
Virtual Machine Tutorial

— 2022 PD1, NCKU CSIE —

Linux and Windows

Windows

- 作為**個人電腦的作業系統**被廣泛使用
- 有許多獨佔遊戲、軟體

e.g. Microsoft Office 只在 MacOS, Windows上可用

多數遊戲如英雄聯盟、只在 Windows 上可用

- 在程式開發方面, 較缺乏靈活性

Linux and Windows

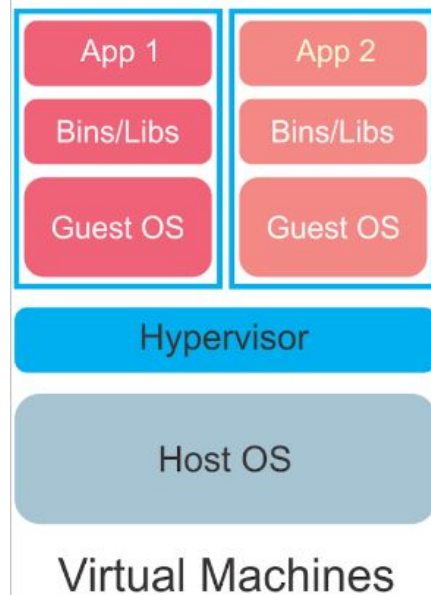
Linux

- 多數的伺服器、工作站運行的作業系統
- 提供多種原生的軟體開發或資訊工程相關的工具
 - e.g. 例如用於無線攻擊的工具 Aircrack-ng
- 缺乏許多日常文書類軟體
 - e.g. LINE, Office 等等
- <https://github.com/torvalds/linux>



What is a Virtual Machine?

- 虛擬機是一種**用來模擬真實電腦的行為的軟體**。因為是一支軟體，所以必須運作在實體電腦上
- 虛擬機能夠提供多數實體電腦的功能(例如：執行應用程式、作業系統)，有些虛擬機還支援模擬不同電腦硬體設備的功能(例如：挑選要有幾個CPU，多少記憶體)，讓你不用真的買一台電腦就能享受組電腦的樂趣(?)
- 虛擬機提供了一個獨立的操作環境，就算把虛擬機的電腦搞壞了，對運作他的實體電腦也不會造成傷害，適合初學者練習使用不同的作業系統



Why Virtual Machine?

- 可以在一部電腦上**同時**執行不同的作業系統
與雙系統的差別：不需頻繁地重新開機切換系統
- 虛擬機是一個獨立的環境
即使虛擬機(客體)的系統環境被破壞，電腦(主體)還是能正常運行
- 可移植性
虛擬機的映像檔可以被移植到不同的電腦上執行

Step 0. 下載所需檔案、軟體

下載 Ubuntu 22.04 (Jammy Jellyfish) 的 iso 檔

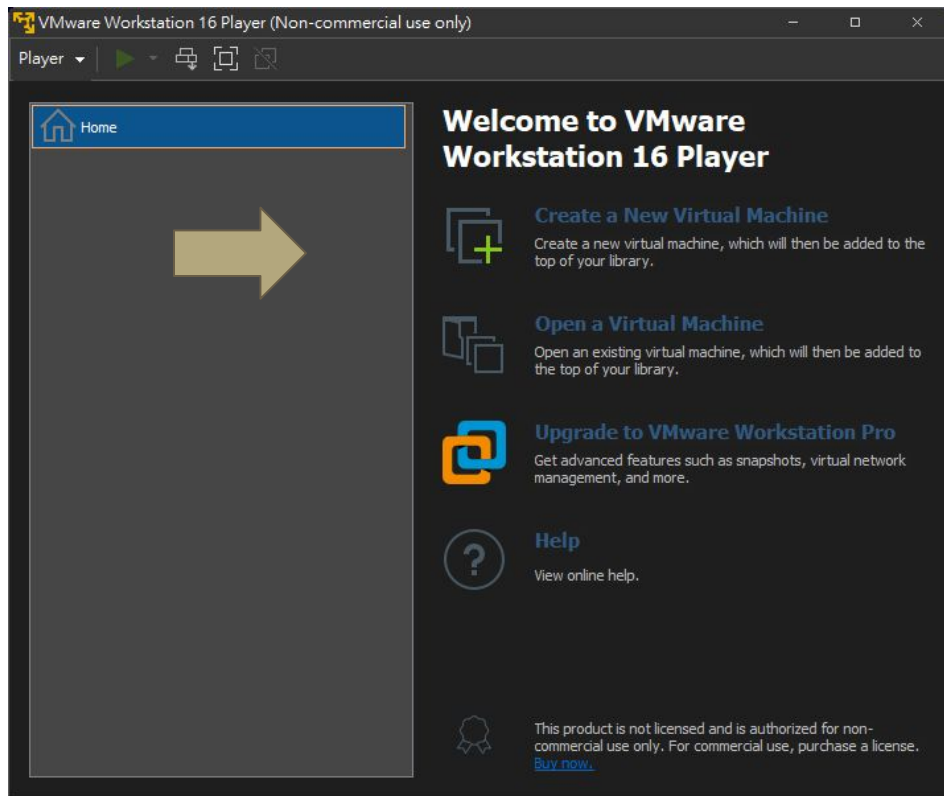
[載點](#) (成功大學電腦網路愛好社 鏡像站)

下載 VMware Workstation Player (For Windows)

[載點](#)

