Environment Setup (2022 OS Project)

Through the course project, you will build a simple FTP server and client to experiment with the key OS features.

Now, for the first part of the project, you are asked to set up the development environment for the simple FTP server and client. If you are familiar with the setup of virtual machines and Ubuntu Linux, you may jump directly to [Complete the gRPC Quick Start in C++] in the following. Otherwise, you can start from [Set up virtual machine (VMware)].

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1. Set up virtual machine (VMware)

中文參考網站：

🌐 免費虛擬機器VMware Workstation 16 Player下載與安裝

English version reference site :

Download and Install VMware Workstation Player/Pro (16/15/14) (minitool.com)

1. Link to VMware's official website, search「Workstation Player」, click 「VMware Workstation Player | VMware | TW」.
   https://www.vmware.com/tw.html

VMware Workstation Player | VMware | TW
裝置支援 **Workstation Player Workstation** Pro 支援 4K/5K/Retina 顯示器 ... 安全功能 **Workstation Player**
Workstation Pro Microsoft 虛擬化式安全性 (Guest) 支援 ... **Workstation Player Workstation** Pro 指令行操作：
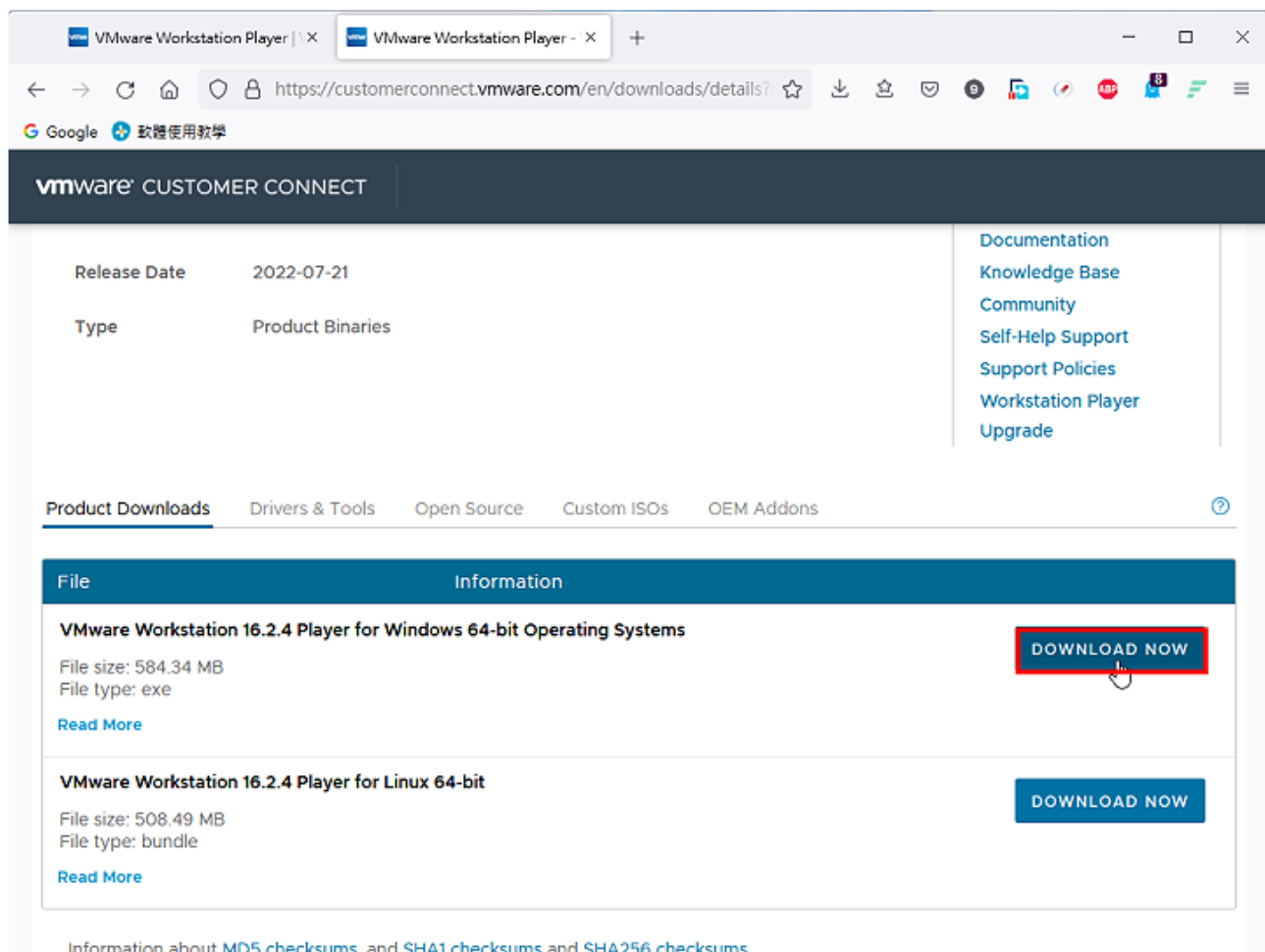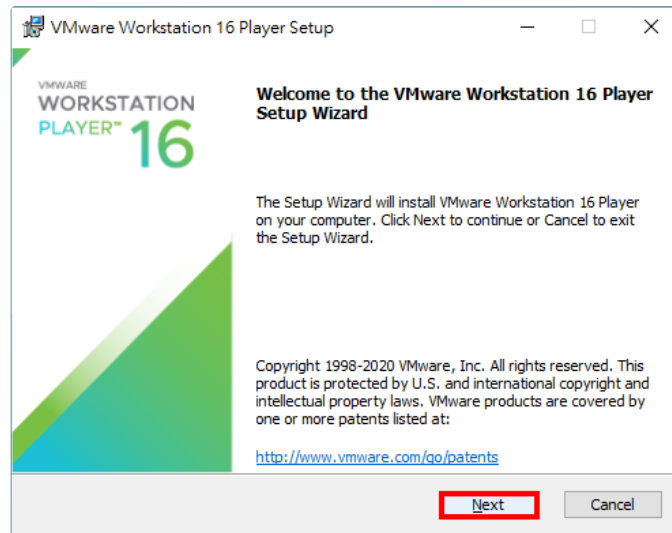vmrun 和 VIX

