SDN Environment Setup

Install ONOS in VM

Outline

- Objective
- Experiment Environment
- Installation
  - VirtualBox 6.1.46
  - Add VM
  - SDN development environment

Objective

- Prepare a operational environment
  - VirtualBox: Open-source cross-platform virtualization application
    - Run virtual machines
  - Ubuntu: Open-source operating system
    - A most popular OS for software development/
  - Bazel:
    - Free SW tool for “automation of building and testing of SW”.
  - ONOS: Open Network Operating System in SDN
    - Offer a graphic interface for observing network topology
  - OVS: Open vSwitch
    - a multilayer software switch licensed under the Open source Apache 2 license.
  - Mininet: Network Emulator
    - Make virtual network environment setup easily

Outline

- Objective
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- Installation
  - VirtualBox 6.1.46
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Experiment Environment

- Ubuntu Desktop 22.04
- Minimum Hardware Requirements:
  - 2 Cores (CPUs)
  - 8GB RAM
  - 30GB HDD

Outline

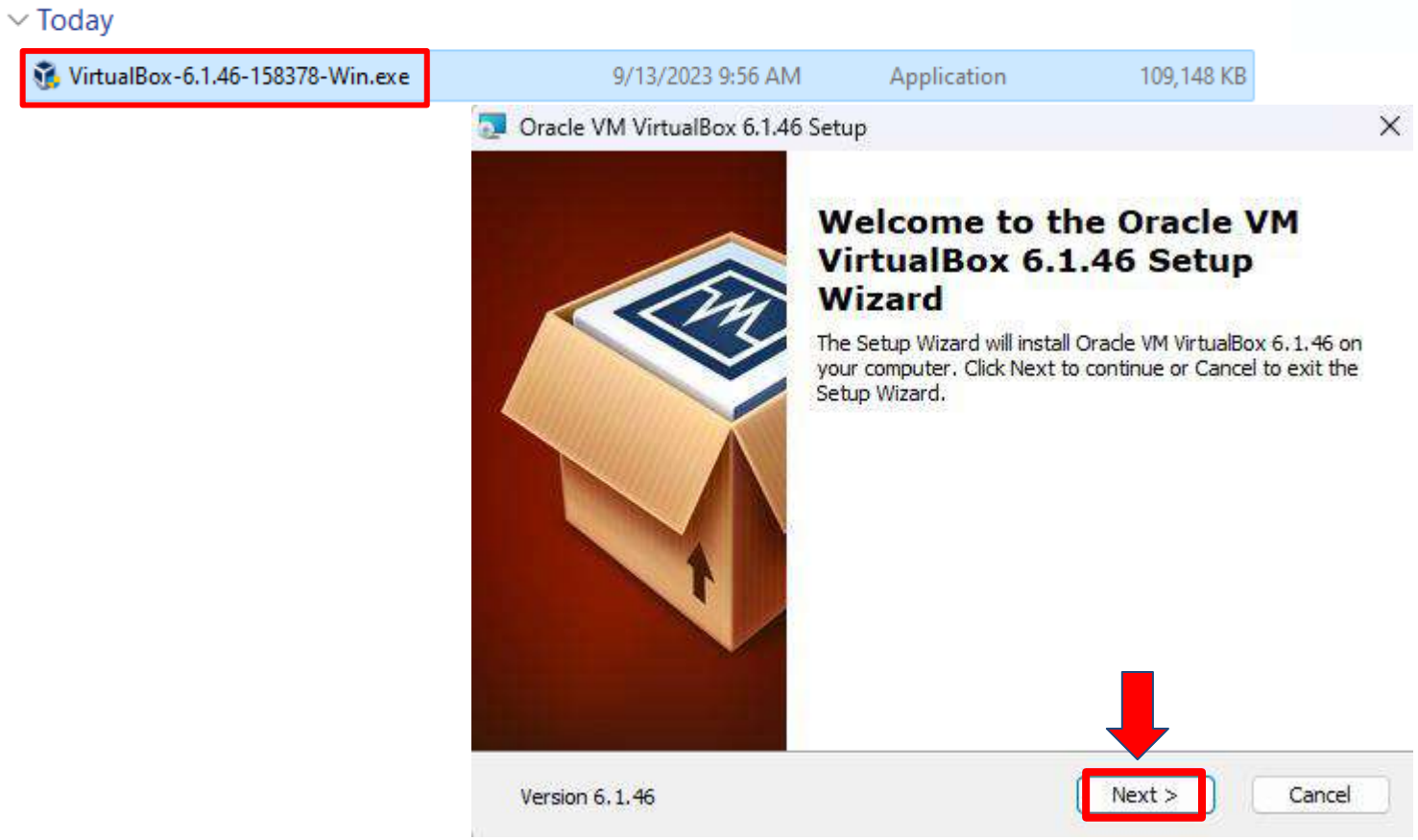
- Objective
- Experiment Environment
- Installation
  - VirtualBox 6.1.46
  - Add VM
  - SDN development environment

VirtualBox Installation (1/7)

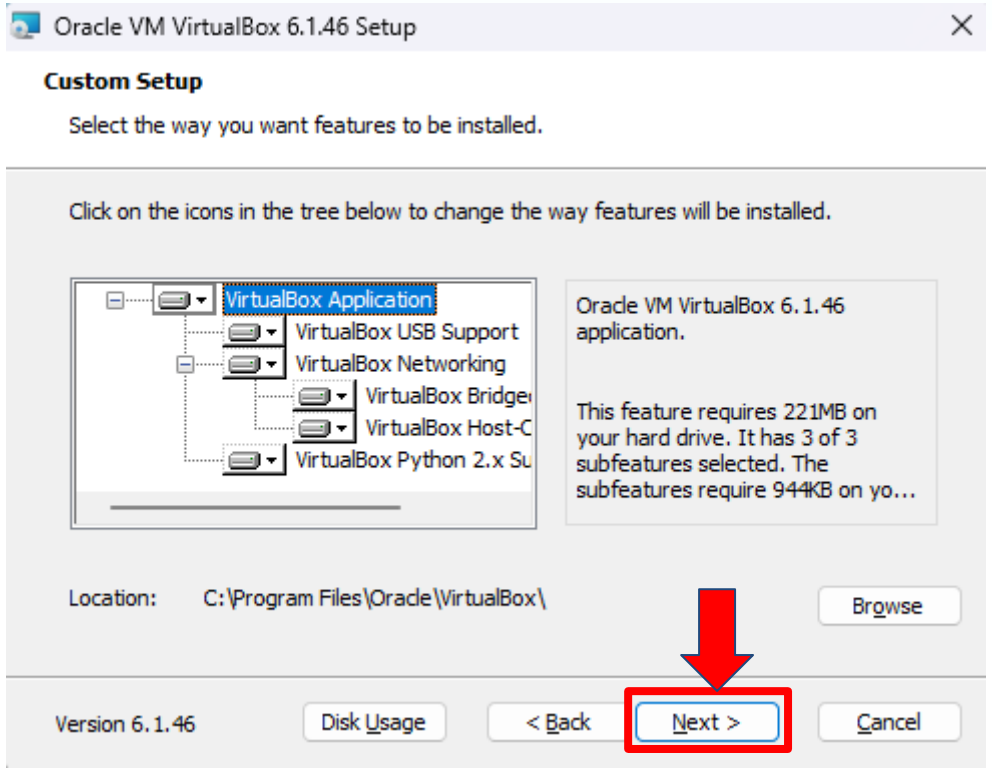
- Go to official download page
- Download the ”platform packages” for your OS

VirtualBox Installation (2/7)

- Start installation

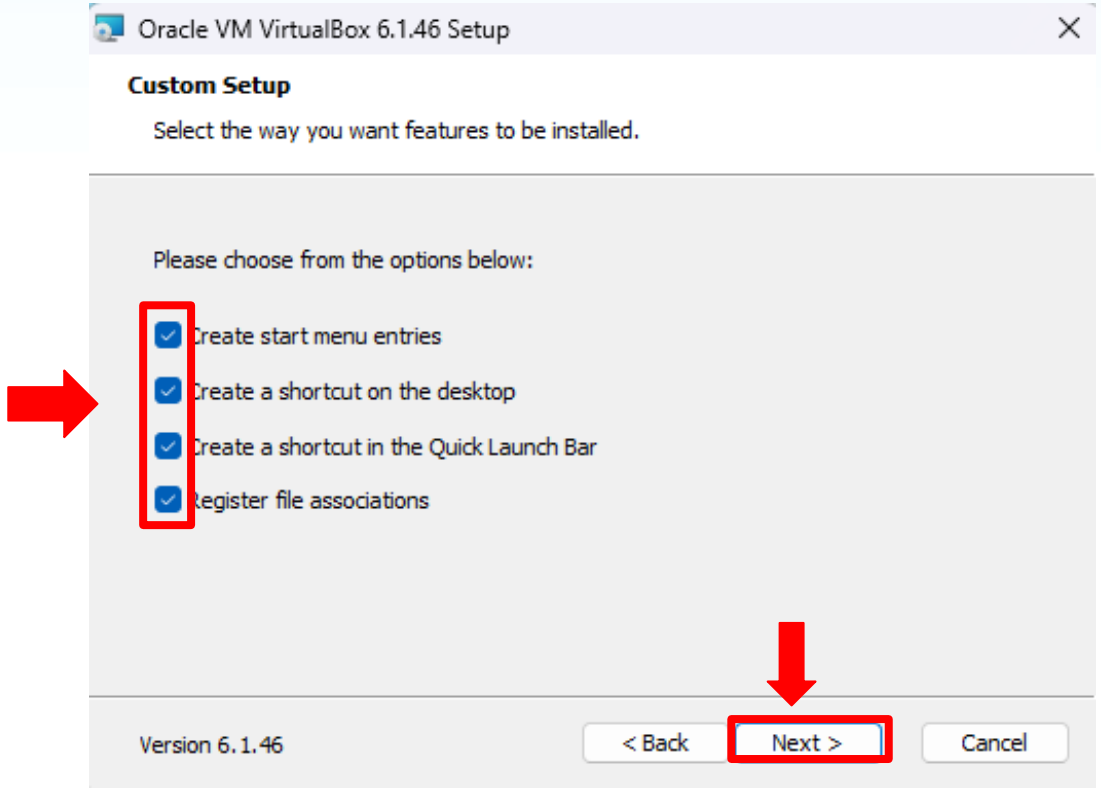


VirtualBox Installation (3/7)

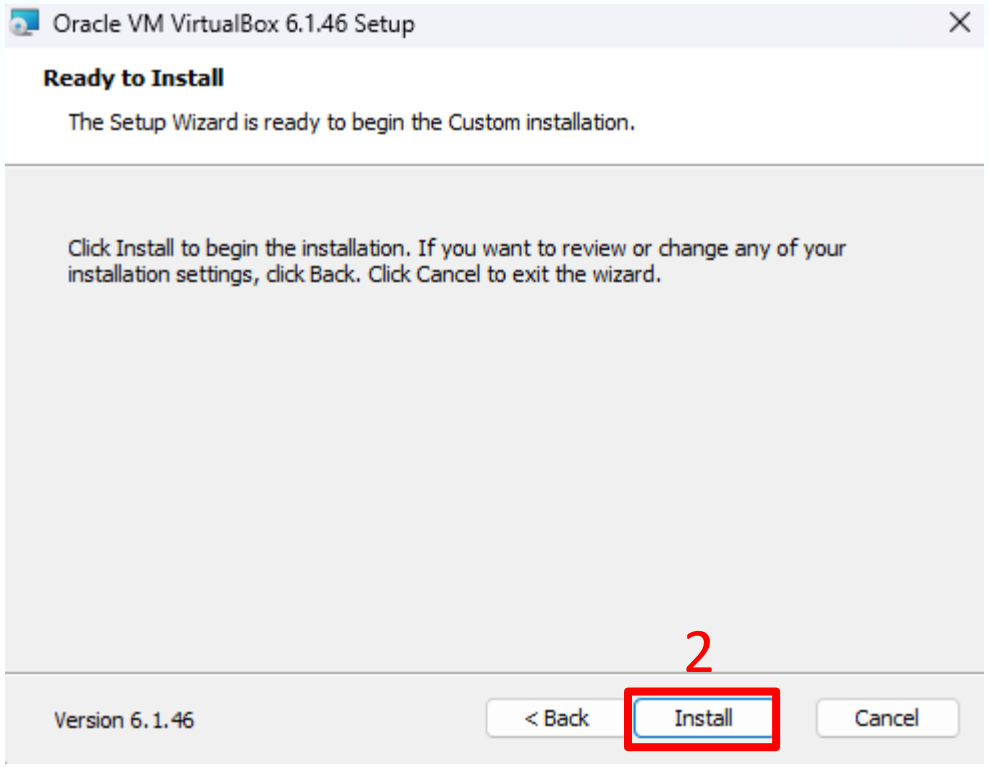


Change installation path if you want

VirtualBox Installation (4/7)



VirtualBox Installation (5/7)



VirtualBox Installation (6/7)

VirtualBox Installation (7/7)

