



Sardar Patel Institute of Technology

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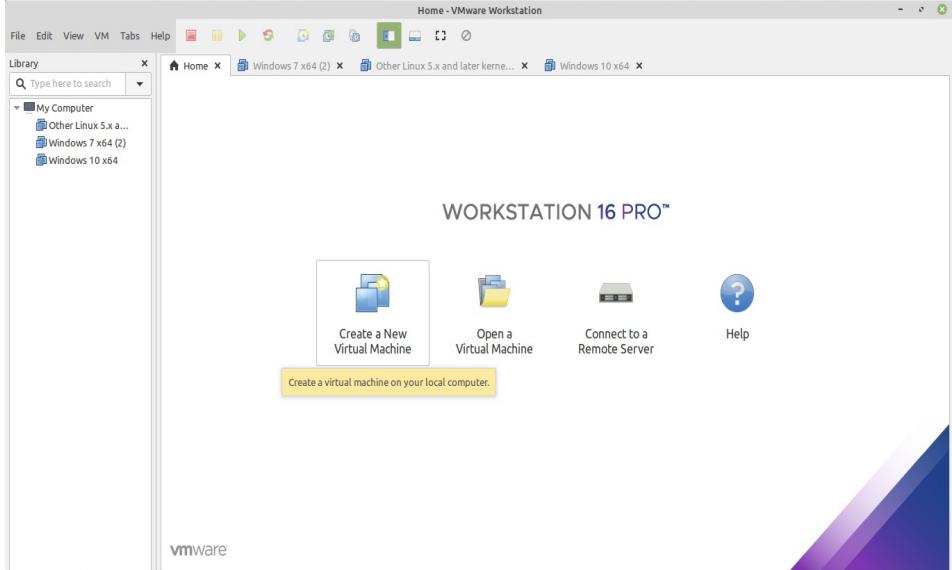
(Autonomous College of Affiliated to University of Mumbai)

Installation of Linux OS on Virtual Machine And Execute 30 commands

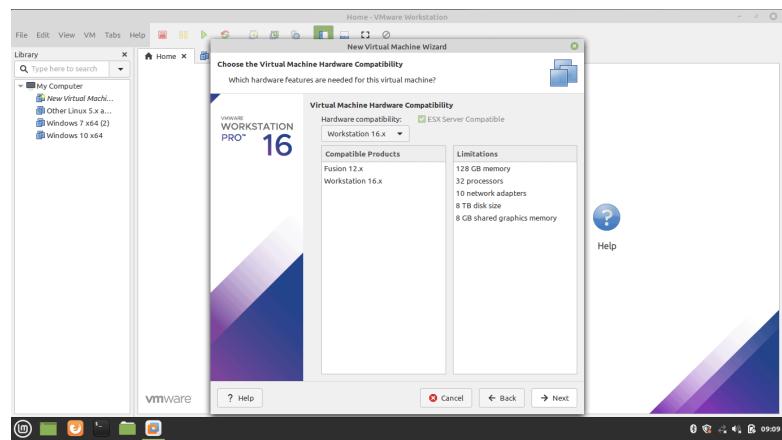
**Name: Pranay Singhvi
UID:2021300126
Batch: Comps B(B4)
Experiment No: 1**

Aim:	Installation of OS in Linux using Virtual Machine and various Linux Commands.
Theory:	<p style="text-align: center;">LINUX</p> <p>Linux is a community of open-source Unix like operating systems that are based on the Linux Kernel. It was initially released by Linus Torvalds on September 17, 1991. It is a free and open-source operating system and the source code can be modified and distributed to anyone commercially or noncommercially under the GNU General Public License. Initially, Linux was created for personal computers and gradually it was used in other machines like servers, mainframe computers, supercomputers, etc. Nowadays, Linux is also used in embedded systems like routers, automation controls, televisions, digital video recorders, video game consoles, smartwatches, etc. The biggest success of Linux is Android (operating system) it is based on the Linux kernel that is running on smartphones and tablets. Due to android Linux has the largest installed base of all general-purpose operating systems. Linux is generally packaged in a Linux distribution.</p> <p style="text-align: center;">UBUNTU</p> <p>Ubuntu is a Linux distribution based on Debian and composed mostly of free and open-source software. Ubuntu is officially released in three editions: Desktop, Server, and Core for Internet of things devices and robots. All of the editions can run on the computer alone, or in a virtual machine. Ubuntu is a popular operating system for cloud computing, with support for OpenStack. Ubuntu's default desktop changed back from the in-house Unity to GNOME after nearly 6.5 years in 2017 upon the release of version 17.10. Ubuntu is released every six months, with long-term support (LTS) releases every two years. As of October 2022, the most-recent release is 22.10 ("Kinetic Kudu"), and the current long-term support release is 22.04</p>

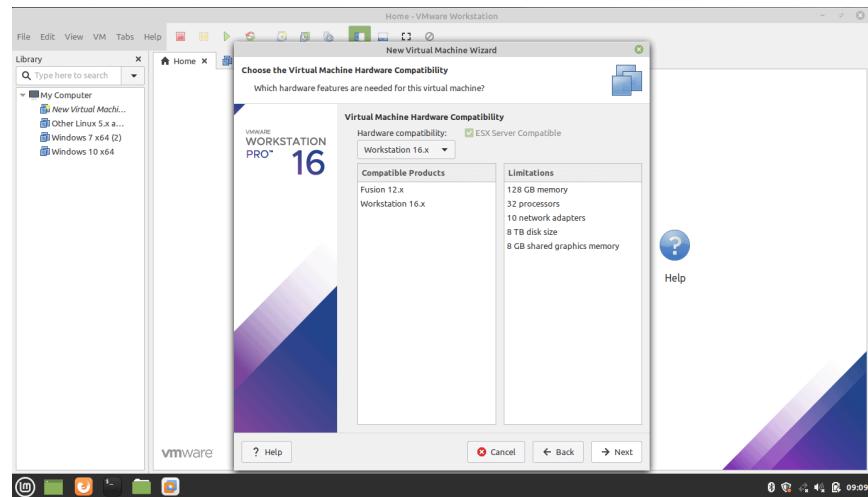
("Jammy Jellyfish"). Ubuntu is developed by British company Canonical, and a community of other developers, under a meritocratic governance model. Canonical provides security updates and support for each Ubuntu release, starting from the release date and until the release reaches its designated end-of-life (EOL) date. Canonical generates revenue through the sale of premium services related to Ubuntu and donations from those who download the Ubuntu software. Ubuntu is named after the Nguni philosophy of ubuntu, which Canonical indicates means "humanity to others" with a connotation of "I am what I am because of who we all are".

INSTALLATION PROCESS:	<p>Prerequisites To Install Ubuntu On VMWare Workstation:</p> <ul style="list-style-type: none"> • To install Ubuntu Linux on VMWare Workstation you just need a physical machine, VMWare Workstation Pro or Player, and Ubuntu Linux ISO image. • A host system with minimum: <ul style="list-style-type: none"> ◦ 8 GB of memory ◦ A quad core CPU ◦ 500 GB of Hard Drive • VMWare Workstation Pro or Player application: Download VMWare Workstation Pro or Player • Ubuntu Operating System to install on VMWare Workstation: Download Ubuntu Linux ISO image. <p>Installation:</p> <p>Step 1. Fire up VMWare Workstation</p> 

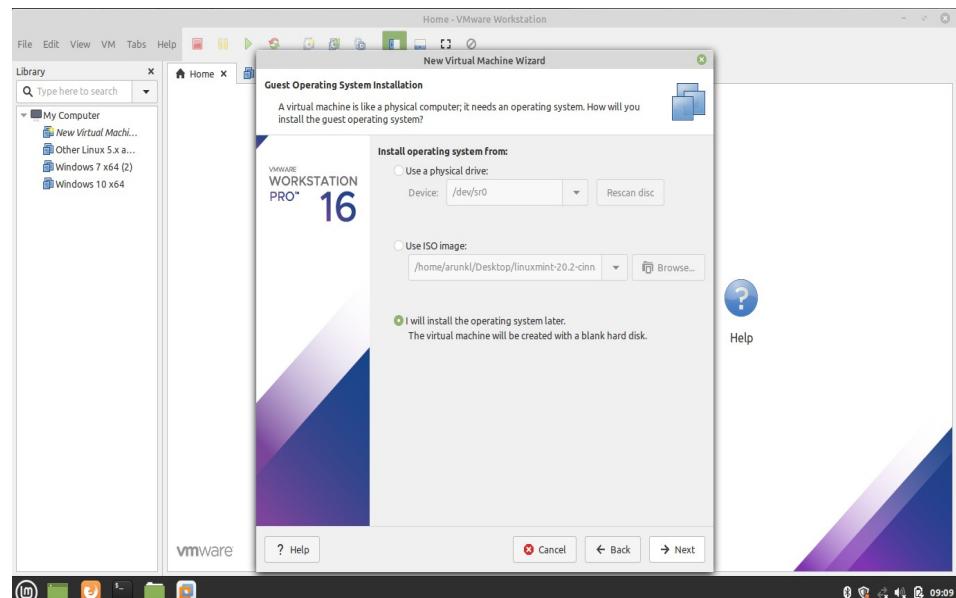
Step 2. Select Custom Configuration Wizard



