



THE UNIVERSITY OF HONG KONG
Department of Data and Systems Engineering
DASE7505 Intelligent Unmanned Systems

Tutorial: Ubuntu Installation and Environment Setup

Objectives:

- By following the instructions in this tutorial sheet, you should have properly installed Ubuntu 22.04 on a virtual machine (VMware Workstation 17 Pro).
- A basic understanding of how a virtual Ubuntu works on Windows.
- Some additional exercises for dual boot and ROS basics are available in the last section with references (optional reading).

Equipment and Systems Requirements:

- A PC with Windows as the operating system (please note that this solution was for Windows environments, **it does not work for MacOS**)
- Disk space: 40 GB
- RAM: 8-16 GB
- CPU @ least 10 GHz in total (~ 4 cores)

Step-by-Step Instructions:

1. Follow the link to Ubuntu release website:

<https://releases.ubuntu.com/jammy/>

You should see the download page in as bellows. Click “64-bit PC (AMD64) desktop image” and it will start downloading the desktop image automatically. (you don’t need to touch the file for this stage)



ubuntu releases

Ubuntu 22.04.5 LTS (Jammy Jellyfish)

Select an image

Ubuntu is distributed on three types of images described below.

Desktop image

The desktop image allows you to try Ubuntu without changing your computer at all, and at your option to install it permanently later. This type of image is what most people will want to use. You will need at least 1024MiB of RAM to install from this image.

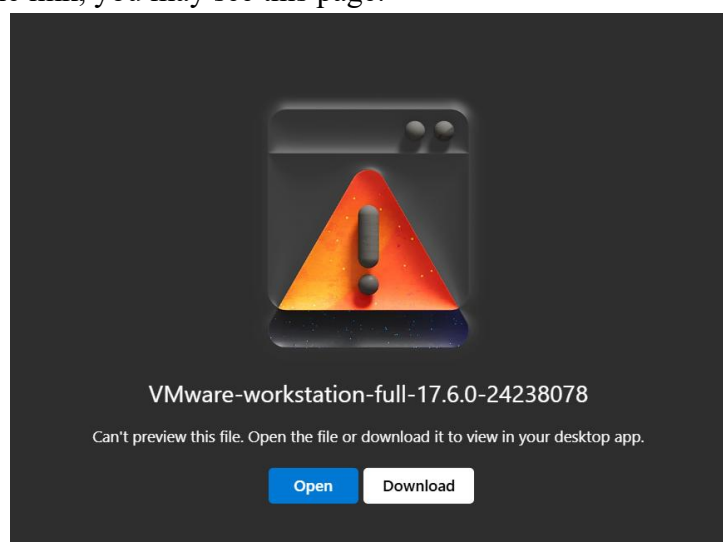
64-bit PC (AMD64) desktop image

Choose this if you have a computer based on the AMD64 or EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). Choose this if you are at all unsure.

2. Follow the link to download the VMware Workstation 17 (Since it's not easy to directly install from the web which requires the license key, you may download this version from the Microsoft OneDrive using you **HKU connect email account and password**)

https://connecthkuhk-my.sharepoint.com/:u:/g/personal/u3012789_connect_hku_hk/EUluHFVXQDFHl3p8KD_NsGa4BP2Dv_AnjNHYPuAD_Jam9Q?e=np8cLu

After clicking the link, you may see this page:

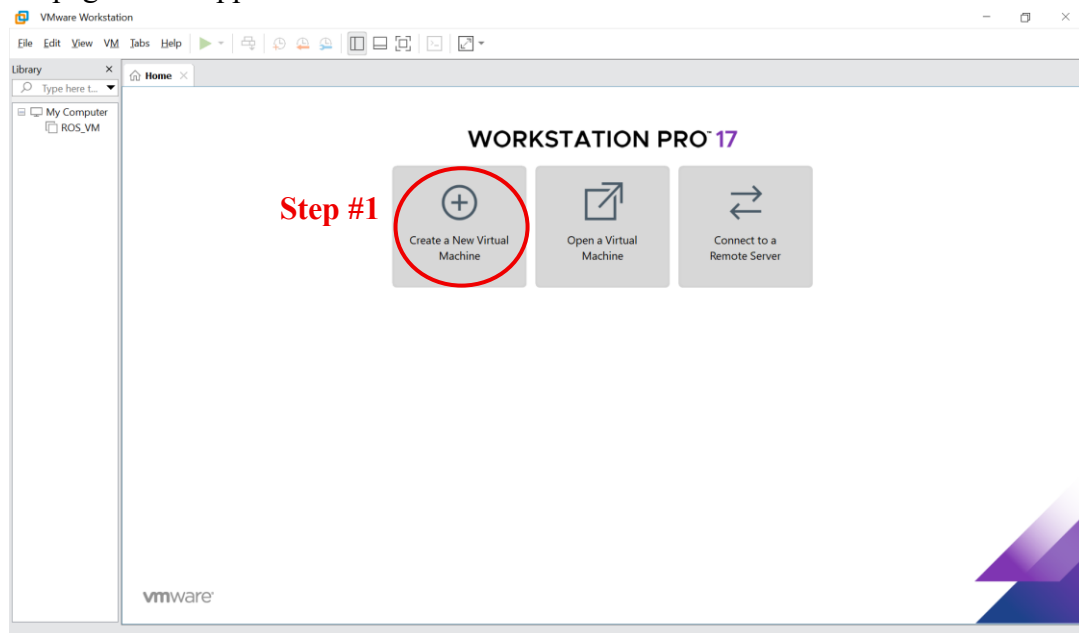


Click “Download” and then it will be stored into your home PC.

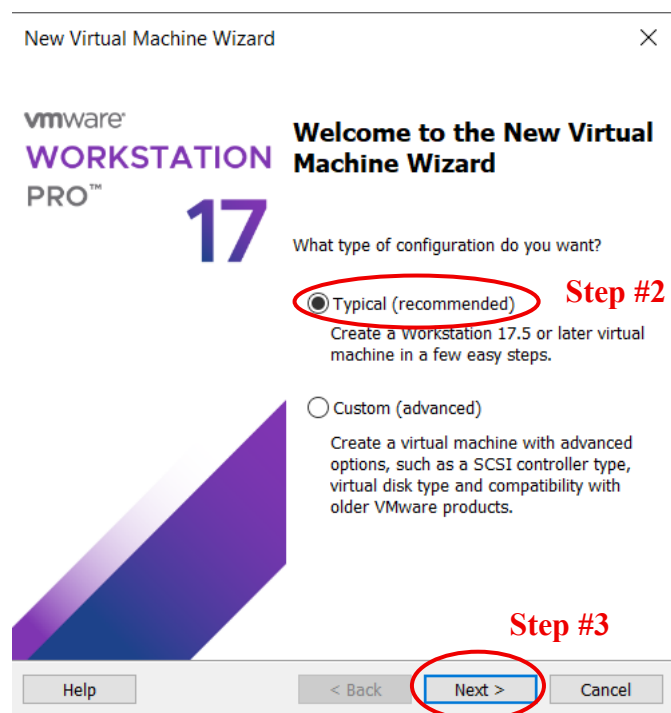
3. After downloading from the OneDrive, you may start to setup the application by following the setup wizard and keep the default settings. After setting up, you may open the



application by just type ‘VMware’ from Search panel or the desktop shortcut directly. The initial page of the application is as:



- Click “Create a New Virtual Machine” and then select “Typical” for the configuration selection, then click “Next”.



- Now you can import the Ubuntu desktop image already downloaded before. Bear in mind that the correct directory path is expected and it should be in the format of “iso”.

Remarks: For students interested in ROS development, we recommend setting your PC's operating system language to English. This prevents common Unicode path errors that occur when directory names mix Chinese and English characters, which is a frequent issue when using the terminal in Linux. Adopting an English environment will also ease your transition into Ubuntu and other open-source development ecosystems.



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

☒ Installer disc image file (iso):
C:\Users\peter\Downloads\ubuntu-22.04.5-desktop-am Browse...

Ubuntu 64-bit 22.04.5 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.