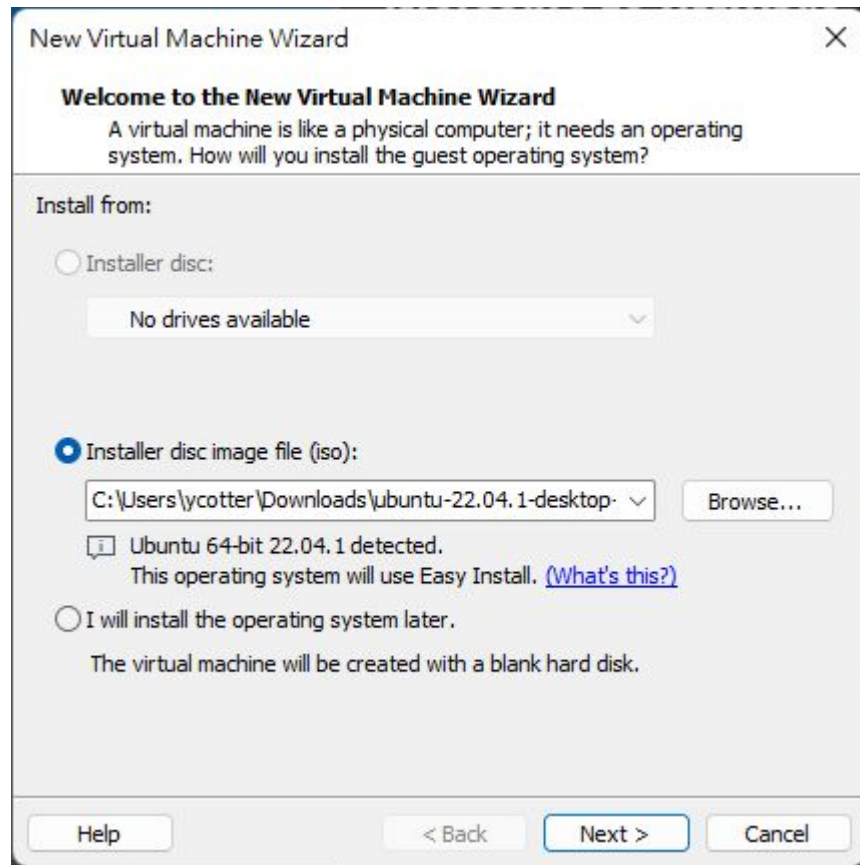
Step 1. 建立虛擬機器

啟動 VMware Workstation Player
然後點選 Create New Virtual Machine



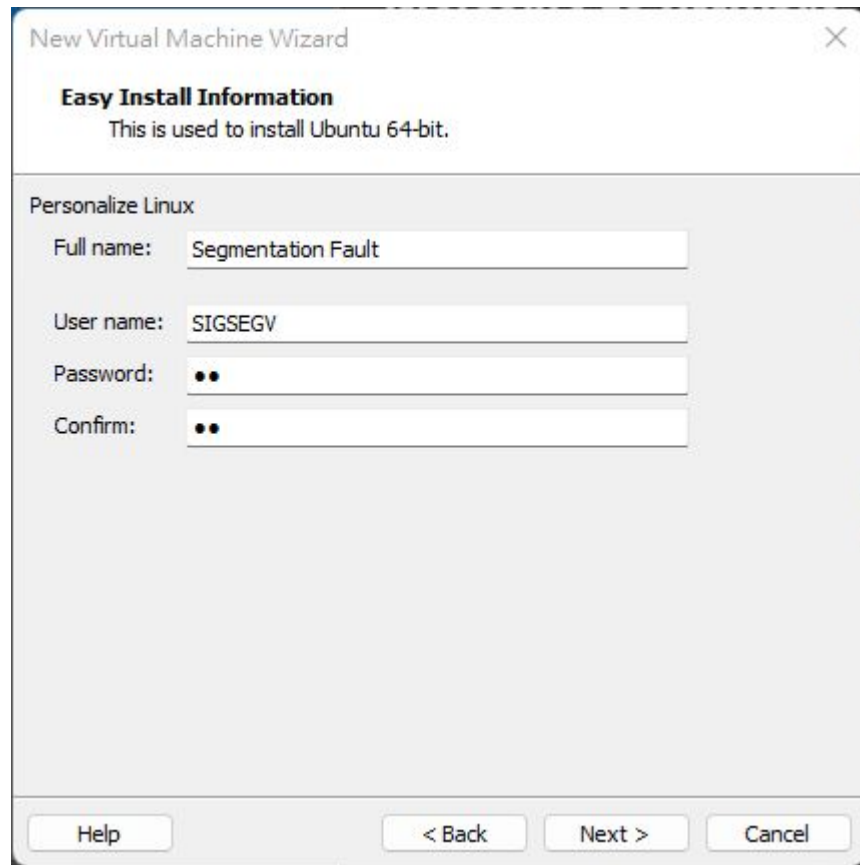
Step 2. 掛接映像檔

點選 Browse... 選擇剛剛下載的 iso 檔



Step 3. 設定帳號密碼

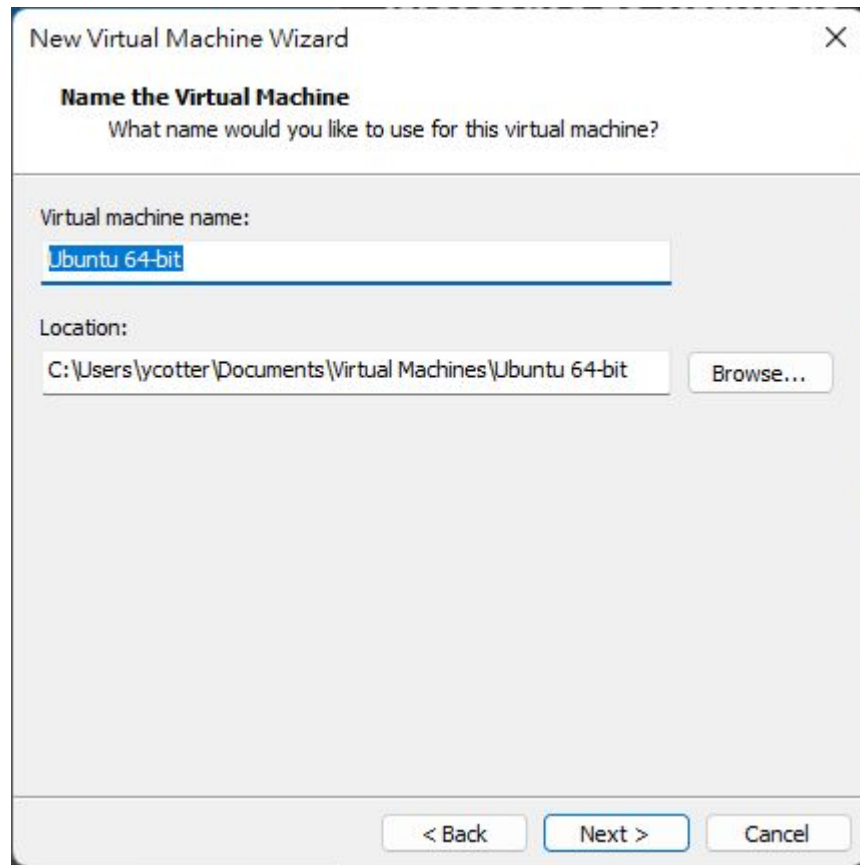
取一個 Username 以及密碼，請務必牢記



The screenshot shows a window titled "New Virtual Machine Wizard" with a close button in the top right corner. The main heading is "Easy Install Information" with a subtitle "This is used to install Ubuntu 64-bit." Below this, the section "Personalize Linux" contains four input fields: "Full name:" with the text "Segmentation Fault", "User name:" with the text "SIGSEGV", "Password:" with two black dots, and "Confirm:" with two black dots. At the bottom of the window are four buttons: "Help", "< Back", "Next >", and "Cancel".