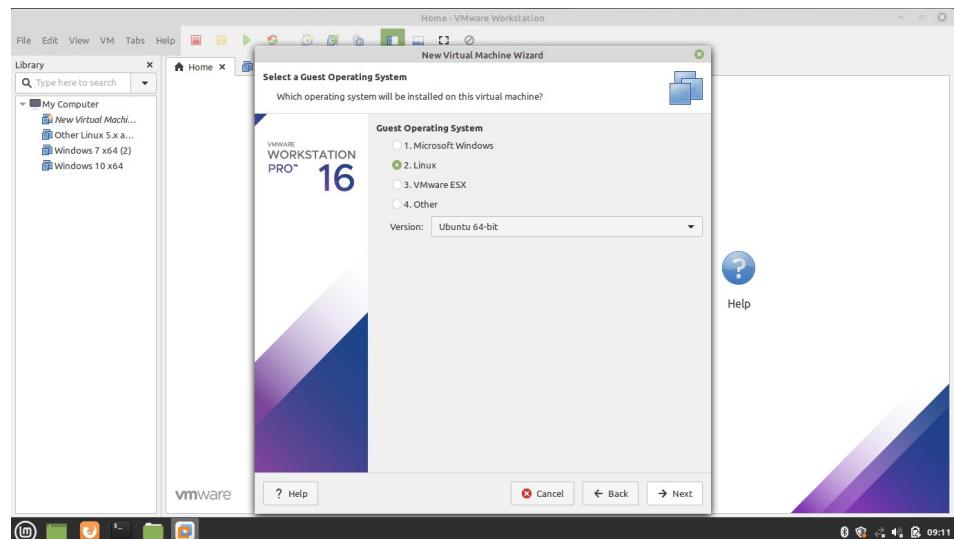
Step 3. Select Virtual Machine Hardware Compatibility



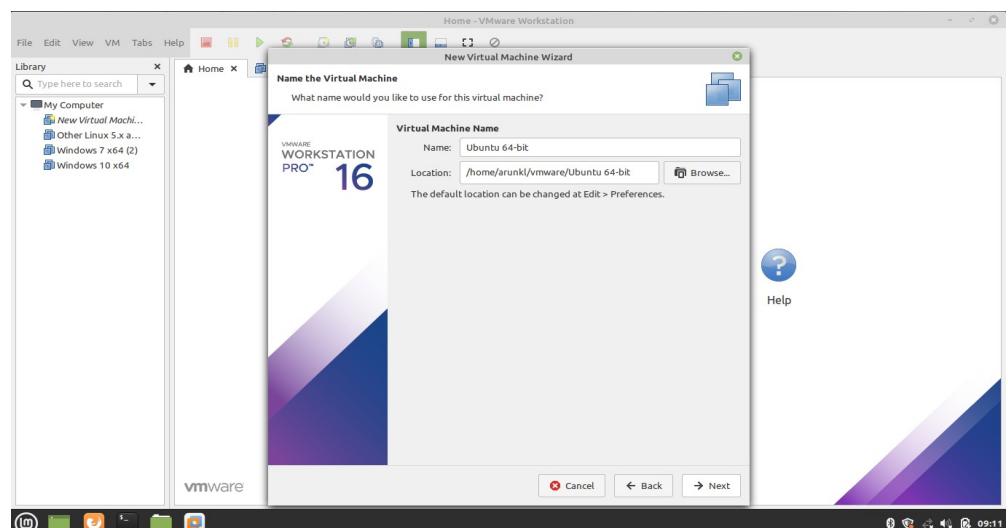
Step 4. Select the Operating System Media



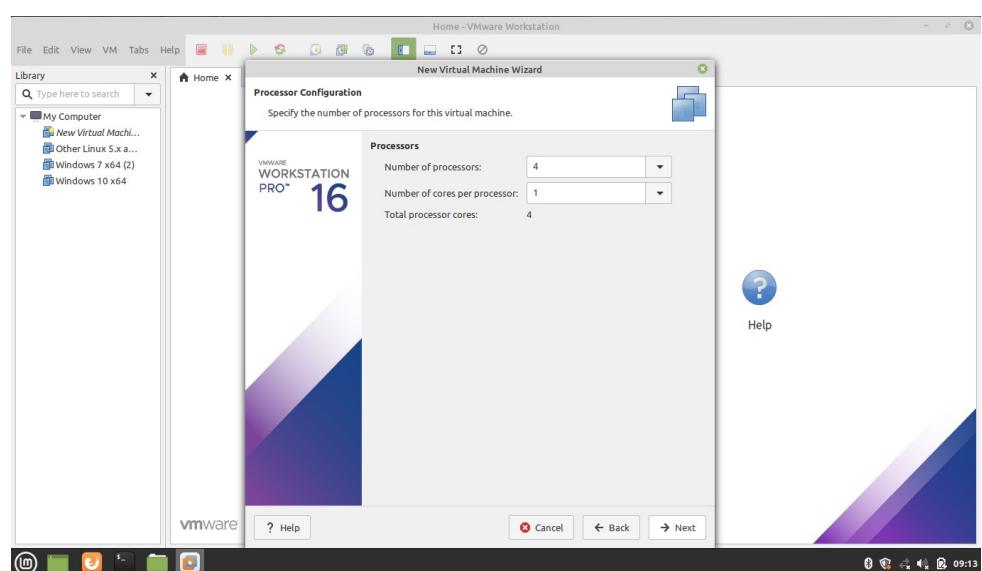
Step 5. Select Guest Operating System



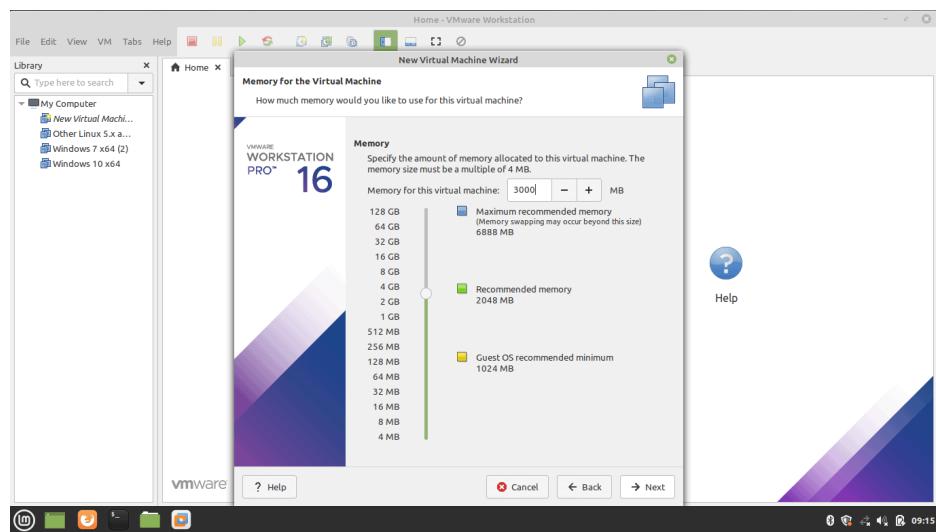
Step 6. Name the Virtual Machine Name and location



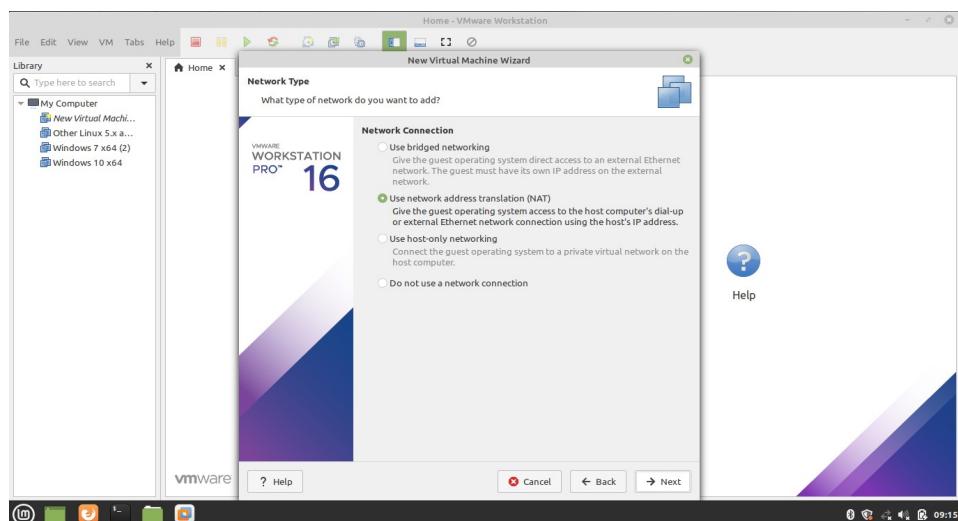
Step 7. Allocate the Processors



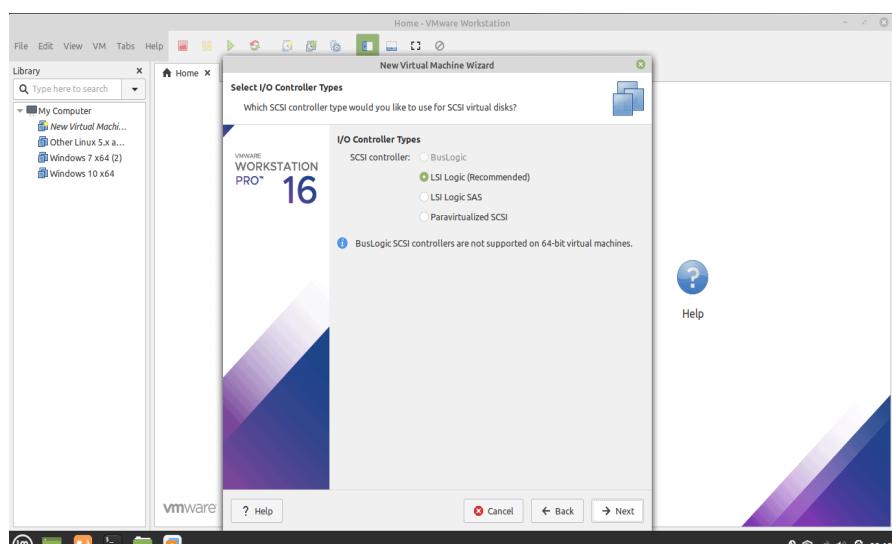
Step 8. Allocate the Memory for Virtual Machine