2. Click「免費下載」.
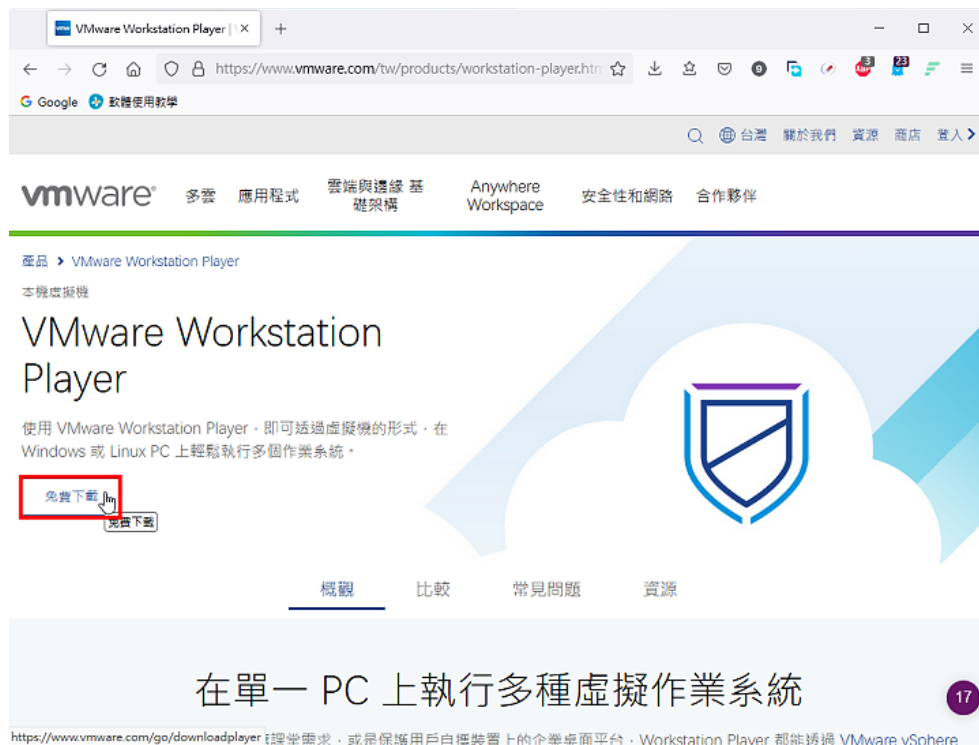
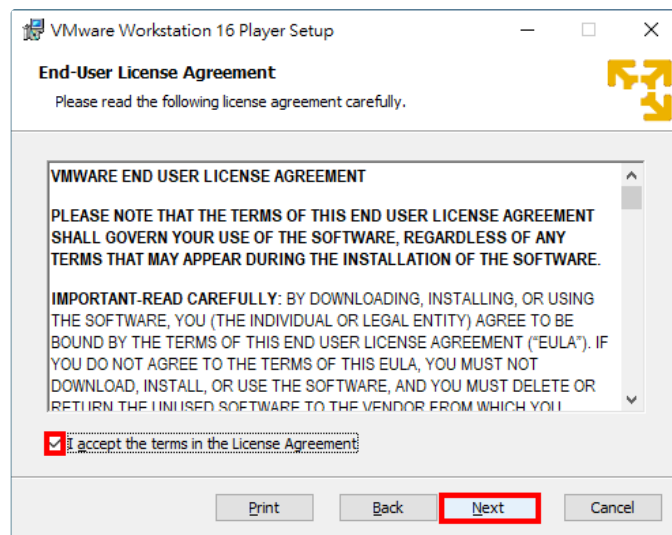

3. Click「GO TO DOWNLOADS」.
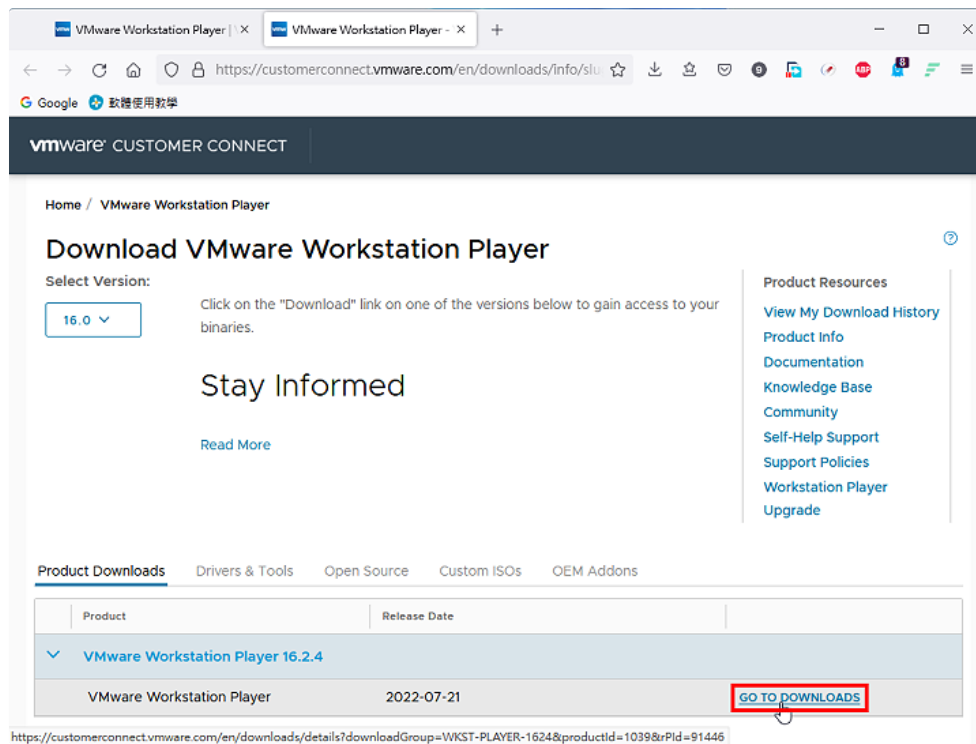
4. Click「DOWNLOAD NOW」。

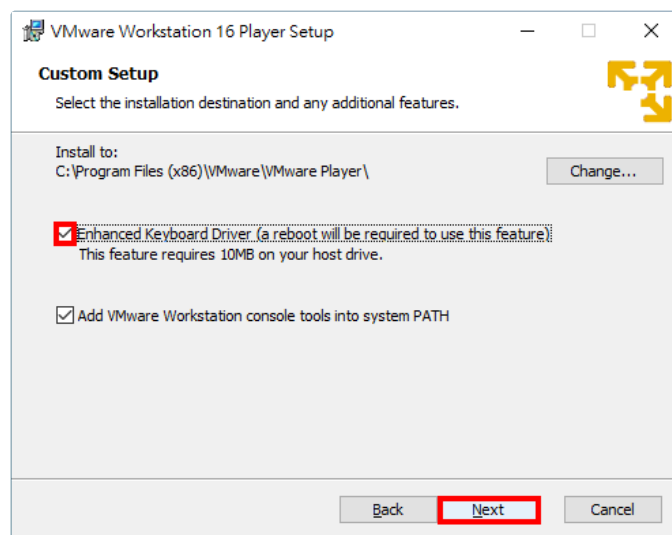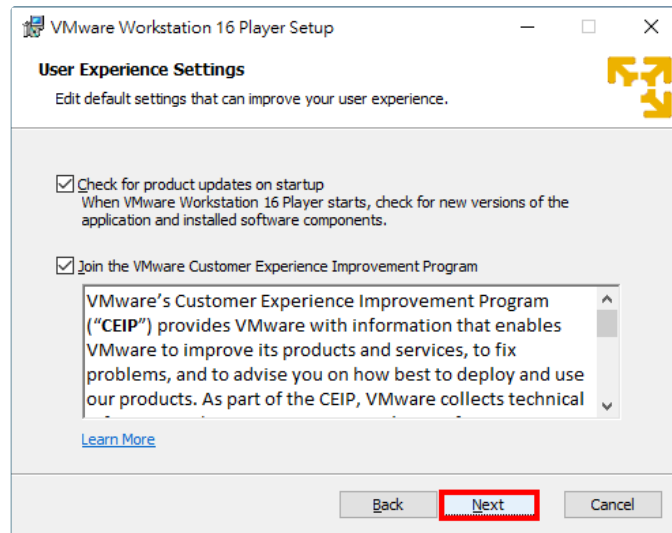5. Once downloaded, execute the .exe, ready to start the installation。