Step 4. 虛擬機命名

直接按 Next



The screenshot shows a Windows-style dialog box titled "New Virtual Machine Wizard" with a close button (X) in the top right corner. The main heading is "Name the Virtual Machine" followed by the question "What name would you like to use for this virtual machine?". Below this, there are two input fields. The first is labeled "Virtual machine name:" and contains the text "Ubuntu 64-bit". The second is labeled "Location:" and contains the path "C:\Users\ycotter\Documents\Virtual Machines\Ubuntu 64-bit", with a "Browse..." button to its right. At the bottom of the dialog, there are three buttons: "< Back", "Next >" (which is highlighted with a blue border), and "Cancel".

New Virtual Machine Wizard

Name the Virtual Machine
What name would you like to use for this virtual machine?

Virtual machine name:
Ubuntu 64-bit

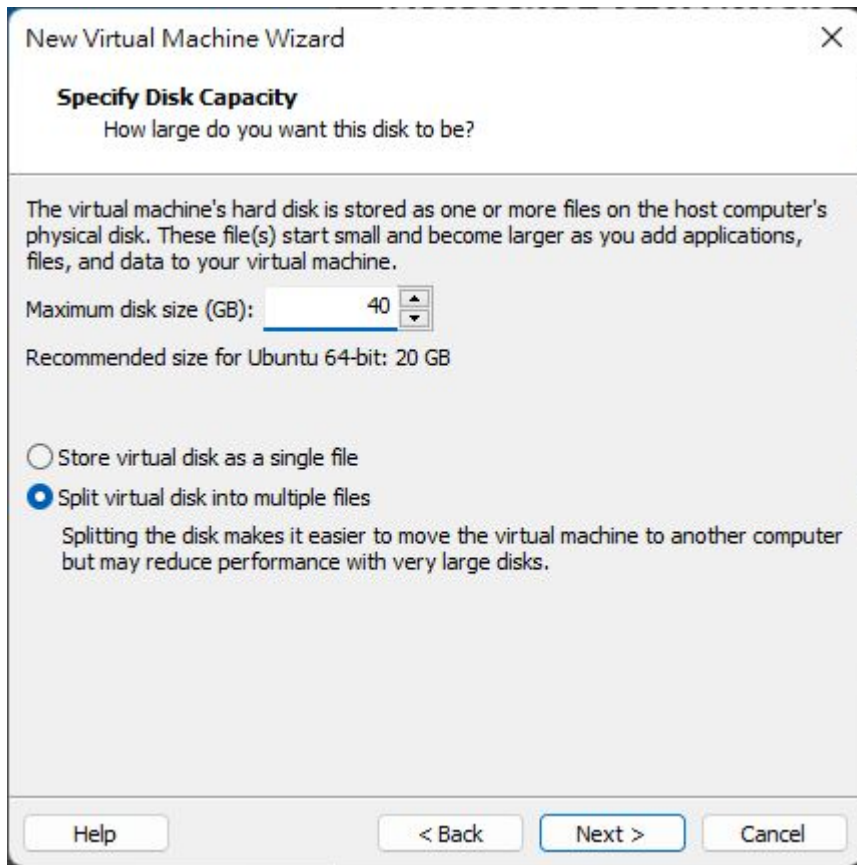
Location:
C:\Users\ycotter\Documents\Virtual Machines\Ubuntu 64-bit Browse...

< Back Next > Cancel

Step 5. 設定虛擬硬碟大小

選擇虛擬機器的硬碟大小

TA 建議約 40 GB 就非常夠用了



The screenshot shows the 'New Virtual Machine Wizard' window, specifically the 'Specify Disk Capacity' step. The window title is 'New Virtual Machine Wizard' with a close button (X) in the top right corner. The main heading is 'Specify Disk Capacity' followed by the question 'How large do you want this disk to be?'. Below this, a text block explains: 'The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.' There is a label 'Maximum disk size (GB):' followed by a text input field containing '40' and a spinner control. Below the input field, it says 'Recommended size for Ubuntu 64-bit: 20 GB'. There are two radio button options: 'Store virtual disk as a single file' (which is unselected) and 'Split virtual disk into multiple files' (which is selected). A descriptive text for the selected option reads: 'Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.' At the bottom of the window, there are four buttons: 'Help', '< Back', 'Next >', and 'Cancel'.

New Virtual Machine Wizard

Specify Disk Capacity
How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 40

