

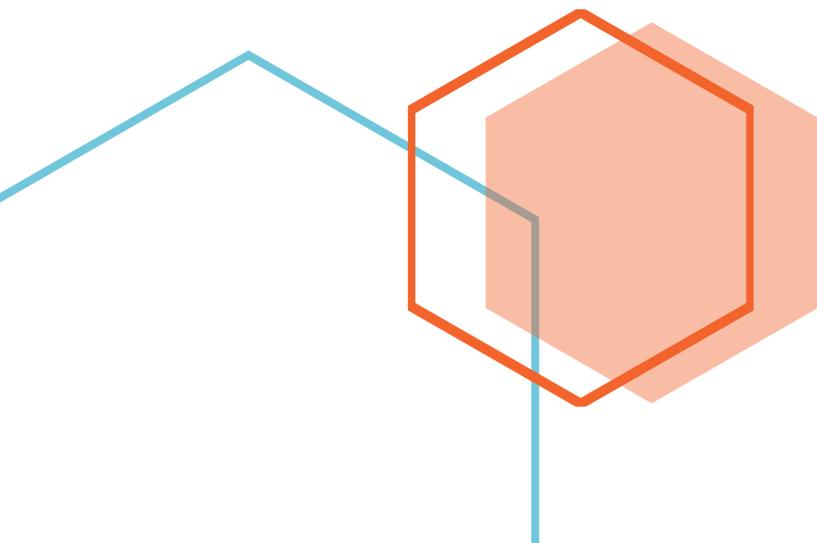


Up & Running with Linux

**There are three ways to obtain
access to Linux OS on your
systems**

This document aims to help students to setup Linux OS on their machines and download, install, and configure all the required tools for the security course.

Abdolrahman Farshgar. Fall-2020





Up & Running with Linux

There are three ways to obtain access to Linux OS on your systems

1. Installing a full version of Linux Operating System on your computer

Linux is one of the most popular operating systems out there. This operating system is widely used by many individuals and organizations. Beside the fact that it is free and open source, it is beautiful and versatile. Computer engineers and developers are holding the concept of open source sanctuary. Therefore, Linux OS is quite common among computer engineers and developers in general.

All in all, I only wish to give you options and I do not want you to jump into an operating system that is outside your comfort zone. It is a great idea to have a fully functioning Linux OS installed on your computer even if it is double-booted along side another operating system of your choice. However, there are a few other alternatives that I will introduce you to in the following sections for you to be able to fulfill your tasks in this course.

2. Running Linux with the help of a virtual machine

Using a virtual machine, like VMware or VirtualBox enables you to install a virtual instance of Linux on your computer.

3. Windows Subsystem for Linux

The Windows Subsystem for Linux lets developers run a GNU/Linux environment including most command-line tools, utilities, and applications directly on Windows, unmodified, without the overhead of a traditional virtual machine or dualboot setup. (The WSL only works on Windows 10)

About Linux



Linux is a family of open-source Unix-like operating systems based on the Linux kernel. From smartphones to cars, supercomputers and home appliances, home desktops to enterprise servers, the Linux operating system is everywhere.

An operating system kernel first released on September 17, 1991, by Linus Torvalds.

Just like Windows, and Mac OS, Linux is an operating system. In fact, one of the most popular platforms on the planet. An operating system is software that manages all of the hardware resources associated with your desktop or laptop.

The Linux operating system comprises several different pieces:

- Bootloader
- Init system
- Daemons
- Graphical server
- Desktop environment
- Applications.



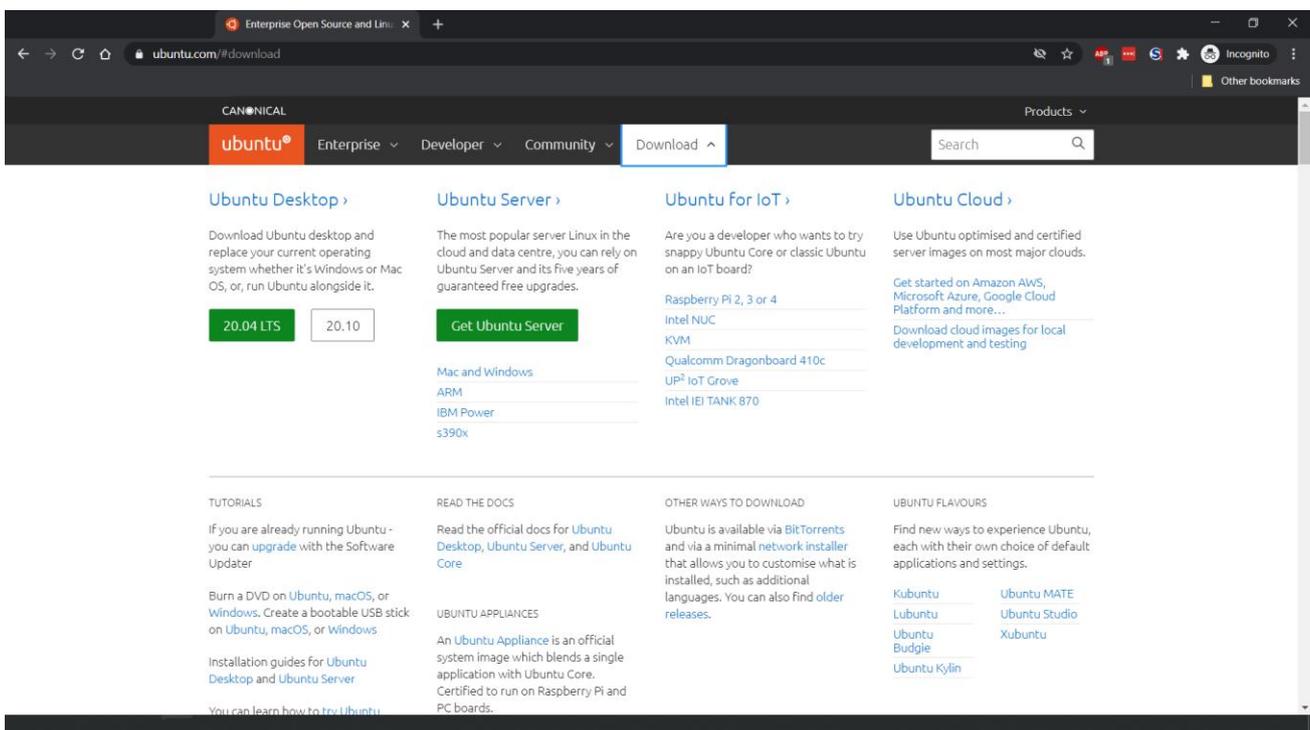
1. Installing a full version of Linux Operating System on your computer

This option is only for those who are Linux advocates and are willing to have this OS installed on their systems permanently. Since the details of installing Linux are well covered on the internet and it requires some expertise, I will leave this one to yourself. I can only warn you about two things that may save your life when installing Linux OS. First of all, be very careful on where you are installing the OS. When you are allocating a space to your new operating system make sure your other data on your machine is safe and you are letting the installation daemon to access and format a dedicated space. Also backing up your entire storage drive seems to be a good idea since you are a beginner and if you make a mistake chances are that you may lose all your data. Secondly, after a successful installation of Linux boot loader files may get corrupted. In that case you can fix the boot loader files using Boot-Repair in Linux or by using the Windows CMD if you obtain an installation media.

2. Running Linux with the help of a virtual machine

First, we need to download an iso file of a Linux distribution of your choice. In this tutorial I will be using Ubuntu Linux since it is very popular, stable, user-friendly, with a large community, and usually it is the first choice of developers.

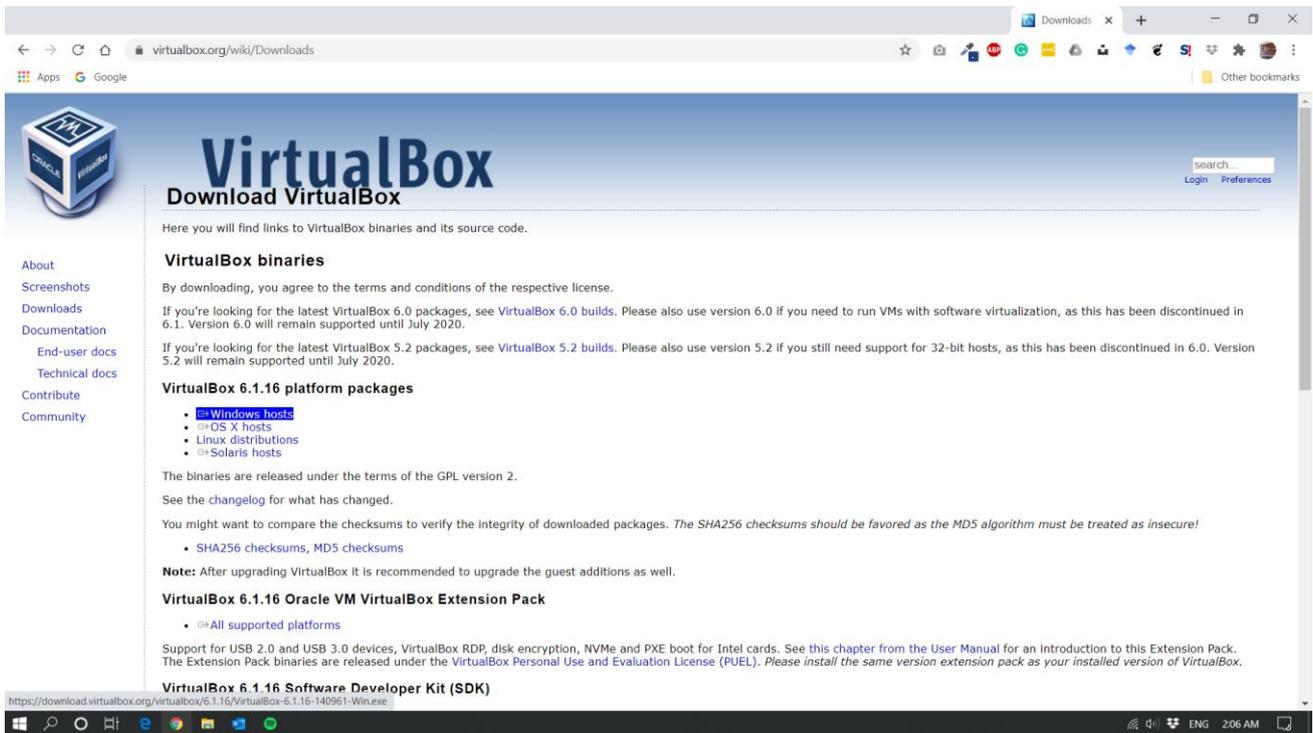
First, we need to get the installation media of the Ubuntu Linux distribution. Head to the Ubuntu.com website and download the latest stable desktop version of the OS. As of right now the latest version is 20.04 LTS (LTS stands for Long Term Service).



