

**LET'S BUILD A 21ST CENTURY ETHICAL HACKING
AND PENETRATION TESTING LAB USING KALI LINUX**



BY PRASHANT SHINDE

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All rights reserved . This book is not for sale , it is just a small help for those who wanting to learn ethical hacking & penetration testing for free . This ebook will help you to setup your own ethical hacking & penetration testing lab for free . No modification is allowed in this ebook without the permission of author . All the information present in this book is originally created by the author . There is no warrenty of the information used in this book because it might change with time . For more information visit

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About the Author



My name is Prashant , I am a passionate computer geek who has mastered different fields of computer studies . My Journey began back in 2009 when I was studying my Bsc II , I joined a computer course where I learned the basics of computers & programming and from there spring greater passion for computers & programming and gained extensive experience in different fields of computer like website design, software development with C & C++, Ethical Hacking, Ubuntu Linux Server Administration .

In the last few years I have taught more than 25000+ students online on Udemy. My Inspiration behind writing this eBook is to give some contribution to the ethical hacking & penetration testing world. This eBook will help all the ethical hacking lovers to setup their own ethical hacking penetration testing lab using free softwares . This is the first version of this eBook which is absolutely free for lifetime.

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INTRODUCTION .

What is hacking ? Types of hackers ?

Computer hacking is an act of gaining an unauthorised access into target computer system or network or to finding the weakness in the target computer system or network .

A hacker is a highly skilled person . He knows everything about the system . He is such a person who contains a strong command over coding , operating systems and networking . This person can build their own tools to perform act of hacking .

On the basis of their knowledge , actions , behaviour hackers are classified into different types . How they use their skills can categories them into different types . So they are classified as follows .

1] White hat hackers :- White hat hackers are highly skilled persons who contains the detailed knowledge about computer systems and networks . They are capable of finding the loopholes in the system . They are authorised to perform the act of penetration testing .They are certified geeks . They use their skills for good purpose and works under the law set by the government that's why they are called as " Ethical hackers " or " While hat hackers ". They can work for government or small companies or big companies to protect their websites or computers networks from bad guys .

2] Black Hat Hackers :- Black hat hackers are also highly skilled person . They are also called as " Crackers ". They also contains the detailed knowledge about computer system or networks . The difference in between white hat hacker & black hat hacker is that they use their skills for bad purpose . They gain an unauthorised access into the target computer systems or networks without the permission of the owner and can steal the information or they can destroy the target system or they can harm the system in different ways . So that's why these guys has been called as " Black hat hackers " .

3] Gray Hat Hackers :- This is the third category of hackers . Gray hat hackers are also highly skilled persons . These guys uses their skills either for good or bad purpose . They are capable of performing both the acts either good or bad . These guys can also use their skills for personal benefits . It's always depends upon their mind set . These guys can make money by showing weaknesses in the target systems or network .

4] Red Hat Hackers :- Red hat hackers are also highly skilled persons like white hat hackers . They never use their skills for bad purpose . These guys are always against the black hat hackers . The only difference in between white hat hacker and red hat hacker is that instead of reporting about the black hat hacker they directly

take down the hacker by ddos attack or uploading viruses on the target system . So that's why these guys are flagged as “ Red Hat Hackers ”.

5] Blue Hat Hackers :- Blue hat hackers are those hackers who don't have any indepth knowledge about the computer systems or networks . These guys uses only already existing tools in the market . These guys never understand how the command or program is working . They use their knowledge for taking revenge from those persons who harmed them . These guys are also called as “ Script Kiddies ”.

6] Green Hat Hackers :- This is the sixth type of computer hackers . These hackers are beginners or babies of hacking world . These guies don't contains a strong knowledge about the computer world but they contains a strong desire to become an expert hacker one day . So many of the readers who have a fundamental knowledge about the computer world and have a strong desire to become an expert hacker one day will fall into this category . So you can call your self “ Green Hat Hacker ”.

7] Hacktivist :- Hacktivist a single person or group of hackers who thinks they can change the system . They act like social activist . They make people aware about the wrong things happening in the system . They reveals those bad secrets which remains underground because of powerful people . Many of you might be aware of wikileaks website . Julian Assange used to reveal the dark secrets on that websites . So you can call him a “ Hacktivist ” .

Ok after learning about what is hacking & types of hackers , now it's time to know about the best ethical hackers for all time . You might be interested in learning their stories . Here we gonna list top 10 hackers from history according to our search & interest .

TOP 10 HACKERS IN THE HISTORY .

Here we gonna discuss the most interesting stories about hackers according to our research . All these stories are just to inspire you to learn ethical hacking & become a cyber criminal specialist . It's all up to you , When you use the information for right purpose then you will become hero and when you use the same information for bad purpose then you will become villain . So let's see the list one by one .

1] KEVIN MITNIK :-

Kevin mitnik is a very famous black hat hacker (cracker) in the history . The story of kevin mitnik is very interesting .The story is all about a security professional whose name was shimomura , whose network is get hacked by kevin mitnik and after that how shemomura set up a trap and track the hacker . It is a very

interesting story , I am not going to talk much more about it because there is a movie released on the hacking war in between the shemomura and kevin mitnik , the name of the movie is “ TAKEDOWN ” . This movie completely explains the story in between “ Kevin Mitnik ” and “ Shimomura ”. So just enjoy the movie .

2] ROBERT TAPPEN MORRIS :-

The story of Robert Morris is another interesting story in hacking world . Robert Morris was a student of Cornell University . In 2 November 1988 he wrote a computer worm named as “ Morris Worm ”. This worm was a self replicating program . He wrote this program to count the size of the ARPANET . ARPANET was the internet of that time . This worm has infected around 60,000 machines at that time . So this is the Basic story of a computer hacker “ Robert Morris ”. You can learn more about it online .

3] David Smith :-

He is another black hat hacker who wrote a computer virus called as “ Melissa ”. According to David Smith the Melissa virus was never meant to cause any harm to the world , it's only purpose is to spread around the computer networks in the world . Smith is the only person who goes into federal jail in united states .

4] Gray McKinnon :-

Gray McKinnon is known as “solo” on Internet . In between Feb 2001 to March 2002 he illegally accessed 97 computers belonging to NASA and US Armed Forces . According to US authorities he has caused a damage worth of \$700000 us dollars .

5] Julian Assange :-

He is also renowned hackers in history . Many of you may have heard his name . He started hacking at the age of 16 with the name “ Mendex ”. Julian has created a website called as “ WikiLeaks ” and began publishing secret documents from anonymous sources . You can call him a hacker of “Hactivist ” type . He started wikileaks in 2006 . You can learn more about him online .

6] Onel de Guzman :-

Onel de Guzman is Philippines student . It is also a hactivist type of hacker who developed a computer virus named “ I Love You ” . This is a quite

interesting virus which replicates it self and destroys the files and folders in current system . After harming one computer he just copies the email list from current user and send the same virus to that email list . So this is also a bad action or abuse of knowledge .

7] Lulz Security :-

It is not a single hacker but a group of hackers . This group was a Black hat hacker group . This group hacked Sony, CIA and FBI accounts . This group was a very bad group who hacked into news corporation account and put a false news that “Rupert Murdoch” has been passed away . Rupert Murdoch was the founder of news corporation . Many people claims that the moto of this group is just to spread awareness about hackers and providing security against them .

8] Jonathan James :-

The story of jonathan james is very interesting . He has been known as “c0mrade” in hacking world . He began hacking at very young age . Once he hacked into NASA's network and downloaded the source code files and shutdowns NASA's network for weeks . He had caused a damage worth of 1.7 million dollars approx .

9] Bob Thomas :-

It is also a Interesting story . Bob Thomas has writtens a computer virus called as “Creeper worm”. It is called as first computer virus written in the world . It was a self replicating virus which has infected many computers running TENEX operating system , later he developed a program called “ Reaper ” to delete the virus . So according to me he is white hat type of hacker , who developed this virus for experimental purpose .

10] Guccifer 2.0 :-

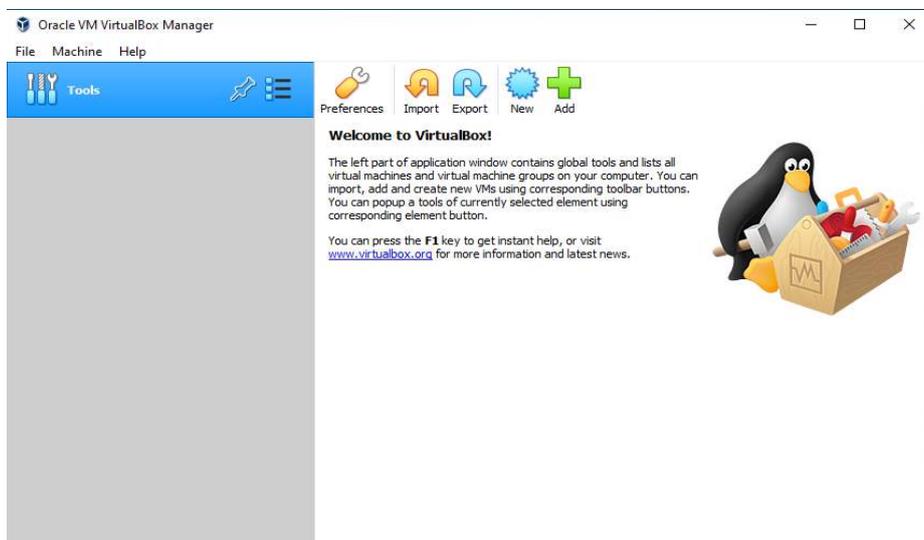
It is the most interesting story amongst all hackers . Nobody knows about it yet . It might be a single person or group . what they did is , during 2016 US Presidential Election , the Democratic National Convention's network was hacked . Thousands of documents were leaked online . Many people believes that behind Guccifer 2.0 there is Russian hacker group . But nobody knows yet the reality .

So all the above a few of the interesting stories about hackers in the history . All these stories are to learn you hackers mind set , so you can understand how they think and you can protect people in the future against cyber crime .

SOFTWARE REQUIREMENTS

In this lecture we gonna talk about the software requirements to setup our own ethical hacking & penetration testing lab . To setup this lab we need one virtualization software and different operating systems . So first of all lets see different virtualization softwares available in the market . There are many softwares are available in the market . Some of them are free and some of them are paid .So let's see them one by one .

1] Oracle VM VirtualBox :- This is a free softwares developed by Oracle . The first version of Oracle VirtualBox is released in 2007 . I set the software at number one because it is absolutely free of cost and you can run multiple operating systems on this without any problem . You can run Windows , Linux , Mac os & Solaris .



Pros :-

- 1] Absolutely free to use .
- 2] Intuitive Interface & Operation .
- 3] Stable to use .

Cons :-

- 1] It requires RAM of particular size to run smoothly .
- 2] You need to download guest additions to use all features .

Download Link :- <https://www.virtualbox.org/>

2] VMWare Workstation Player :- This is another type of virtualization software . This software is available for free to use for personal use but you need to pay some amount for business purpose . This also runs on Windows , Mac os and Linux Operating system .



Pros :-

- 1] It is also easy to use software .
- 2] Evaluation version is available .
- 3] Supports Directx .

Cons :-

- 1] It uses lot of resources .
- 2] Not every program works in emulation .

Download Link :- <https://www.vmware.com/in/products/workstation-player/workstation-player-evaluation.html>

3] Parallels Desktop :- It is a software designed for mac computers only. Many people thinks that it can only used to run Windows Operating system as guest on Mac os but it's not true . You can also run chrome os ,Linux os on it . It is available in paid version but you can try 15 day trial version .



Pros :-

- 1] It runs windows , Linux , Chrome os on Mac machines .
- 2] It's available in three versions according to requirements .

Cons :-

- 1] It requires lot of resources .
- 2] You need to upgrade to paid subscription yearly .

Download Link :- <https://www.parallels.com/products/desktop/trial/>

4] QEMU :- It is another software used in virtualization . It is also available for Windows , Mac os & Linux Operating Systems . You can also call it machine emulator and virtualizer . It runs perfectly on Linux . Following is a basic screenshot of it .

```
QEMU
Machine View
Debian GNU/Linux 7 debian-amd64 tty1
debian-amd64 login: root
Password:
Last login: Wed Nov 22 04:14:59 UTC 2017 on tty1
Linux debian-amd64 3.2.0-4-amd64 #1 SMP Debian 3.2.51-1 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
root@debian-amd64:~# _
```

Pros :-

1] Its free to use .

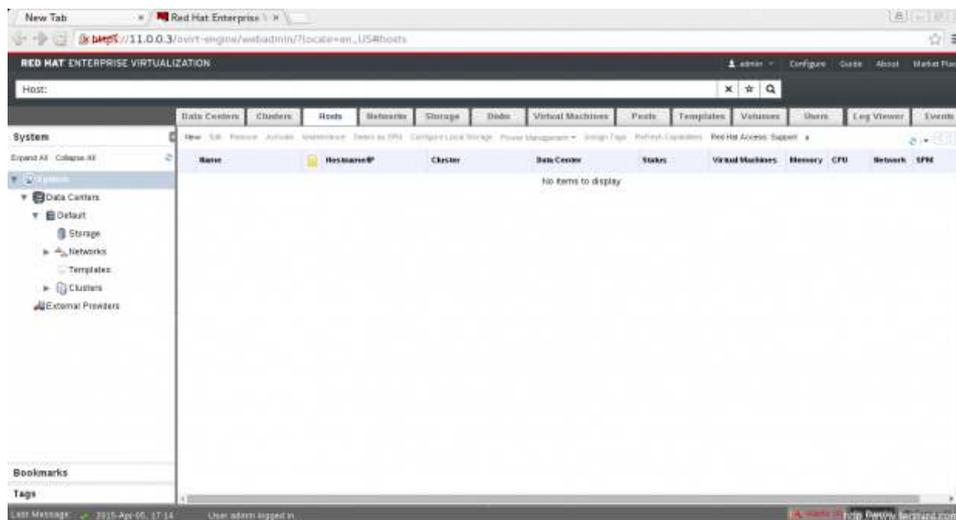
2] Easy to use .

Cons :-

1] It is lacking of providing any sophisticated interface tool .

Download Link :- <https://www.gemu.org/download/>

5] Red Hat Virtualization :- As the name reflects it is designed for Linux Platform. It is the virtualization platform which has been designed for enterprise level users . It's not free to use but you can try trial version . Following is the basic screenshot of red hat .



Pros :-

1] Easy to use .

2] Powerful baremetal options .

Cons :-

1] Support model is costly .

Download Link :- <https://www.redhat.com/en/technologies/virtualization/enterprise-virtualization>

So above is the list of top 5 softwares available in the market which can be used in virtualization .But according me virtualbox is the best option . So in our ebook we gonna use virtualbox as our main software to build our penetration testing Lab .

After this we need some operating systems to build our ethical hacking and penetration testing Lab . So following is the List of Operating systems we need to download .

List of Required Operating Systems :-

- 1] Kali Linux .
- 2] Metasploitable2 .
- 3] Windows 10 .
- 4] Ubuntu Desktop .

HARDWARE REQUIREMENTS

In this chapter we gonna talk about the hardware requirements to setting up our ethical hacking & penetration testing lab . The hardware means the amount of RAM , Processor , wifi adapters and ip camers . In this chapter we gonna talk about all the details step by step .

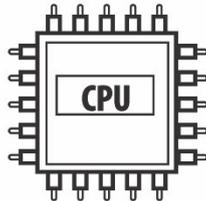
1] RAM :- This is the first important part in building our lab . The job of ram is to provide a space for our software that we are working on . Suppose you have installed MSOFFICE on your machine and you are not using it . Then it remains on your hard disk in the form of files , but when you start the MSOFFICE application then it will be opened up inside computer RAM . So that means when we work on any software that software actually runs inside RAM . So when we install any operating system then some part of the operating system remains on hard disk and some part remains active in RAM to perform some task , like when you start windows operating system , you will see windows desktop . To show this desktop on your monitor there is process or program is running at the background and it uses some amount of RAM to run successfully . So now I think you have understand how it works .



So to build our LAB we gonna use different operating systems , but we don't gonna start all of them at the same time , we gonna use the Kali Linux virtual machine as default os and later operating systems according to our needs . So we need at leads 6 GB of RAM in order to build this LAB . If you have 8 GB then it's cool . But you can run our LAB in 6 GB environment too .

2] PROCESSOR :- After RAM the next important factor to develop our ethical hacking lab is processor . The processor is called as " Brain of computer " . We gonna use the virtual box for our lab which devides the processor in between the host and the guest operating system . The main computer on which our virtual box is installed is called as "host computer" and the operating inside of it is called as "host operating system" and the operating systems that we gonna use in our virtual box is called " Guest operating system " .

So suppose you have quad core processor on your computer and you have installed windows 10 on it as host os and kali linux as guest os on virtual box .Then you can assign few cores of processor to the Kali linux virtual machines while creating the virtual machine . Means you can assign 2 cores out of 4 to kali linux operating system inside virtual box .



So we need at least a quad core processor of intel or AMD . so if you have intel machine with i-3 processor running on it then you can definitely develop our lab . If you have a Laptop with i3 processor and 6 or 8 GB of RAM then you can definitely create our lab environment inside it . So I strongly recommend to use i-3 processor and above to build our ethical hacking & penetration testing lab and the same logic is applicable to AMD processors . Look for the cores and speed of at least 2.0 GHz of the processor .

3] GPU (optional) :- GPU stands for graphics processing unit , which is used to enhance photo/video editing quality or to enhance gaming experience . But you can also use it to increase brute force attack performance . Because it contains a separate processor so that's why it can enhance the password cracking speed .



Installing Graphics card is optional part in Building our ethical hacking and penetration testing lab . You can build our lab without the use of this graphics card . So if you have it then just install the graphics card along with it's graphics drivers inside of your machine . You can use any compatible graphics card in your system .

4] Hard Disk :- To create our lab this is also another important part . All our operating system and software files will be stored on our hard disk . So you need to set at least 40 GB of storage space free on your host operating system . In case of

windows 10 host operating system you need to set at least 40 GB of free space in order to setup our own lab .

5] Keyboard (Optional) :- In this section we gonna talk about the special keyboards used by hackers . You can set up your ethical hacking lab with normal keyboard as well that's why this section is optional . so there are different types of keyboards are available in the market . But hackers uses special keyboards called as "mechanical keyboards". Along with that they prefer to use mechanical keyboards with cherry mx switches . Following are few examples of best mechanical keyboards according to our study .

- ➔ EagleTech KG011 Mechanical keyboard :- This is one of the best keyboard I feel in terms of price , build quality and feel . It contains led lighting so that you can view keys on your keyboards at night as well . You can see the image below .



- ➔ Motospeed :- This is another type of mechanical keyboard which looks cool , in terms of ethical hacking . So if you like it and if you have budget then you can buy it . Please see the following image for refrence .