Recommended size for Ubuntu 64-bit: 20 GB

☐ 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

Step6. 設定虛擬機器配備

選擇虛擬機的 RAM 大小與存放位置等等

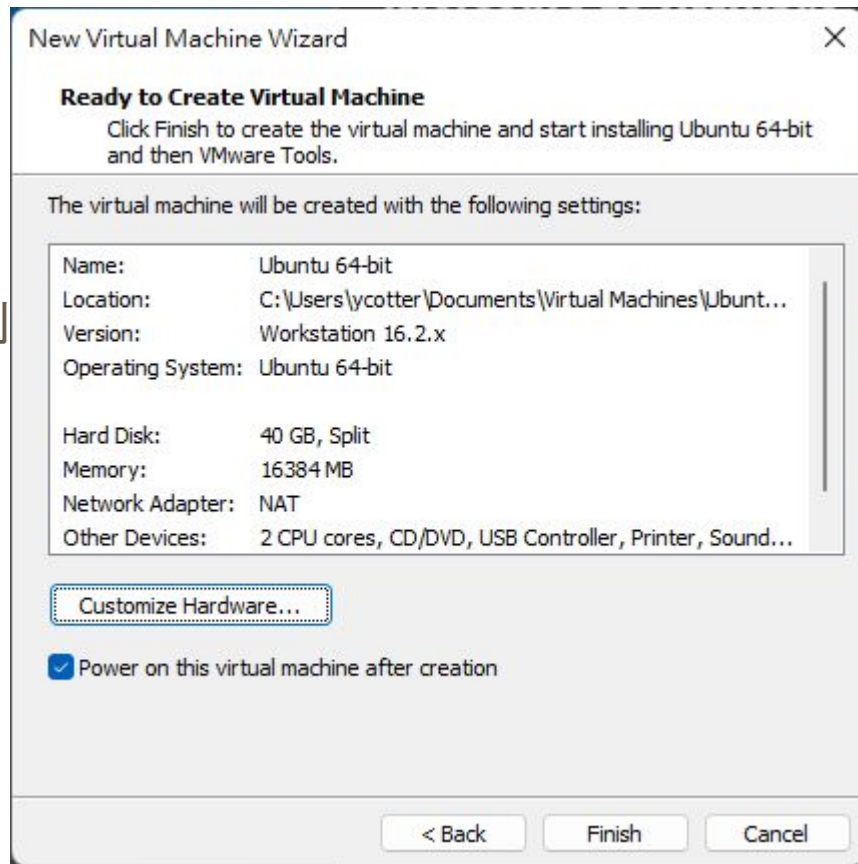
分配大小以不超過電腦配備的二分之一為原則

例如, TA 的電腦有 12 個邏輯處理器跟

32 GB 的 RAM

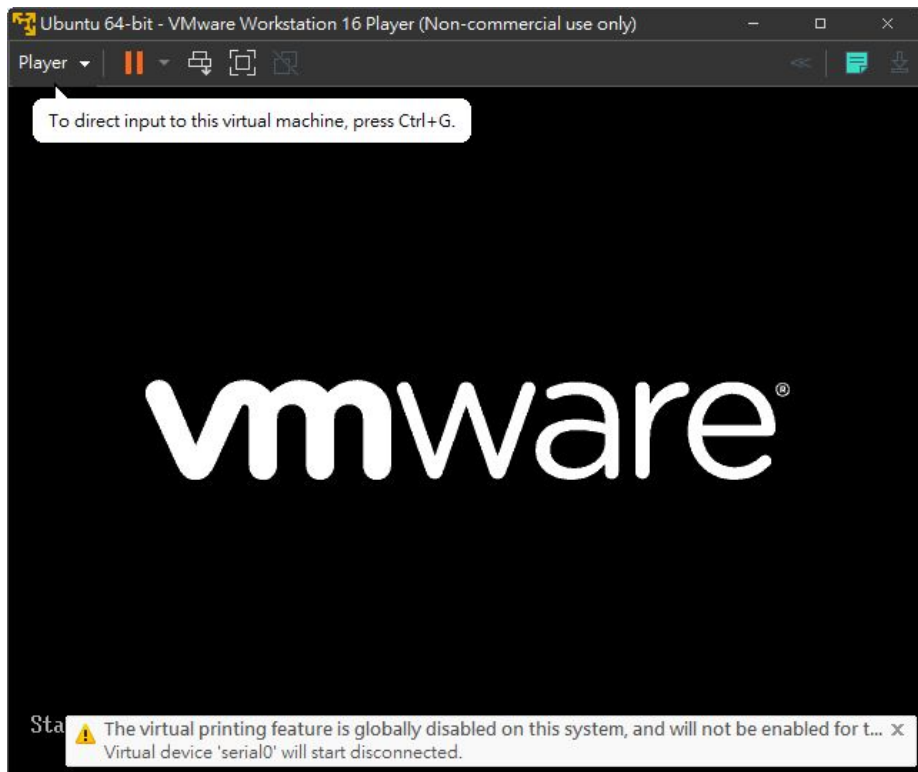
分配時就不應該分超過 6 cores, 16GB RAM

