LEARNING TO USE VIRTUAL MACHINES

HOW TO INSTALL A LINUX VIRTUAL MACHINE IN WINDOWS

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INTRODUCTION

Virtual Machines are a great way to set up and test various operating systems and software without replacing your existing operating system or purchasing a new computer. Virtual machines (or VMs) take resources from your current computer, the "host", and dedicate them to a new "guest" machine that will act as a software-based computer (there is even a power button).

In this tutorial, we are going to be using Oracle's VirtualBox software to set up a VM for the popular Linux operating system, Ubuntu. This tutorial will give you the basic knowledge to build a virtual machine for any operating system within Windows, as well as set up a guest machine to begin learning Linux on!

SYSTEM REQUIREMENTS

Before we begin, we need to make sure your computer meets the minimum system requirements for both the VirtualBox software as well as the Ubuntu operating system. Most modern computers running Windows 10 or 11 should meet requirements, but a minimum of 25 GB of free hard-drive space will be required for the installation of Ubuntu.

Specific requirements for VirtualBox and Ubuntu are available at the links below.

VirtualBox Minimum System Requirements:

https://www.virtualbox.org/wiki/End-user_documentation

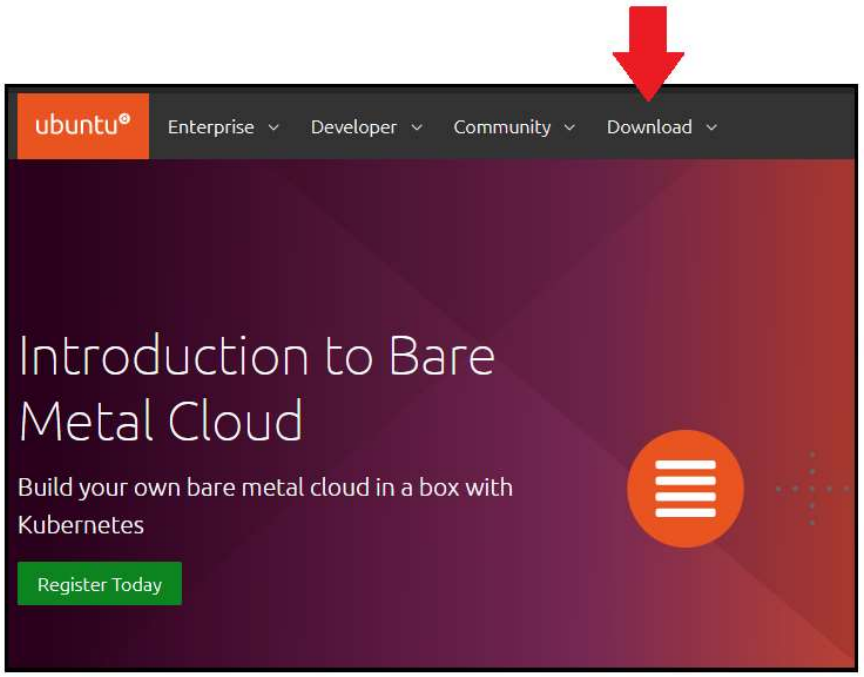
Ubuntu Desktop Edition Minimum System Requirements:

