What is Virtualization?

Virtualization is an computer hosting another computer through an virtual machine software which the computer being hosted will be sitting on top of the original OS system the virtual machine software can be install on any computer. This wouldn't be possible if it wasn't for hypervisor because it plays a big roll in virtualization because hypervisors will run various amounts of OS. Virtualization is also easy to manage by creating and removing a virtual machine on a virtual software user will also be able to change how much ram, storage etc they would want on their machine. There are many good things about virtualization such as using a virtual machine and installing and updating apps are way faster. Also the virtual machine softwares are safe to use such as oracle virtual box which is know by people around the world also virtual machines can help the user decide if they want to make that their OS. Hypervisor playing a big part in virtualizations make's allot of possibilities such as hosting servers or testing out an OS that is way more secure then windows.

Types of virtualization

Client side virtualization: The client side of virtualization is to where the user is able to manage what evert virtual machine that they have created on their software such as oracle virtual box. The user just need to make sure that they have enough ram and storage and a decent CPU to be able to run the virtual machine from softwares like virtual box. The client can select what type of OS what they want their virtual machine to be they can select linux or windows then the user can go to a website like Ubuntu and download it's latest ISO and add it to their virtual machine boot in settings. If the user isn't to happy with their type which ever is chosen and choose one of the other options such as windows however linux is better then windows. The user will also have the ability do delete their virtual machine how ever doing this will delete all the data that is within the virtual machine it is recommended to back up what ever data is on that virtual machine. The user will be able to create an virtual machine in a software and select what ever type of OS they want and is able to manages their virtual machine.

Server side virtualization: Server side virtualization is one physical server that runs multiple virtual machines how ever there is an limit like 5 to 10 but at least multiple can run on one server. So a company can have multiple servers and run virtual machines which and allot of things can be done by running multiple virtual machines such as hosting web servers.

Types of hypervisors

- Type 1: Type one hypervisors are installed directly on the host machine many multiple virtual machines can be installed on the users machine this wouldn't be possible at all without hyper visor 1. Hyper visor 1 is also to be known highly secured because no matter how many virtual machines the user have's it will not be connected together at all. Keep in mind that hyper visor 1 will be interacting with a user physical computer hardware such as CPU,RAM and storage that user would need to be sure that they have the requirements to run a virtual machine. Type 1 will help intense task by having hardware acceleration this will push the system components which is good because the system will push to it's best. Type 1 is also a bare metal what is bare metal? bare metal runs off no type of operating which is amazing because starting from something small to big takes allot of time. If the user is being attack there will be better chances with bare metal because again of the security it is very impressive for something that dose not have a OS system.

- Type 2: Type 2 will not interact with the user computer hardware instead type 2 will be installed on top of another OS in other words type 2 will run in a and operating system. Type 2 hypervisor uses softwares such as microsoft's Virtual PC, oracle virtual box and vmware there are other more virtual

machines hosting softwares but oracle virtual box is an popular choice to use. oracle virtual box is also free to use so now users can just go right a head and download the virtual box software and began exploring other different types of OS. Type 2 virtual box if the virtual machine wasn't given enough ram and storage it will began to do that so make sure to add an good amount for the virtual machine. Type 2 are usually found in places with a small amount number servers and there will also be no need to install any other software just keep the one that was downloaded. Type 2 will host an virtual desktop which is another layer on top of the user desktop virtual box software is free to use no one do not need to buy anything at all.

Virtual Box

Steps to install virtual box

1. Download the virtual box installer from Virtualbox.org
2. Once you've downloaded your selected platform package
3. lunch the installer then click next

4. Then choose where ever you want your virtual machine to be located at.
5. You'll be brought to custom setup choose to what ever you like then press next then press yes on the next page.

6. You will be brought to a Ready to install press install a pop up will ask you do you want to install this device press install.

How to create an virtual machine

1. Now I'll be on Ubuntu but you should still have the same interface open oracle virtual machine then press on New. Type what name you want to call your virtual machine also on the type select Linux then on version select ubuntu.

2. After pressing next you will have to select what ever amount of ram you would like to use. 2GB is recommended but for me personally I do 6GB because I have an 32GB ram capacity if you have more but all means go ahead.

3. When you come up to Hard disk press on create a virtual hard disk now which the storage will be 10GB as shown in this screenshot then click on create.

4. On hard disk type file select VDI

5. Select dynamically allocated.

6. Select what size you want your virtual machine to have then click on create.

7. Now go to this website Ubuntu and download the latest version of ubuntu.

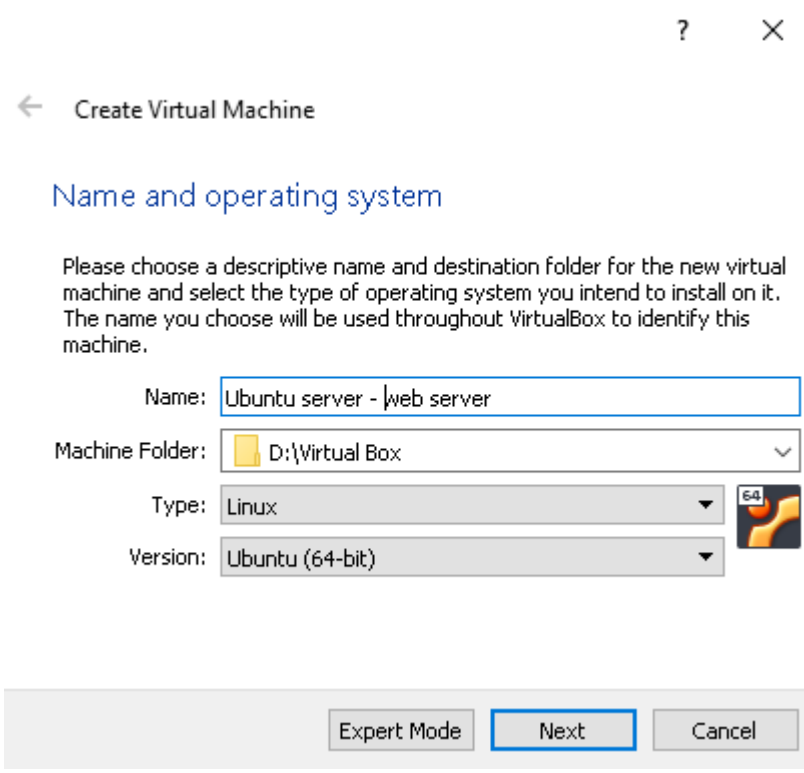
8. Go to settings select storage then empty then click on disk icon to see a drop down menu. Then click on choose a disk file select the Ubuntu OS that you downloaded from Ubuntu website then press ok.