6] WIFI ADAPTER :- This is another important part in building our own ethical hacking and penetration testing lab . Wifi adapters are used for packet injection in wifi password cracking . There are many types of wifi adapters are available in the market . But not all are capable of performing the wifi attacks . We need a wifi adapters which supports monitor mode or packet injection . You also might be thinking that you have a laptop & it contains a default built-in wifi then why you

should buy a new one . Yes you are correct ,but these built-in wifi adapters are impossible to access inside the virtual machine and also they doesn't support monitor mode .

So what type of wifi adapter you should buy for our ethical hacking lab . You should by a wifi adapter which supports monitor mode or packet injection . There are few chipsets you should consider before buying the adapter, following chipsets supports monitor mode & packet injection .

1] Atheros AR9271

2] Realtek AR8812AU

3] Ralink RT3070

So before buying your wifi adapter for wifi hacking consider the chipset . There are many wifi adapters are available in the market and which are costly and few are cheaper . so we gonna list few examples below including costly and cheapest wifi adapters .

1] ALFA AWUS036NHA :- This is one of the best wifi adapter which supports monitor mode and packet injection . It works with 2.5GHz frequency . It works in Windows Mac os and Linux . It contains Atheros AR9271 chipset. Following is a picture of our ALFA AWUS036NHA wifi adapter . You can buy it in between \$80-100 US dollars .



2] ALFA AWUS036NH :- This is another wifi adapter which support both packet injection and monitor mode . This is one of the best wifi adapters . But it is a bit costly as like the above wifi adapter . This wifi adapter works with Ralink RT3070 chipset . This wifi adapter works with 2.4GHz frequency . It works with Windows , Linux and Mac os . Following is a picture of our ALFA AWUS036NH wifi adapter . You can buy it in between \$70-110 US dollars .



3] Terabyte TB-WD-1111 :- This is one of the cheapest wifi adapter which supports both monitor mode and packet injection . It works with 2.4GHz frequency wifi networks . It will work both in Windows and Kali Linux . Following is a picture of Terabyte TB-WD-1111 wifi adapter which will help you finding it online . You can buy it in between \$3-5 US dollars .



7] RASBERRY PI (Optional) :- Rasberry Pi is a device where we can install kali linux operating system in order to create a portable hacking machine . Getting raspberry pi is optional . If you don't want to invest more money then it's fine . But with raspberry pi you can build a really cool portable hacking machine . You can see the following picture for refrence . But along with raspberry pi you need to buy a micro-sd card for storage and touch screen for output . The complete setup of Rasberry pi will cost you around \$100-150 dollars .



8] SOFTWARE DEFINED RADIO DONGLE (Optional) :- The SDR dongle is also very interesting hardware in building our own ethical hacking lab . With this dongle we can listen to radio frequencies , we can listen to conversation between mobiles . Means it is very interesting topic . Listening to someones conversation is illegal . It is just for educational purpose only . NooElec NESDR Smart Dongle is good quality dongle . You can use it to do some fun with radio frequencies . It will cost you around \$50-100 dollars , you need to buy it along with it's antennas .



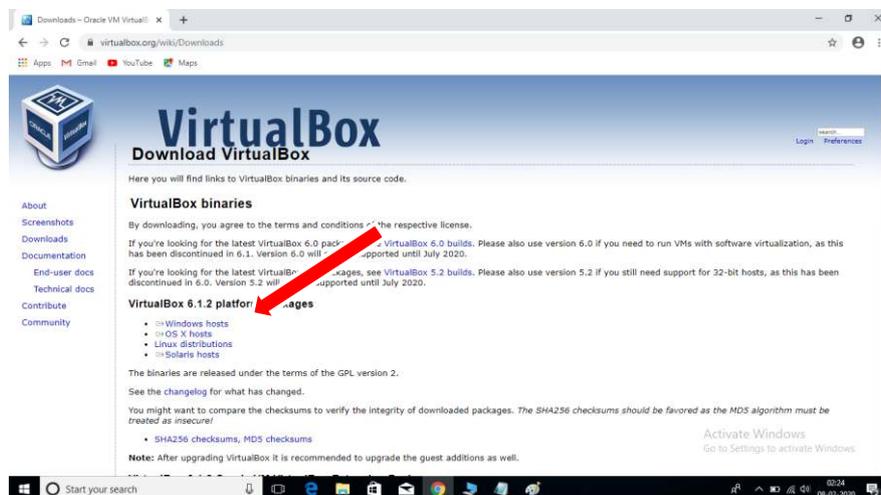
DOWNLOADING AND INSTALLING VIRTUALBOX .

To build our lab we gonna use virtualbox as a virtualization software . This is one of the best software in virtualization market . The best part of it is that it is free to use and easy to configure .

So to download the latest version of virtualbox first go to <https://www.virtualbox.org> and you will find the following page at the beginning .



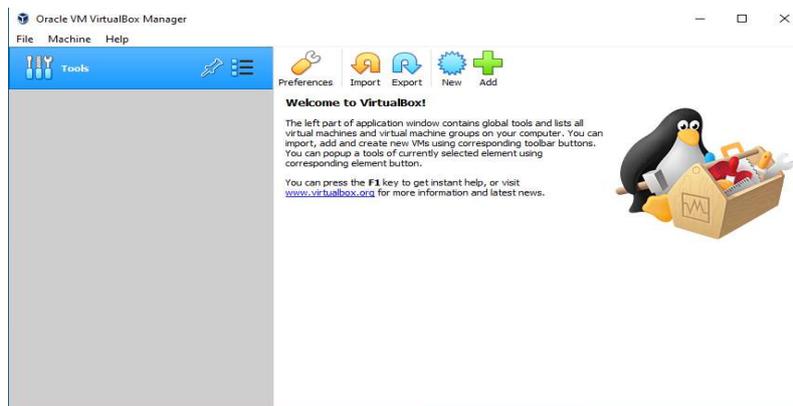
At this page you will find the download Virtualbox button . So just click on it and you will be redirected to another page . At his page you will find different download links . You need to download the latest version according to your operating system . For windows users you need to click on the first link as show in the image below .



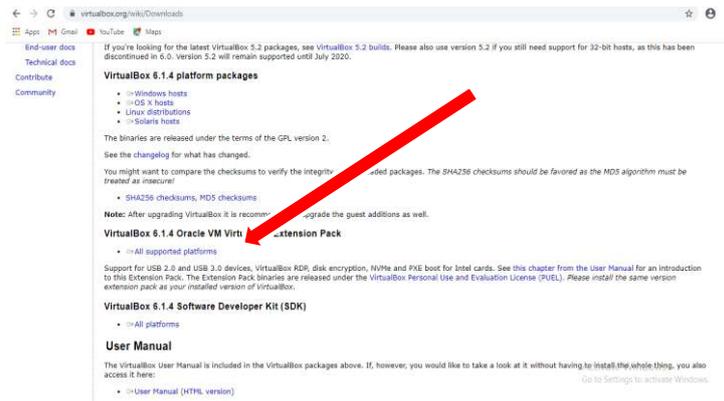
After clicking on the link the download will begins automatically . so after downloading just click on the setup file which will begin the installation procedure . at the beginning you will see the following window .



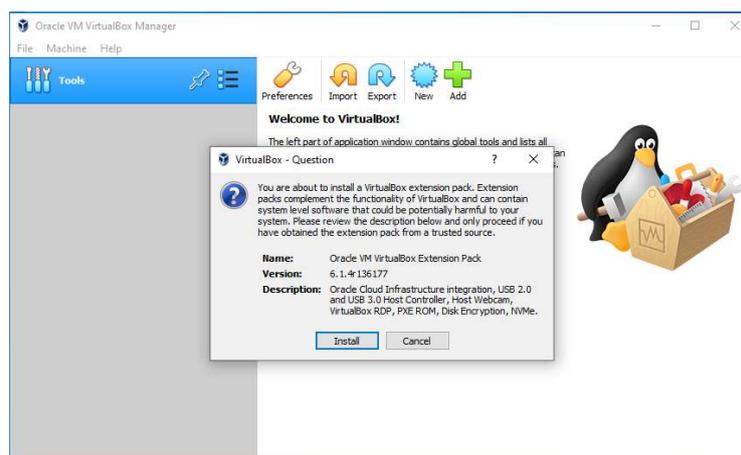
After appearance of this window , just click on next button . after this you will see another window then just click on next again . Again you will find another window , so again just click on next . After this you will find a new window where you can see a warning message relating to “Network Interface” , so just click on “Yes” button . After that you will get another window , here you just need to click on “ Install ” button now . After clicking on install , windows 10 will ask you about “ This app will make some change and do you want to allow ” , so at this message click on Yes and after that the installation procedure will begin and after finishing the procedure it will start the virtual box for you . Following is main windows which appear after fresh installation of virtualbox .



After installation of virtual box , the next important action you need to take is to install extension pack . You will get the download link for the VirtualBox Extension Pack exactly below the virtual box download link . You can see the following picture for refrence . Extension pack is really important to install . After installation of extension pack you can enjoy different features of virtualbox , like you can connect pen drive , memory cards to virtual machines successfully after installation of extension pack .



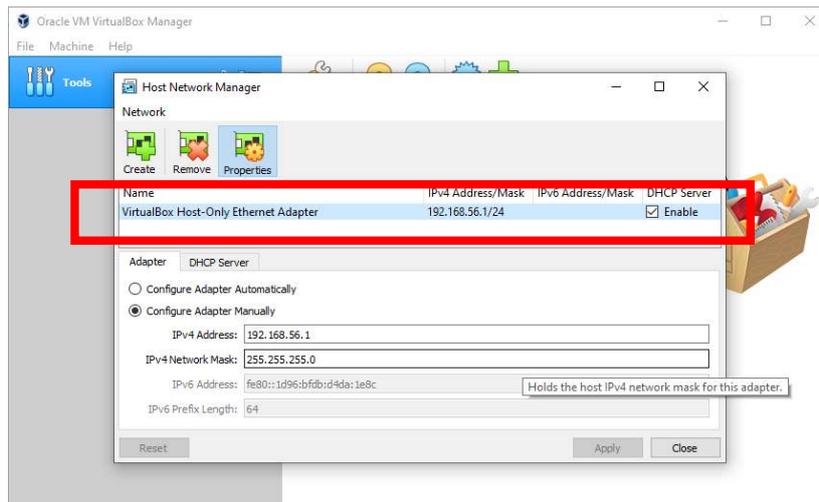
After downloading the extension pack just copy it on your desktop and click on the setup file . It will start the following windows for you , which you can see in the picture . You need to click on install button here . After that windows will ask you that do you want this app to make changes , then just click on yes .



After that you will get a new window which contains the license agreement . Here you just need to scroll down the page at bottom and click on I agree . After that it will install the extension pack successfully for you .

NOTE :- While installing the extension pack you need to consider one thing & i.e. to make sure that you have disabled the antivirus protection for few minutes , otherwise you can get some problems while installation .

After installation of virtualbox , you need to check one thing again and i.e. “Virtual Box Host only Ethernet adapter is installed successfully or not . To check that just click on File menu and then click on “Host Network Manager” after clicking on this menu item you will see the following window . If you found the settings as shown in following window then that’s ok . But if you find there is no network adapter is installed successfully then you can create new one by just clicking on “create” tab from the same window . It will automatically installs VB Ethernet adapter for you .



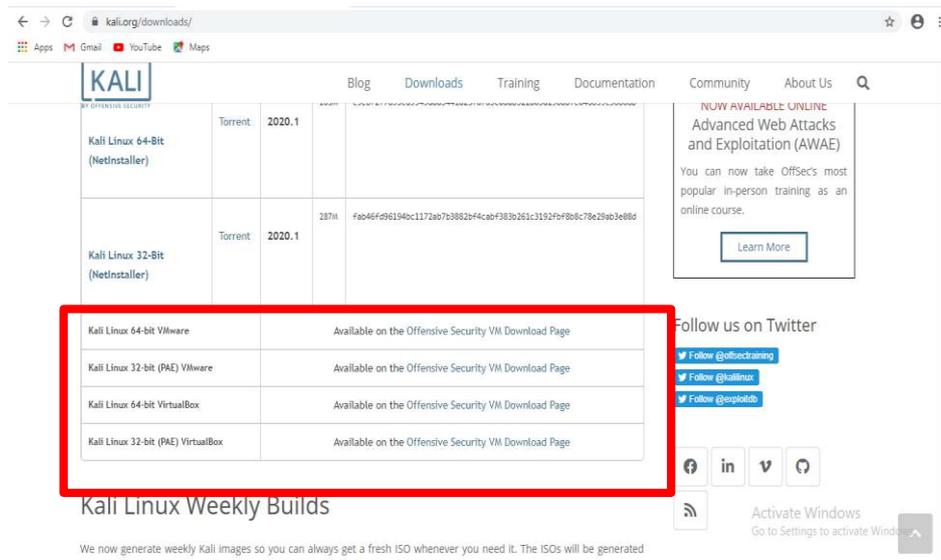
If you find the virtual box adapter as shown in above image pointed with red rectangle then you don't need to worry about it . If you didn't find it then just simply click on create tab . It will automatically setups the VB Ethernet adapter for you .

If all of your settings are good then that means we have successfully installed the virtual box software in our lab . Now our next step is to install our main operating system i.e. kali linux which will be used for ethical hacing & penetration testing purpose .

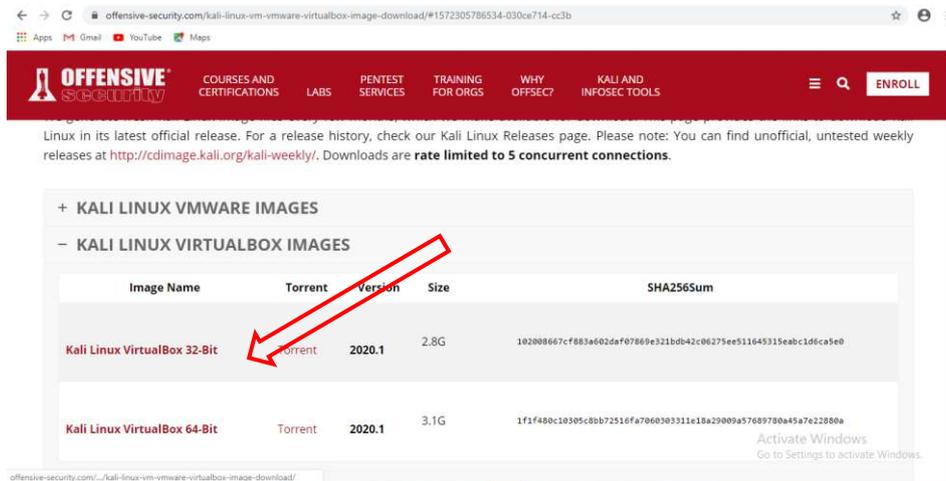
DOWNLOADING & INSTALLING KALI LINUX .

Now it's time to learn , how to download & install our main operating system , which we gonna use for ethical hacking & penetration testing purpose . Kali linux is latest trending and most successful pentration testing tool . In kali linux you can perform any type of attack & secure them . You can perform wireless penetration testing , you can perform website penetration testing , you can perform wordpress penetration testing , you can perform network penetration testing , you can perform operating system level penetration testing & much more .

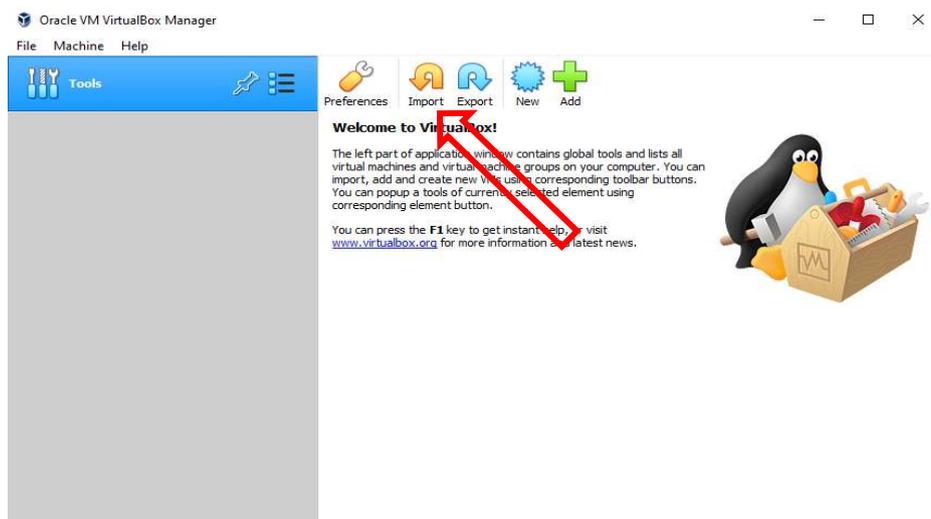
So to download the latest version of kali linux first visit <https://www.kali.org> and click on download menu link . After clicking download menu , you will find a list of different download options . You can either download the iso image or vmware or virtuabox images . But I would strongly recommend you to download latest version of virtual box image , because it will be very easy for us to create a virtual machine with virtual box image . It will also save a lot more time . Following is the page which you will find after clicking on download menu link .



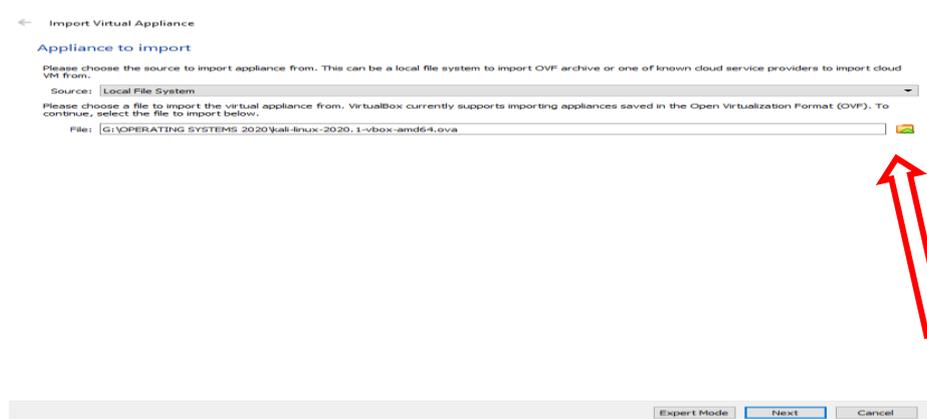
Note :- As you can see in the above picture that there are two versions of Kali Linux i.e. one is 32-bit and other is 64-bit . You need to download the version according to your processor type . If you processor is 32-bit then just download the 32-bit version and if you have 64-bit processor then just download 64-bit version . So when you click on download link you will be redirected to another page , where you can see the download link options on the same page , so just click on download link and download the image . You can see the download options in the following image .



