Install Ubuntu on VirtualBox

Introduction

Linux is an industry-standard operating system, and **Ubuntu** is a popular distribution of Linux. In order to run Ubuntu as the guest operating system in a virtual machine on your host machine (such as your Windows or Mac laptop), you can first install VirtualBox and then install Ubuntu within VirtualBox. Then whenever you start VirtualBox, you can select Ubuntu (or any other guest operating system that you've installed) to run in the virtual machine managed by VirtualBox.

> If you are on **Windows 10**, a better solution for getting Ubuntu is to install it directly using the Windows Subsystem for Linux feature. For instructions, see https://docs.microsoft.com/en-us/windows/wsl/install-win10 and the tutorial, "Install Ubuntu on Windows 10": http://www.cs.sjsu.edu/~mak/tutorials/InstallUbuntuWindows.pdf.

> If you are on a Macintosh platform, you do not need to install Linux, since **macOS** is based on a (non-Linux) version of UNIX. The latest versions of macOS use **zsh** as the default shell (command-line) language. You may want to replace it with the more popular industry-standard **bash**. See the tutorial, "Install bash for macOS": http://www.cs.sjsu.edu/~mak/tutorials/InstallBashForMacOS.pdf

Hardware-assisted virtualization

To support a virtual machine, your laptop's Intel CPU chip must have virtualization technology (VT-x) enabled. It is enabled by default on some laptop brands, but disabled by default on others. To see whether or not it's enabled on your Windows laptop, follow the instructions at https://www.intel.com/content/www/us/en/support/articles/000005486/processors.html

If VT-x is disabled, you must enable it by changing an option in the BIOS of your laptop. See the instructions at https://www.sysprobs.com/disable-enable-virtualization-technology-bios

How to access the BIOS depends on the laptop brand: https://www.lifewire.com/bios-setup-utility-access-keys-for-popular-computer-systems-2624463

Download the Ubuntu installation disk

Go to https://www.ubuntu.com/download/desktop and download the latest version of Ubuntu, which is a 64-bit operating system. You will get a **.iso** file which is an image of the installation optical disk (i.e., a CD ROM). Remember where you stored the file.

Install and configure VirtualBox

VirtualBox is a virtual machine manager under which you will run Ubuntu. Windows 10 or macOS will be the **host operating system** for the virtual machine, and Ubuntu will be the **guest operating system** running in the virtual machine.

Download the latest version of VirtualBox from https://www.virtualbox.org/. Install and run it. It should appear as in Figure 1, except that if this is your first time running it, there won't be any other guest operating systems already installed.

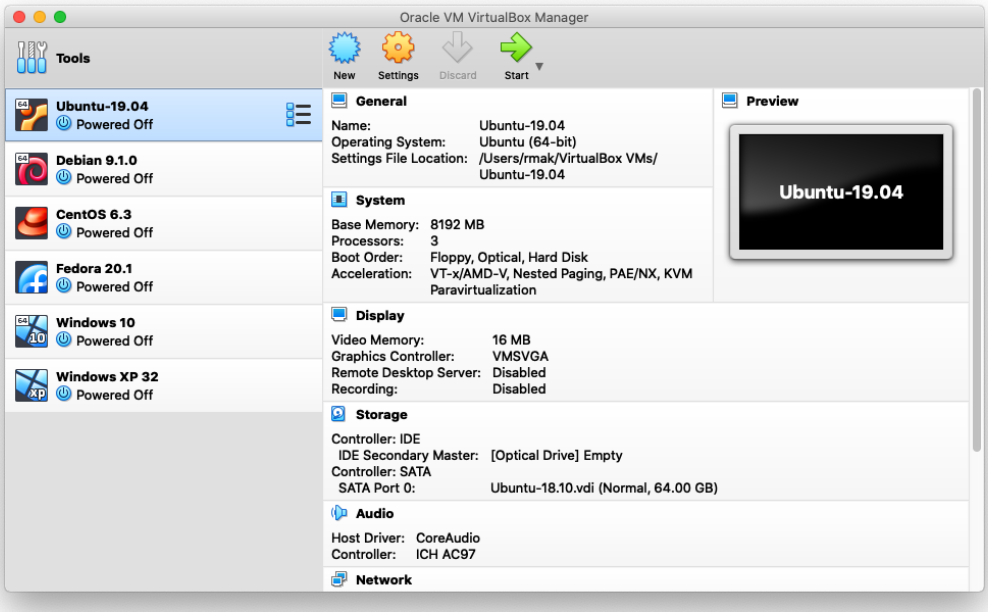

Figure 1. The VirtualBox main screen (running on MacOS X).