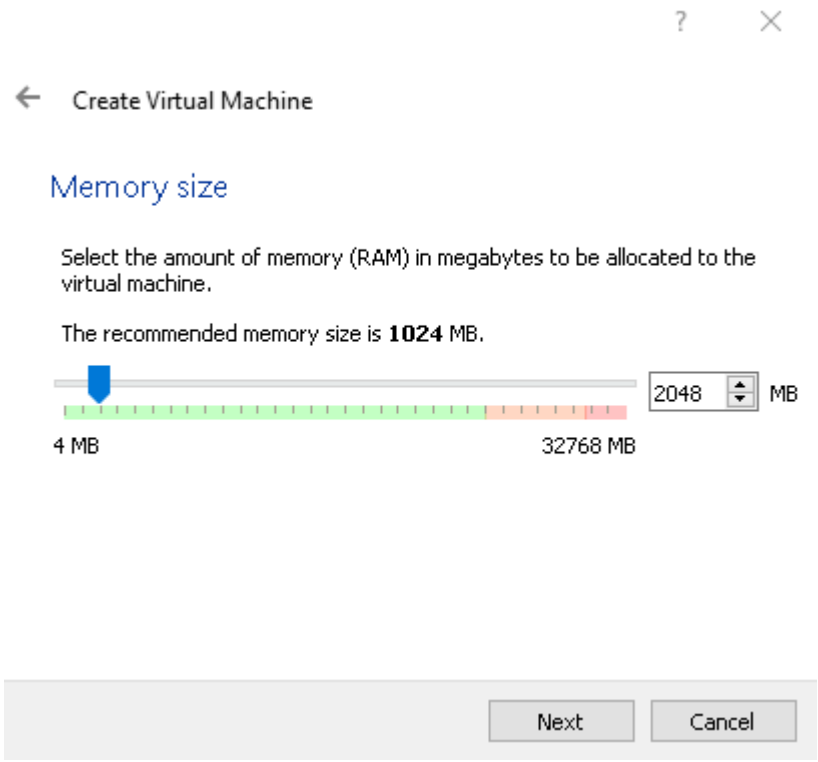
Installing Ubuntu Server

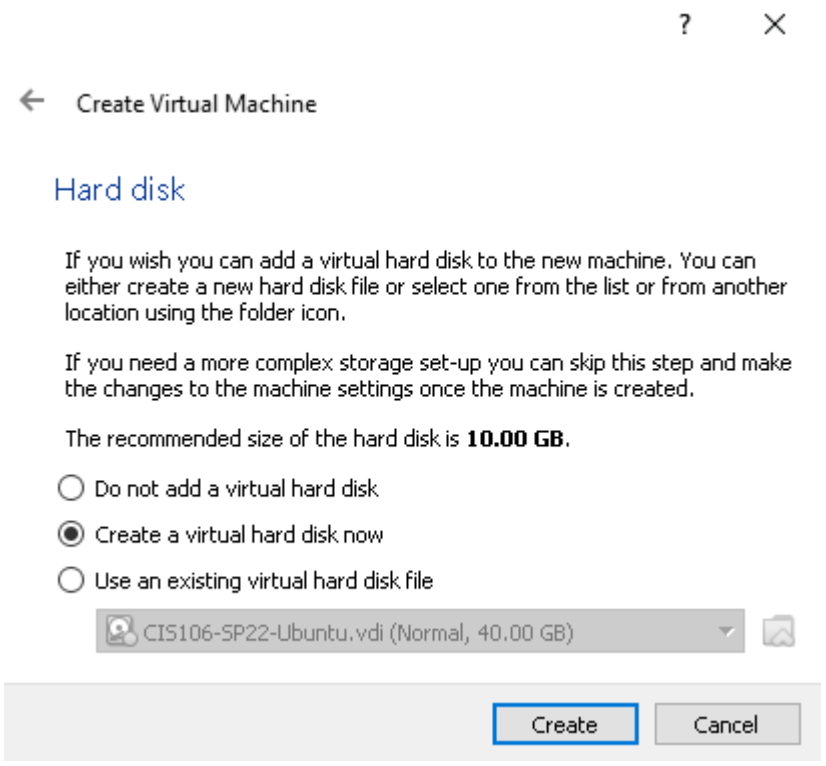
1. Go to the Ubuntu website and download the server ISO

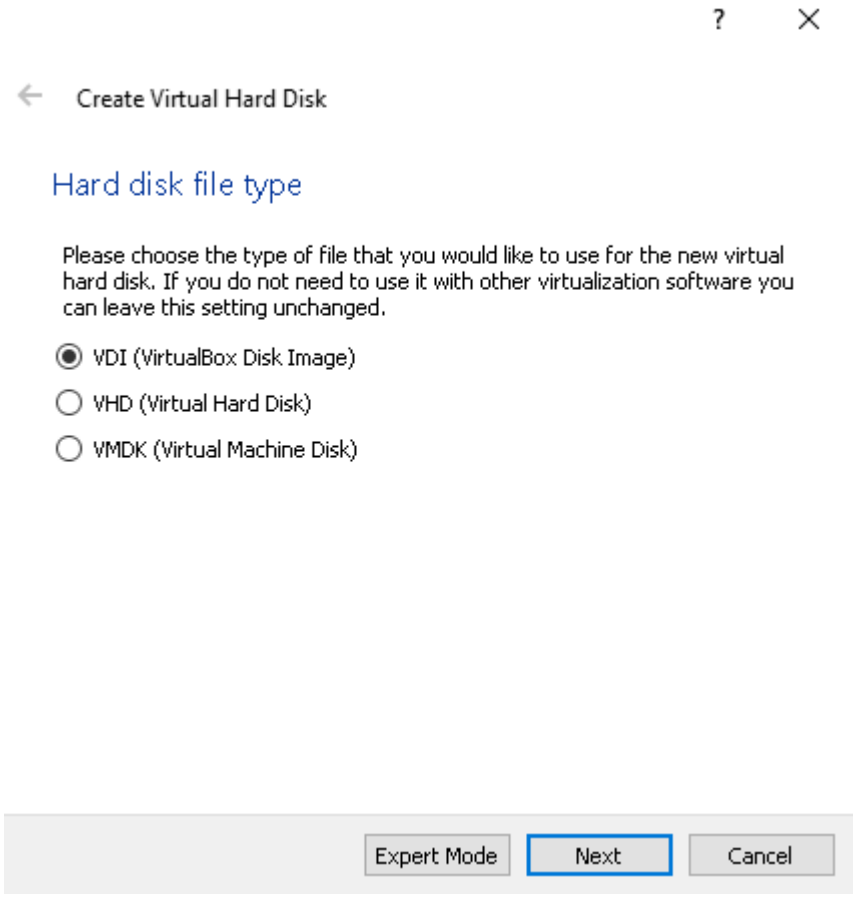
2. Here is an screenshot of the system requirements you need.