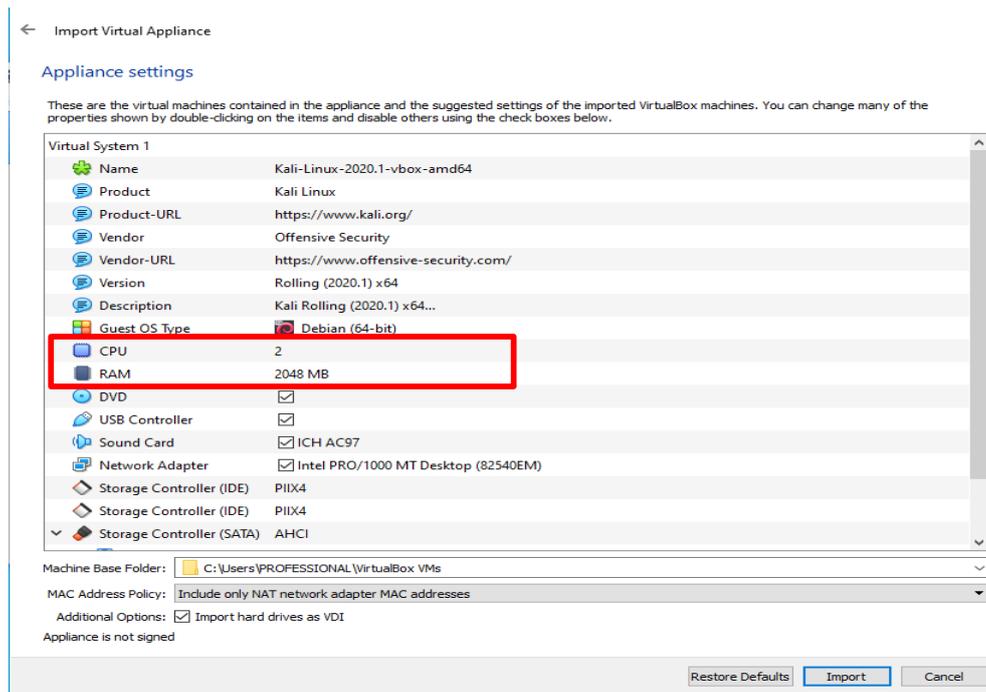
Ok after downloading the latest version of kali linux , now it's time to install it . So to install it first start the virtualbox and click on IMPORT button as shown in following window .



When you click on import button it will show you another windows , where you need to select the virtualbox image file . following is the windows where you need to show the virtualbox image file path .

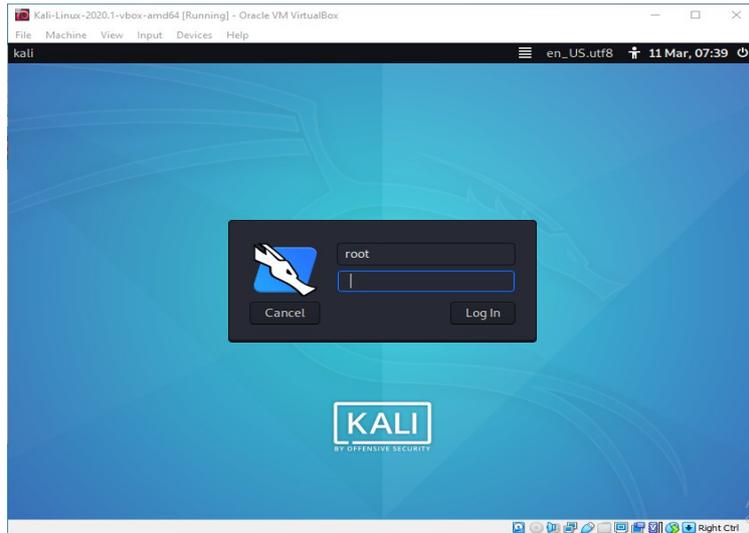


So just click on folder icon and show the path of virtualbox image file . and click on next .After that you will see another window where you can see different requirements for this version of kali linux . Please see the following picture for reference . You can see in red color rectangle , it is showing the amount of RAM and Processor cores required for our kali linux machine . So it requires at least 2 GB of RAM and 2 cores of the processor to run successfully . So as this window appears you can see IMPORT option at the bottom , so just click on import .

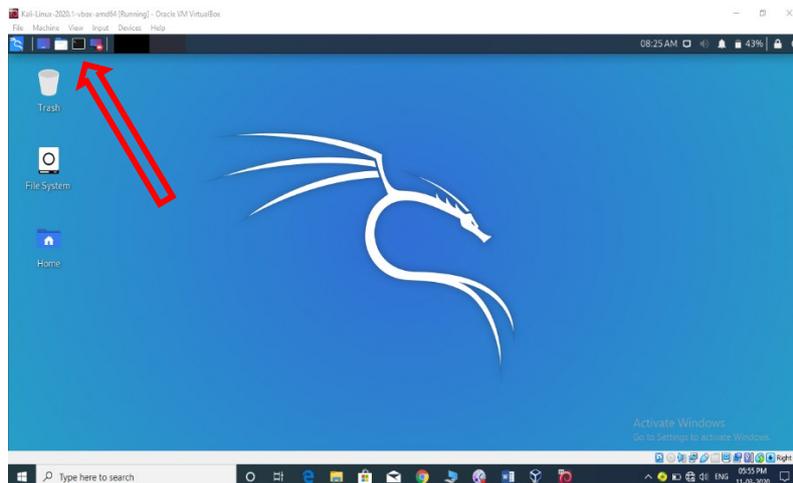


After clicking on IMPORT it will ask you for whether you are agree to the terms or conditions or not . So just click on agree and it will start to install the kali linux for you . After few minutes you will see it installed successfully .

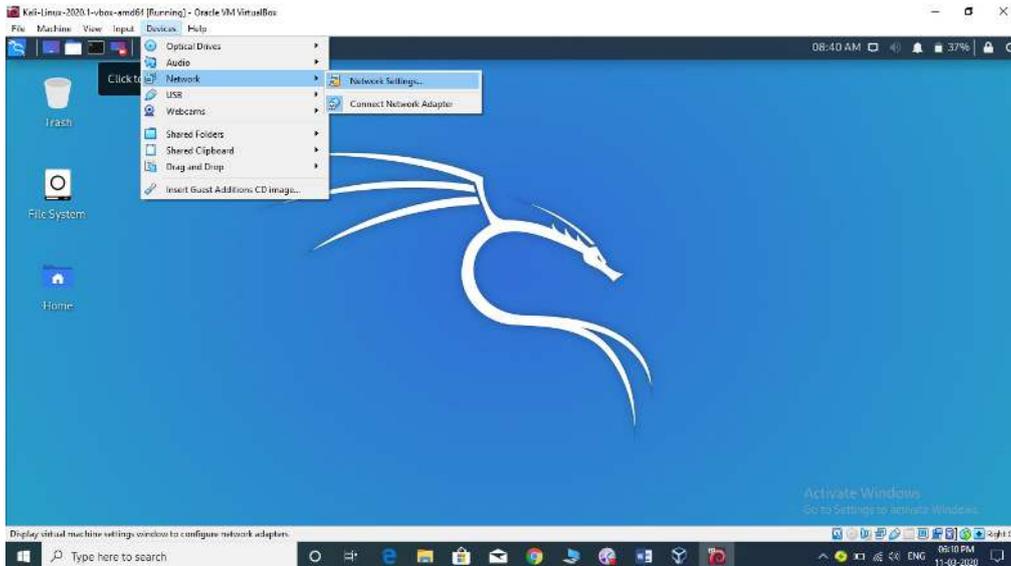
Now to start our kali linux virtual machine what you need to do is , just click on start button on VBox tab . It will start the Kali Linux virtual machine for you . After starting the Kali Linux virtual machine you will see the following window , where you need to enter the USERNAME & PASSWORD . The default username and password for this version i.e. 2020.1 is USERNAME :- kali & PASSWORD :- kali and some older version of kali linux the default username and password is root and toor sequentially .



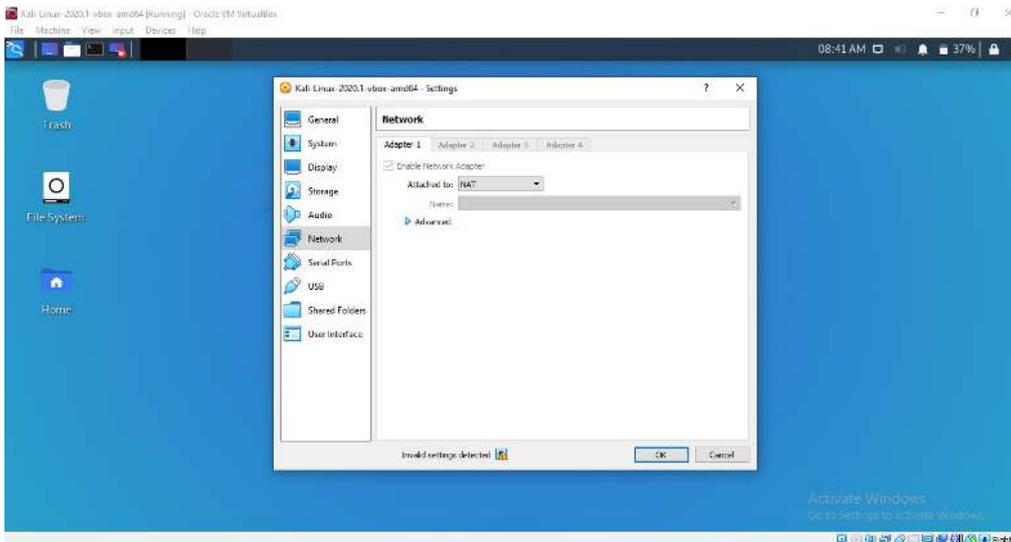
After entering username and password , you will get inside kali linux and you will find the following screen at first time . The arrow in the following picture is pointing towards Terminal window .



Now it's time update and upgrade our kali linux machine . So first of let's check we are connected to the internet or not . To access the Internet from our kali linux machine what you need to do is check the network settings from devices menu . Please see the following picture for refrence .



Now just click on Network settings and you will find following window . Here you just need to make sure that you have selected the NAT option .



NAT stands for Network Address Translation . This is a protocol which is used to access the internet inside our virtual machine from the host machine . After making sure the NAT is selected , now click on ok and start the terminal window .

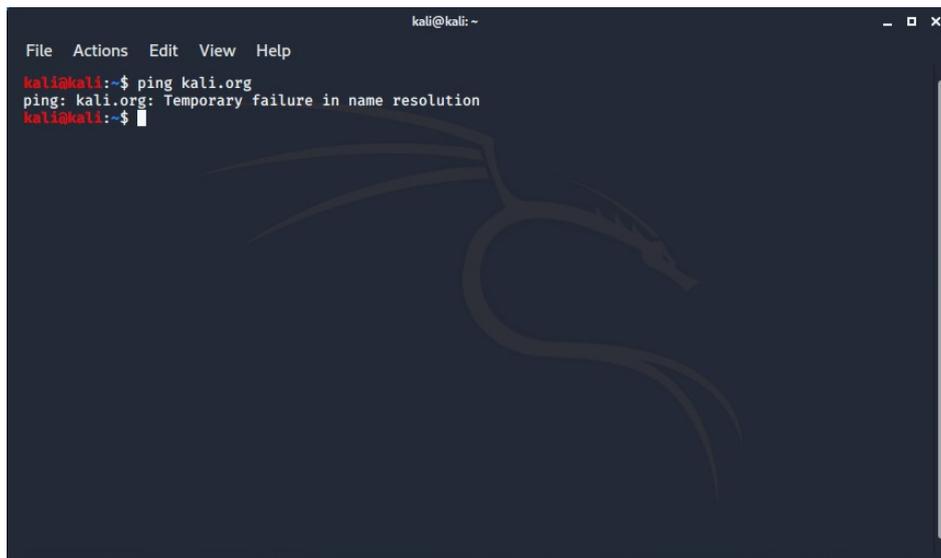
TESTING THE INTERNET CONNECTION IS WORKING OR NOT .

First start the terminal ,by pressing ctrl+alt+t and type the command “ping” and the address of any website . Here I am gonna type the address as “kali.org” . So in total just type the command as :- ping kali.org . If the ping is successful that means we are connected to the internet . If not then that mean we need to check our internet connection and settings .

Following picture is the demonstration of ping command .

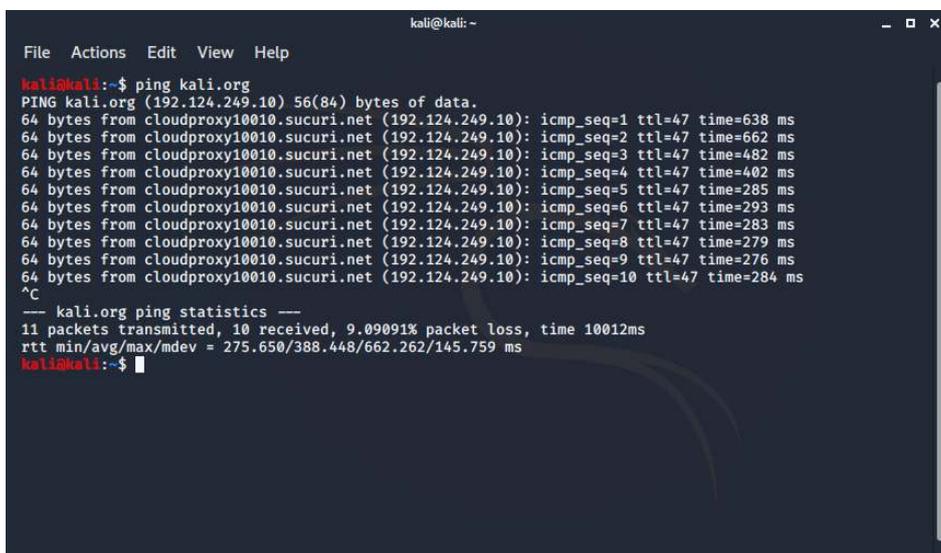
1] failed ping command :- When you are not connected to the internet successfully then you will get the following results for ping commands . You can see the error as

“ Temporary failure in name resolution ”. we have typed the command “ ping kali.org ” at the terminal .



```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ ping kali.org  
ping: kali.org: Temporary failure in name resolution  
kali@kali:~$
```

2] Successful ping command :- When our internet connection is working then you will see the successful ping command as shown in the following picture .



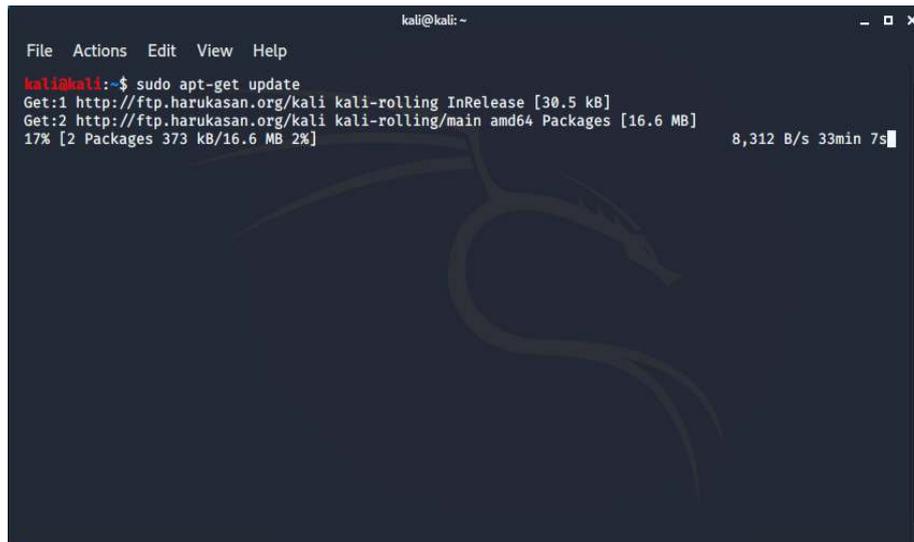
```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ ping kali.org  
PING kali.org (192.124.249.10) 56(84) bytes of data:  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=1 ttl=47 time=638 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=2 ttl=47 time=662 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=3 ttl=47 time=482 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=4 ttl=47 time=402 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=5 ttl=47 time=285 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=6 ttl=47 time=293 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=7 ttl=47 time=283 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=8 ttl=47 time=279 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=9 ttl=47 time=276 ms  
64 bytes from cloudproxy10010.sucuri.net (192.124.249.10): icmp_seq=10 ttl=47 time=284 ms  
^C  
--- kali.org ping statistics ---  
11 packets transmitted, 10 received, 9.09091% packet loss, time 10012ms  
rtt min/avg/max/mdev = 275.650/388.448/662.262/145.759 ms  
kali@kali:~$
```

UPDATING AND UPGRADING THE KALI LINUX SYSTEM :- After testing the internet connection now it’s time to update and upgrade our system . The update command will download the available list of software packages to current version but doesn’t install them . After updating the software repository you need to upgrade it . So after updating the system just type the command to upgrade the system . The upgrade command will actually install the software packages . So let’s see them one by one .

1] UPDATING THE SYSTEM :- To update the system just type the command as follows .

:-> sudo apt-get update

You can see the following picture for reference . When the command is successful then you will see the output as follows . If you get any error like E:unable to locate software package , then you must check your internet connection .

A terminal window titled 'kali@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The terminal shows the command 'kali@kali:~\$ sudo apt-get update' and its output: 'Get:1 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]', 'Get:2 http://ftp.harukasan.org/kali kali-rolling/main amd64 Packages [16.6 MB]', and '17% [2 Packages 373 kB/16.6 MB 2%]'. A progress bar is visible on the right side of the terminal window, showing 17% completion with a speed of 8,312 B/s and a time of 33min 7s.

```
kali@kali:~$ sudo apt-get update
Get:1 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Get:2 http://ftp.harukasan.org/kali kali-rolling/main amd64 Packages [16.6 MB]
17% [2 Packages 373 kB/16.6 MB 2%]
```

2] UPGRADING THE SYSTEM :- It is the actual act of installing the software packages which we have downloaded with update command . So just type the command as follows .

:-> sudp apt-get upgrade .

The above command will actually upgrade software packages to current version in our kali linux environment .

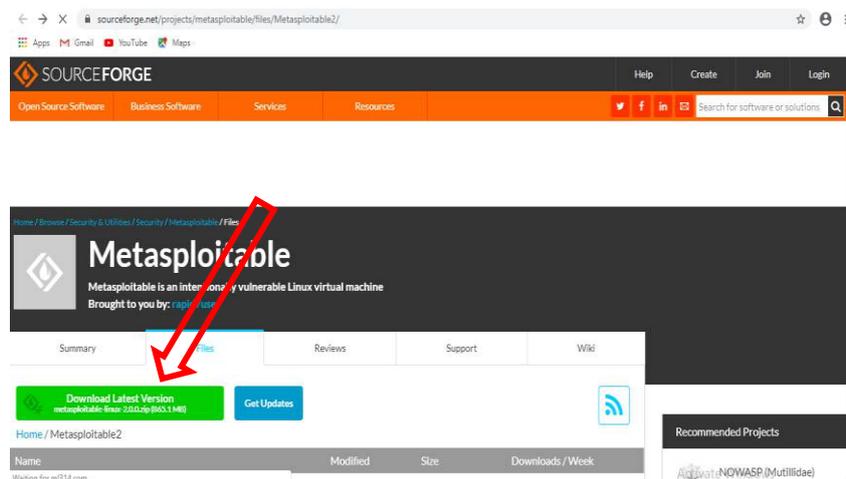
DOWNLOADING & INSTALLING METASPLOITABLE2

Now it's time to install metasploitable2 . Metasploitable2 is nothing but a linux distribution which contains vulnerable web applications . This distribution comes with these vulnerable applications for testing & training purpose . Metasploitable2 is mainly useful in performing website related penetration testing , with metasploitable we can perform web attacks like SQL Injection & many more .

