EECS 489 Virtual Machine Setup

1 Introduction

This document details how to set up the EECS 489 VM using VMWare Fusion (Mac) or VMWare Workstation (Windows). If you're using a different VM software, your software will almost certainly have the same options as what is described in this guide located in similar menus. Follow each step in sequence, exactly as is detailed in this document.

Code blocks such as

Code

```
$ echo "I am a command"
$ echo Hello world
```

mean to first run `echo "I am a command"` **without** the dollar sign, and then run `echo Hello world` **also without the dollar sign** in the terminal on the virtual machine.

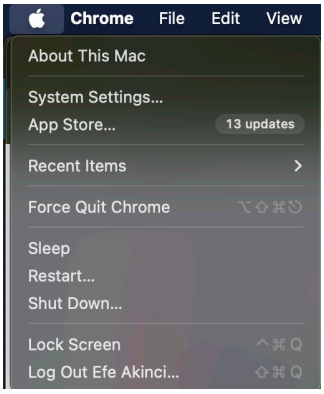
Instructions begin on the next page.

2 Downloading the VM Image

2.1 Identify Your CPU

> **Info**
>
> This section describes how to identify your CPU architecture on a Mac. Windows machines are overwhelmingly on Intel/AMD chips on an x86 architecture. If you're not sure what architecture your non-Mac laptop uses, search up the model specs. If it is an ARM-based CPU, follow the instructions for "Apple Chip." If it's an x86 chip, follow the instructions for "Intel Chip."

First, click the Apple Logo on the top left of your screen, and click "About This Mac."



Make a note of what the item labelled "Chip" says.

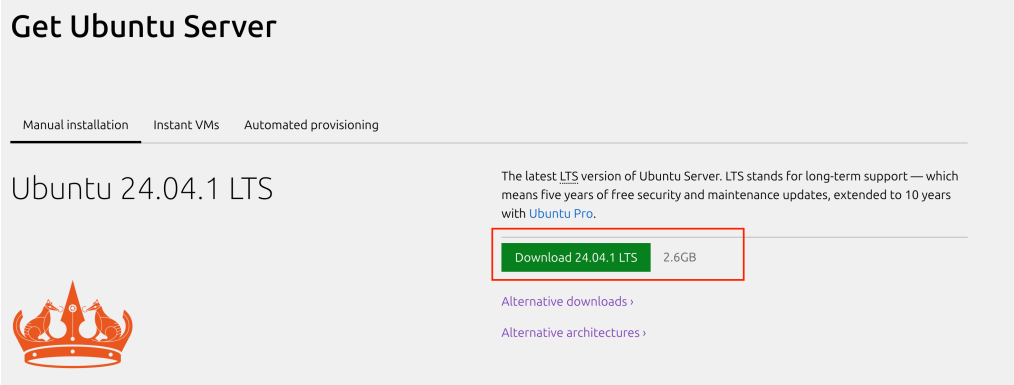
If the chip is of the form `Intel *`, follow the instructions for **Intel Chips** below. If it is of the form `Apple M*`, follow the instructions for **Apple Chips.**

2.2 Download the Ubuntu Image

Intel Chip

Go to https://ubuntu.com/download/server.

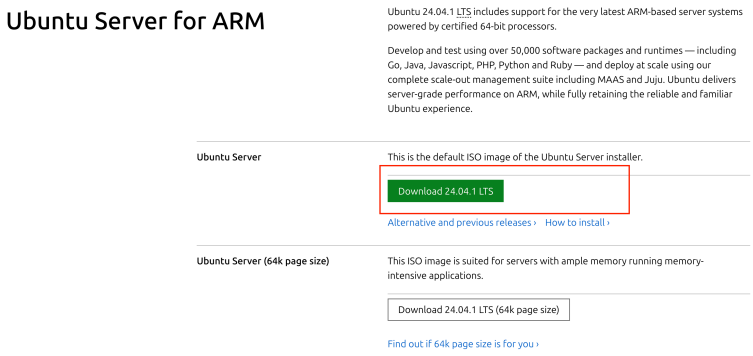
Click the big button that says “Download 24… LTS.”



Apple Chip

Go to https://ubuntu.com/download/server/arm.

Click the big button that says “Download 24… LTS”

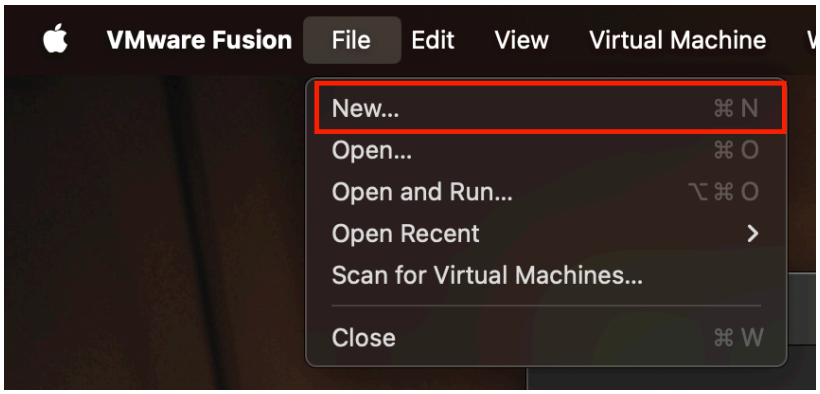


3 Creating the VM

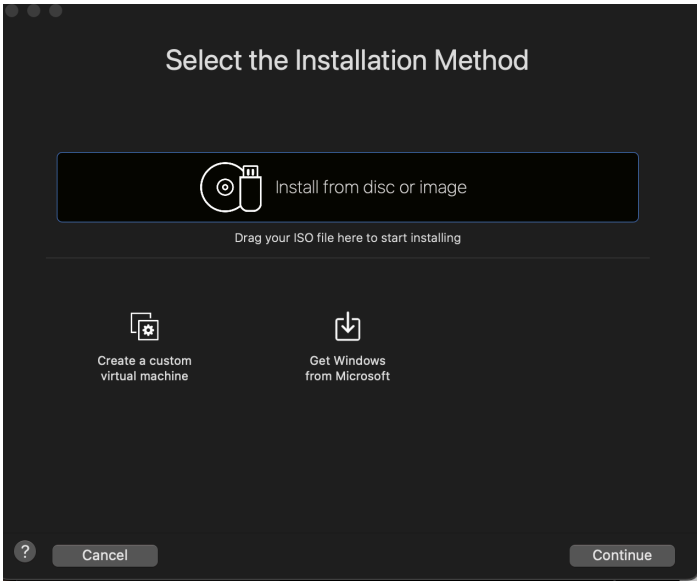
This section includes instructions for VMWare Fusion (Mac) in Section 3.1 and VMWare Workstation (Windows) in Section 3.2. Please follow whichever applies.

