

## Install in Virtual Box get your Kali 2016 Linux up and running in a Virtual Machine

#### **Overview**:

This guide is to help you get going with the "The Complete Hacking Course" for beginners without buying any specialized equipment for penetration testing. As an introduction to Pen Testing this will be all you need for this course. As you advance you will probably not be using a Virtual Machine (VM) for your testing purposes.

It does not matter what the OS of your host machine is, if you can get a Virtual Box up and running the steps are the same.

The reason we suggest a Virtual Machine for beginners is that if something goes awry you won't lose your entire system.

This document was done independently with no connections to anyone. The intent is to speed up the Kali installation process in a Virtual Machine.

## Before you Begin

- Working with what you already have is fine for the course, however not for real world pen testing
- Most things will work, and by the way some things just DO NOT.
- Does internal wireless meet the chip requirements? STOP Warning: A VM will show up in Kali as an Ethernet adapter eth0. You can't do the wireless lectures without an external USB wireless card when using a Virtual Machine.
- To be redundant I did not say use the internal wireless card in a Virtual Machine.
- To be able to do the wireless lectures in a VM, do a search for USB wireless adapters for Kali Linux. Here are a couple of sites that talk about what to use:
   <u>http://www.blackmoreops.com/2014/01/08/recommended-usb-wireless-cards-kali-linux/</u> and <u>http://www.aircrack-ng.org/doku.php?id=compatibility\_drivers</u> and
   <u>http://www.wirelesshack.org/top-kali-linux-compatible-usb-adapters-dongles-2015.html</u>

#### **Installation Steps**

Pre-Flight check List

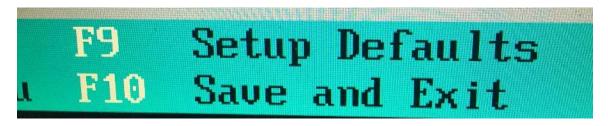
- Check for any updates to your BIOS, then Enable Virtualization in your BIOS.
- Check your disk space on your current OS. You need 15% free for your system and then you need additional space for Virtual Box and Kali. This is important to CHECK before you begin.
- Hyper-V cannot be used for this course. VMware can, but you should know how to use it.
- Note: If you have enabled Hyper-V, you will have issues when trying to install Kali in Virtual Box and will not be able to see the 64Bit versions of Linux for Virtual Machines you can disable Hyper-V in Windows Features just uncheck anything Hyper-V and reboot
- Check your version of your OS. Is it 64 Bit or 32 Bit? All your downloads should match your system. (64 bit program is not going work on a 32 bit machines)
- Download Virtual Box & Virtual Box extension and install both before creating your Kali Virtual Machine <u>https://www.virtualbox.org/wiki/Downloads</u>
- Download the Kali 2106 iso from <a href="https://www.kali.org/downloads/">https://www.kali.org/downloads/</a> be sure you have a complete download (some security suites will block this)
- Before attaching your USB external Wireless card, be sure to get Kali up and working with Virtual Box extensions, guest additions and updates installed.

## **BIOS Enable Virtualization**

Enable Virtualization in the BIOS (if you do not you will not be able to see 64bit editions and the install may fail). Enter the BIOS during startup of your physical system. Each system is different so **the key to press may be different for your system.** I used a Dell laptop so I had to hit F2 on boot up to get into my BIOS.

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In this case Virtualization was under the Advanced Tab, you want to make sure that it is enabled (MOST of the trouble with setting up a VM have been caused by skipping doing this part) Once you have enabled Virtualization you want to save your changes and exit the BIOS. In some systems it may not say Virtualization but AMD-V or VT-x



Some systems may need to be powered down completely then restarted for this to take effect. You can check with your system manufacturer or google how to get into your BIOS. You can read about what the BIOS is at <u>https://en.wikipedia.org/wiki/BIOS</u>

#### Virtual Box + Extensions

Install the Virtual Box and then install the Virtual Box Extensions. These are basic Windows programs just take the defaults for both Virtual Box & Virtual Box Extensions.

If your host system is OS X or Linux you need to do the same installs but with the Virtual Box editions that match your system. The steps for creating a Virtual Machine are the same.