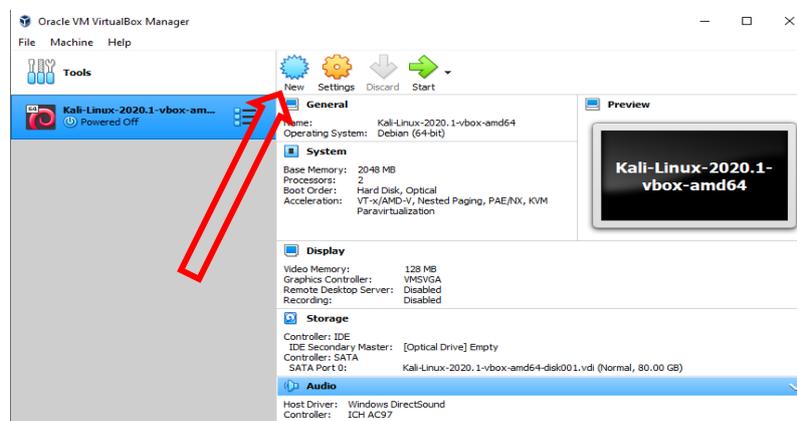
Now it's time to download metasploitable2 distribution . First of all go to google.com and search for “ Metasploitable2 ” . You will find different links related to metasploitable2 . You need to search link related to sourceforge.net or you can directly follow the link below .

<https://sourceforge.net/projects/metasploitable/files/Metasploitable2/>

After opening the link , you will find the following page , here you need to click on download link as shown in the picture .



After downloading the metasploitable2 , Let's install it on our virtualbox . So to install it , first unzip the downloaded folder and then click on NEW button on your virtual box or go to Machine menu and click on NEW .



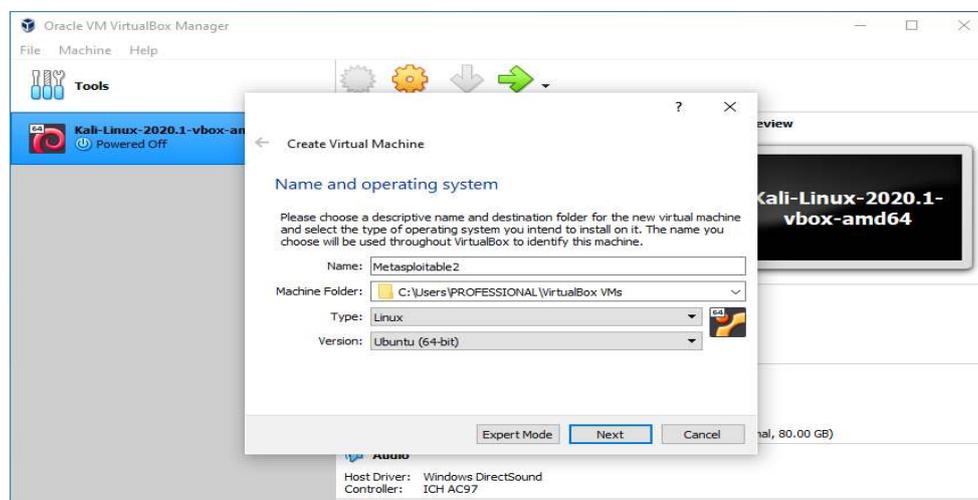
After clicking on NEW button , you will see the following box as shown in the picture , where you need to fill up the following information , such as 1] Machine name 2] Type 3] Version .

So set the information , such as

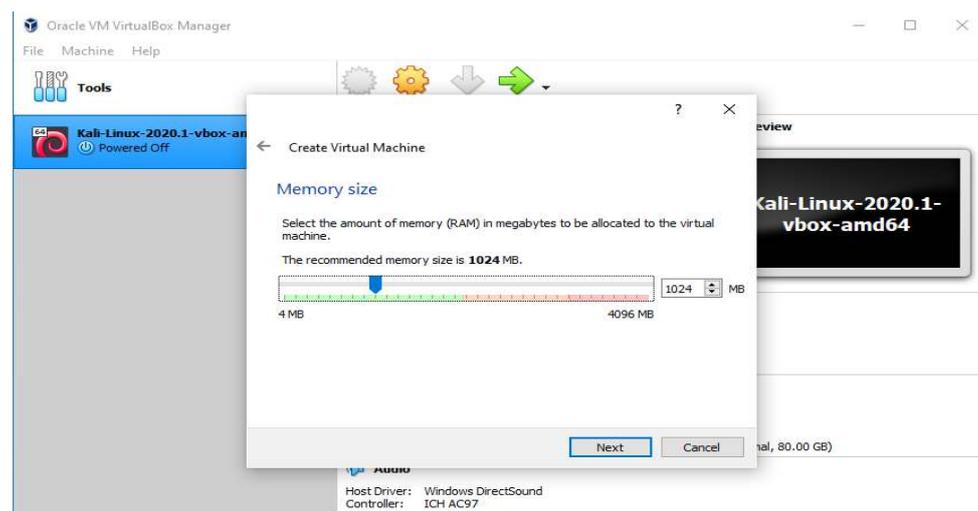
1] Machine name :- Metasploitable2 .

2] Type :- Linux .

3] Version :- Ubuntu (64-bit) Choose the version on your processor type 32-bit or 64 bit



After filling the information just click on next and you will see the following window , here you can set the RAM size for your machine , so set it to 1 GB . It's enough .



After setting the RAM , click on NEXT and you will find the following window , where you need to select the unzipped metasploitable.vmdk file . After selecting the file , click on create . Now after that the window will disappear , now it's time to set up the network settings . So just select the metasploitable2 from the Operating system

list and click on settings option which is present at top . After clicking on settings you will find the following window ,where you need to click on Network and then click on “Enable Network adapter” list . Here from the list you need to select “Host-only Adapter” and click on ok .

Now after this select our Kali-Linux Machine and perform the same operation i.e. go to settings → Network → Enable Network adapter and choose Host only adapter from the list .

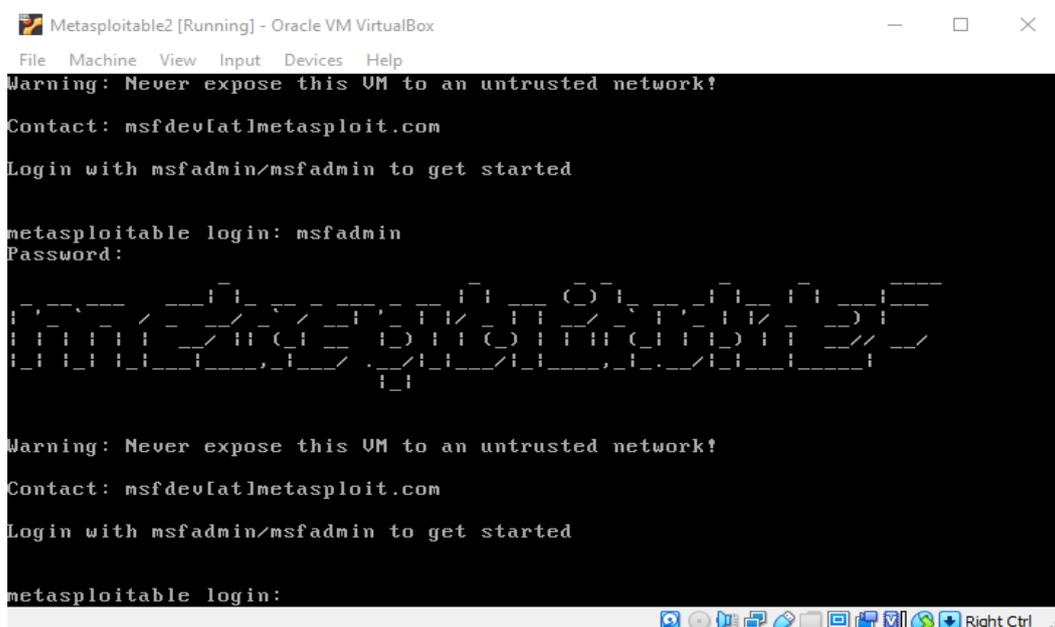
Now after changing the Network settings on both the machines start them one by one . Just select the metasploitable2 machine from list and click on start .

When the metasploitable2 starts , you will see the following window , it doesn't contains GUI interface . Just enter the following username and password as

Username :- msfadmin

Password :- msfadmin

After entering username hit enter and then type the password and hit enter , while entering password , you could not see anything at screen , so just type the password and hit enter.



```
Metasploitable2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Warning: Never expose this VM to an untrusted network!
Contact: msfdev[at]metasploit.com
Login with msfadmin/msfadmin to get started

metasploitable login: msfadmin
Password:

Warning: Never expose this VM to an untrusted network!
Contact: msfdev[at]metasploit.com
Login with msfadmin/msfadmin to get started

metasploitable login:
```

After entering into metasploitable2 ,type the command “ ifconfig ” , it will reveal the IP address of metasploitable2 machine . see the following picture for reference . The rectangle shown in the following picture represents the IP address of metasploitable2 machine .

```
Metasploitable2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
No mail.
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:68:50:ed
          inet addr:192.168.56.101  Bcast:192.168.56.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe68:50ed/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:40  errors:0  dropped:0  overruns:0  frame:0
          TX packets:72  errors:0  dropped:0  overruns:0  carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8161 (7.9 KB)  TX bytes:10224 (9.9 KB)
          Base address:0xd020 Memory:f1200000-f1220000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:148  errors:0  dropped:0  overruns:0  frame:0
          TX packets:148  errors:0  dropped:0  overruns:0  carrier:0
          collisions:0 txqueuelen:0
          RX bytes:46333 (45.2 KB)  TX bytes:46333 (45.2 KB)

msfadmin@metasploitable:~$
```

Now what you need to do is just copy this ip address or note down the ip address and go to our kali linux machine and ping the metasploitable2 machine as shown in the following picture . As you can see the ping is successful that means our machine is successfully connected to our kali linux machine .

```
kali@kali: ~
File Actions Edit View Help
kali@kali:~$ ping 192.168.56.101
PING 192.168.56.101 (192.168.56.101) 56(84) bytes of data:
64 bytes from 192.168.56.101: icmp_seq=1 ttl=64 time=2.25 ms
64 bytes from 192.168.56.101: icmp_seq=2 ttl=64 time=1.06 ms
64 bytes from 192.168.56.101: icmp_seq=3 ttl=64 time=1.02 ms
64 bytes from 192.168.56.101: icmp_seq=4 ttl=64 time=0.986 ms
64 bytes from 192.168.56.101: icmp_seq=5 ttl=64 time=0.916 ms
^C
--- 192.168.56.101 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4065ms
rtt min/avg/max/mdev = 0.916/1.247/2.251/0.504 ms
kali@kali:~$
```

Here we have connected both the machines with “ Host Only Network ” Interface . We have used host only network because we don’t want to connect to the internet and we want to perform all our test inside the local network over LAN .

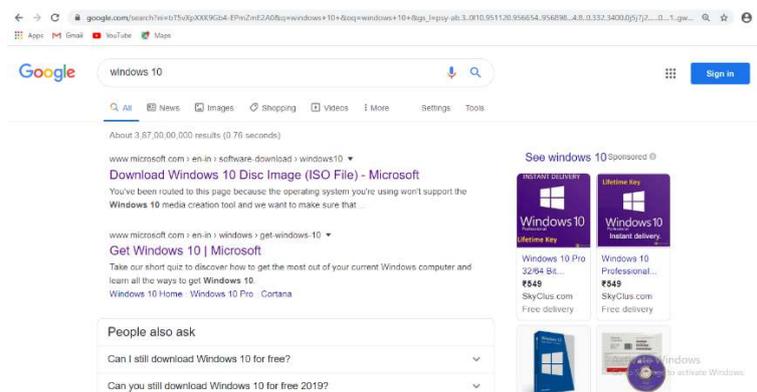
Now just type “ sudo ifconfig ” to get the ip address of kali linux machine and note down the ip address and goto our metasploitable2 machine and ping to our kali linux machine with this ip address .

So by this way we can practice our ethical hacking skills in safe environment .

7. DOWNLOADING AND INSTALLING WINDOWS 10 .

Now it's time to download & install windows 10 in our ethical hacking lab . The purpose of downloading and installing windows 10 in our kali linux environment is to learn or test windows 10 for vulnerabilities of different types .

To download windows 10 just go to <https://www.microsoft.com> & search for windows 10 and download the windows 10 os or the other way is just search google.com for windows 10 and you will directly get the download link for windows 10 . You can see in the following picture of google search result which will show download links at the top .



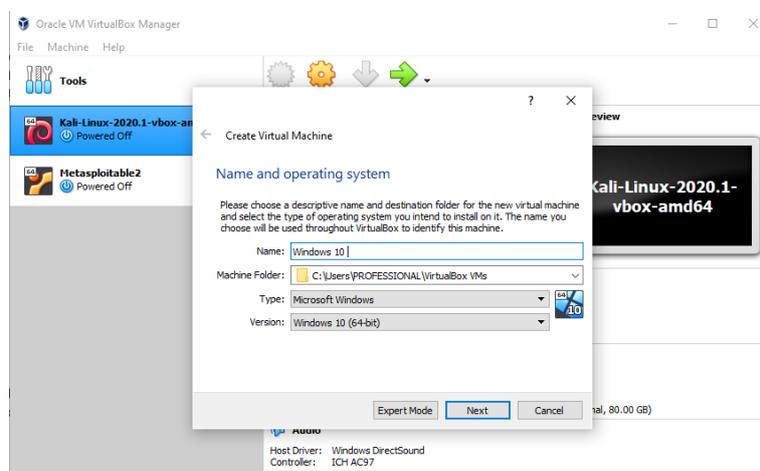
Now after downloading windows 10 ISO files , go to our kali linux machine and click on NEW and fillup the following information .

Name :- Windows 10

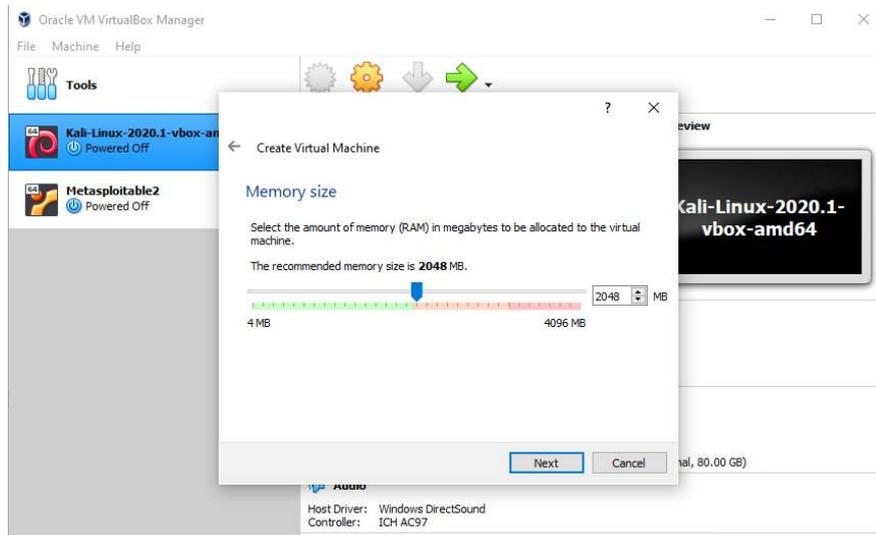
Type :- Microsoft Windows

Version :- Windows 10 (64) .

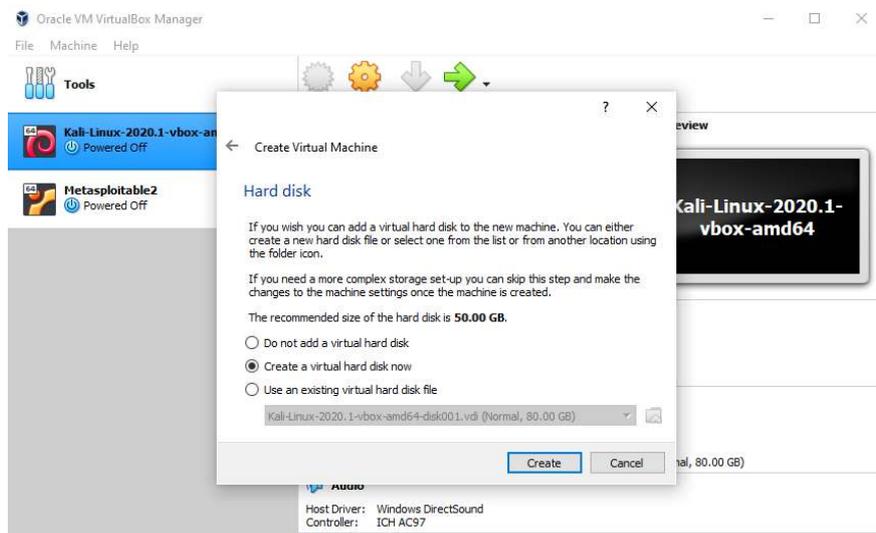
set the version 32-bit or 64 bit based on your processor type . see the following picture for refrence .



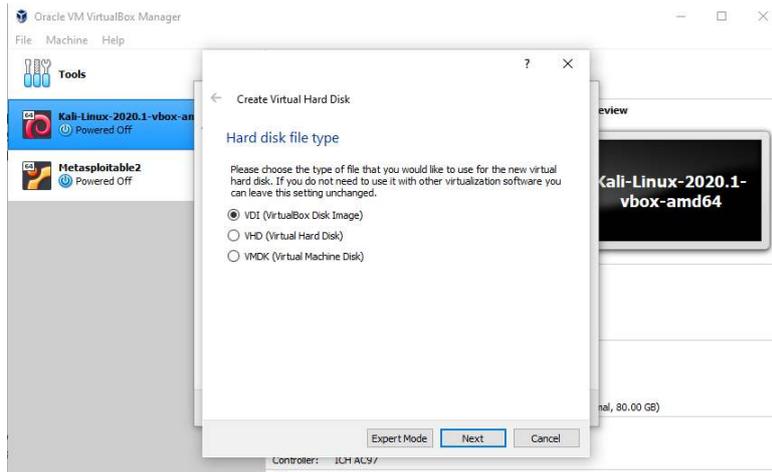
After filling the information click on NEXT and set the RAM for your windows 10 machine . By default it takes 2 GB of RAM but you can increase the size based on your RAM capacity . By moving the slider to left or right you can increase or decrease the RAM amount . So if you have more RAM in you computer then you can increase the size here or leave it to default 2 GB .