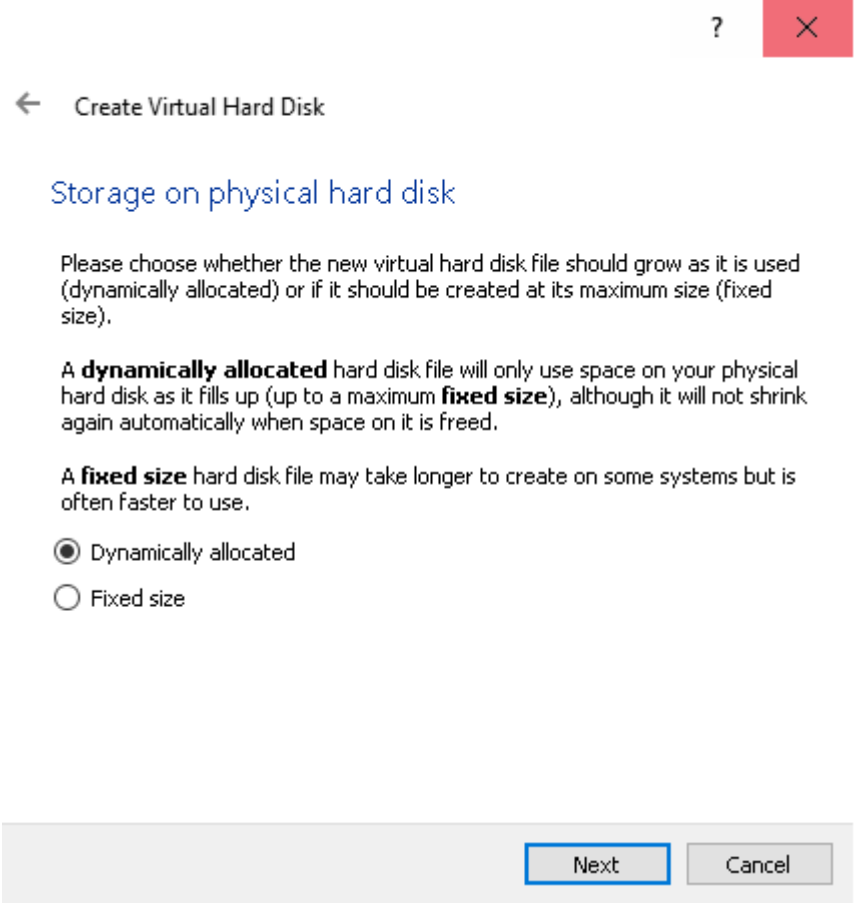
3. Select Linux as the type of OS then name your virtual machine Ubuntu server - web server once you've done this step follow the screenshots bellow. Also you will only need 1 Gigabyte of RAM and it is recommended to give your web server more then just 1.5GB 10GB will be fine after you have finished click on create on File location and size.

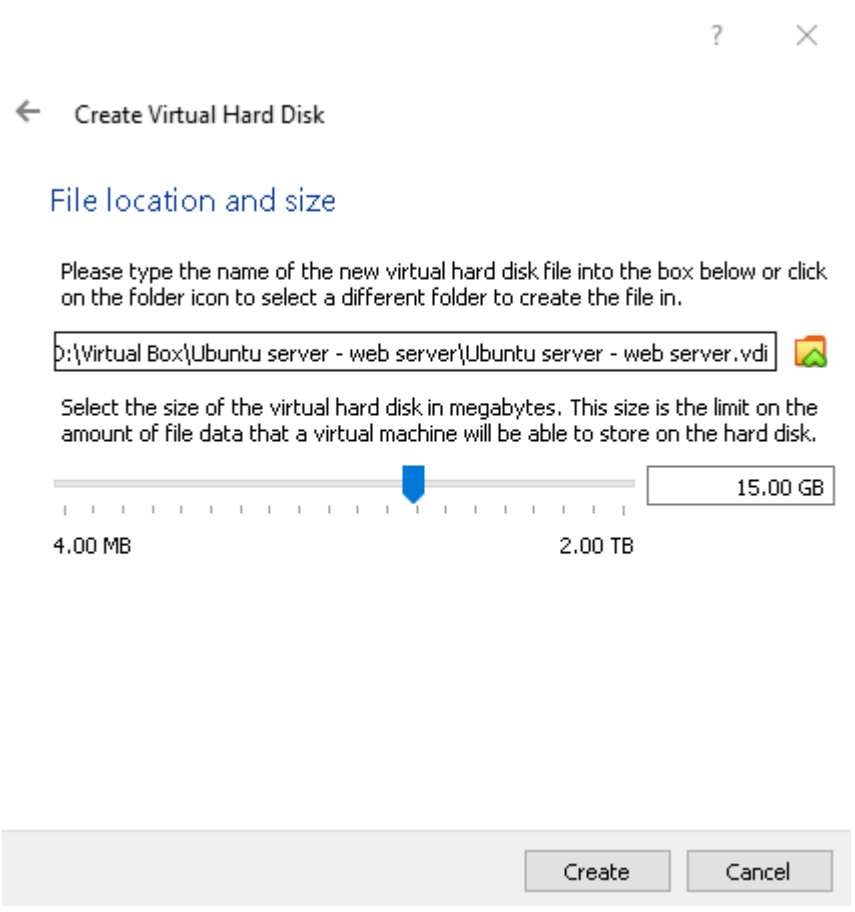

Create Virtual Machine
Name and operating system
Please choose a descriptive name and destination folder for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.
Name: Ubuntu server - web server
Machine Folder: D:\Virtual Box
Type: Linux
Version: Ubuntu (64-bit)
Expert Mode
Next
Cancel