To avoid any problems when in Windows choose right click & **Run as Administrator** option (even if you have administrative rights). Be sure you have the version that matches your system OS if you are not in Windows. All downloads can be found at <u>https://www.virtualbox.org/wiki/Downloads</u>

You also need to download Kali Linux 2016 iso file from

<u>https://www.kali.org/downloads/</u> pick the version that matches your system. Install based on your operating system. If you have a 64 bit system then download the 64 bit versions & 32 bit just use the 32 bit options. If you do not have virtualization available only use the 32 bit downloads for your install.



In Windows Run as administrator when finished close and install VBox xtensions



## Building your Kali Virtual Machine

Start Virtual Box (I already have Kali installed here in another VM that's why you see that icon there ....we will make a new VM here)

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Kali  O Powered Off	📃 General	E Preview
	Name: Kali Operating System: Debian (64-bit)	
	System	
	Base Memory: 2048 MB Boot Order: Floppy, Optical, Hard Disk Acceleration: VT-x/AMD-V, Nested Paging, KVM Paravirtualization	Kali
		(Lengel )
	Display	
	Video Memory: 12 MB Remote Desktop Server: Disabled Video Capture: Disabled	
	Storage	
	Controller: IDE IDE Secondary Master: [Optical Drive] Empty Controller: STAT SATA Port 0: Kali.vdi (Normal, 100.00 GB)	
	🕞 Audio	
	Host Driver: Windows DirectSound Controller: ICH AC97	
	P Network	
	Adapter 1: Intel PRO/1000 MT Desktop (Bridged Adapter, Intel(R) Dual Band Wirel	ess-AC 7260)
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Click on New

This Starts the Creation of a new VM

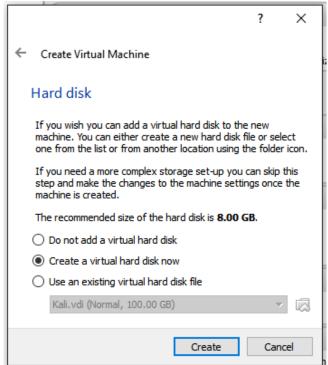
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	on it. The name you choose will be used throughout VirtualBox to identify this machine.	
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	Type: Linux	
	Version: Debian (64-bit)	
	Expert Mode Next Cancel	and Wireless-AC 7260)
	USB	
	USB Controller: OHCI, EHCI	
	Device Filters: 0 (0 active)	
	Gamma Shared folders	
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	Description	
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- Give it a name like "Kali" or whatever you want it to be.
- Then click the drop down menu by "type" and choose "Linux"

• Then choose the "Debian 64bit" (if you have a 64 bit system, and virtualization is on in the BIOS (if you have 32bit system then Debian 32bit option) PRESS next

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-		
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	Next Cancel	

Set your memory size, my machine has **8gig** available so I am giving the **VM 2 gig**. You can type in how much you want to give the VM. I chose 2048. This can be changed later if needed. (Don't give it to little or it will be slow and too much your host system will be slow)



Next we will Create a virtual hard disk for Kali. I used 32gig for this example. You can give it more space if you have it. (again check the free space on your actual hard drive)

Create Virtual Hard Disk
Hard disk file type
Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
VDI (VirtualBox Disk Image)
O VMDK (Virtual Machine Disk)
O VHD (Virtual Hard Disk)
O HDD (Parallels Hard Disk)
QED (QEMU enhanced disk)
O QCOW (QEMU Copy-On-Write)
Expert Mode Next Cancel

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Unless you have other plans take the default and press next

