

# VirtualBox/Ubuntu 20.04 LTS Installation

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ECE 2620 - Computer Networks

Villanova University  
Electrical and Computer Engineering

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Instructions updated (February 5, 2021) by: Dr. Sarvesh Kulkarni, sarvesh.kulkarni@villanova.edu

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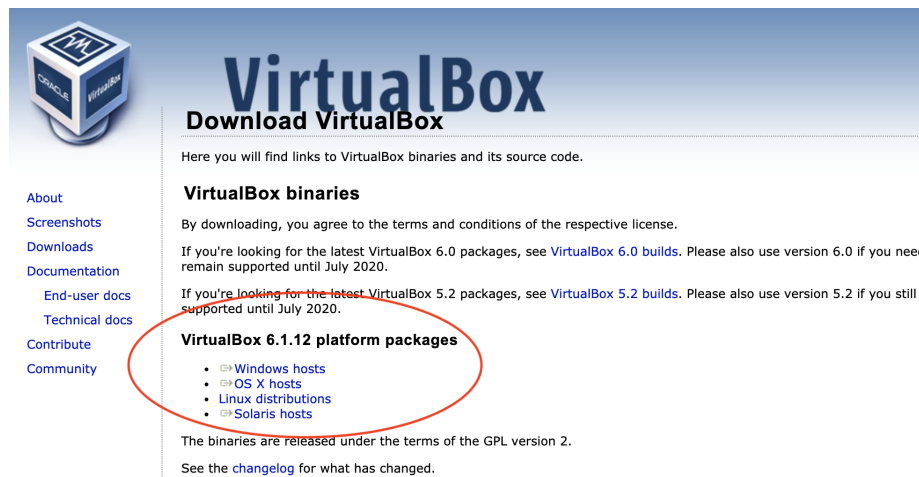
## 1 Objective

This document is a guide for

1. Installation of the VirtualBox Virtual machine on the Host OS (Windows / Mac OSX), and
2. Installation of Ubuntu 20.04 LTS as a Guest OS in VirtualBox.

## 2 Download Oracle VM VirtualBox Installation File

1. Download VirtualBox from: <https://www.virtualbox.org/wiki/Downloads>
2. Select the download link for your operating system

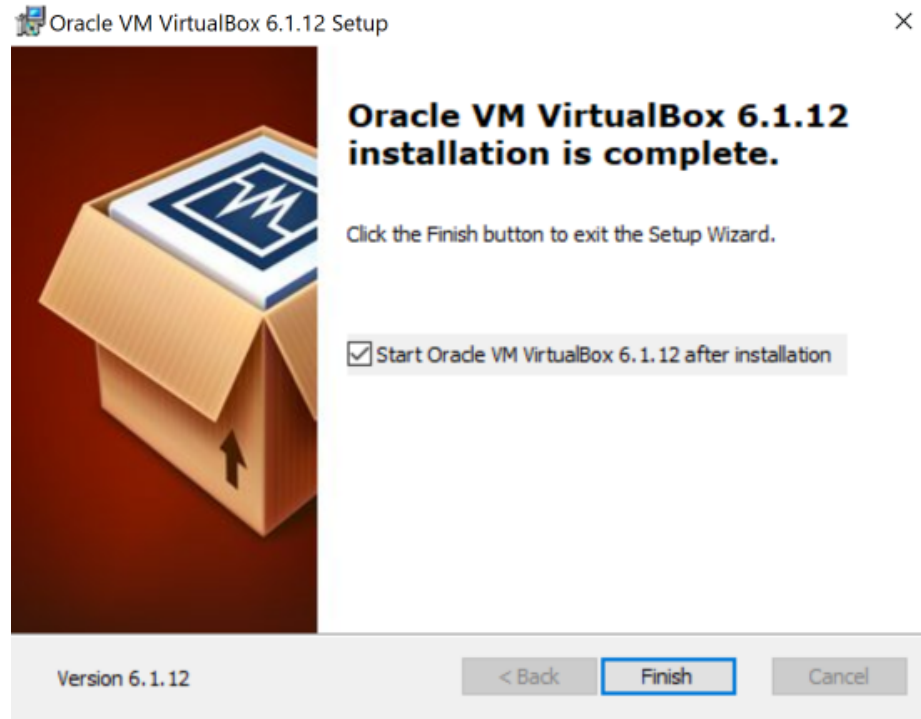


The screenshot shows the 'Download VirtualBox' page on the Oracle VM website. On the left is a navigation menu with links for 'About', 'Screenshots', 'Downloads', 'Documentation', 'End-user docs', 'Technical docs', 'Contribute', and 'Community'. The main content area has the title 'VirtualBox Download VirtualBox' and a sub-header 'Download VirtualBox'. Below this, it states: 'Here you will find links to VirtualBox binaries and its source code.' There are two sections: 'VirtualBox binaries' and 'VirtualBox 6.1.12 platform packages'. The 'VirtualBox binaries' section includes a license agreement and links to 'VirtualBox 6.0 builds' and 'VirtualBox 5.2 builds'. The 'VirtualBox 6.1.12 platform packages' section is circled in red and lists: 'Windows hosts', 'OS X hosts', 'Linux distributions', and 'Solaris hosts'. At the bottom, it says 'The binaries are released under the terms of the GPL version 2.' and 'See the changelog for what has changed.'