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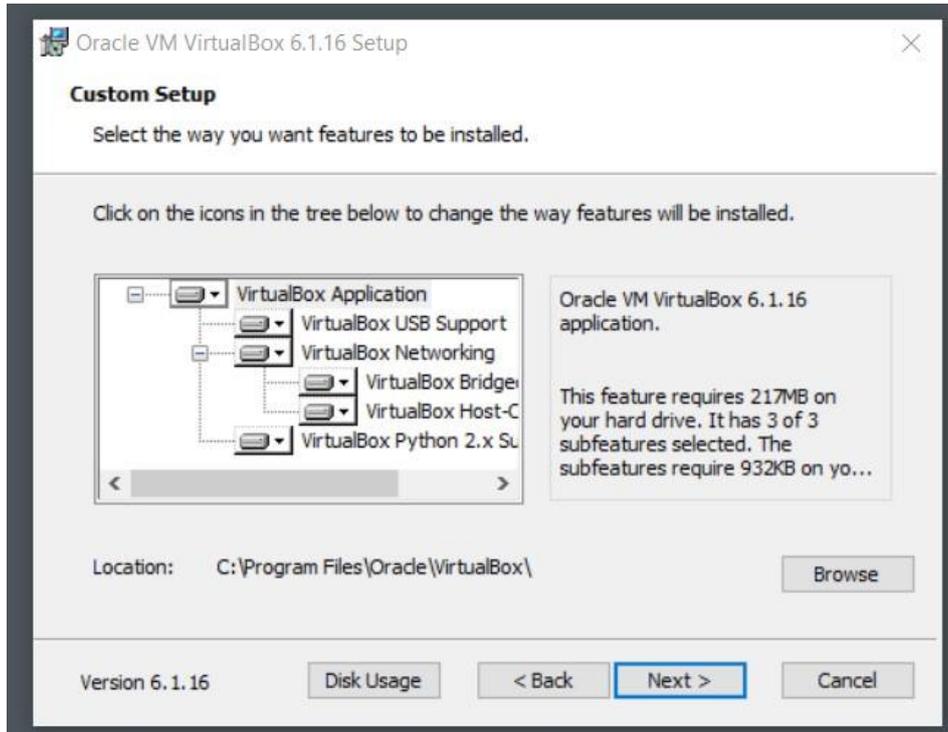
Once the installation media (iso file) is downloaded, we need to download, install, and configure our virtual machine software. In this case we will be using Oracle VirtualBox since it is powerful and free to use. Open VirtualBox.org website on your browser and download the software as in the picture below. (Available for Mac, Linux, and Windows)



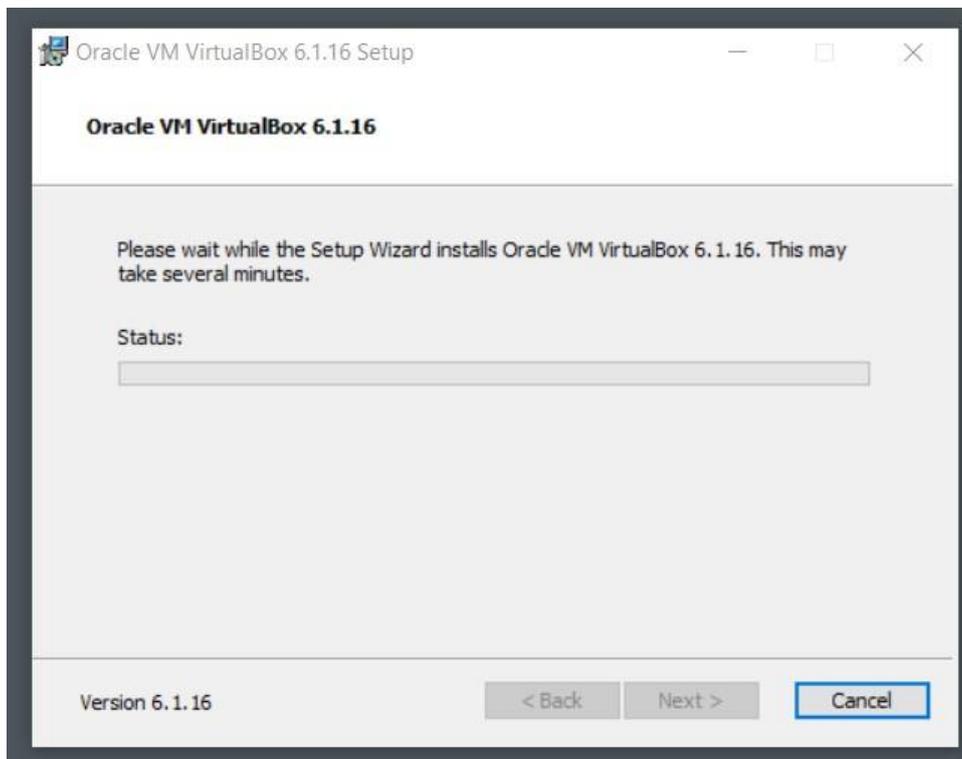
Choose your current operating system and hit download. Then, follow the instructions below to install the software.



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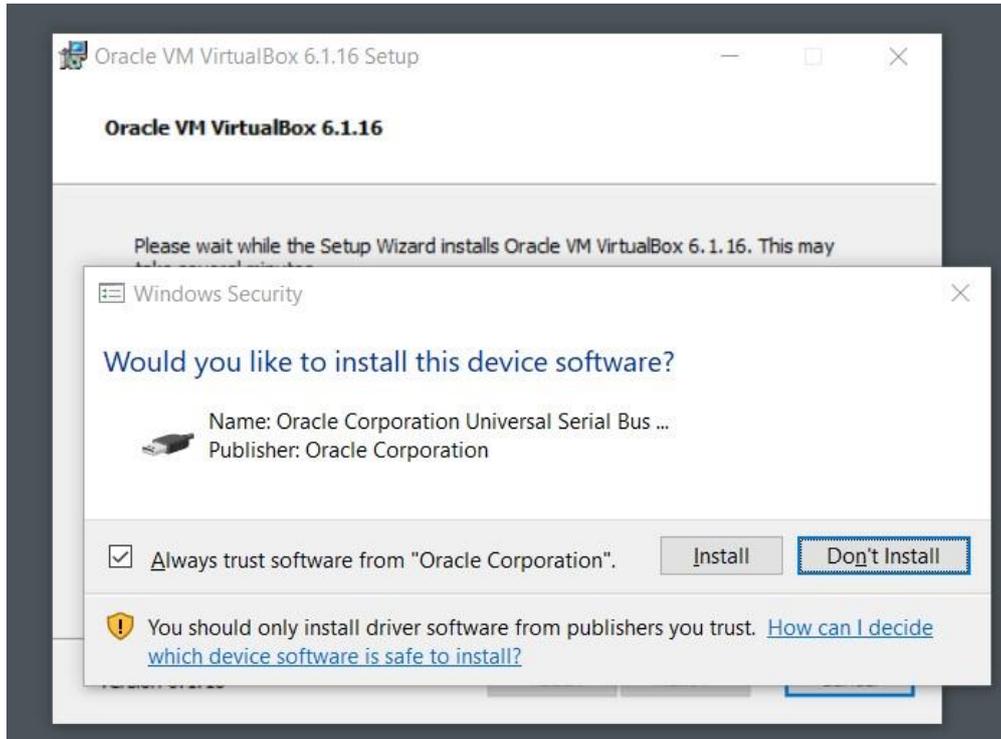


Choose a proper location for the installation files or stick to the defaults. Then hit Next.



Eventually the software will start to install.

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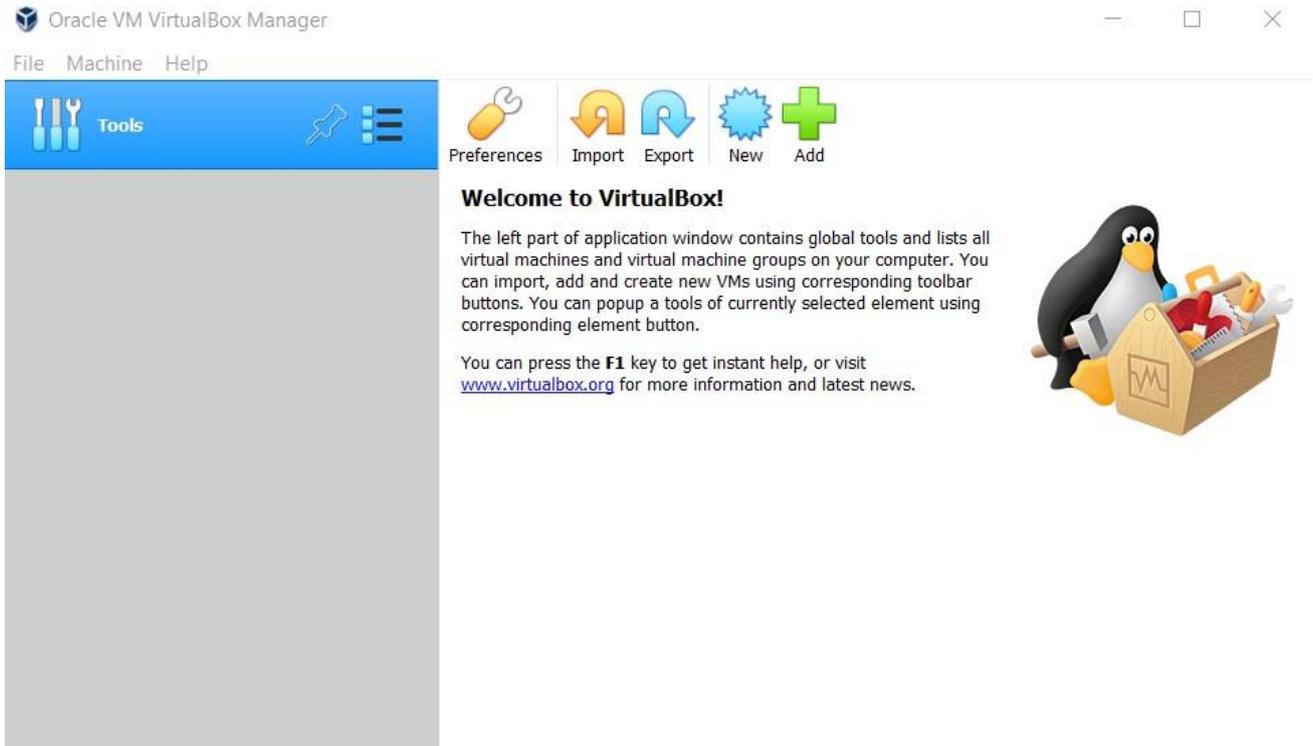


If you were prompted by the windows security, go ahead and trust the software and let the installation to finish its job.