2		

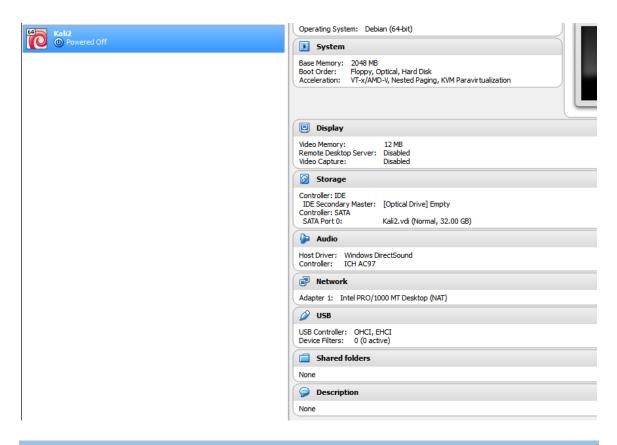
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← Create Virtual Hard Disk	
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A <b>dynamically allocated</b> hard disk file will only use space on your physic hard disk as it fills up (up to a maximum <b>fixed size</b> ), although it will not shr again automatically when space on it is freed.	
A <b>fixed size</b> hard disk file may take longer to create on some systems but often faster to use.	is
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Kali2				
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I set this to **32 gig. If have space to spare try 64 gig** and click create (Do Not take default of 8 Gig change it)



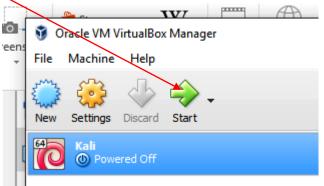
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General   System   Display   Display   Paravirtualization Interface:   Default ▼   Hardware Virtualization:   Hardware Virtualization:   Enable Nested Paging   Network Serial Ports VISB Shared Folders User Interface			
User Interface			
	OK Cancel	He	p

Under System, under the Acceleration tab, all of the options should be checked (*These might be grayed out if you did not turn on virtualization on in your BIOS*)

Bridge your adapter (the name of your actual adapter may be different) You want the adapter that your host system is currently getting an ip address and connecting to the internet

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Make your network setting look exactly like this, but with the adapter you have and allow all in the advanced section. Your VM is now prepped, press OK, go to the top of VBox and press START

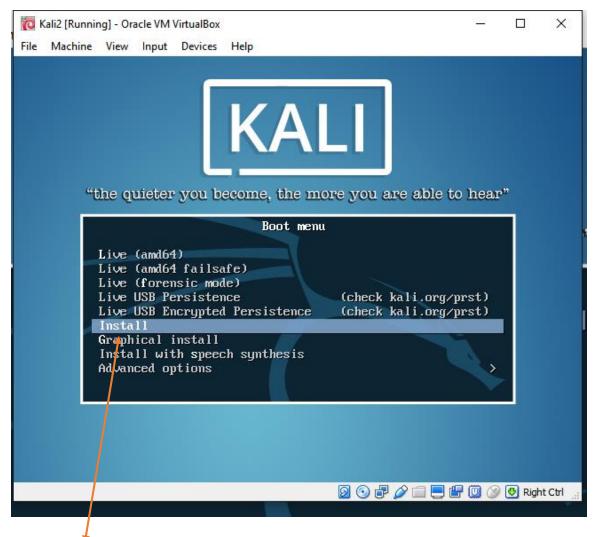


## Install Kali ISO image

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		ps
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🕑 kali-linux-2016.1-amd64	Browse to the 2016 iso	

Browse to the 2016 iso

"Select start-up disk" will pop up, browse to the Kali ISO image you downloaded. Use the folder icon to browse to it if you do not see it (hopefully you remember where you put it ) press Start



Use the Install option and you are on your way

Choose the languag		ect a language tallation process. The selected language will	
also be the defaul Language:	t language for the insta: C Albanian Arabic Asturian Basque Belarusian Bulgarian Catalan Chinese (Simplified) Chinese (Traditional) Croatian Czech Danish Dutch English Esperanto Estonian Finnish French Galician German Greek	- No localization * - Shqip - صحب - Asturianu - Euskara - Беларуская - Воsanski - Български - Саtalà - 中文(简体) - 中文(常體) - Hrvatski - Čeština - Dansk - Nederlands - English - Esperanto - Esperanto - Eesti - Suomi - Français - Galego - Deutsch - Ελληνικά *	
<go back=""></go>			

Select your language and country. I picked American English (select the defaults on the remainder of the set up screens for your country etc) (incorrect keyboard and you may not be able to log in after)

File Machine View Input Devices Help		
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The install should begin. This can take time. (If you did not allow enough disk space, this operation may fail)

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		know wh	nat yo	our hos	stname s	hould	that identifies your system to the network. If you don't be, consult your network administrator. If you are setting can make something up here.	
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Here you can call it what you want but for Most of the screens, you can take the default and just press continue (enter key)

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A domain name is not required, just press continue.