Click the *New* button and fill in the **Create Virtual Machine** form (Figure 2). Pick an appropriate name. Choose a machine folder on your laptop that will contain the virtual machine image. The type should be *Linux*, and the version should be *Ubuntu (64 bit).* Set a memory size for the virtual machine, but don't give it more than half of the memory of your host laptop. Select the *Create a virtual hard disk now* radio button. Click the *Create* button.

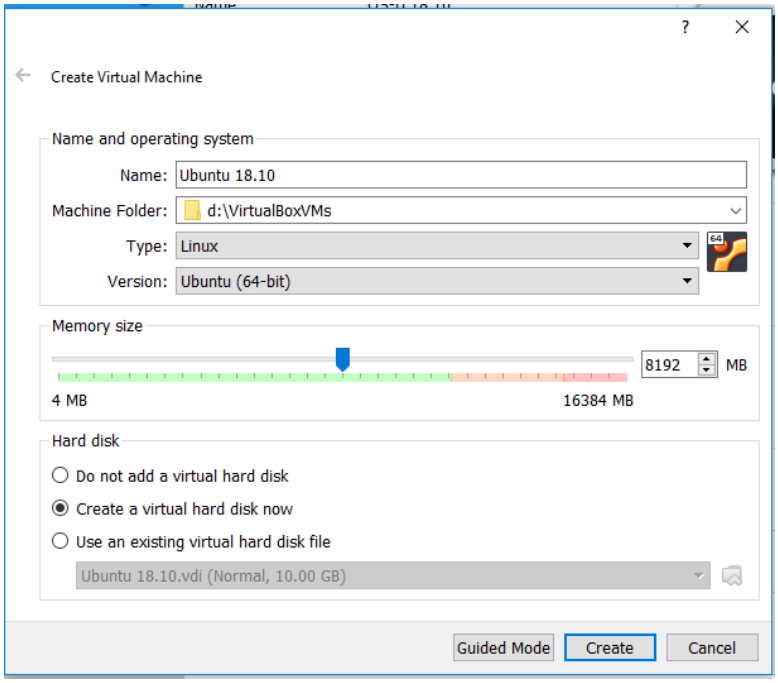

Figure 2. The Create Virtual Machine form.

On the **Create Virtual Hard Disk** form (Figure 3), specify the maximum size to which Ubuntu's virtual hard disk can grow. Select the *VDI (VirtualBox Disk Image)* and *the Dynamically allocated* radio buttons. Click the *Create* button. This creates the new virtual machine named, for example, Ubuntu 18.10 (Figure 4).

Note: For an installation of Ubuntu, specify at least **64 GB** for the size of the virtual hard disk.

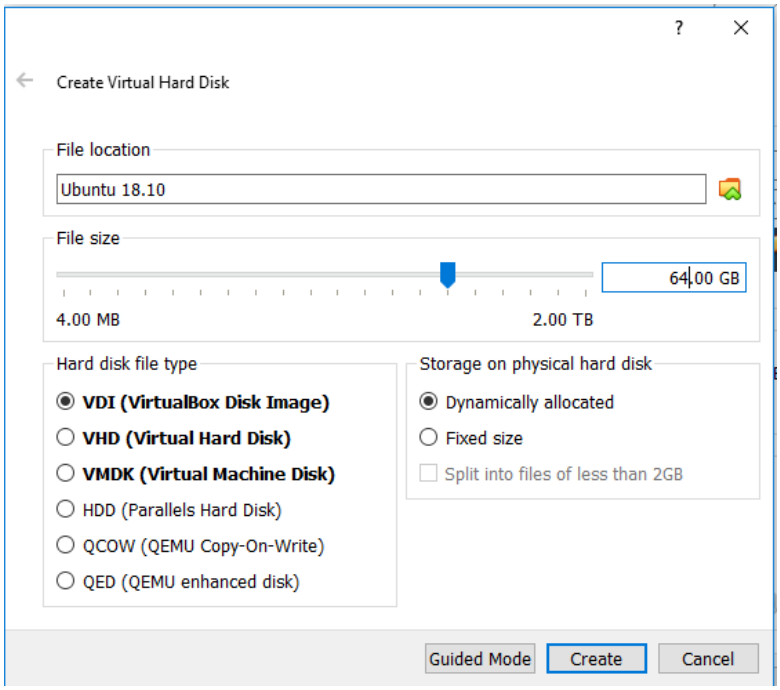

Figure 3. The Create Virtual Disk form.