https://help.ubuntu.com/community/Installation/SystemRequirements

DOWNLOADING UBUNTU DESKTOP

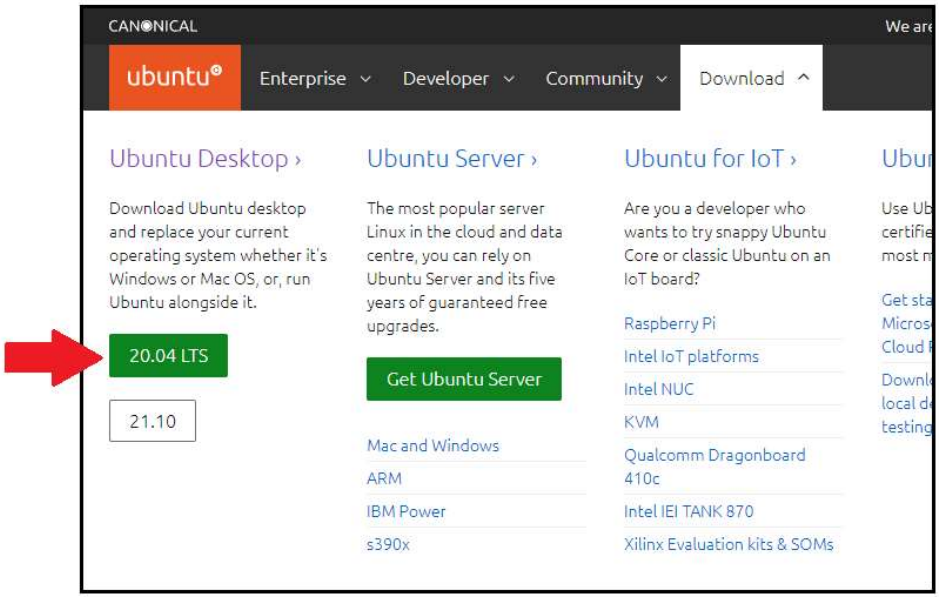
Ubuntu Desktop is a Linux based open source operating system developed and maintained by Canonical. Ubuntu offers the power of Linux while giving the user an easy-to-use Graphical User Interface to make Windows or Mac users more at home. In order to create out Ubuntu virtual machine, we first need to download the Ubuntu .ISO file.

1. Visit https://ubuntu.com/and select the "Download" link from the top of the webpage.



2. In the dropdown menu, select the "20.04 LTS" button on the left to be directed to the download page.

Note: The version number may be different depending on when you are using this guide, but the current version will be at the top of the page. Older versions are available for users with specific needs.



3. The download for the Ubuntu .ISO will start automatically after following the above step, and will take a moment to complete. While the download completes, continue this guide to download and install VirtualBox.

DOWNLOADING AND INSTALLING VIRTUALBOX

Oracle VirtualBox is freely available Open-Source Software that allows businesses and users to create and run virtual machines. VirtualBox is the software we will use to host our Ubuntu virtual machine.

1. Visit https://www.virtualbox.org/ and select the “Downloads” link from the left side of the webpage.

2. Since this tutorial is for Windows, select the download link for “Windows Hosts” located below the VirtualBox 6.1.32 platform packages heading.

   Note: The version number may be different depending on when you are using this guide, but the current version will be at the top of the page. Older versions are available for users with specific needs.

3. Run the installer for Oracle VirtualBox.

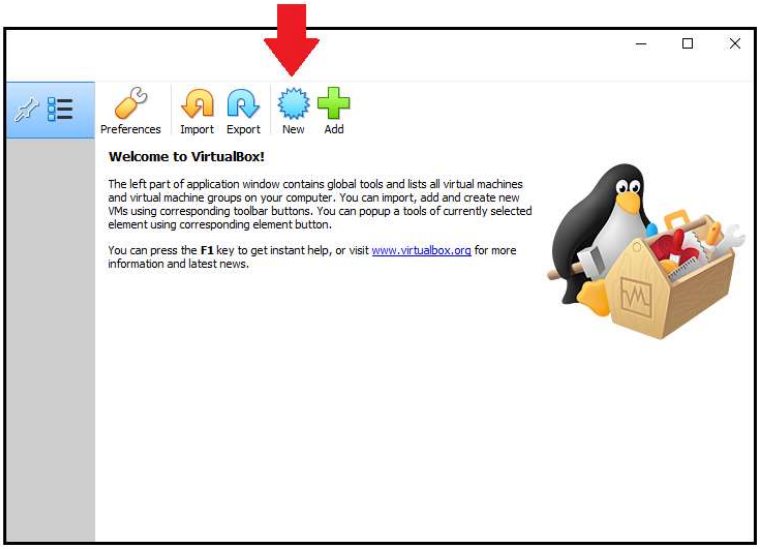
   Since we do not have any special needs for the installation of Ubuntu, run the installer with default settings and allow VirtualBox to launch upon completion.

   Throughout the installation you may be presented with warnings that your network interface will be reset or a system restart is necessary. If these pop-ups appear, approve the requested action and continue installation.