Kali2 [Running] - Oracle VM VirtualBox	- 0
e Machine View Input Devices Help	
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You need to set a password for 'root', the system administry unqualified user with root access can have disastrous resul choose a root password that is not easy to guess. It should dictionaries, or a word that could be easily associated with	s, so you should take care to not be a word found in
A good password will contain a mixture of letters, numbers a changed at regular intervals.	nd punctuation and should be
The root user should not have an empty password. If you lear account will be disabled and the system's initial user acco become root using the "sudo" command.	
Note that you will not be able to see the password as you t	be it.
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Set your password, don't forget it. It is case sensitive, and you will need to verify it on the next screen (important you have the right language already set or you may get in later) Set your time zone (when you boot into Kali make sure your time zone and time are correct), this can prevent some programs from loading correctly like the Tor browser

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File Machine View Input Devices Help		
[!] Configure the clock         If the desired time zone is not listed, then please go back to the step "G and select a country that uses the desired time zone (the country where yo located).         Select your time zone:         Eastern         Central         Mountain         Pacific		
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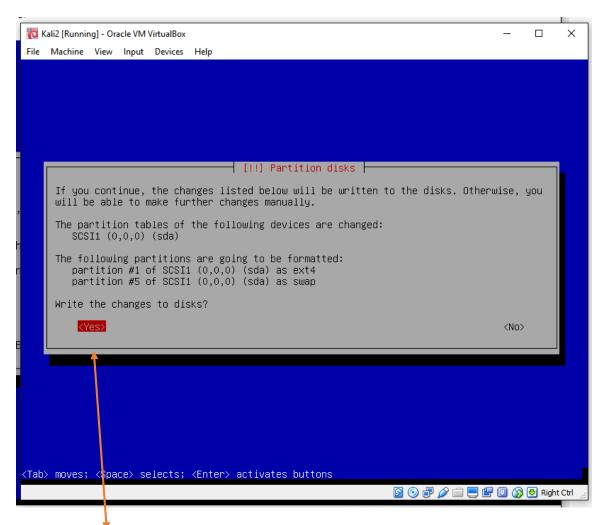
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<rau,< td=""><td>moves,</td><td>Кора</td><td>uez st</td><td>16618,</td><td>Achiter 2</td><td>activate</td><td>SUULTON</td><td>3</td><td>ର ଜ</td><td>P 🖉 🗐</td><td>= 🗗 💷 🔇</td><td>B Rich</td><td>t Ctrl</td></rau,<>	moves,	Кора	uez st	16618,	Achiter 2	activate	SUULTON	3	ର ଜ	P 🖉 🗐	= 🗗 💷 🔇	B Rich	t Ctrl
								<u> </u>					

Press enter

īē	Kali2 [Runnir	ig] - Ora	cle VM \	VirtualBox		_		×
File	Machine	View	Input	Devices	Help			
					[!] Partition disks			
	Selected	for	partit	ioning:				
	SCSI1 (O	,0,0)	(sda)	- ATA	VBOX HARDDISK: 34.4 GB			
	The disk choose t				d using one of several different schemes. If you are ur	isure	,	
	Partitio	ning :	scheme	:				
			Se	eparate	in one partition (recommended for new users) /home partition /home, /var, and /tmp partitions			
	<go< td=""><td>Back&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td></go<>	Back>						
KTak	<pre>&gt; moves;</pre>	KSpa	ce≻ se	elects;	<enter> activates buttons</enter>			

Keep selecting the defaults until you get to "Network Mirror"