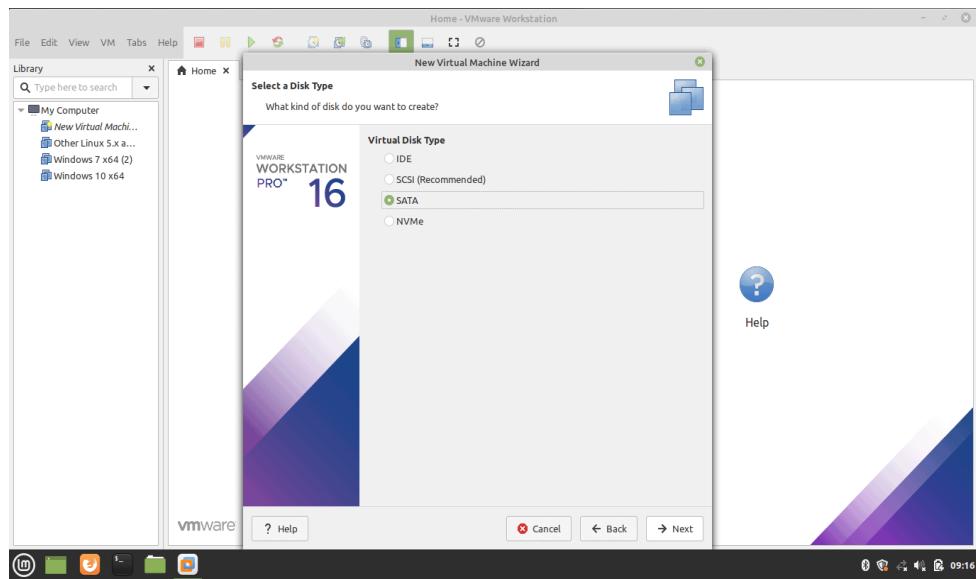
Step 9. Choose the Network Configuration