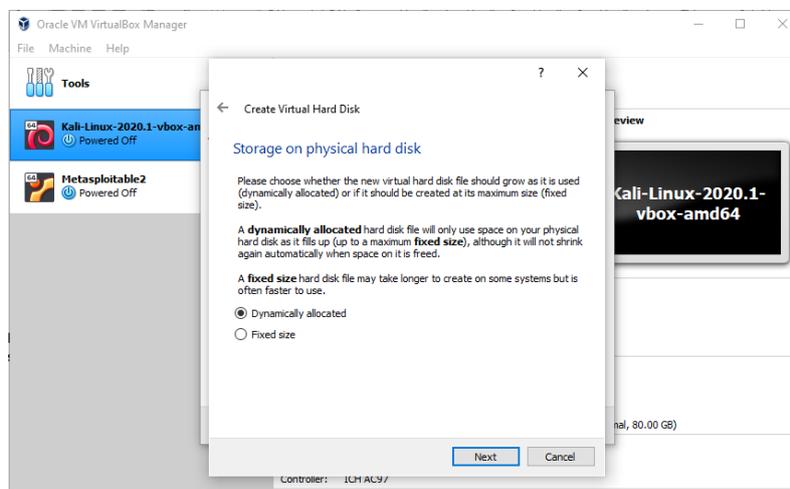
Now after setting up the RAM , now click NEXT and here you need to choose the SECOND option i.e. “ Create a virtual hard disk now ” click on create as shown in the following picture .



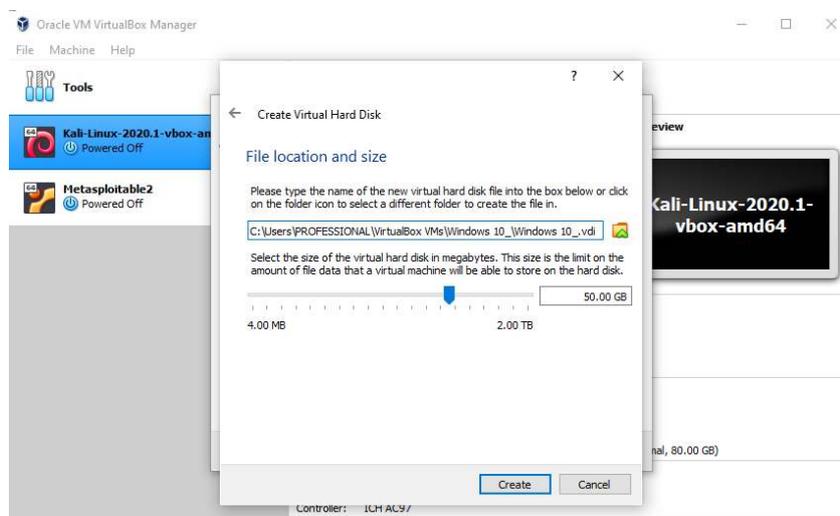
After clicking on create you will see the following window , so do not change anything here & click on next .



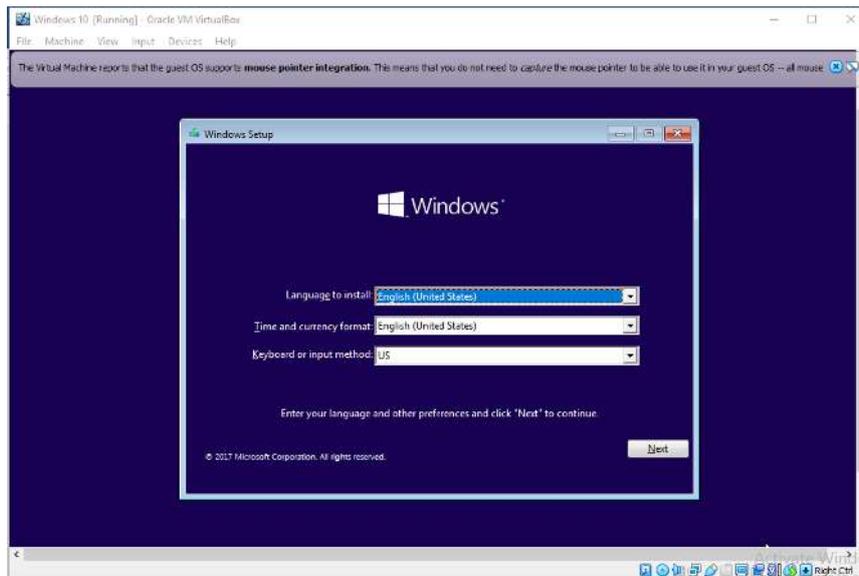
Now after clicking on next you will see the following window , here leave the settings to dynamic and click on Next as shown in following picture .



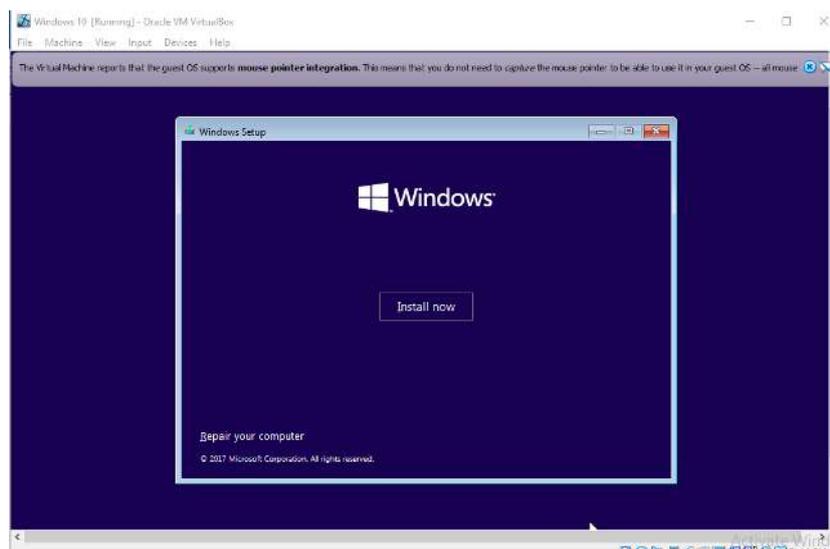
Now you will see the following window , here you can increase or decrease the amount of hard disk space , so leave it to 50 GB as it is and click on create as follows .



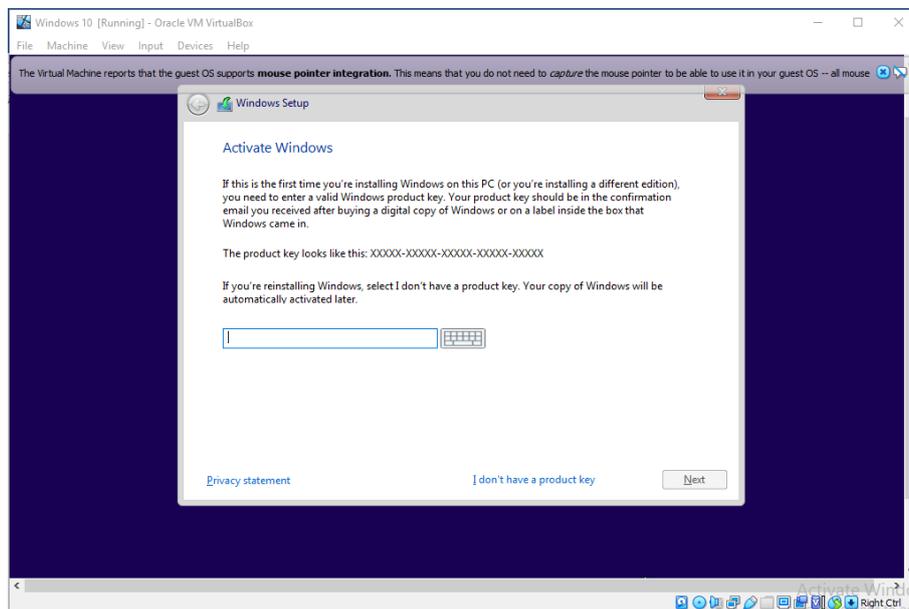
Now after clicking on create you will see a option windows 10 in your virtualbox tab . so just select windows 10 and click on start . After starting our windows 10 you will see the following window , where you need to select the WINDOWS 10 ISO file or you need to show file path for WINDOWS 10 ISO file and then click on start button . After clicking on start button the installation of windows 10 will begin . At the beginning of installation you will see the following window where you need to set language , time and currency format and keyboard input method . So I recommend you to set the information as it is or you can change according to your requirement .



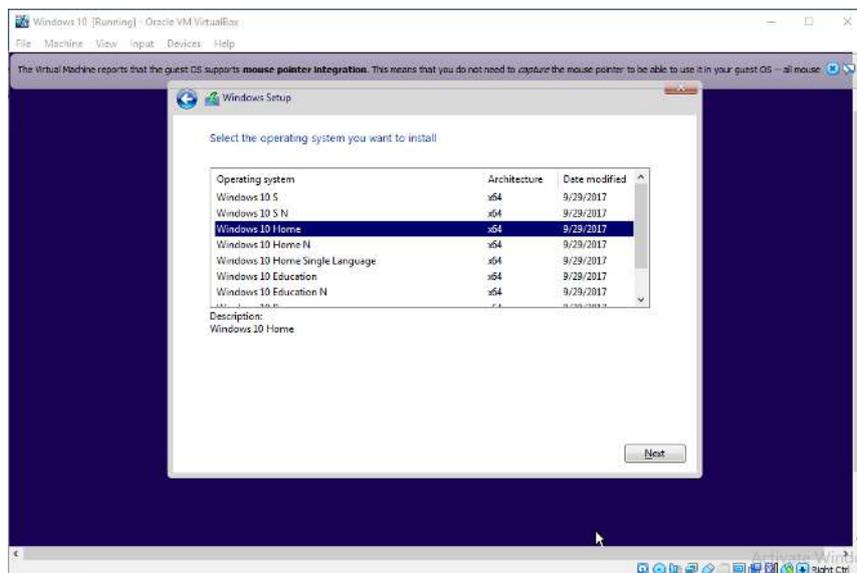
After filling the information click on next and you will see the following window where you need to click on install now button as shown in following picture .



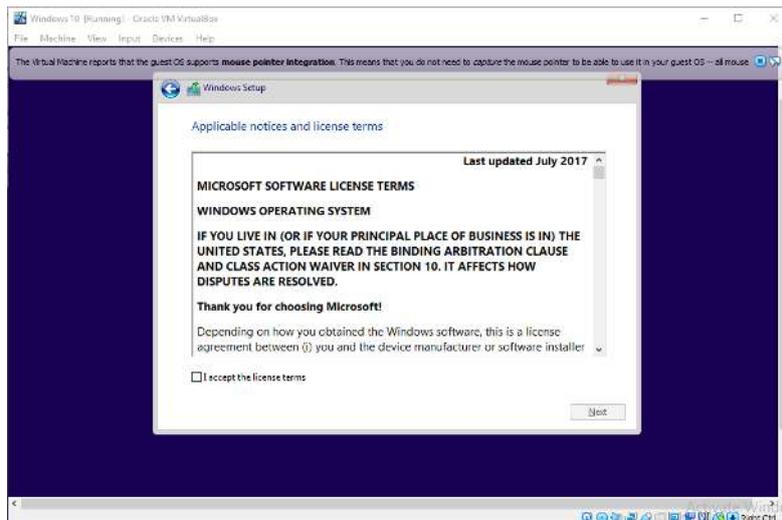
After clicking on install now button you will see the following window where it will ask to enter license key of the product , so just click on I don't have a product key as shown in following picture .



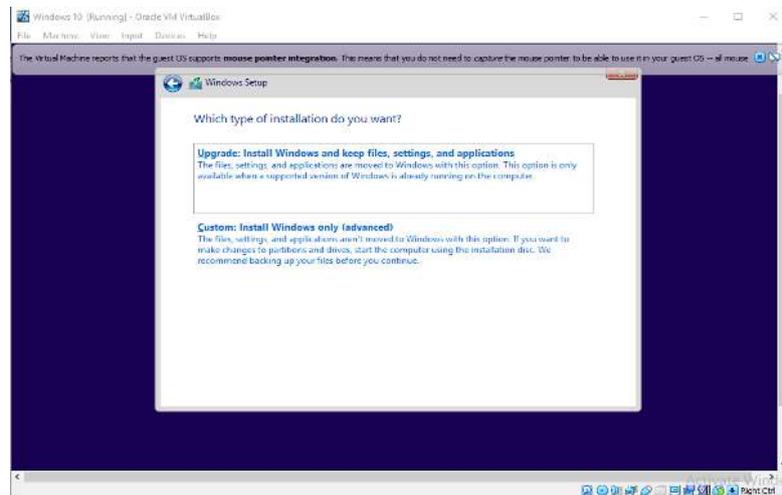
After clicking on that you will get the following window , here you need to set the windows edition , it could be Home or professional or education . Here I am gonna set Home edition , so after setting the option click next .



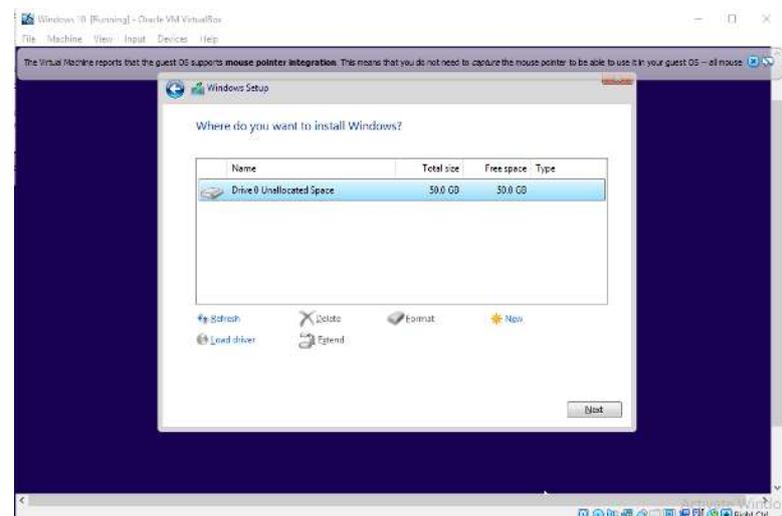
After clicking on next you will see the following license agreement window , so accept the license agreement by clicking on the check box & click on next .



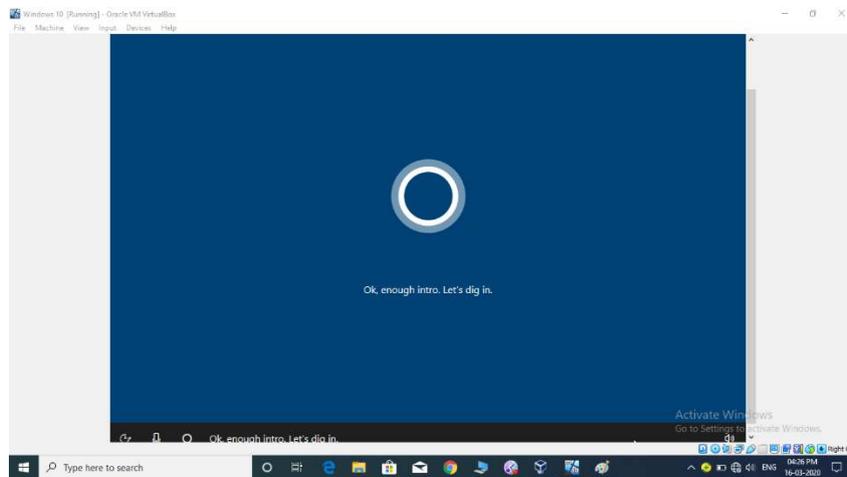
Now after clicking on next you will get the following window , here you need to select the second option “ Custom Install windows ” .



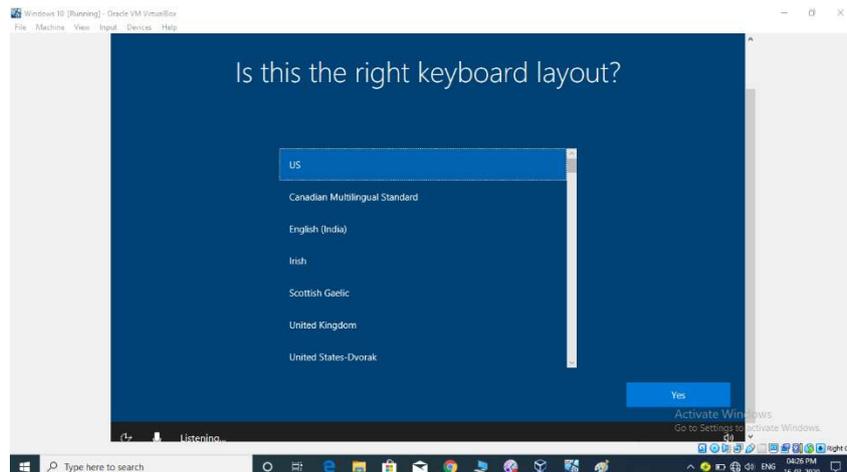
After selecting the second option , you will get the following window , here you need to click on next button . If you want you can create different partitions here , like C , D , E , F drive .



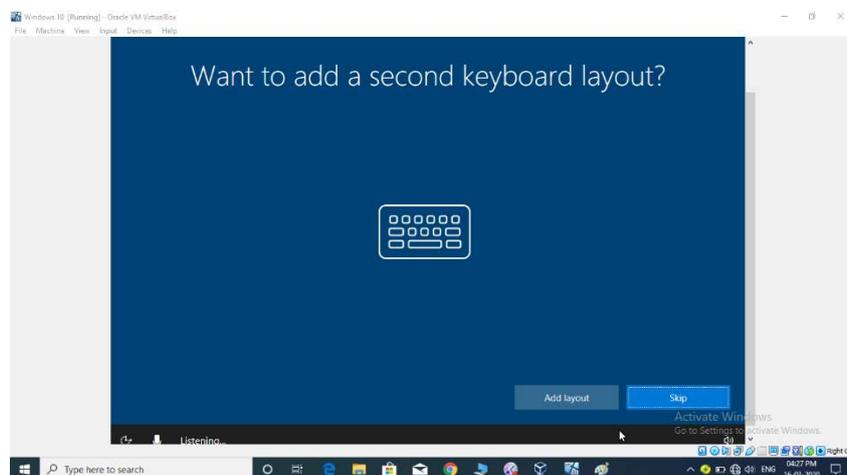
After clicking on next , the computer will restart and start to install the operating system on “ C :” Drive . It will restart two times , so you need to be patience until you will get the following window , where Cortana ask you to complete the installation process .



