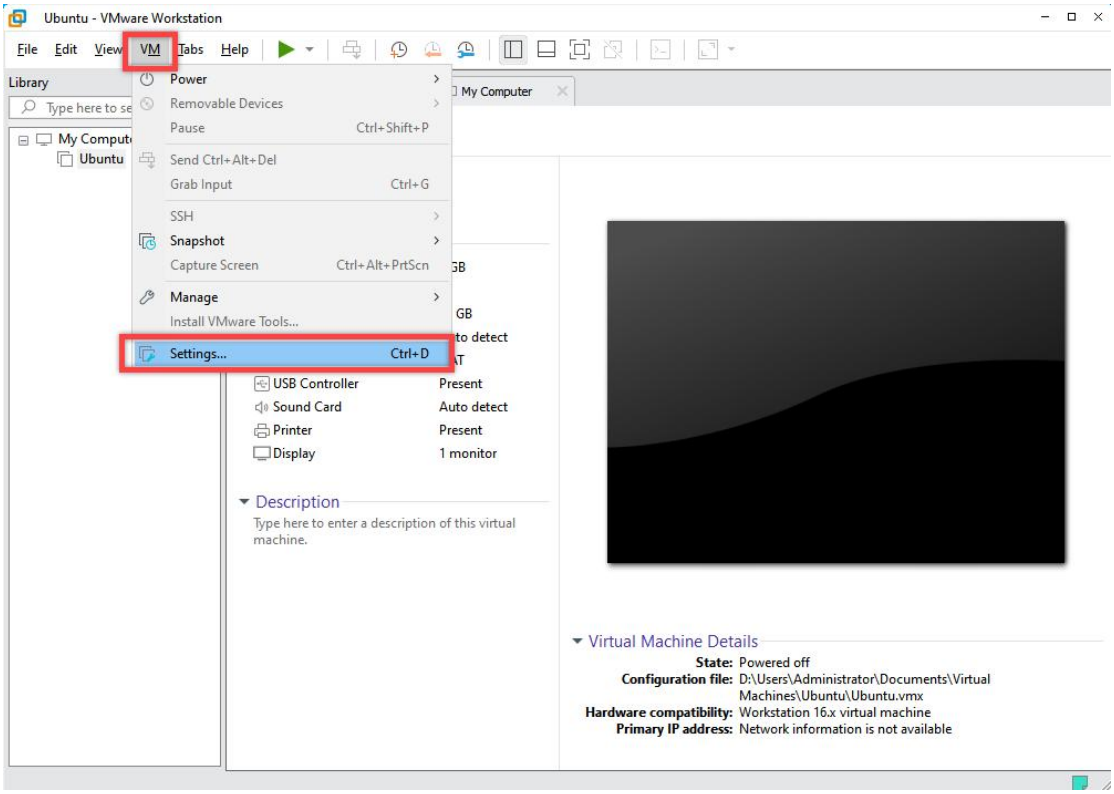
1.4 Share Folder

In later program development, we need to transfer the files between the hosts and virtual machine. For example, the source codes are saved in virtual machine, while they need to be read or modified on hosts. Therefore shared folder is required.

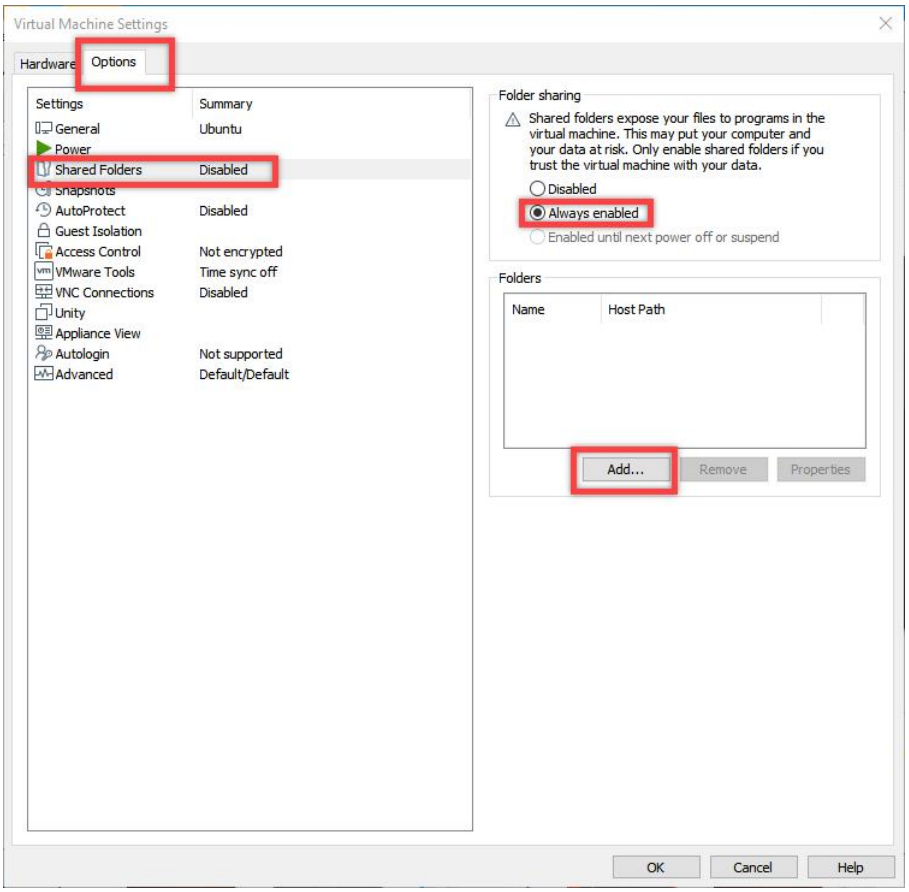
If you are using VMware, we can directly set on VMware to realize the function of shared folder.