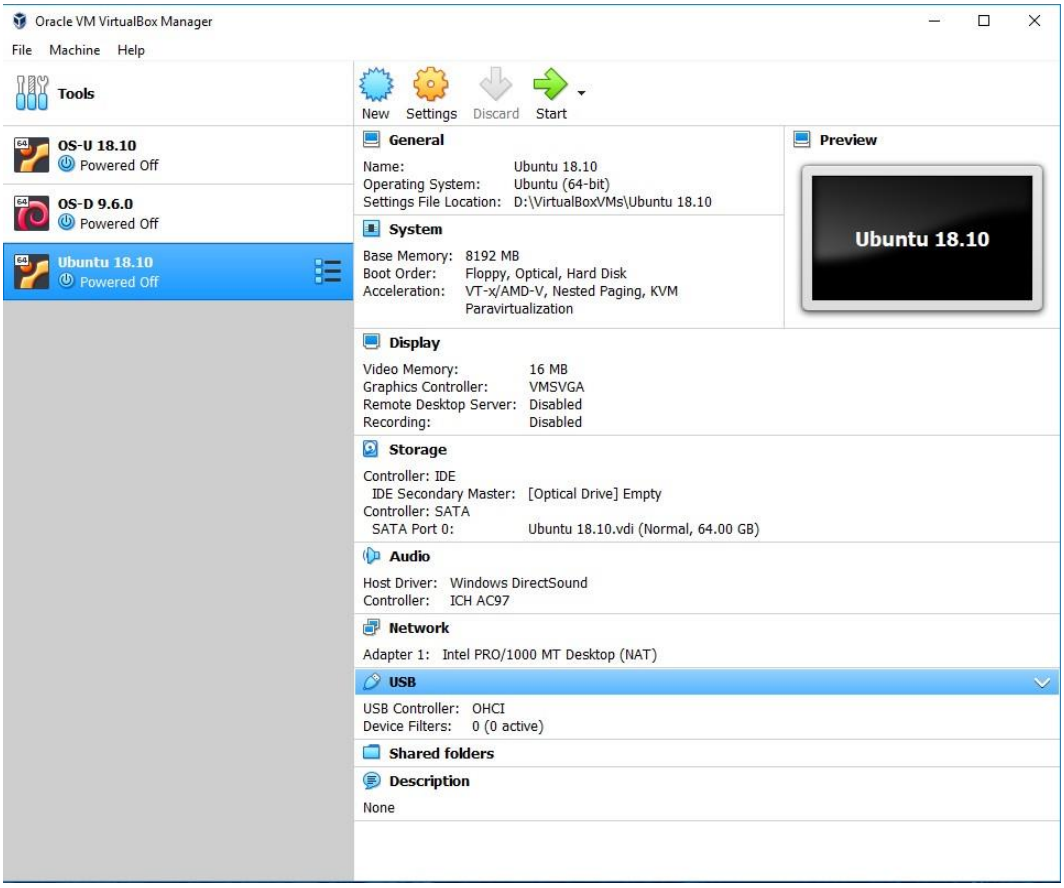

Figure 4. The virtual machine named Ubuntu 18.10 is created.

Select the name of the newly created virtual machine. Click the *Settings* icon at the top. Then click on *System* in the left panel. In the **System Settings** form, select the *Motherboard* tab. Specify the amount of base memory you want to devote the virtual machine, but not more than half of the physical memory in your host machine. Select the *Processor* tab (Figure 5) and specify the number of CPUs you want to devote to the virtual machine, but not more than half the number of CPUs in your host machine. Click the *OK* button.

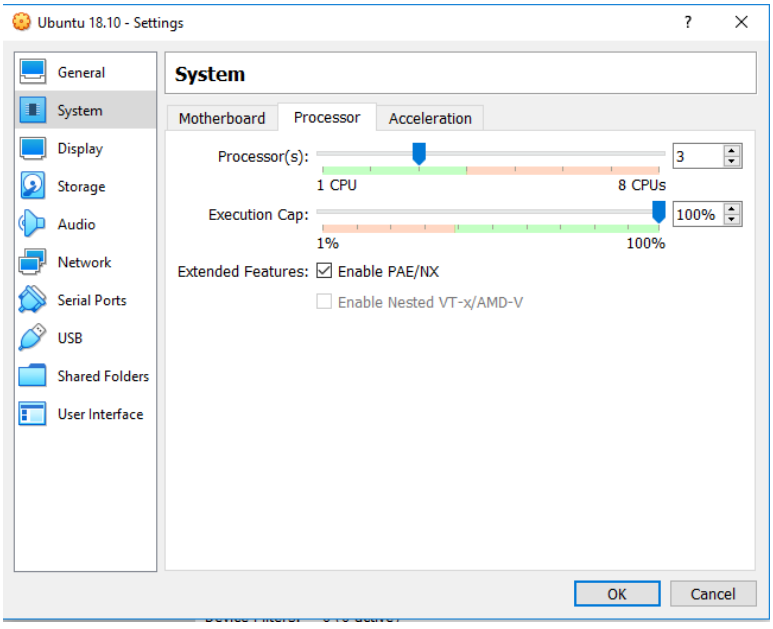

Figure 5. The System Settings form.