Outline

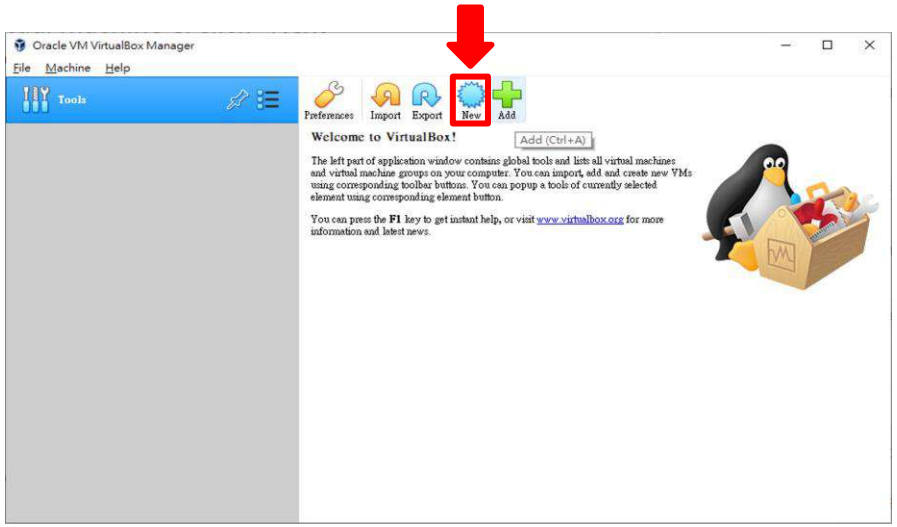
- Experiment Environment
- Installation
  - VirtualBox 6.1.46
  - Add VM
    - Download image file
    - Virtual machine setting
    - Ubuntu installation
  - SDN development environment

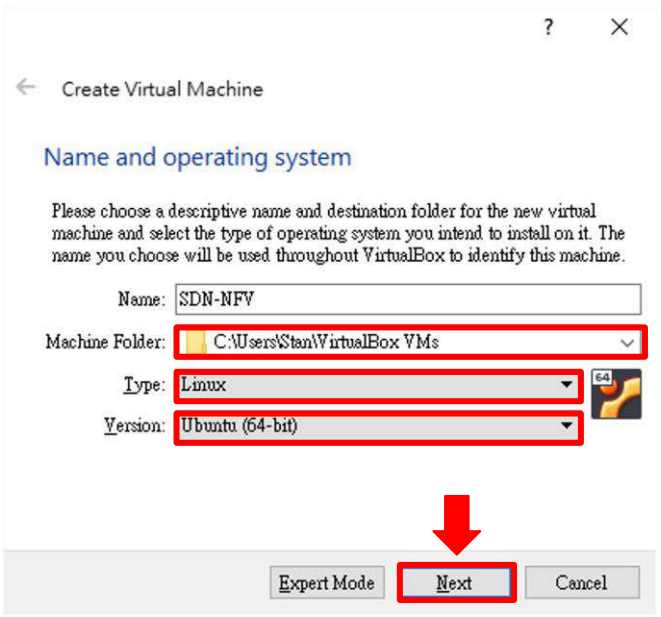
Download image file (1/10)

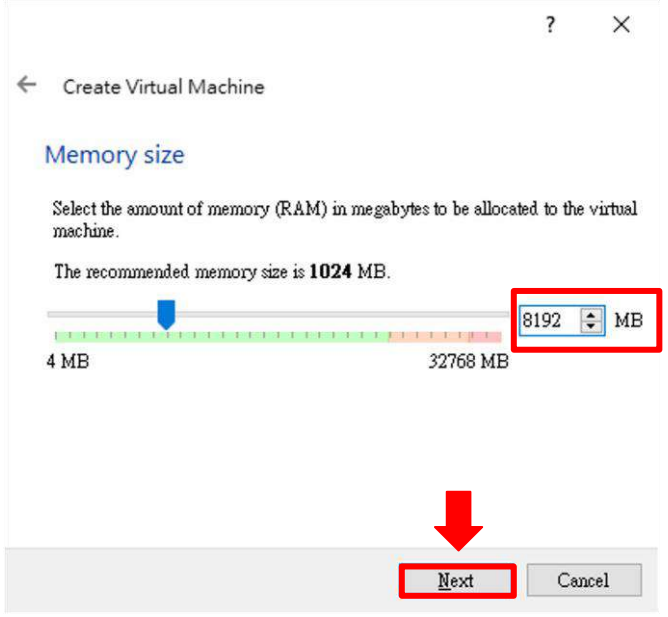
- Download image file (.iso) first
  - https://www.ubuntu-tw.org/modules/tinyd0/
  - Ubuntu Desktop 22.04

Virtual machine setting (2/10)

1. Start VirtualBox & Click “New”
2. Name the virtual machine (SDN-NFV), then click “Next”
3. Adjust the memory size to 8192MB, then click “Next”

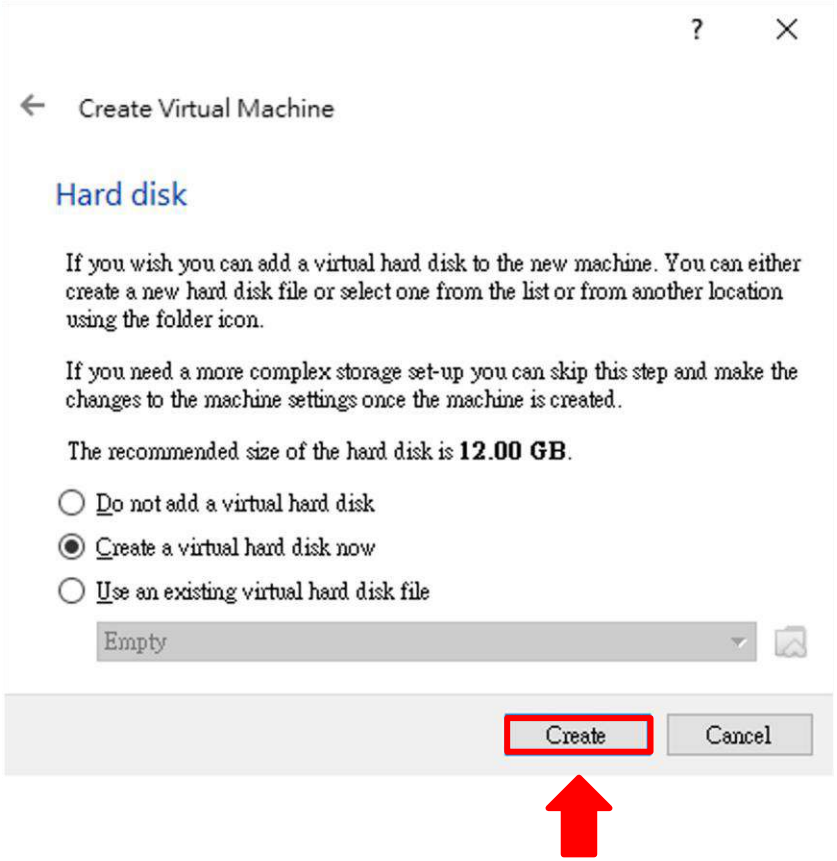


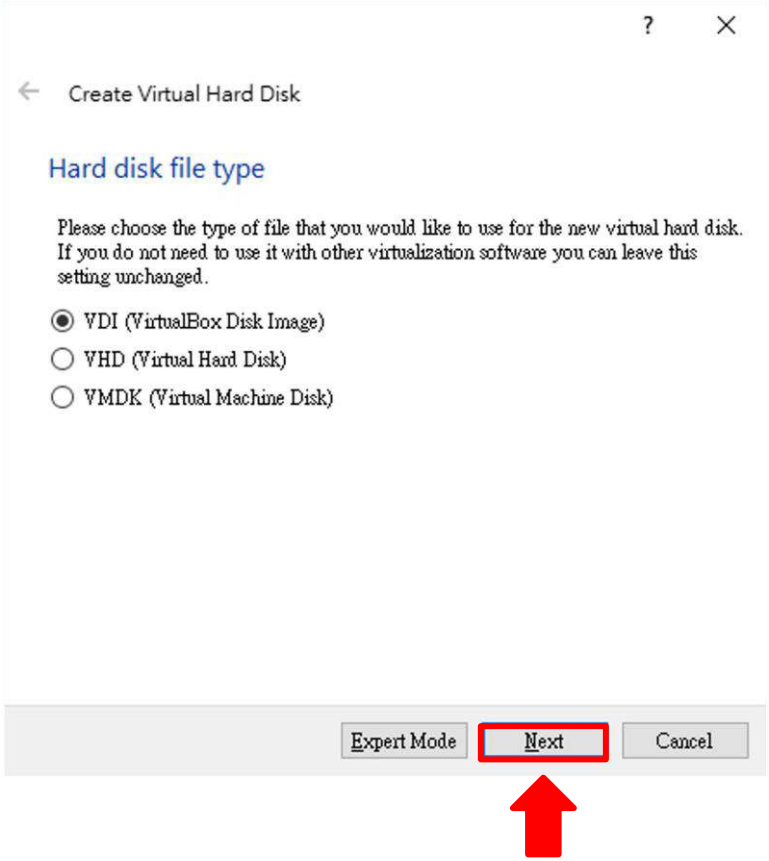




Virtual machine setting (3/10)

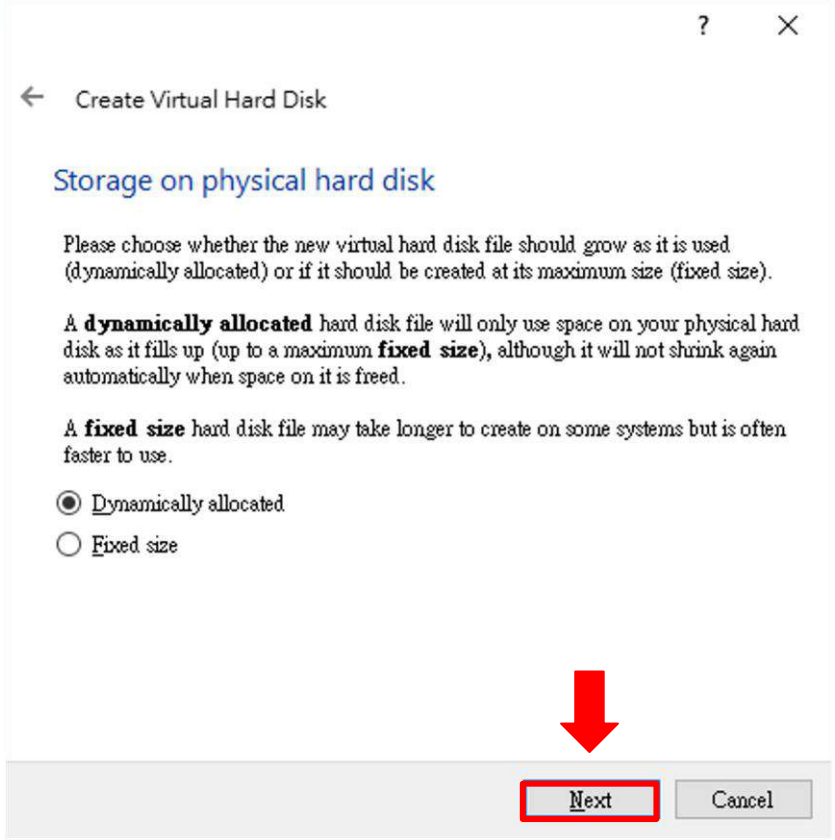
1. Click “Create”
2. Click “Next”

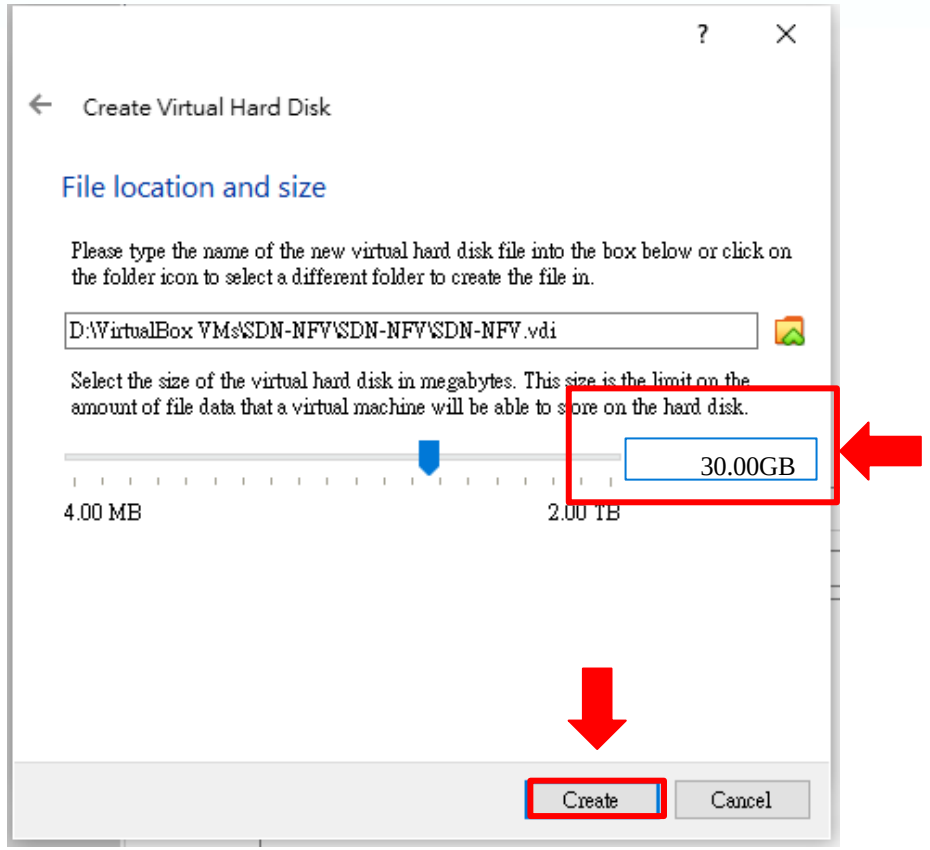




Virtual machine setting (4/10)