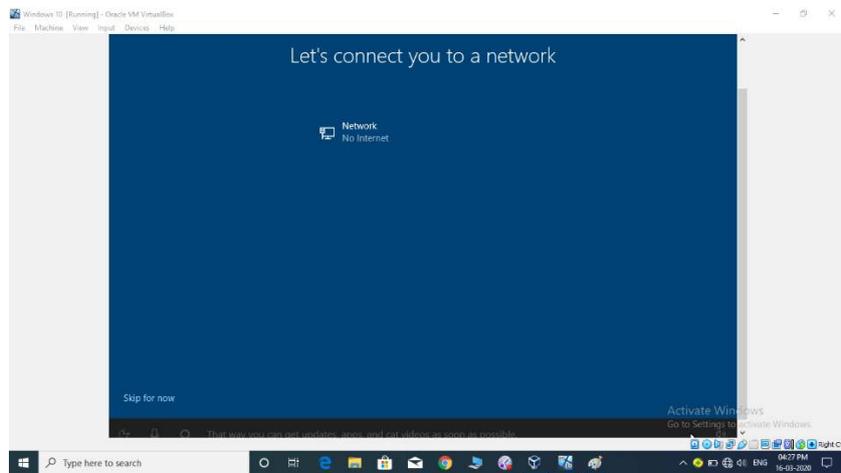
So at first it will ask you to select the keyboard layout for your machine , so I recommend you to set it to US English .



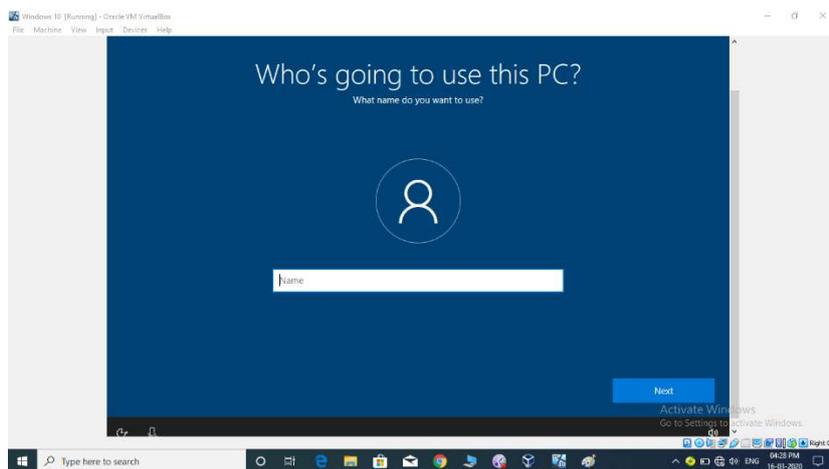
After that it will ask you to set second keyboard layout , here skip this step .



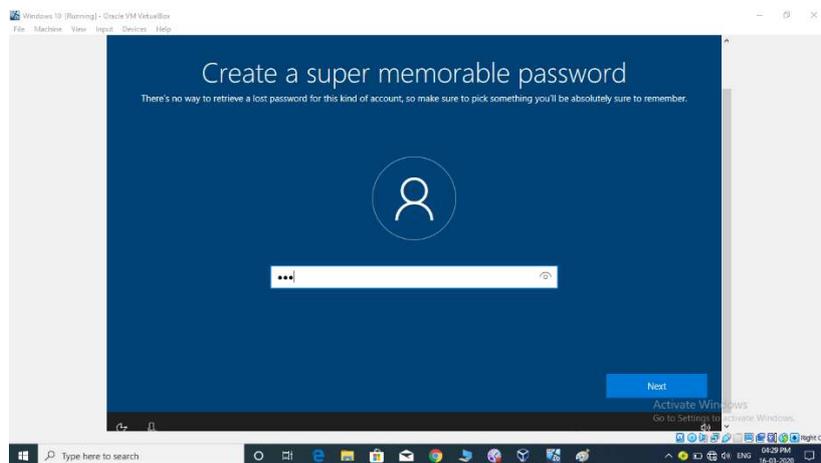
After skipping on this step , you will get the following window , here you need to skip this step too, so click on skip for now .



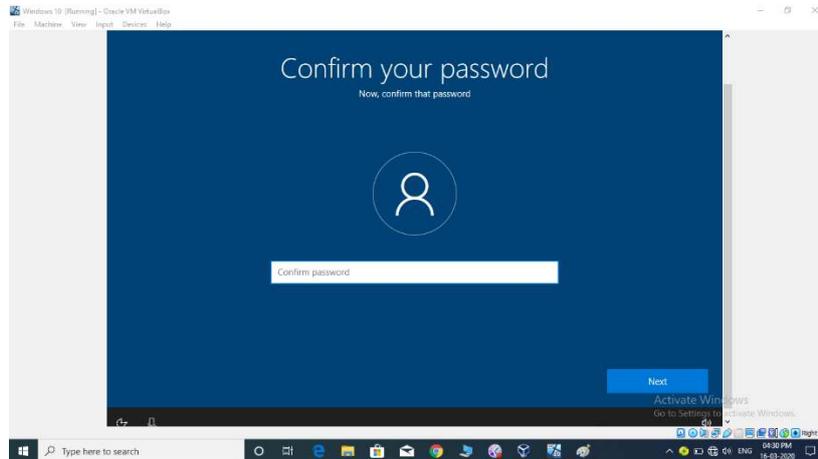
After skipping on above step , you will see the following window , here you need to set up USERNAME and PASSWORD for your windows account . so set the user name first and click on next .



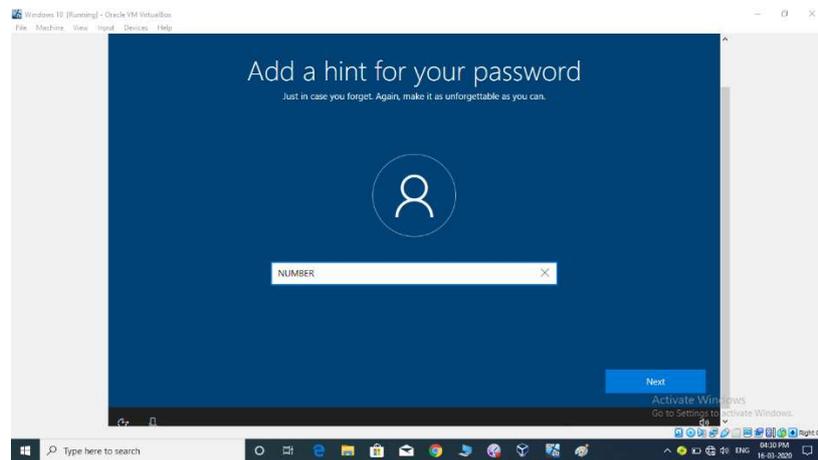
After that you need to setup password for your account as shown in following window . So setup password and click on next .



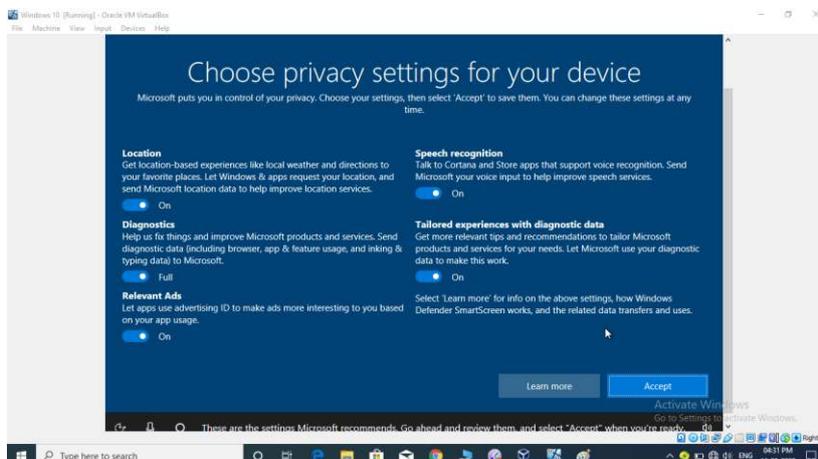
After this it will again show the same window for confirming the password , so enter the same password again and click on next .



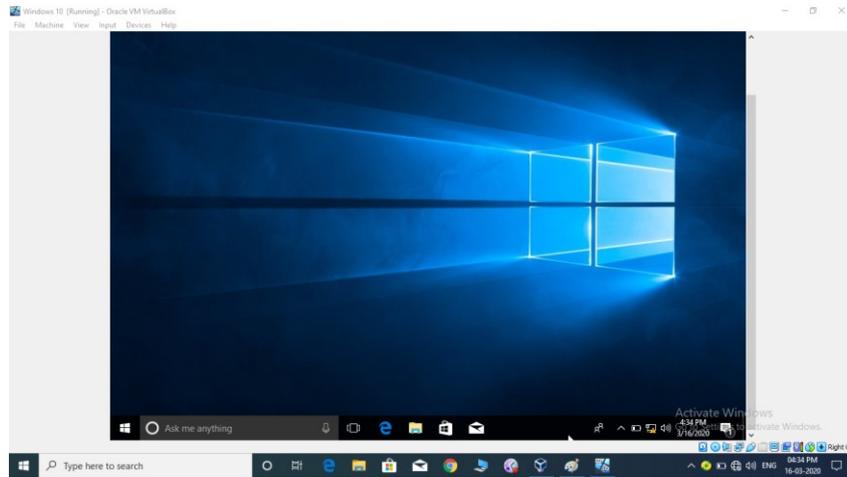
After that it will show another window , here you need to enter a password hit for your password and click on Next .



After that it will show another window as shown below here you need to accept the settings , so just click on Accept .



After accepting , it will restart the system and after few minutes you will see your fresh desktop of windows 10 as shown below .



8. DOWNLOADING & INSTALLING UBUNTU DESKTOP .

In this chapter we gonna install Ubuntu desktop as virtual machine . When you want to test Linux system for any vulnerability then you can perform the test on Ubuntu desktop .

So to install the Ubuntu desktop first we need to download it on our system . So to download it on your system first go to <https://www.ubuntu.com> and click on download link and just download Ubuntu desktop .

The Ubuntu Desktop 19.10 which we gonna install has following requirements :-

PROCESSOR :- 2 GHz .

RAM :- 4 GB .

HARD DISK SPACE :- 25 GB .

So follow the same steps which we had used for installing windows 10 as follows :-

1] click on NEW .

2] Enter the following details :- 1] NAME :- UBUNTU DESKTOP .

2] TYPE :- LINUX .

3] VERSION :- UBUNTU (64-bit) .

3] Set the RAM size .

4] Create a Virtual Hard Disk .

5] Then select VDI (VirtualBox Disk Image) .

6] Then click on Dynamically allocated .

7] Then set the disk size (you can increase if you want) .

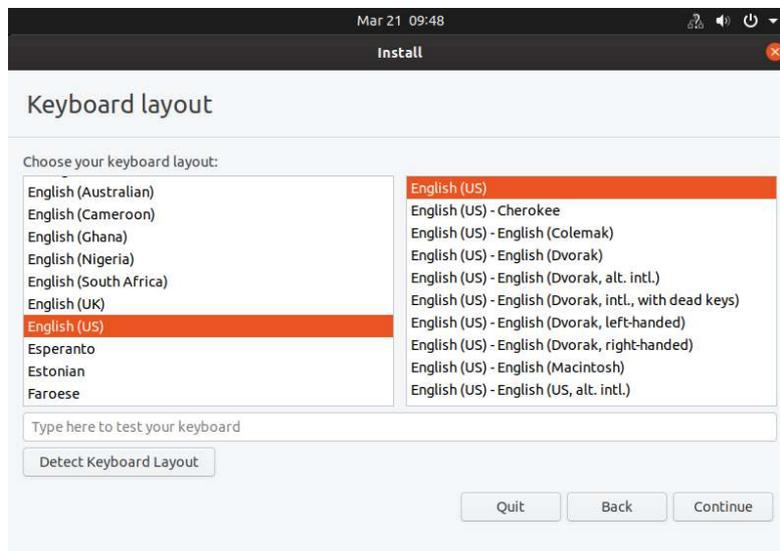
8] After that click on create .

9] After that select on “ UBUNTU DESKTOP ” icon and click on start .

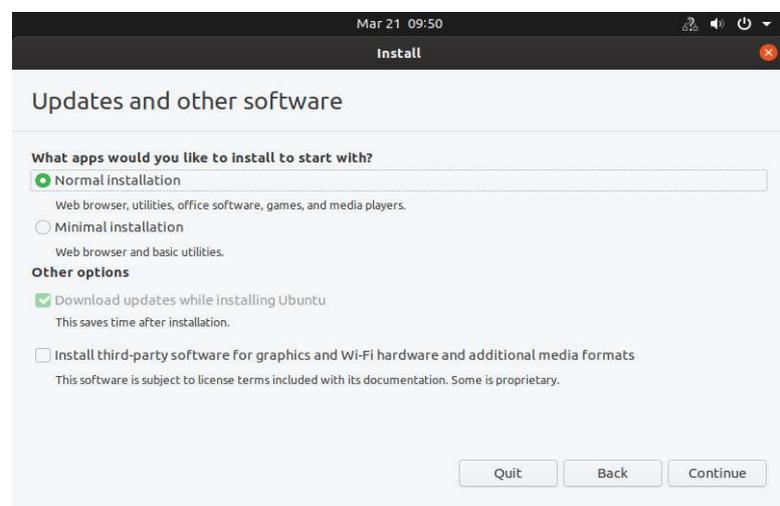
After clicking on start you will see the following windows , here you need to select you language first and then click on “ Install Ubuntu ” .



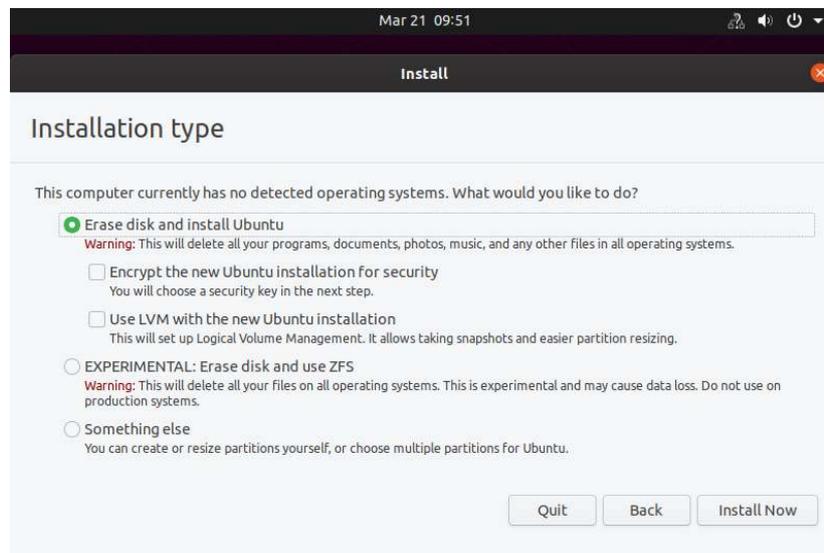
After clicking on install Ubuntu , you will get the following window here you need to select keyboard layout for Ubuntu . Here i recommend you to set English(US) in both the boxes and click on continue .



After clicking on continue you will get the following window , here you need to select “ Normal installation ” and click on continue .



After clicking on continue button you will get the following window , Here just set the option to default , i.e. “ Erase disk and install Ubuntu ” and click on Install Now button .



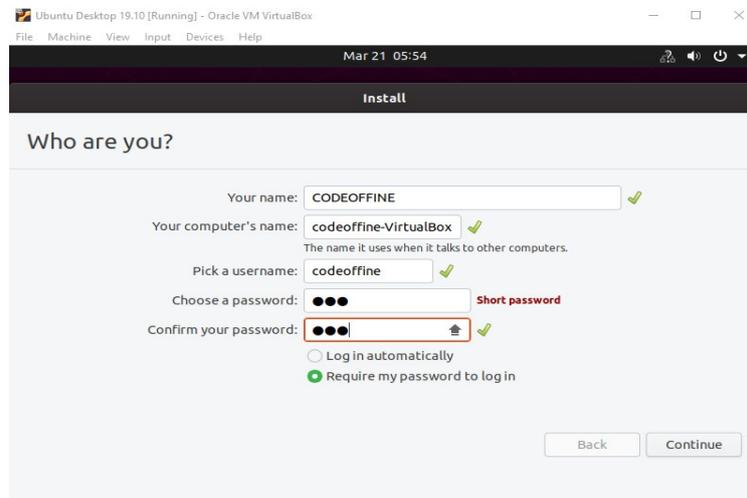
After clicking on Install Now button you will get the following window , so just click on continue .



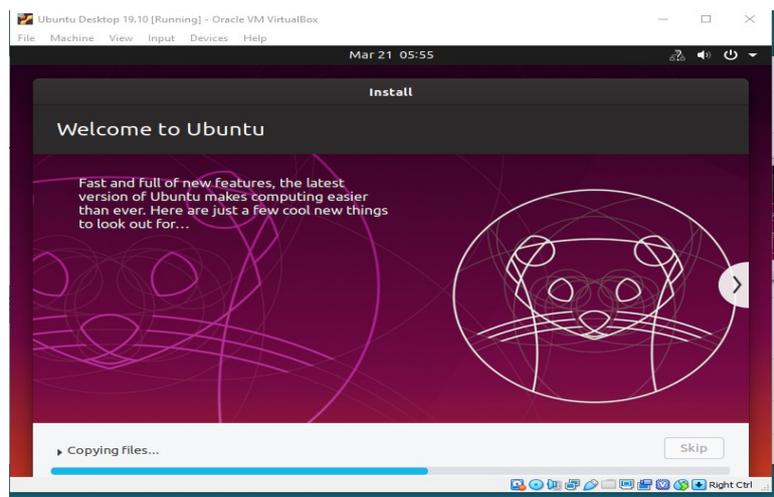
After above step you will see the following window , here you need to select your region or country . So set your region and click on continue .



Now after clicking on continue you will get the following window , here you need to fillup your information . So enter your name , computer name , username for your computer , then set a password and at the end choose “ Require my password to log in ” . After filling all the information as shown in following box click on continue.



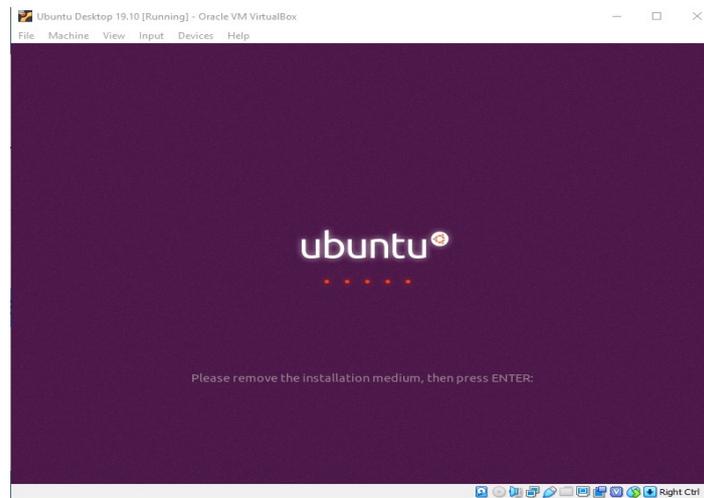
After clicking on continue you will see the following window , where copying of files and installation of packages will begin . It will take some time , so be patience .