### 3 Install Oracle VM VirtualBox

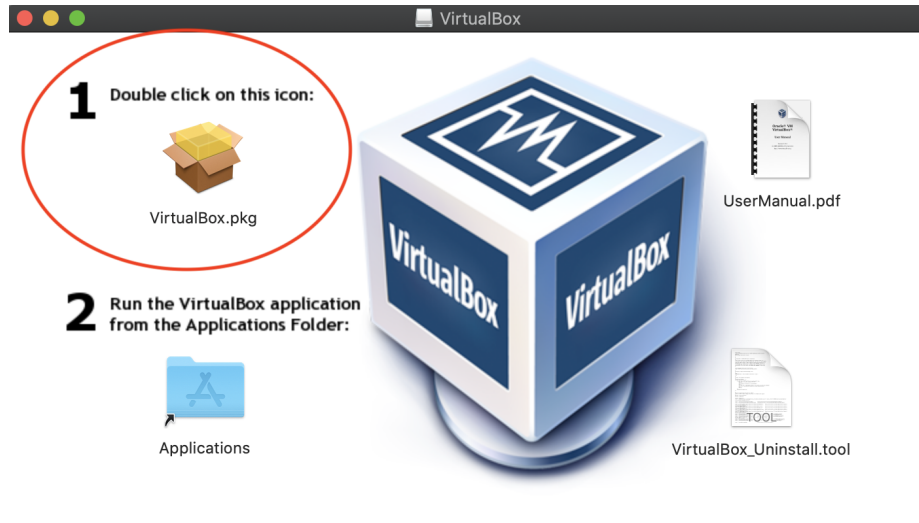
#### 3.1 Oracle VM VirtualBox Installation on Windows

1. Double-click the downloaded .exe installation file
2. Follow the on-screen instructions to install VirtualBox
3. After completing the the installation, the final dialog box should indicate whether the installation was successful.



### 3.2 Oracle VM VirtualBox Installation on Mac OSX

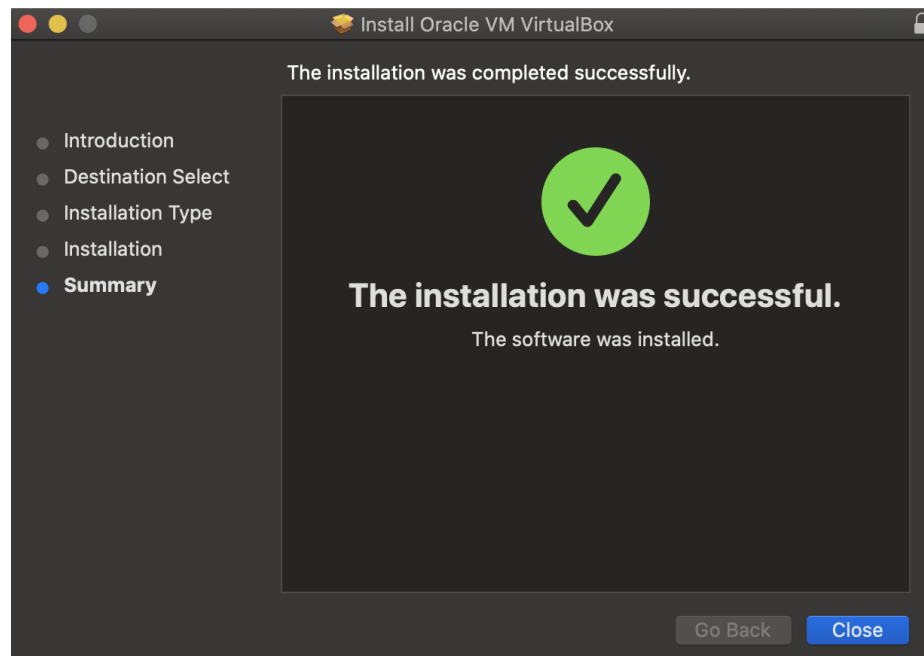
1. Open the downloaded .dmg file
2. Follow the on-screen instructions to double click the VirtualBox.pkg icon