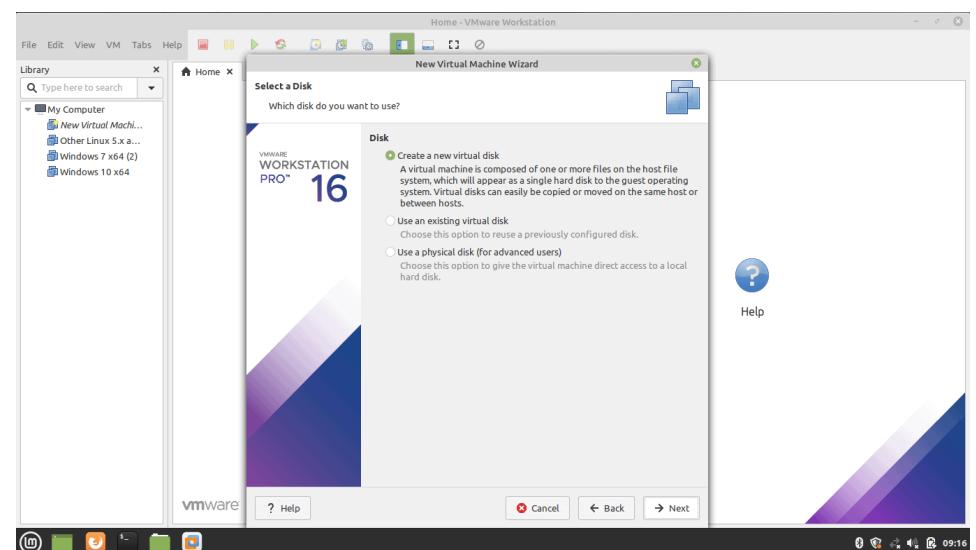
Step 10. Select the I/O Controller Type



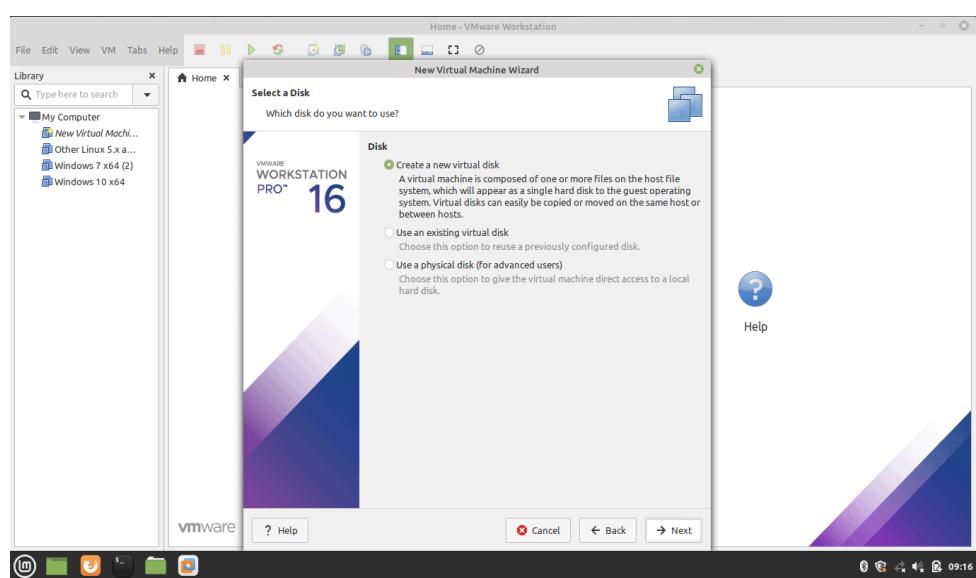
Step 11. Select Disk Type



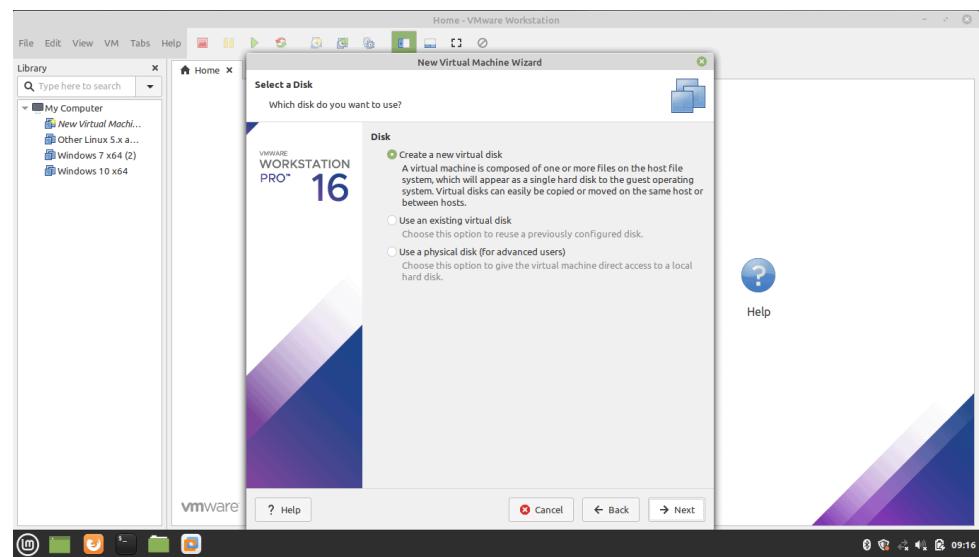
Step 12. Select Virtual Disk



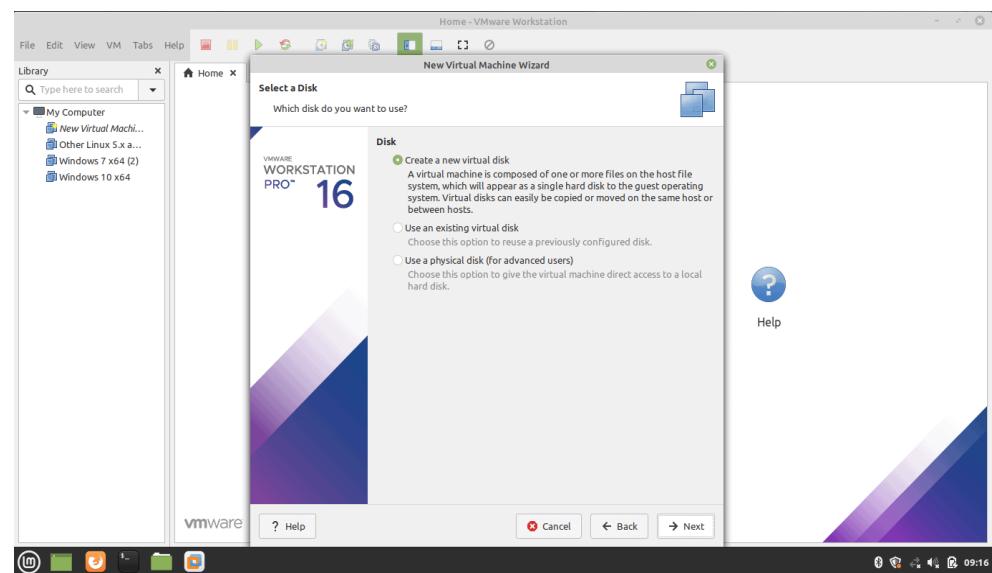
Step 13. Select Disk Capacity



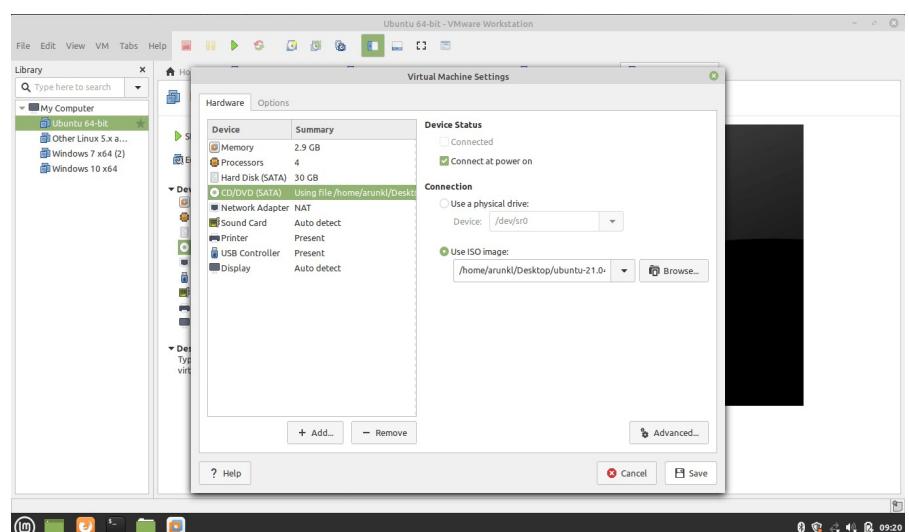
Step 14. Specify Virtual Disk File



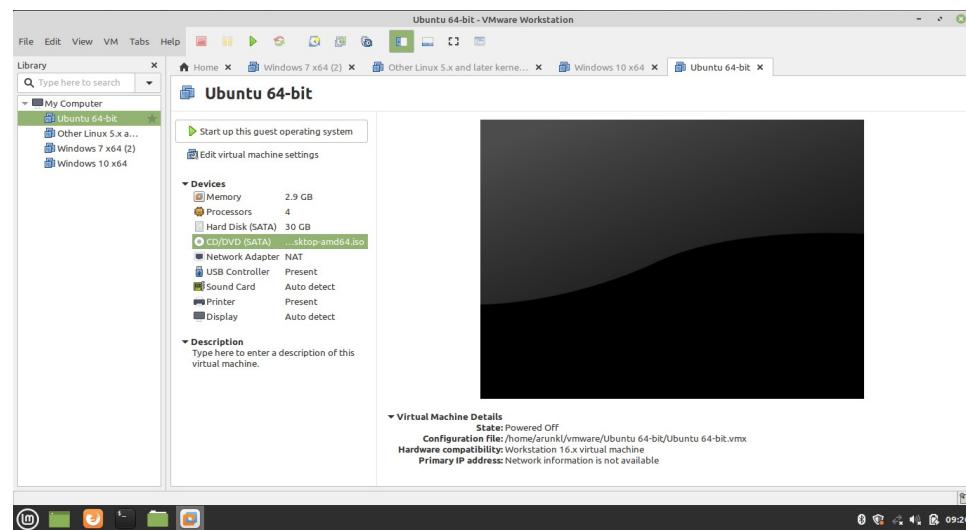
Step 15. Create Virtual Machine



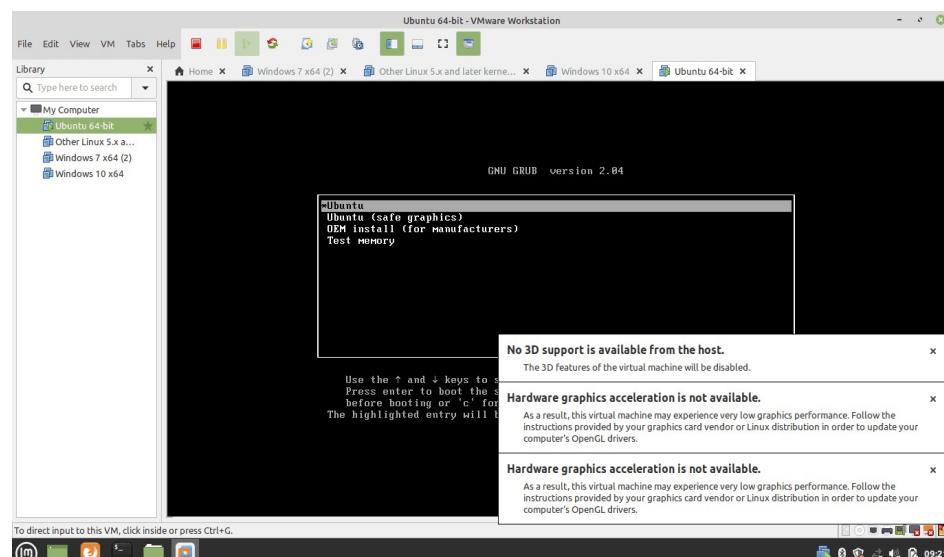
Step 16. Supply Ubuntu ISO Image to Virtual Machine



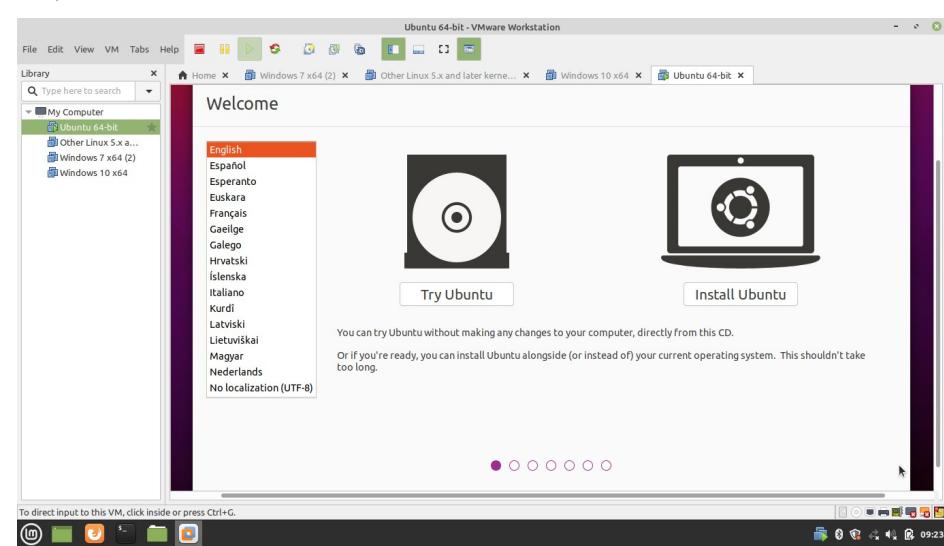
Step 17. Install Ubuntu Linux on VMWare Workstation