如何查看電腦的配備



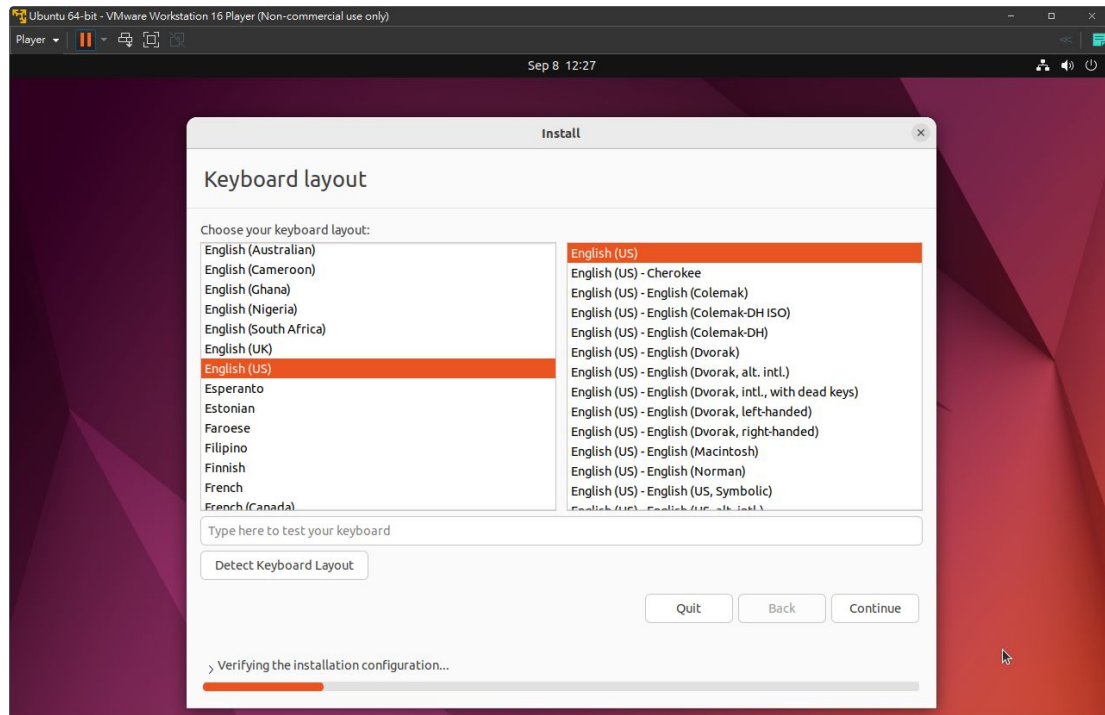
Step 7. 第一次開機

啟動虛擬機



Step 8. 設定鍵盤配置

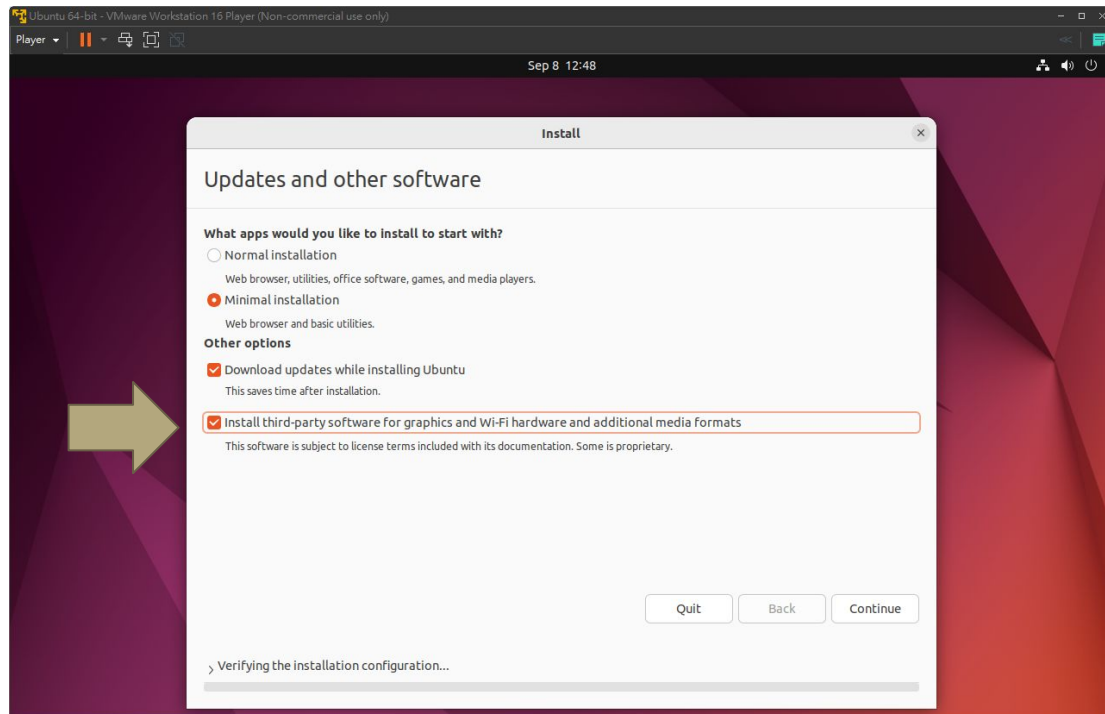
在台灣買的筆電照預設值即可



Step 9. 設定安裝型態

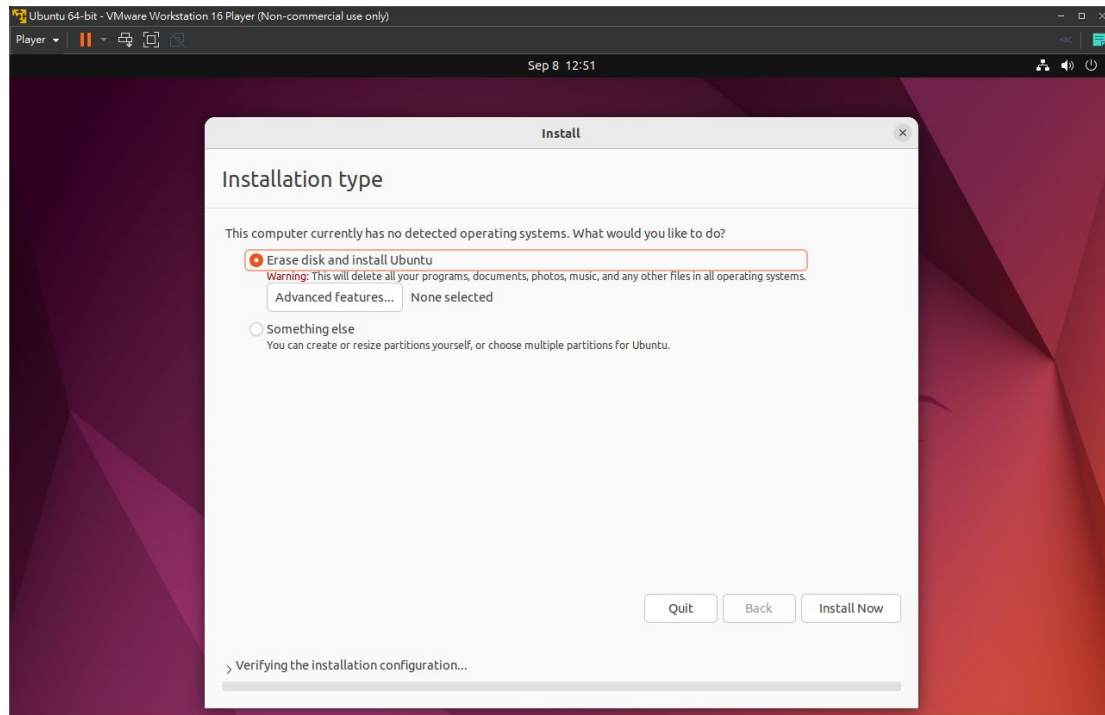
依個人需要選擇 normal
或 minimal installation

並且建議點選最後一個選項



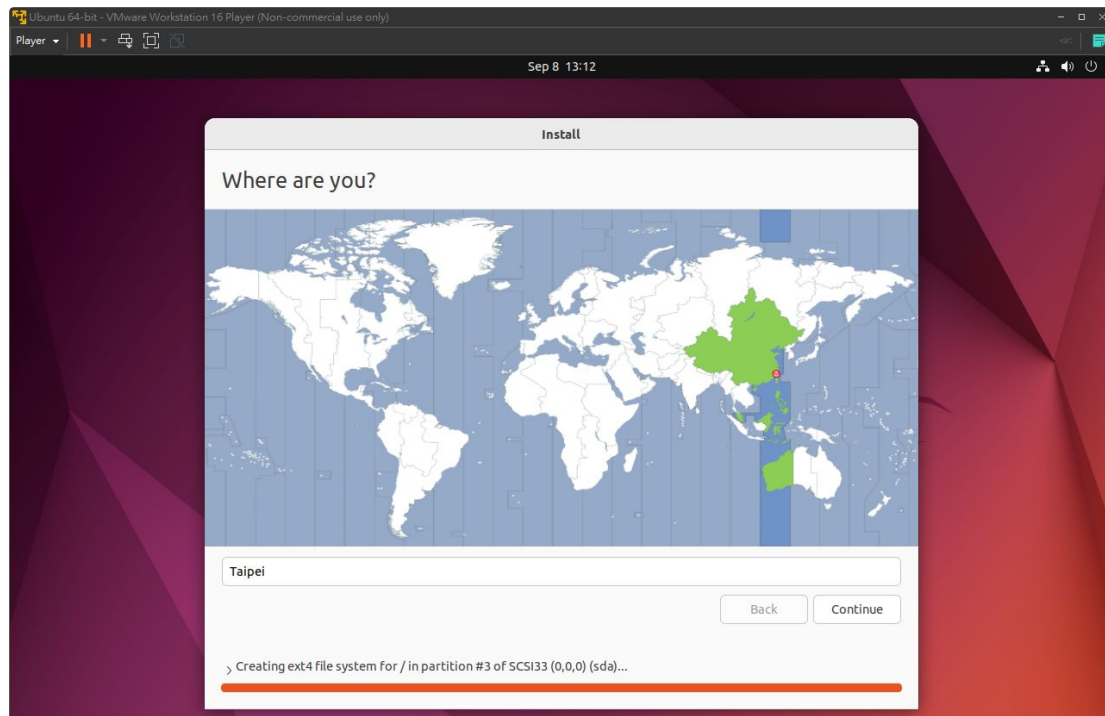