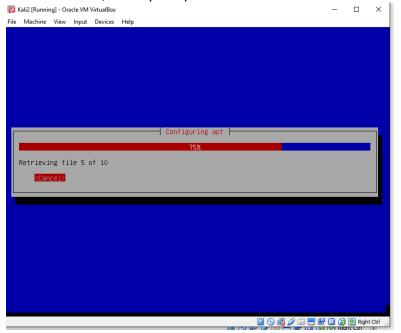


Tab over to "Yes" Press enter

The install will begin and will take a while, be patient.

ic k	ali2 [Runnir	ng] - Ora	acle VM	VirtualBox			-		×
File	Machine	View	Input	Devices	Help				
					[!] Configure the package manager				
Г	A netw	ork m	irror <sub>.</sub>	can be	used to supplement the software that i	s included on	the CD-	ROM.	
	IN1S M	ay ai	so mak	ke newer	versions of software available.				
	Use a	netwo	rk mir	rror?					
	<g <6<="" td=""><td>o Bac</td><td>k&gt;</td><td></td><td></td><td><yes></yes></td><td>KNO</td><td><b>.</b></td><td></td></g>	o Bac	k>			<yes></yes>	KNO	<b>.</b>	
<tab< td=""><td>&gt; moves;</td><td><spa< td=""><td>ce&gt; se</td><td>elects;</td><td><enter> activates buttons</enter></td><td></td><td></td><td></td><td></td></spa<></td></tab<>	> moves;	<spa< td=""><td>ce&gt; se</td><td>elects;</td><td><enter> activates buttons</enter></td><td></td><td></td><td></td><td></td></spa<>	ce> se	elects;	<enter> activates buttons</enter>				
						o 🗗 🖉 🗐 🛙	P 🔟 🐼	🔁 Righ	t Ctrl

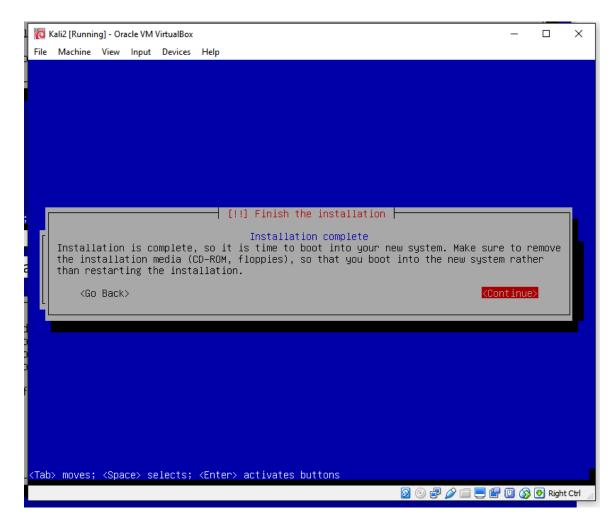
When it gets close to the end, it will prompt about a network mirror select "No" for this



The installation will continue.

	-		
g	Ø	Kali2 [Running] - Oracle VM VirtualBox — [	
١	File	Machine View Input Devices Help	
		[!] Install the GRUB boot loader on a hard disk	
		It seems that this new installation is the only operating system on this computer. If a it should be safe to install the GRUB boot loader to the master boot record of your fin hard drive. Warning: If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system	rst
12		temporarily unbootable, though GRUB can be manually configured later to boot it.	
X	٩	Install the GRUB boot loader to the master boot record?	
		<go back="">  &lt;</go>	
<	Tab	b> moves; <space> selects; <enter> activates but(ons</enter></space>	
L		0 🖸 🗗 🖉 🖾 🗮 🛄 🐼 🗩	Right Ctrl
Yc	วน	are in a VM do not panic, press "YES"	
n	Г	[!] Install the GRUB boot loader on a hard disk	
80		You need to make the newly installed system bootable, by installing the GRUB boot load on a bootable device. The usual way to do this is to install GRUB on the master boot record of your first hard drive. If you prefer, you can install GRUB elsewhere on the drive, or to another drive, or even to a floppy.	ler
а		Device for boot loader installation:	
1		Enter device manually	
		/dev/sda (ata-VBOX_HARDDISK_VBd72f4dcf-bf81942c) <go back=""></go>	

It is a VM select the second option, and the install will continue. This does not touch your physical hard drive it is going to go on the virtual hard drive you created