Note: For an installation of Ubuntu, specify at least **2 CPUs** and **4 GB of memory**.

Click *Storage* in the left panel. The **Storage Settings** form (Figure 6) shows the virtual CD ROM drive, which is initially empty, and the virtual hard drive, which is the .vdi **virtual disk image** that VirtualBox created. Select *Empty* under *Controller: IDE*.

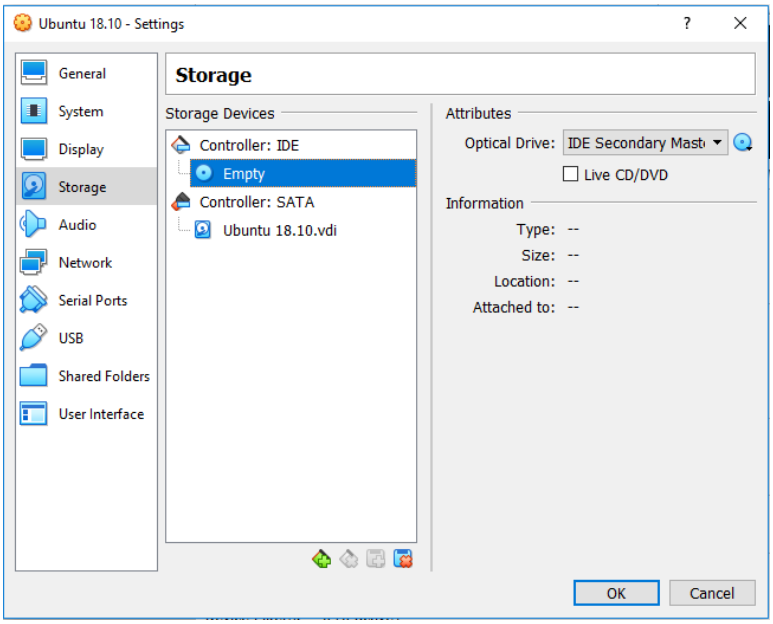

Figure 6. The initial Storage Settings form.

You want to install Ubuntu on the virtual machine, so you must "insert" the .iso installation disk image file that you downloaded earlier into the virtual CD ROM drive. Look under *Attributes* and click on the image of the disk to the right of the dropdown menu. Select the .iso file to insert into the drive. You should now see the .iso file name under *Controller: IDE* (Figure 7). Click the *OK* button.

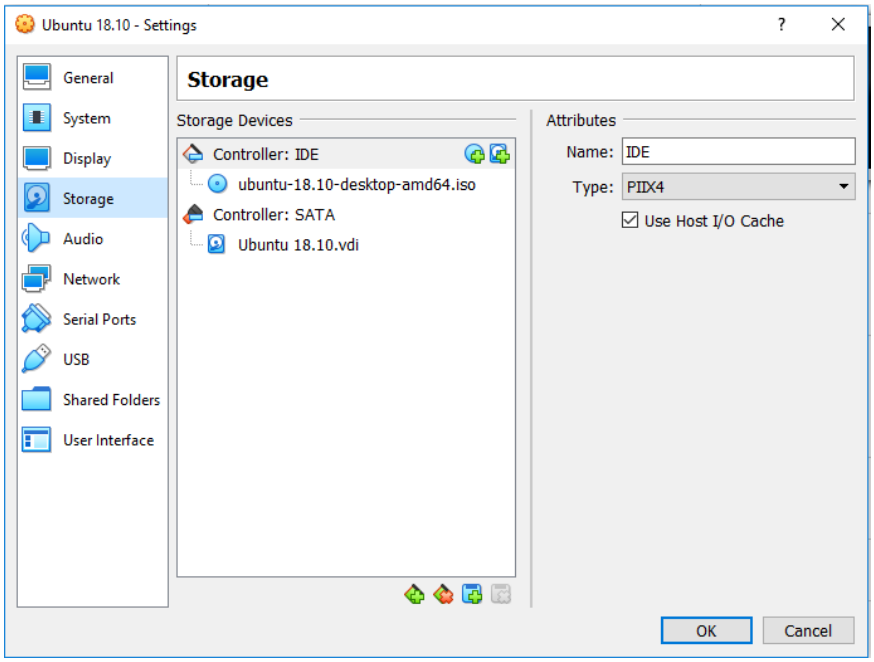

Figure 7. The installation disk image inserted into the virtual CD ROM drive.

Install Ubuntu

Now you are ready to start the virtual machine (Figure 8) in order to install Ubuntu. To start the Ubuntu virtual machine, highlight it and click the *Start* button at the top.