Step 10. 設定虛擬硬碟分割

點選 Install Now



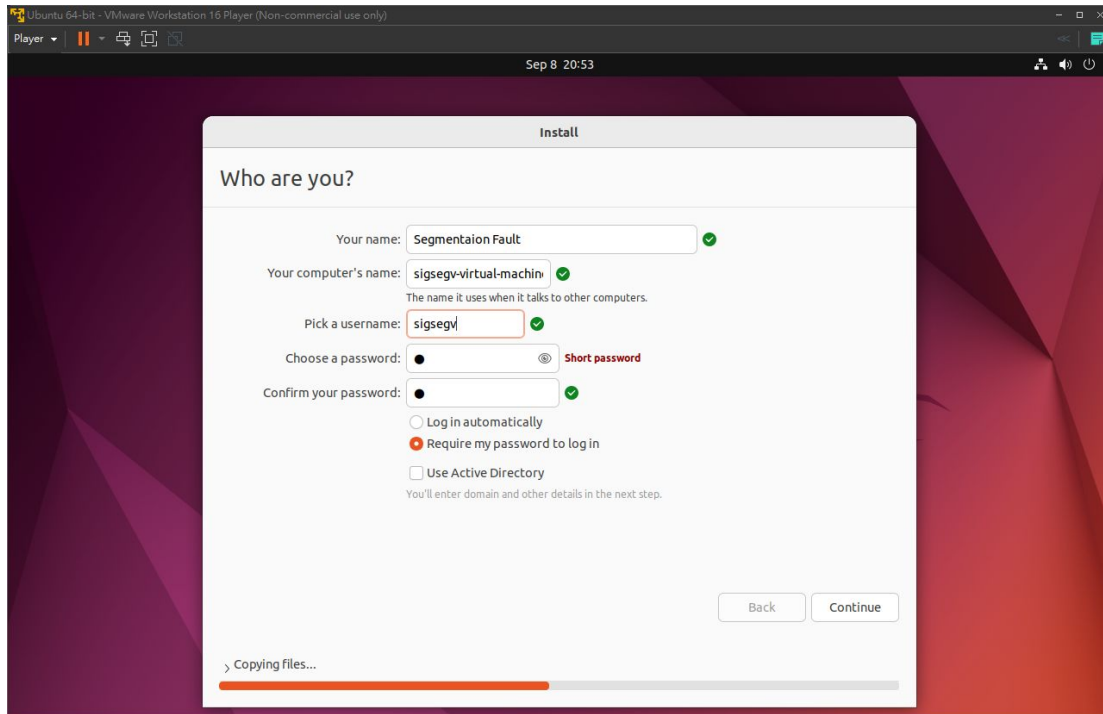
Step 11. 設定時區

點選 Continue



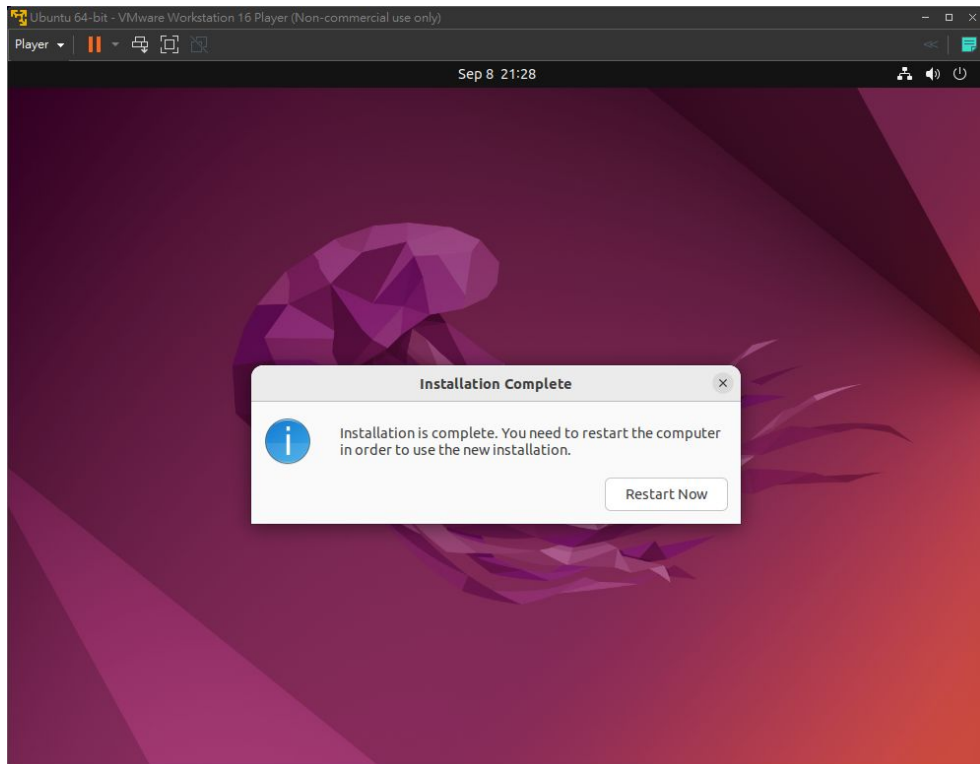
Step 12. 設定帳號密碼

再次輸入 username 與密碼



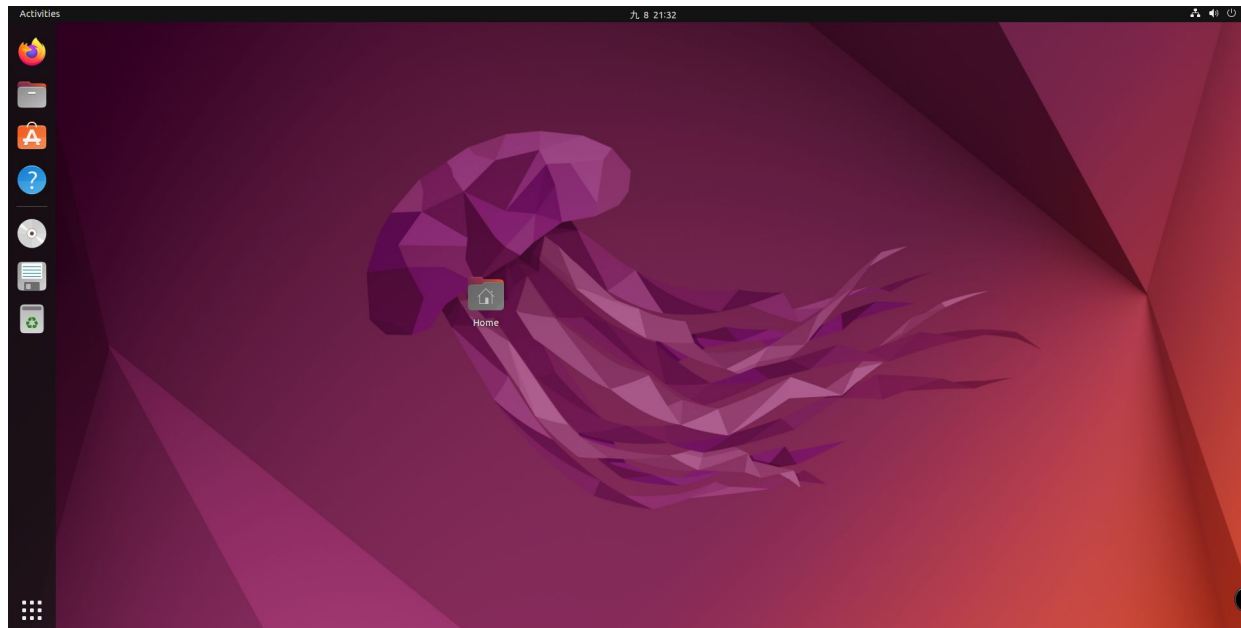
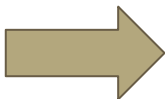
Step 13. 系統安裝完成