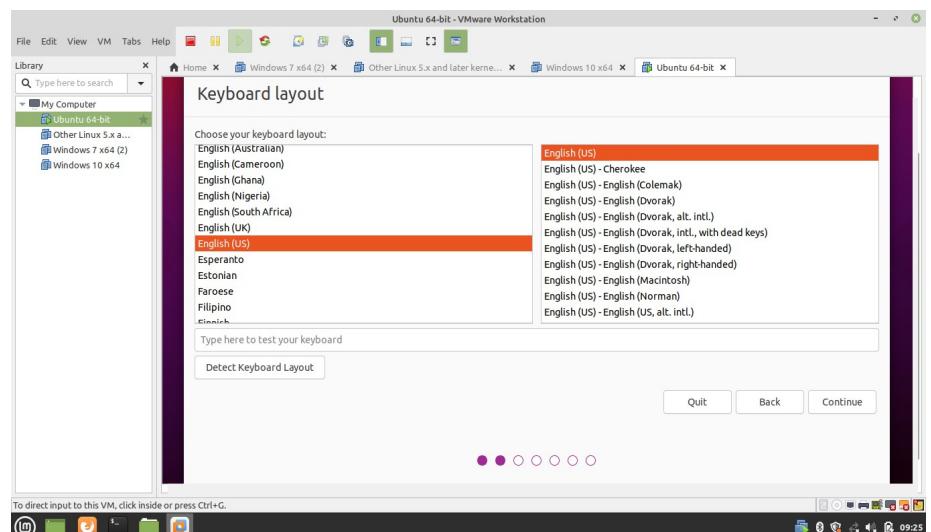
Step 18. Power On the Virtual Machine



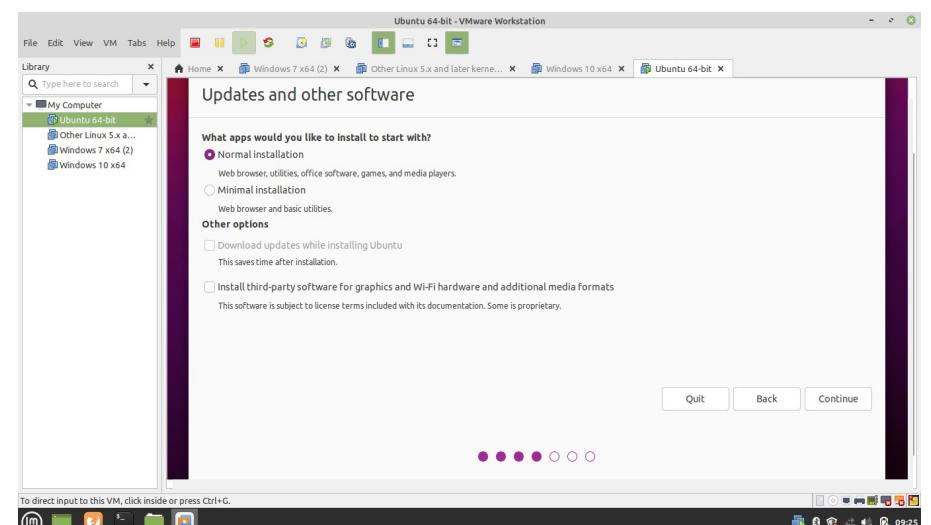
Step 19. Welcome Ubuntu Virtual Machine



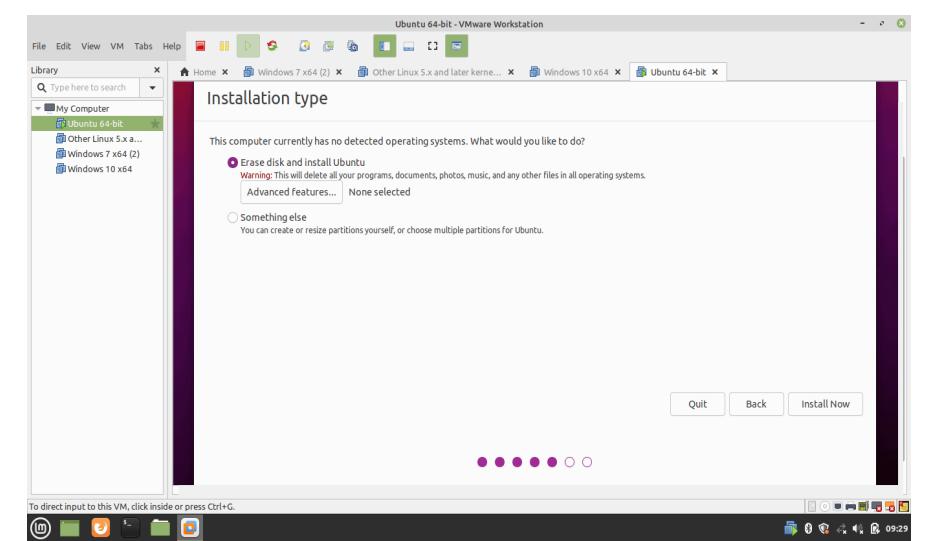
Step 20. Select Keyboard Layout



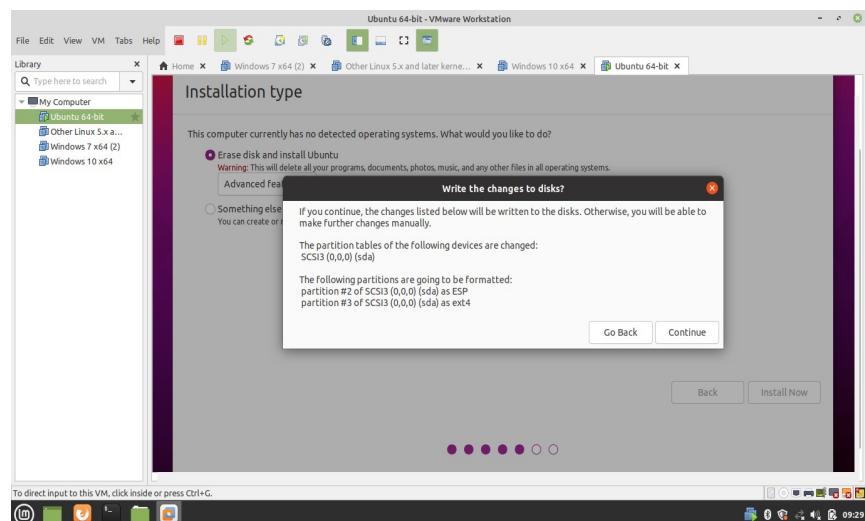
Step 21. Software Update and Package Selection in Virtual Machine