3.1 VMWare Fusion (Mac)

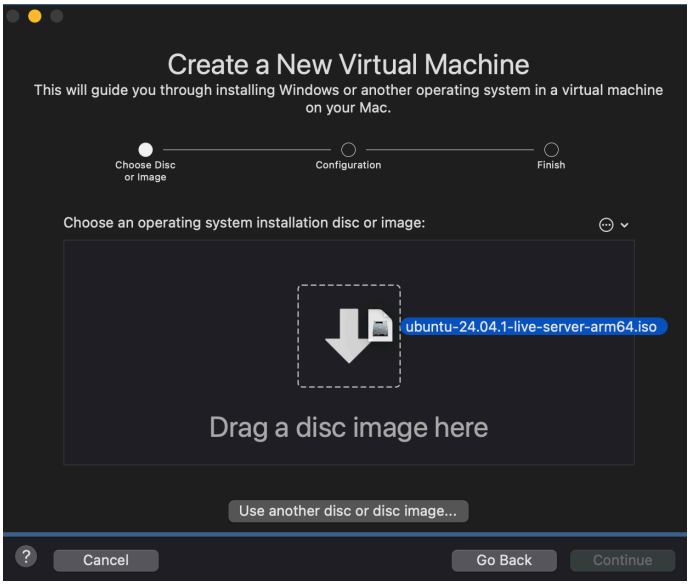
Launch VMWare Fusion. Once it is launched, on the toolbar, select "File," followed by "New."



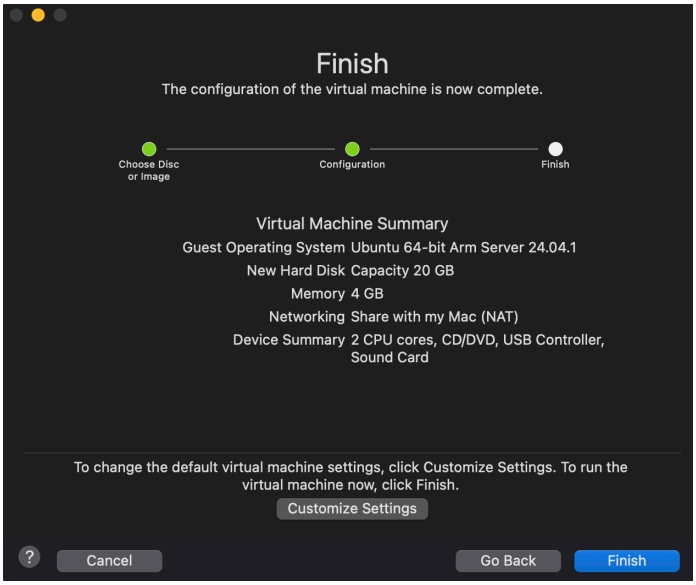
Make sure that "Install from disc or image" is selected, and click "Continue."



Drag the `.iso` file you downloaded from the Ubuntu website onto VMWare Fusion and click continue.



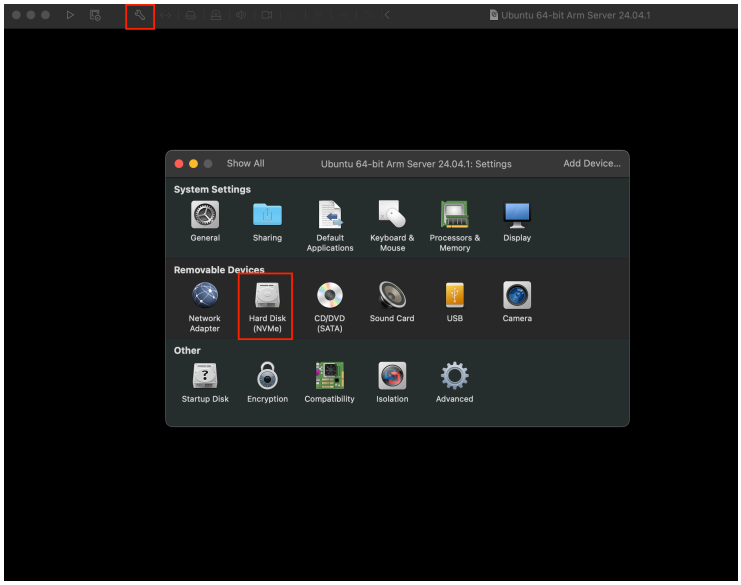
On the next screen, make sure that 4GB of RAM is allocated to the Virtual Machine.



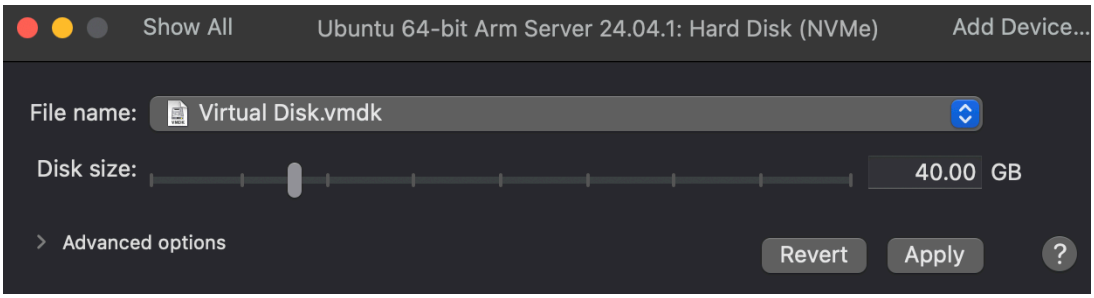
Click continue, and finish.

