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.

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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 poplar 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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YOU CAN IDAM NOW IO IT	WINDHDITI I S ASSAL SAID			

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.



VirtualBox Application VirtualBox USB Support VirtualBox Networking VirtualBox Networking VirtualBox Networking VirtualBox Networking VirtualBox Networking VirtualBox Networking VirtualBox Python 2.x Su VirtualBox Python 2.x Su	Click on the icons in th	e tree below to change the	way features will be installed.
VirtualBox Bridge VirtualBox Host-C VirtualBox Python 2.x Su VirtualBox Python 2.x Su		Box Application VirtualBox USB Support VirtualBox Networking	Oracle VM VirtualBox 6.1.16 application.
< >>		VirtualBox Bridge VirtualBox Host-C VirtualBox Python 2.x Su	This feature requires 217MB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 932KB on yo
	<	>	

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

🛃 Oracle VM VirtualBox 6.1.16 Setu	р			×
Oracle VM VirtualBox 6.1.16				
Please wait while the Setup Wiz take several minutes. Status:	ard installs Oracle VM Virt	ualBox 6.1.16. T	his may	
			,	
Version 6.1.16	< Back	Next >	Cance	el

Eventually the software will start to install.

Oracle VM VirtualBox 6.1.16				
Please wait while the Setup Wizard in	istalls Oracle VM Virtu	alBox 6.1.16. Th	is may	
Windows Security				
Would you like to install this	s device softwa	ire?		
Name: Oracle Corporation	n Universal Serial B	us		
Publisher: Oracle Corporat	tion			
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Always trust software from "Ora	cle Corporation".	Install	Do <u>n</u> 't	Insta
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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.

🛃 Oracle VM VirtualBox 6.1.16	Setup	×
	Oracle VM VirtualBox 6.1.16 installation is complete.	
	Click the Finish button to exit the Setup Wizard.	
ł	Start Oracle VM VirtualBox 6.1.16 after installation	
Version 6.1.16	< Back Finish Cancel	

If you open VirtualBox it should look like this:

🜍 Oracle VM VirtualBox Manager



Click on New to create a new virtual environment.

Tools	\$ ₩	Preferences Import Export New Add	
	 Create Virtual Name and op Please choose a de machine and select name you choose to Name: U Machine Folder: 1 Type: 1 Version: 0 	? × all but Machine Decrating system escriptive name and destination folder for the new virtual the type of operating system you intend to install on it. The will be used throughout VirtualBox to identify this machine. buntu C:\PortableApps\VirtualBoxPortable\VMs inux buntu buntu	

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



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.



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.

Oracle VM VirtualBox I Sila Mashina Hola	Manager	-	×
Tools	Create Virtual Hard Disk File location and size Nease type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in. C:\PortableApps\VirtualBoxPortable\VMs\Ubuntu\Ubuntu.vdi Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk. 10.00 GB 4.00 MB 2.00 TB		
	Create Cancel		

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

🕤 Oracle VM VirtualBox Manager File Machine Help		- □ >
Tools	New Settings Discard Start	
Ubuntu O Powered Off	General Name: Ubuntu Operating System: Ubuntu (64-bit)	Preview
	System Base Memory: 2048 MB Boot Order: Floppy, Optical, Hard Disk Acceleration: VT-x/AMD-V, Nested Paging, KVM Paravirtualization	Ubuntu
	Display Video Memory: 16 MB Graphics Controller: VMSVGA Remote Desktop Server: Disabled Recording: Disabled	
	Storage Controller: IDE IDE Secondary Master: [Optical Drive] Empty Controller: SATA	

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.

le Machine Help	Ubuntu 20 [Powered	Off] - Oracle VM VirtualBox —			
000	File Machine View	Input Devices Help			
Tools	You have the Auto captur	e keyboard option turned on. This will cause the Virtual Ma	chine to 🙁 🔀		
64 Obuntu 20					
Powered Off	Optical Disk Selecto	n.	? ×		
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	3 D Objects	EyeQ	10/5/2020 9:28 PM	File folder	
	SD Objects	📕 Gerdoo Dictionary	10/24/2020 10:44 PM	File folder	
	Desktop	Internet.Download.Manager.6.35.Build.12	5/31/2020 8:08 PM	File folder	
	Documents	Microsoft.Office.2019.Pro.Plus.1911.12228	1/1/2020 12:28 AM	File folder	
	Downloads	Picasa.Photo.3.9.0.Build.141.259	2/29/2020 7:16 PM	File folder	
	Music	VirtualBox.6.1.10.Portable	6/25/2020 1:03 PM	File folder	
	Pictures	WinRAR.5.90	3/30/2020 12:32 PM	File folder	
	Videos	WiresharkPortable	6/17/2020 2:36 PM	File folder	
	💺 Local Disk (C:)	ZD.Soft.Screen.Recorder.11.2.1.Portable	3/25/2020 7:17 PM	File folder	
	🔷 Network 🗸	ubuntu-20.04-desktop-amd64.iso <	6/24/2020 5:52 PM	Disc Image File	2,65
	File na	me: ubuntu-20.04-desktop-amd64.iso	~	All virtual optical disk f	iles (*.dr

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

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

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Choose your keyboard type and your preferred language.