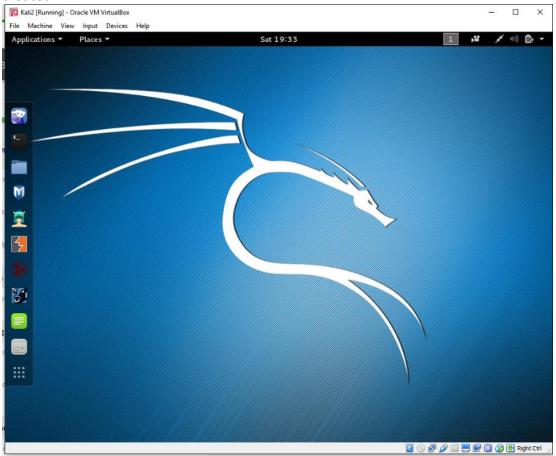
You are almost there

		Kali2 [Runnir						-		×
	File	Machine	View	Input	Devices	Help				
1										
l										
10 50 50							Finishing the installation			
50 01							61%			
l										
כ		Running	remov	e-live	e-packag	ges				
;									n nati	CHI.
	_					_			Right	Ctri

Almost done.



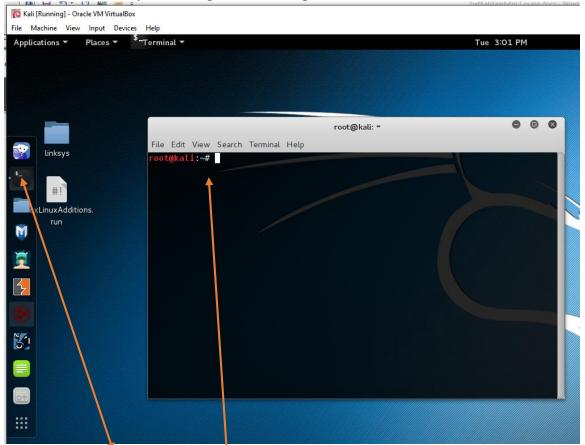
Welcome to KALI in a VM, login as root and use the password you have previously created



Let the games begin. You have gotten this far, next we will tweak the installation and get ready for updates and other internet functionality

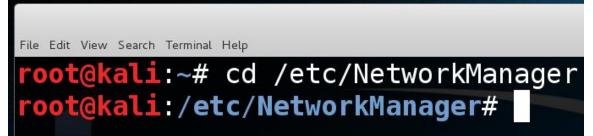
## Tweak your Kali VM

There are a few final steps and your Kali VM will be ready to go. Let's go to the "Terminal" and verify and change some settings.



To launch the terminal: press the icon under iceweasel, it looks like a command prompt, and when it opens you see this screen. This is where we are going to verify some settings.

Change the NetworkManager.conf file settings from "false" to "true"



We want to get to the directory that contains the NetworkManager.conf file. From the prompt, change your directory with cd /etc/NetworkManager (case sensitive) your prompt should change to that directory

File Edit View Search Terminal Help

# root@kali:/etc/NetworkManager# ls conf.d dispatcher.d NetworkManager.conf root@kali:/etc/NetworkManager#

root@

root@kali: /etc/NetworkManager

Once there type in **Is** and confirm. You will see the "NetworkManager.conf file" (Seen here in white).

We then want to edit this file. We are going to use nano (a text editor for this) In the same directory type in nano NetworkManager.conf and press enter (case sensitive)

	-
File Edit View Search Terminal Help	
<pre>root@kali:/etc/NetworkManage</pre>	<b>er#</b> nano NetworkManager.conf
	GNU nano 2.2.6
GNU nano 2.2.6	[main]
[main]	plugins=ifupdown,keyfile
plugins=ifupdown,keyfile	[ifupdown]
[ifupdown]	managed=true
managed=false	

Where it says "managed=false" change to managed=true Then hit Ctrl+O and hit enter to save then Ctrl+X to exit the editor and return to the terminal and see if u can ping google.com