6. Click「Next」。

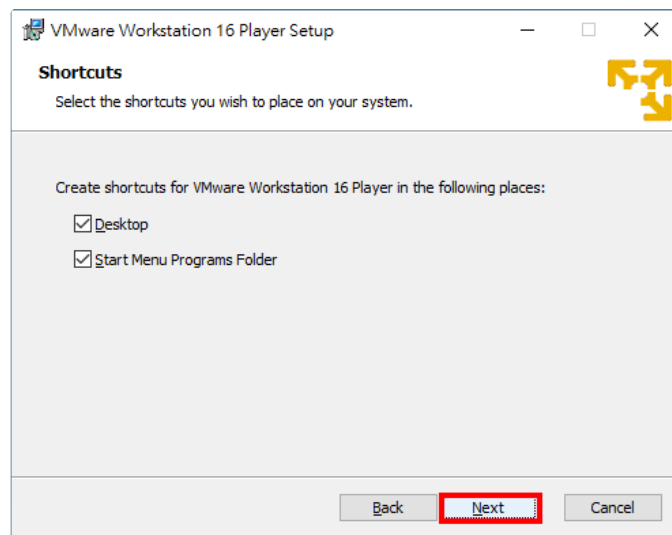7. Choose「I accept the terms in the License Agreement.」。
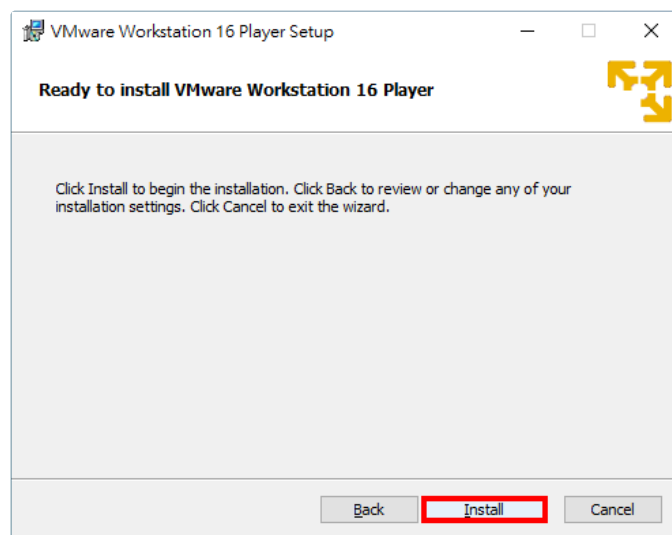

8. Choose「Enhanced Keyboard Driver...」。

9. Choose「Next」。
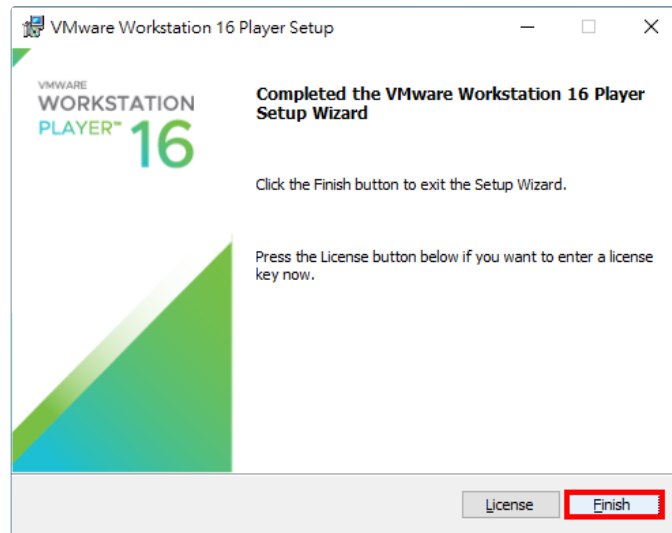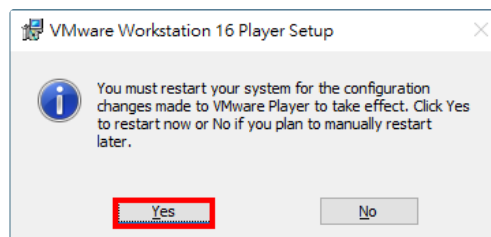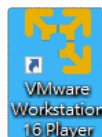

10. Click「Next」。

11. Click「Install」。
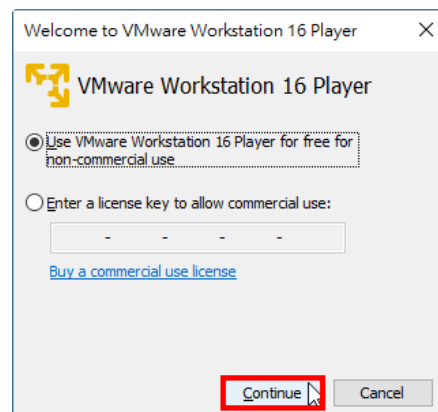
12. Wait for the installation to complete，click「Finish」。
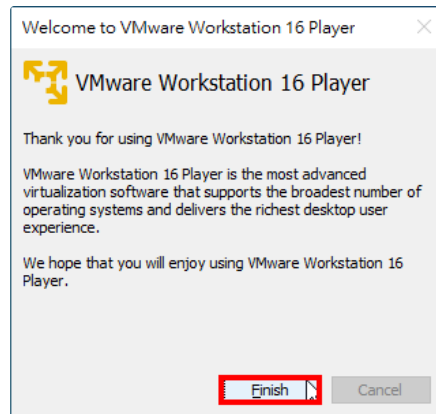
13. Click「Yes」，and need to restart。
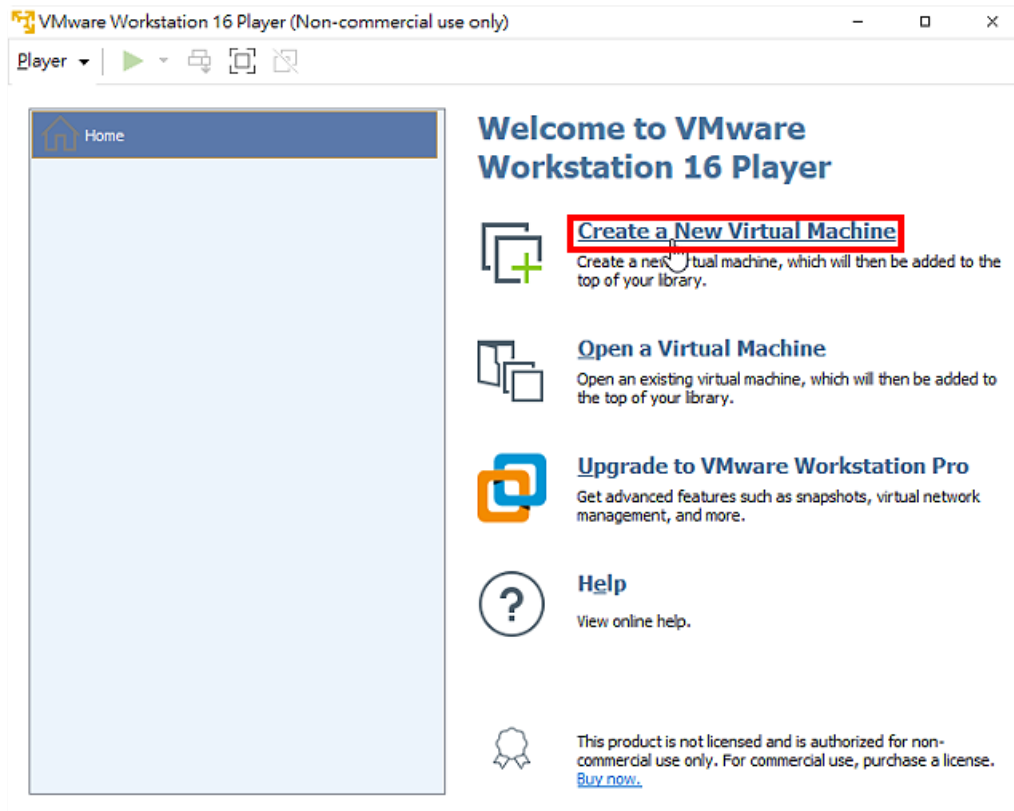
14. Open the VMware Workstation 16 Player。

15. Click「Continue」。

16. Click「Finish」。

17. You finish the installation of VMware。

2. Set up Ubuntu 20.04.4 LTS

中文參考網站 :

🔵 VMware Workstation 16 Player安裝Ubuntu 20.04

安裝Ubuntu 20.04 @ 軟體使用教學 :: 隨意窩 Xuite日誌

English version reference site :