1.4.1 Create and Check Share Folder

1) Power off Ubuntu, and click “**virtual machine->settings**”

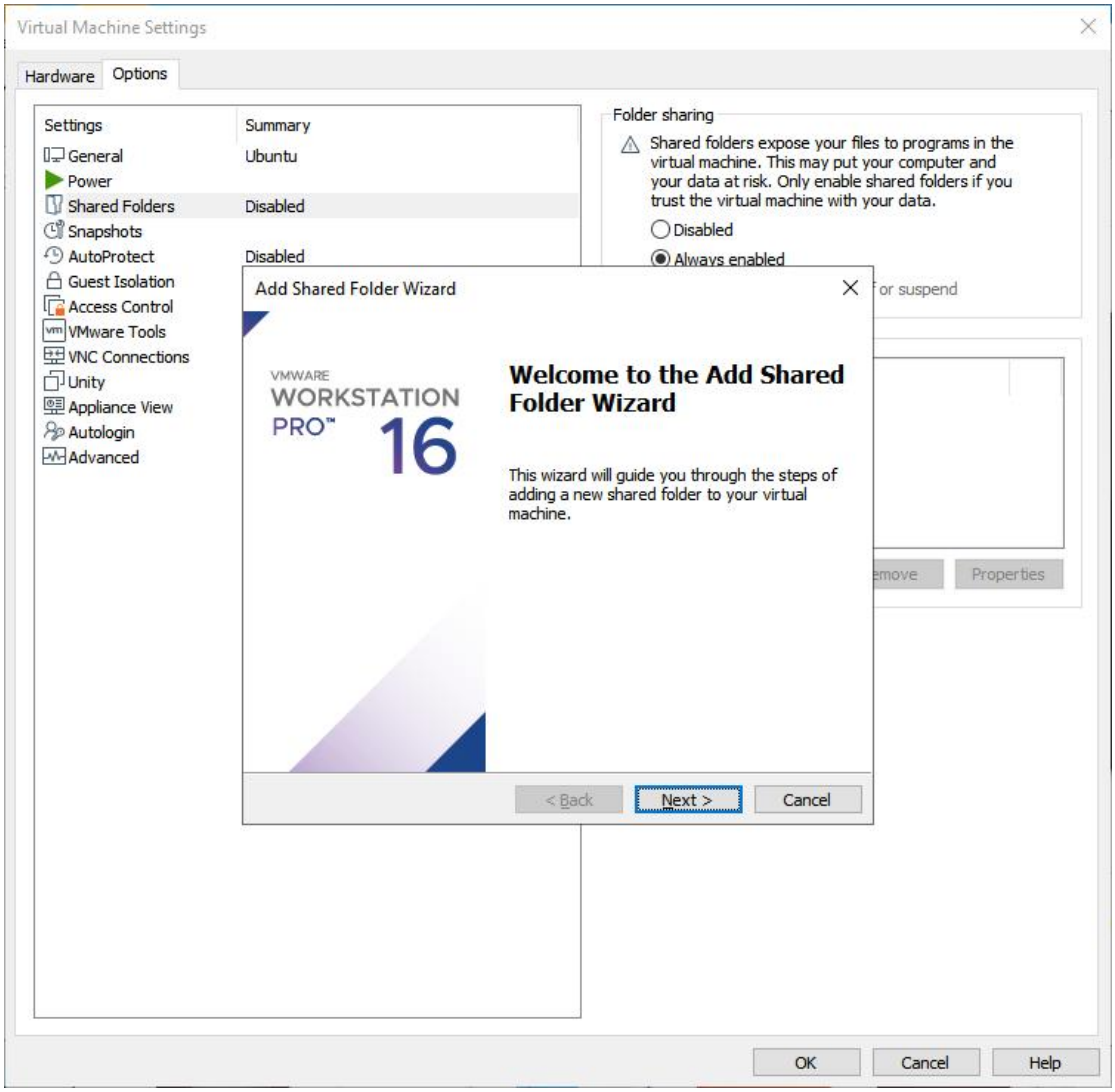


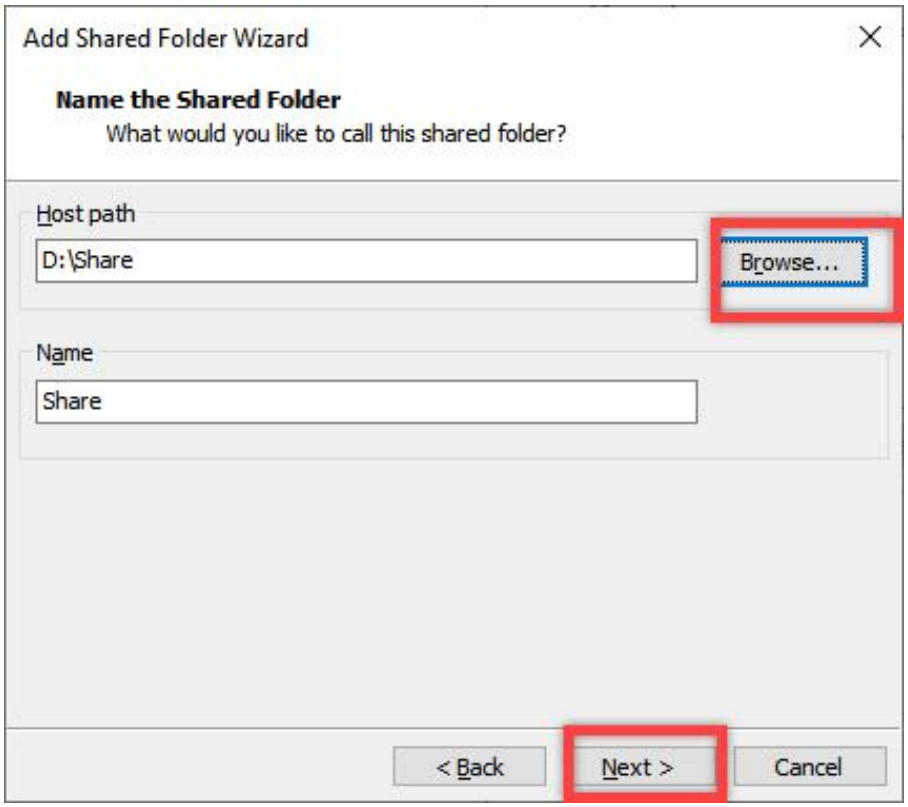
2) Then, click "**Option->Shared Folders->Always Enabled->Add**".