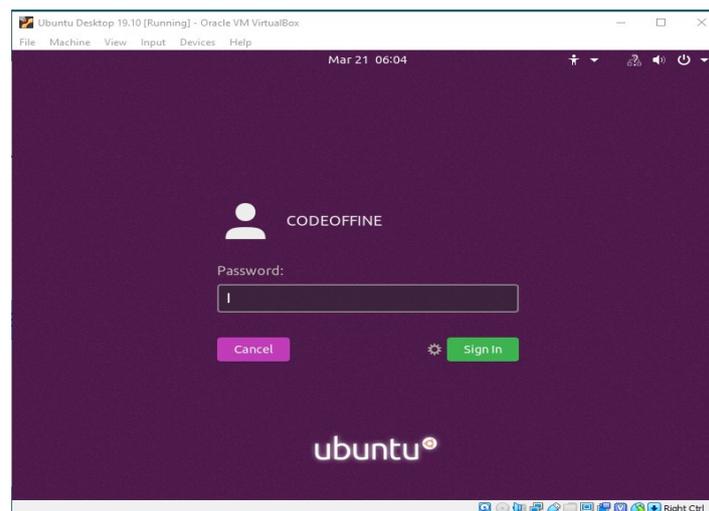
After waiting for some time you will get the following window , here click on restart now and wait until the VM restarts .



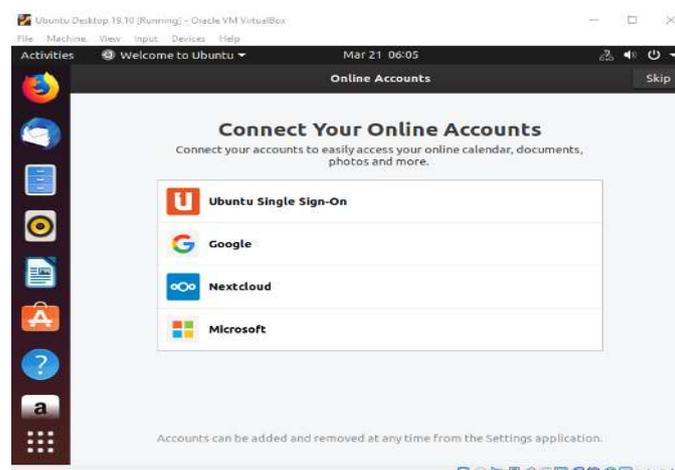
After restarting the VM , you will get the following window , here you need to wait for some time .



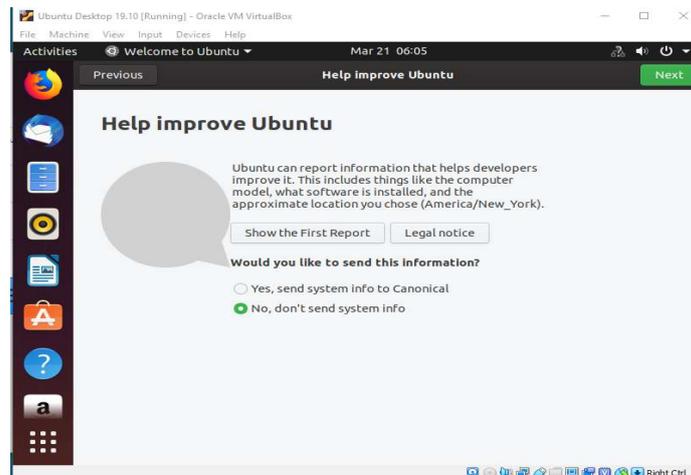
After sometime you will see the following window , here you need to enter your password and click on Sign In .



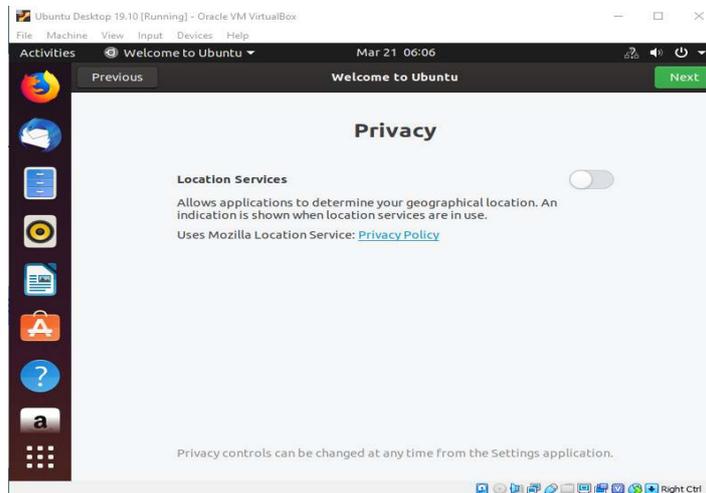
After first time " Sign In " you will see the following window , here you click on skip at the upper right corner of the window



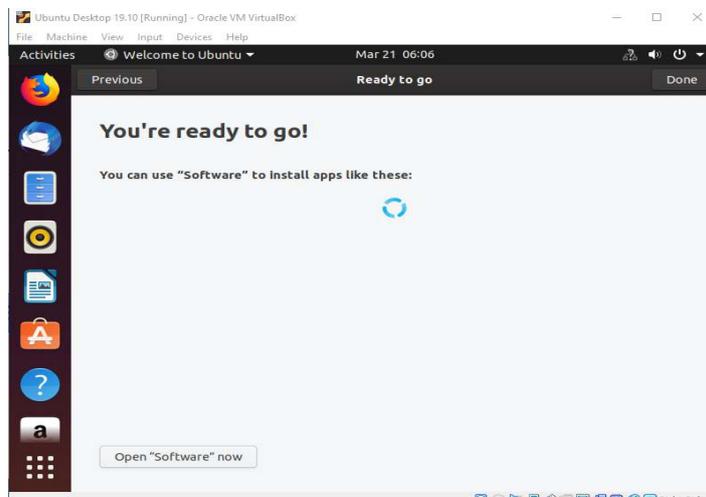
After skipping the above step , you will get the following window , here just click on Next .



Now clicking on Next , you will see the following window , here again click on Next .



After clicking on Next you will get the following window , here click on done .



Now it's done , We have successfully installed our Ubuntu Desktop 19.10 .

Installing Guest Additions :- Now it's time to install Guest additions . Guest Additions will helps us to use more features of virtual box . So to install the guest additions follow the following steps .

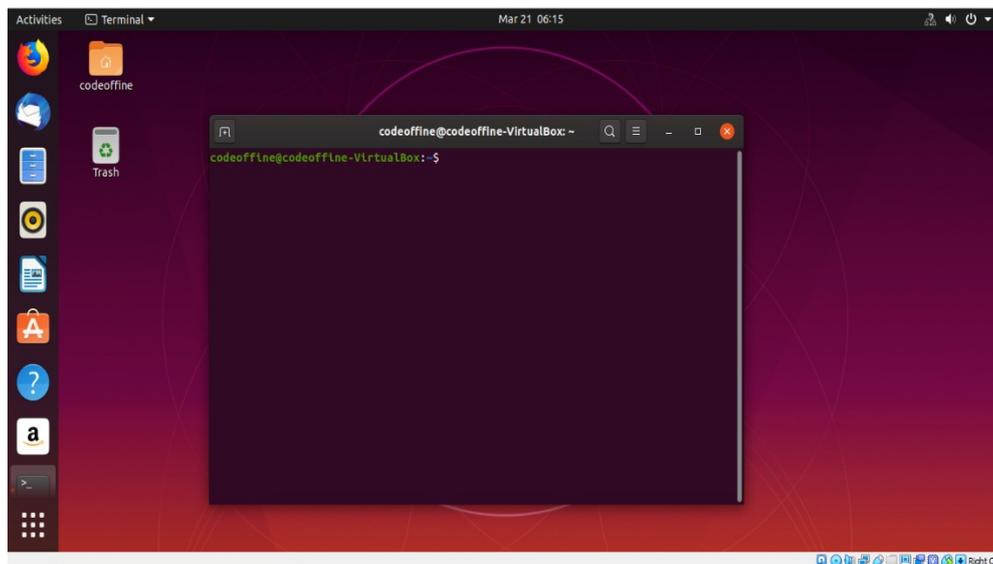
1] Click on “ Devices ” Menu on virtual machine menu .

2] Now you will see the “ Install Guest Additions ”. You can see this options at the bottom .

After clicking on Install Guest Additions you will see the following window , so just click on Run button and it will install the Guest additions for you .



After installing the Guest additions , just restart your machine and you will see our Ubuntu Desktop 19.10 in Full Screen . Following is the first look of Ubuntu Desktop 19.10 after installing Guest Additions . You can start Terminal my pressing Alt + Ctrl + T at the same time . After pressing Ctrl+ Alt + T you will the terminal as shown below .



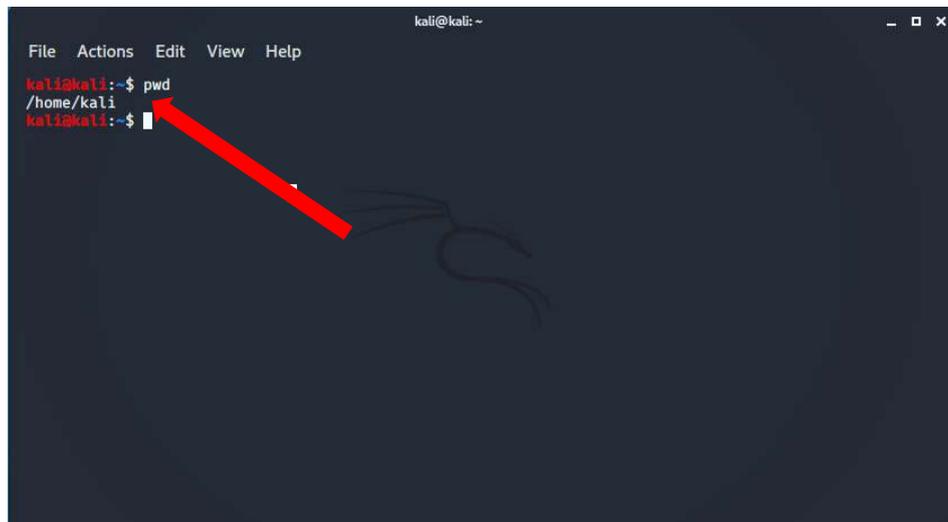
PERFORMING BASIC OPERATIONS IN KALI LINUX .

In this chapter we gonna learn to interact with linux terminal . It seems difficult at the beginning to use and remember the commands , but it becomes easier after some time . According to my point of view it's difficult and exciting at the same time to interact with the Terminal . So let's get started with creating directories .

1] CREATING AND LISTING DIRECTORIES :-

In linux system folder is called as directory . So here we gonna see how to create a directory , list available directories , changing directories .

First of all press the key combination Ctrl+Alt+T to start the terminal . After starting the terminal let's see where we are now . Just type PWD on terminal and hit enter . It will show you your present working directory . See the following picture , which shows present working directory as /home/kali .

A screenshot of a terminal window titled 'kali@kali: ~'. The window has a menu bar with 'File', 'Actions', 'Edit', 'View', and 'Help'. The terminal shows the following text: 'kali@kali:~\$ pwd', followed by the output '/home/kali' on the next line. A red arrow points from the output to the prompt 'kali@kali:~\$' on the line below.

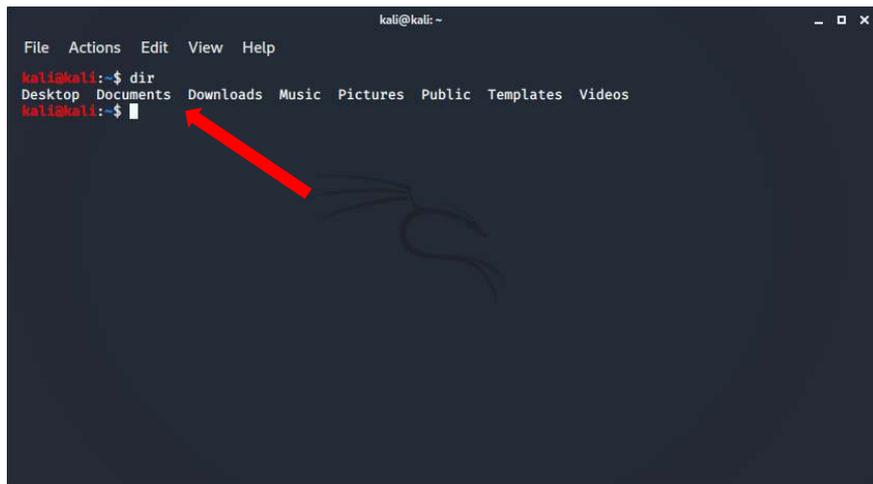
By observing above picture you can see , the user is present inside / home / kali .

Where the starting forward slash / represents the Root Directory . Root directory is main directory where the Linux operating system is get installed . Then after root directory there is home directory and then kali directory . So Basically now the user is inside kali directory and / home / kali is the full path of directory .

Now let's see how to list the directories . To list the directories there is a command dir . So just type dir on the terminal and hit enter and you will see the list of directories available inside current directory .

Just type → dir and hit enter .

Following picture shows you the list of directories available on the users current directory .



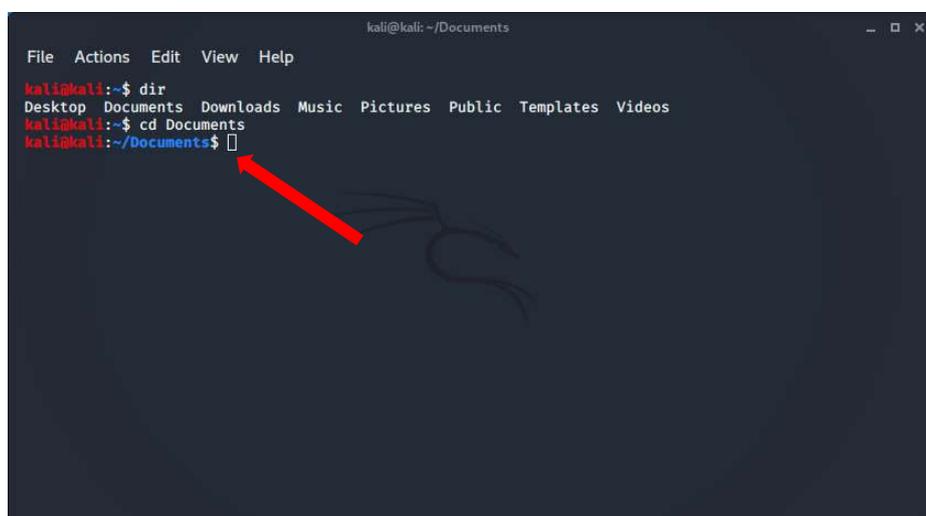
```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ dir  
Desktop Documents Downloads Music Pictures Public Templates Videos  
kali@kali:~$
```

2] CHANGE , CREATE , RENAME , REMOVE DIRECTORIES :-

Now let's see how to change your directory . Now the user is present inside / home / kali directory and inside kali directory there are many directories listed in above screenshot as Desktop Documents Downloads Music Picture Public Templates Videos . Now lets see how to move from kali directory to Documents directory . To change the directory there is a command cd . CD stands for change directory . After typing the command cd you need to provide the full path of the directory , where you want to move . Here I just want to move inside Documents directory . Because Documents directory is present inside the current directory that's why we don't need to add the full path of it , we can directly type the name of the directory after typing the command as follows .

➔ cd Documents .

As you can see in the following picture , after typing the above command our directory is changed to Documents , so now we are inside Documents directory .

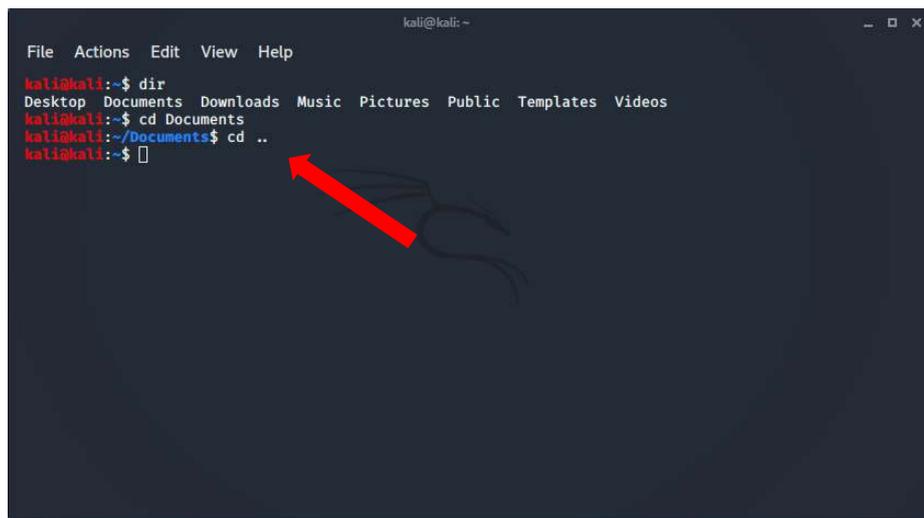


```
kali@kali: ~/Documents  
File Actions Edit View Help  
kali@kali:~$ dir  
Desktop Documents Downloads Music Pictures Public Templates Videos  
kali@kali:~$ cd Documents  
kali@kali:~/Documents$
```

Now let's see how to get back to our previous directory . To get back to our previous directory there is dot dot operator . Just type command cd and .. to get back to kali directory as shown below .