 Installing Linux Ubuntu Version 20.04 in VMware Workstation Player - Windows 11 Installation Guides (dellwindowsreinstallationguide.com)
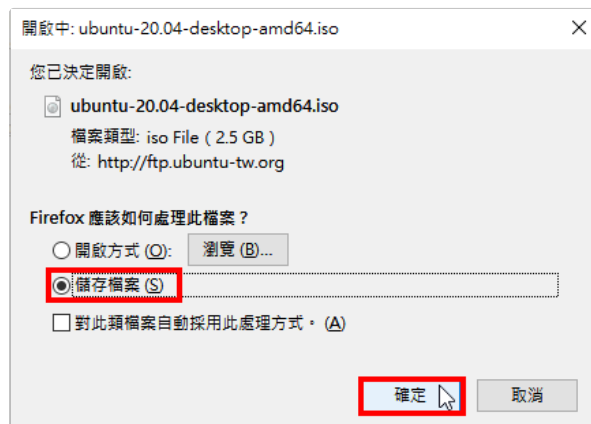
1. Link to the Ubuntu officail website，choose select the same options as below image, click「開始下載」.   http://www.ubuntu-tw.org/modules/tinyd0/
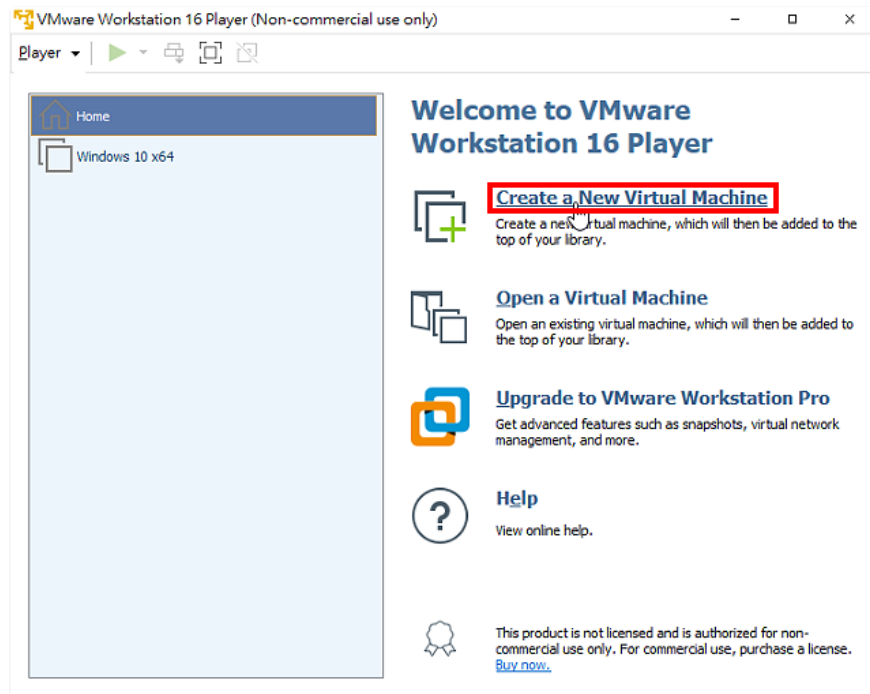
2.