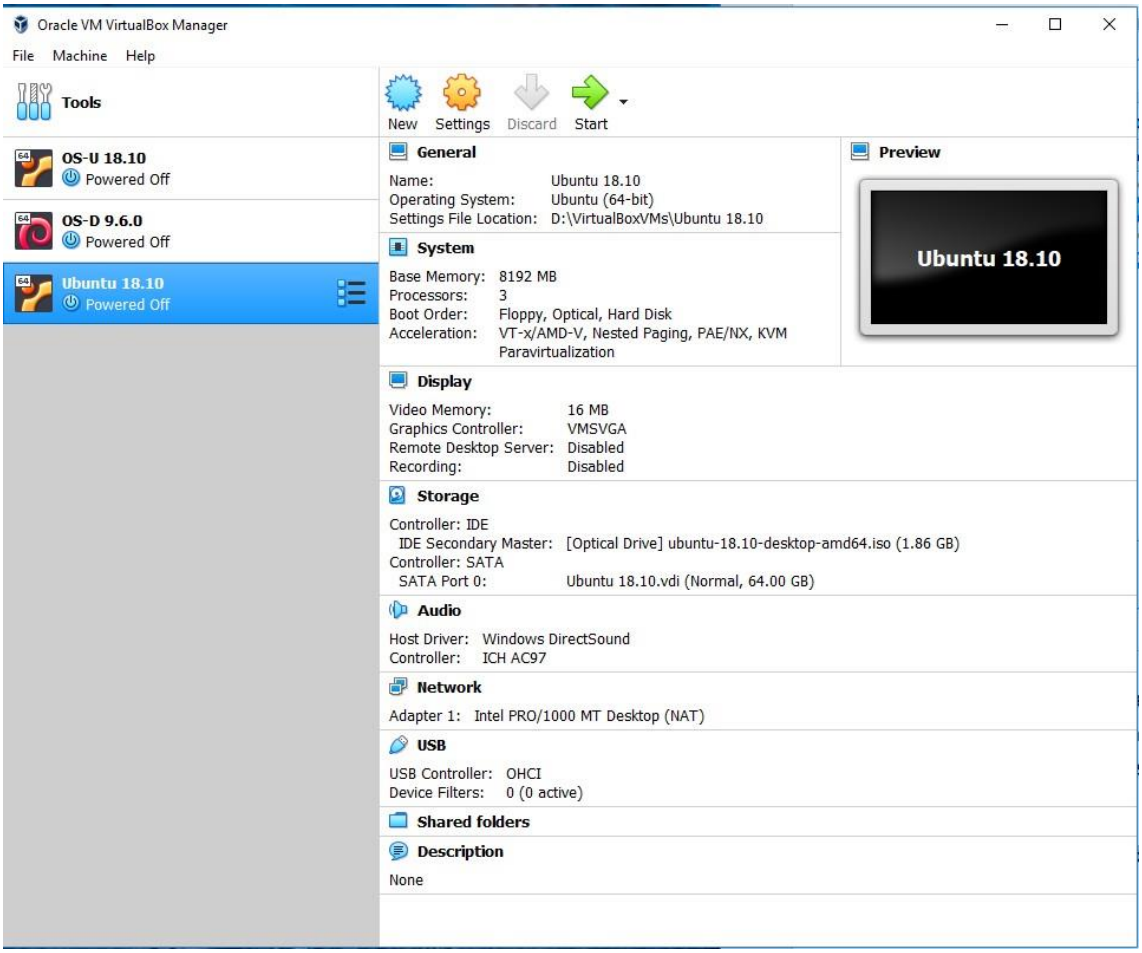

Figure 8. Ready to start the Ubuntu virtual machine.

The virtual machine will boot off the installation disk and start the installation process (Figure 9). Because the installation process downloads files from the Internet, you will need a good connection.

Choose your language and click *Install Ubuntu* to start the installation process. At various times, you will be asked to make a choice. Except otherwise directed, you should accept the default choices.