> **Warning**
>
> Do not run the Virtual Machine yet! If the machine is automatically ran when you clicked finish, click “Virtual Machine” on the toolbar, and click “Shut Down.” If the option is grayed out, your machine is suspended. To unsuspend it, click the play button on the window. You should now be able to shut the machine down.

Click on the settings icon on the virtual machine. This will launch the settings window. On the settings window, click “Hard Disk”.



The next prompt asks for how much disk space the virtual machine will use. As you will not require much space for running your projects, this does not need to be large. We suggest providing a maximum disk size of 15 GB or larger.

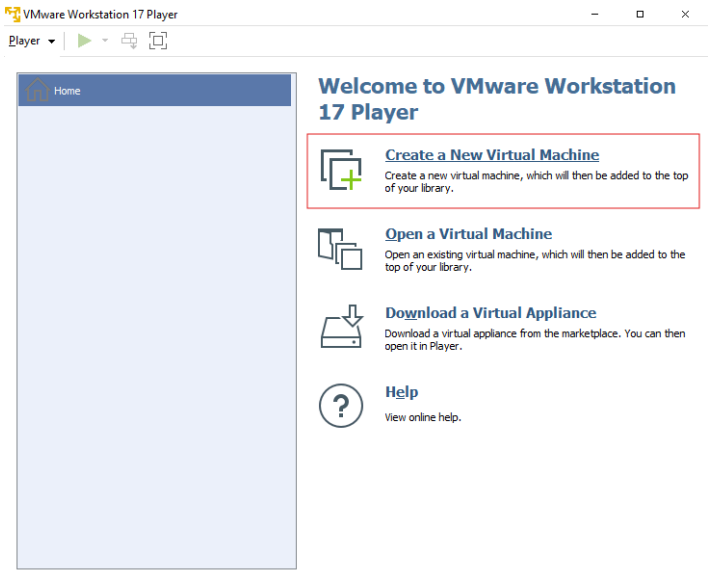


You can also set up shared folders using settings later; this will enable you to easily share files between your local computer and the virtual machine filesystem.

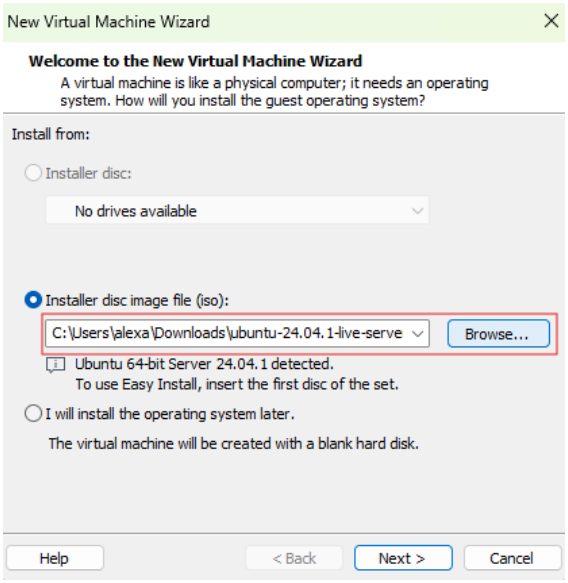
Now, launch the VM by clicking the play icon on the window.

3.2 VMWare Workstation (Windows)

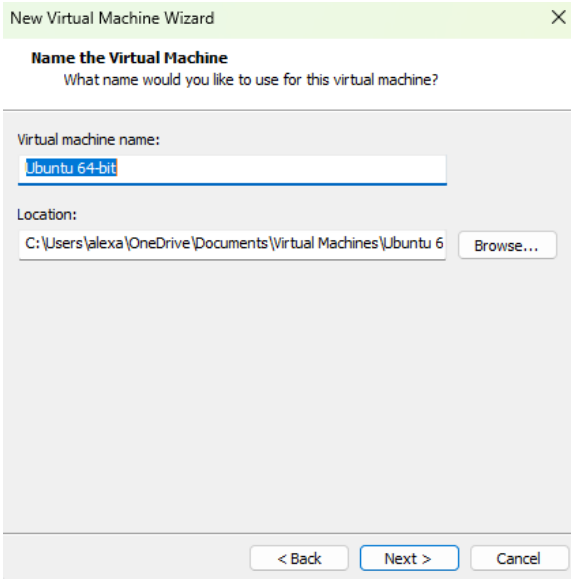
Launch VMWare Workstation. Once it is launched, select “Create a New Virtual Machine”.



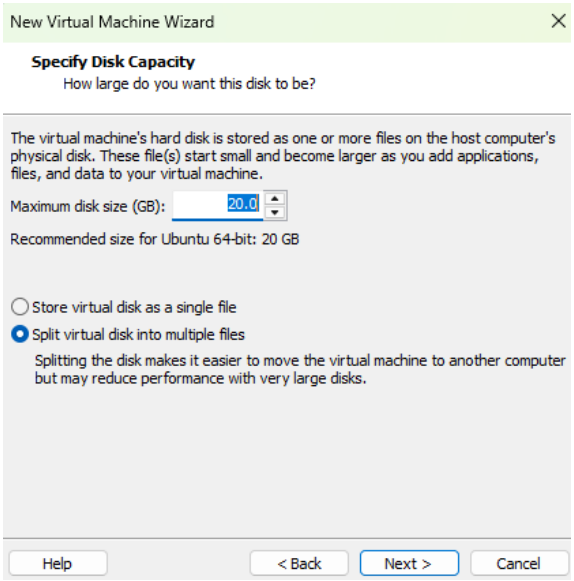
The next prompt asks for what operating system image to use. Select “Browse” to specify the `.iso` file you downloaded from the Ubuntu website and select “Next”.