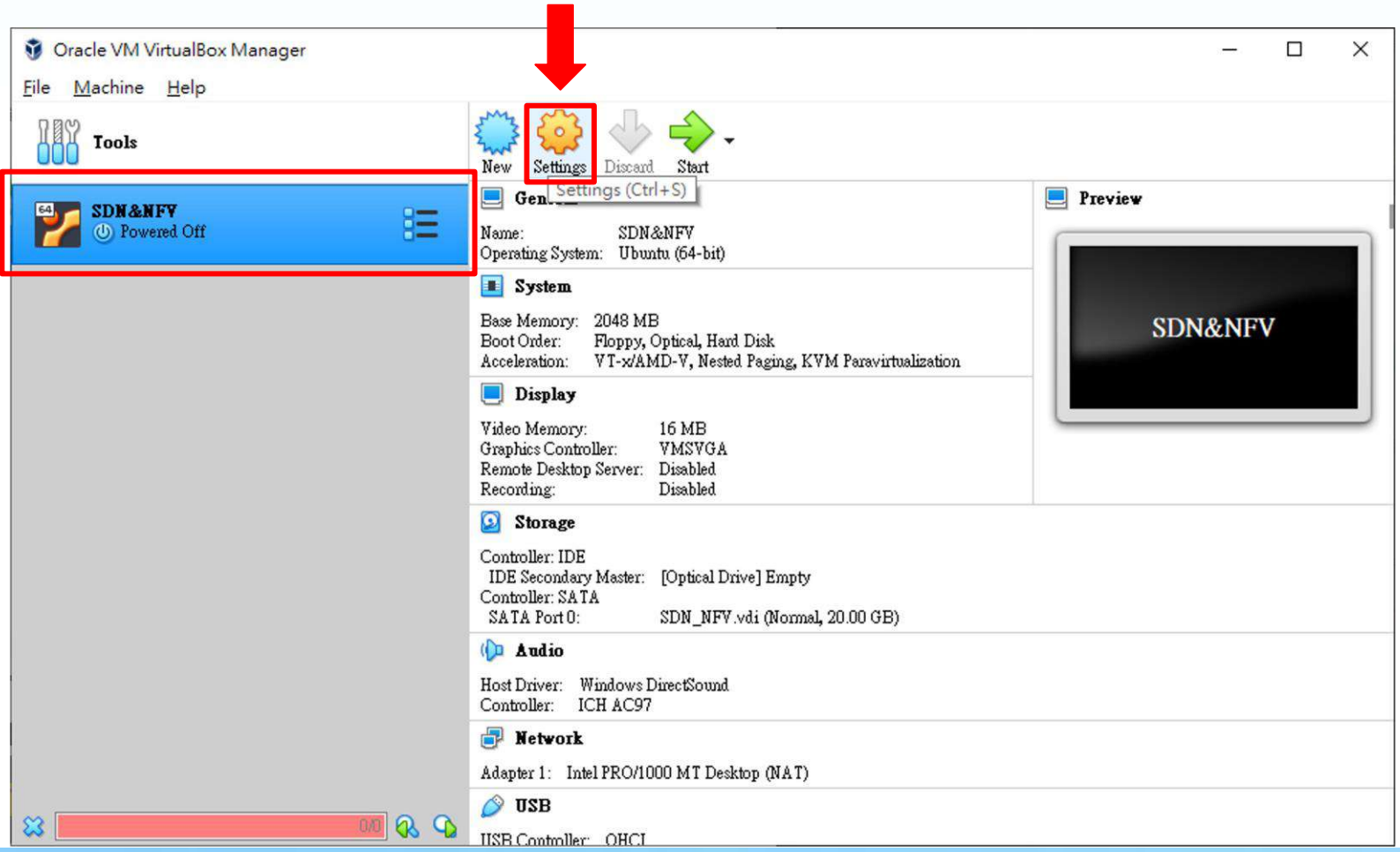
1. Click “Next”
2. Adjust the size of virtual HD to 30GB, then click “Create”





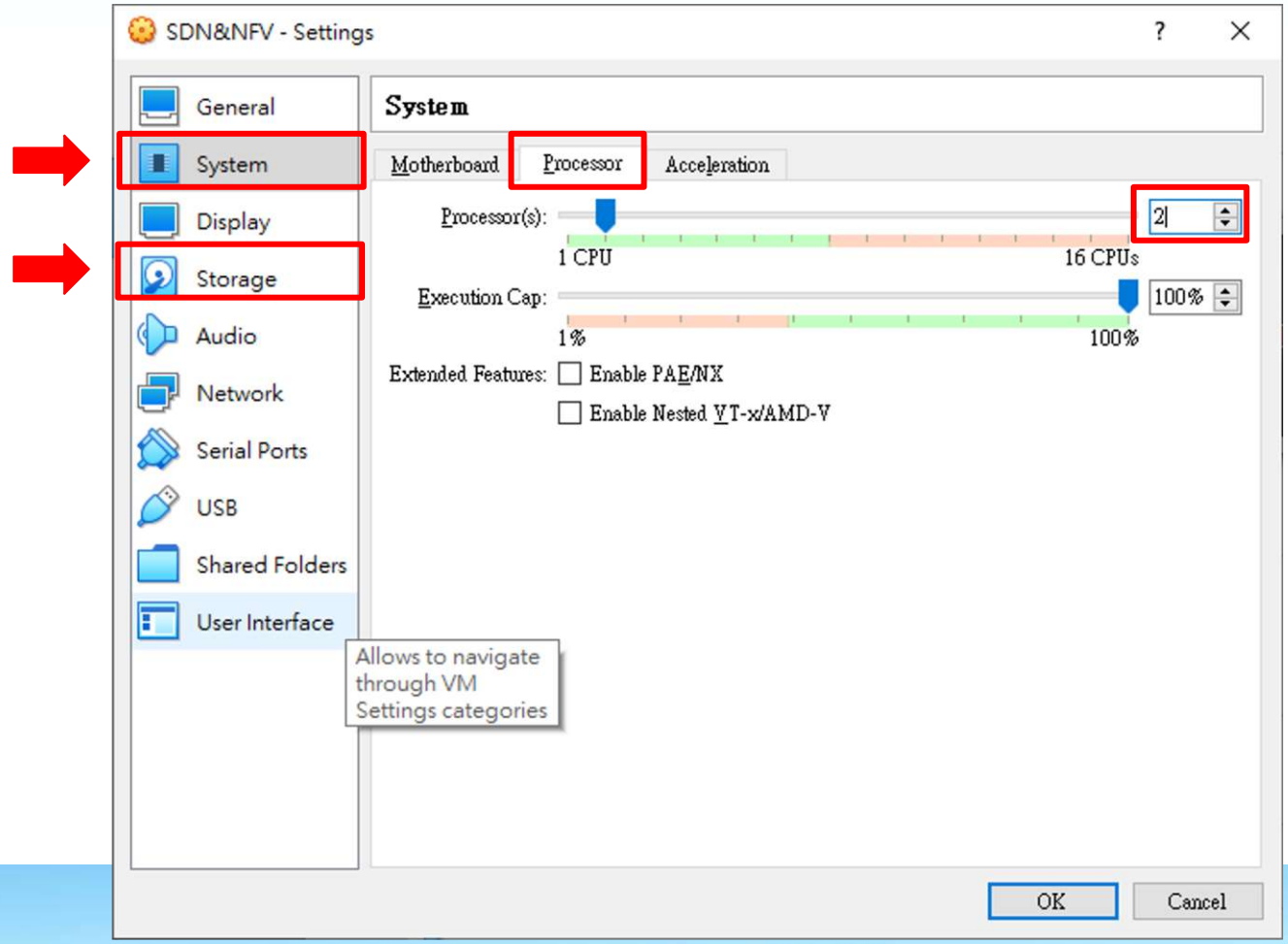
Virtual machine setting (5/10)

- Click “Settings”



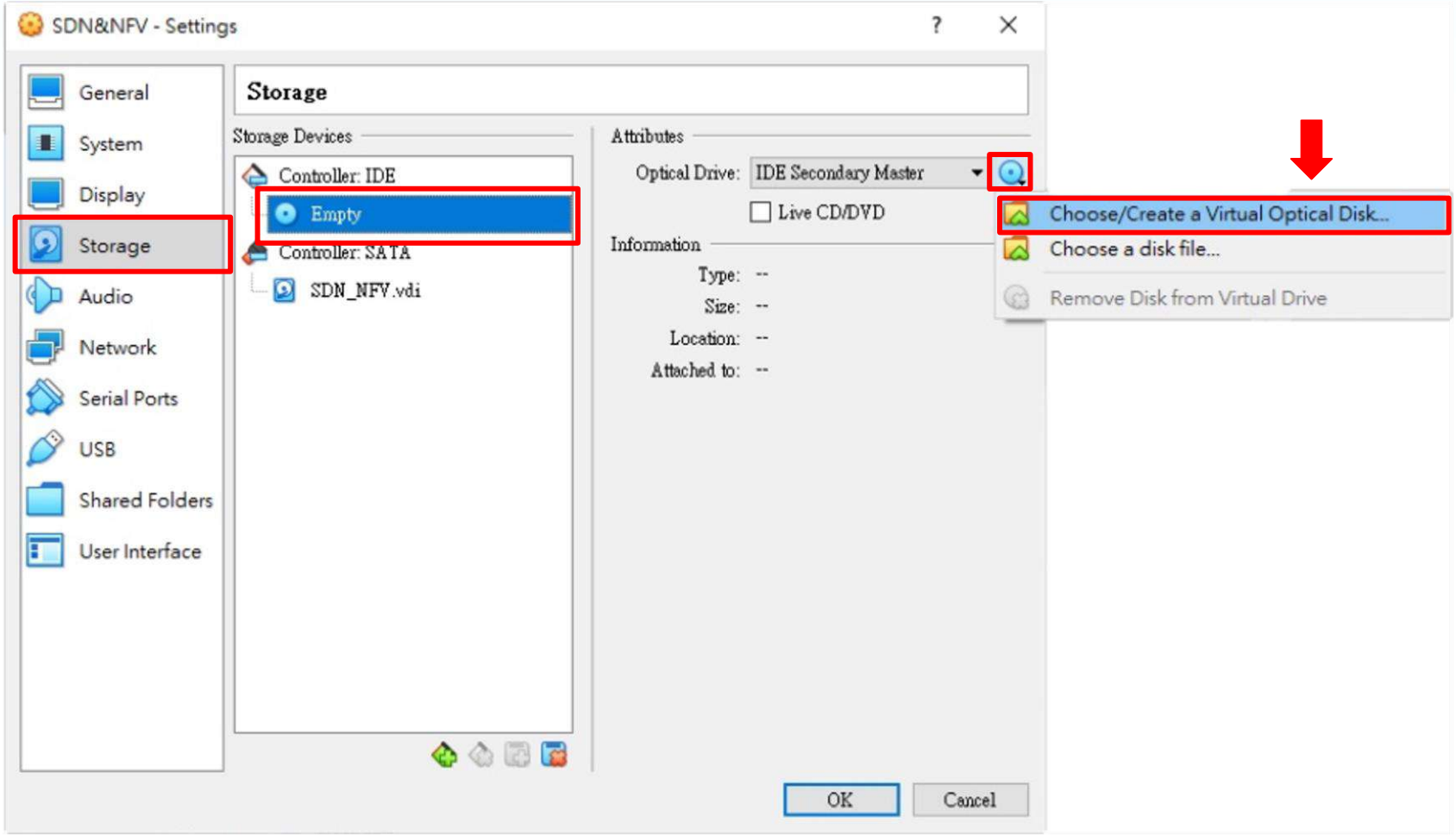
Virtual machine setting (6/10)

- System > Processor
  - Set 2 CPUs, then click “Storage”