CONFIGURING THE VIRTUALBOX HOST

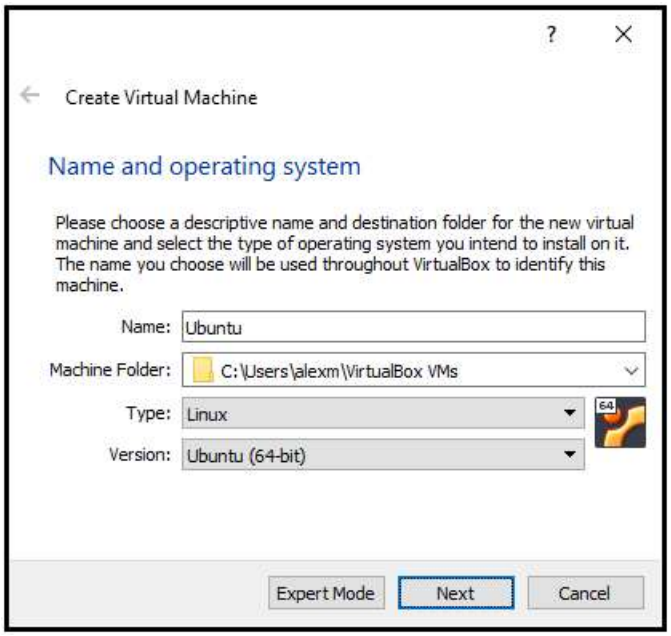
After completing the installation of VirtualBox and launching the application, it's time to set up the Ubuntu Desktop virtual machine from the VirtualBox Manager. Take a moment to read the "Welcome to VirtualBox!" splash text and ensure that the Ubuntu download has completed before continuing.

1. To begin configuration of the new VM, select "New".



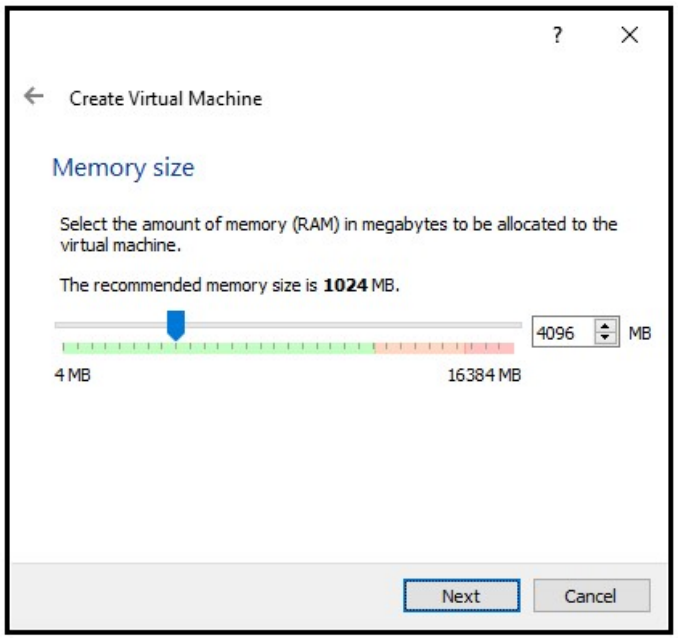
2. In the pop up window, enter a name for the VM, change Type to "Linux", and Version to "Ubuntu (64-bit)". Select "Next".

   Note: For this tutorial, we will be using default locations for all files associated with our VM, but feel free to change them if desired.



3. Allocate a minimum of 4 GB (4096 MB) of RAM to the VM. Select “Next”

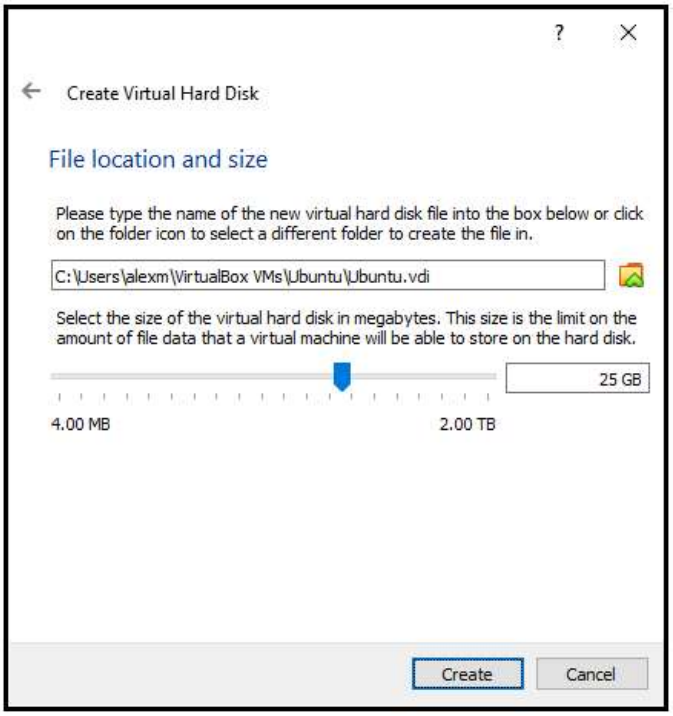
   Note: Allocating more RAM will improve the performance of the VM for more resource intensive tasks, but be aware that you need to leave enough resources for your host to continue operating normally. This option can be after installation is completed.