Help < Back Next > Cancel

Step #4

Step #5

Your own path

Select “Next” and then you will see the following page for customizing the Linux OS information. This step will not make big difference since **you will need to set the login username and password for the Ubuntu systems after initializations (see later instructions and video demo).**

New Virtual Machine Wizard

Easy Install Information
This is used to install Ubuntu 64-bit.

Personalize Linux

Full name: Peterwang Just example

User name: peter Please use your own name

Password: •••••

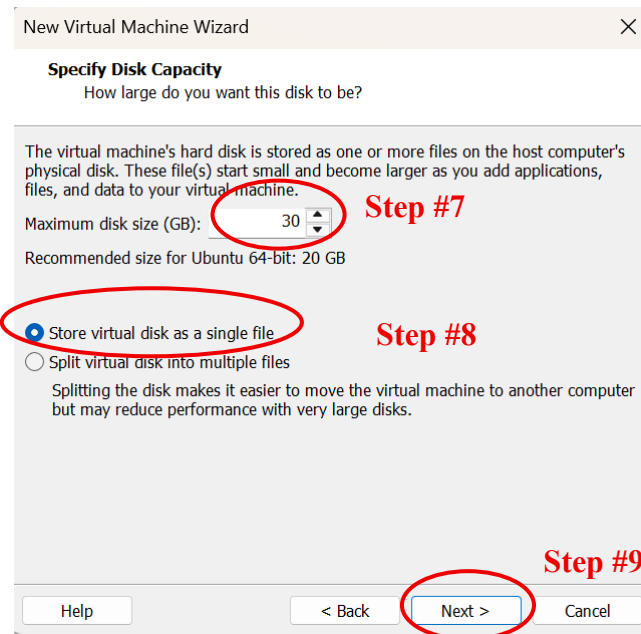
Confirm: •••••

Help < Back Next > Cancel

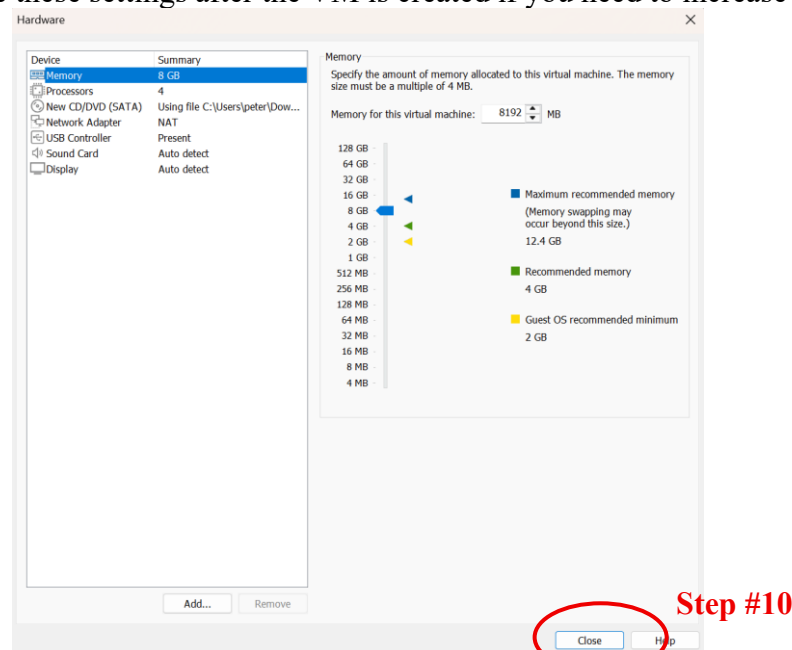
Step #6



6. Select “Next” and follow the Wizard instructions until you reach “Specify Disk Capacity”. As shown below, changes the settings under “Specify Disk Capacity” to be:
- 30 (or more if you wish) in “Maximum disk size (GB)” instead of 25.
 - “Store virtual disk as a single file” for the virtual disk setting instead of multiple files.