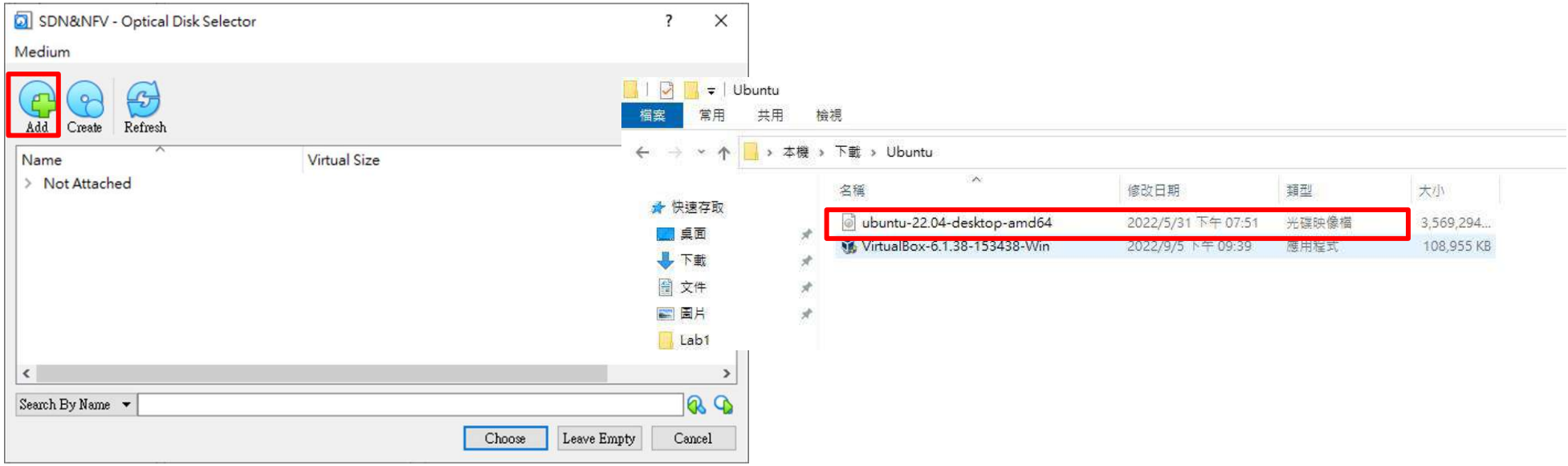
Virtual machine setting (7/10)

- Storage > Controller: IDE



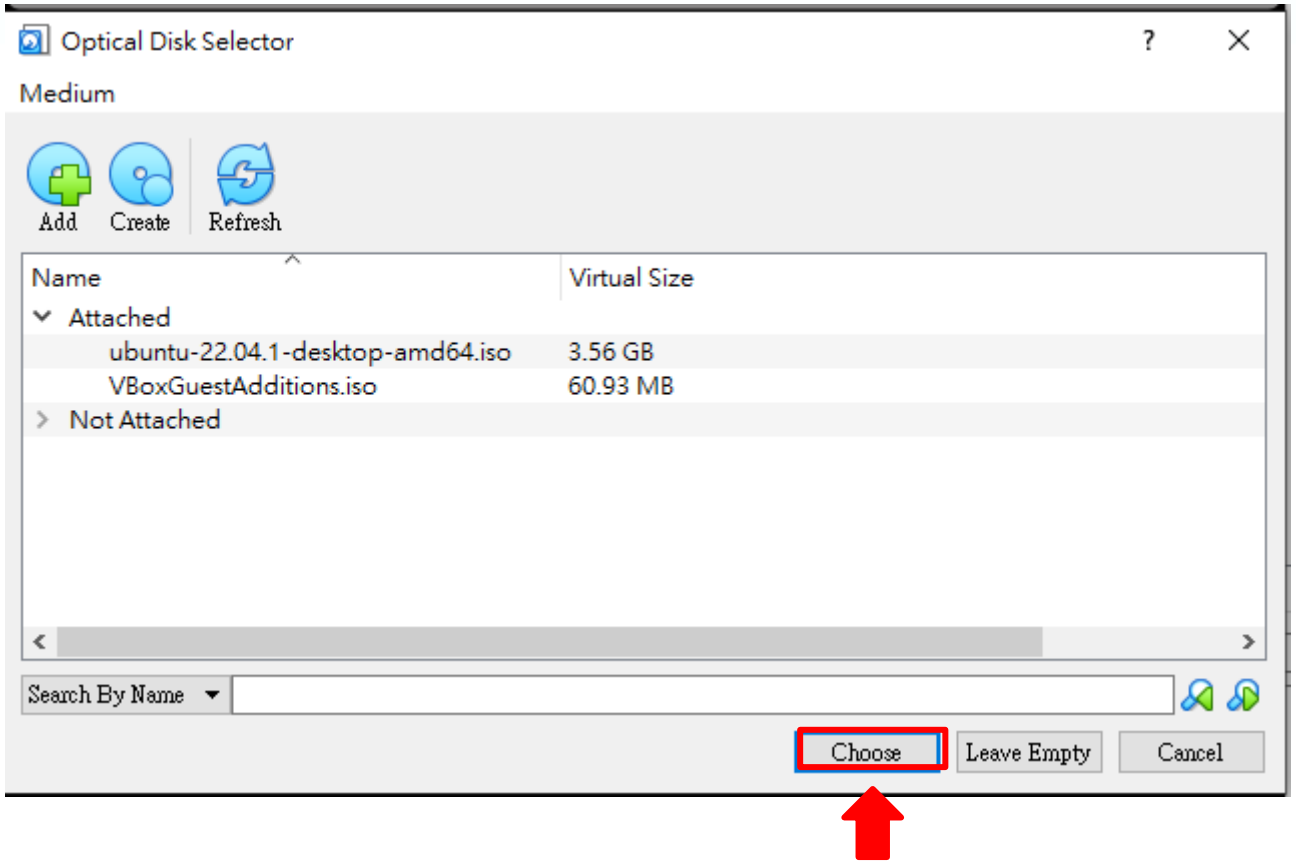
Virtual machine setting (8/10)

1. Click “Add”
2. Choose the previously downloaded image file (.iso)
3. Click “Open”



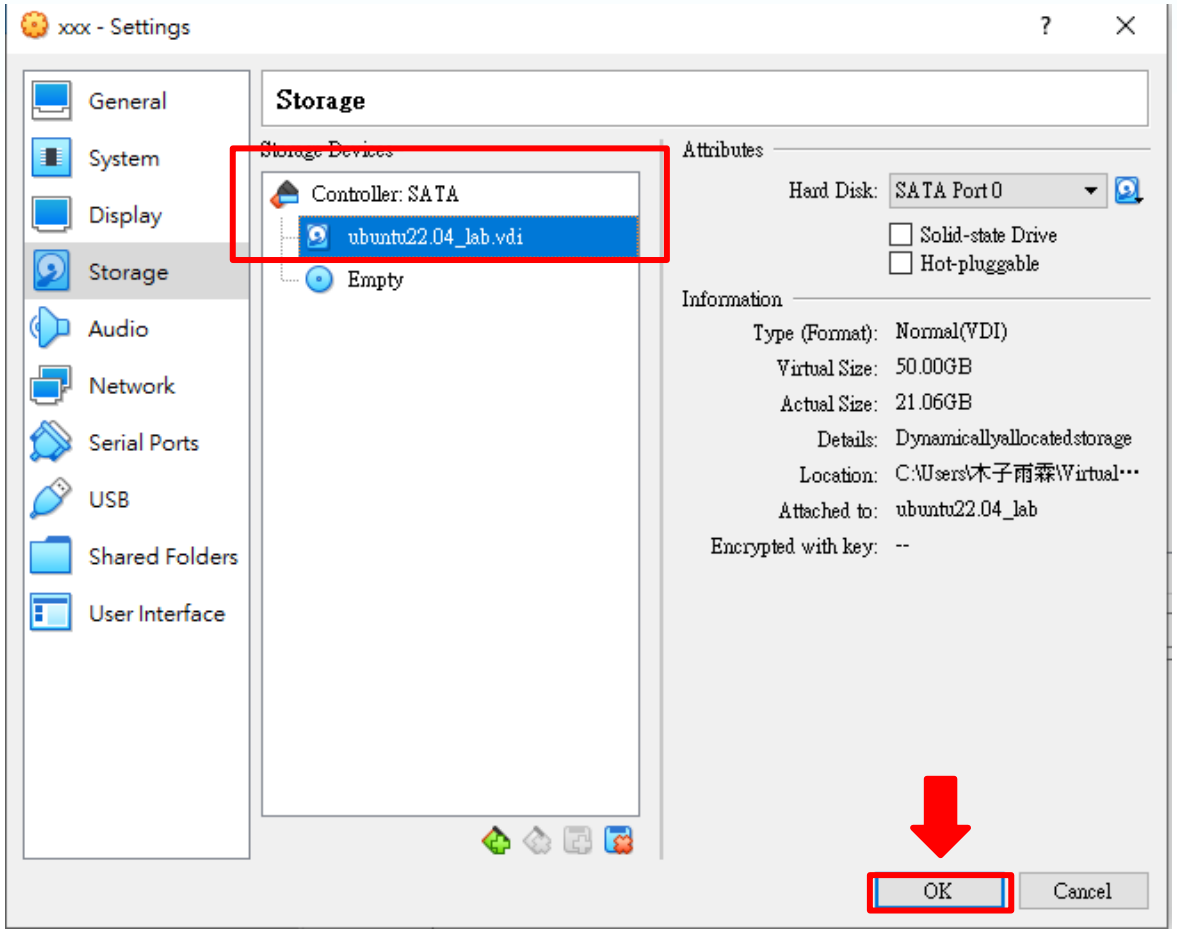
Virtual machine setting (9/10)

- Click “Choose”



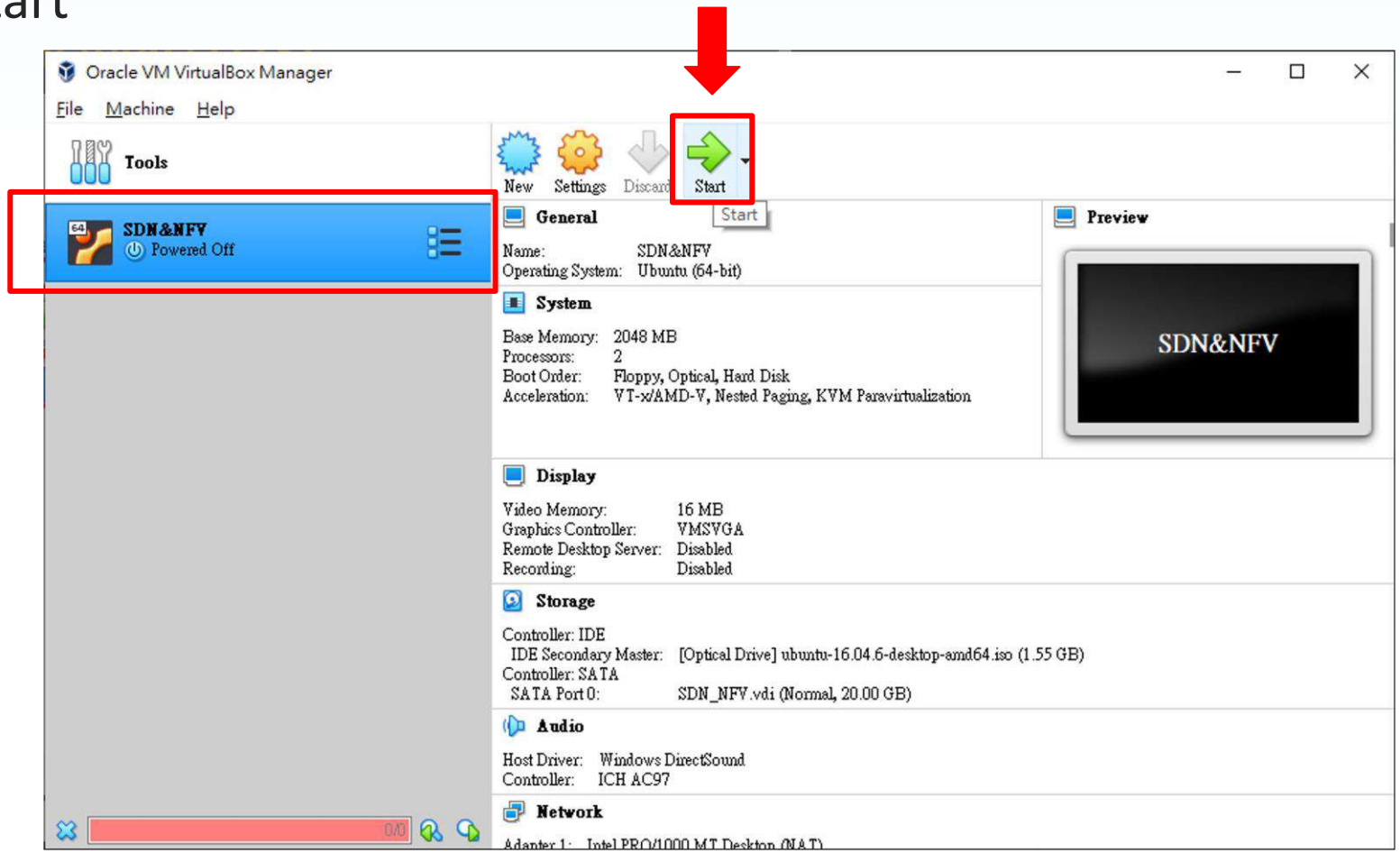
Virtual machine setting (10/10)