3. Follow the on-screen prompts to install VirtualBox at the location of your choosing.

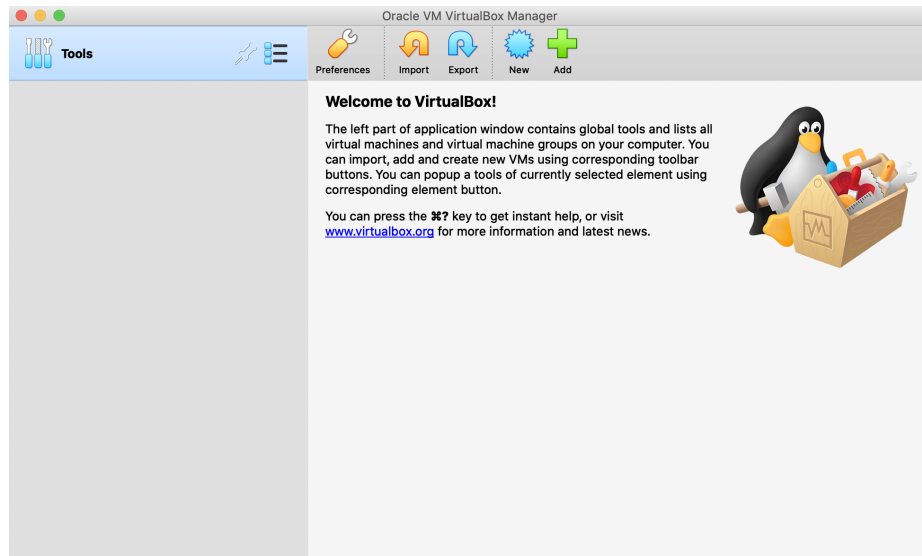


4. After completing the installation, the final dialog box will indicate whether the installation was successful.

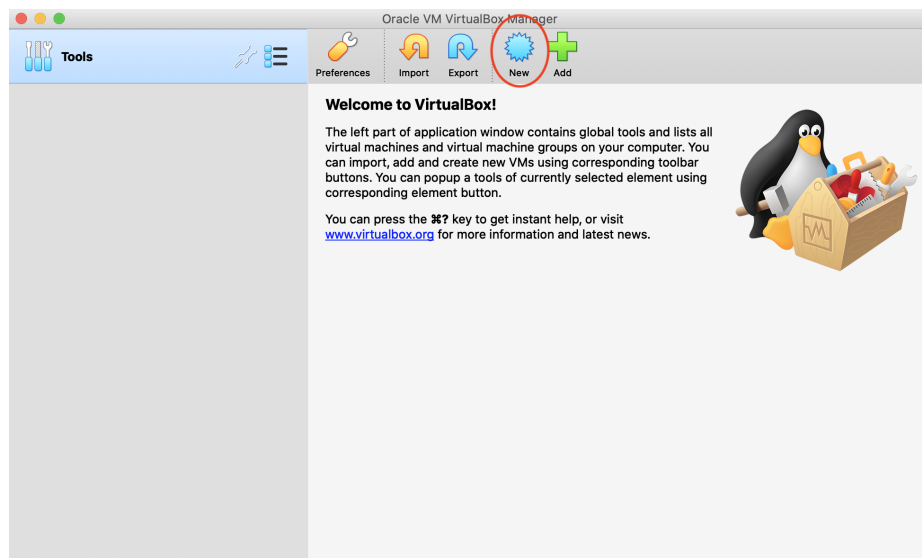


## 4 Installation of Ubuntu 20.04 LTS in VirtualBox

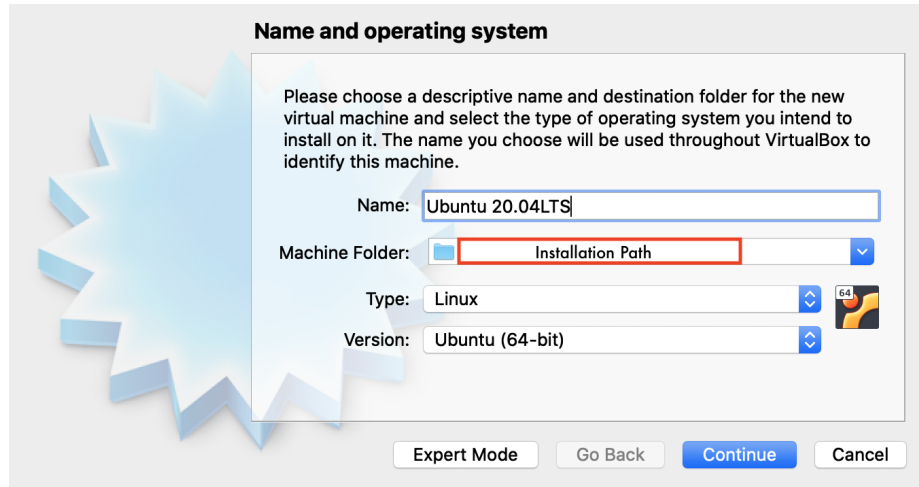
1. Download the Ubuntu 20.04 LTS 64-bit ISO file from:  
<https://ubuntu.com/download/desktop>
2. Start VirtualBox, and you will see:



3. Click 'New' to begin the setup of a new virtual machine (VM).



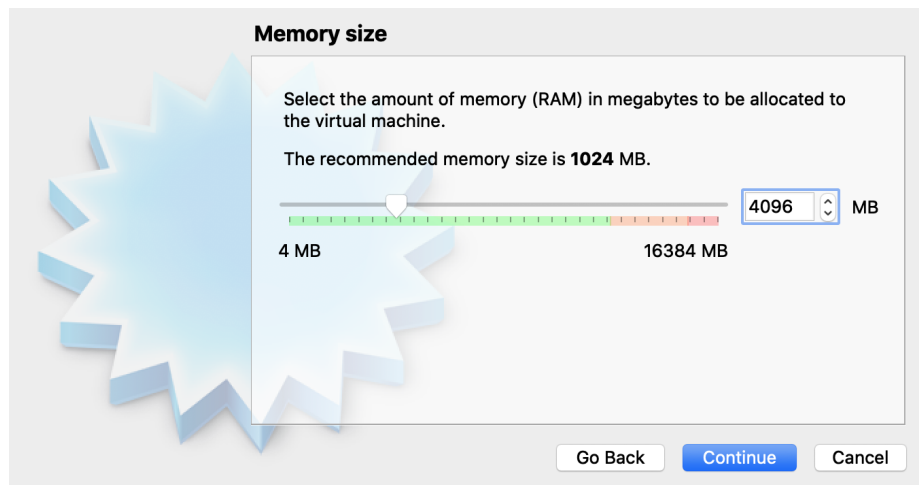
4. Configure the dialog box with the following settings for a Linux 64-bit installation. You may choose to use a different name for the VM and the Installation Path.



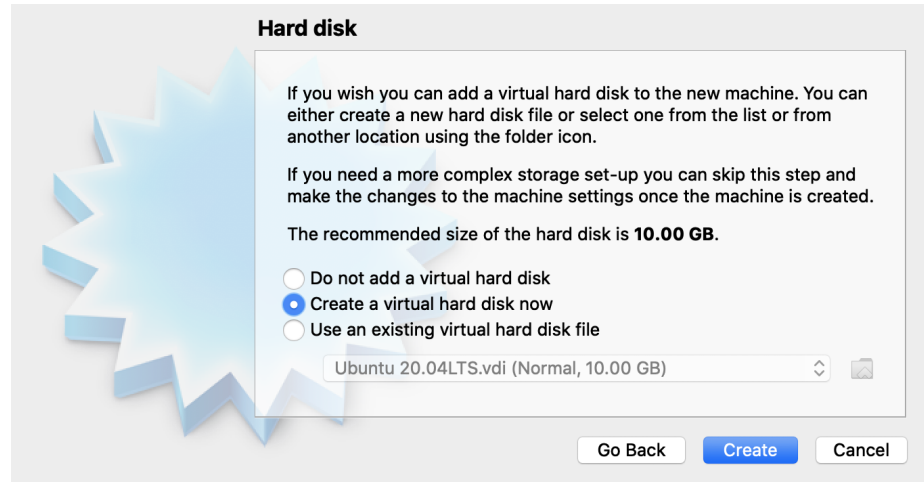
5. Select the amount of memory (RAM) that should be allotted to the VM. Ubuntu recommends that 1 GB minimum be allocated to the VM, but **we prefer 4 GB minimum, 8 GB ideal**. You must leave approximately 8 GB for the host OS (i.e. Windows/OSX) to operate satisfactorily.

So, for instance, if your system has 16 GB RAM, then you can allocate 8 GB for the VM, leaving 8 GB for the host OS. Note that the VM will use this allocated RAM only when it is running; therefore, when the Ubuntu VM is turned off, its entire memory allocation will be returned to your host OS.