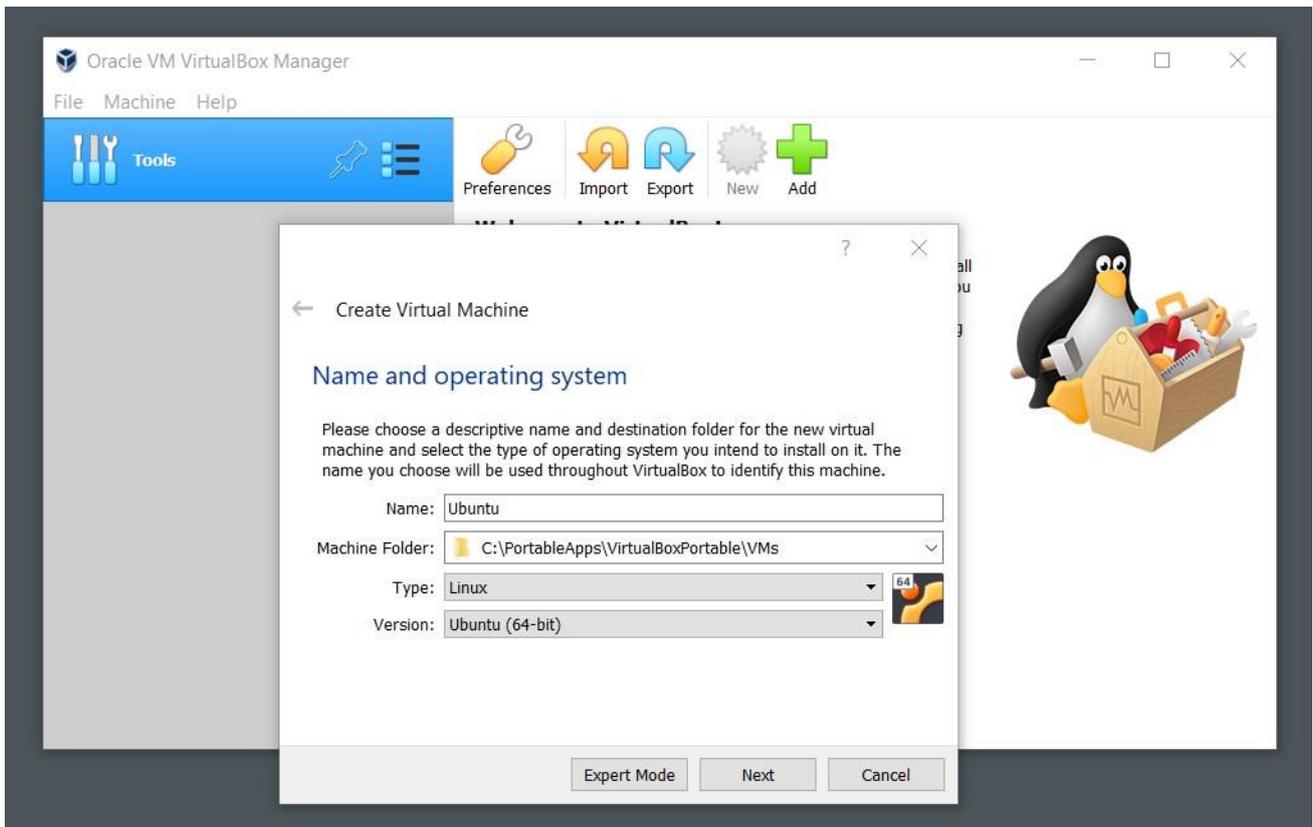


If you open VirtualBox it should look like this:

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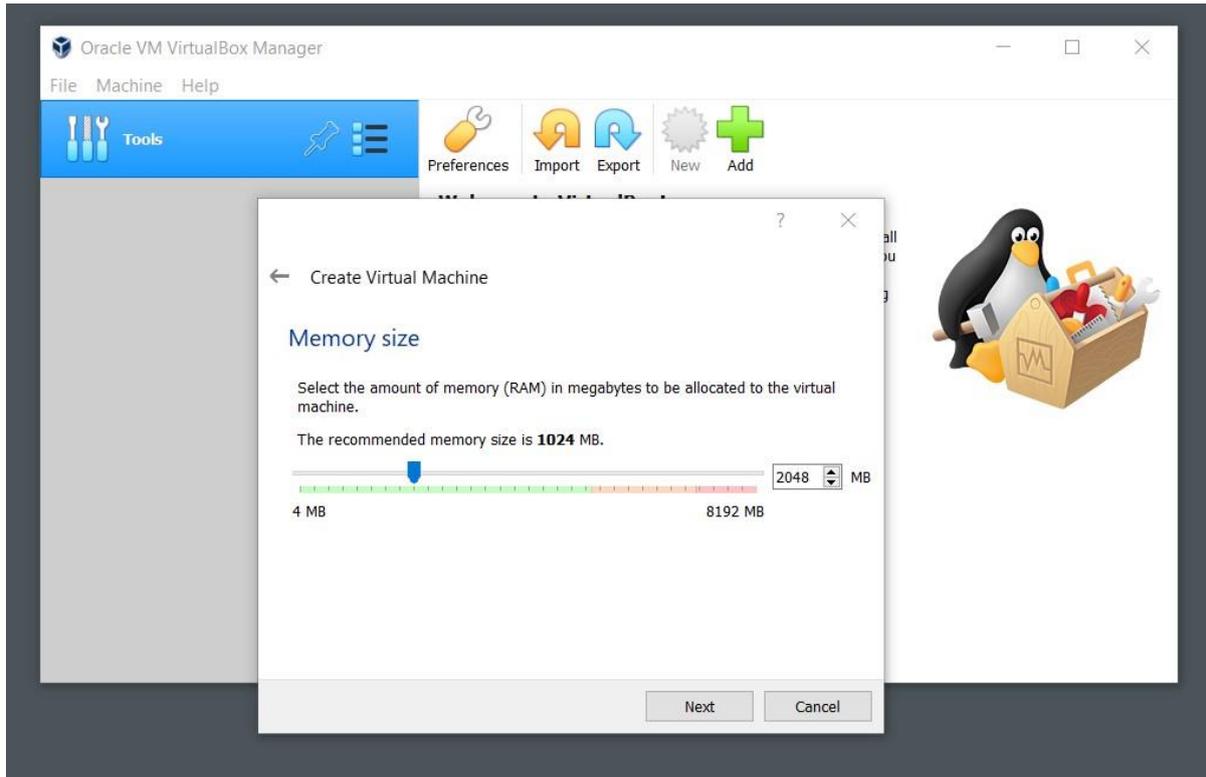


Click on New to create a new virtual environment.

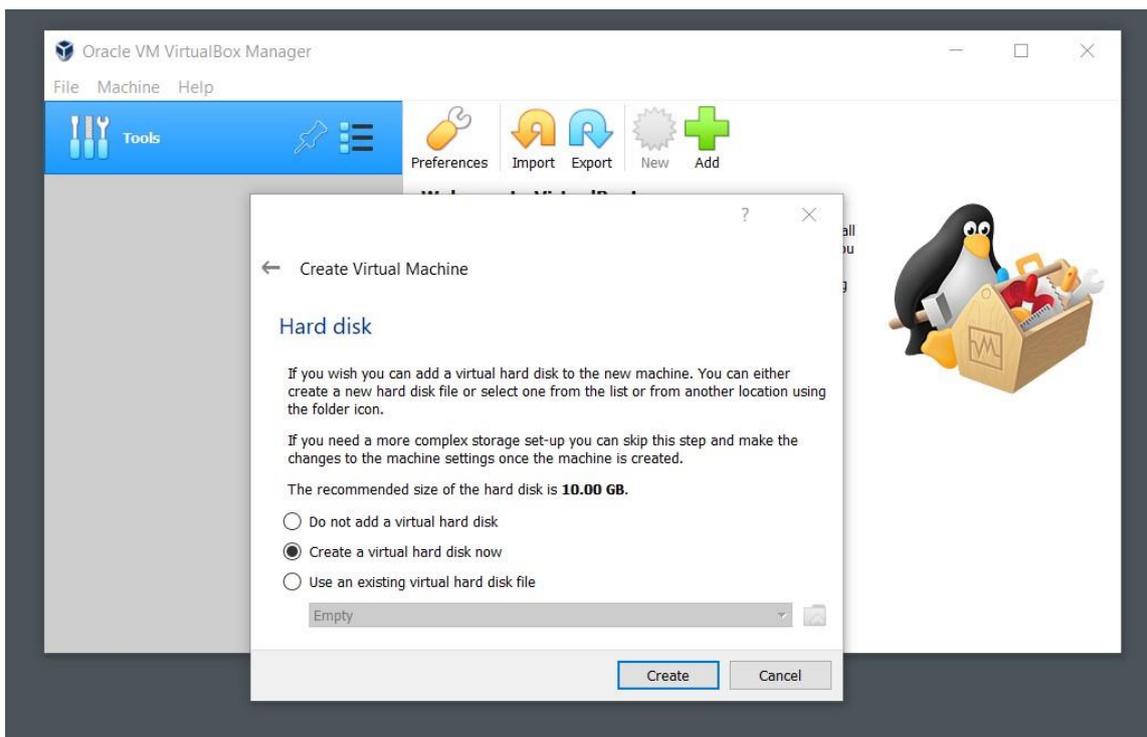


Choose a proper name and location for your new virtual machine. Then hit Next.