Create Virtual Machine
Memory size
Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.
The recommended memory size is 1024 MB.
2048
MB
4 MB
32768 MB
Next
Cancel


Create Virtual Machine
Hard disk
If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.
If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.
The recommended size of the hard disk is 10.00 GB.
Do not add a virtual hard disk
Create a virtual hard disk now
Use an existing virtual hard disk file
CIS106-SP22-Ubuntu.vdi (Normal, 40.00 GB)
Create
Cancel

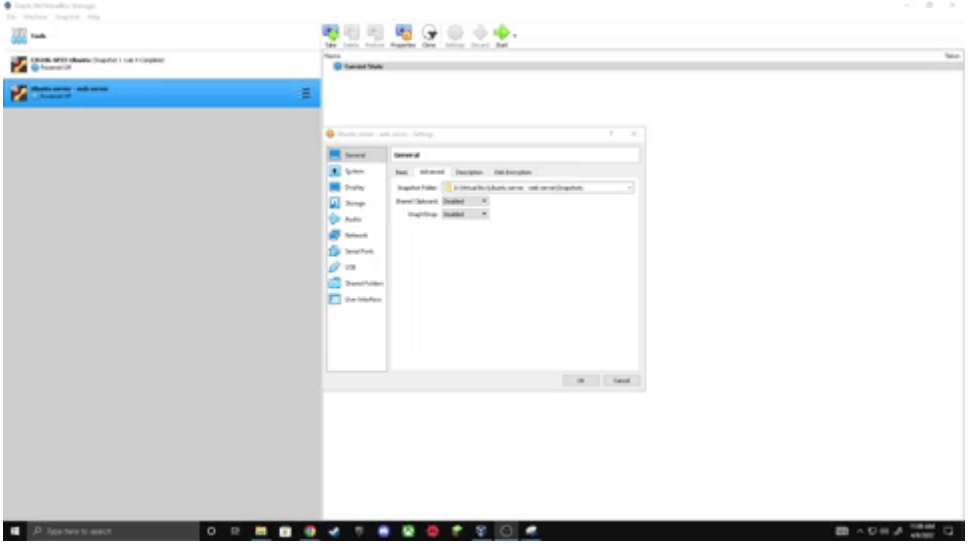

Create Virtual Hard Disk
Hard disk file type
Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
VDI (VirtualBox Disk Image)
VHD (Virtual Hard Disk)
VMDK (Virtual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





4. Settings

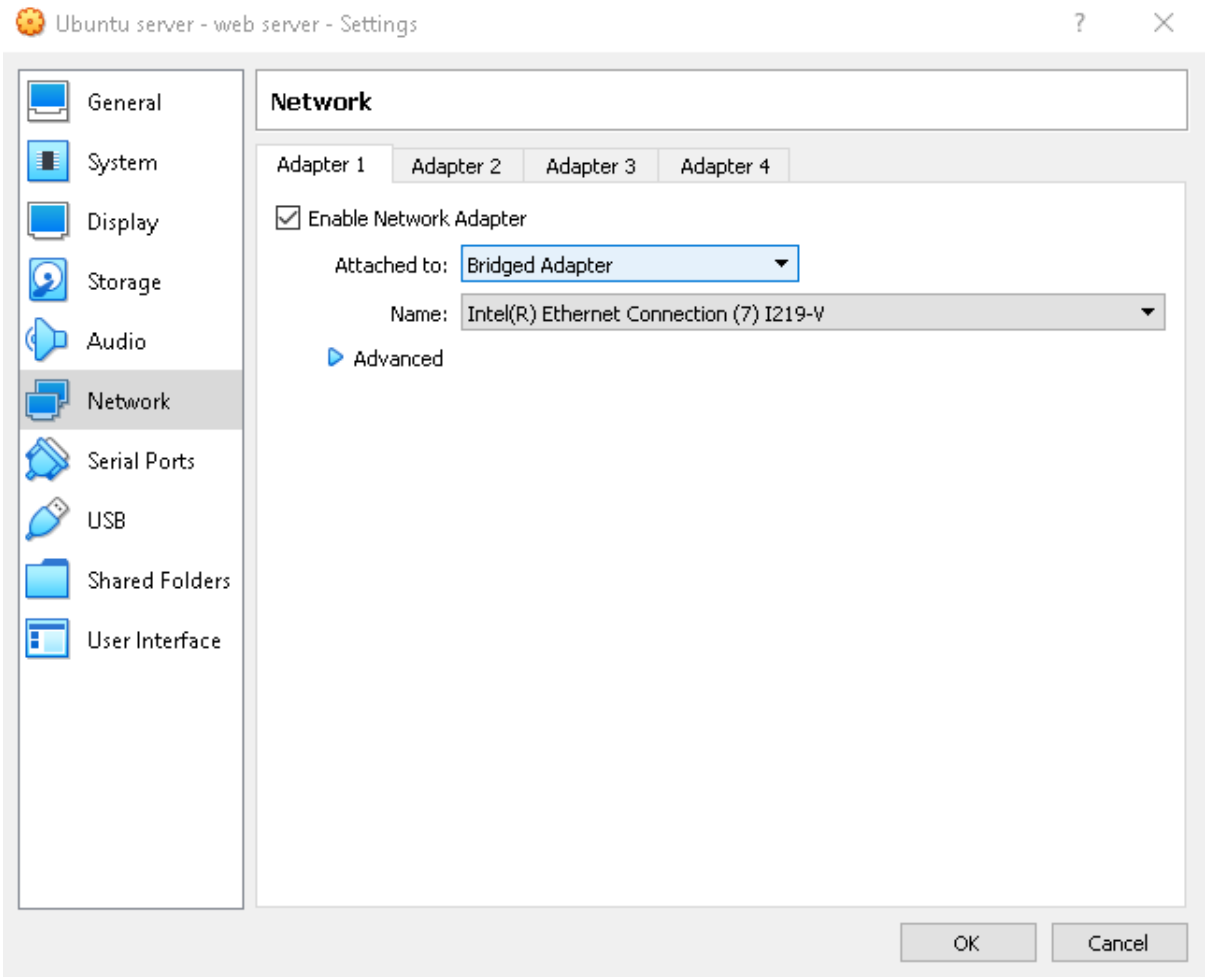
    1. Now go to your settings on your virtual machine and go to General then advanced tab and set shared clipboard to bidirectional.
    2. Go to your display and turn off floppy.
    3. Go to storage and select Empty then select the small disk icon choose from file and select the Ubuntu server ISO that you have downloaded.