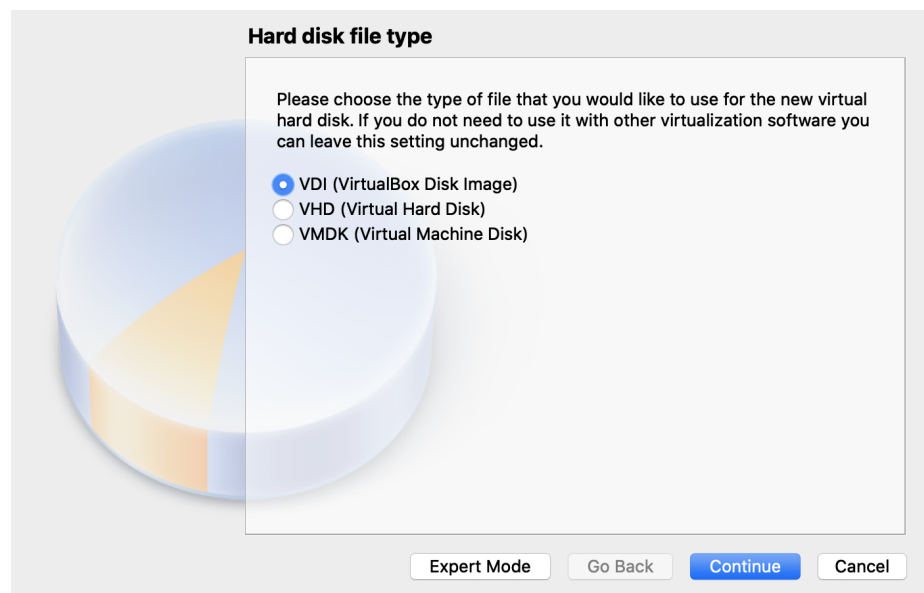
**NOTE: Your host OS must have enough memory, or the performance of both the VM and the host OS will suffer. Check your memory usage in task manager (Windows)/activity monitor (Mac) to determine the amount of RAM that can be allocated to VirtualBox. RAM-heavy applications such as Google Chrome should be closed before starting the Ubuntu VM so as to leave more free RAM for the latter. The memory allocation may be changed after configuration if you want to experiment with different values.**



6. Create a virtual 'hard disk' for the VM to utilize.



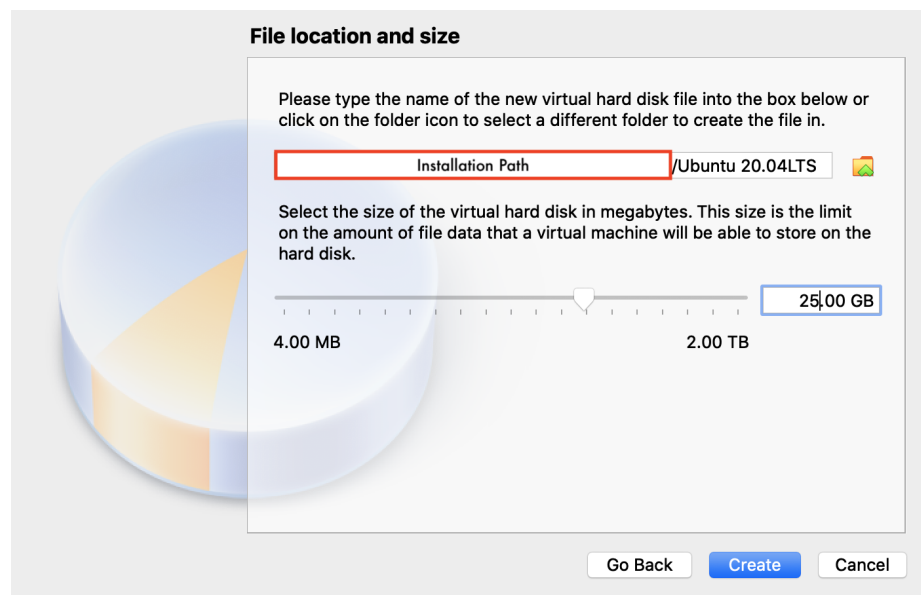
7. Configure this just-created virtual hard disk. Keep the default 'VDI (VirtualBox Disk Image)'.



8. Select the hard disk type. 'Dynamically allocated' is recommended for our class. It will expand storage space as and when needed, which will work fine in our case. 'Fixed size' offers better performance, however, the hard disk size cannot be changed easily later if you start running out of virtual hard disk space.

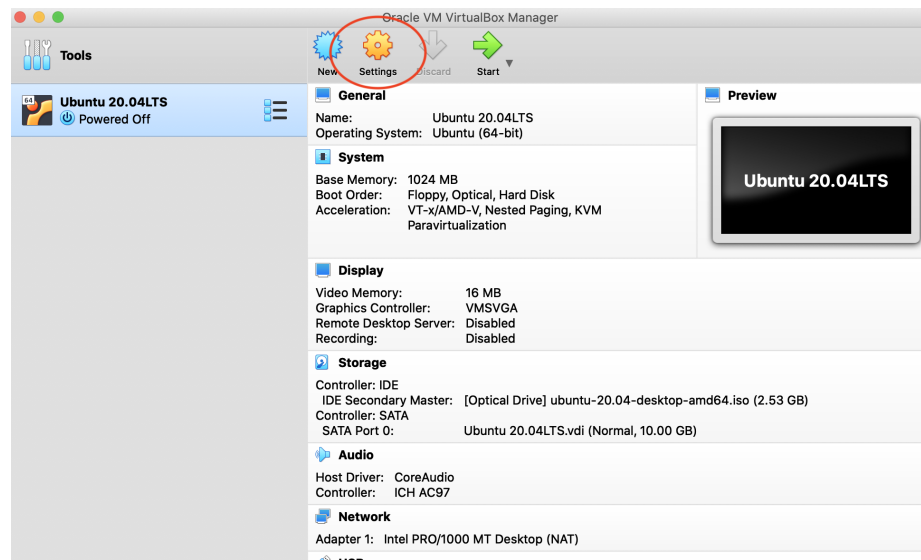


9. Select the size of the hard disk. Ubuntu recommends that you allocate at least 25 GB. The hard disk file will default to your installation path chosen earlier.