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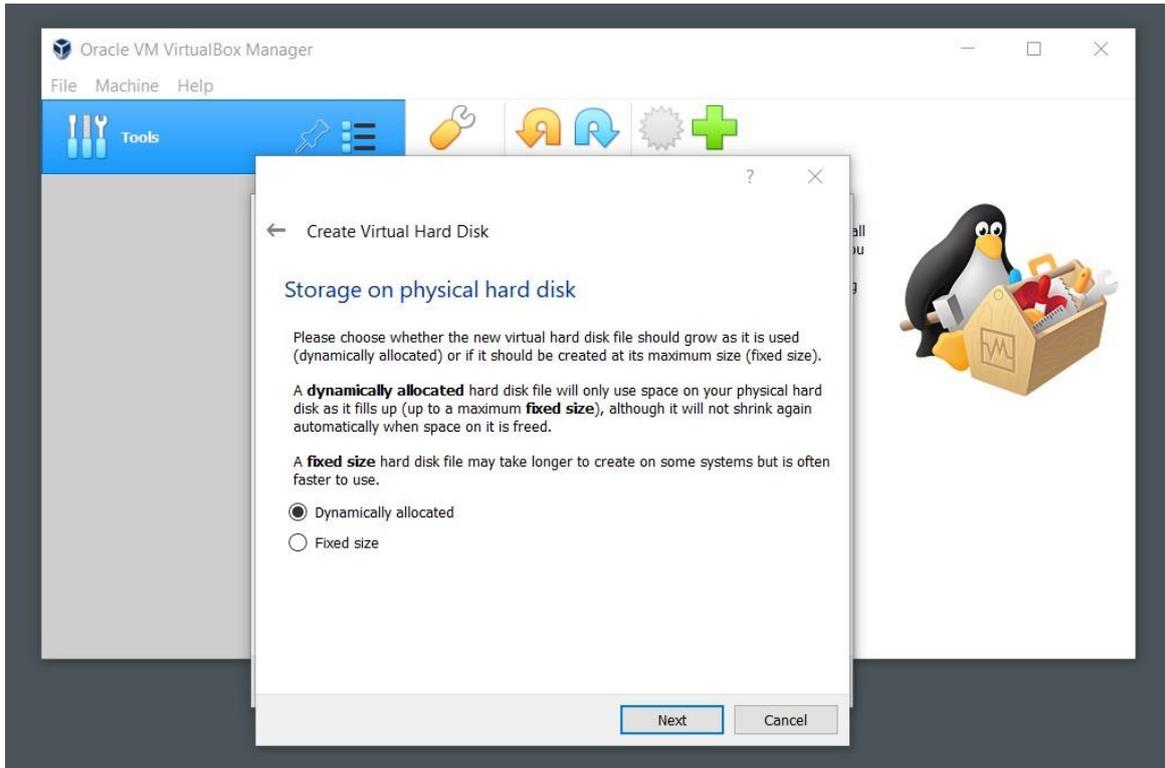


In this step you got to choose a dedicated amount of RAM to the virtual machine. It goes without saying that if your RAM resources are abundant, choose larger numbers than what I have selected; otherwise, stick with the default settings.

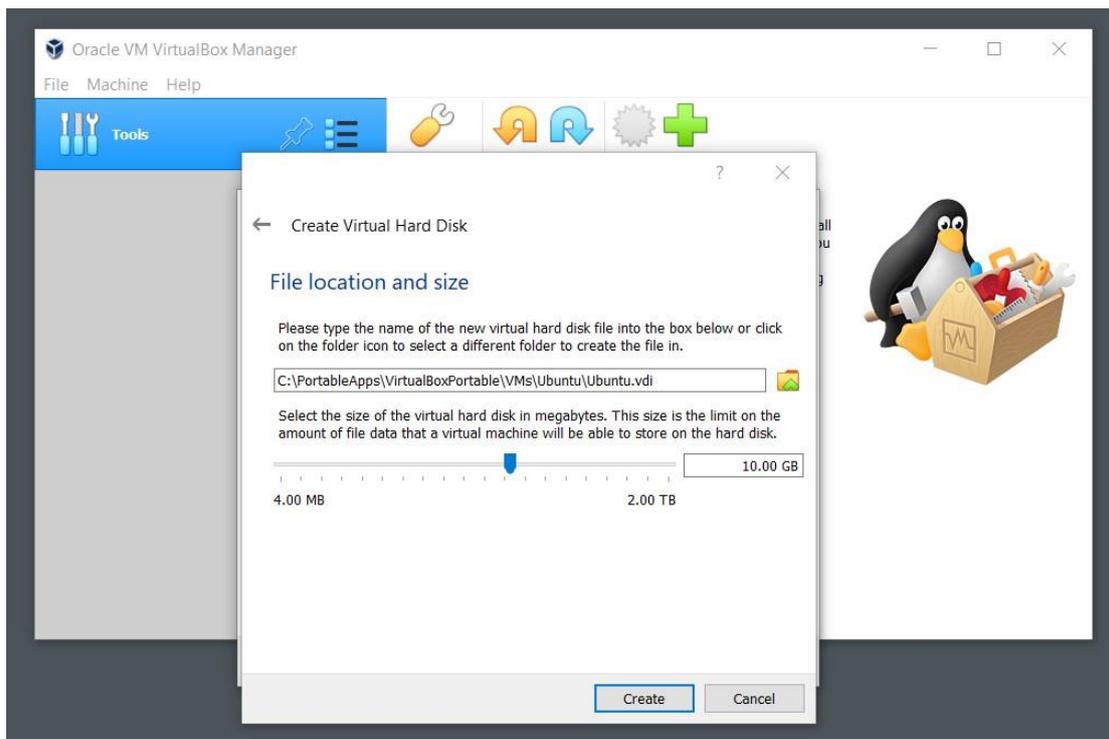


Later on, choose to create a new virtual disk.

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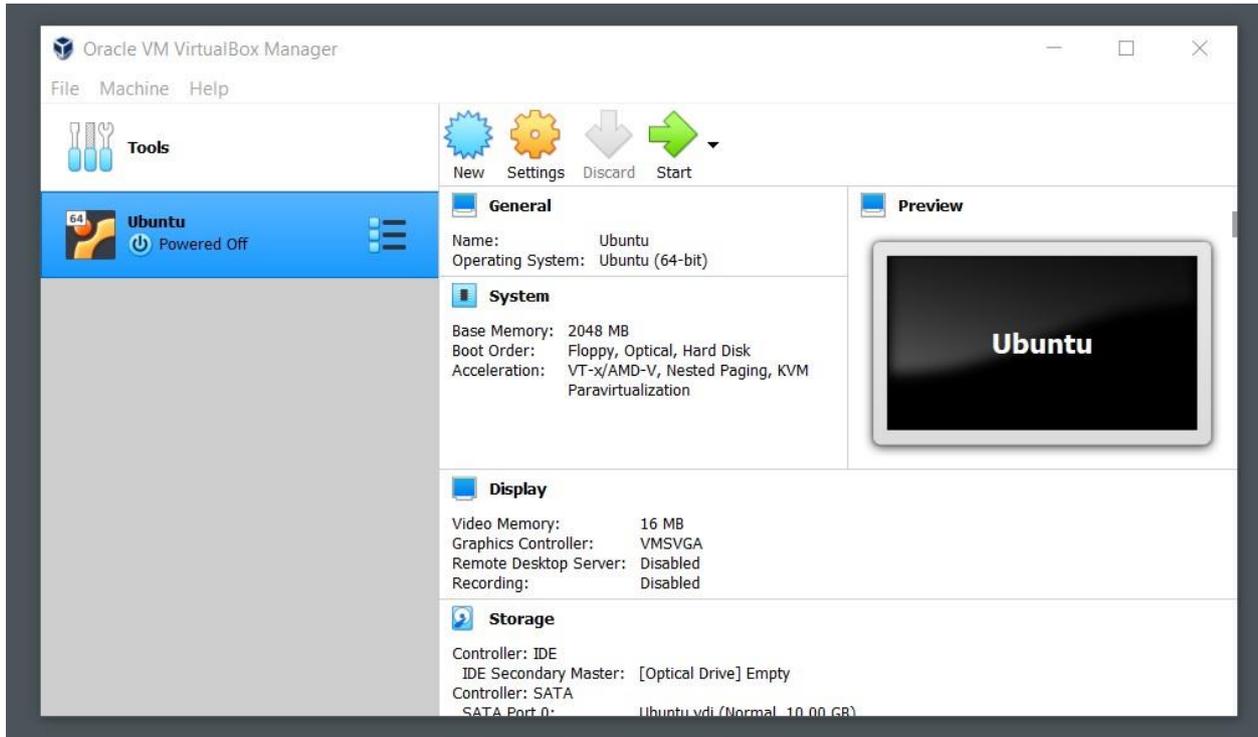


The Dynamic allocation of the virtual disk will take less space on your computer and only uses the allocated space if it is necessary. However, it is a bit slower than the fixed sized virtual disk that takes a fixed portion of your computer's free space. Choose any option that favors you most.

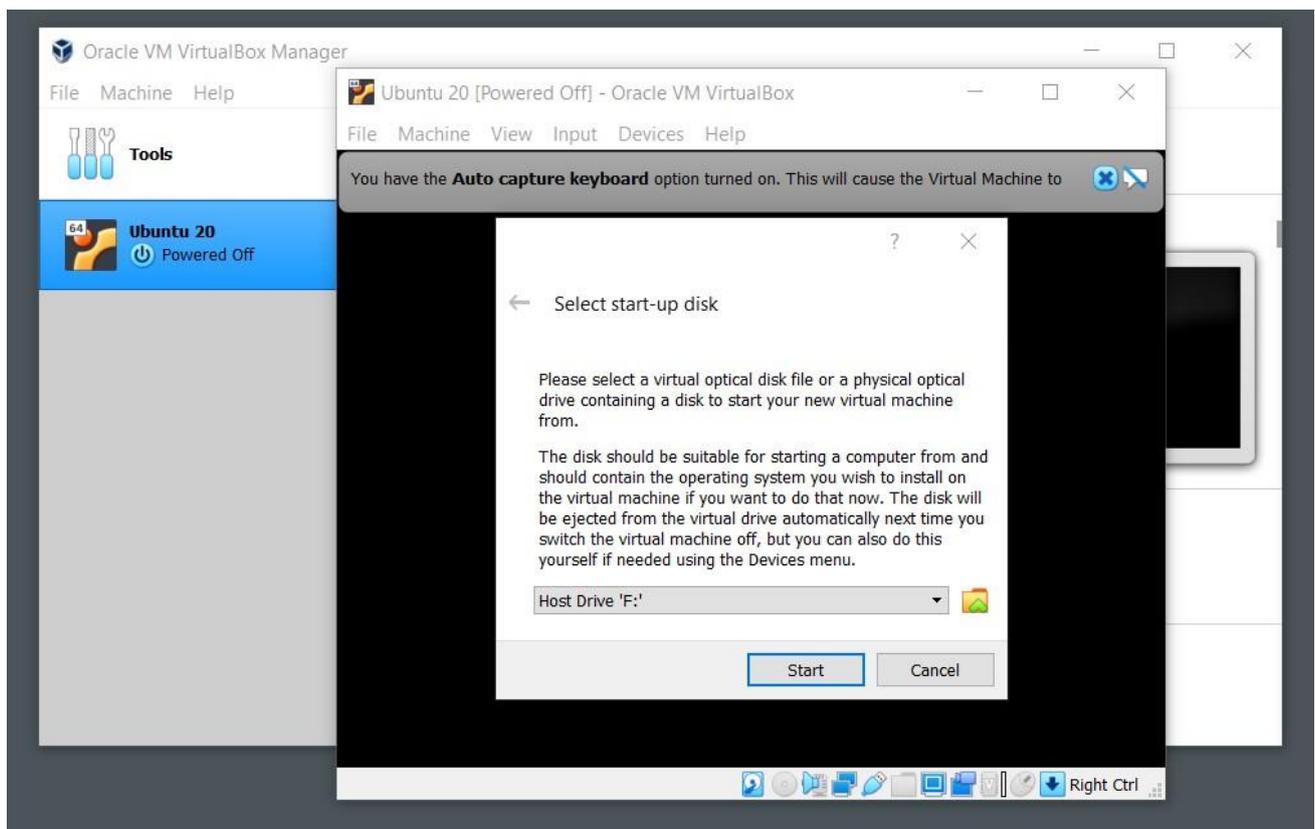


To install Linux, you need at least 10 GB of free space.