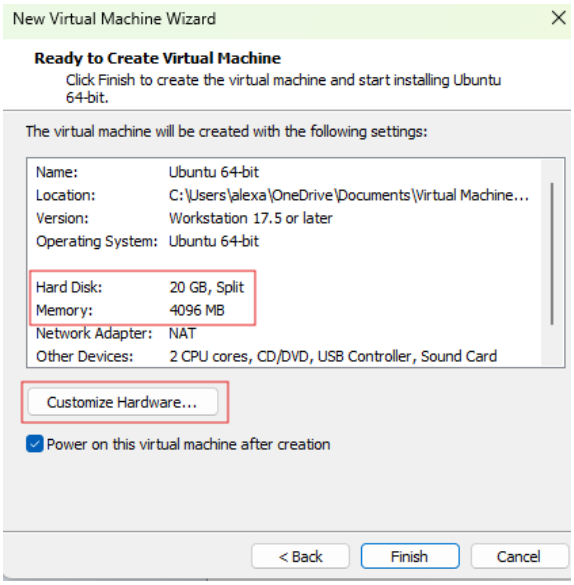
The next prompt asks for the name and location of your virtual machine. You can change this to whatever you would like. Select “Next”.

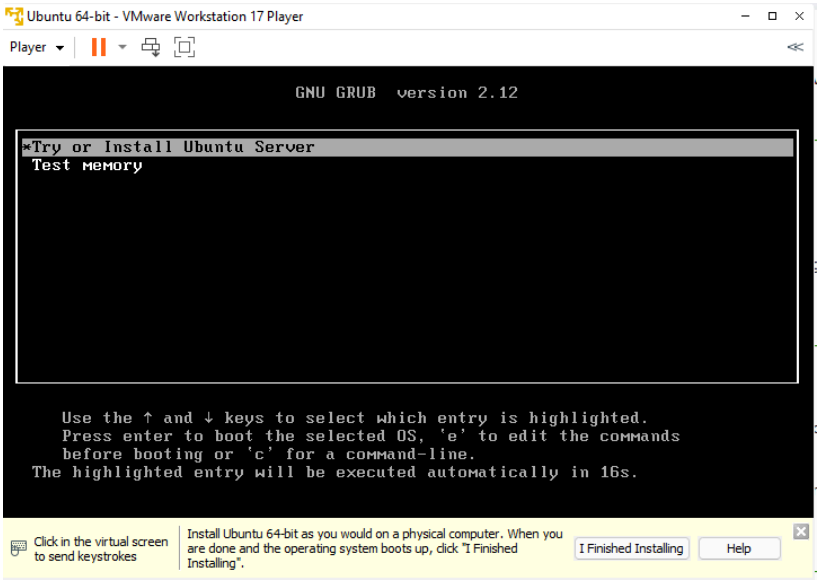


The next prompt asks for how much disk space the virtual machine will use. As you will not require much space for running your projects, this does not need to be large. We suggest providing a maximum disk size of 15 GB or larger.



The next prompt asks you to confirm the settings of the virtual machine. Listed will be the hard disk size and memory. We suggest using a memory size of at least 4 GB, so if the default memory size is lower, select “Customize Hardware” uand change the memory. Once you confirm the settings, select “Finish”. The virtual machine should then power on.





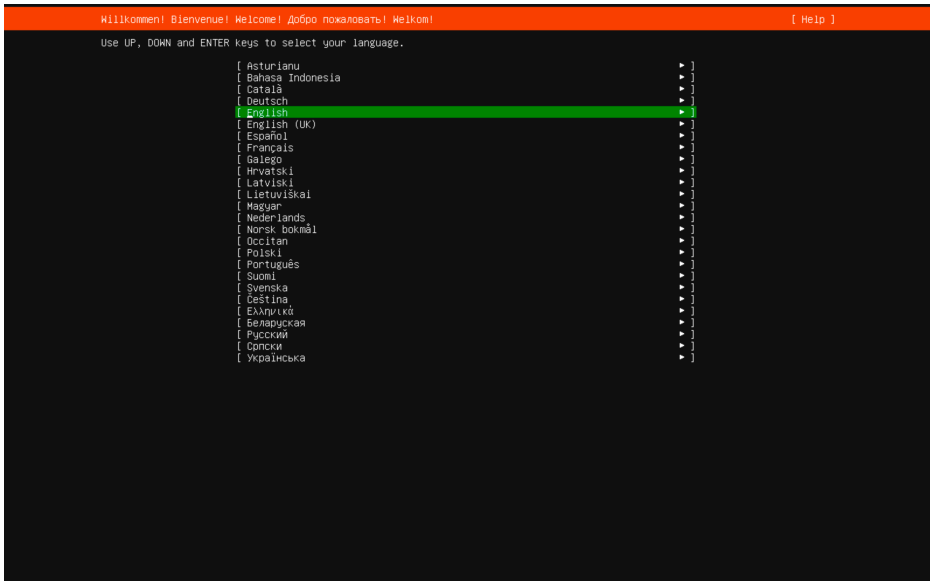
4 Setting Up the VM

> **Warning**
>
> It is important you do **everything** as directed during the setup. Do not enter a username that is different than what we provide, or change any settings differently. Some of our scripts depend on the username being the same as what we provide.

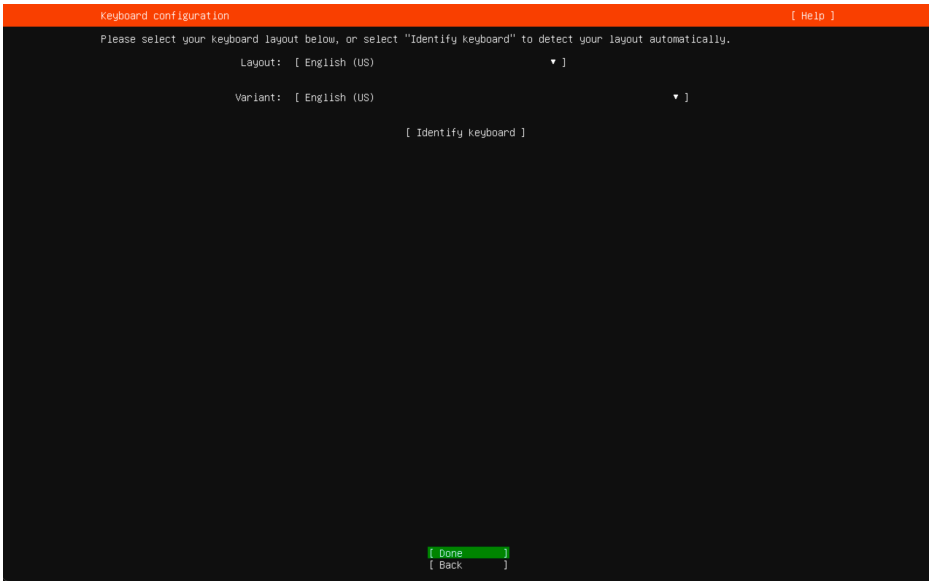
> **Info**
>
> You cannot use you mouse at this step. Navigate the menus with the arrow keys on your keyboard, and use the “Enter/Return” key to select.