Choose「儲存檔案」。

3. Go back to VMware，click「Create a New Virtual Machine」。

4. Choose「I will Install the operating system later」。
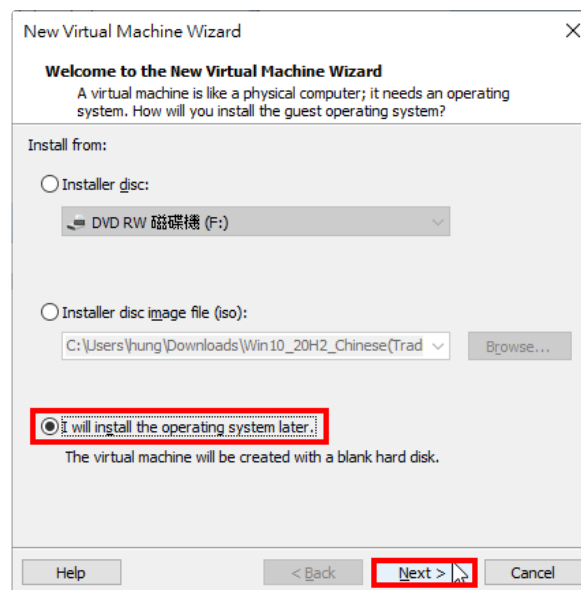
5. Choose「Linux」OS system , and choose「Ubuntu 64-bit」version .
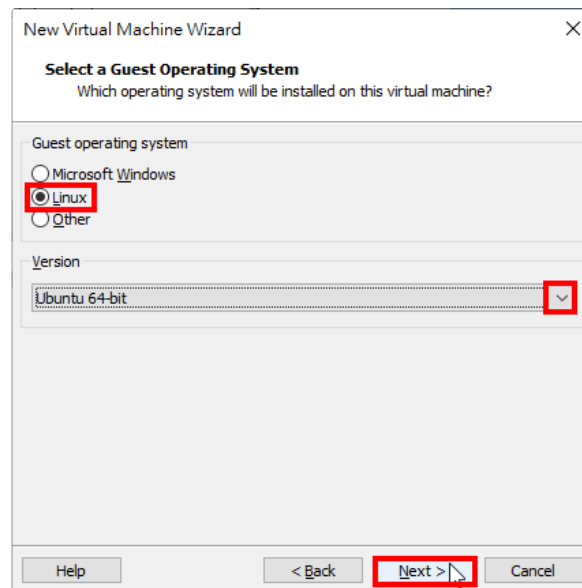
6. Name your VM and select your Location to install .
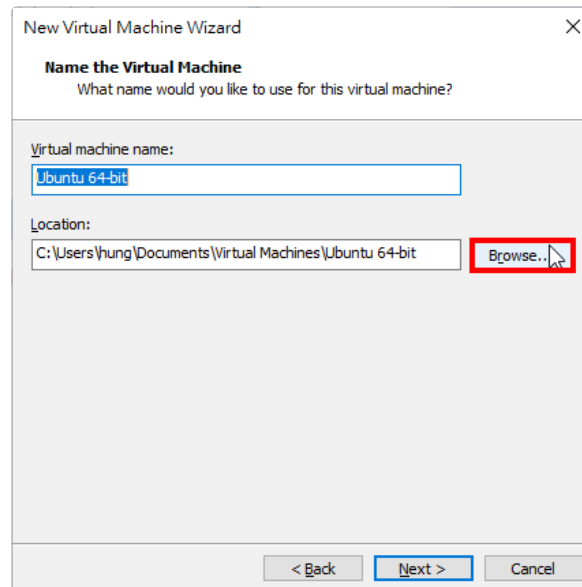
7. Set the size of your VM disk, and choose「Store virtual disk as a single files」。
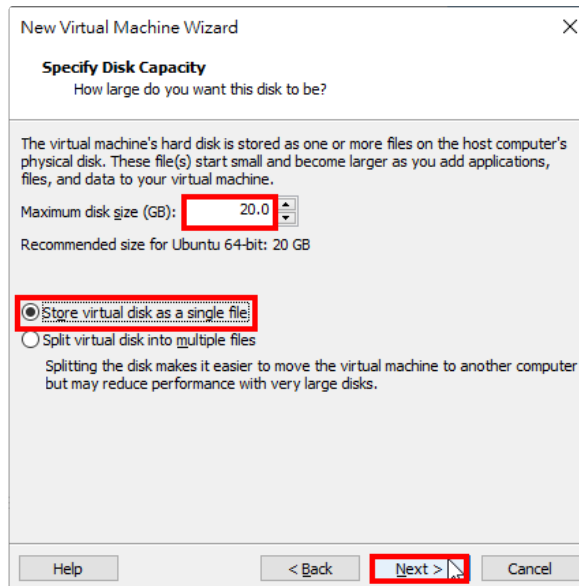
8. Click「Customize Hardware…」。
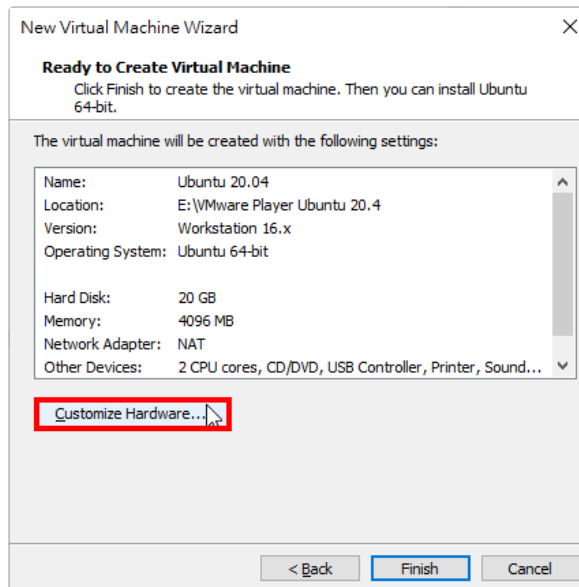
9. In「memory」option, adjust the memory to an appropriate size. (Theoretically, the bigger the better, but it is better not to exceed 1/2 of the actual computer)
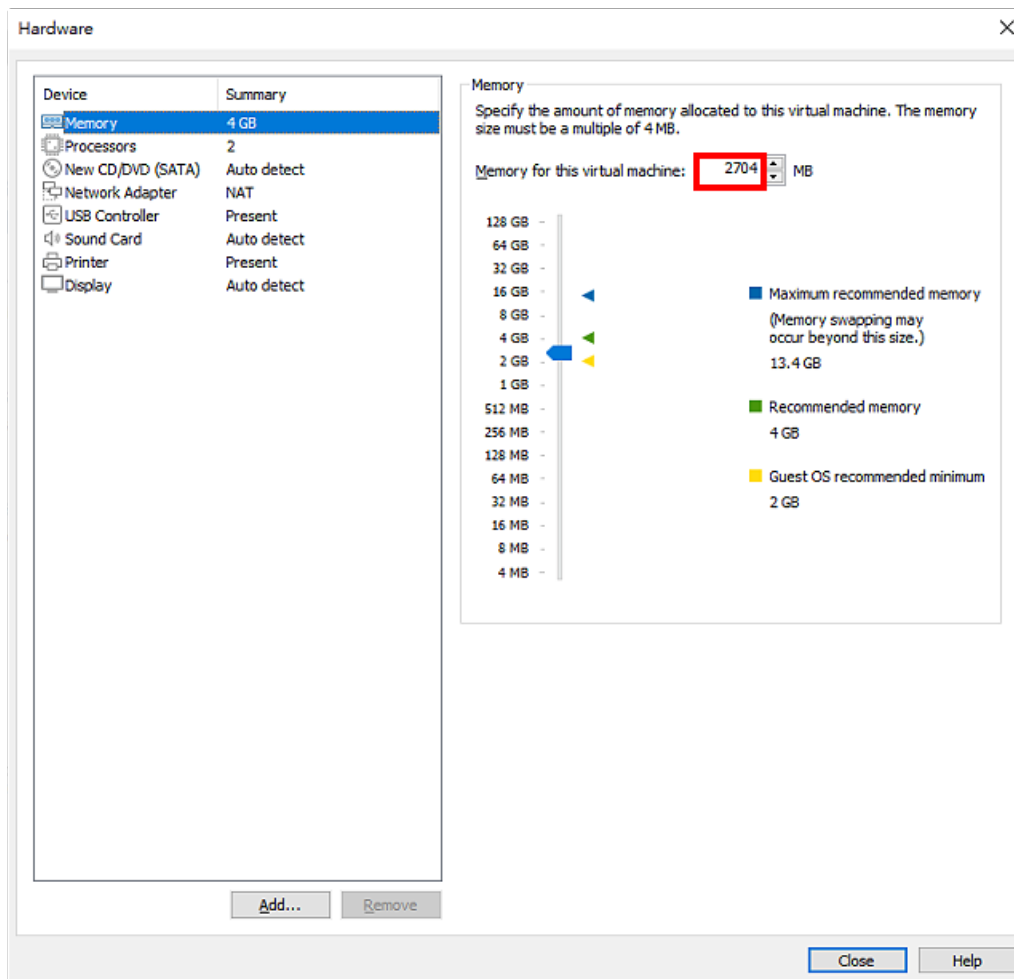