安裝完成之後按下 Restart Now



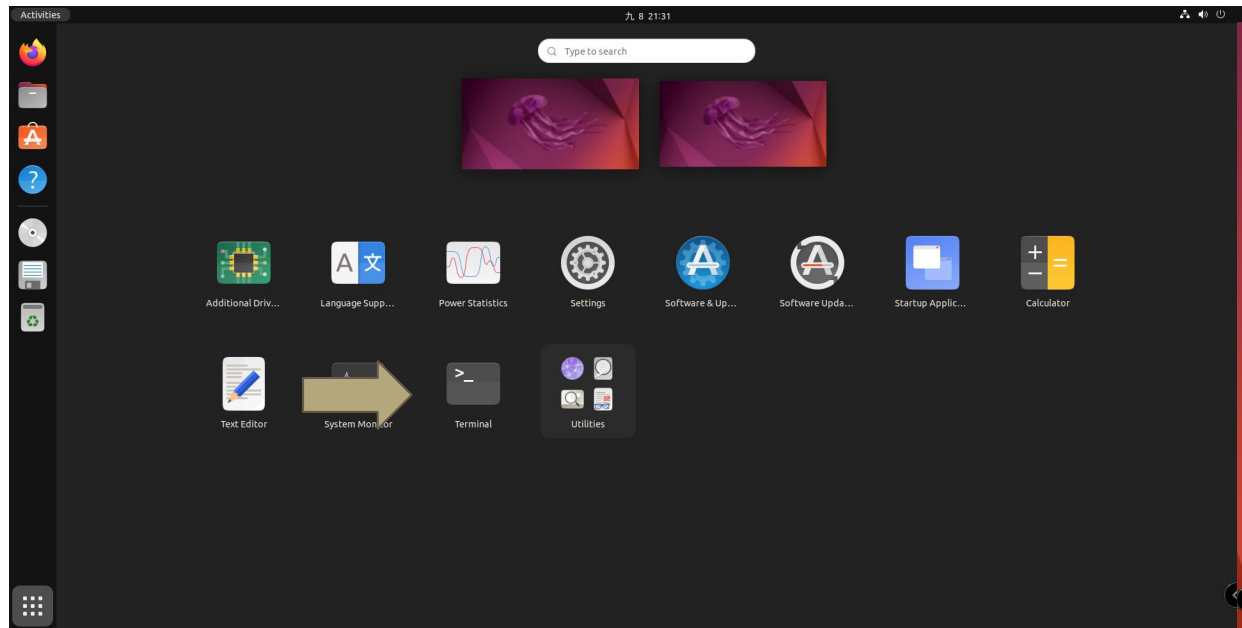
Step 14. 開啟 Terminal

點選程式集



Step 14. 開啟 Terminal

點選 Terminal



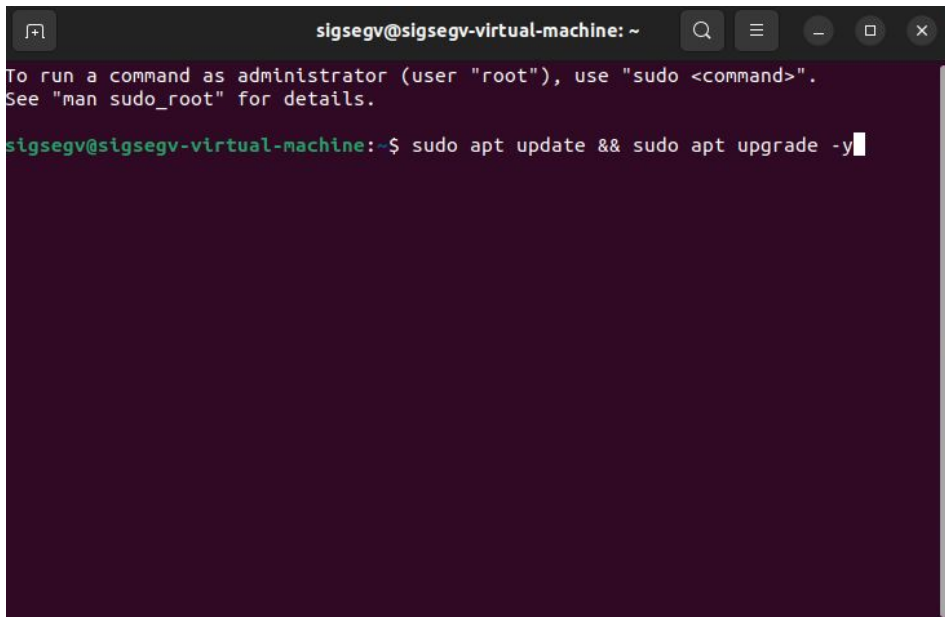
Step 15. 更新並安裝軟體

依序執行下列指令：

```
sudo apt update && sudo apt upgrade -y
```

```
sudo apt install vim gcc gdb -y
```

並依照指示輸入密碼

A terminal window titled 'sigsegv@sigsegv-virtual-machine: ~' with standard window controls. The terminal shows a message about running commands as administrator, followed by the command 'sudo apt update && sudo apt upgrade -y' being entered at the prompt. The prompt is 'sigsegv@sigsegv-virtual-machine:~\$' and the command is partially executed, with a cursor at the end.

```
sigsegv@sigsegv-virtual-machine: ~  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
sigsegv@sigsegv-virtual-machine:~$ sudo apt update && sudo apt upgrade -y
```