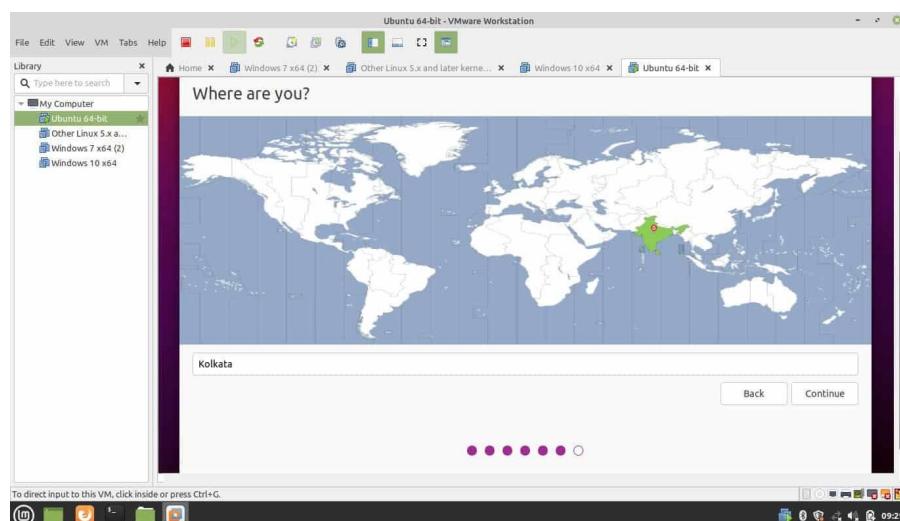
Step 22. Partition the Disk



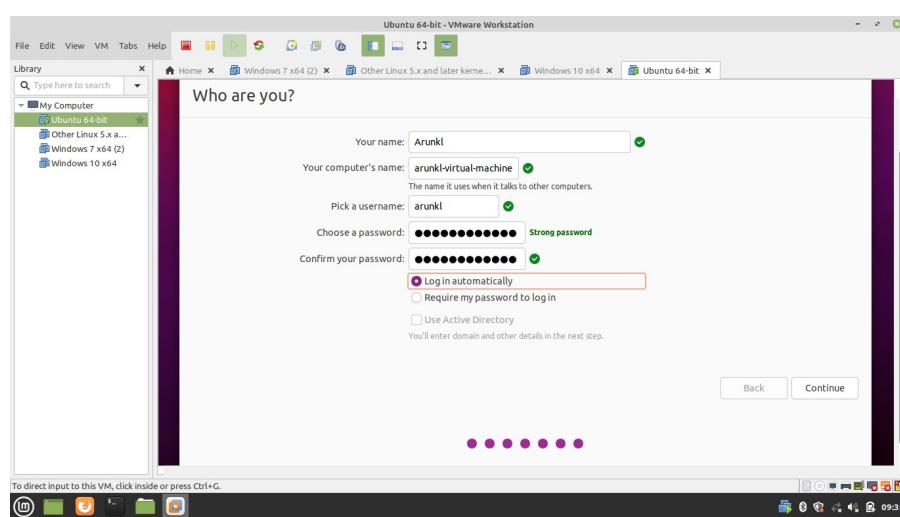
Step 23. Write Changes to Disk



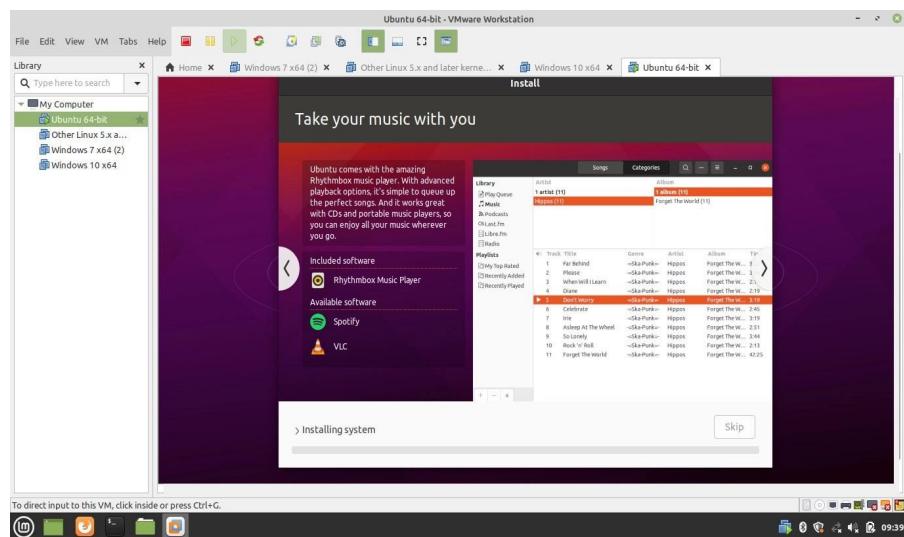
Step 24. Select Time Zone



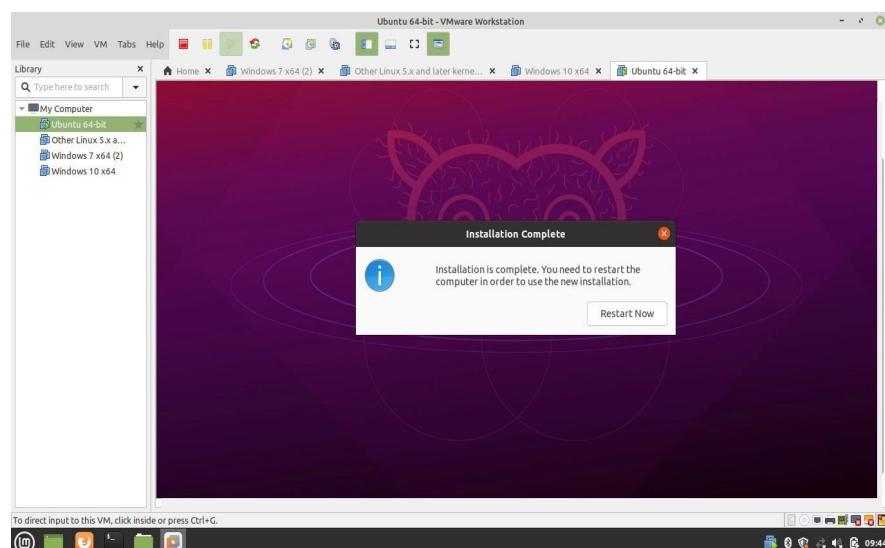
Step 25. Create an Admin Account



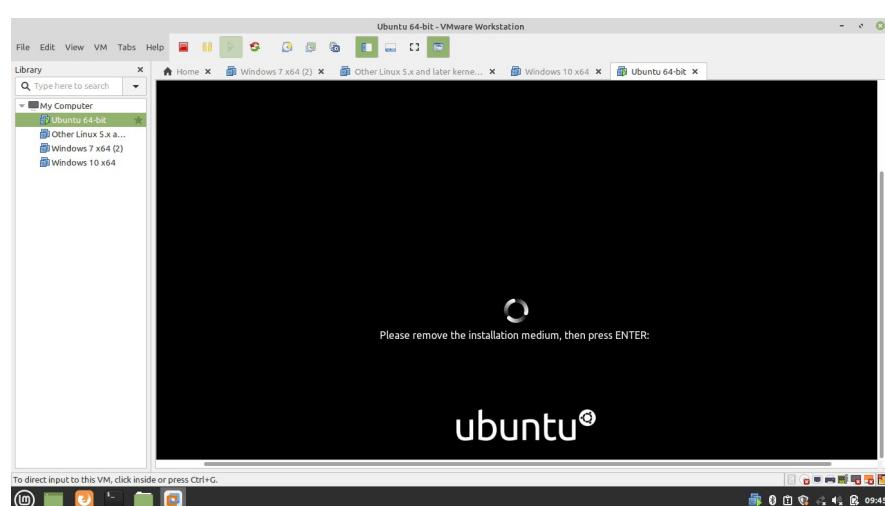
Step 26. Installation of Ubuntu in Progress



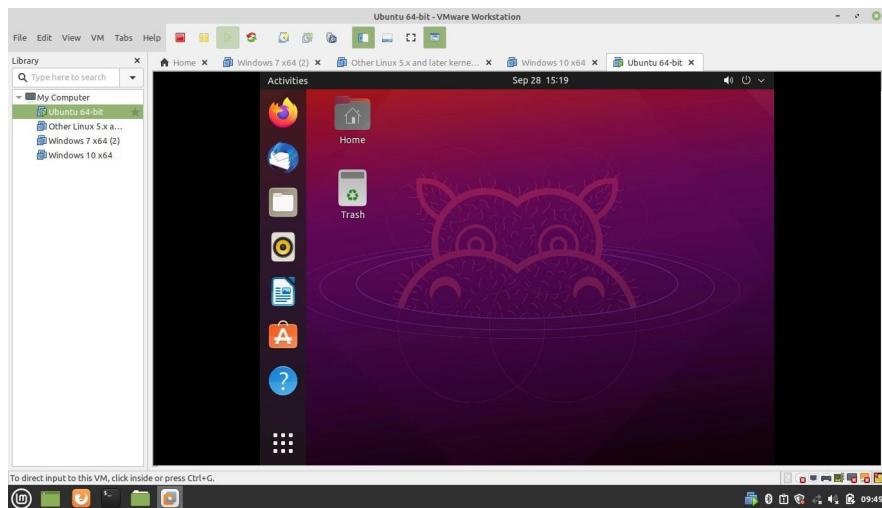
Step 27. Reboot Virtual Machine



Step 28. Remove the installation media



Step 29. Boot Ubuntu



Linux
Commands:

Linux Directory/File Commands:

1. **pwd**: The `pwd` command is used to display the location of the current working directory.

```
spit@spit-ThinkCentre-M70s:~/Downloads$ pwd
/home/spit/Downloads
```

2. **mkdir**: The `mkdir` command is used to create a new directory under any directory.

```
spit@spit-ThinkCentre-M70s:~/Downloads$ mkdir myways
spit@spit-ThinkCentre-M70s:~/Downloads$ cd myways
```

3. **ls**: The `ls` command is used to display a list of content of a current directory.

```
spit@spit-ThinkCentre-M70s:~/Downloads$ ls
'Unconfirmed 141204.crdownload'
```

4. **cd**: The `cd` command is used to change the current directory.

```
spit@spit-ThinkCentre-M70s:~/Downloads$ mkdir myways
spit@spit-ThinkCentre-M70s:~/Downloads$ cd myways
```

5. **rmdir**: The `rmdir` command is used to delete a directory

```
spit@spit-ThinkCentre-M70s:~/Downloads/myways$ mkdir myrules
spit@spit-ThinkCentre-M70s:~/Downloads/myways$ rmdir myrules
spit@spit-ThinkCentre-M70s:~/Downloads/myways$ ls
myways.txt
```

6. **touch**: The `touch` command is used to create empty files. We can create multiple empty files by executing it once.

```
spit@spit-ThinkCentre-M70s:~/Downloads/myways$ touch myways.txt
```

7. **cp**: The `cp` command is used to copy a file or directory.

```
[pranaysinghvi@CAT0 Experiment1 % cp Myrule.txt mylife.txt
[pranaysinghvi@CAT0 Experiment1 % ls
Myrule.txt      mylife.txt
```

8. **rm**: The `rm` command is used to remove a file

```
[pranaysinghvi@CAT0 Experiment1 % rm Myrule.txt
[pranaysinghvi@CAT0 Experiment1 % ls
mylife.txt
```

9. cat: The cat command is a multi-purpose utility in the Linux system. It can be used to create a file, display content of the file, copy the content of one file to another file, and more.

```
[pranaysinghvi@CATO Experiment1 % cat Myrule.txt  
My life My rules
```

10. mv: The mv command is used to move a file or a directory from one location to another location.

```
[pranaysinghvi@CATO Experiment1 % mv mylife.txt ../  
[pranaysinghvi@CATO Experiment1 % ls
```

Linux Utility Commands:

1. find : The find command is used to find a particular file within a directory. It also supports various options to find a file such as byname, by type, by date, and more.

The following symbols are used after the find command:

(.) : For current directory name

(/) : For root

Syntax : e.g. find . -name "*pdf"

```
[pranaysinghvi@CATO Experiment1 % find . -name "*.txt"  
. ./exp1.txt
```

2. locate : The locate command is used to search a file by file name. It is quite similar to find command; the difference is that it is a background process. It searches the file in the database, whereas the find command searches in the file system. It is faster than the find command. To find the file with the locates command, keep your database updated.