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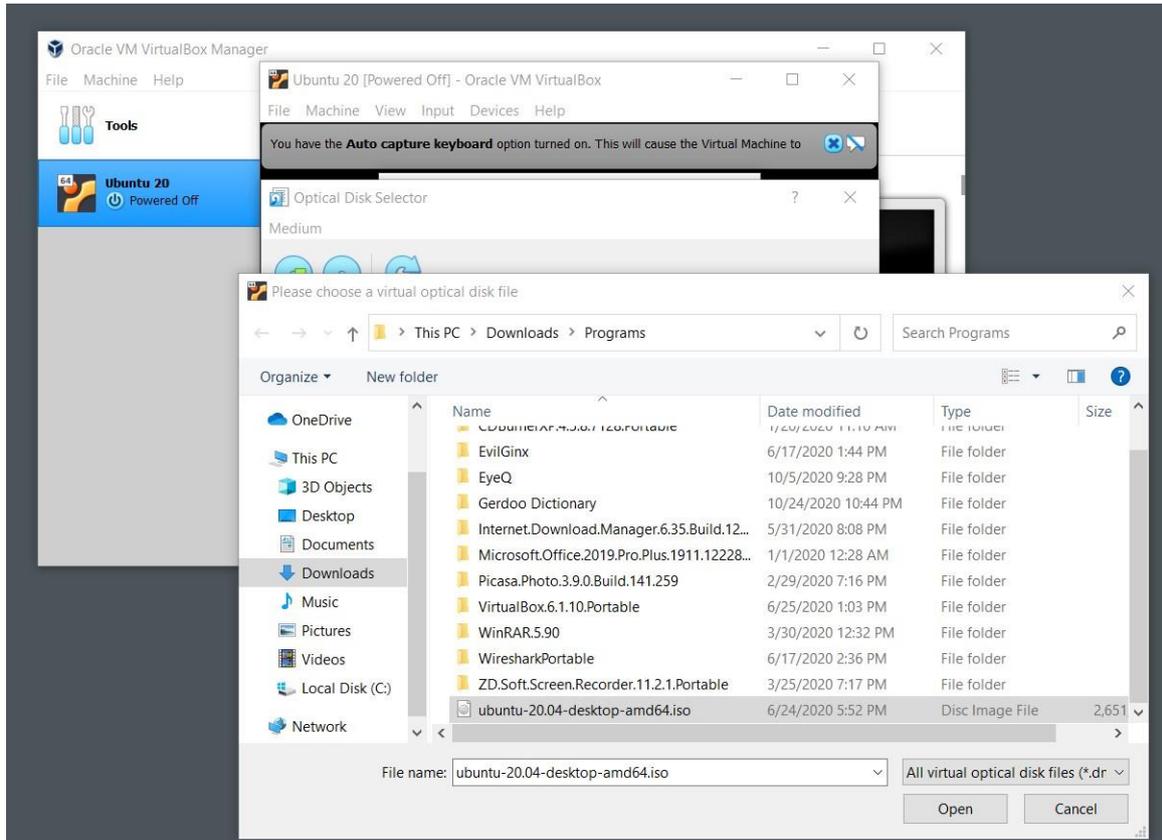


Once the configuration process is finished you will see your virtual machine name on the left panel. Then hit Start for your machine to begin working.

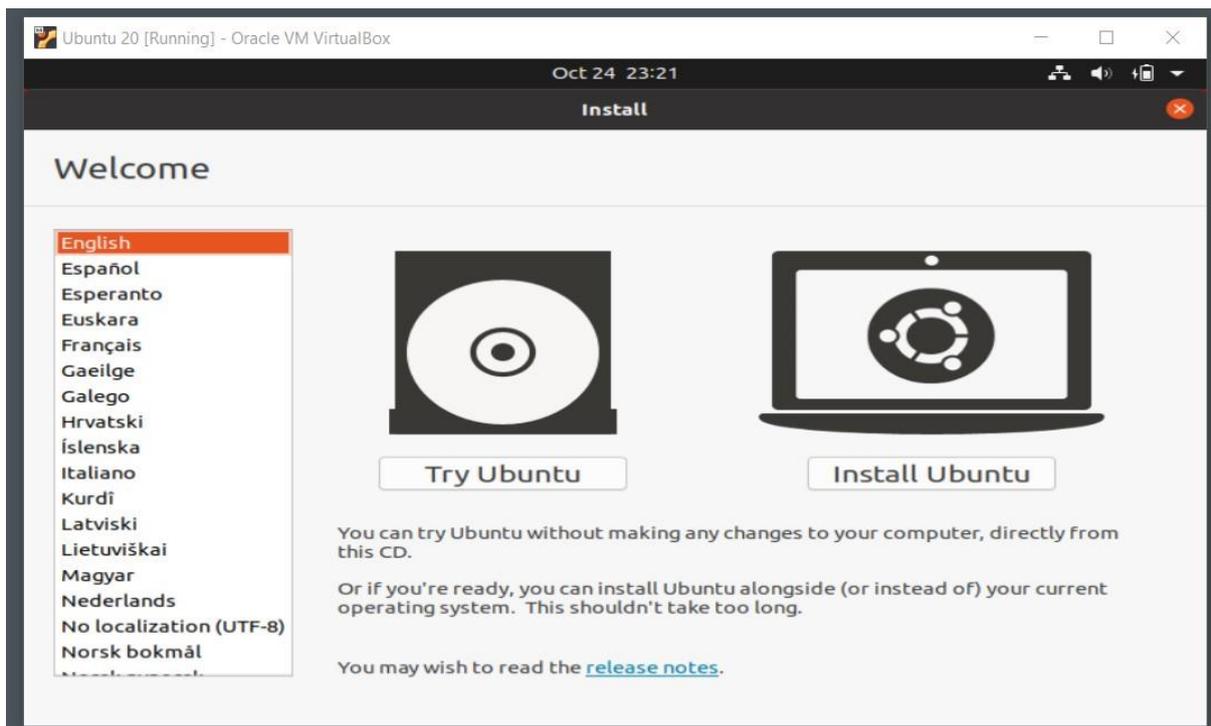


The first time that you tend to start your machine you will be asked for the iso file of the Linux OS. Give the address of the iso file that you have downloaded earlier.

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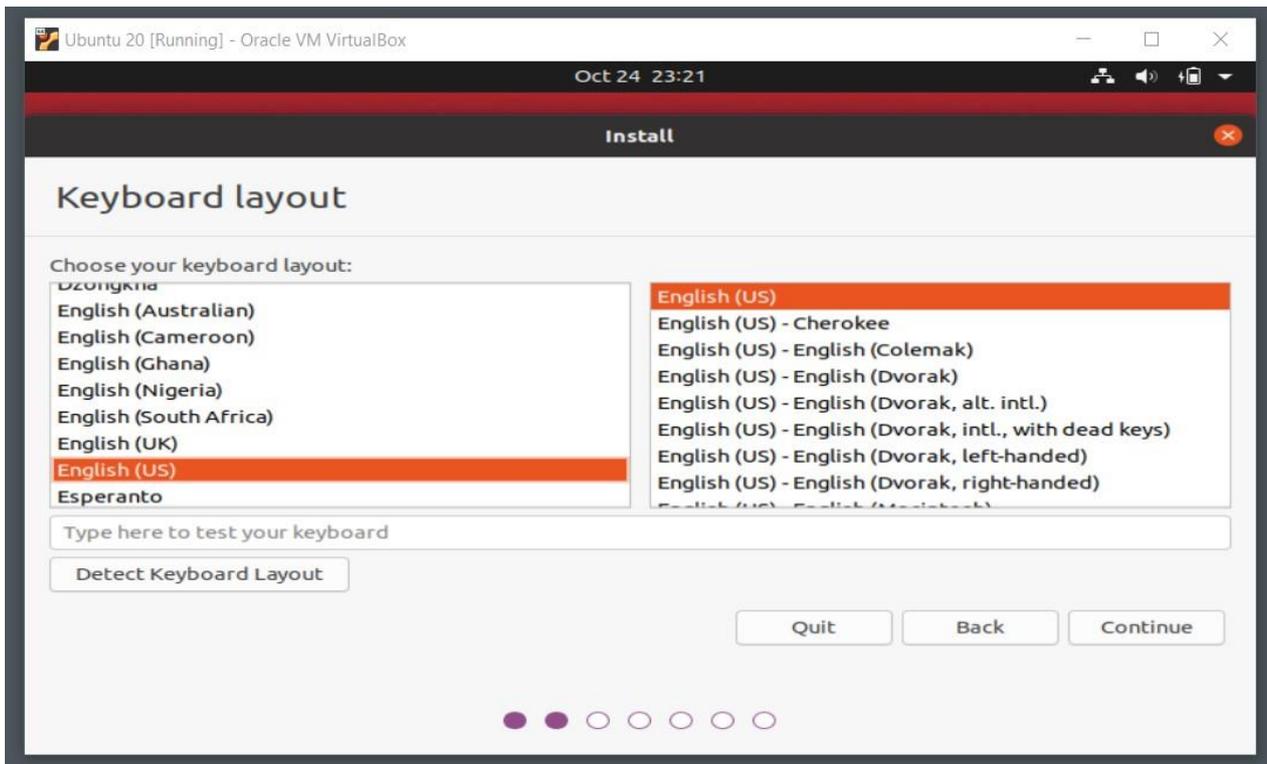


If you finish the previous steps successfully, you should be able to see the stage shown at the picture below after sometime.