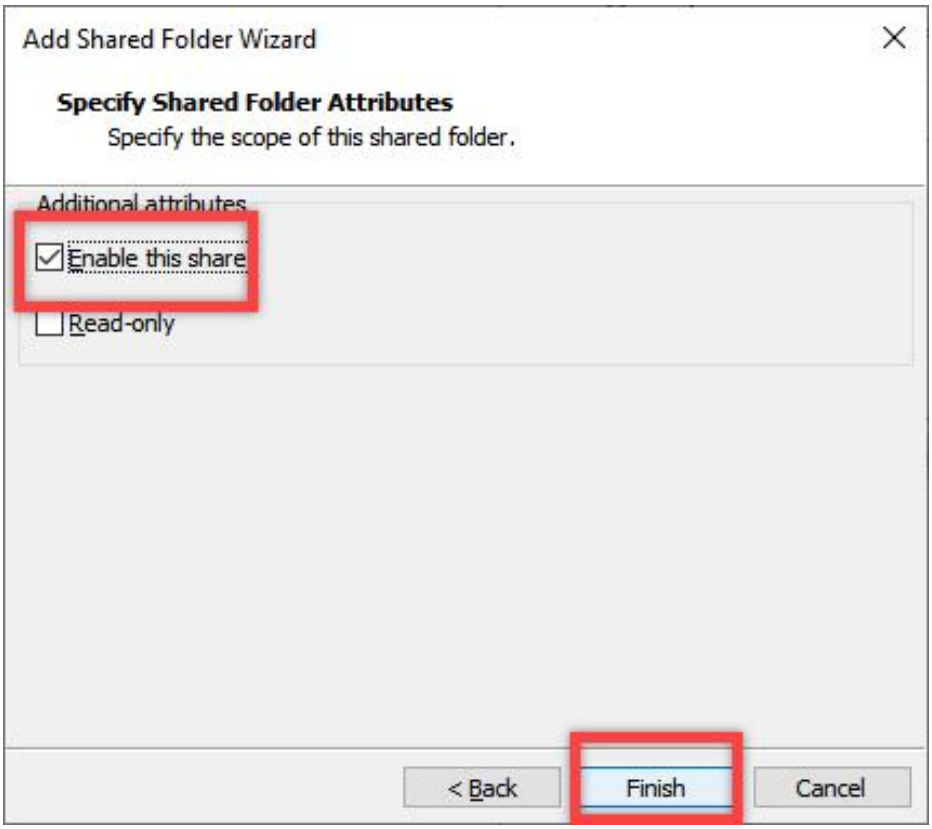


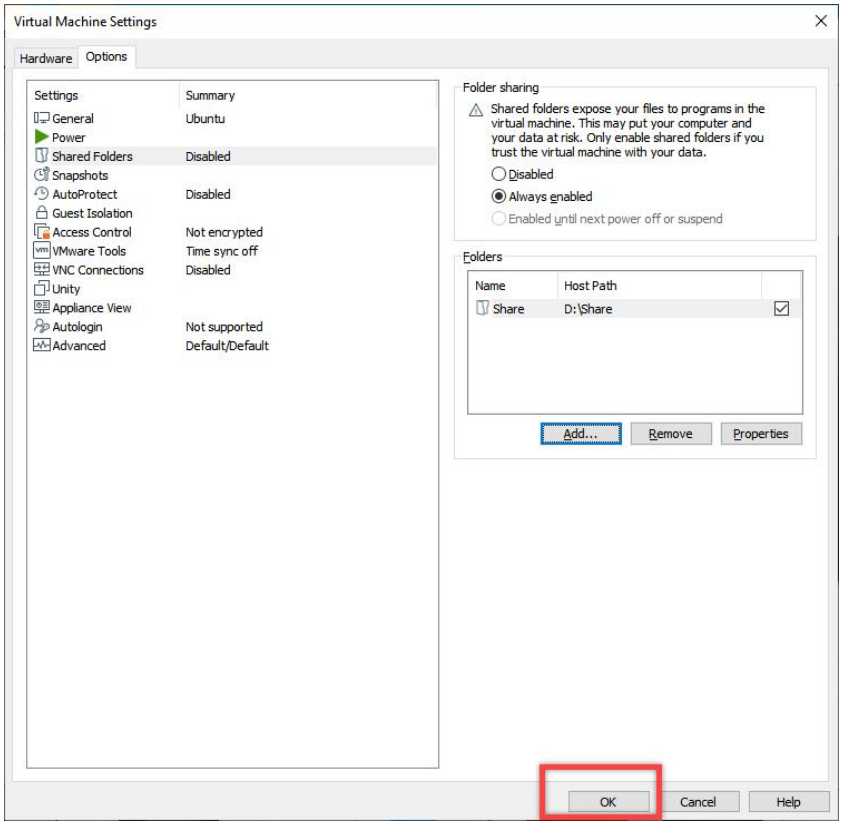
3) In later pop-up interface, click “**Next->Browse**”, and select the host path where the folder is built. And, name it “**share_test**”.

Note: ensure there is no content in the share holder when first configuration, otherwise it will fail to configure. If share folder contains files, please remove the files first.




Add Shared Folder Wizard
Name the Shared Folder
What would you like to call this shared folder?
Host path
D:\Share
Browse...
Name
Share
< Back
Next >
Cancel


Add Shared Folder Wizard
Specify Shared Folder Attributes
Specify the scope of this shared folder.
Additional attributes
Enable this share
Read-only
< Back
Finish
Cancel



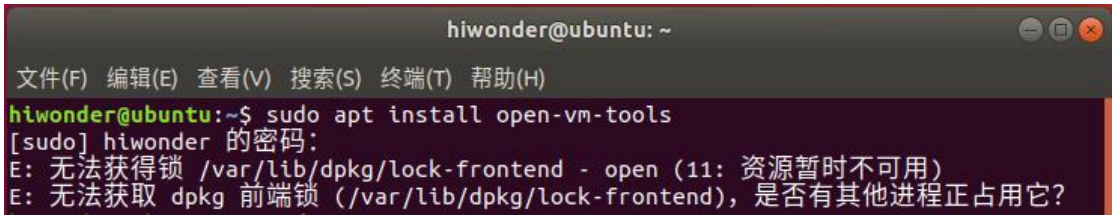
4) Power on virtual machine and start the system. If it shows that “cannot connect to virtual device”, choose “NO”.

5) Having entered the desktop, press “**Ctrl+Alt+T**” to open command line terminal.

6) Input command “**sudo apt install open-vm-tools**”, then input password. (The input password will hidden. Press Enter when you finish.)

```
hiwonder@ubuntu:~$ sudo apt install open-vm-tools
[sudo] password for hiwonder:
Reading package lists... Done
Building dependency tree
Reading state information... Done
open-vm-tools is already the newest version (2:11.0.5-4ubuntu0.18.04.1).
0 upgraded, 0 newly installed, 0 to remove and 219 not upgraded.
hiwonder@ubuntu:~$
```

Note: if following messages pop up, you can restart NAT server according to the file in "**2. Linux Basic Lesson>Lesson 2 Environment Configuration in Windows**".