🚰 Ubuntu 20 [Running] - Oracle VM VirtualBox				\times
Oct 24 23:22		*	()) +[] 🕶
Install				8
Updates and other software				
What apps would you like to install to start with?				
O Normal installation				
Web browser, utilities, office software, games, and media players.				
O Minimal installation				
Web browser and basic utilities.				
Other options				
Download updates while installing Ubuntu				
This saves time after installation.				
Install third-party software for graphics and Wi-Fi hardware and additional media for	mats			
This software is subject to license terms included with its documentation. Some is proprietary.				
Quit	Pack	Cor	tinue	
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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.



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.

🕎 Ubuntu 20 [Running] - Oracle VM VirtualBox			-		×
	Oct 25 02:25		4	•	+ 🖬 👻
	Install				
Who are you?					
Your name:	Abdolrahman		0		
Your computer's name:	linux-pc	•			
	The name it uses when it talks	to other computers.			
Pick a username:	rahman				
Choose a password:	•	Short password			
Confirm your password:	•	•			
	O Log in automatically				
	 Require my password 	to log in Back		Contin	ue

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.

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.



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



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		~	ර් Search Programs a	nd Features				Q
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ew installed updates	To uninetall a program coloct it from the list and then	click I In	install Change or Penair					
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	Grammarly for Microsoft® Office Suite	Gramm	marlv	9/30/2020	29.5 MR	6 8 747		_

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

👸 Control Panel\All Control Panel	Items\Programs and Features							-	×
\leftarrow \rightarrow \checkmark \uparrow $\overline{{\rm Gr}}$ \ll All Control Panel Items $>$ Programs and Features \checkmark			Search F	rograms	s and Features				٩
Control Panel Home View installed updates	Uninstall or change a program	-		×					
off	Turn Windows features on or off Organia Name AnyD Cassi AnyD Cassi Marchine Platform Data Direct Direct <td>OK</td> <td>clear its ch on.</td> <td>eck</td> <td>Installed On 9/22/2020 1/7/2020 9/22/2020 9/22/2020 9/22/2020 10/17/2020 9/21/2020 10/24/2020 9/22/2020 4/7/2020 7/2/2020 10/5/2020 9/22/2020 9/22/2020</td> <td>Size 2.00 MB 60.2 MB 94.4 MB 79.4 MB 7.62 MB 32.6 MB 314 MB 1.46 GB 269 MB</td> <td>Version ad 6.0.7 1.7.0 193.5662.56 3.17.0 193.5662.58 5.11 4.6.4 0.8.887 108.4453 6.1 #164 11.1.20810.00 6.25.1.9091 9.7.0.29478 2.28.0 86.0.4240.111</td> <td></td> <td></td>	OK	clear its ch on.	eck	Installed On 9/22/2020 1/7/2020 9/22/2020 9/22/2020 9/22/2020 10/17/2020 9/21/2020 10/24/2020 9/22/2020 4/7/2020 7/2/2020 10/5/2020 9/22/2020 9/22/2020	Size 2.00 MB 60.2 MB 94.4 MB 79.4 MB 7.62 MB 32.6 MB 314 MB 1.46 GB 269 MB	Version ad 6.0.7 1.7.0 193.5662.56 3.17.0 193.5662.58 5.11 4.6.4 0.8.887 108.4453 6.1 #164 11.1.20810.00 6.25.1.9091 9.7.0.29478 2.28.0 86.0.4240.111		
	Currently installed programs Total size: 25.6 0 147 programs installed	3B							

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

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

Microsoft Store					- 🗆 X			
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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.

	In the second secon
This PC	Welcome to Ubuntu 20.04 LTS (GNU/Linux 4.4.0-19041-Microsoft x86_64)
Saatty	* Documentation: https://help.ubuntu.com * Management: https://landscape.canonical.com * Support: https://ubuntu.da/avantage System information as of Wed Oct 28 13:15:17 ET 2020
	System Load: 0.52 Processes: 7
	Usan of American Hear Journal in: 0
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Image: Open service Image: Open service	Oukkenlaanse en Pather Hoase Payme Python 33 Q2- Visual Studio
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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.

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.