10. In「New CD/DVD」options，choose「Use ISO image file:」, click「Browse…」.
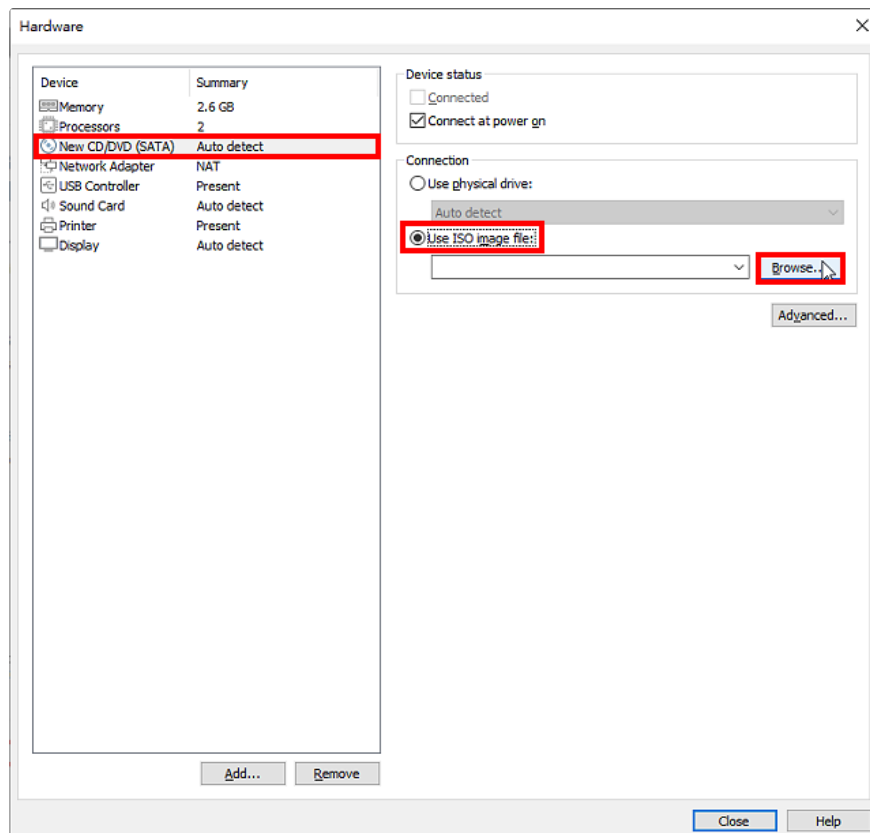
11. Selection「ubuntu-20.04-desktop-amd64.iso」we downloaded in step 2. before, and click「開啟」.
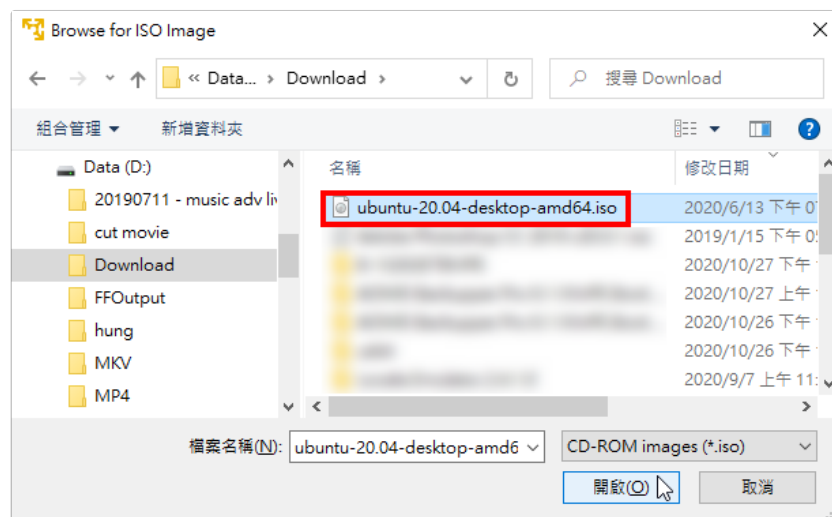
12. Setting is finished, click「close」.
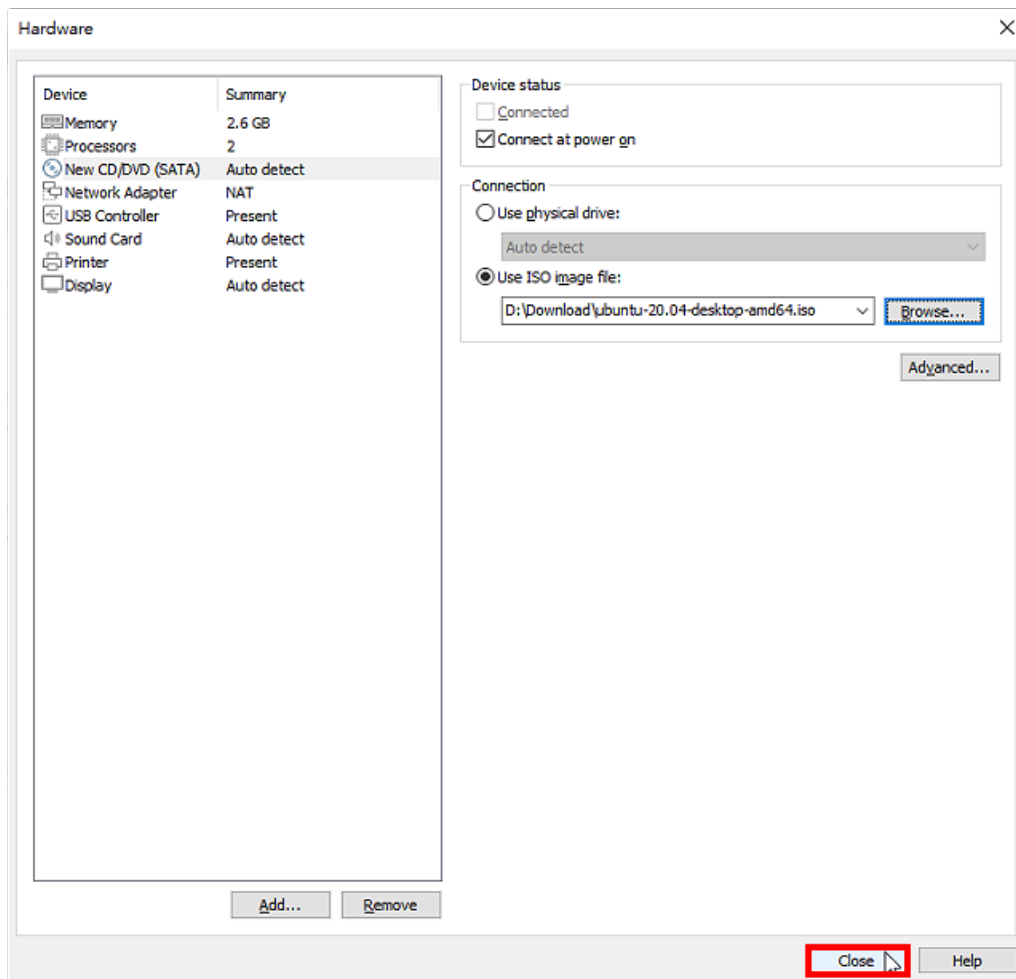
13. Click「Finish」。
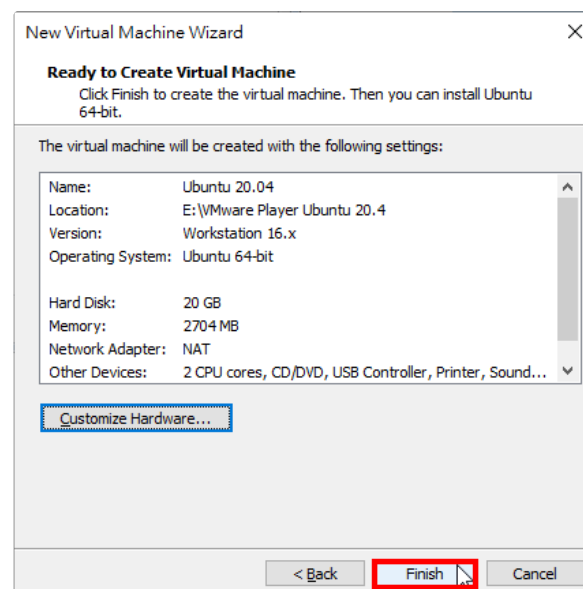
14. Click「Play virtual machine」, ready to install the Ubuntu。
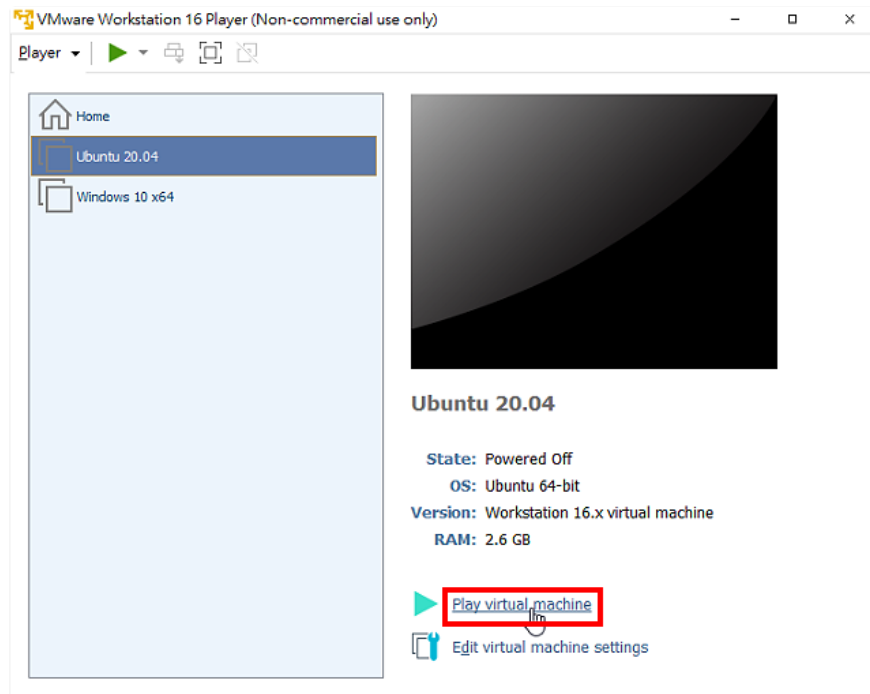
15. Choose your language (English or Chinese …)，click 「Install Ubuntu」.
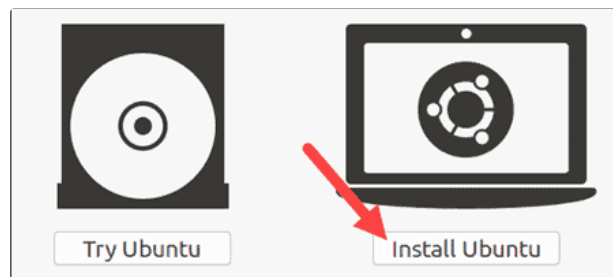
16. Select 「English (US)」, click 「continue」。
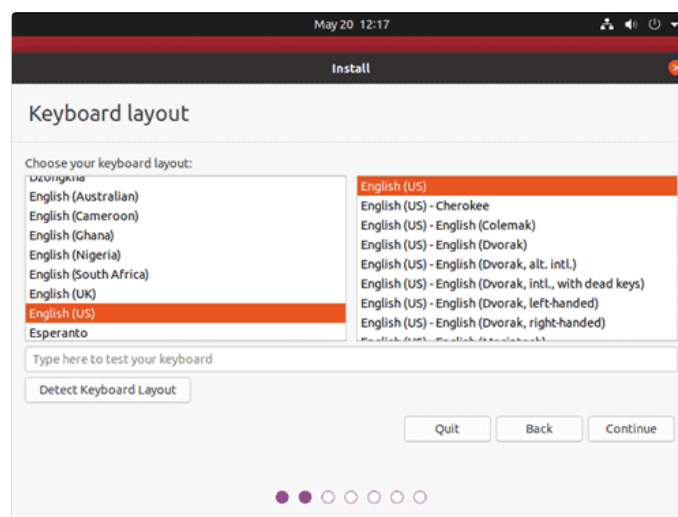
17. Choose 「Install third-party ……」, click 「continue」.