---

7) Input "**ls /mnt/**" to check whether "**hgfs**" folder is generated under "**/mnt**" directory after configuring virtual machine.

```
hiwonder@ubuntu:~$ ls /mnt/
hgfs
```

Note: If there is no "hgfs" folder as pictured

```
hiwonder@ubuntu:~$ ls /mnt/
hiwonder@ubuntu:~$
```

You need to create manually. Input command "sudo mkdir /mnt/hgfs". (Password is required. The input password will hidden. Press Enter when you finish.)

---

8) Input command "**sudo mount -t fuse.vmhgfs-fuse .host:/ /mnt/hgfs -o allow_other**" to mount the folder manually, if you found "**hgfs**" folder under

"**/mnt**" directory

```
hiwonder@ubuntu:~$ sudo mount -t fuse.vmhgfs-fuse .host:/ /mnt/hgfs -o allow_oth
er
```

Note: if the prompts below occur

```
hiwonder@ubuntu:~$ sudo mount -t fuse.vmhgfs-fuse .host:/ /mnt/hgfs -o allow_oth
er
fuse: mountpoint is not empty
fuse: if you are sure this is safe, use the 'nonempty' mount option
```

Input command "sudo mount -t fuse.vmhgfs-fuse .host:/ /mnt/hgfs -o allow_other -o nonempty" to remount.

9) Input command "**cd /mnt/hgfs/Share**" to enter shared folder when you finish mounting. (Shared folder name should be consistent with name of the folder you create in host device. If not consistent, please change it.)

10) The shared folder is saved in **E:\share**, and ****/mnt/hgfs/share/**** of the virtual machine. Make a test: put "test.txt" into the shared folder of host device.

Input "**ls**" under /mnt/hgfs/Share/ of virtual machine. If this file shows up, the configuration is successful.

```
hiwonder@ubuntu:/mnt/hgfs/Share$ ls
test.txt
hiwonder@ubuntu:/mnt/hgfs/Share$
```

1.5.2 Common Problem in Shared Folder

① files cannot be shared

1) check whether hgfs shared folder is created according to step 1-7 in "**1.4.1 Create and Check Share Folder**"

2) Check whether local shared folder contains files. If there are files in it, create a new shared folder according to step 2-3 in "**1.4.1 Create and Check Share Folder** "

3) Configure the virtual machine shared folder again referring to step 1-2 in "**1.4.1 Create and Check Share Folder**"

② Cannot find shared folder after restart virtual machine

If you cannot find the shared folder after manual mounting and restarting virtual machine, you can mount it automatically. You can configure automatic mounting through the vi editor. Since the pre-installed vi editor is a simple version in Ubuntu system, in order to better edit the files, we need to uninstall it and reinstall the complete version of the vi editor.

1) Open the command line terminal and input "**sudo apt-get remove vim-common**" to uninstall the vi editor.

```
hiwonder@ubuntu:~$ sudo apt-get remove vim-commo
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  xxd
Use 'sudo apt autoremove' to remove it.
The following packages will be REMOVED:
  ubuntu-minimal vim-common vim-tiny
0 upgraded, 0 newly installed, 3 to remove and 216 not upgraded.
After this operation, 1,687 kB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 127837 files and directories currently installed.)
Removing ubuntu-minimal (1.417.5) ...
Removing vim-tiny (2:8.0.1453-1ubuntu1.4) ...
Removing vim-common (2:8.0.1453-1ubuntu1.4) ...
Processing triggers for desktop-file-utils (0.23-1ubuntu3.18.04.2) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for gnome-menus (3.13.3-11ubuntu1.1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for mime-support (3.60ubuntu1) ...
```

2) Input command “**sudo apt-get install vim**” to install the vi editor of the complete version.

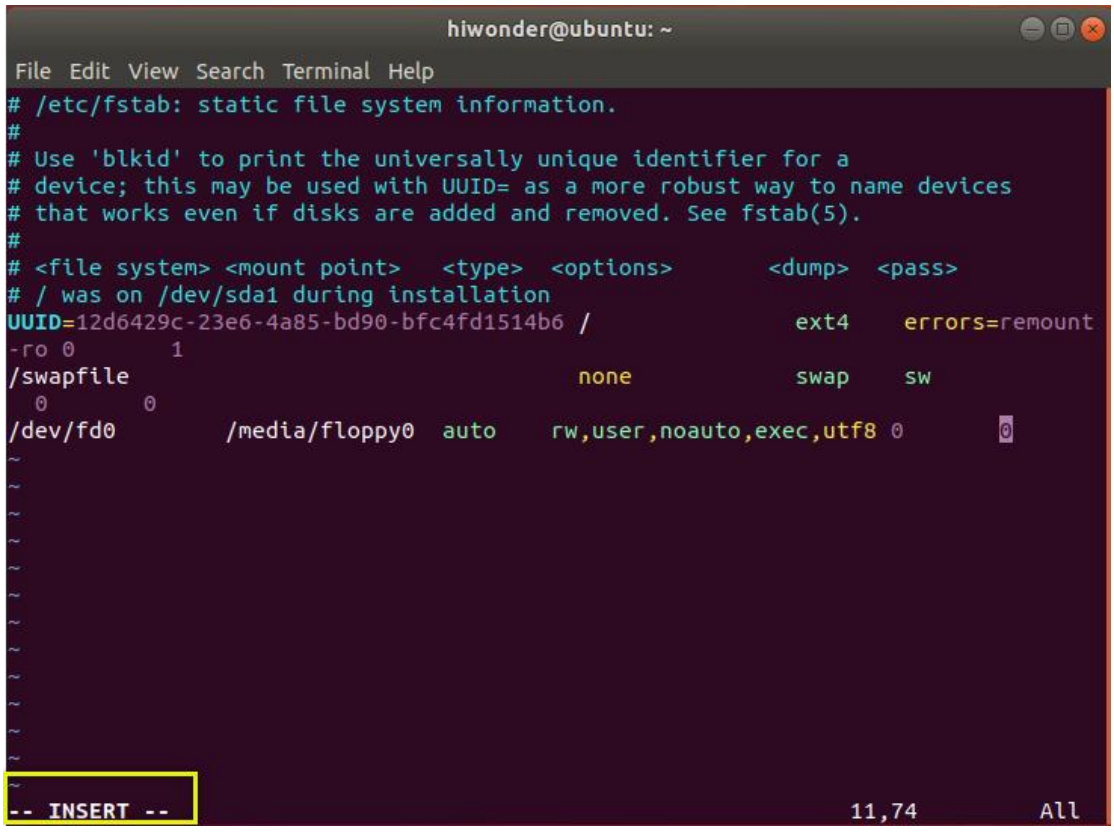
```
hiwonder@ubuntu:~$ sudo apt-get install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  vim-common vim-runtime
Suggested packages:
  ctags vim-doc vim-scripts
The following NEW packages will be installed:
  vim vim-common vim-runtime
0 upgraded, 3 newly installed, 0 to remove and 216 not upgraded.
Need to get 6,660 kB of archives.
After this operation, 32.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://mirrors.aliyun.com/ubuntu bionic-updates/main amd64 vim-common all
2:8.0.1453-1ubuntu1.8 [71.1 kB]
Get:2 http://mirrors.aliyun.com/ubuntu bionic-updates/main amd64 vim-runtime all
 2:8.0.1453-1ubuntu1.8 [5,435 kB]
Get:3 http://mirrors.aliyun.com/ubuntu bionic-updates/main amd64 vim amd64 2:8.0
.1453-1ubuntu1.8 [1,154 kB]
Fetched 6,660 kB in 1s (7,130 kB/s)
Selecting previously unselected package vim-common.
(Reading database ... 127773 files and directories currently installed.)
Preparing to unpack .../vim-common_2%3a8.0.1453-1ubuntu1.8_all.deb ...
Unpacking vim-common (2:8.0.1453-1ubuntu1.8) ...
Selecting previously unselected package vim-runtime.
```