4. The next three screens give advanced options for creating your VMs hard drive, continue with default settings until you reach the “File location and size” screen.

5. From the “File location and size” screen you can change the size of the VMs virtualized hard drive. Select 25 GB in accordance with the Ubuntu minimum system requirements. Select “Create”.

   Note: The size that we select here is the maximum size that VirtualBox will allow the hard drive file to take on your computer. VirtualBox dynamically allocates storage to the VM as is required, saving space on your host PC until it is needed.

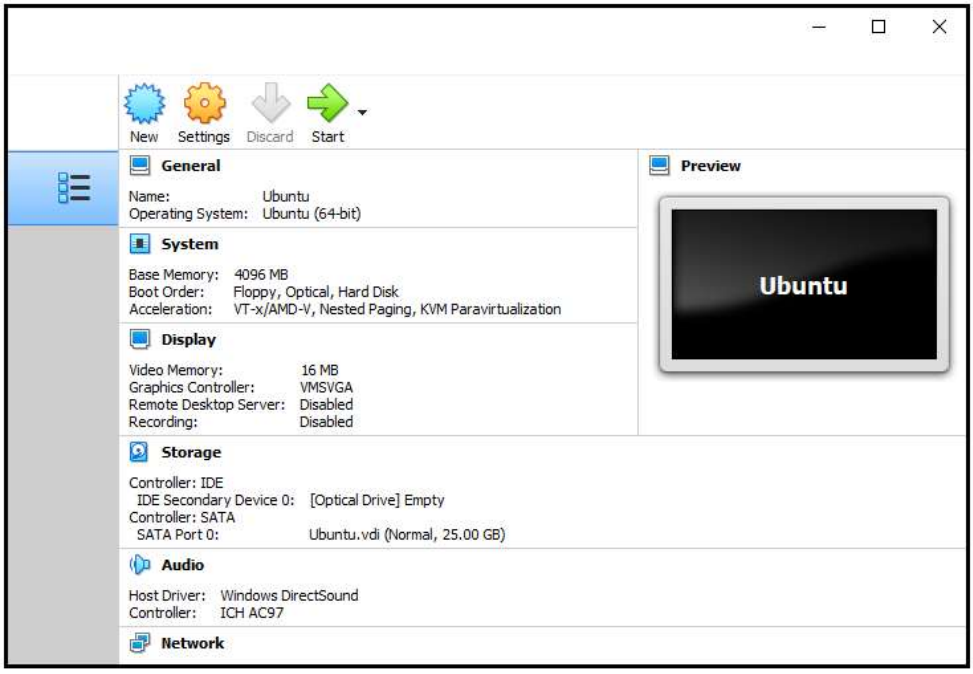


6. After completing this step, you will be returned to the main VirtualBox manager screen and be ready to run our new virtual machine for the first time.