18. click「Install now」

Install

Installation type

This computer currently has no detected operating systems. What would you like to do?

◉ **Erase disk and install Ubuntu**
   Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.

   [Advanced features...] None selected

○ **Something else**
   You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

[Quit] [Back] [Install Now]

19. Use the time zone of「Taipei (台北)」, click「Continue」。

Install

Where are you?

Taipei

Back   Continue

20. Set your name, password ….

21. wait for installation, click「Restart Now」once the installation finished.

22. Remenber to press 「Enter」。

Please remove the installation medium, then press ENTER:
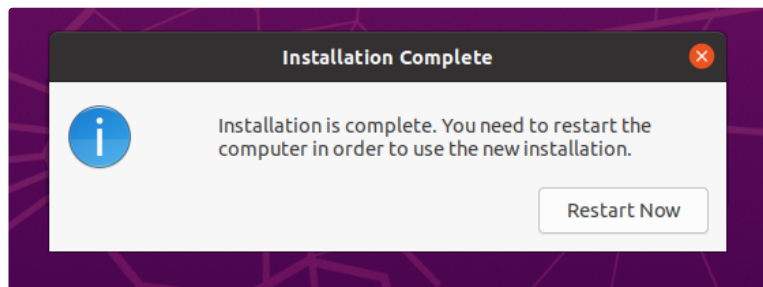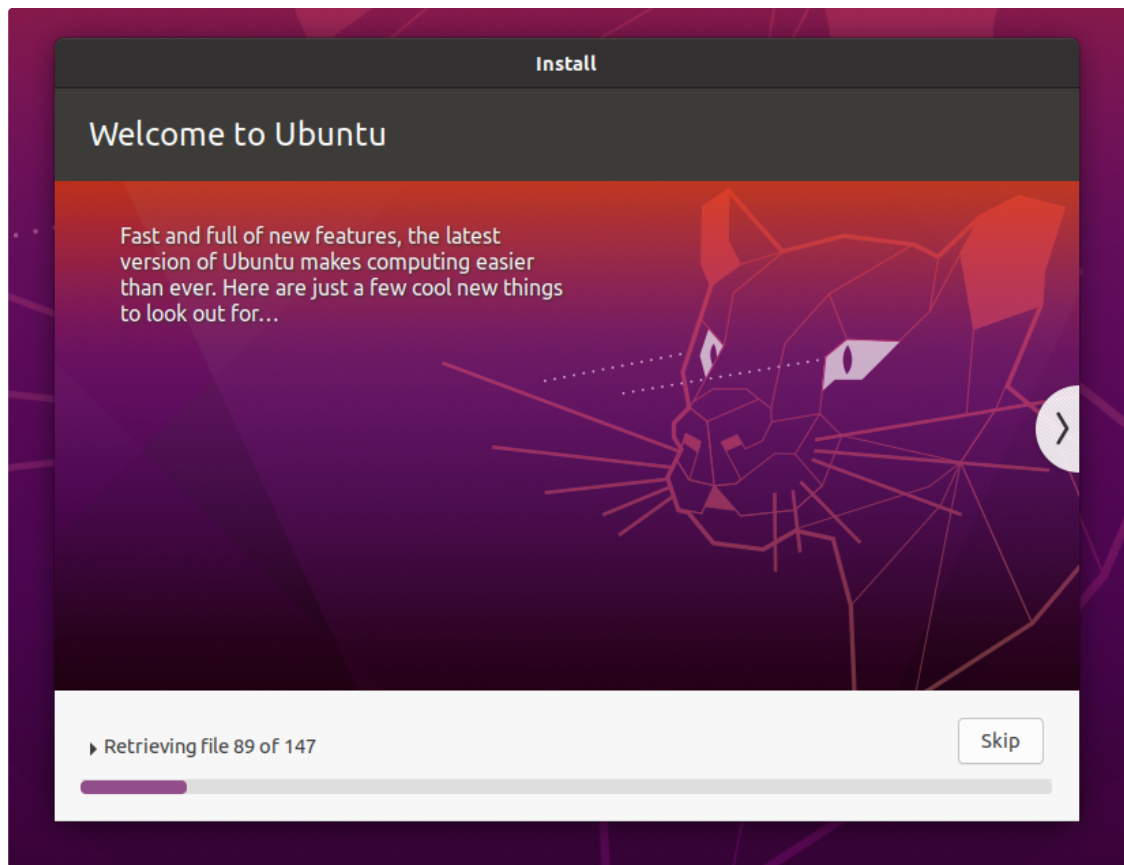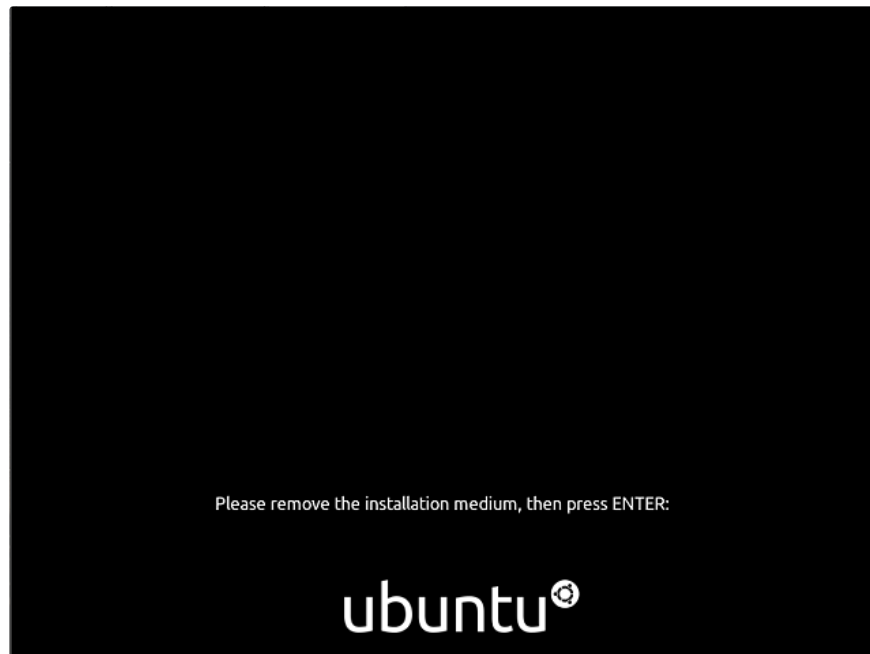
ubuntu®