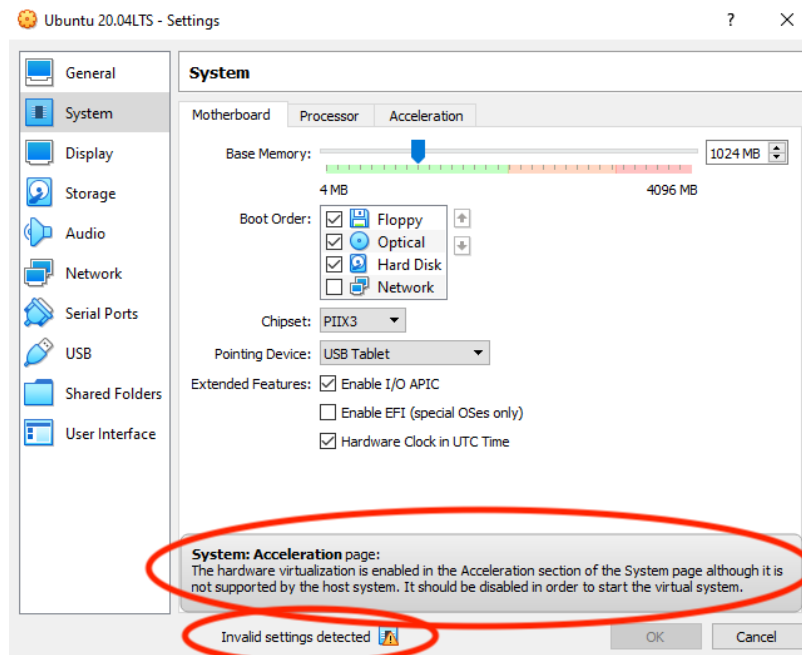




10. The initial settings for the VM are all done and you will be presented with the following screen. Click 'Settings' to make some additional configuration changes.

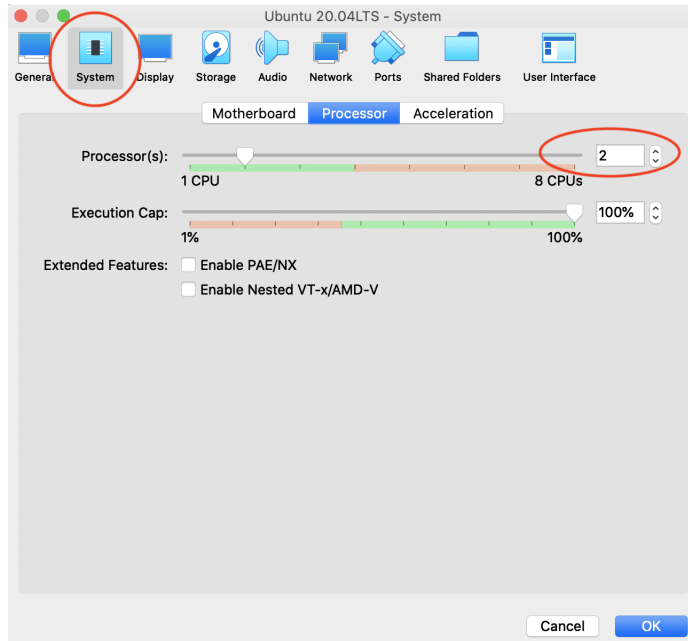


11. NOTE: If virtualization is not enabled, VirtualBox will not run and will produce the following 'invalid settings' error. If you see this error in regard to hardware virtualization, the virtualization settings in your BIOS may need to be changed. Please contact the instructor for assistance.