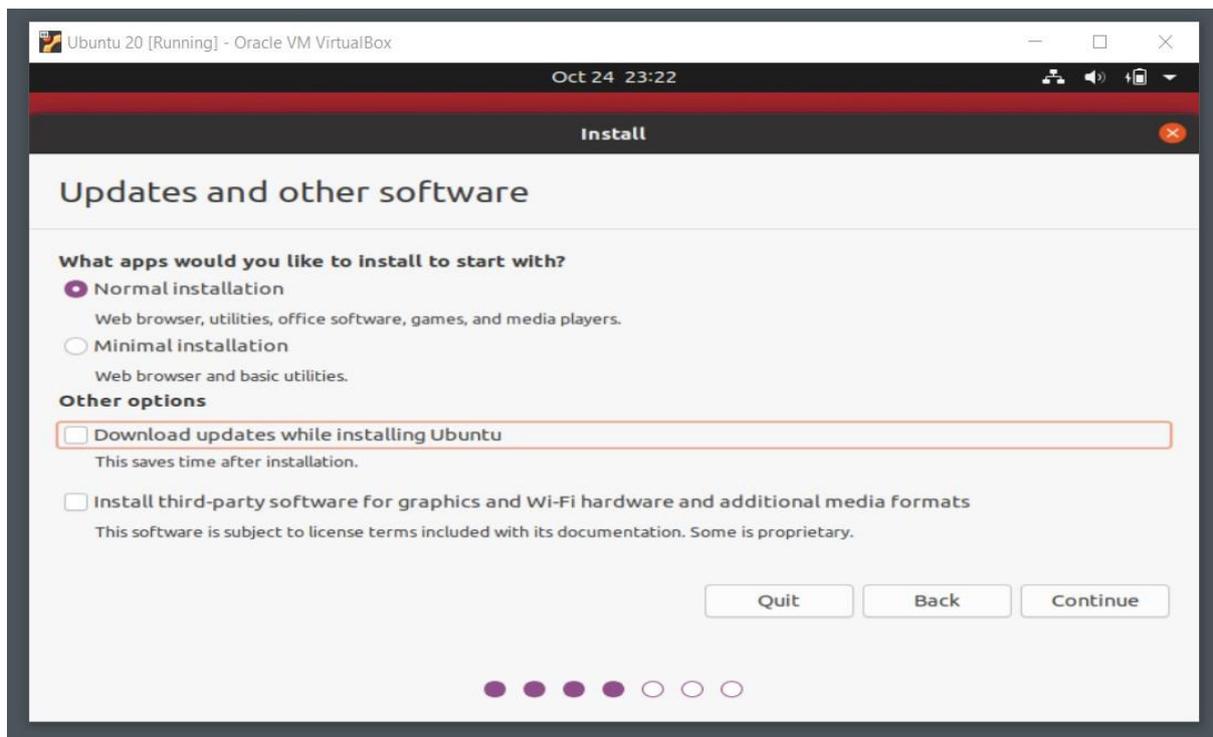


Now, we will be installing Ubuntu Linux on our virtual machine.

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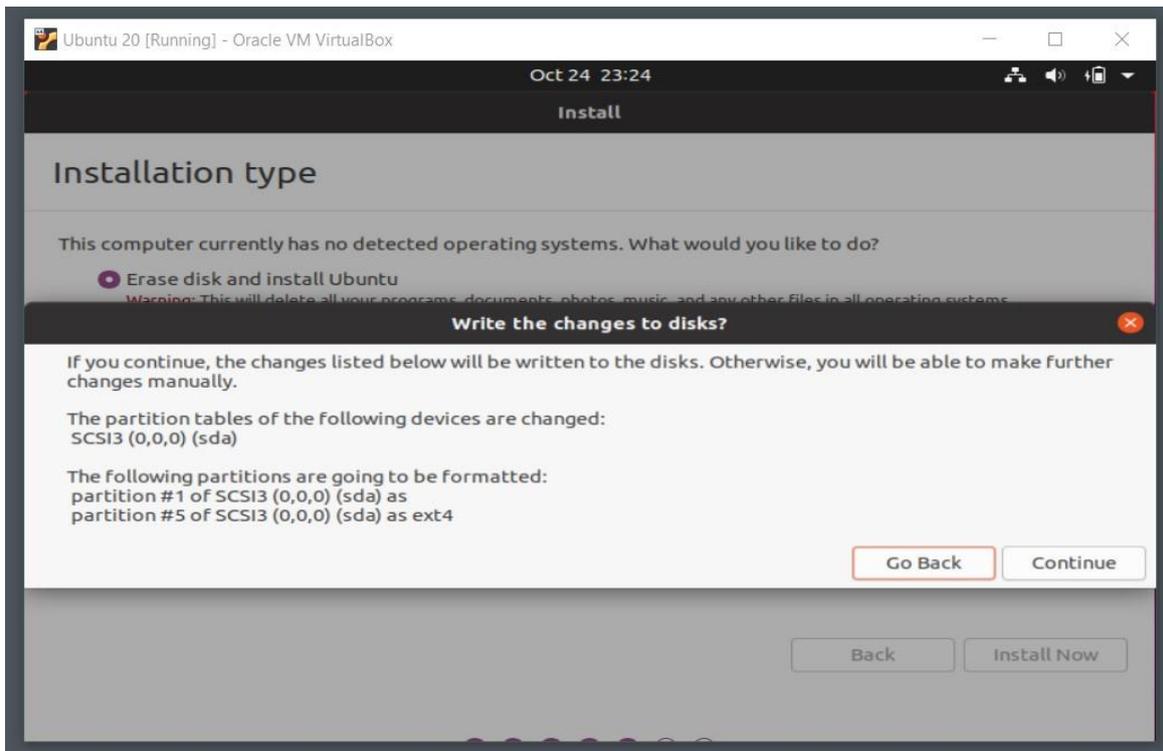


Choose your keyboard type and your preferred language.

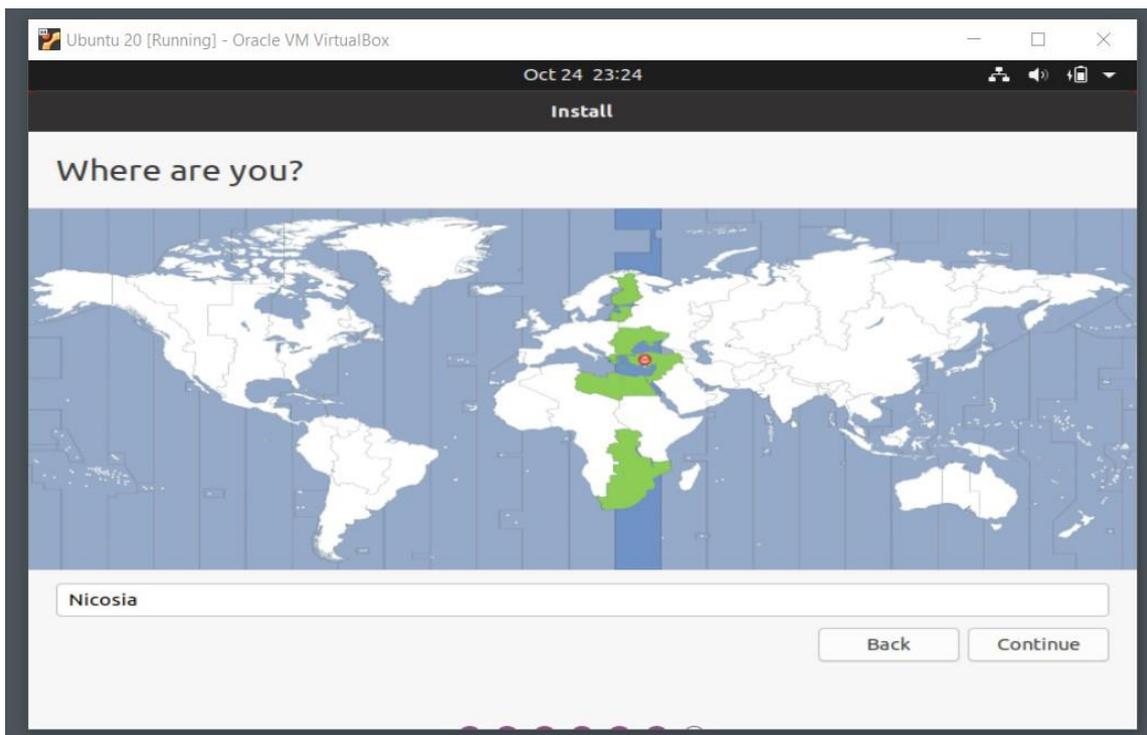


Perform a normal installation and uncheck download updates as you can do it later if you want to. Third-party apps are not required inside a virtual machine but rather useful in a real installation of Linux.

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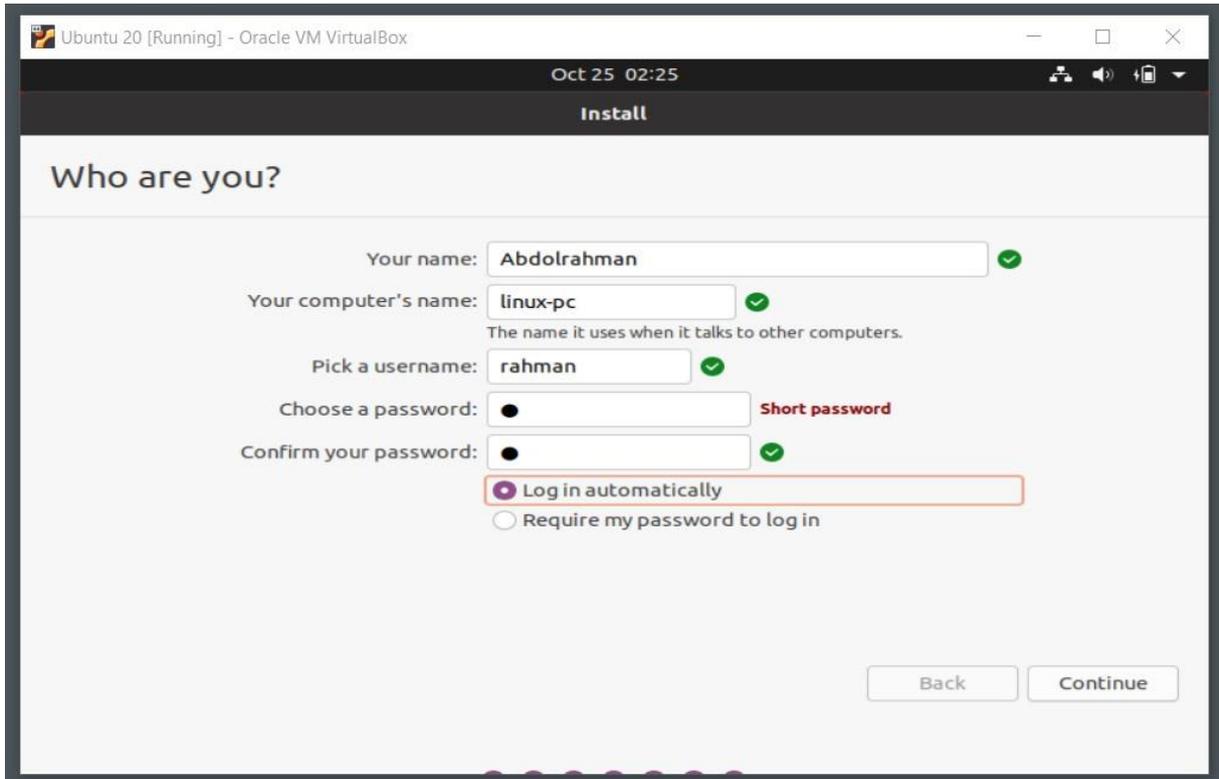


In this step, only if you are installing Linux on a virtual machine, choose to erase disk and install Ubuntu option. Then, hit continue. (This step is extremely important if you are installing Linux on your real computer instead of doing it virtually. If you are not careful with the options you will lose all your data.)