3) Input command “**sudo vi /etc/fstab**”, and open this configuration file through vi editor. And then input the password. Pay attention the password you input will be hidden, and you can press Enter after inputting.

```
hiwonder@ubuntu:~$ sudo vi /etc/fstab
[sudo] password for hiwonder:
```

4) Copy "**.host:/ /mnt/hgfs fuse.vmhgfs-fuse auto,allow_other 0 0**"

5) Return to vi editor and press "i" key. Move to the end of the file through pressing " ↑ ↓ ←→" keys.



6) Press Enter and right click to paste the content copied in step 5 to the file.

```
/dev/fd0        /media/floppy0  auto    rw,user,noauto,exec,utf8 0       0
.host:/    /mnt/hgfs    fuse.vmhgfs-fuse    auto,allow_other    0    0
~
~
```

7) Press Enter and input ":wq" and press Enter to save and exit editing.

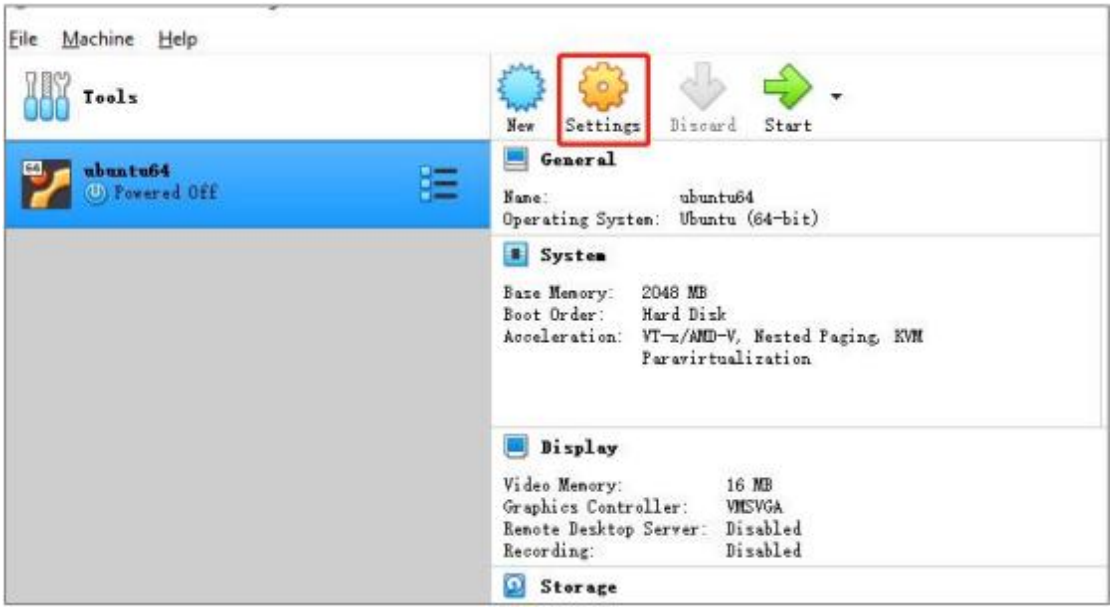
```
/dev/fd0        /media/floppy0  auto    rw,user,noauto,exec,utf8 0       0
.host:/    /mnt/hgfs    fuse.vmhgfs-fuse    auto,allow_other    0    0
~
~
~
~
~
~
~
~
:wq
```

8) Restart the virtual machine and check whether the shared folder can be found.