> **Info**
>
> VMWare fusion will “capture” your mouse, which may prevent you from using your cursor outside of the VM. To release your cursor, press the `Ctrl` and `Cmd` keys at the same time (`CTRL + CMD`).

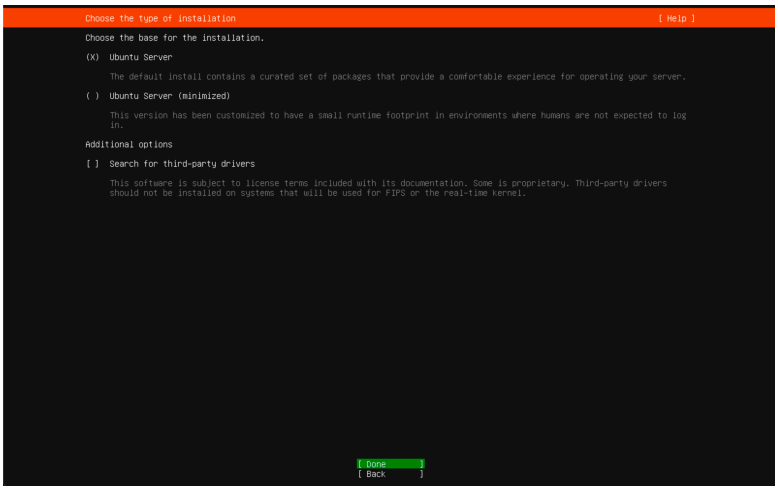
Select “Try or Install Ubuntu Server”, and wait for the machine to boot up until you get arrive at this screen. Select English as your language.

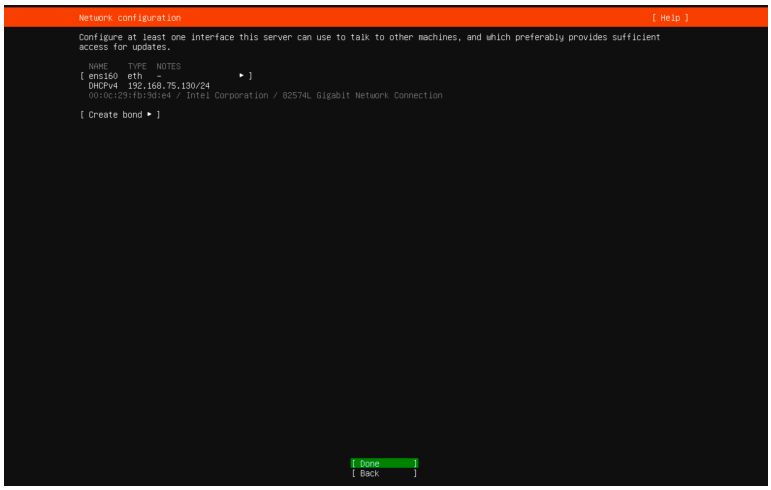


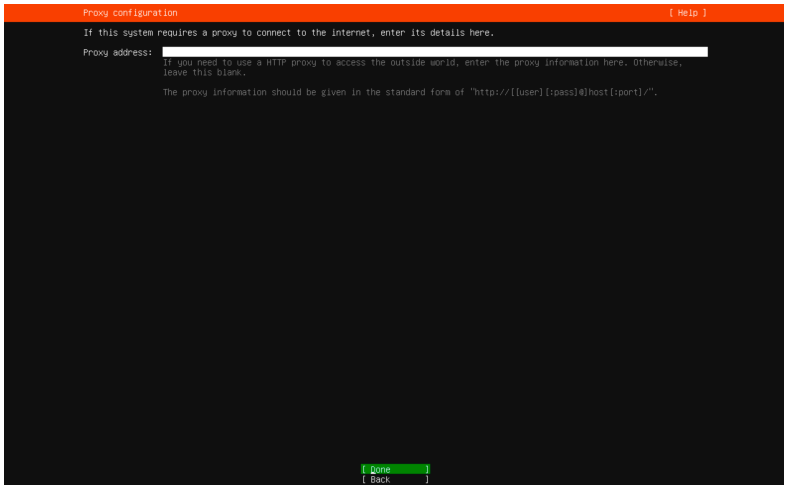
Click “Done” on the next page.