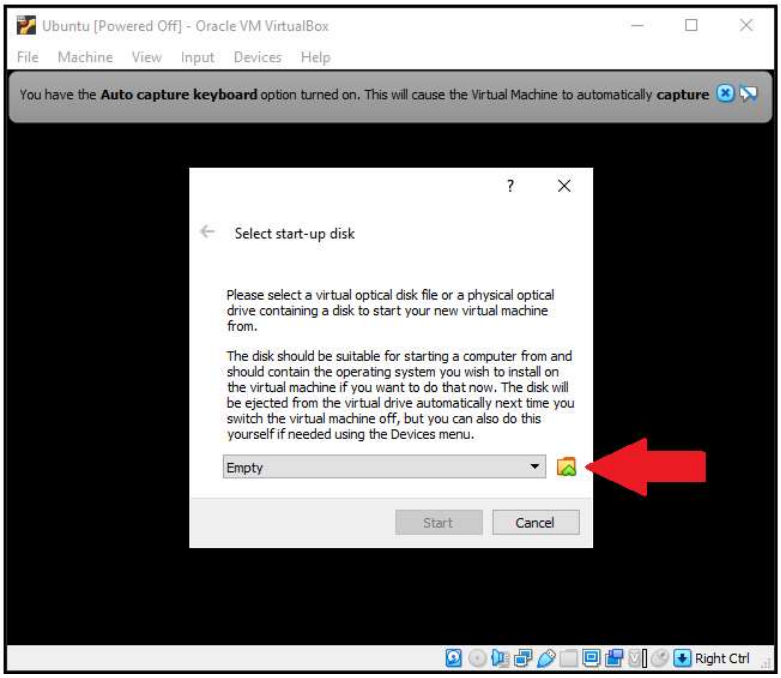
FIRST TIME STARTUP AND INSTALLING UBUNTU

Now that you have built the virtual system that will run Ubuntu, it's time to install the OS to the machine as well as some software to help with the virtualization process.

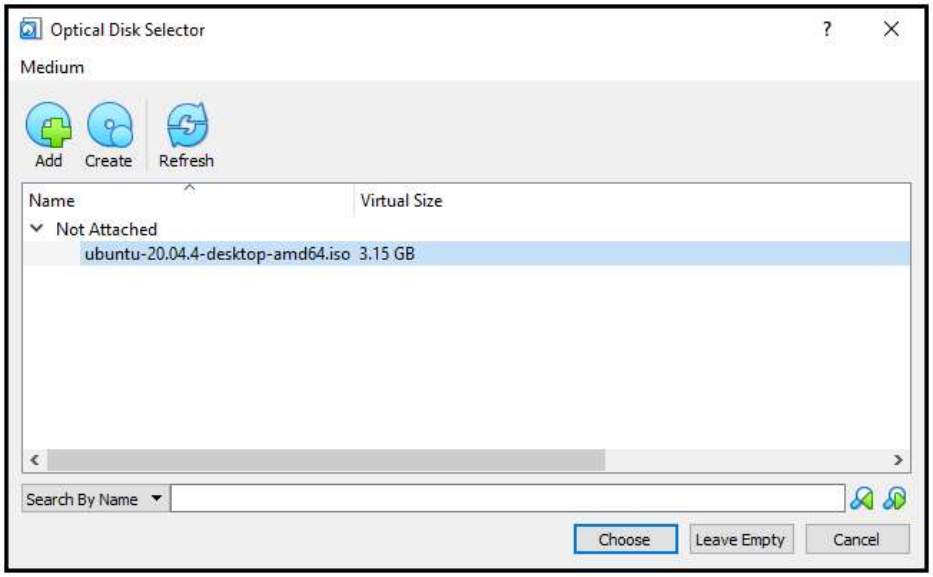
From the VirtualBox Manager screen, we can now see all of the details of the machine we previously configured. This screen allows you to interact with the "physical" components of the machine, such as downloading a software .ISO file and using the [Optical Drive] selection to virtualize inserting physical media.



1. Select the green "Start" arrow to boot the VM. You will be greeted will a new window asking you to select a startup disk. Click the folder icon in the bottom right.



2. In the Optical Disk Selector window pop-up, click the “Add” icon in the top left, and navigate to the Ubuntu .ISO that you downloaded earlier. After selecting the .ISO file, you will see it listed in the window as pictured. Select “Choose” when complete.



3. You will be returned to the “Select start-up disk” window with the Ubuntu .ISO populated in the file selection bar. Select “Start” to begin the Ubuntu setup!