➔ `cd ..`

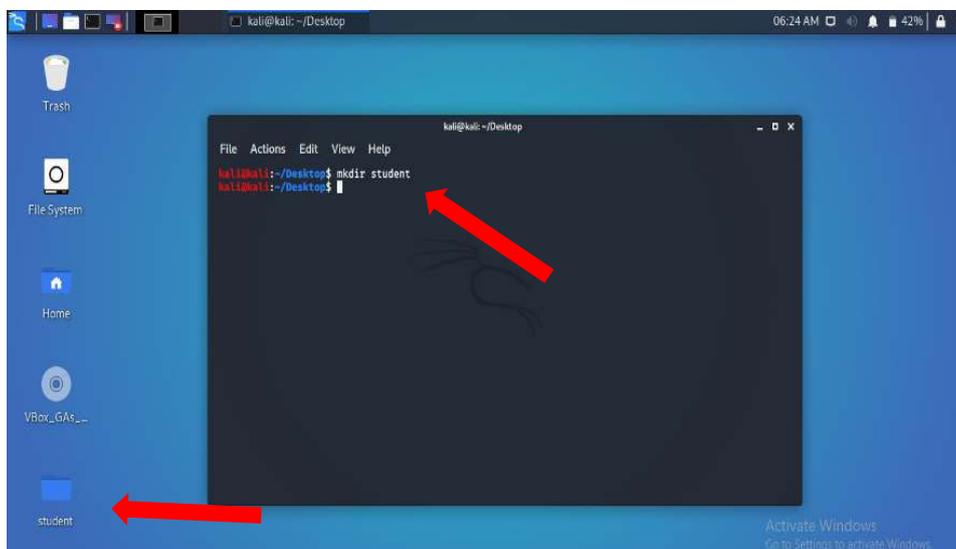
After typing the command `cd ..` you will get back to kali directory . The .. operator works with cd command to get one directory back or forward . Please observe the following picture .



```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ dir  
Desktop Documents Downloads Music Pictures Public Templates Videos  
kali@kali:~$ cd Documents  
kali@kali:~/Documents$ cd ..  
kali@kali:~$
```

A terminal window titled 'kali@kali: ~' showing the execution of the `dir`, `cd Documents`, and `cd ..` commands. A red arrow points from the `cd ..` command to the resulting prompt `kali@kali:~$`.

Now let's see how to create a directory . To create a directory there is a command `mkdir` , Just type `mkdir directory_name` and hit enter . First move on Desktop directory , so that we will be able to see the directory visually . So just type `cd Desktop` to move on Desktop . After getting on Desktop just type `mkdir` and directory name and hit enter . Please see the following picture where i have created a directory `student` on Desktop .



➔ `mkdir student .`

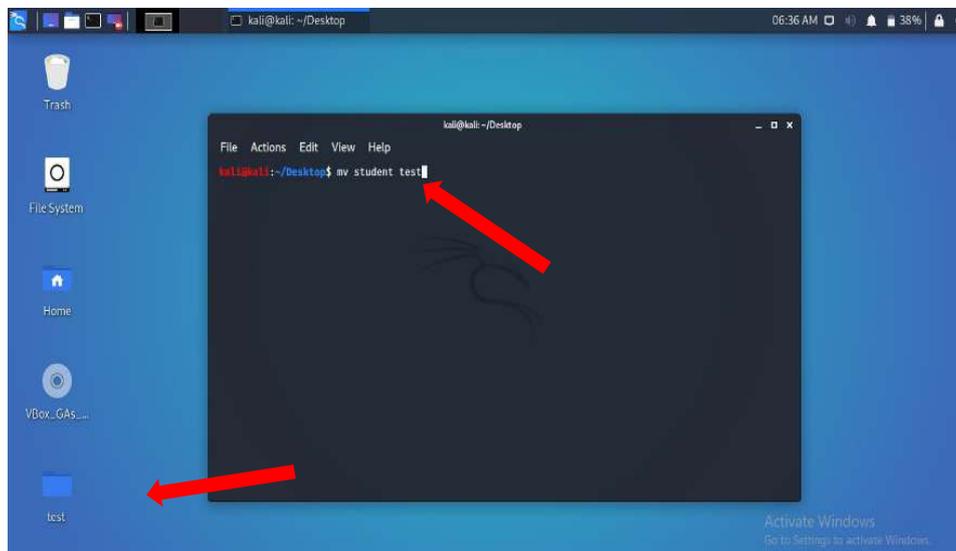
In above picture you can see student directory is created above desktop after typing the above command . You can create many directories in one shot , just type the name of directories followed by mkdir command .

Now let's see how to rename the directory . To rename a directory there is a command mv . Following is the syntax to rename the directory .

➔ `mv old_name new_name .`

as you can see above , first you need to enter the old name of directory and then enter the new name after typing mv command . So I have renamed the student directory to test directory with the command `mv student test .`

observe the following picture to see the output of above command .



Now it's time to see how to remove a directory . To remove a directory there is a command rmdir . Following is the basic syntax to remove a directory .

➔ `rmdir directory_name .`

Let's remove the test directory . To remove the directory , type the command as follows and hit enter . after typing the above command you will find the directory will be removed from desktop .

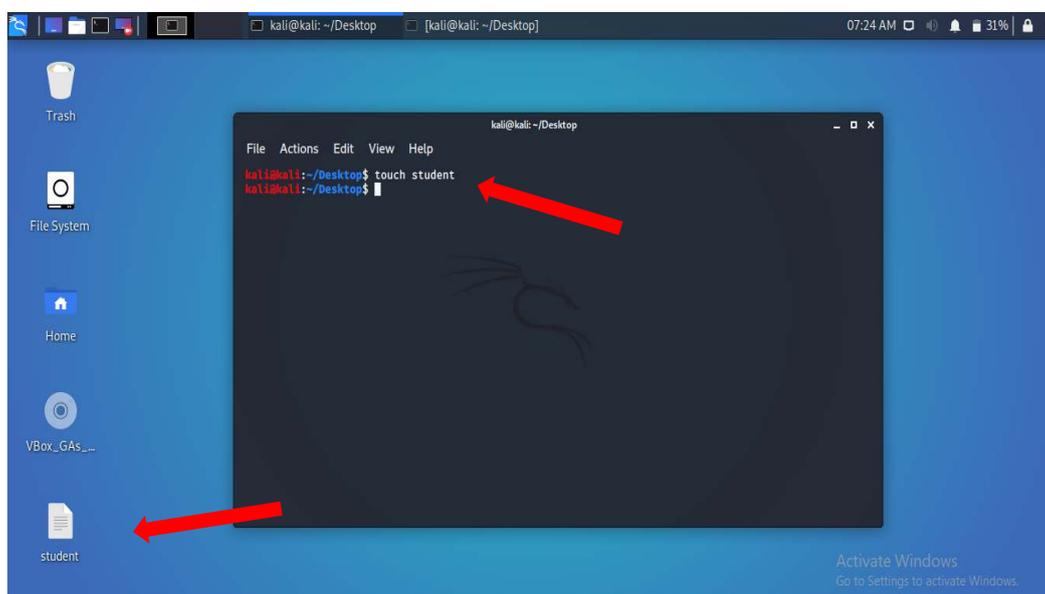
➔ `rmdir test`

3] CREATE , RENAME , REMOVE FILES :-

In above part we have learned How to create , rename and remove directories . Now let's see how to create , rename and remove files in linux . To create a file there is command touch . Following is the basic syntax to create file .

➔ touch filename

So let's create a file student . Just type touch student and hit enter .After typing the above command you will find the a file student is get created on desktop . observe the following picture .



Now let's see how to rename a file . There is the same command mv to rename a file . So just type mv old_file_name and then new_file_name .

➔ mv student test

above command will rename student file to test .

Now let's see how remove a file . To remove the file there is a command rm . You need to enter file name after typing the command rm . Following is the basic syntax .

➔ rm file_name

so let's remove our file test . Just type rm test and hit enter . You can see the command in following picture .

```
kali@kali: ~/Desktop
File Actions Edit View Help
kali@kali:~/Desktop$ rm test
kali@kali:~/Desktop$
```

4] ADD , SWITCH , REMOVE USERS in Linux :-

In this part we gonna learn how to add new users in our linux systems and how to remove them when we need . so to add the user there is a command adduser . Following is the basic syntax to add users in our linux system .

➔ `sudo adduser user_name`

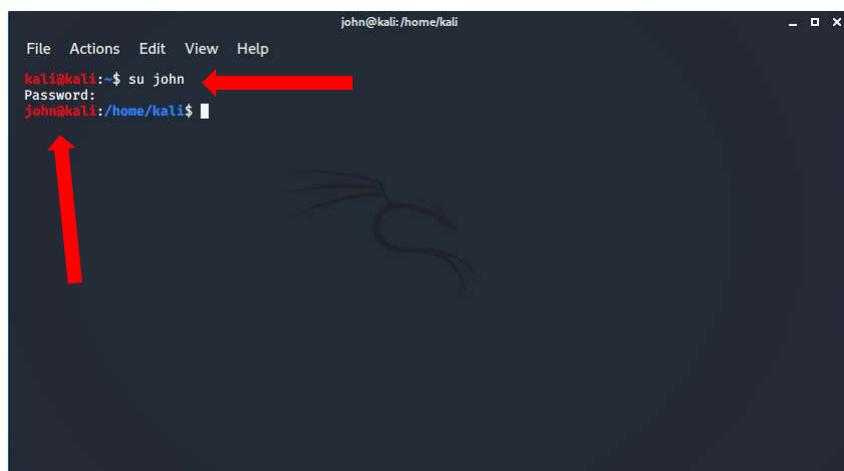
by following the above syntax you can add new users in our linux system . In above command sudo is for getting administrative level privileges . You can't add new users without sudo . so let's add a new user " john " . just type the command " sudo adduser john " and hit enter . after hitting enter it will ask you to enter password for the user , so enter the password and hit enter , after hitting enter again you need to re-enter a password . After that it will ask you to enter Full Name , Room Number , Work Phone , Home Phone , Other . After entering all the information a new user will be added in our system .

```
kali@kali: ~
File Actions Edit View Help
kali@kali:~$ sudo adduser john
Adding user `john' ...
Adding new group `john' (1001) ...
Adding new user `john' (1001) with group `john' ...
Creating home directory `/home/john' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for john
Enter the new value, or press ENTER for the default
   Full Name []: john john
   Room Number []: 1234
   Work Phone []: 34555
   Home Phone []: 55555
   Other []: USA
Is the information correct? [Y/n] Y
kali@kali:~$
```

Now let's see how to switch from the current user to new user that we have created . To switch to new user there is a command `su` . `su` stands for switch user . Following is the basic syntax to use the command .

➔ `su user_name`

so to switch to our new user `john` , just type `su john` and hit enter , after hitting enter it will ask you for password , so just enter the password that we have entered during creation of user `john` and hit enter . After hitting enter you will find yourself to the new user . You can see the change of user name at the terminal . see the following picture for reference . You can see how the name of terminal is changed from `kali` to `john` at left side , pointed by red arrow .

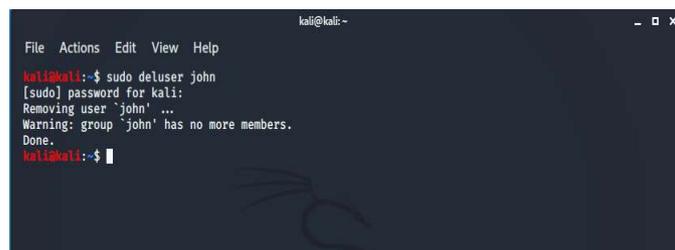


```
john@kali: /home/kali
File Actions Edit View Help
kali@kali:~$ su john
Password:
john@kali: /home/kali$
```

Now let's see how to remove a user from linux system . To remove the user you need to have `sudo` access .i.e. administrative level privilege . So there is a command `deluser` which can be used to remove a user in linux system . Following is the basic syntax to remove a user .

➔ `sudo deluser user_name`

So let's remove our newly added user `john` from our system . Just type `sudo deluser john` and hit enter . After hitting enter it will ask you to enter password for current user . You can't remove user `john` by logging in as `john` . First switch to another user and then perform the above operation . so I switched back to user `kali` and performed the `deluser` operation and you will find the user will be removed . Please see the following picture for reference .



```
kali@kali:~$ sudo deluser john
[sudo] password for kali:
Removing user 'john' ...
Warning: group 'john' has no more members.
Done.
kali@kali:~$
```

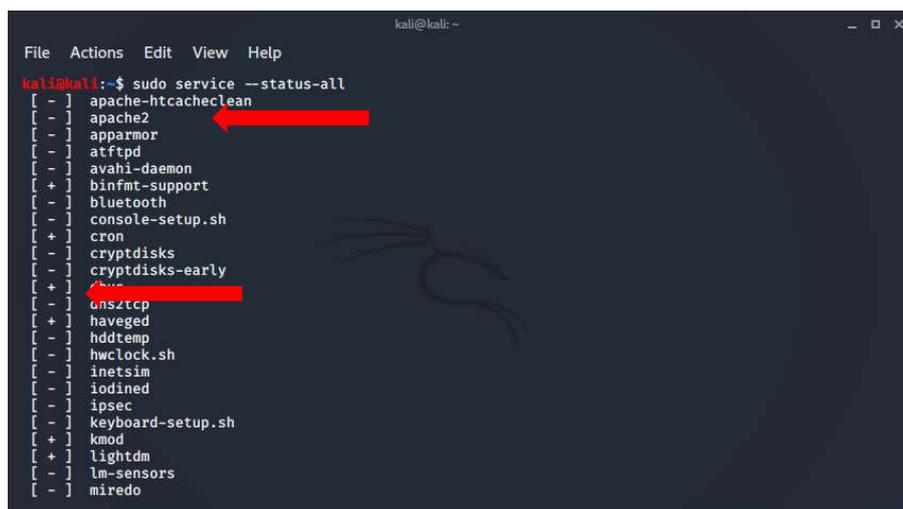
5] START , STOP , RESTART SERVICES IN LINUX :-

In this section we gonna talk about how to interact with services in linux . In our computers memory there are different services which are running at background . We can't see them as running directly , but with the help of linux command we can observe them . There is a command named service which is used to manage services in linux . But to use the service command you need to have administrative level privilege .

So to view the status of all the services running on our linux system just use the service command in following format .

➔ `sudo service --status-all` .

When you type the above command then it will show all the services running on you system along with their status on left side with + and - symbol . The + symbol represents the status of service as active and - symbol represents as inactive . On the right side service name is present .



```
kali@kali:~$ sudo service --status-all
[ - ] apache-htcacheclean
[ - ] apache2
[ - ] apparmor
[ - ] atftpd
[ - ] avahi-daemon
+ [ + ] binfmt-support
[ - ] bluetooth
[ - ] console-setup.sh
+ [ + ] cron
[ - ] cryptdisks
[ - ] cryptdisks-early
[ - ] cups
+ [ + ] dnsmasq
[ - ] dnstcp
+ [ + ] haveged
[ - ] hddtemp
[ - ] hwclock.sh
[ - ] inetsim
[ - ] iodined
[ - ] ipsec
[ - ] keyboard-setup.sh
+ [ + ] kmod
+ [ + ] lightdm
[ - ] lm-sensors
[ - ] miredo
```

Now let's see how to start or stop a particular service with service command . So first see how to check the status of a particular service . To view the status of a particular service you just need to add status parameter along with service name . So just check the status of apache2 service . Just type the command as follows .

➔ `sudo service apache2 status`

It will show the status as inactive as shown in following picture . You can see the arrow is pointing to the status of service .

```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ sudo service apache2 status  
● apache2.service - The Apache HTTP Server  
  Loaded: loaded (/lib/systemd/system/apache2.service; disabled; vendor preset: disabled)  
  Active: inactive (dead) ←  
  Docs: https://httpd.apache.org/docs/2.4/  
  
Mar 29 05:43:53 kali systemd[1]: Starting The Apache HTTP Server ...  
Mar 29 05:43:53 kali apachectl[2474]: AH00558: apache2: Could not reliably determine the server's full  
Mar 29 05:43:53 kali systemd[1]: Started The Apache HTTP Server.  
Mar 29 05:45:34 kali systemd[1]: Stopping The Apache HTTP Server ...  
Mar 29 05:45:34 kali apachectl[2518]: AH00558: apache2: Could not reliably determine the server's full  
Mar 29 05:45:34 kali systemd[1]: apache2.service: Succeeded.  
Mar 29 05:45:34 kali systemd[1]: Stopped The Apache HTTP Server.  
lines 1-12/12 (END)
```

Now let's start the service with the parameter "start", you just need to add the parameter "start" along with service name. So just type the command along with service name and parameter as follows.

→ `sudo service apache2 start`

After executing the above command we can see the active status as follows.

```
kali@kali: ~  
File Actions Edit View Help  
kali@kali:~$ sudo service apache2 start  
kali@kali:~$ sudo service apache2 status  
● apache2.service - The Apache HTTP Server  
  Loaded: loaded (/lib/systemd/system/apache2.service; disabled; vendor preset: disabled)  
  Active: active (running) since Sun 2020-03-29 05:56:43 EDT; 4s ago  
  Docs: https://httpd.apache.org/docs/2.4/  
  Process: 2650 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)  
  Main PID: 2654 (apache2) ←  
  Tasks: 6 (limit: 2341)  
  Memory: 12.0M  
  CGroup: /system.slice/apache2.service  
          └─2654 /usr/sbin/apache2 -k start  
            └─2655 /usr/sbin/apache2 -k start  
              └─2656 /usr/sbin/apache2 -k start  
                └─2657 /usr/sbin/apache2 -k start  
                  └─2658 /usr/sbin/apache2 -k start  
                    └─2659 /usr/sbin/apache2 -k start  
  
Mar 29 05:56:43 kali systemd[1]: Starting The Apache HTTP Server ...  
Mar 29 05:56:43 kali apachectl[2653]: AH00558: apache2: Could not reliably determine the server's full  
Mar 29 05:56:43 kali systemd[1]: Started The Apache HTTP Server.  
lines 1-19/19 (END)
```

Now let's how to stop the service. To stop a service you need to add the parameter stop at the end of service. So use the command as follows,

→ `sudo service apache2 stop`

In the same way you can restart a service as follows.

→ `sudo service apache2 restart`

After executing the restart command you can check the status of apache2 service with status parameter. In this way you can interact with services in linux.

6] INSTALLING AND REMOVING SOFTWARE PACKAGES IN LINUX :-

In this last section we gonna learn how to install or remove a software packages in linux system . Kali linux , Ubuntu are debian based linux distributions . So here we gonna see how to install softwares in debian based linux system .

To install a software package, the command is used as follows .

→ `sudo apt-get install package_name`

Above is the command used to install a package . To use the command you need to have administrative level privilege , that's why we are using sudo and then apt-get install for installing the package and then package_name .

So here we gonna install ufw firewall in our kali linux environment with the above command . so just follow the following steps .

STEP 1 Make sure internet connection is active on host pc .

STEP 2 then check network configuration settings in virtual box & set it to NAT

STEP 3 Enter following command .

→ `sudo apt-get install ufw`

The above command will install the software package ufw . if you get any error then perform update and upgrade with following command .

→ `sudo apt-get update`

→ `sudo apt-get upgrade`

Now let's see how to remove a software package in Linux . To remove any package there is only one parameter you need to add i.e. remove instead of install in above command . so just type the command as follows .

→ `sudo apt-get remove apache2 .`

When you execute the above command , it will ask you whether you want to remove this software package or not , then you need to press Y on your keyboard , then it will remove the apache2 software package from our system .

So all the above are basic linux command which are helpful in performing beginner level operations on linux systems . But if you are not satisfied and want to learn more & indepth then just get our course " The complete Ubuntu Linux Server Administration Course " , published on udemy platform . To get the discount just visit <https://www.codeoffline.com> & follow the link of your course choice . This link will automatically openup with discount coupon on udemy page .