2. VirtualBox Virtual Machine Installation and Configuration

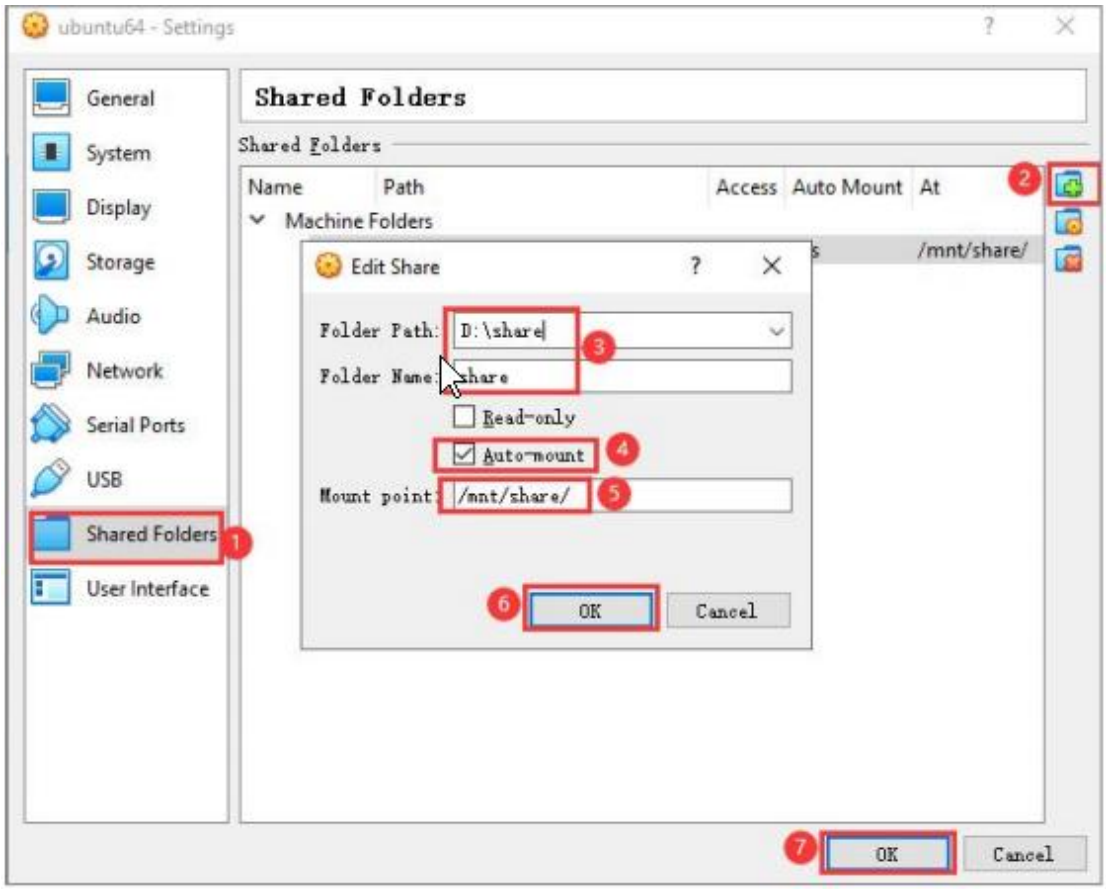
2.1 Create New Virtual Machine

1) Click "**settings**"

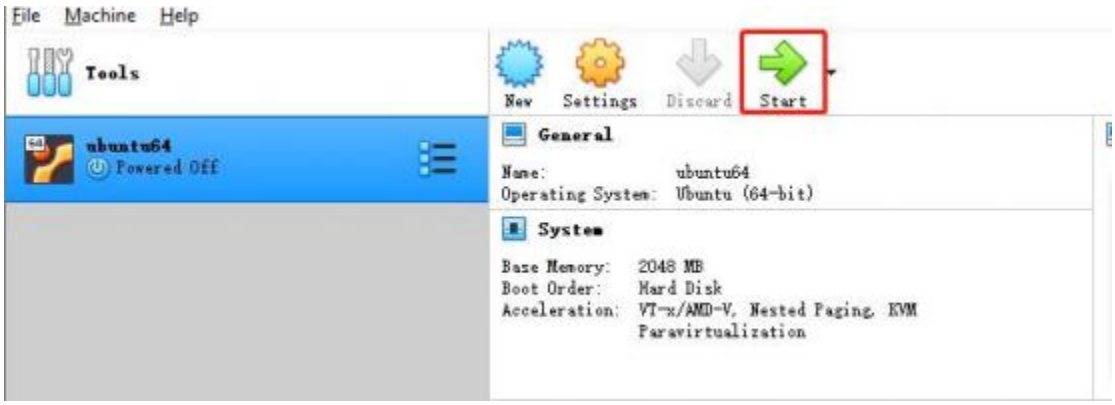


2) Click “shared folder>  ”. Then input the folder path and name. After that, tick “auto-mount” and fill in mount point “**/mnt/share/**”. When you finish , click “OK”

Note: ensure there is no files in the path you set, otherwise shared folder cannot be created.