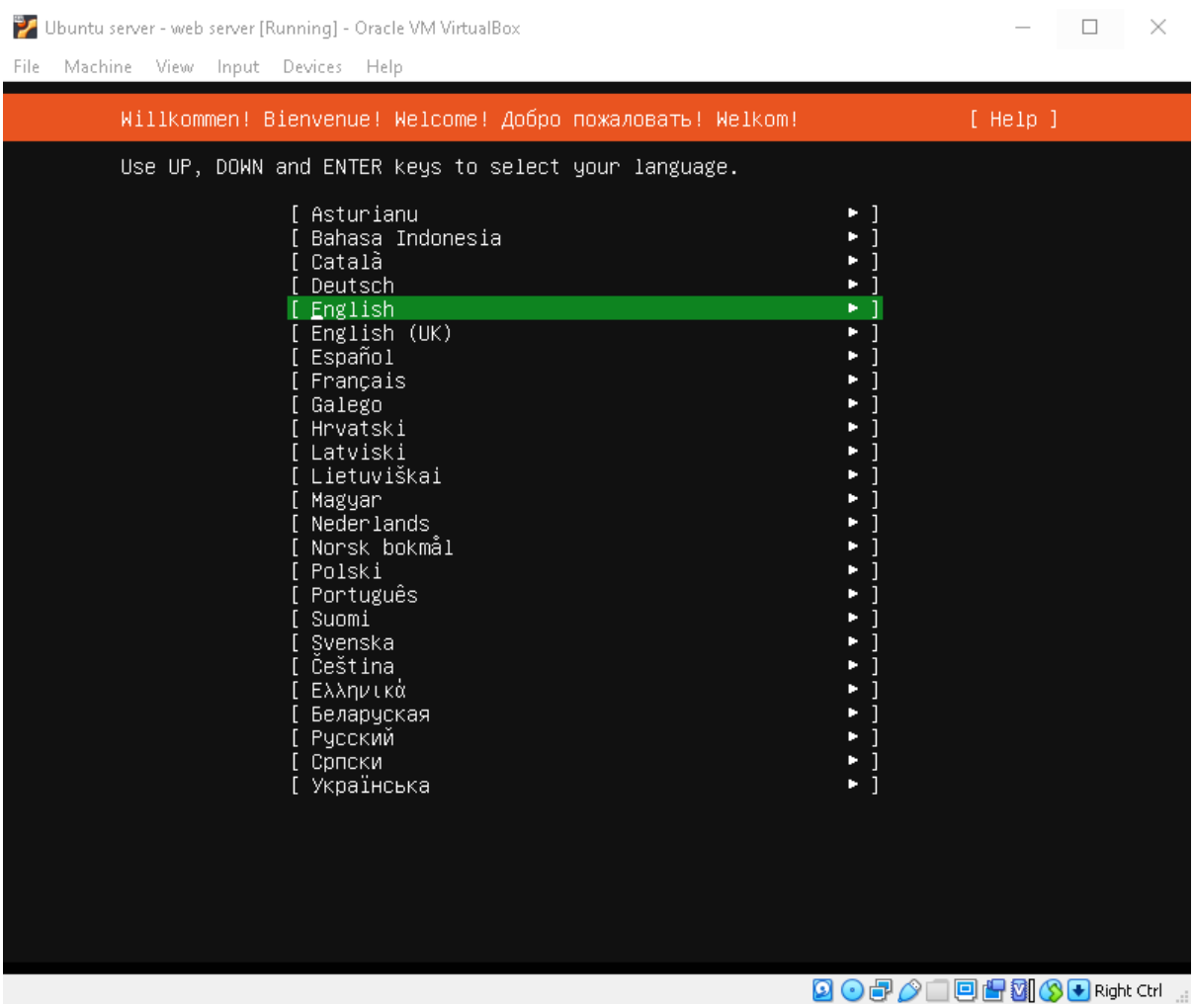


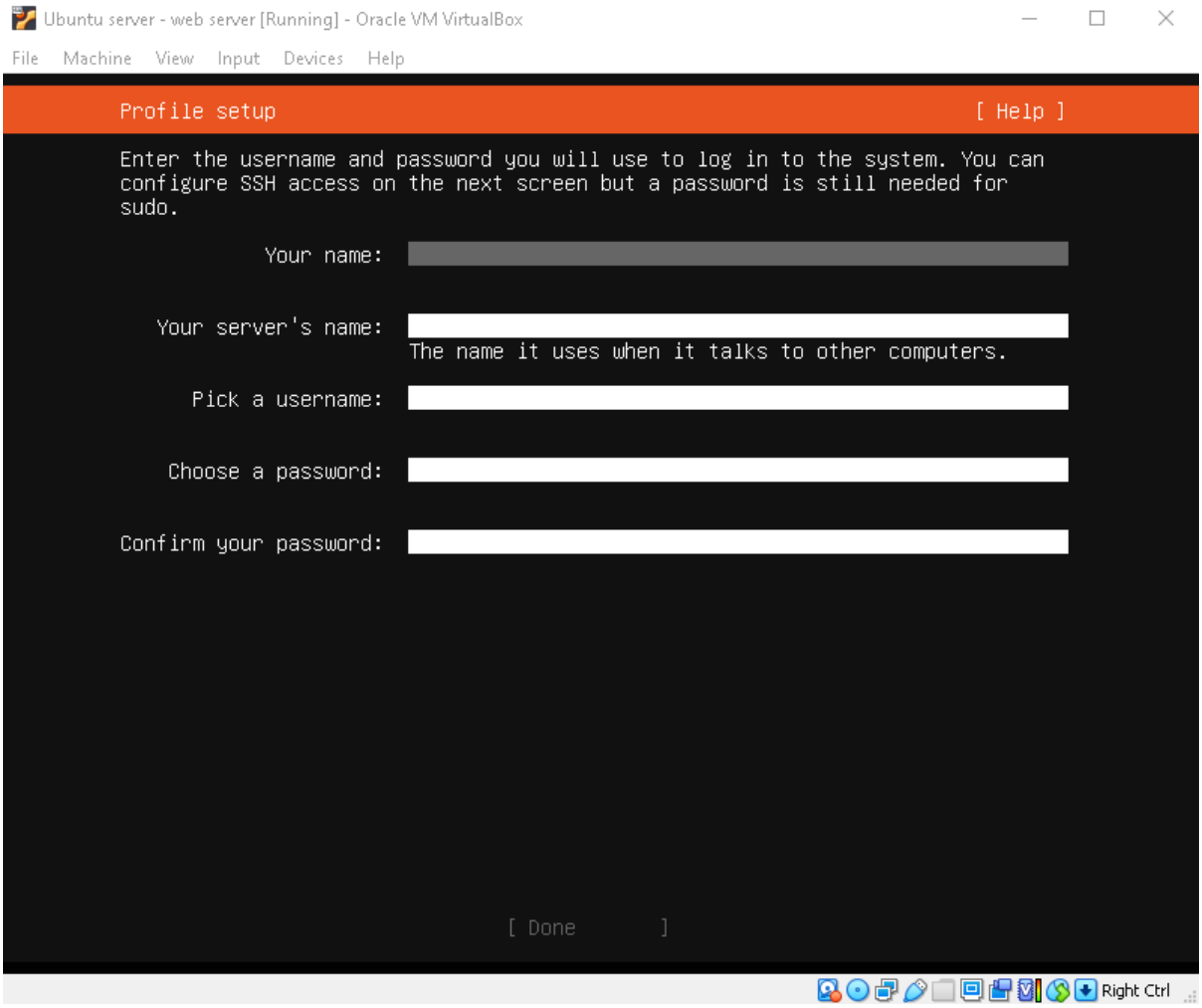
5. Start Ubuntu web server

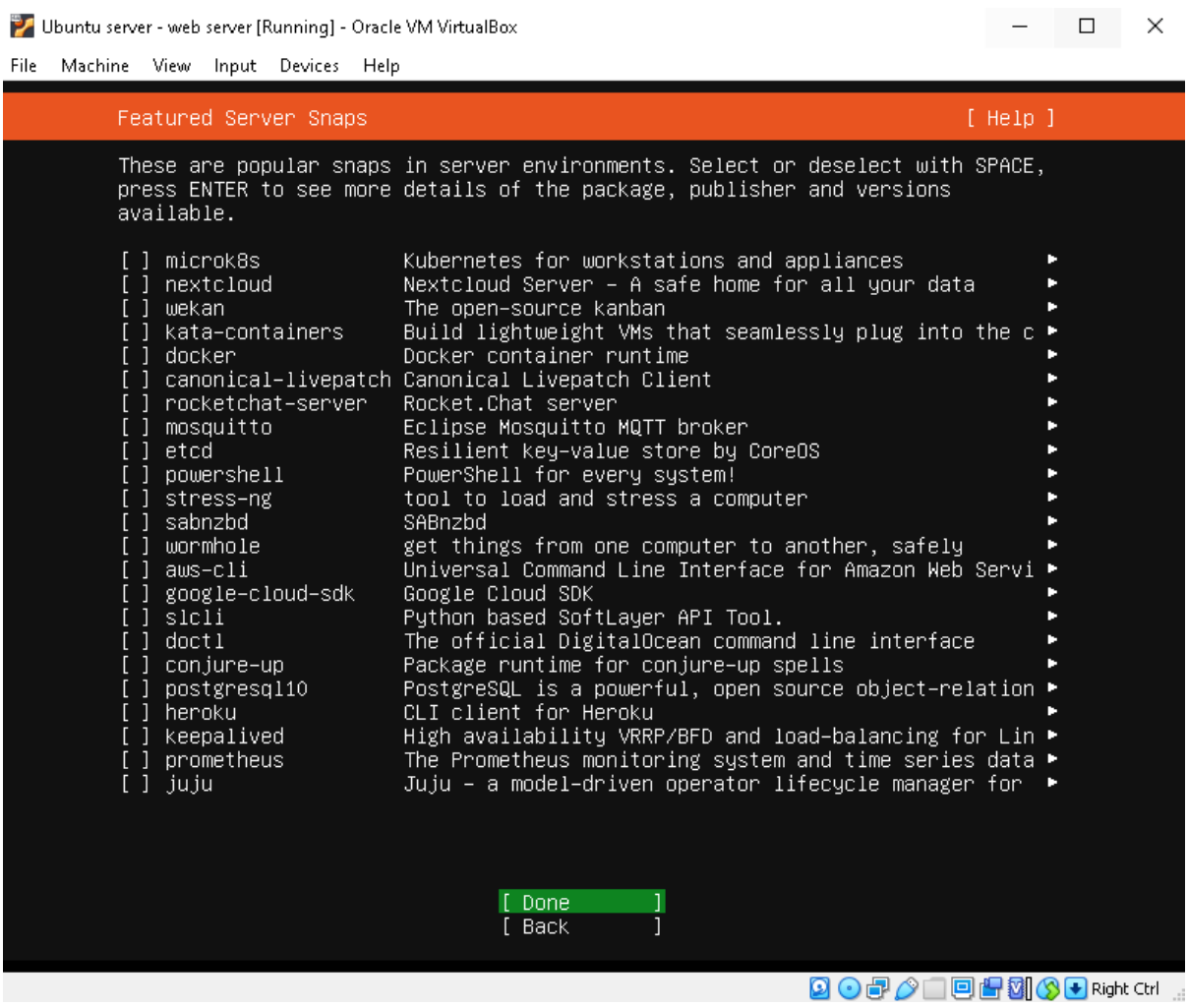
    1. select your language using the arrow keys then press enter.
    2. Now on Network connections you can check that if your virtual machine webserver is connected by typing `hostname -I` after using that command use `ipconfig` on your windows computer.
    3. Then press tab until you get to done then press enter.
    4. You'll be asked if your sure you want to confirm of what changes you made press enter on done then press continue.
    5. Enter your name, server name, username and choose a password press tab to move to the next box after you filled out your profile press enter on Done.
    6. press done when you get to featured server snaps then when you get to the installing process of the system let it install.
    7. Once it's completed press enter on Reboot Now.
    8. When it shows failed press enter.
    9. Then you will be asked to login enter your information.
    10. Press enter on Enable ubuntu advantage once you get to SSH setup press space then press tab until you get to Done then press enter.
    11. type `sudo apt update; sudo apt upgrade -y` then press enter.
    12. if you want to to turn off the virtual machine type `shutdown` if want shut down now intead of waiting type `shutdown -c` then `shutdown now`