- Make sure all settings are right, then click “OK”



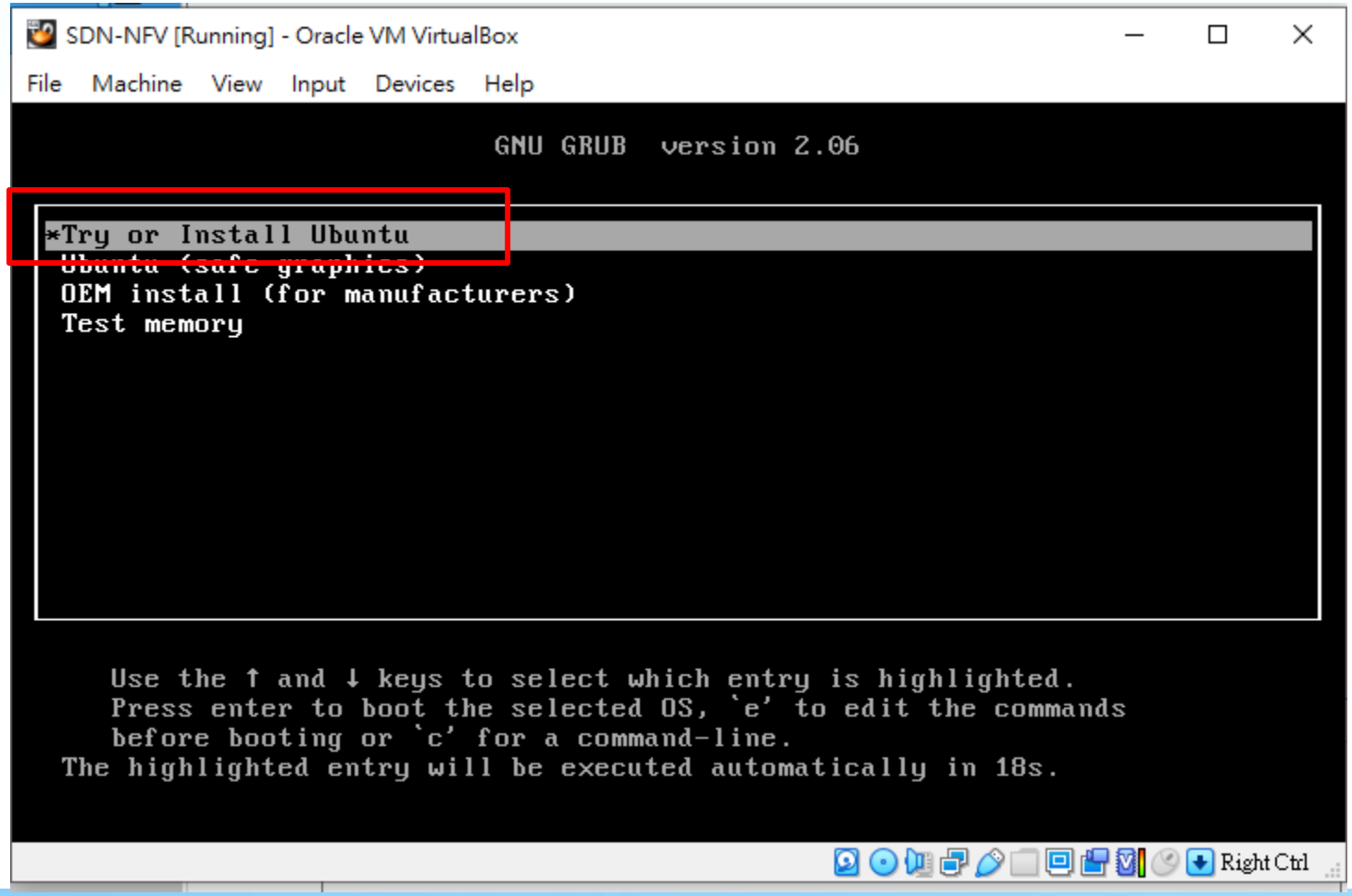
Ubuntu Installation (1/12)

- Click “Start”

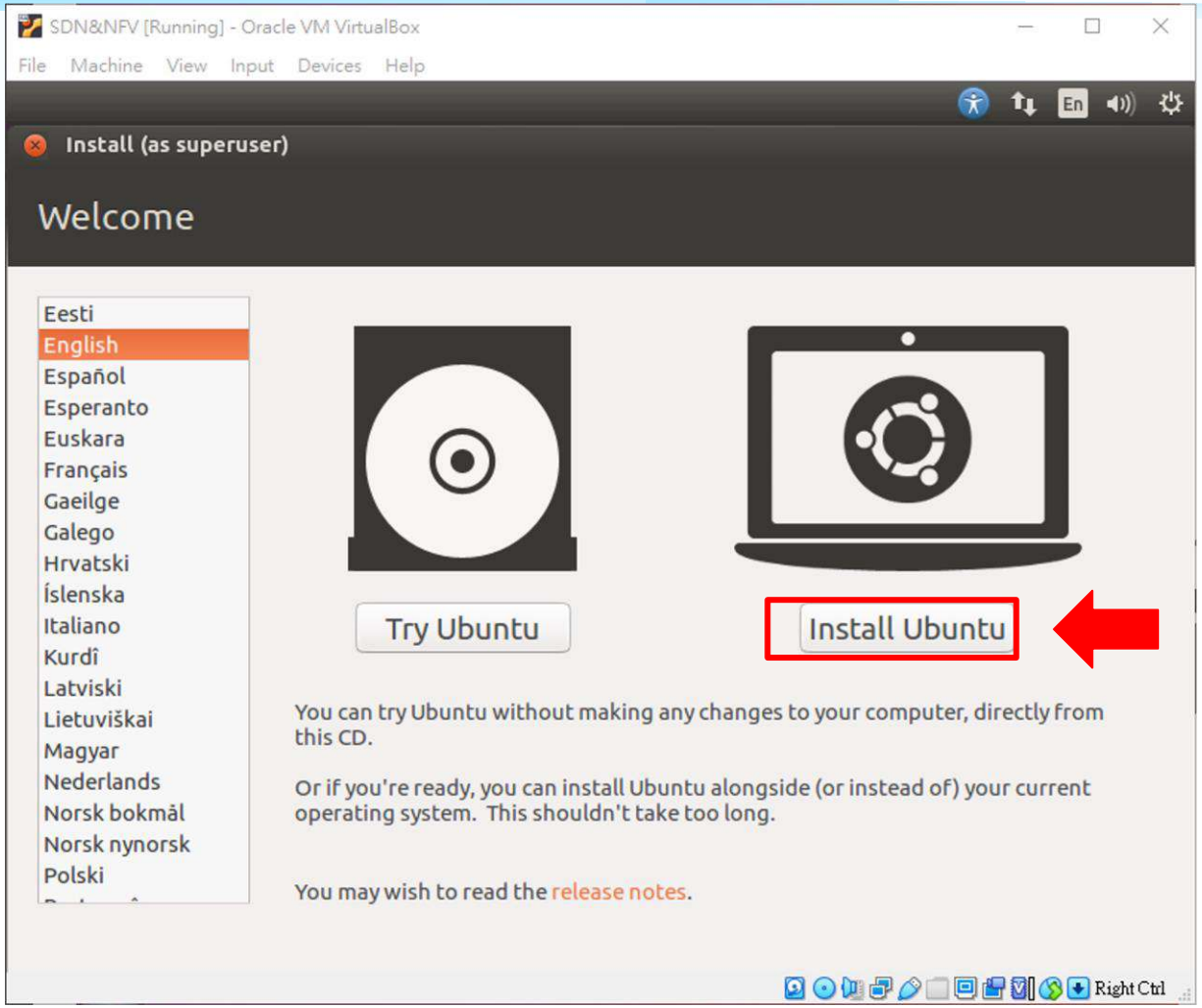


Ubuntu Installation (2/13)

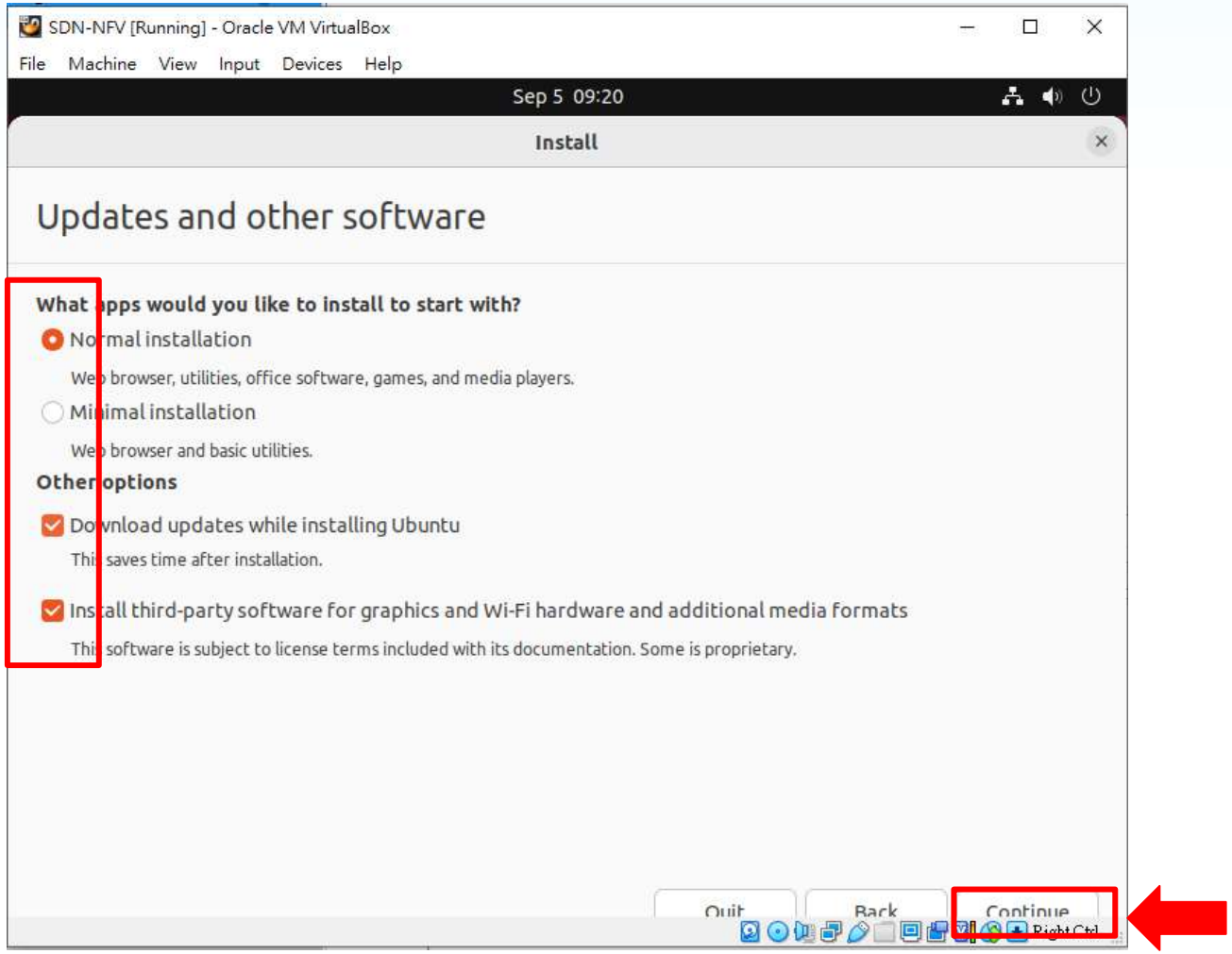
Choose “Try or install Ubuntu” and press “Enter”