Syntax locate file_name

```
spit@spit-ThinkCentre-M70s:~$ locate sysctl.conf  
/etc/sysctl.conf  
/etc/sysctl.d/99-sysctl.conf  
/etc/ufw/sysctl.conf  
/snap/core/14399/etc/sysctl.conf  
/snap/core/14399/etc/sysctl.d/99-sysctl.conf  
/snap/core/14447/etc/sysctl.conf  
/snap/core/14447/etc/sysctl.d/99-sysctl.conf  
/usr/share/doc/procps/examples/sysctl.conf  
/usr/share/man/man5/sysctl.conf.5.gz
```

3. date : The date command is used to display date, time, time zone, and more.

Syntax : date

```
[pranaysinghvi@CATO Desktop % date  
Mon Feb 13 21:51:32 IST 2023
```

4. cal : The cal command is used to display the current month's calendar with the current date highlighted.

Syntax : cal

```
[pranaysinghvi@CATO Desktop % cal
February 2023
Su Mo Tu We Th Fr Sa
      1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28
```

5. sleep : The sleep command is used to hold the terminal by the specified amount of time. By default, it takes time in seconds.
 Syntax : sleep time_in_seconds

```
[pranaysinghvi@CATO Desktop % sleep 10
```

6. time: The time command is used to display the time to execute a command.

Syntax : time

```
[pranaysinghvi@CATO Desktop % time sleep 10
sleep 10  0.00s user 0.00s system 0% cpu 10.005 total
```

7.zcat : The zcat command is used to display the compressed files.

```
saad@Ubuntu:~/Desktop$ ls
a.out hello.c hello.txt.gz saad
saad@Ubuntu:~/Desktop$ zcat hello.txt
Hello World
```

8. df: The df command is used to display the disk space used in the file system. It displays the output as in the number of used blocks, available blocks, and the mounted directory.

```
[pranaysinghvi@CATO Desktop % df
Filesystem 512-blocks Used Available Capacity iused ifree %iused Mounted on
/dev/disk3s1 478724992 17319584 188093040 9% 348574 940465200 0% /
devfs 711 711 0 100% 1230 0 100% /dev
/dev/disk3s6 478724992 8388712 188093040 5% 4 940465200 0% /System/Volumes/VM
/dev/disk3s2 478724992 9191400 188093040 5% 846 940465200 0% /System/Volumes/Preboot
/dev/disk3s4 478724992 45192 188093040 1% 72 940465200 0% /System/Volumes/Update
/dev/disk2s2 1024000 12328 988584 2% 3 4942920 0% /System/Volumes/xarts
/dev/disk2s1 1024000 12520 988584 2% 31 4942920 0% /System/Volumes/iSCPReboot
/dev/disk2s3 1024000 848 988584 1% 39 4942920 0% /System/Volumes/Hardware
/dev/disk3s5 478724992 253930624 188093040 58% 1839807 940465200 0% /System/Volumes/Data
map auto_home 0 0 0 100% 0 0 100% /System/Volumes/Data/home
```

9. exit: Linux exit command is used to exit from the current shell. It takes a parameter as a number and exits the shell with a return of status number.

```
[pranaysinghvi@CATO Desktop % exit

Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.

Deleting expired sessions...           14 completed.

[Process completed]
```

11. clear: Linux clear command is used to clear the terminal screen.

```
[pranaysinghvi@CATO Desktop % cd Experiment1
pranaysinghvi@CATO Experiment1 % touch Myrule.txt
pranaysinghvi@CATO Experiment1 % ls
Myrule.txt
pranaysinghvi@CATO Experiment1 % cp Myrule.txt mylife.txt
pranaysinghvi@CATO Experiment1 % ls
Myrule.txt  mylife.txt
pranaysinghvi@CATO Experiment1 % vim Myrule.txt
pranaysinghvi@CATO Experiment1 % cat Myrule.txt
My life My rules

pranaysinghvi@CATO Experiment1 % rm Myrule.txt
pranaysinghvi@CATO Experiment1 % ls
mylife.txt
pranaysinghvi@CATO Experiment1 % mv mylife.txt ../
pranaysinghvi@CATO Experiment1 % ls
pranaysinghvi@CATO Experiment1 % cd ../
pranaysinghvi@CATO Desktop % ls
Dynamic Linking          February Balance Sheet.xlsx    StaticLinking
Experiment1               Project                         mylife.txt
                                         -$Bunk Class Ki ninja tech.xlsx
pranaysinghvi@CATO Desktop % date
Mon Feb 13 21:51:32 IST 2023
pranaysinghvi@CATO Desktop % cal
February 2023
Su Mo Tu We Th Fr Sa
      1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28

pranaysinghvi@CATO Desktop % sleep 10
pranaysinghvi@CATO Desktop % time sleep 10
sleep 10 0.00s user 0.00s system 0% cpu 10.005 total
pranaysinghvi@CATO Desktop % df
Filesystem 512-blocks Used Available Capacity iused ifree %iused Mounted on
/dev/disk3s1 478724992 17319584 188093040 9% 348574 940465200 0% /
devfs 711 711 0 100% 1230 0 100% /dev
/dev/disk3s6 478724992 8388712 188093040 5% 4 940465200 0% /System/Volumes/VM
/dev/disk3s2 478724992 9191400 188093040 5% 846 940465200 0% /System/Volumes/Preboot
/dev/disk3s4 478724992 45192 188093040 1% 72 940465200 0% /System/Volumes/Update
/dev/disk2s2 1024000 12328 988584 2% 3 4942920 0% /System/Volumes/xarts
/dev/disk2s1 1024000 12520 988584 2% 31 4942920 0% /System/Volumes/ISCPreboot
/dev/disk2s3 1024000 848 988584 1% 39 4942920 0% /System/Volumes/Hardware
/dev/disk3s5 478724992 253930624 188093040 58% 1839807 940465200 0% /System/Volumes/Data
map auto_home 0 0 0 100% 0 0 100% /System/Volumes/Data/home
pranaysinghvi@CATO Desktop % clear]
```

```
pranaysinghvi@CATO Desktop %
```

Linux Networking Commands:

1.ifconfig:

The ifconfig function displays the current configuration for a network interface when no optional parameters are supplied. If a protocol family is specified, ifconfig reports only the details specific to that protocol family.

```
students@students-HP-Pro-3330-MT:~$ ifconfig
enp8s0    Link encap:Ethernet HWaddr 24:be:05:0e:32:5c
          inet addr:172.16.31.222 Bcast:172.16.31.255 Mask:255.255.255.0
          inet6 addr: fe80::4a78:59b8:1095:182f/64 Scope:Link
             UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
             RX packets:65507 errors:0 dropped:0 overruns:0 frame:0
             TX packets:26032 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:1000
             RX bytes:43006147 (43.0 MB) TX bytes:4335987 (4.3 MB)

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:65536 Metric:1
             RX packets:2109 errors:0 dropped:0 overruns:0 frame:0
             TX packets:2109 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:1000
             RX bytes:355549 (355.5 KB) TX bytes:355549 (355.5 KB)
```

2.man ifconfig:

This is the manual version of ifconfig which gives details of all commands and the various sub options of each command.

```
IIFCONFIG(8)                               Linux Programmer's Manual                               IIFCONFIG(8)

NAME
       ifconfig - configure a network interface

SYNOPSIS
       ifconfig [-v] [-a] [-s] [interface]
       ifconfig [-v] interface [afstype] options | address ...

DESCRIPTION
       Ifconfig is used to configure the kernel-resident network interfaces. It is used at boot time to set up interfaces as necessary. After that, it is usually only needed when debugging or when system tuning is needed.

       If no arguments are given, ifconfig displays the status of the currently active interfaces. If a single interface argument is given, it displays the status of the given interface only; if a single -a argument is given, it displays the status of all interfaces, even those that are down. Otherwise, it configures an interface.

Address Families
       If the first argument after the interface name is recognized as the name of a supported address family, that address family is used for decoding and displaying all protocol addresses. Currently supported address families include inet (TCP/IP, default), inet6 (IPV6), ax25 (AMPR Packet Radio), ddp (Appletalk Phase 2), ipx (Novell IPX) and netrom (AMPR Packet radio).

OPTIONS
       -a     display all interfaces which are currently available, even if down
       -s     display a short list (like netstat -i)
       -v     be more verbose for some error conditions

interface
       The name of the interface. This is usually a driver name followed by a unit number, for example eth0 for the first Ethernet interface. If your kernel supports alias interfaces, you can specify them with eth0:0 for the first alias of eth0. You can use them to assign a second address. To delete an alias interface use ifconfig eth0:0 down. Note: for every scope (i.e. same net with address/netmask combination) all aliases are deleted, if you delete the first (primary).

       up     This flag causes the interface to be activated. It is implicitly specified if an address is assigned to the interface.
       down   This flag causes the driver for this interface to be shut down.

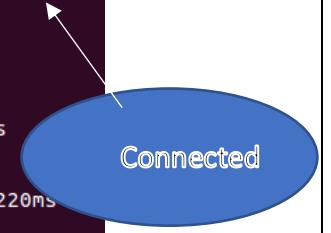
       [-]arp  Enable or disable the use of the ARP protocol on this interface.
       [-]promisc
```

3.ping:

The ping command is a Command Prompt command used to test the ability of the source computer to reach a specified destination computer. It's a simple way to verify that a computer can communicate with another computer or network device