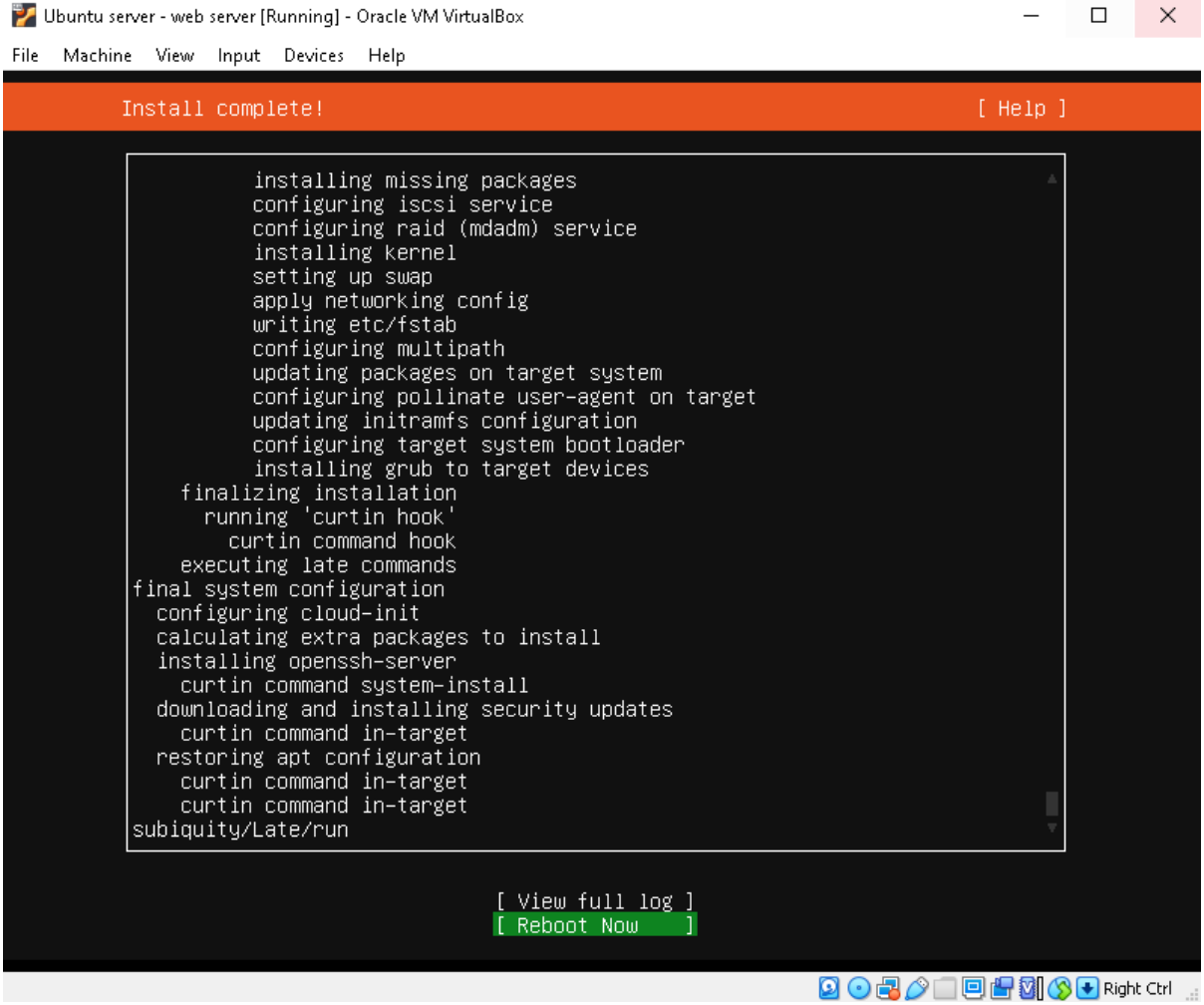
13.