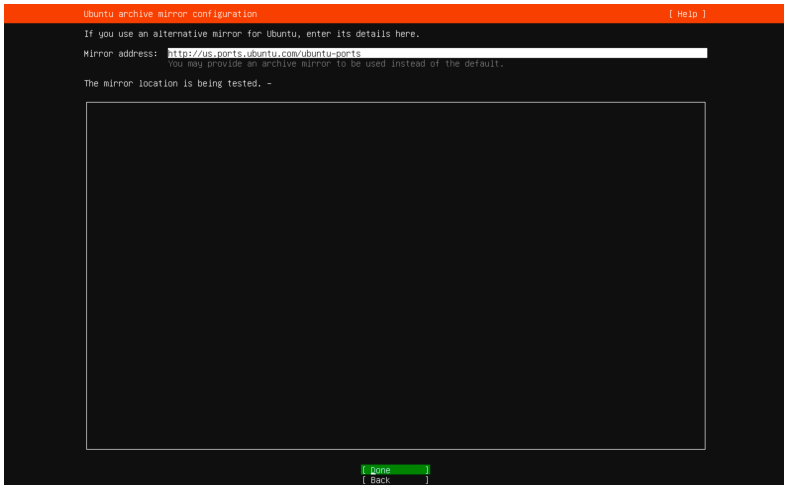


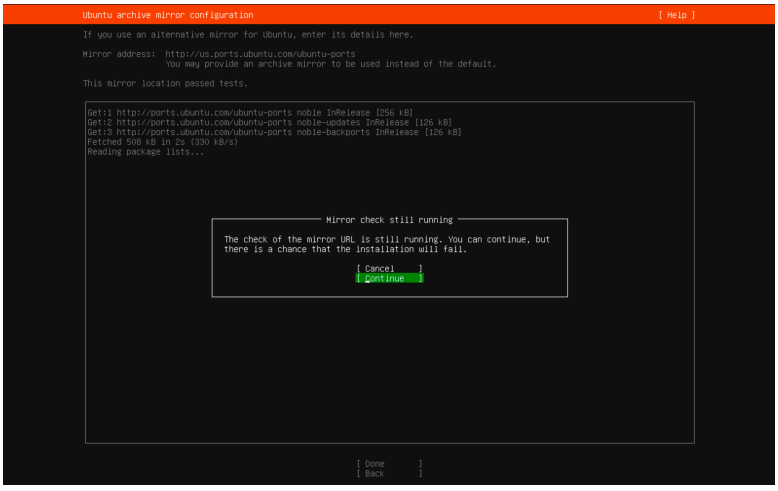
Click through the given options on each of the following screens. You do not need to change anything on the following screens, simply keep hitting “Continue”.

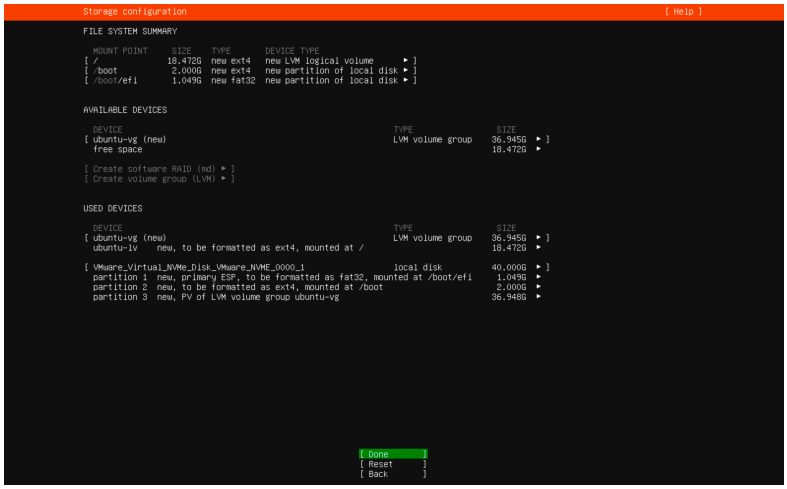


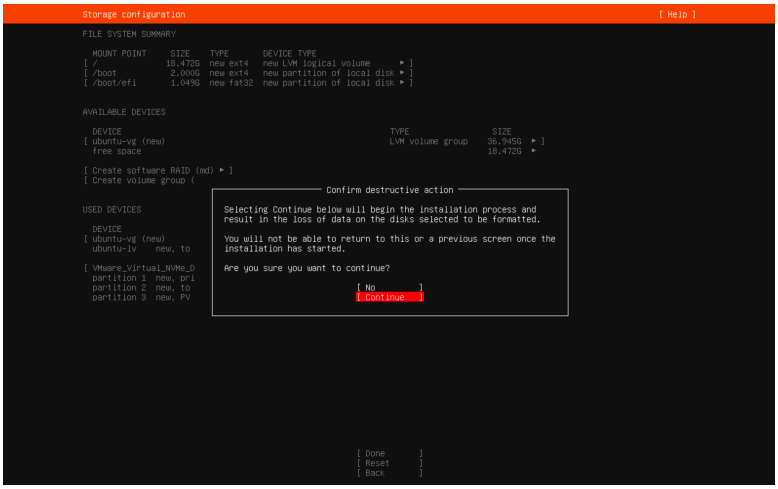



Proxy configuration
[Help]
If this system requires a proxy to connect to the internet, enter its details here.
Proxy address:
If you need to use a HTTP proxy to access the outside world, enter the proxy information here. Otherwise, leave this blank.
The proxy information should be given in the standard form of "http://[[user][:pass]@]host[:port]/".
[Done]
[Back]


Ubuntu archive mirror configuration
[Help]
If you use an alternative mirror for Ubuntu, enter its details here.
Mirror address: http://us.ports.ubuntu.com/ubuntu-ports
You may provide an archive mirror to be used instead of the default.
The mirror location is being tested. -
[Done]
[Back]

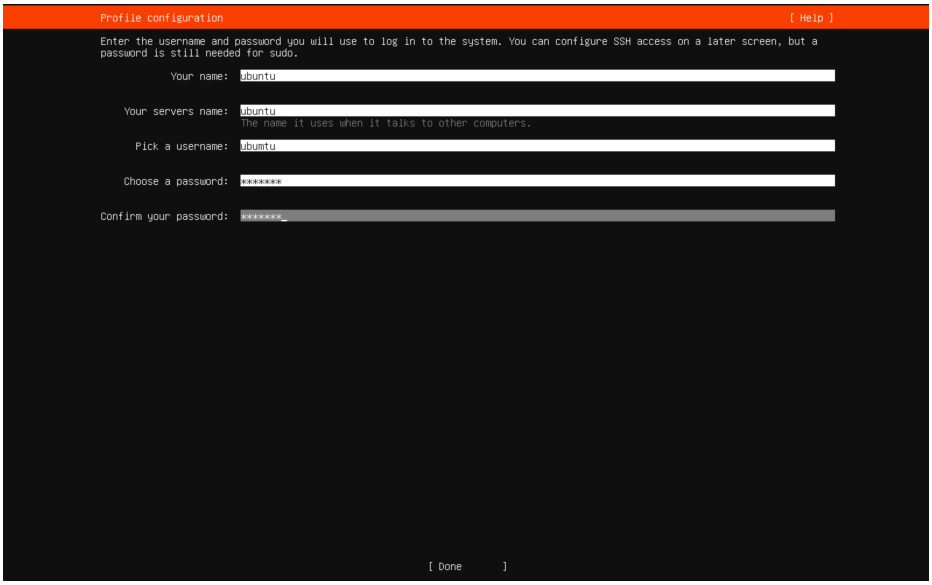

Ubuntu archive mirror configuration
[Help]
If you use an alternative mirror for Ubuntu, enter its details here.
Mirror address: http://us.ports.ubuntu.com/ubuntu-ports
You may provide an archive mirror to be used instead of the default.
This mirror location passed tests.
Get:1 http://ports.ubuntu.com/ubuntu-ports noble InRelease [256 kB]
Get:2 http://ports.ubuntu.com/ubuntu-ports noble-updates InRelease [126 kB]
Get:3 http://ports.ubuntu.com/ubuntu-ports noble-backports InRelease [126 kB]
Fetched 508 kB in 2s (330 kB/s)
Reading package lists...
Mirror check still running
The check of the mirror URL is still running. You can continue, but there is a chance that the installation will fail.
[Cancel]
[Continue]
[Done]
[Back]