Check your source file for the correct repositories for Kali updates and upgrades the current files can be found here <u>http://docs.kali.org/general-use/kali-linux-sources-list-repositories</u> You need all lines of this to match in your source file to avoid duplicates. I just cleaned mine out and pasted the ones in that link in. Let's check or clean out the file

<pre>root@kali:~# cd /etc/apt</pre>										
<pre>root@kali:/etc/apt# ls</pre>										
apt.conf.d	preferences.d	sources.list~								
listchanges.conf		sources.list.d								
<pre>root@kali:/etc/ap</pre>	t#									

Navigate to cd /etc/apt directory and do an ls to check for the sources.list file again we are going to use nano to check out this file by typing nano sources.list

In this case I took the lines in the link and pasted them into the file and cleaned out the rest **NOTE they do change it now and then** so you need to check Kali docs at docs.kali.org



If they match you are good to go, if not cut and paste into your nano session again Ctrl+O and press enter to save and Ctrl+X to exit

Time to get updates and/or upgrades. Once we have connectivity and repositories in the source file it's time to check for updates

Applications 🔻	Places 🔻	<sup>\$</sup> -Terminal ▼	•				Τι	ue 3:48 I	PM
								root@ka	li: ~
File Edit View	w Search Ter	minal Help							
root@	kali:~	~# apt-g	jet i	update	&&	apt-get	upgr	ade	
Type in	apt-g	et update &8	k apt-ge	et upgrade	–y (tł	ne –y is answ	ering yes t	o thin	igs
that want	to install v	without prom	npting y	ou to ansv	ver fo	r each one)			
File Edit View Search	Terminal Help			root@kali: ~					• •
		get update							
		ty.kali.org .kali.org s							
		ty.kali.org							
Hit http:	//securi	ty.kali.org	sana/	updates/n	on-fr	ee Sources			
		ty.kali.org							
		.kali.org s ty.kali.org					n-en IIS		
		ty.kali.org							
		, 313 kB/9,09						for	heac

Once the updates start, be patient big files sometimes look like your system is locked and the first time you do this it can take a while. (You should consider doing this fairly often as there are often updates) When completed, you may see notices, the ones that begin with "W" are only warnings and not a problem. However, if you start seeing ones that begin with "E" and text, read them /check connectivity/check the source file again. With the new rolling updates you will also want to run **apt-get dist-upgrade** and this can take a while. Reboot Kali and do the **apt-get update && apt-get upgrade –y** again to be sure you have everything.

### Install Guest additions in Kali

So your VM can use USB devices and other system tools you need to install VBox Guest additions into the Kali VM (Make sure you have updated like above before starting this) There are no optional steps so make sure you can do them successfully before moving on.

To check for linux headers you are looking for the current linux-headers that end in kali-all-amd64 the version will change over time



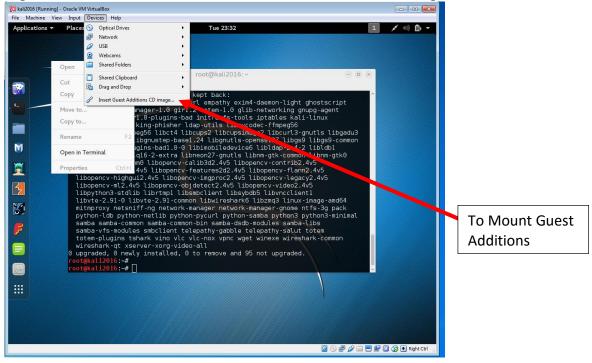
header | grep -i linux look for the one ending in -kali-all-amd64 es) linux-headers-4.4.0-kali1-all - All header files for Linux 4.4 (meta-package) linux-headers-4.4.0-kali1-all-amd64 - All header files for Linux 4.4 (meta-packag