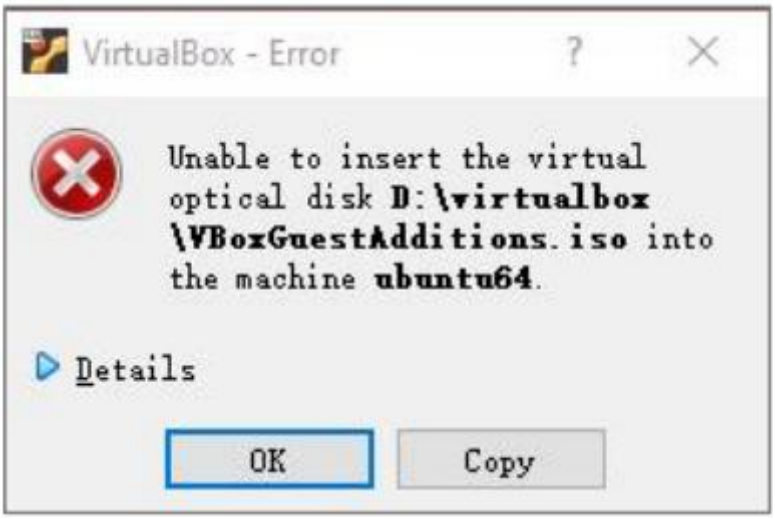


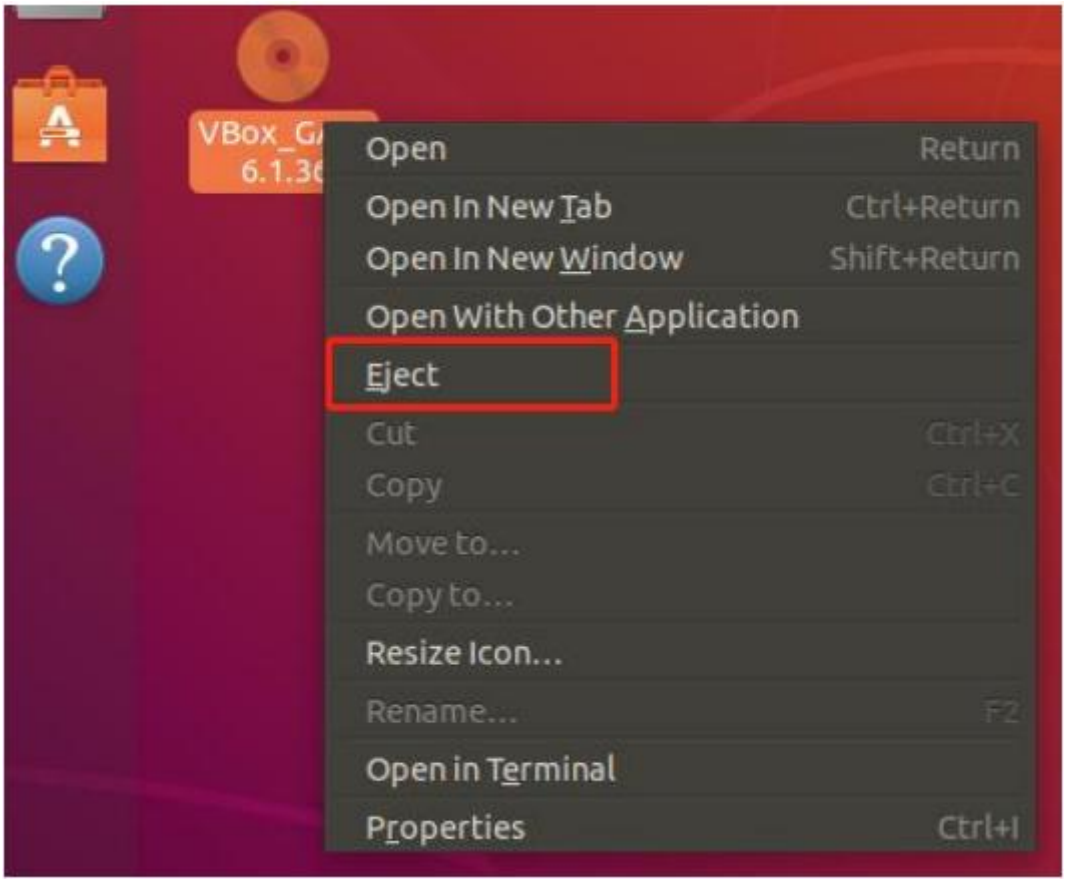
3) Start virtual machine.



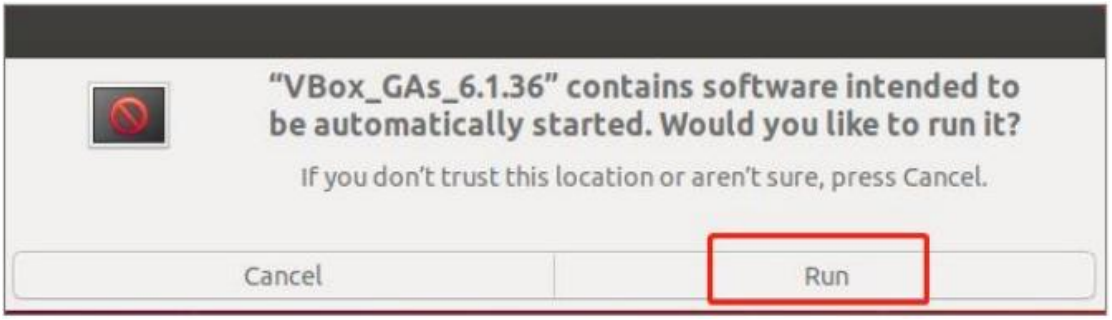
4) Click “**device>insert guest additions CD images**”

If this error box pops up, return back to the desktop, right click the disk to eject. Then install it again.