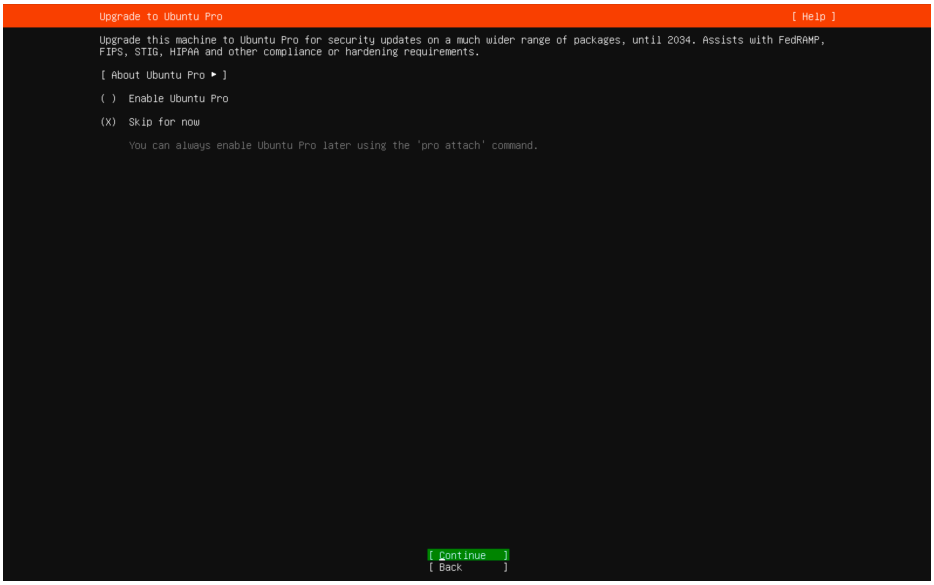


After this screen, enter the following information on the “Profile configuration screen” and hit continue.

Your name	ubuntu
Your servers name	ubuntu
Pick a username	ubuntu
Choose a password	eecs489
Confirm your password	eecs489

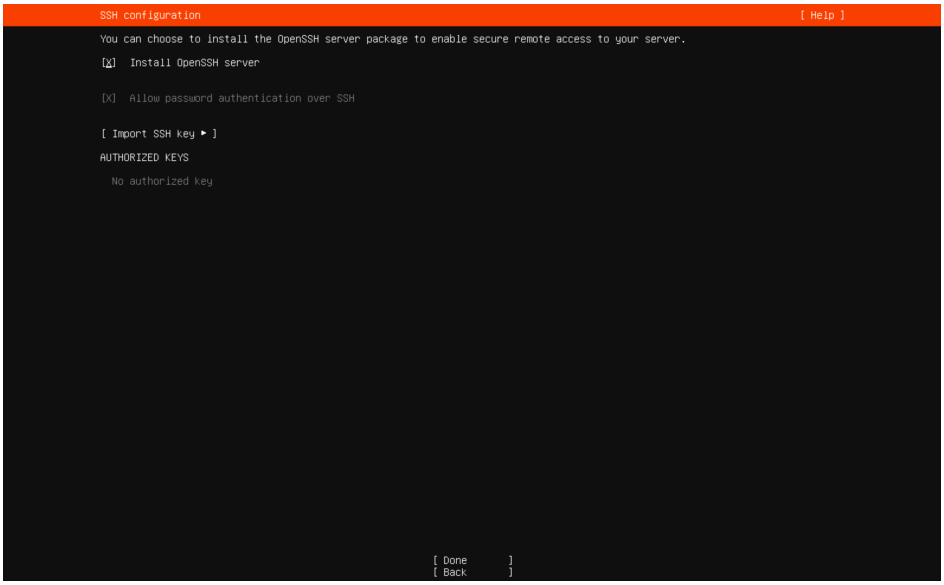


On the next screen, click “continue.”

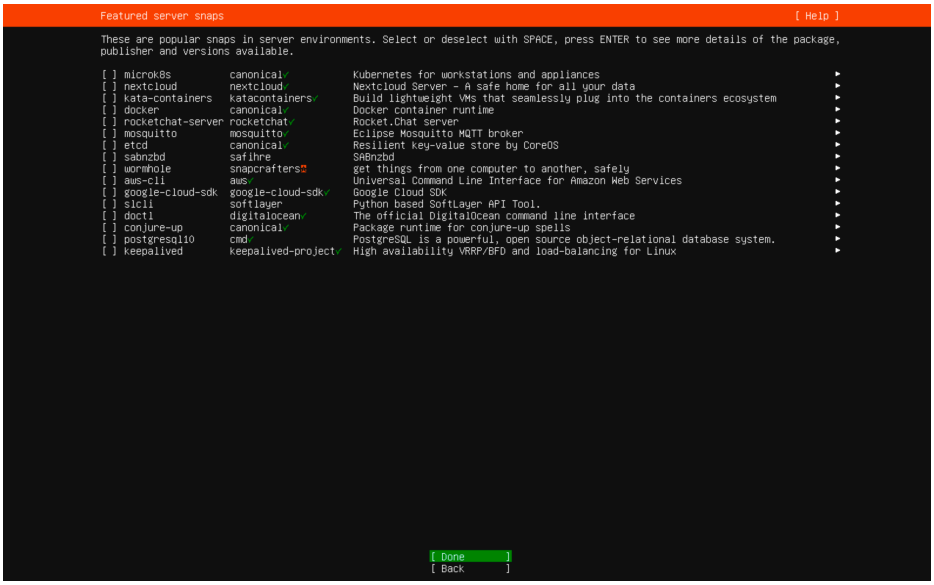


On the next screen, make sure your selections look like the image below, and hit Done.