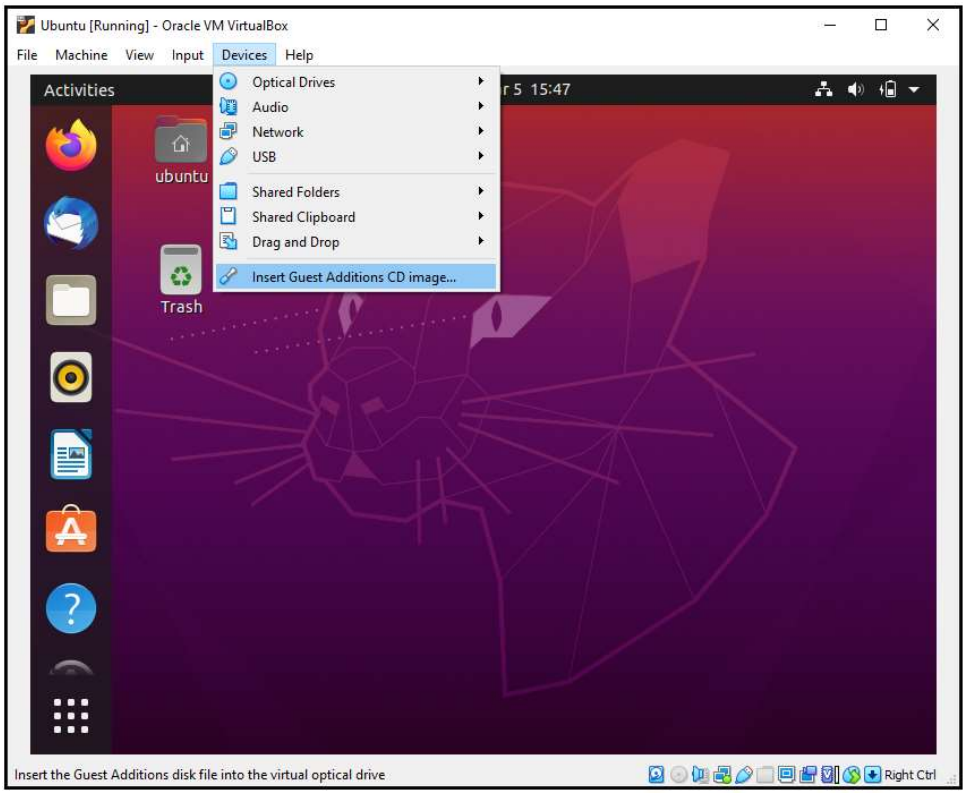
4. Continue the Ubuntu installation inside of the VM window using default options and once you reach the Ubuntu desktop, allow any system updates to be installed when prompted. In the next section we will install additional software to better support the virtualization of Ubuntu.

INSTALLING GUEST ADDITIONS

Now that we have installed Ubuntu and have a functioning virtual machine, we will install VirtualBox's "Guest Additions" to better optimize the system. Guest Additions contains drivers and system applications that assist with virtualization such as being able to resize the display window, peripherals being connected virtually to the VM, and internet connectivity. Skipping this step can lead to poor and unexpected performance in the VM.

Full details about Guest Additions and what it does for a virtual machine can be found in the VirtualBox documentation at the following link https://www.virtualbox.org/manual/ch04.html .

1. Once you have reached the Ubuntu Desktop, from the VirtualBox window select "Devices" and "Insert Guest Additions CD Image…".



2. Ubuntu will prompt you to confirm installation and to enter your password, allow the process to complete. Once completed, restart the machine as you would from a regular physical computer (in Ubuntu the power menu is located in the top right of the screen).

   Note: If system updates have not completed from your initial installation, you may encounter a permissions error when attempting to restart. If this is the case, cancel the reboot and wait for the system restart prompt from the software updater. As with any new PC, there will be many updates trying to process at once, if you run into any errors, restarting the virtual machine can help resolve them.

3. Now that the system has rebooted, you have the option to resize the VirtualBox window with an automatically scaling desktop and better mouse and keyboard support, among a wide variety of background optimizations for the system.

4. Congratulations! Your new Ubuntu machine is ready to use.

ADDITIONAL RESOURCES

Now that you have a new Linux machine, you probably found this guide with a goal in mind (or you wouldn't have gone through all of this trouble in the first place).

Below are some selected resources for those looking to expand their Linux skills and general knowledge of

"What is open source?"

https://www.redhat.com/en/topics/open-source/what-is-open-source

"The Linux command line for beginners"

https://ubuntu.com/tutorials/command-line-for-beginners#1-overview

"Linux software equivalent to Windows software"

https://wiki.linuxquestions.org/wiki/Linux_software_equivalent_to_Windows_software