## oot@kali2016:~#

root@kali2016:~# apt-get install linux-headers-4.4.0-kali1-all-amd64

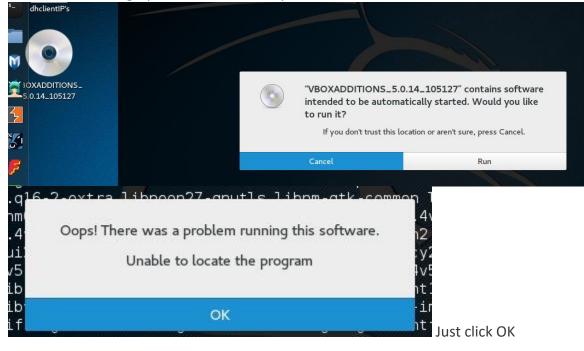
Install Linux headers at the time of writing it went to 4.5 this does change so type in the version you see when you do the apt-cache search header | grep –I linux and install with apt-get install linux-headers-4.5.0-kali1-all-amd64

When that finishes (just in case) run **apt-get update && apt-get upgrade** –y (their might be nothing to update but it is good to check) then in the terminal type reboot

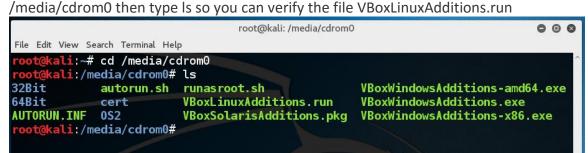


#### Log back into kali click devices click Insert Guest Additions CD image

Your should see a graphic of a cd and an option to run and when u click run it will fail

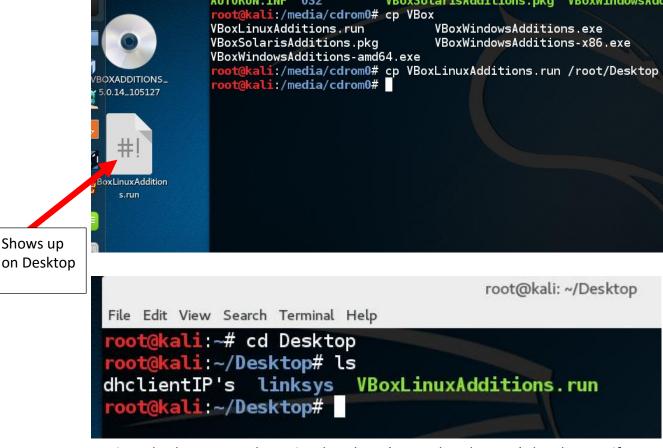


Then go back to your terminal navigate to the media you just mounted type in cd



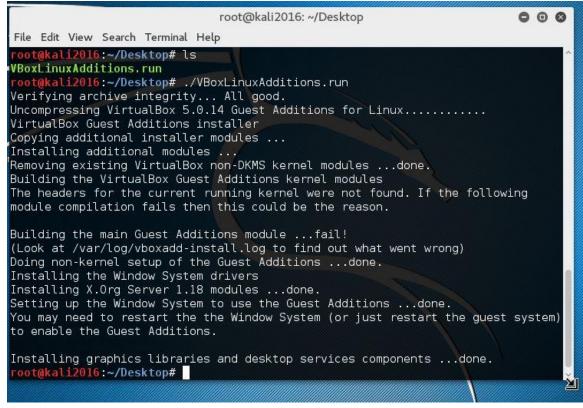
You want to copy this file to your desktop in order to get it to run type in cp

VBoxLinuxAdditions.run /root/Desktop (you must remember this is case sensitive)



Navigate back to root and type in cd Desktop (remember the caps) then Is to verify you see it

Now run the file by typing ./VBoxLinuxAdditions.run (you can copy & paste)



Your Kali VM is ready to use, ENJOY!

#### Resources

- VBOX & Guest Additions <u>https://www.virtualbox.org/wiki/Downloads</u>
- Kali ISO <u>https://www.kali.org/downloads/</u>
- TOR Browser <u>https://www.torproject.org/</u>
- Kali Repository for your source file <u>http://docs.kali.org/general-use/kali-linux-sources-list-repositories</u>
- Kali Docs <u>http://docs.kali.org/</u>
- What is the BIOS <u>https://en.wikipedia.org/wiki/BIOS</u>

#### Good To Have:

Home router or a neighbor's permission for you to study them <sup>(2)</sup> Old windows pc to attack or VM with Windows (unpatched to see the ugly)