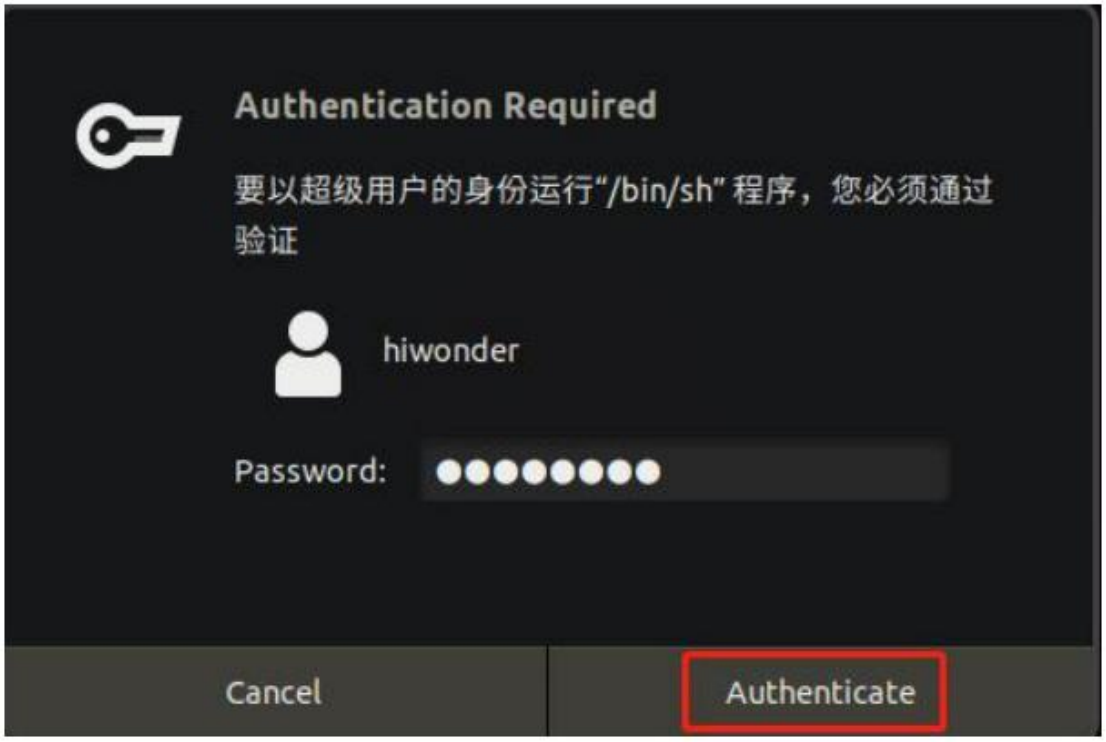




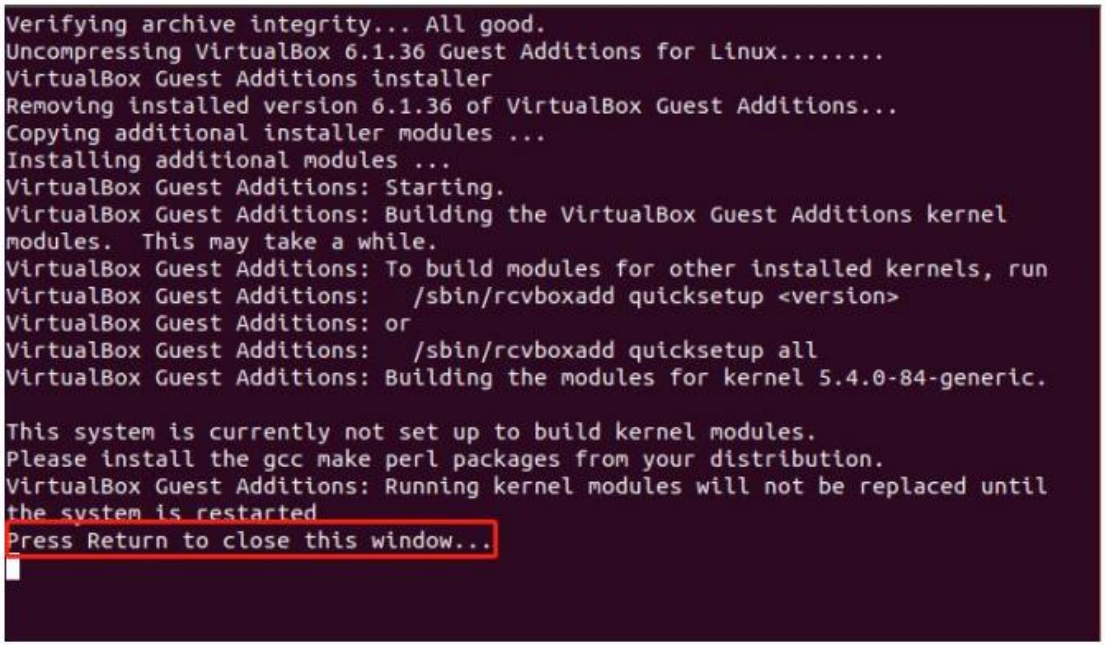
5) After installation, run this software.



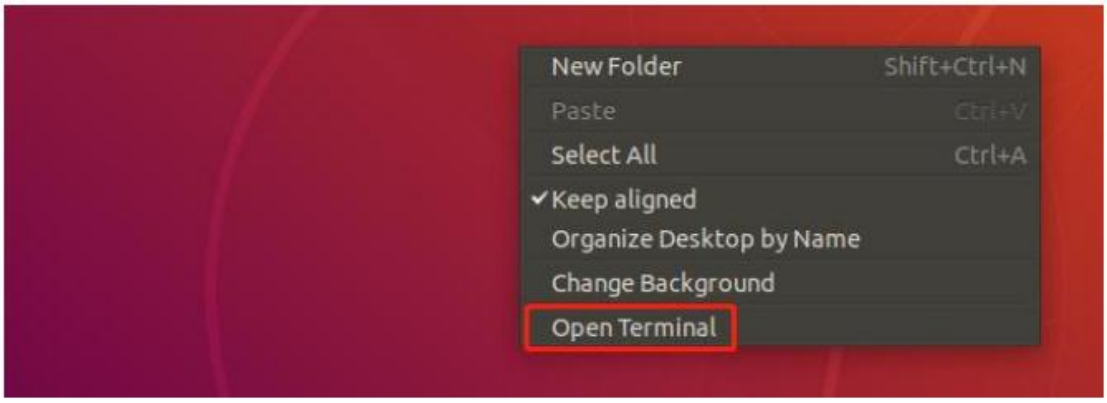
6) Input password to verify



7) If you receive the following prompt, it means that the installation is completed, and Press Enter to close this window.



8) Right click desktop, and select “open terminal”



9) Input command "**sudo mkdir /mnt/share**" to create shared folder. Password is required, and the password you input will hidden. Having finished, press Enter.

```
hiwonder@hiwonder-VirtualBox:~$ sudo mkdir /mnt/share
```

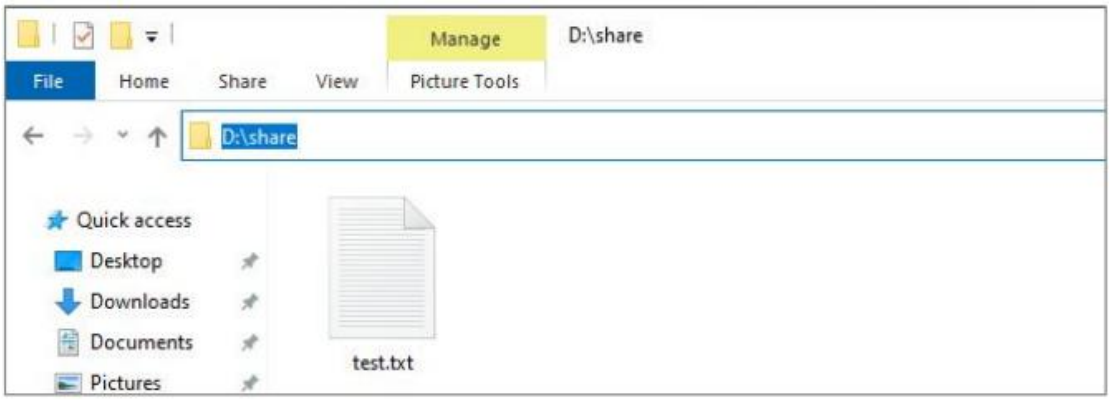
10) Input command "**sudo mount -t vboxsf share /mnt/share**" to mount shared folder. And the first "**share**" of the command is the path where the shard folder is stored under the host device. You need to change it based on real path.

```
hiwonder@hiwonder-VirtualBox:~$ sudo mount -t vboxsf share /mnt/share
```

11) After the folder is mounted, input command "**sudo usermod -aG vboxsf $(whoami)**" to get access to this folder. Lastly, restart virtual machine.

```
hiwonder@hiwonder-VirtualBox:~$ sudo usermod -aG vboxsf $(whoami)
```

12) Test whether the shared folder works. Put a test file into the shared folder on hose device.



13) Open the terminal on virtual machine. Input command "**cd /mnt/share**" to enter the shared folder.

```
hiwonder@hiwonder-VirtualBox:~$ cd /mnt/share
```

14) Input command "**ls**" to check what is included in the folder. If the files on two devices are consistent, the shared folder is created successfully.