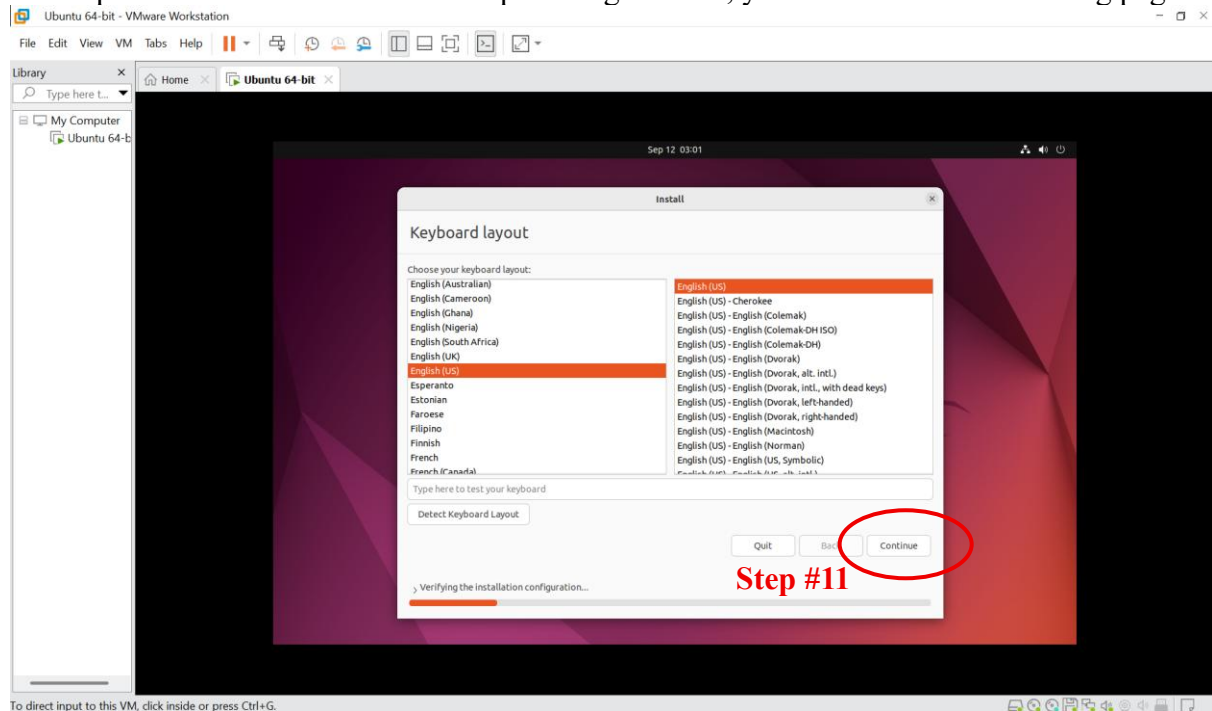


7. Select “Next”, you will see a summary of your settings. Click on “Customize Hardware...”. The window below will open. Here you can select computational resources you want to reserve to your virtual machine. It is recommended to provide at least 4GB of RAM (8 if possible, depending on your host machine, you can see on the window the recommendations by VMWare based on the host machine), and 2 processor cores (4 if possible, depending on host machine, do not use all or more cores than your host has). You can also change these settings after the VM is created if you need to increase or decrease.





- Close the Customize Hardware window, and then click on “Finish”. VMware should open and Ubuntu installation will start automatically. This step will take some time and please be patient. When the initialization process goes well, you should see the following page:



Follow the setup for the keyboard layout and other basic elements (just like your PC), and you should not need to change any default setting.