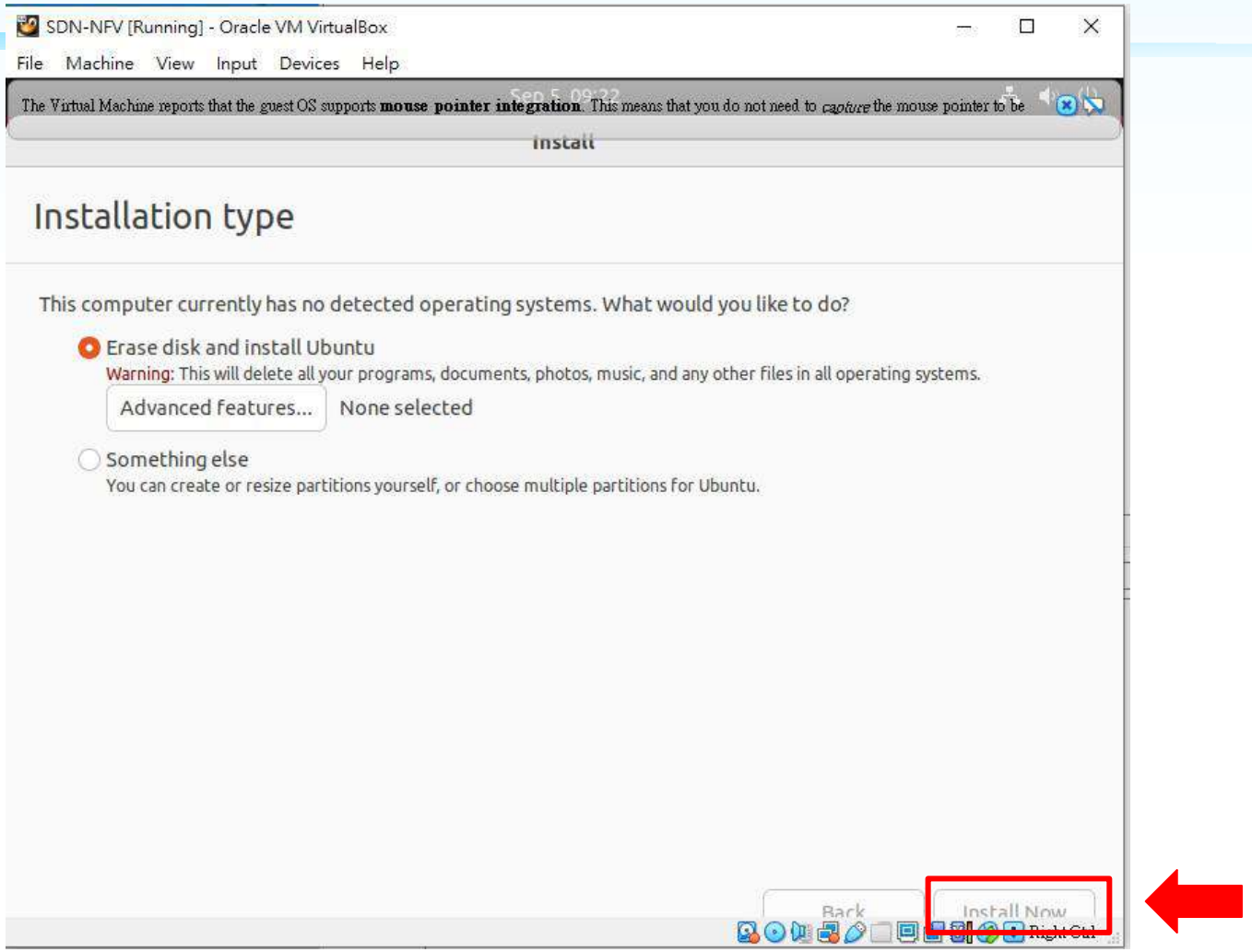
Ubuntu Installation (3/13)



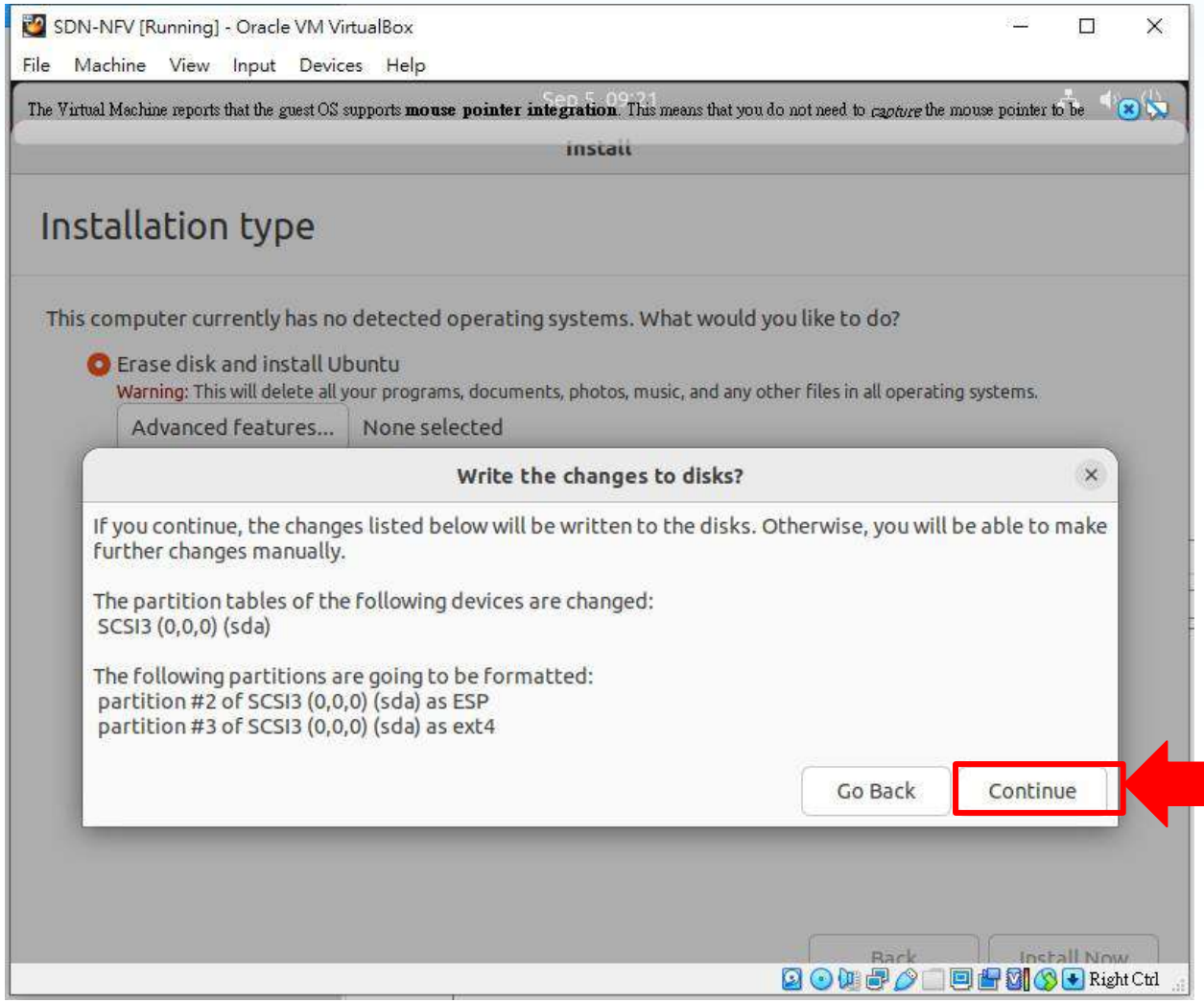
Ubuntu Installation (4/13)



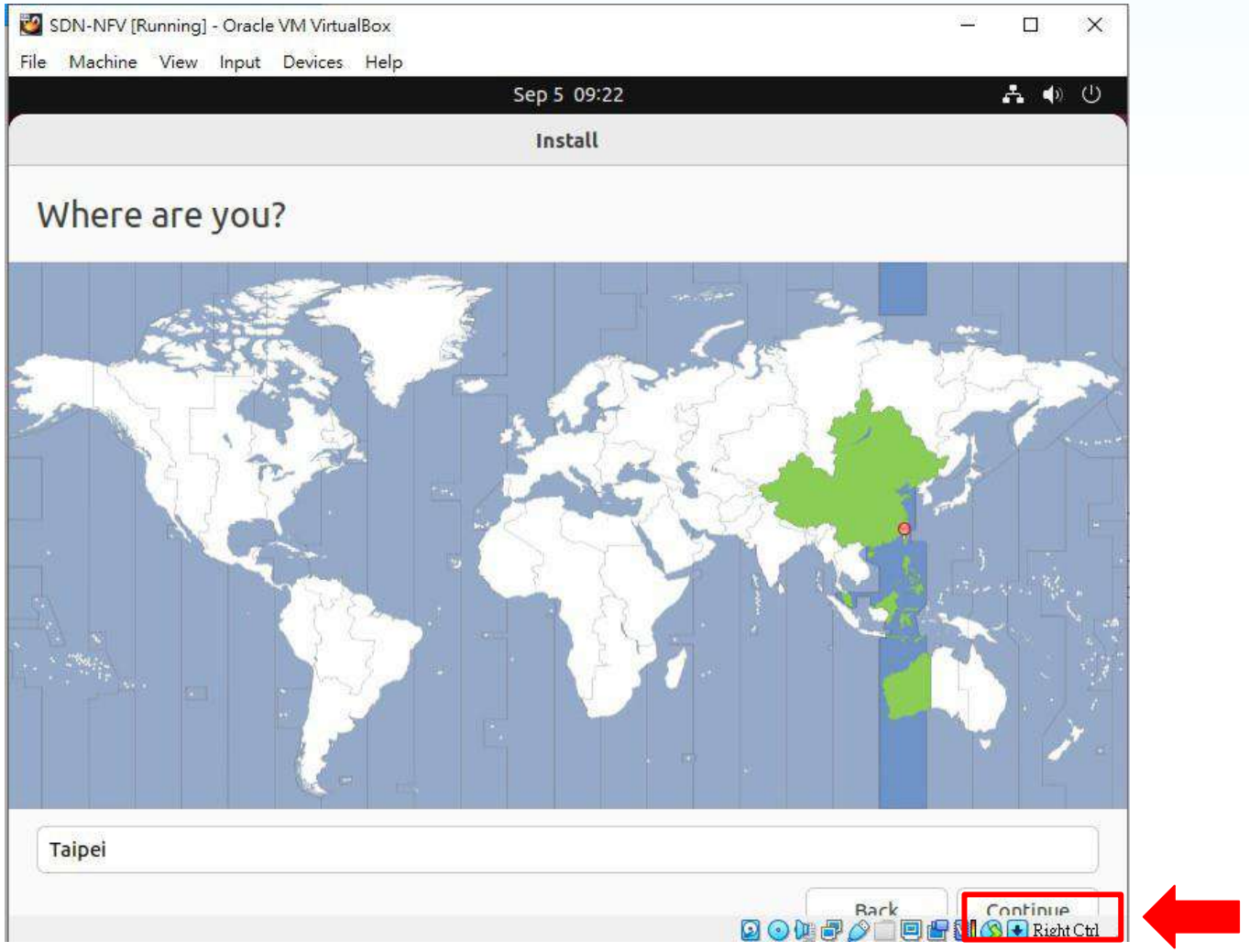
Ubuntu Installation (5/13)



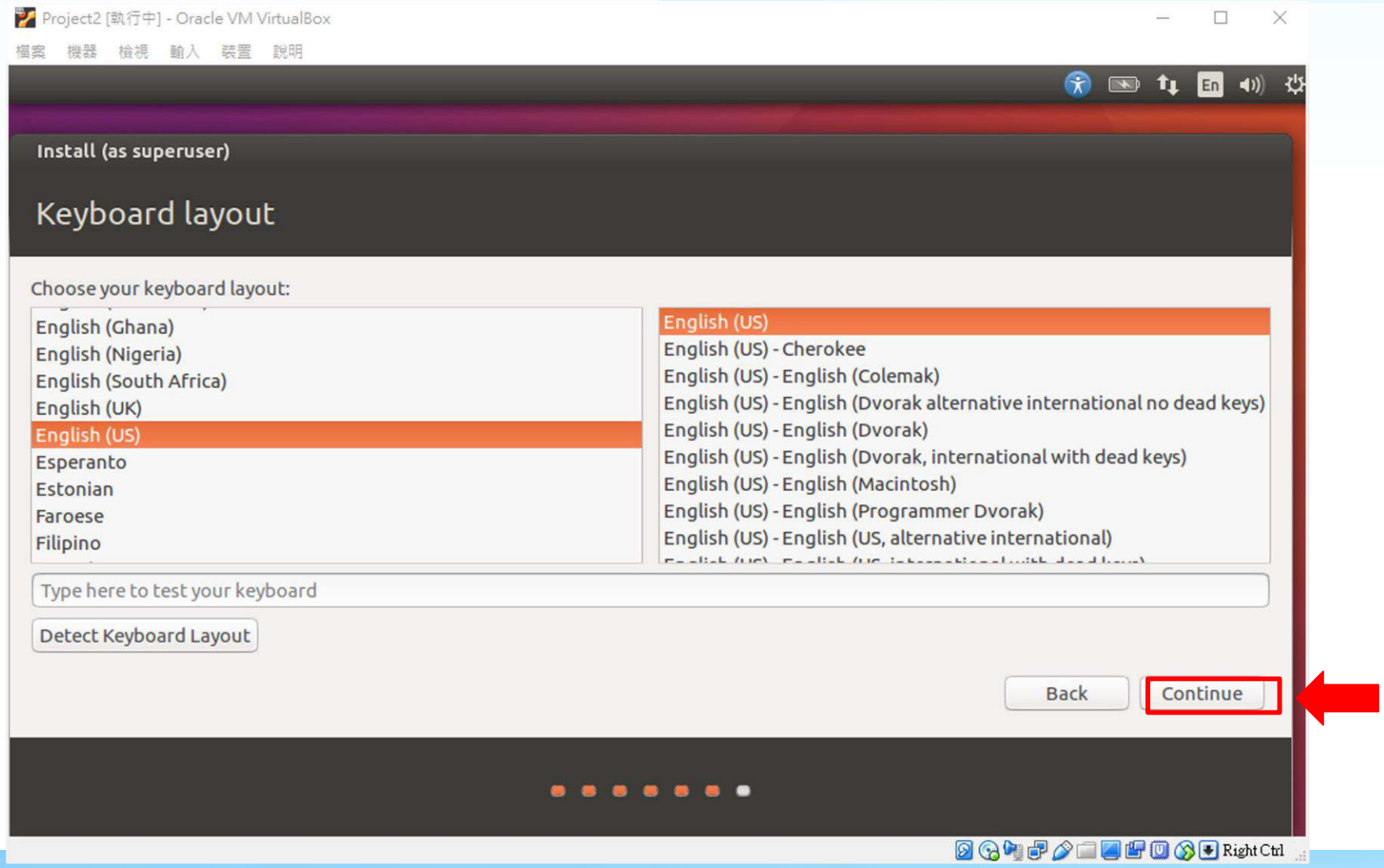
Ubuntu Installation (6/13)