Step 16. 檢查軟體安裝狀況

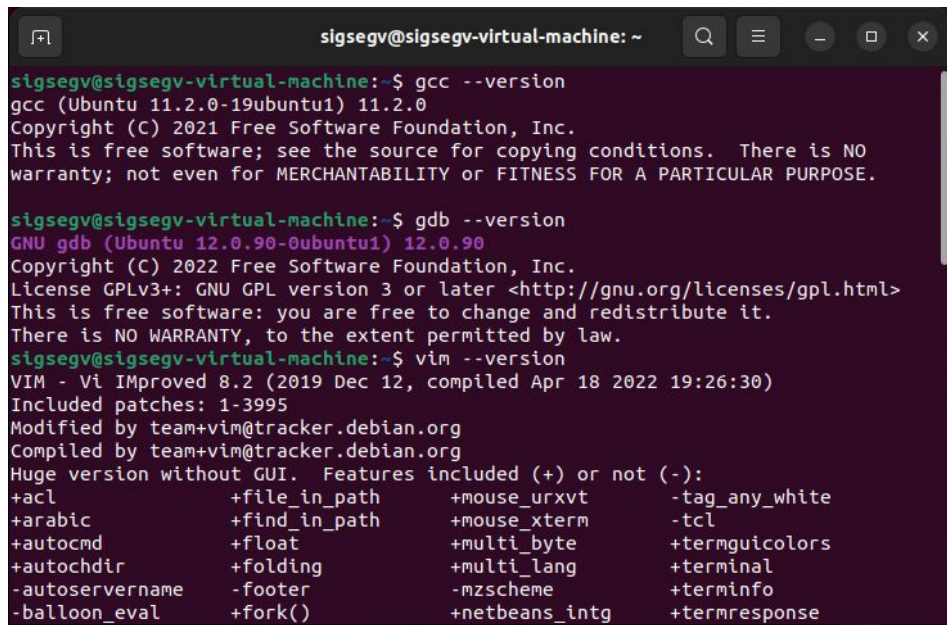
依序執行下列指令:

`gcc --version`

`gdb --version`

`vim --version`

檢查是否安裝成功

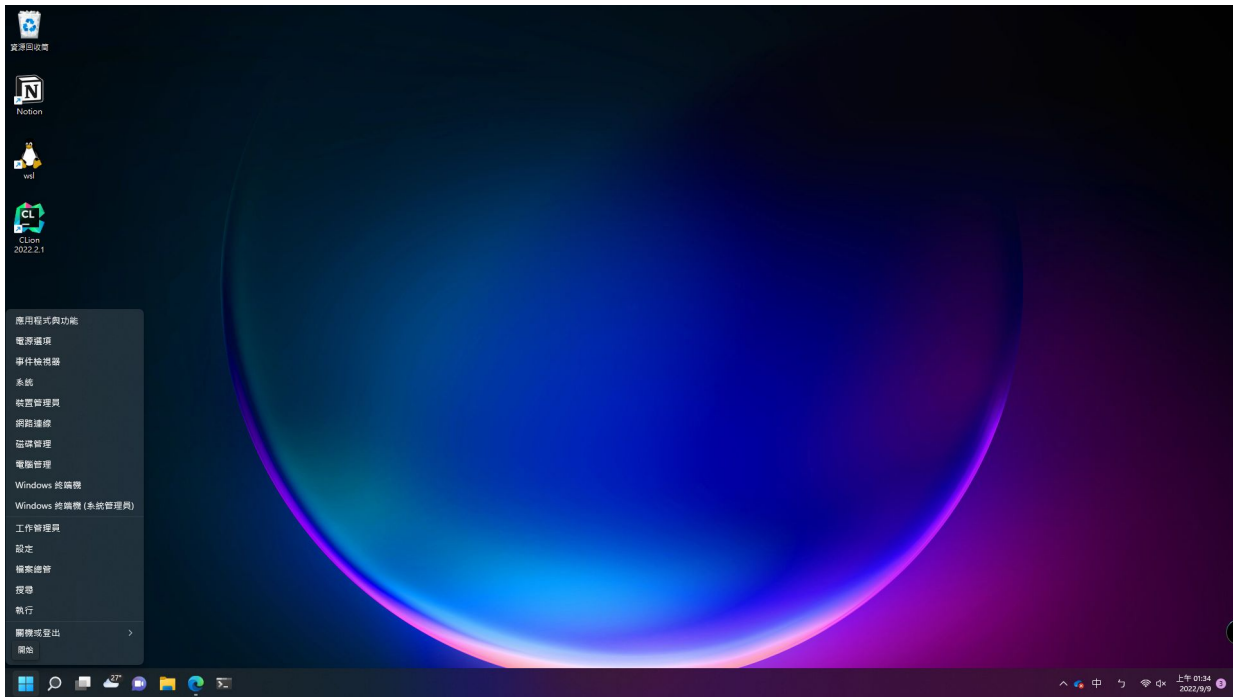
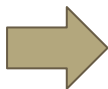


```
sigsegv@sigsegv-virtual-machine: ~  
sigsegv@sigsegv-virtual-machine:~$ gcc --version  
gcc (Ubuntu 11.2.0-19ubuntu1) 11.2.0  
Copyright (C) 2021 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
  
sigsegv@sigsegv-virtual-machine:~$ gdb --version  
GNU gdb (Ubuntu 12.0.90-0ubuntu1) 12.0.90  
Copyright (C) 2022 Free Software Foundation, Inc.  
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>  
This is free software: you are free to change and redistribute it.  
There is NO WARRANTY, to the extent permitted by law.  
  
sigsegv@sigsegv-virtual-machine:~$ vim --version  
VIM - Vi IMproved 8.2 (2019 Dec 12, compiled Apr 18 2022 19:26:30)  
Included patches: 1-3995  
Modified by team+vim@tracker.debian.org  
Compiled by team+vim@tracker.debian.org  
Huge version without GUI. Features included (+) or not (-):  
+acl                +file_in_path      +mouse_urxvt       -tag_any_white  
+arabic             +find_in_path      +mouse_xterm       -tcl  
+autocmd            +float             +multi_byte        +termguicolors  
+autochdir          +folding           +multi_lang        +terminal  
-autoservername     -footer            -mzscheme          +terminfo  
-balloon_eval       +fork()            +netbeans_intg     +termresponse
```

如何查看電腦硬體配置 - 1

在 Windows 鍵上按右鍵

點擊工作管理員



如何查看電腦硬體配置 - 2

點選 效能 頁籤

兩個紅框處可以看到 TA 的電腦有：

12 個邏輯處理器

32 GB RAM