23. Select the user and input your password.

6月14日 11：09

hung

沒有列出來？
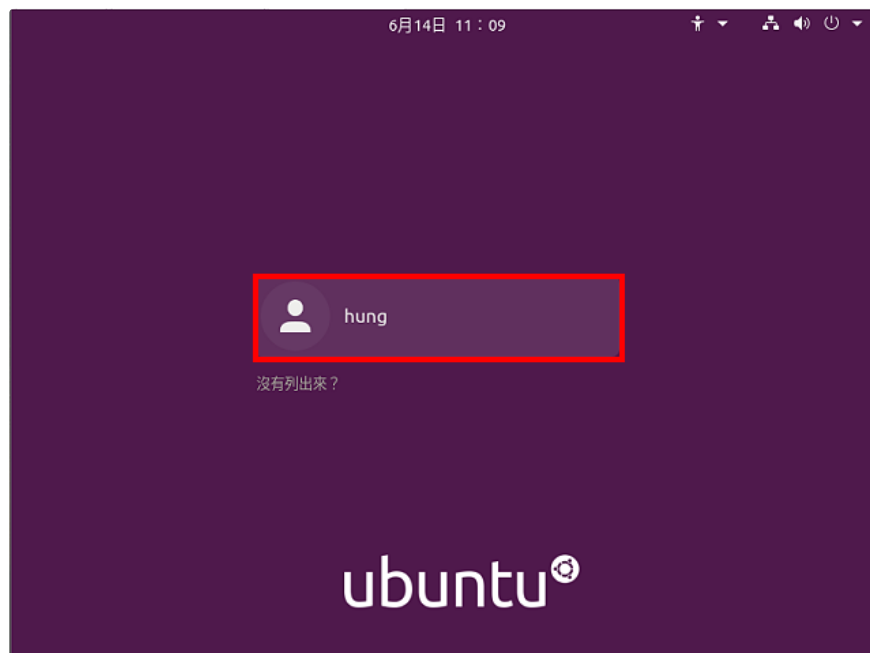
ubuntu®

24. Can install anything you want ~
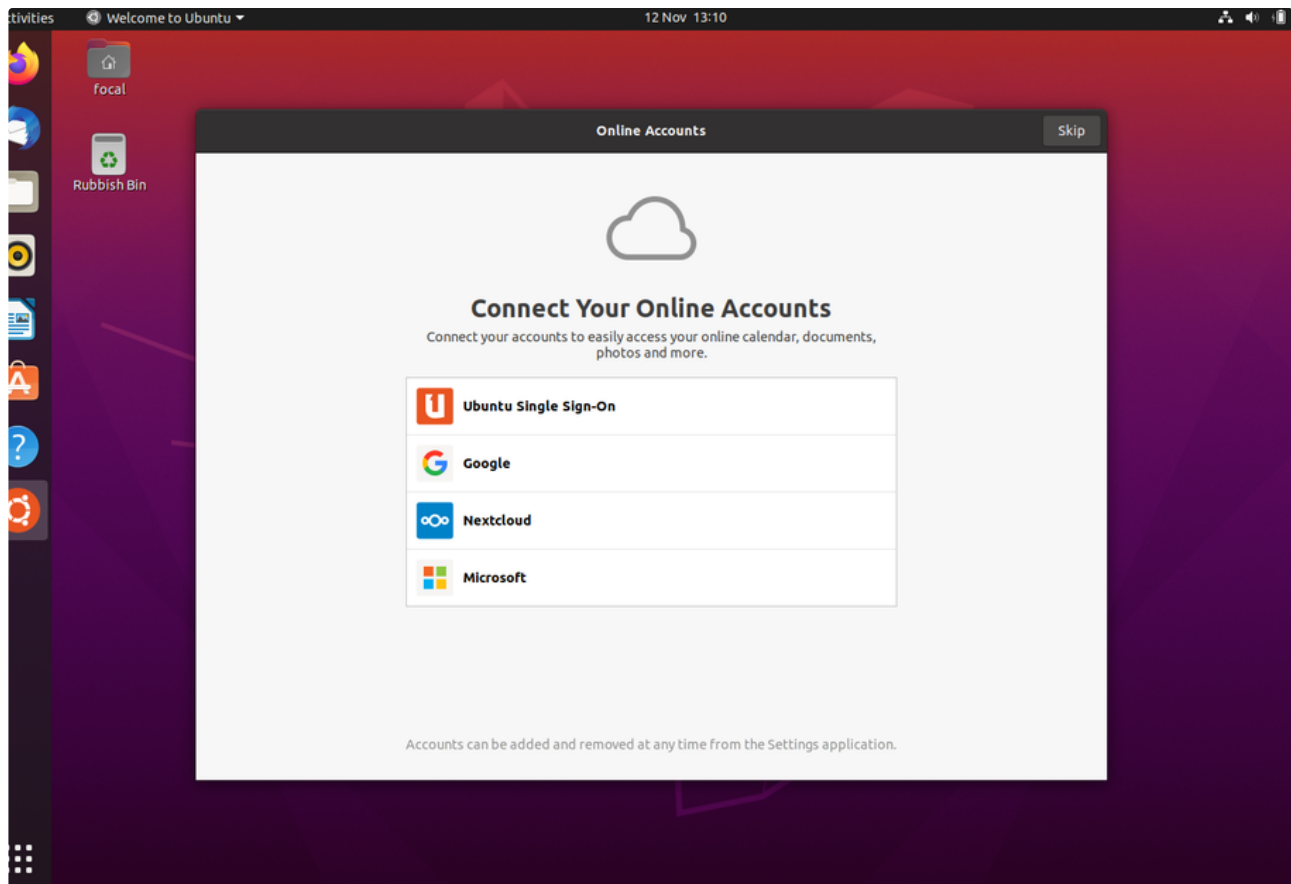
3. Complete the gRPC Quick Start in C++

Reference site :

gRPC Quick Start in C++

How to Install Protobuf on Ubuntu 20.04 (github.com)

0. Open the terminal

1. Install some tools that will be used.

$ sudo apt-get install pkg-config

$ sudo apt install -y cmake

$ sudo apt-get install build-essential autoconf automake libtool make g++ unzip
$ sudo apt-get install libgflags-dev libgtest-dev
$ sudo apt-get install clang libc++-dev

$ sudo apt install git

2. Download gRPC

$ git clone https://github.com/grpc/grpc.git
$ cd grpc
$ git submodule update --init

3. Install protobuf

$ cd third_party/protobuf/

$ git submodule update --init --recursive

$ ./autogen.sh

$ ./configure

// need much time !!

$ make

$ make check

$ sudo make install

$ sudo ldconfig

$ protoc --version   // Check if the installation was successful

4. Compile and install gRPC

$ cd grpc/

$ mkdir -p cmake/build

$ pushd cmake/build

$ export MY_INSTALL_DIR=$HOME/.local

$ export PATH="$PATH:$MY_INSTALL_DIR/bin"

$ mkdir -p $MY_INSTALL_DIR

$ cmake -DgRPC_INSTALL=ON   -DgRPC_BUILD_TESTS=OFF   -DCMAKE_INSTALL_PREFIX=$MY_INSTALL_DIR   ../..

$ make

$ make install

5. Demo

$ cd grpc/examples/cpp/helloworld/

$ mkdir -p cmake/build

$ pushd cmake/build

$ cmake -DCMAKE_PREFIX_PATH=$MY_INSTALL_DIR ../..

$ make

#Open the example server and client

$ ./greeter_server

$ ./greeter_client

Greeter received: Hello world

<Submission Checklist>

Prepare a report in PDF format with the following items

A1. Open a terminal window on Ubuntu Linux and type in the shell command 'top' to show the running processes on the system.

A2. Do a screenshot of the whole Ubuntu desktop environment (including the terminal window running *top*).

A3. Paste the screenshot in your report.

B1. Run the example gRPC client program and the gRPC server program on two different virtual machines.

B2. Modify the programs so that the client running in VM_1 can **send the 'world' string to the server in VM_2 , and the server can return the 'Hello world' string back to the client**.

B3. In the report, describe the changes you have made and attach a copy of the screenshots of both VMs from running Step B2.

Reference

🌐 免費虛擬機器VMware Workstation 16 Player下載與安裝

Download and Install VMware Workstation Player/Pro (16/15/14) (minitool.com)

 Installing Linux Ubuntu Version 20.04 in VMware Workstation Player - Windows 11 Installation Guides (dellwindowsreinstallationguide.com)

🌐 VMware Workstation 16 Player安裝Ubuntu 20.04

安裝Ubuntu 20.04 @ 軟體使用教學 :: 隨意窩 Xuite日誌

Quick start | C++ | gRPC

How to Install Protobuf on Ubuntu 20.04 (github.com)

(2条消息) Ubuntu安裝GRPC_蓬萊道人的博客-CSDN博客

(2条消息) ubuntu20.04 编译安装 grpc-c++_Bart__的博客-CSDN博客