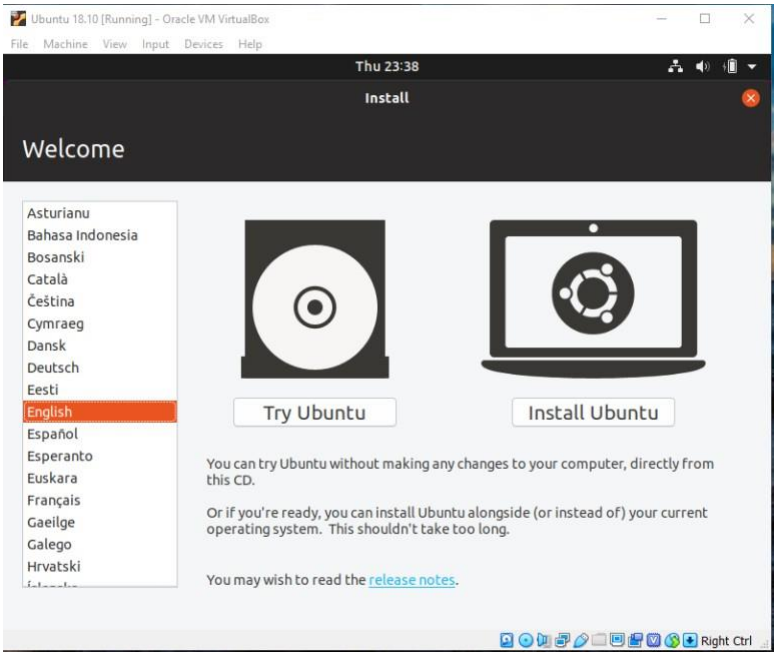

Figure 9. Starting the installation process.

On the **Installation type** form, accept the choice *Erase disk and install Ubuntu* (Figure 10). The disk that it will erase is the virtual disk, not your host laptop's physical disk! Click the *Install Now* button and the subsequent *Continue* button.

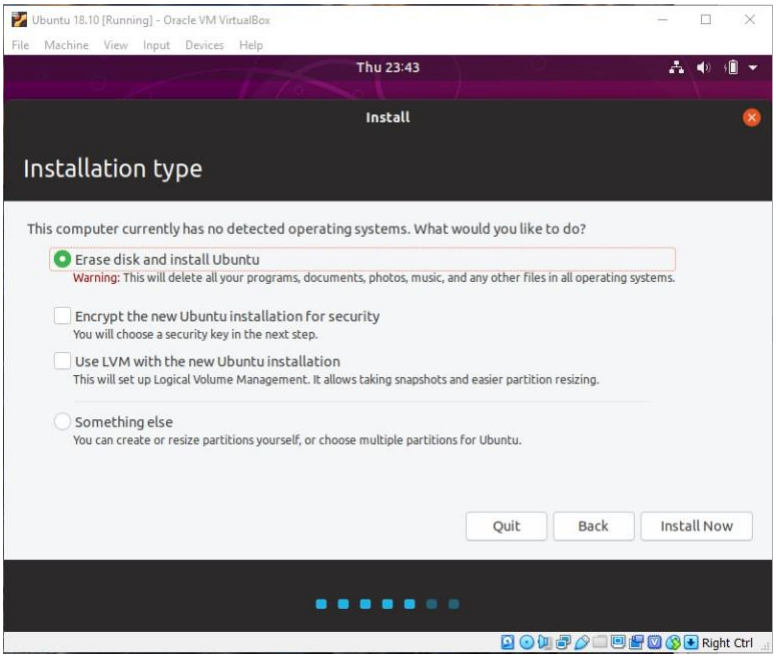

Figure 10. Erase the virtual disk and install Ubuntu.

On the **Who are you?** form (Figure 11), enter appropriate names. The username will also become the name of your home directory in /home. The passwords will become your login passwords.

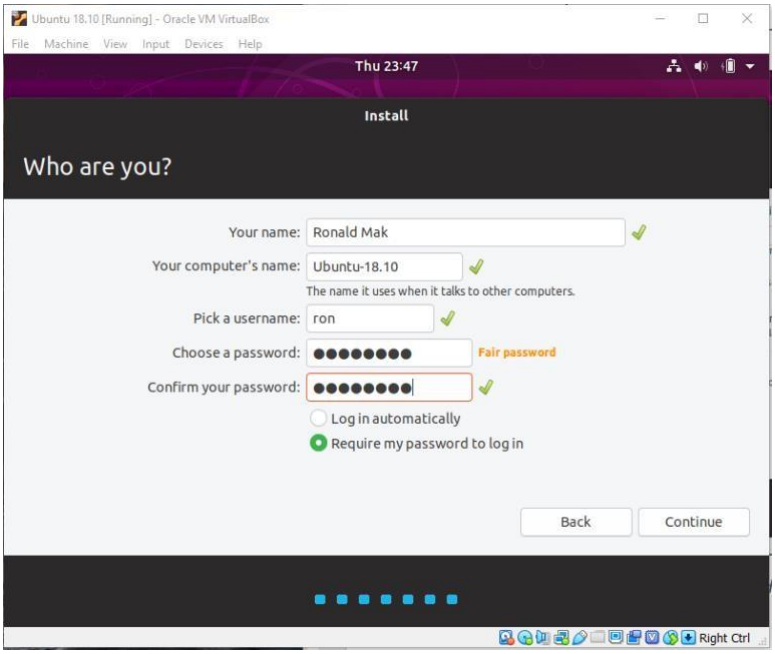

Figure 11. Choose names and passwords.