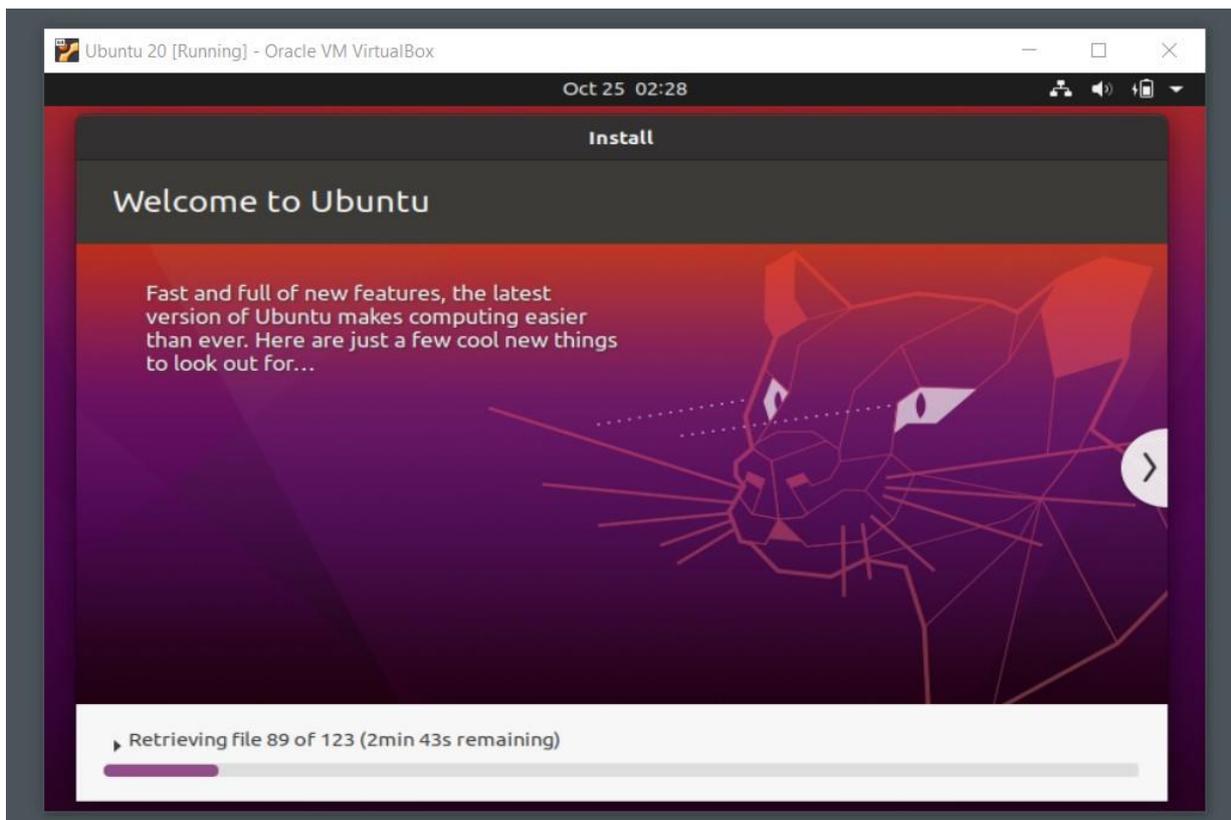


Next, choose your current time zone and location.

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Then, choose a username and a password for your new virtual instance of Linux.



Finally, Linux starts to get installed on your virtual machine. This will take 10-20 minutes depending on the speed of your computer and your internet connection.

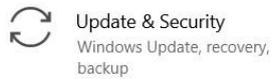
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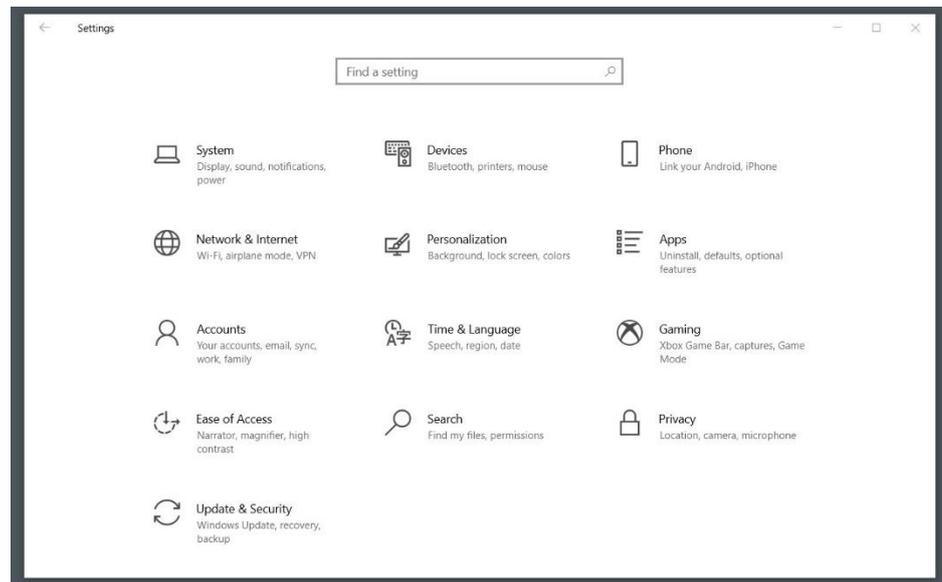
When the installation is finished, the setup will prompt you to hit the Enter key on your keyboard and then after an automatic reboot of the virtual machine you will see the Linux operating system installed on your computer.

3. Windows Subsystem for Linux

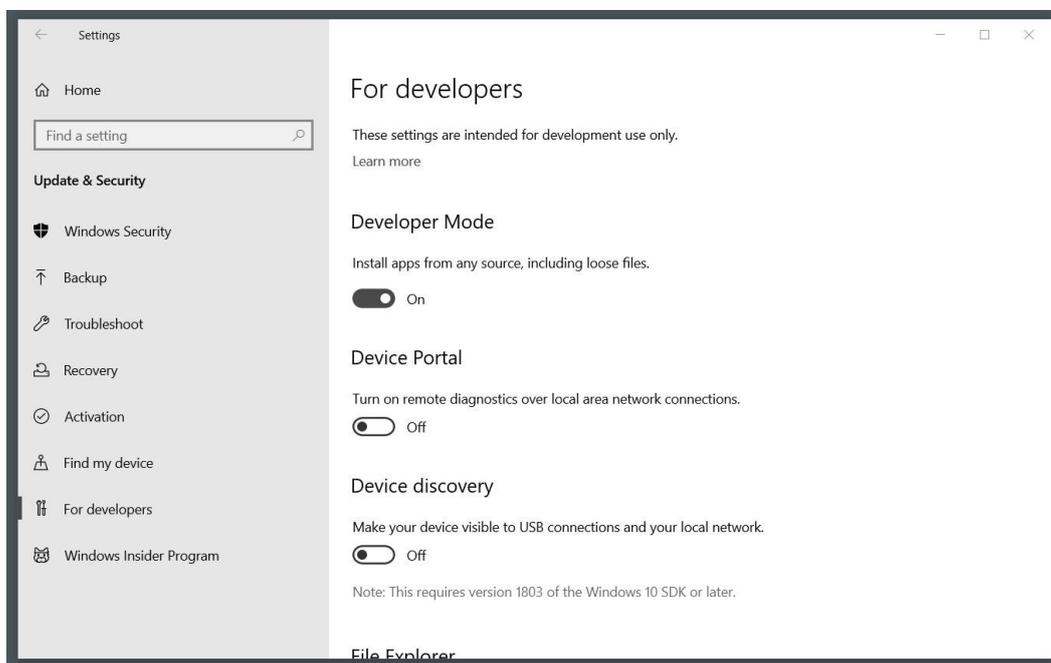
One of my favorite ways of utilizing Linux utilities is through WSL. Now that Windows is finally cooperating with some great Linux distributions, developers can use Linux Shell inside Windows 10 easily. To do so, we first need to enable a few settings on our Windows 10.