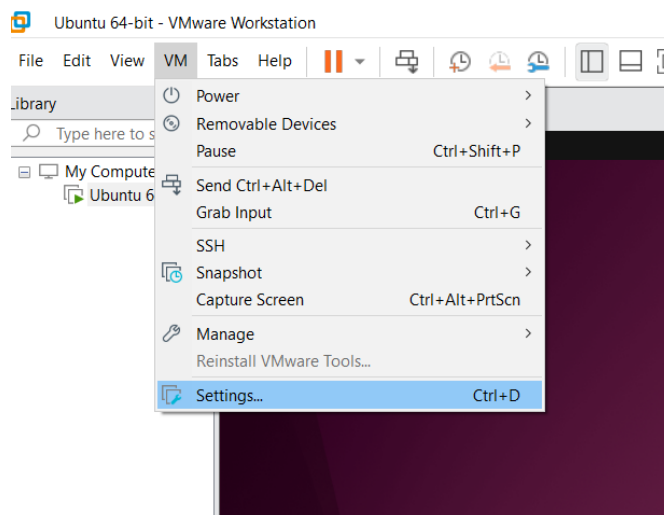
- To make sure you installed everything correctly, open a terminal Ctrl + Shift + T, and type the following command in the terminal:

```
$> sudo apt update && sudo apt install lsb-core lsb-release  
$> lsb_release -a
```

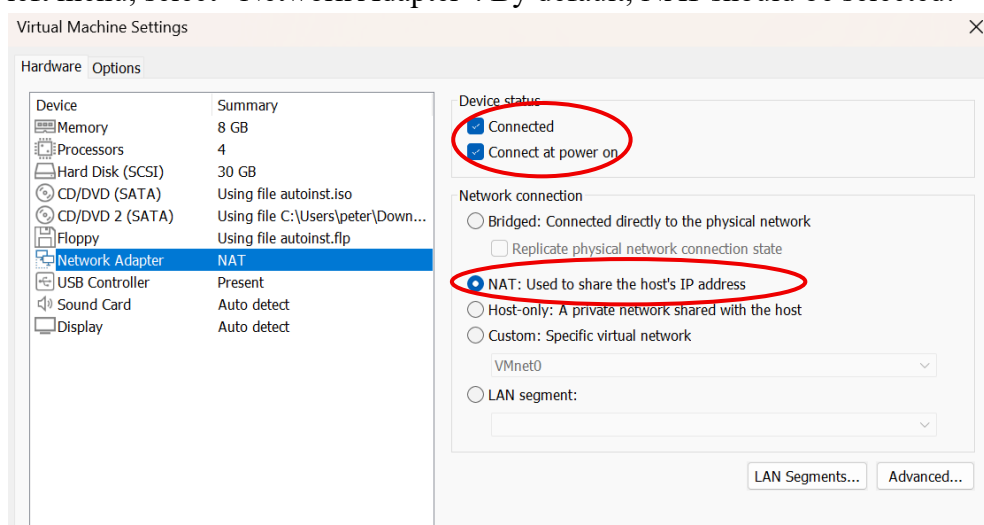
If the terminal works well, it should output the following messages:

```
peterwang@peterwang-virtual-machine:~$ lsb_release -a  
LSB Version:    core-11.1.0ubuntu4-noarch;security-11.1.0ubuntu4-noarch  
Distributor ID: Ubuntu  
Description:    Ubuntu 22.04.5 LTS  
Release:        22.04  
Codename:       jammy  
peterwang@peterwang-virtual-machine:~$
```

- Check the internet settings: Go to VMware settings: Click “VM” at the top left and choose “Settings”, as shown below:



In the left menu, select “Network Adapter”. By default, NAT should be selected:



Make sure that under Device Status, you have ‘Connected’ and ‘Connected at power on’ both selected. Now you can click the Firefox browser to see whether you can connect to the internet.

Questions:

Any technical issues may be contacted via emails to our TA team (email addresses enclosed in lecture note).

References and Optional Readings:

- Using commands in terminal is an essential requirement for ROS development. To better familiarize yourself with the basic operations, you may read this guideline: <https://www.geeksforgeeks.org/linux-unix/basic-linux-commands/> or watch some introductory videos on YouTube.
- Dual boot for Ubuntu could be learned from this video: <https://youtu.be/QKn5U2esuRk?si=4O7Vov9eNprvNg5T>
- For students interested in ROS, you may watch some video courses given by GYH.AI. (only in Chinese and an older version of Ubuntu, but very useful for new ROS learners):



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https://class.guyuehome.com/p/t_pc/goods_pc_detail/goods_detail/p_5e0ed4a96f471_cDGnHkoh?content_app_id=

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