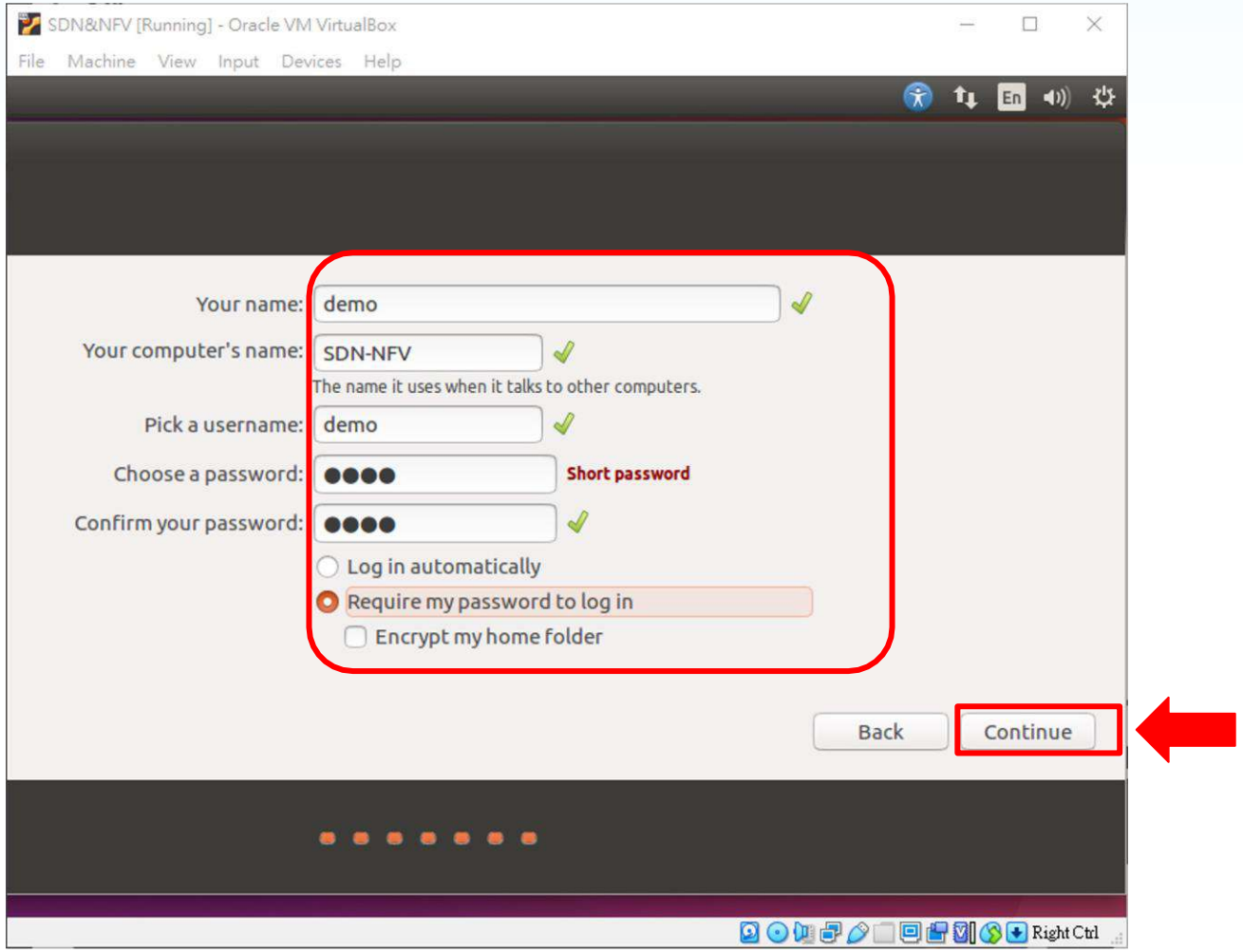
Ubuntu Installation (7/13)



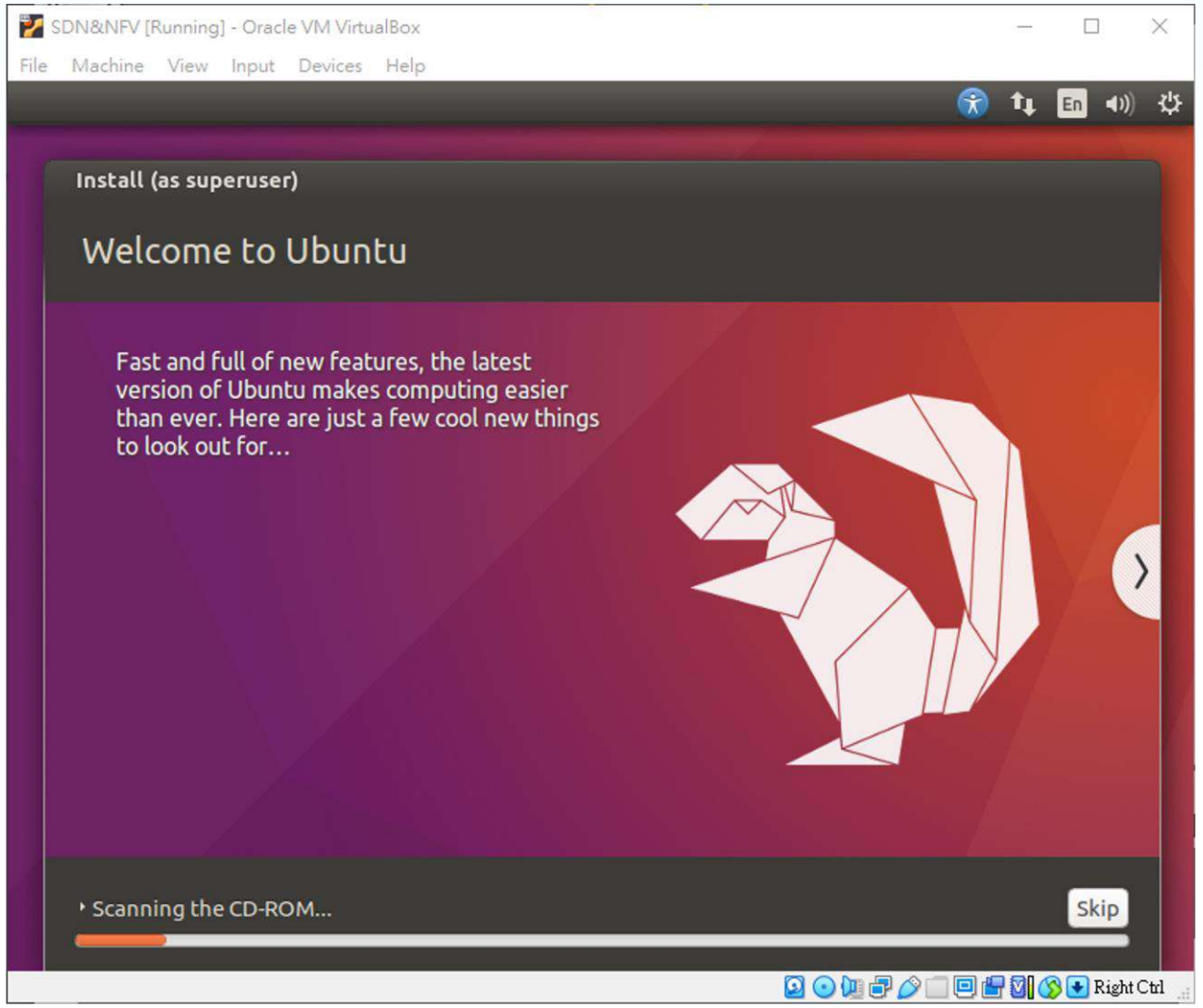
Ubuntu Installation (8/13)



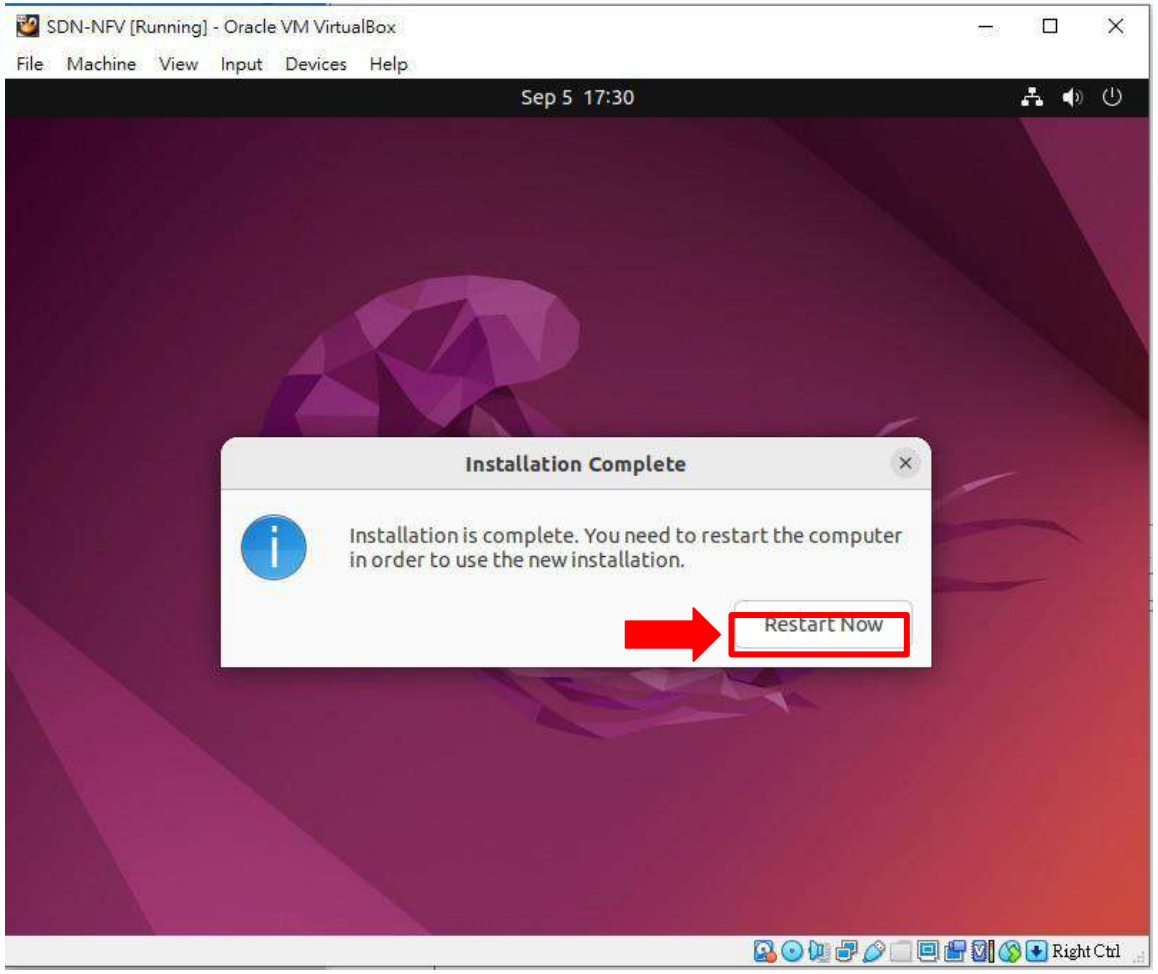
Ubuntu Installation (9/13)



Ubuntu Installation (10/13)