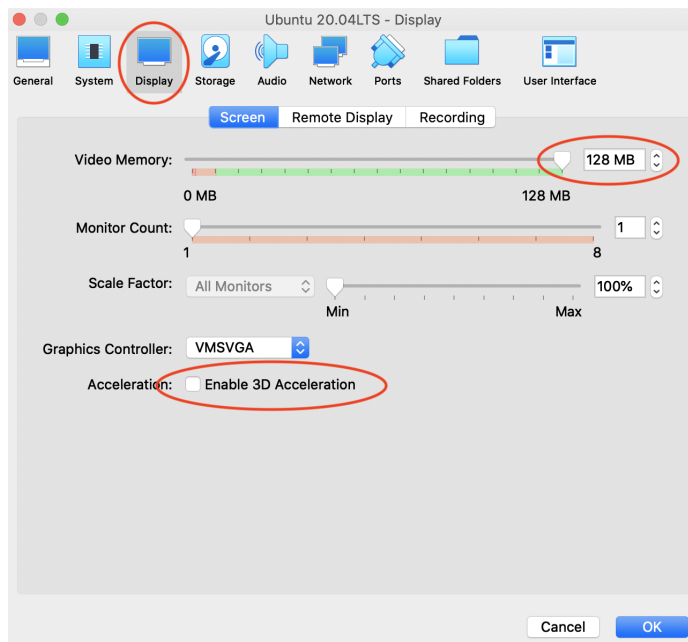


12. Go to the 'System' tab in 'Settings'. If possible, increase the number of CPUs available to 2 or more.

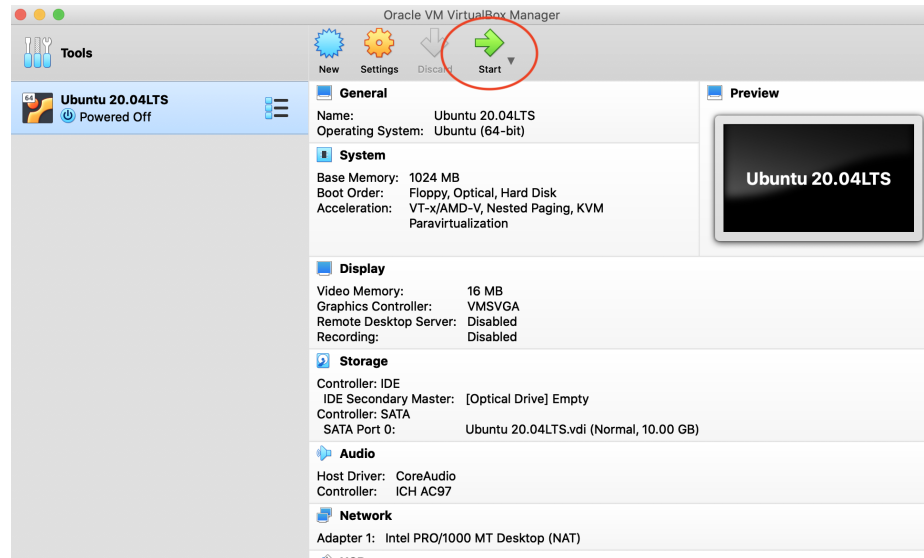
**NOTE: Leave at least 2 CPUs for the host OS to operate effectively or else both the host OS and VM performance will suffer.**



13. Under the Display tab, ensure 3D acceleration is **not** checked and increase the amount of video memory available to 128 MB.



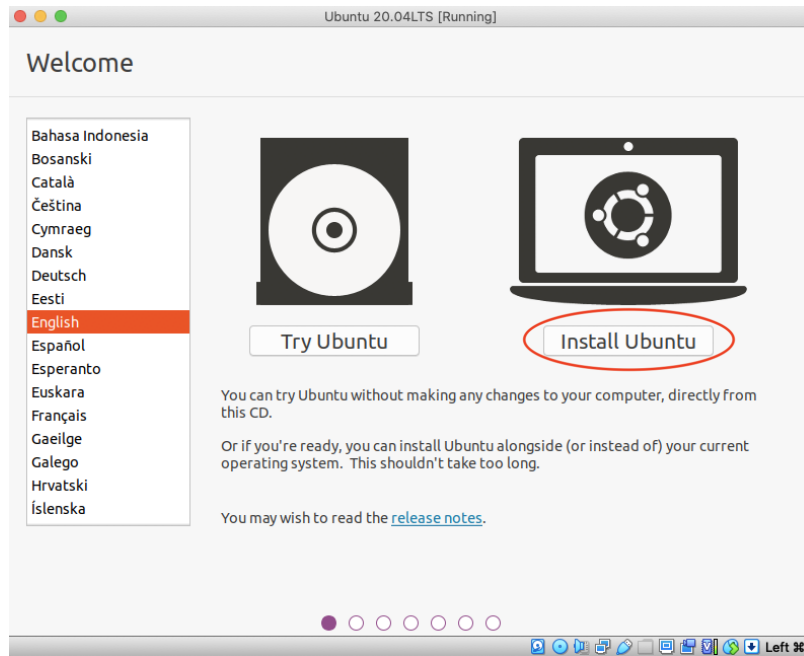
14. Return to the main screen. Click 'Start' to begin Ubuntu installation.