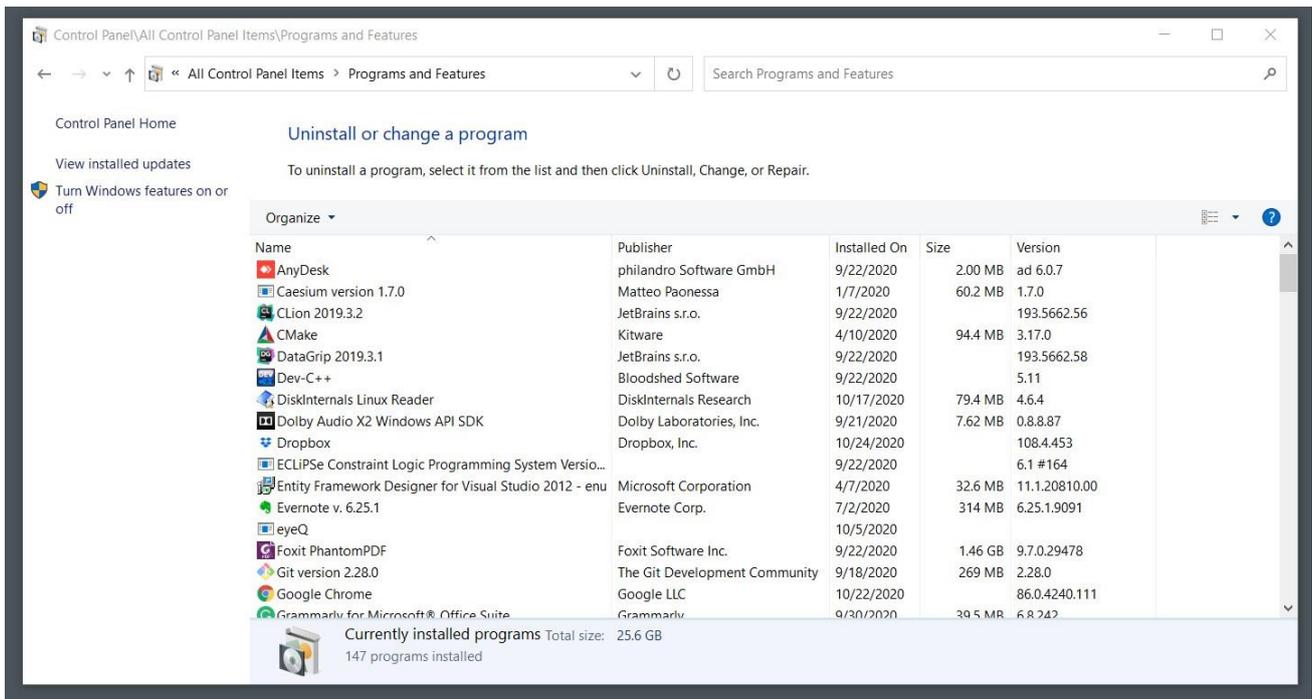
Update & Security
Windows Update, recovery, backup



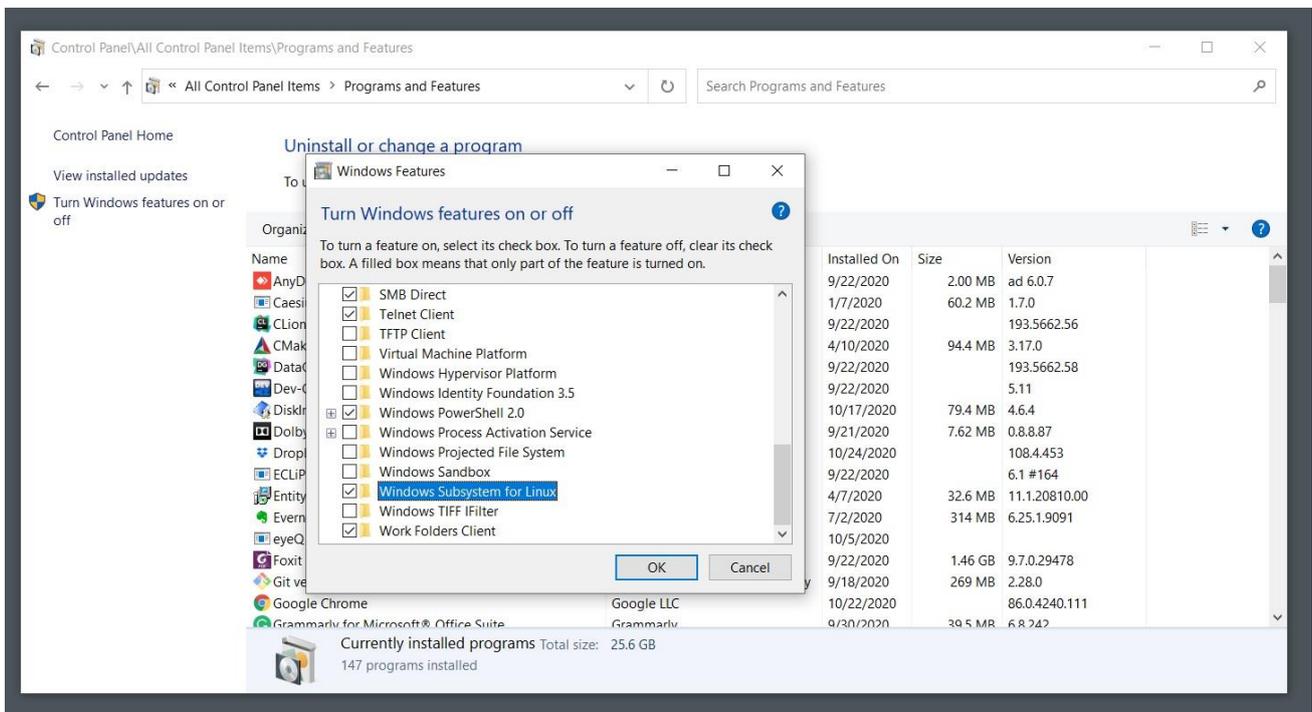
Select Update & Security section of the Settings menu. Then in the for developers' section, enable the Developer Mode.



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Also, via the Control Panel and Programs and Features section, you need to enable a couple of Windows features.

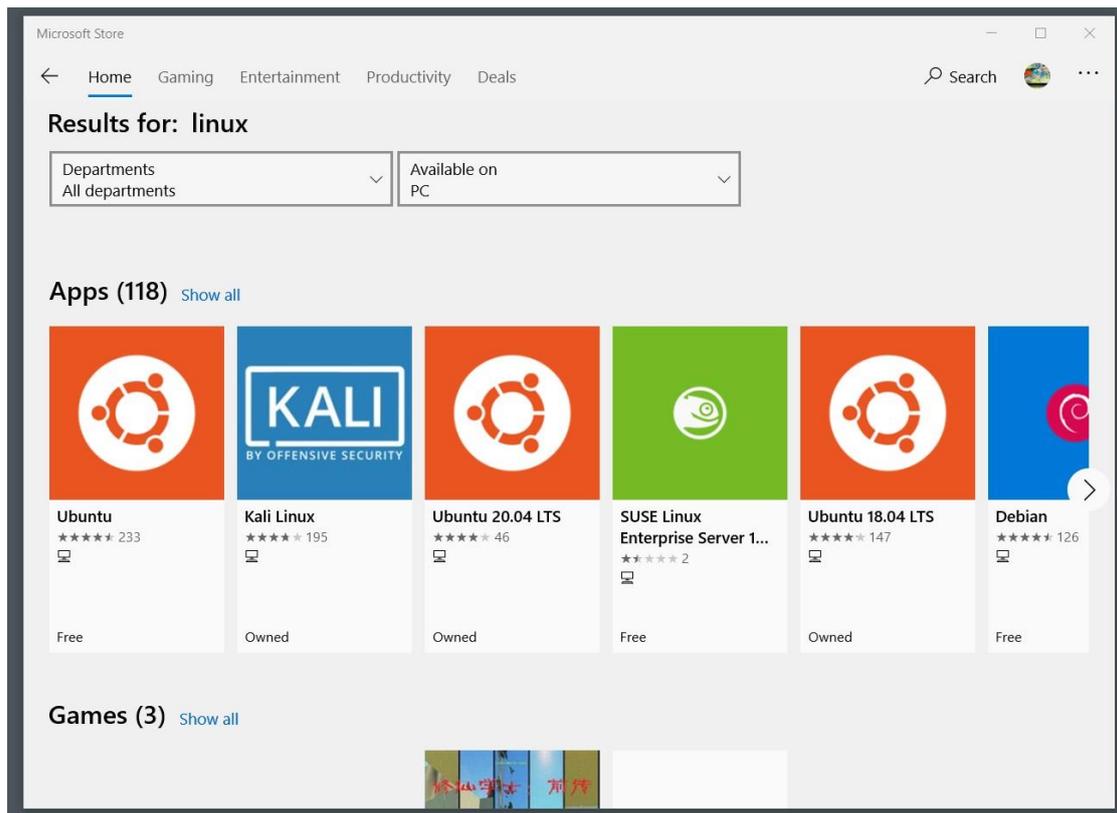


Windows Subsystem for Linux and Virtual Machine Platform options should be turned on.

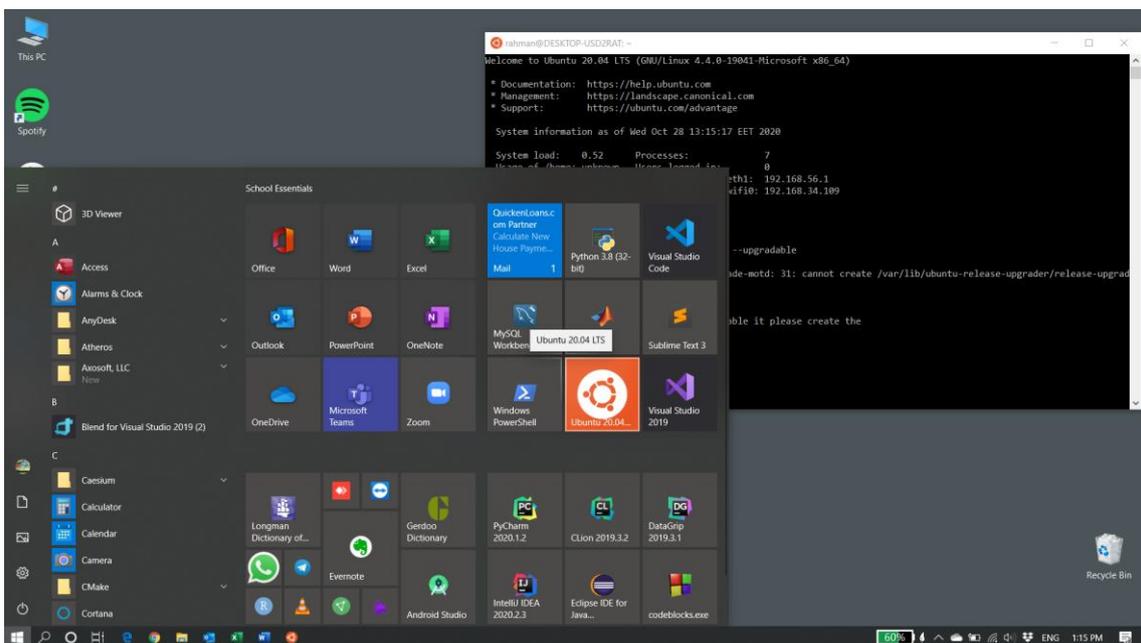
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The final step here is to download and install Linux from Microsoft Windows Store.



Multiple Linux distributions are available to be used through the WSL. For this course we will be using Ubuntu 20.04 LTS but you can own multiple versions at the same time. If you wish to indulge your curiosity, I recommend OpenSUSE Linux to you as well.



The Shell will be opened after installation and you will be asked to enter a username and a password to be used with the Shell.

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If you search online for a Linux shell, you will come across a series of websites that provide only a limited number of core functionalities of this operating system accessed online.

Unlike the previous methods, online shells make the least amount of Linux features available for the users but in case that your computer is really slow you may try these online shells even though they can not perform all the things that we may need in this course.