The below screenshot shows ping from a locally connected computer

```
students@students-HP-Pro-3330-MT:~$ ping 172.16.31.55
PING 172.16.31.55 (172.16.31.55) 56(84) bytes of data.
64 bytes from 172.16.31.55: icmp_seq=1 ttl=64 time=0.492 ms
64 bytes from 172.16.31.55: icmp_seq=2 ttl=64 time=0.397 ms
64 bytes from 172.16.31.55: icmp_seq=3 ttl=64 time=0.417 ms
64 bytes from 172.16.31.55: icmp_seq=4 ttl=64 time=0.398 ms
64 bytes from 172.16.31.55: icmp_seq=5 ttl=64 time=0.433 ms
64 bytes from 172.16.31.55: icmp_seq=6 ttl=64 time=0.417 ms
64 bytes from 172.16.31.55: icmp_seq=7 ttl=64 time=0.416 ms
64 bytes from 172.16.31.55: icmp_seq=8 ttl=64 time=0.427 ms
64 bytes from 172.16.31.55: icmp_seq=9 ttl=64 time=0.429 ms
64 bytes from 172.16.31.55: icmp_seq=10 ttl=64 time=0.428 ms
^C
--- 172.16.31.55 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9220ms
rtt min/avg/max/mdev = 0.397/0.425/0.492/0.031 ms
```



Connected

```
students@students-HP-Pro-3330-MT:~$ ping 172.16.31.600
ping: unknown host 172.16.31.600
```

Not Connected

4.netstat:

Netstat command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.

```
students@students-HP-Pro-3330-MT:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        4      0 172.16.31.222:47650    172.16.31.8:netbios-ssn ESTABLISHED
tcp        0      0 172.16.31.222:41526    any-in-2678.1e100:https ESTABLISHED
tcp        0      0 172.16.31.222:41688    ec2-52-89-241-77:.https ESTABLISHED
tcp        0      0 172.16.31.222:53382    bon07s37-tn-f5.1e:https ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type            State           I-Node   Path
unix     2      [ ]      DGRAM           CONNECTED      27843   /run/user/1000/systemd/notify
unix     2      [ ]      DGRAM           CONNECTED      14105   /run/systemd/cgroups-agent
unix     8      [ ]      DGRAM           CONNECTED      14114   /run/systemd/journal/socket
unix     2      [ ]      DGRAM           CONNECTED      14115   /run/systemd/journal/syslog
unix    14      [ ]      DGRAM           CONNECTED      14126   /run/systemd/journal/dev-log
unix     3      [ ]      DGRAM           CONNECTED      14104   /run/systemd/notify
unix     3      [ ]      STREAM          CONNECTED     29026   /run/systemd/journal/stdout
unix     3      [ ]      STREAM          CONNECTED     28388
unix     3      [ ]      STREAM          CONNECTED     28239
unix     3      [ ]      DGRAM           CONNECTED     47751
unix     3      [ ]      STREAM          CONNECTED     42136
unix     3      [ ]      STREAM          CONNECTED     28392
unix     3      [ ]      STREAM          CONNECTED     28825
unix     3      [ ]      STREAM          CONNECTED     26488
unix     3      [ ]      STREAM          CONNECTED     23618
unix     3      [ ]      SEQPACKET        CONNECTED     34600
unix     3      [ ]      STREAM          CONNECTED     30917
unix     3      [ ]      STREAM          CONNECTED     30820
unix     3      [ ]      STREAM          CONNECTED     27450   /run/systemd/journal/stdout
unix     3      [ ]      STREAM          CONNECTED     27318
unix     3      [ ]      STREAM          CONNECTED     20182
unix     3      [ ]      STREAM          CONNECTED     17316
unix     3      [ ]      STREAM          CONNECTED     28306   @/tmp/dbus-NhDKqkJdmC
unix     3      [ ]      STREAM          CONNECTED     28288
unix     3      [ ]      STREAM          CONNECTED     25483
unix     3      [ ]      STREAM          CONNECTED     42987
unix     3      [ ]      STREAM          CONNECTED     27298   @/tmp/dbus-NhDKqkJdmC
unix     3      [ ]      STREAM          CONNECTED     19828
unix     3      [ ]      STREAM          CONNECTED     42144   @/tmp/dbus-NhDKqkJdmC
unix     3      [ ]      STREAM          CONNECTED     28994   @/tmp/dbus-NhDKqkJdmC
unix     3      [ ]      STREAM          CONNECTED     28356   @/tmp/dbus-DLfgbbRlU2
```

5.traceroute:

traceroute command in Linux prints the route that a packet takes to reach the host. This command is useful when you want to know about the route and about all the hops that a packet takes.

```
students@students-HP-Pro-3330-MT:~$ traceroute google.com
traceroute to google.com (216.239.38.120), 30 hops max, 60 byte packets
 1  172.16.31.1 (172.16.31.1)  0.288 ms  0.963 ms  0.944 ms
 2  125.99.120.241 (125.99.120.241)  2.817 ms  3.260 ms  2.941 ms
 3  192.168.210.29 (192.168.210.29)  1.539 ms  1.571 ms  1.752 ms
 4  192.168.44.57 (192.168.44.57)  2.723 ms  4.155 ms  4.146 ms
 5  192.168.27.34 (192.168.27.34)  3.480 ms  3.463 ms  3.444 ms
 6  125.99.55.254 (125.99.55.254)  3.332 ms  3.004 ms  3.038 ms
 7  125.99.55.253 (125.99.55.253)  3.829 ms  3.910 ms  3.912 ms
 8  * * *
 9  10.240.254.120 (10.240.254.120)  3.199 ms  3.101 ms  3.192 ms
10  * * *
11  * * *
12  125.99.55.163 (125.99.55.163)  6.623 ms  6.258 ms  6.362 ms
13  125.99.55.165 (125.99.55.165)  5.620 ms  5.612 ms  5.565 ms
14  * * *
15  any-in-2678.1e100.net (216.239.38.120)  3.550 ms  3.501 ms  3.468 ms
```

6.nslookup:

nslookup (stands for "Name Server Lookup") is a useful command for getting information from the DNS server. It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record. It is also used to troubleshoot DNS-related problems.

```
students@students-HP-Pro-3330-MT:~$ nslookup spit.ac.in
Server:      127.0.1.1
Address:     127.0.1.1#53

Name:   spit.ac.in
Address: 172.16.10.6
Name:   spit.ac.in
Address: 172.16.10.2
Name:   spit.ac.in
Address: 172.16.10.3
```

7.arp:

ARP stands for Address Resolution Protocol, which is used to find the media access control address of a network neighbour for a given IPv4 Address.

```
students@students-HP-Pro-3330-MT:~$ arp
Address          HWtype  HWaddress          Flags Mask
172.16.31.80    ether    18:60:24:7b:60:2e  C
172.16.31.55    ether    18:60:24:7b:5f:f4  C
172.16.31.225   ether    d0:67:e5:11:f3:06  C
172.16.31.11    ether    (incomplete)
172.16.31.1     ether    e0:07:1b:c2:64:60  C
```

arp -a:

This command formats the output of arp in alternate BSD style

```
students@students-HP-Pro-3330-MT:~$ arp -a
? (172.16.31.80) at 18:60:24:7b:60:2e [ether] on enp8s0
? (172.16.31.55) at 18:60:24:7b:5f:f4 [ether] on enp8s0
? (172.16.31.225) at d0:67:e5:11:f3:06 [ether] on enp8s0
? (172.16.31.11) at <incomplete> on enp8s0
? (172.16.31.1) at e0:07:1b:c2:64:60 [ether] on enp8s0
```

8.host:

host command in Linux system is used for DNS (Domain Name System) lookup operations. In simple words, this command is used to find the IP address of a particular domain name or if you want to find out the domain name of a particular IP address the host command becomes handy.

```
pranaysinghvi@CATO ~ % host spit.ac.in
spit.ac.in has address 43.252.193.19
spit.ac.in mail is handled by 5 ALT2.ASPMX.L.GOOGLE.COM.
spit.ac.in mail is handled by 10 ALT3.ASPMX.L.GOOGLE.COM.
spit.ac.in mail is handled by 1 ASPMX.L.GOOGLE.COM.
spit.ac.in mail is handled by 5 ALT1.ASPMX.L.GOOGLE.COM.
spit.ac.in mail is handled by 10 ALT4.ASPMX.L.GOOGLE.COM.
```

9.iwconfig:

iwconfig is used to display and change the parameters of the network interface which are specific to the wireless operation

```
itdept@itdept-OptiPlex-3010:~$ iwconfig
enp3s0      no wireless extensions.

vmnet1      no wireless extensions.

vmnet8      no wireless extensions.

lo         no wireless extensions.
```

10.Curl:

curl is a command-line tool to transfer data to or from a server, using any of the supported protocols

```
itdept@itdept-OptiPlex-3010:~$ curl -O https://unsplash.com/photos/d0ZJoIPhrI  
% Total    % Received % Xferd  Average Speed   Time   Time   Time  Current  
          Dload  Upload Total Spent   Left Speed  
100  202k  100  202k    0      0  363k      0 --:--:-- --:--:-- 363k
```

CONCLUSION:

I learned about installing virtual box in windows and learned about different Linux commands.