The installation process will take a while, especially if you have a slow Internet connection. You can watch files download and install, or you can go have a cup of coffee. When it's finally done, it will ask you to restart (Figure 12). Press the *Restart Now* button.

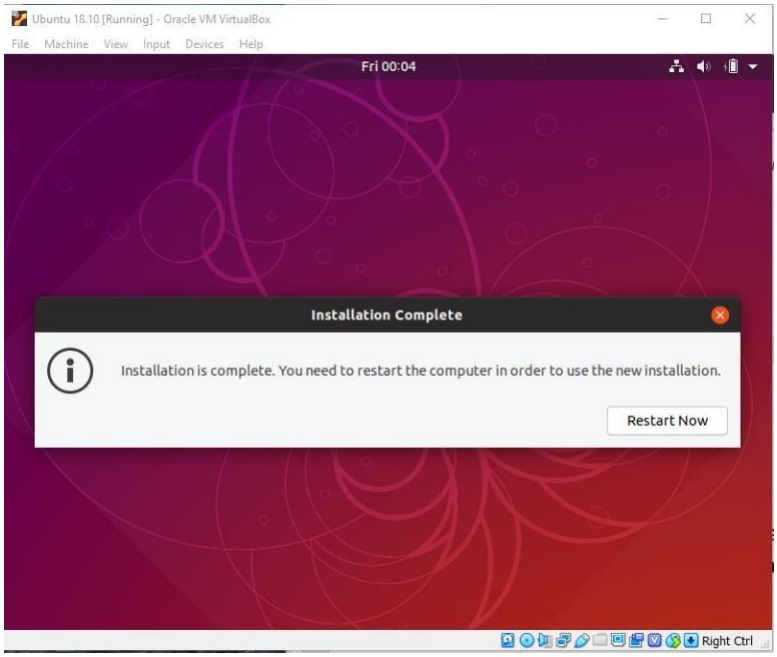

Figure 12. Installation is complete.

Ubuntu will restart and ask you to remove the installation disk from the virtual CD ROM drive (Figure 13).

Right-click on the image of the CD ROM at the bottom of the screen and select *Remove disk from virtual drive*. You may need to press the right control key on your keyboard if the virtual machine has “captured” your mouse. After removing the disk, click in the Ubuntu window and press the enter key.

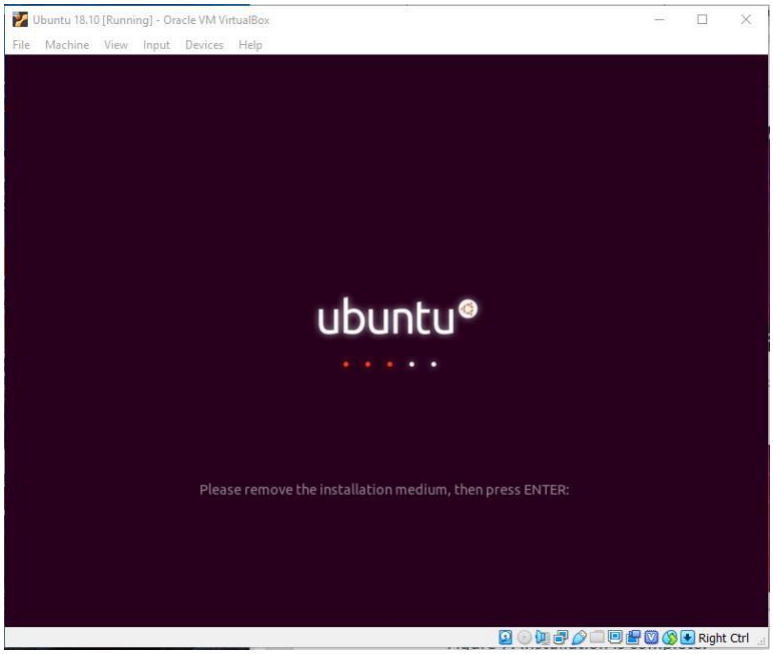

Figure 13. After the initial system restart.

After the VirtualBox splash screen and some system startup messages, you will be asked to log in (Figure 14).

Click on your name and enter your password.