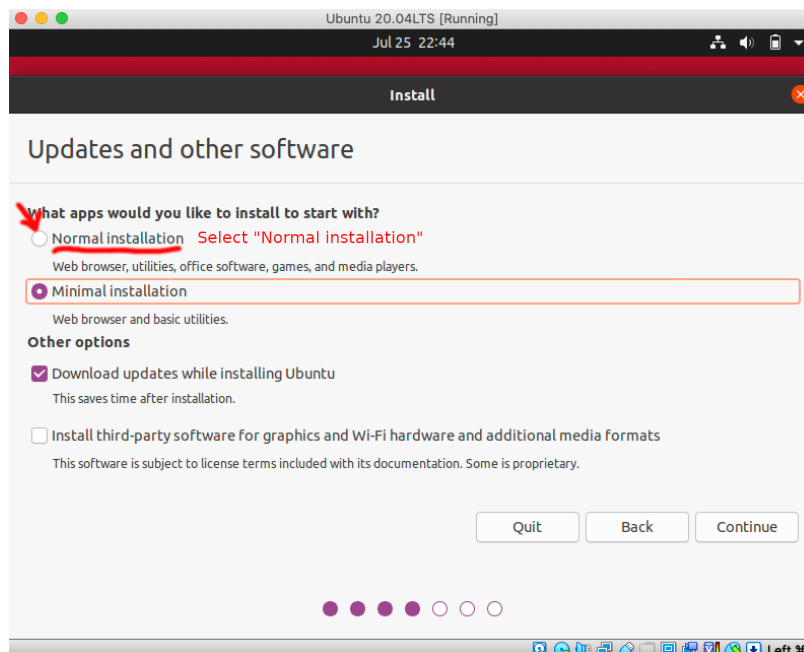
15. An ISO selection screen will pop-up, which is where you should select the Ubuntu ISO file downloaded previously. Click the folder icon to add the ISO file if the file is not listed.



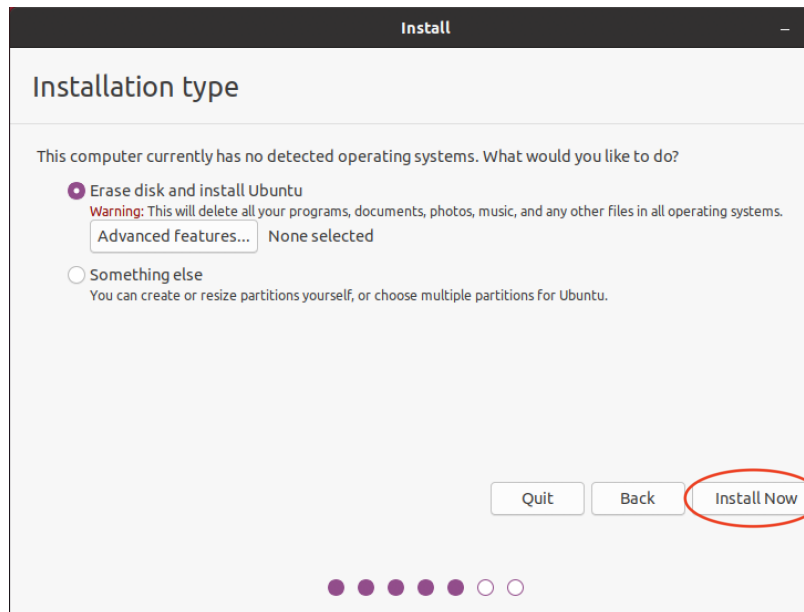
16. Click 'Install Ubuntu'



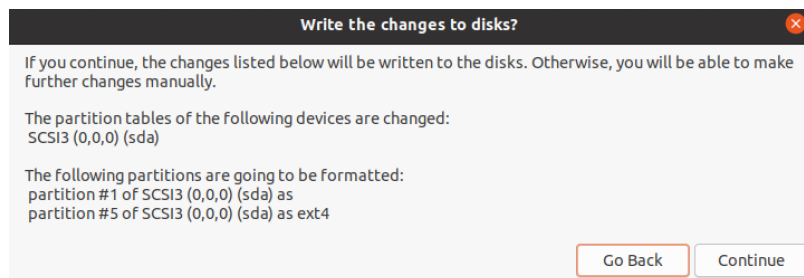
17. Select 'Normal installation'



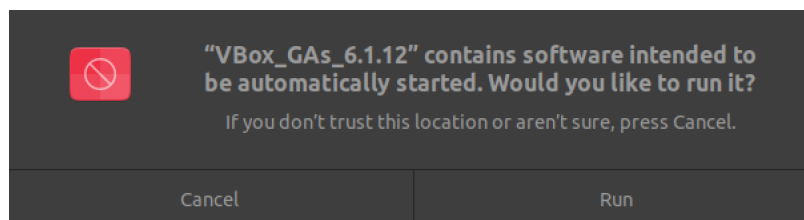
18. Select “Erase disk and install Ubuntu” and then click ‘Install Now’. Don’t worry, this step only erases the virtual disk that you created, not your main (physical) system drive.



19. Press ‘Continue’ to proceed with the disk partition formatting.



20. Follow the on-screen prompts to set the time zone, system name, and password. The Ubuntu desktop will now show up.
21. Install the “guest additions” from VirtualBox: Devices → Insert Guest Additions CD image..



22. Restart the Ubuntu VM.

That’s all folks!