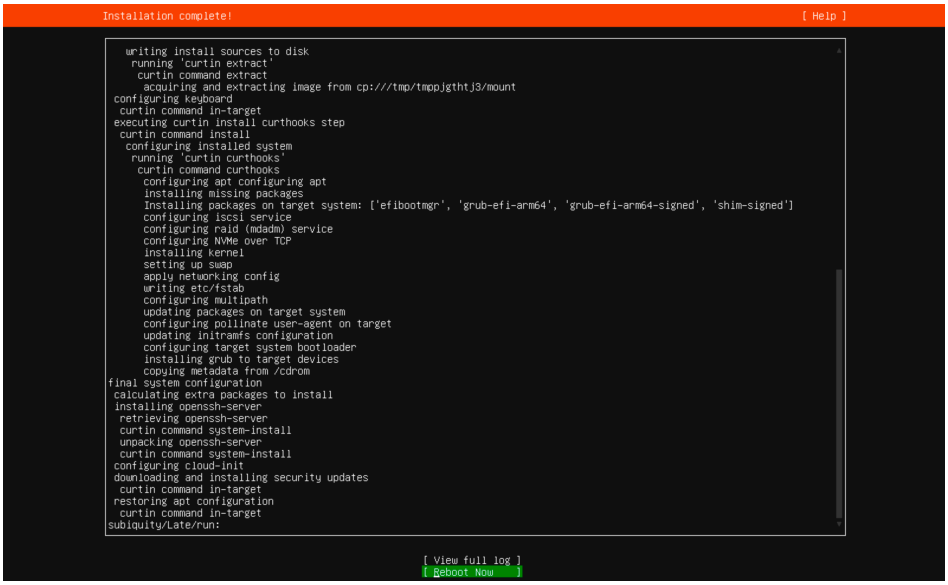
> ⚠ **Warning**
>
> Make sure `Install OpenSSH server` is checked!



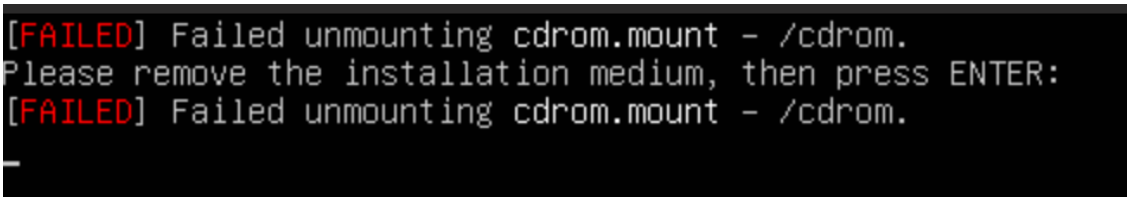
On the final page, hit “Done”.



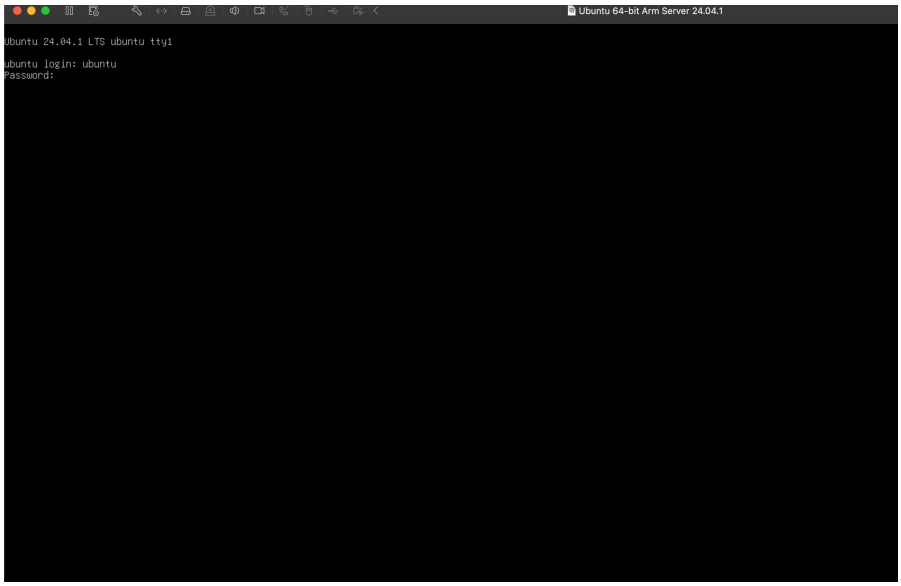
Wait until the installation finishes, and hit “Reboot Now.”



If you see this, just hit “Enter”



On the next screen, enter `ubuntu` as your `ubuntu login`, and `eecs489` as your password.



Once you are at the command line, run the following commands:

Code

```
$ sudo apt update
$ sudo apt install -y build-essential cmake libboost-all-dev open-vm-tools
```

Now, install Mininet:

Code

```
$ sudo apt-get install mininet
```

Verify that Mininet installed properly by running

Code

```
$ mn --version
```

You should get `2.3.0` (or something similar) as an output. Having a slightly different version will not be a problem. Once the above commands are complete, run

Code

```
$ sudo reboot now
```

5 Setting Up Remote Development

You can now use the terminal to `git clone` the projects from GitHub and get to work.

You will find it helpful to use `ssh` with tools like VSCode Remote Development or CLion Remote Development to complete your projects.

In your virtual machine terminal run

Code

```
$ ip a
```

which will produce an output that looks like

You can use the ip address of `ens160` (or whichever adapter other than `lo` that has a field called `inet`). In the above photo, the IP is 192.168.75.135.

Using that IP address, **on your computer's terminal**, you can run

Code

```
$ ssh ubuntu@<IP>
```

and enter the password `eecs489` to login. You can use the same username/password combination for remote development tools.

If you want to use VSCode, you can use the Remote SSH extension to then SSH into your virtual machine with VSCode, so you can open folders and modify files within the virtual machine through your local VSCode application. You will use the same ssh command as above to ssh into the VM through the extension.