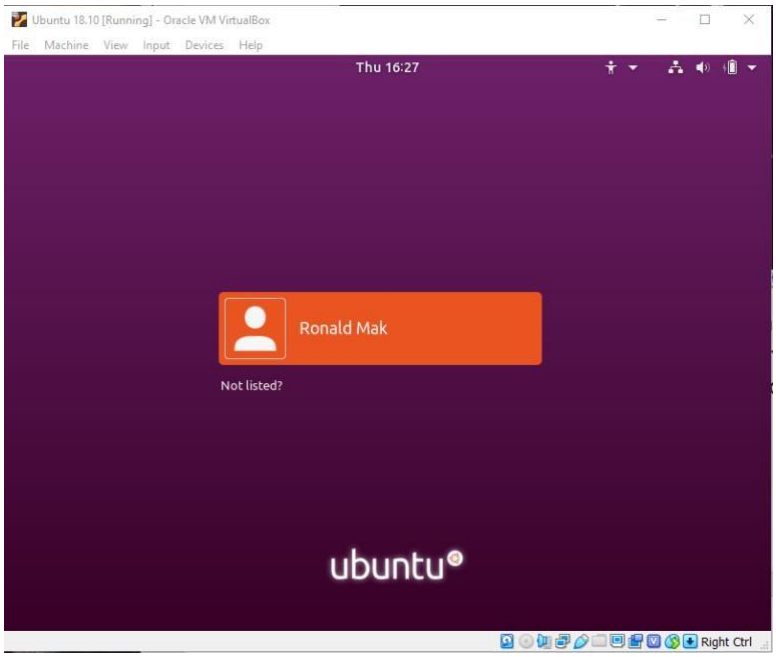

Figure 14. The login screen.

You have successfully installed Ubuntu as a virtual machine (Figure 15)!

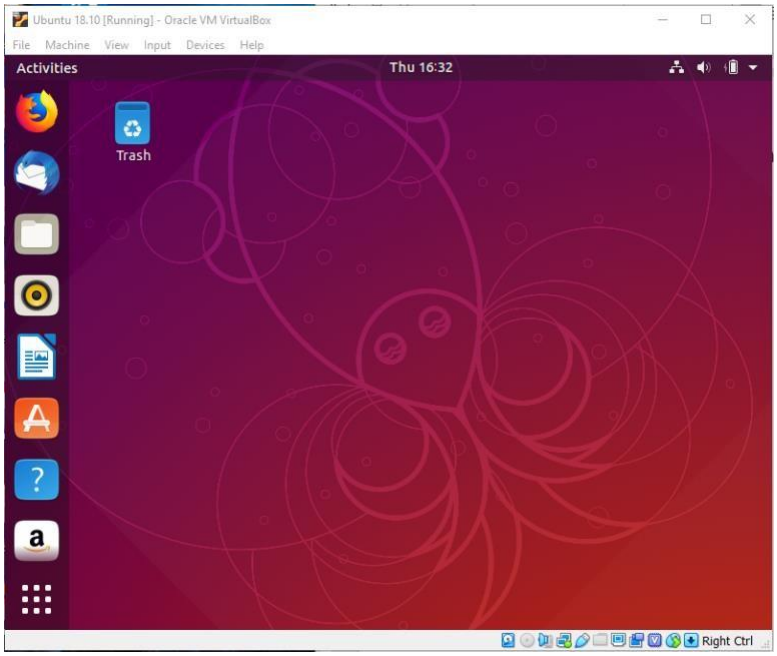

Figure 15. Ubuntu is successfully installed!

Open an Ubuntu terminal window

Open an Ubuntu terminal window in order to enter and execute commands on the command line. Click the Show Applications icon (the matrix of nine dots) at the bottom left of the desktop to display application icons. In the search box at the top, type "terminal". The terminal icon appears. Right-click the icon and select *Add to Favorites* to add a terminal icon to the left panel so that you can easily open a terminal window in the future. Double-click the terminal icon to open a terminal window (Figure 16).

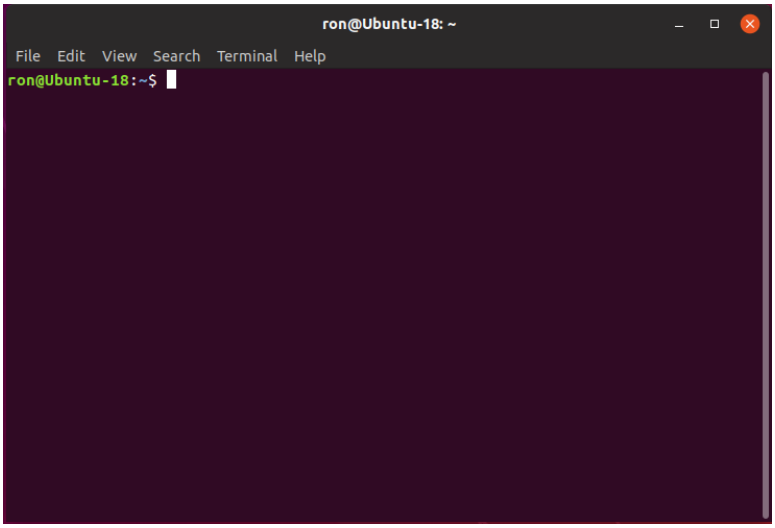

Figure 16. An Ubuntu terminal window.