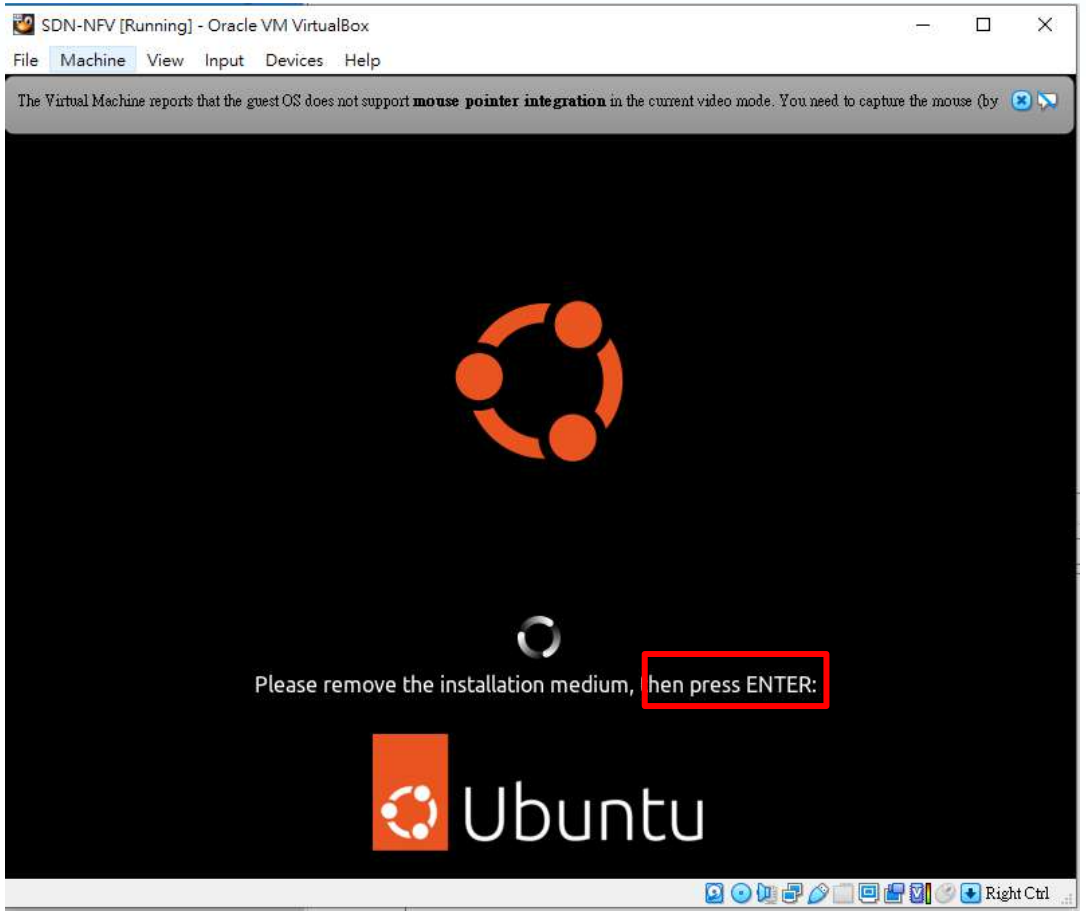


Ubuntu Installation (11/13)

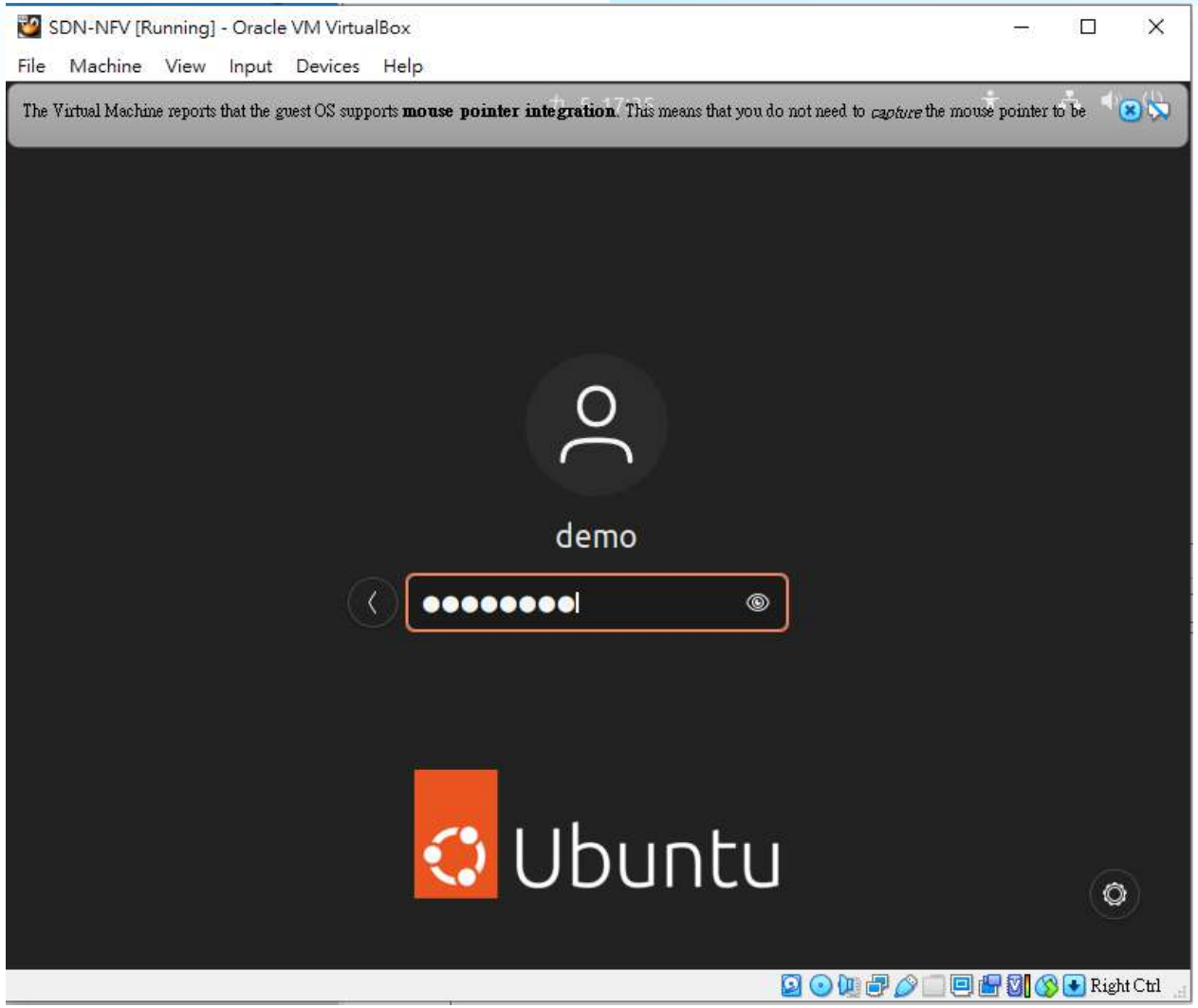


Ubuntu Installation (12/13)

- Press “Enter”, then VM will restart



Ubuntu Installation (13/13)

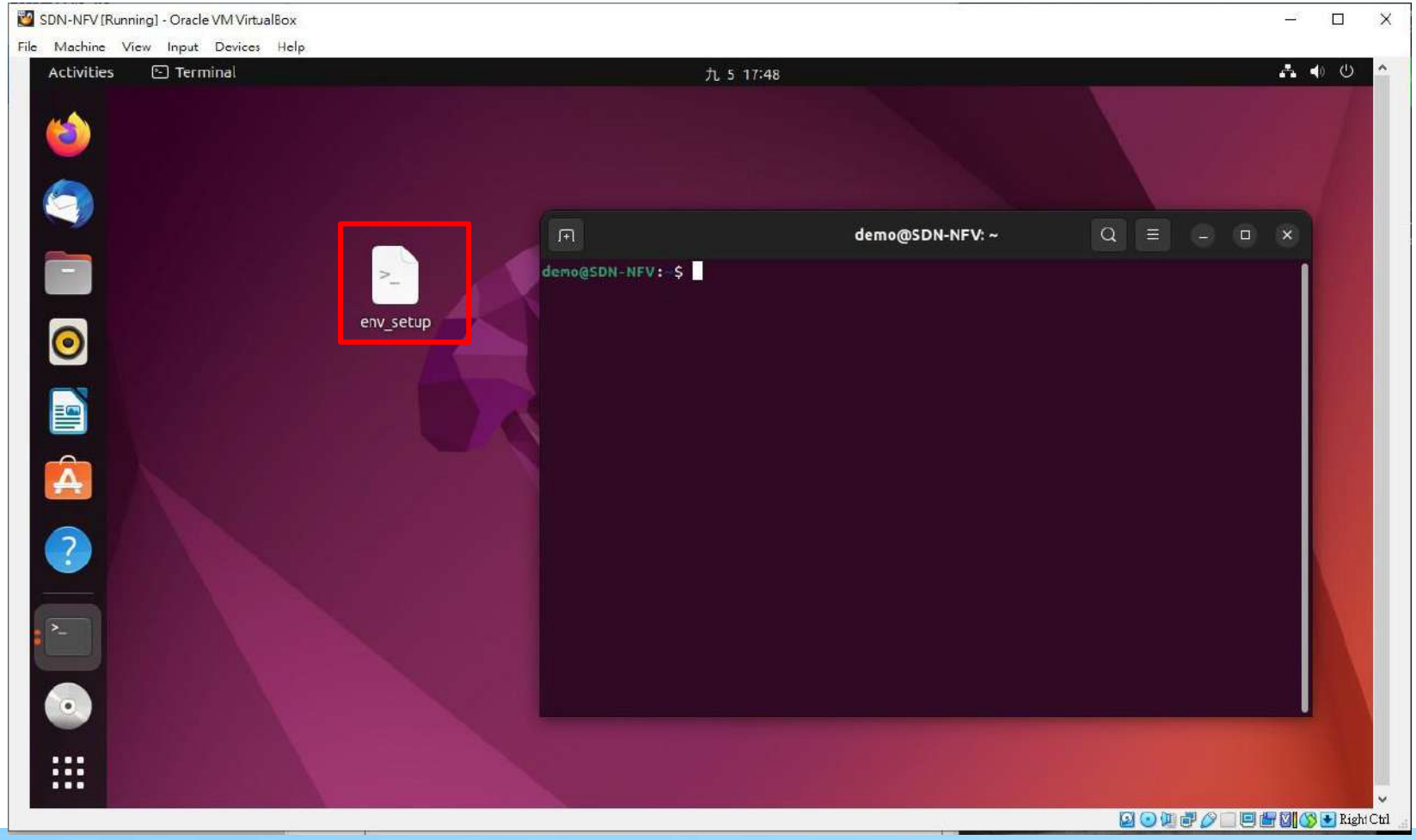


Outline

- Experiment Environment
- Installation
  - VirtualBox 6.1.2
  - Add VM
  - SDN development environment

SDN development environment (1/4)

- Download “env_setup” from e3
- Open terminal



SDN development environment (2/4)

- Go to directory where the “env_setup” is

  `$ cd ~/Desktop`

- Change file permission to execute

  `$ chmod +x env_setup`

- Execute the shell script

  `$ ./env_setup`

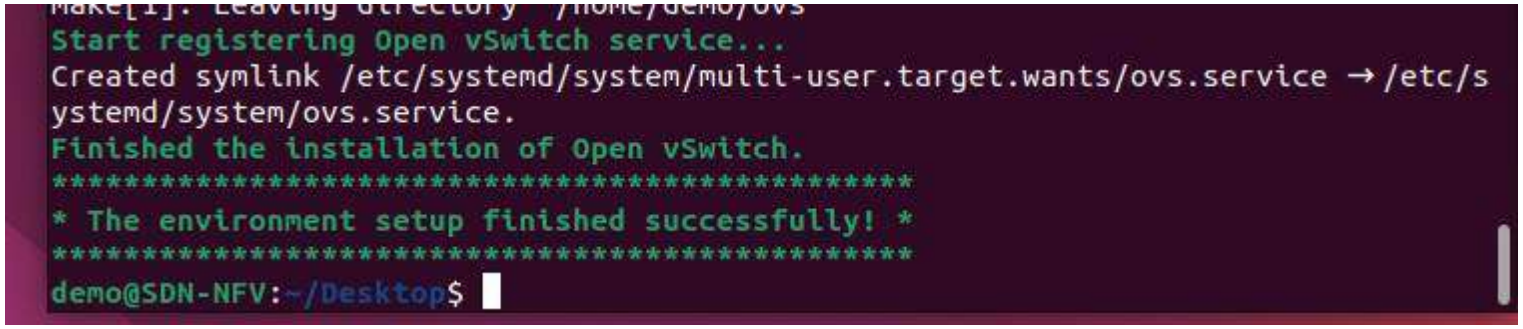
```
demo@SDN-NFV:~$ cd ~/Desktop/
demo@SDN-NFV:~/Desktop$ chmod +x env_setup.sh
demo@SDN-NFV:~/Desktop$ ./env_setup.sh
[sudo] password for demo:
```

SDN development environment (3/4)

- It will take around 20 minutes (or more)
- Shell script will automatically install:
  - Bazelisk 1.12.0
  - ONOS 2.7.0
  - Mininet 2.3.0
  - OvS 2.17.2

SDN development environment (4/4)

- If the installation complete, you'll see finish message



- Run the command

```
demo@SDN-NFV:~$ source ~/.bashrc
```

- After this, you have finished your environment setup