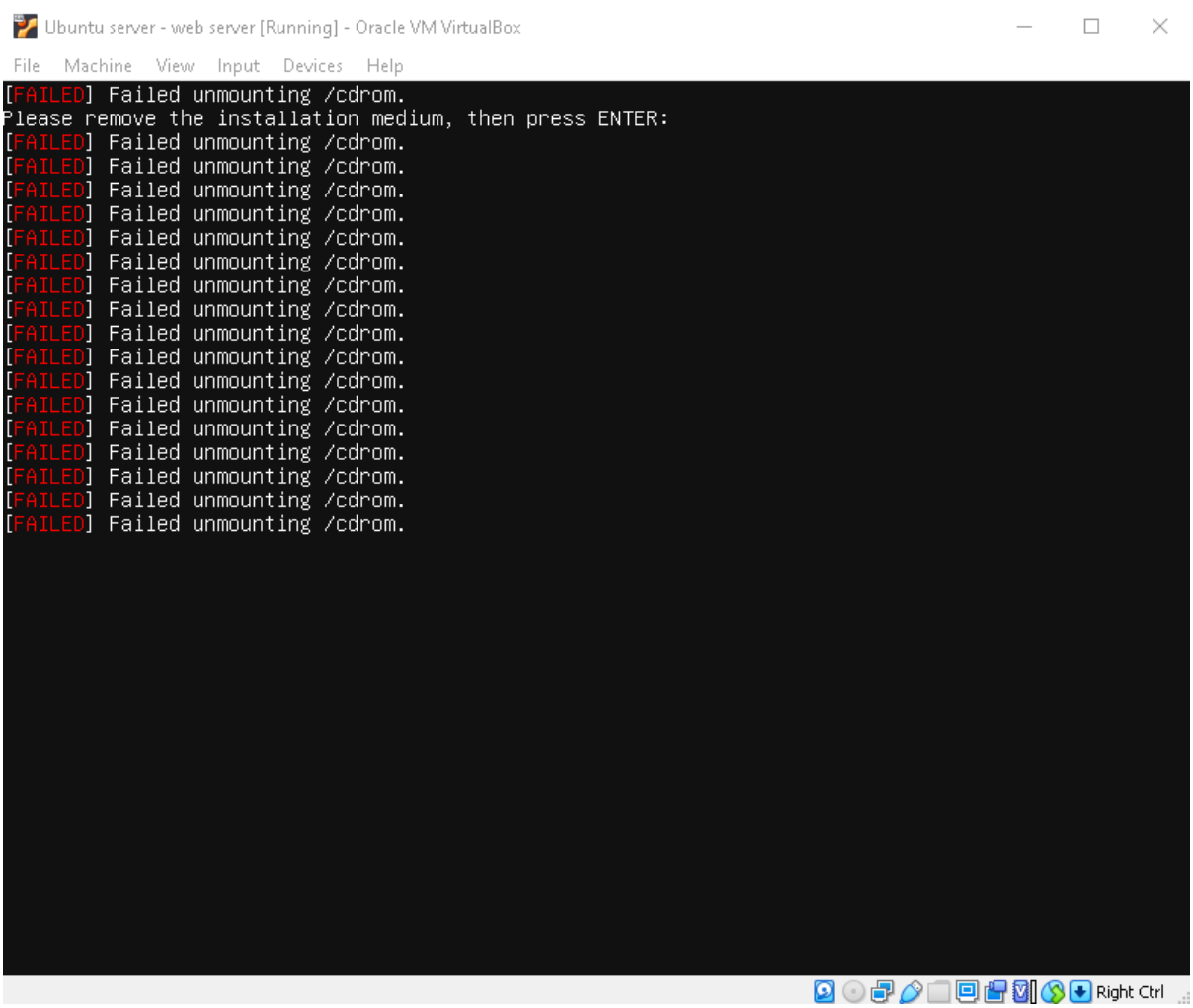

Ubuntu server - web server - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
Bridged Adapter
Name:
Intel(R) Ethernet Connection (7) I219-V
Advanced
OK
Cancel


Ubuntu server - web server [Running] - Oracle VM VirtualBox
File
Machine
View
Input
Devices
Help
Willkommen! Bienvenue! Welcome! Добро пожаловать! Welkom!
[Help]
Use UP, DOWN and ENTER keys to select your language.
[Asturianu ▸]
[Bahasa Indonesia ▸]
[Català ▸]
[Deutsch ▸]
[English ▸]
[English (UK) ▸]
[Español ▸]
[Français ▸]
[Galego ▸]
[Hrvatski ▸]
[Latviski ▸]
[Lietuviškai ▸]
[Magyar ▸]
[Nederlands ▸]
[Norsk bokmål ▸]
[Polski ▸]
[Português ▸]
[Suomi ▸]
[Svenska ▸]
[Čeština ▸]
[Ελληνικά ▸]
[Беларуская ▸]
[Русский ▸]
[Српски ▸]
[Українська ▸]
Right Ctrl


Ubuntu server - web server [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Profile setup [Help]
Enter the username and password you will use to log in to the system. You can configure SSH access on the next screen but a password is still needed for sudo.
Your name:
Your server's name:
The name it uses when it talks to other computers.
Pick a username:
Choose a password:
Confirm your password:
[Done]
Right Ctrl


Ubuntu server - web server [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Featured Server Snaps [Help]
These are popular snaps in server environments. Select or deselect with SPACE, press ENTER to see more details of the package, publisher and versions available.
[ ] microk8s Kubernetes for workstations and appliances
[ ] nextcloud Nextcloud Server - A safe home for all your data
[ ] wekan The open-source kanban
[ ] kata-containers Build lightweight VMs that seamlessly plug into the c
[ ] docker Docker container runtime
[ ] canonical-livepatch Canonical Livepatch Client
[ ] rocketchat-server Rocket.Chat server
[ ] mosquitto Eclipse Mosquitto MQTT broker
[ ] etcd Resilient key-value store by CoreOS
[ ] powershell PowerShell for every system!
[ ] stress-ng tool to load and stress a computer
[ ] sabnzbd SABnzbd
[ ] wormhole get things from one computer to another, safely
[ ] aws-cli Universal Command Line Interface for Amazon Web Servi
[ ] google-cloud-sdk Google Cloud SDK
[ ] slcli Python based SoftLayer API Tool.
[ ] doctl The official DigitalOcean command line interface
[ ] conjure-up Package runtime for conjure-up spells
[ ] postgresql10 PostgreSQL is a powerful, open source object-relation
[ ] heroku CLI client for Heroku
[ ] keepalived High availability VRRP/BFD and load-balancing for Lin
[ ] prometheus The Prometheus monitoring system and time series data
[ ] juju Juju - a model-driven operator lifecycle manager for
[Done]
[Back]
Right Ctrl


Ubuntu server - web server [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Install complete! [Help]
installing missing packages
configuring iscsi service
configuring raid (mdadm) service
installing kernel
setting up swap
apply networking config
writing etc/fstab
configuring multipath
updating packages on target system
configuring pollinate user-agent on target
updating initramfs configuration
configuring target system bootloader
installing grub to target devices
finalizing installation
running 'curtin hook'
curtin command hook
executing late commands
final system configuration
configuring cloud-init
calculating extra packages to install
installing openssh-server
curtin command system-install
downloading and installing security updates
curtin command in-target
restoring apt configuration
curtin command in-target
curtin command in-target
subiquity/Late/run
[View full log]
[Reboot Now]
Right Ctrl


Ubuntu server - web server [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
[FAILED] Failed unmounting /cdrom.
Please remove the installation medium, then press ENTER:
[FAILED] Failed unmounting /cdrom.
[FAILED] Failed unmounting /cdrom.
[FAILED] Failed unmounting /cdrom.
[FAILED] Failed unmounting /cdrom.
[FAILED] Failed unmounting /cdrom.
[FAILED] Failed unmounting /cdrom.
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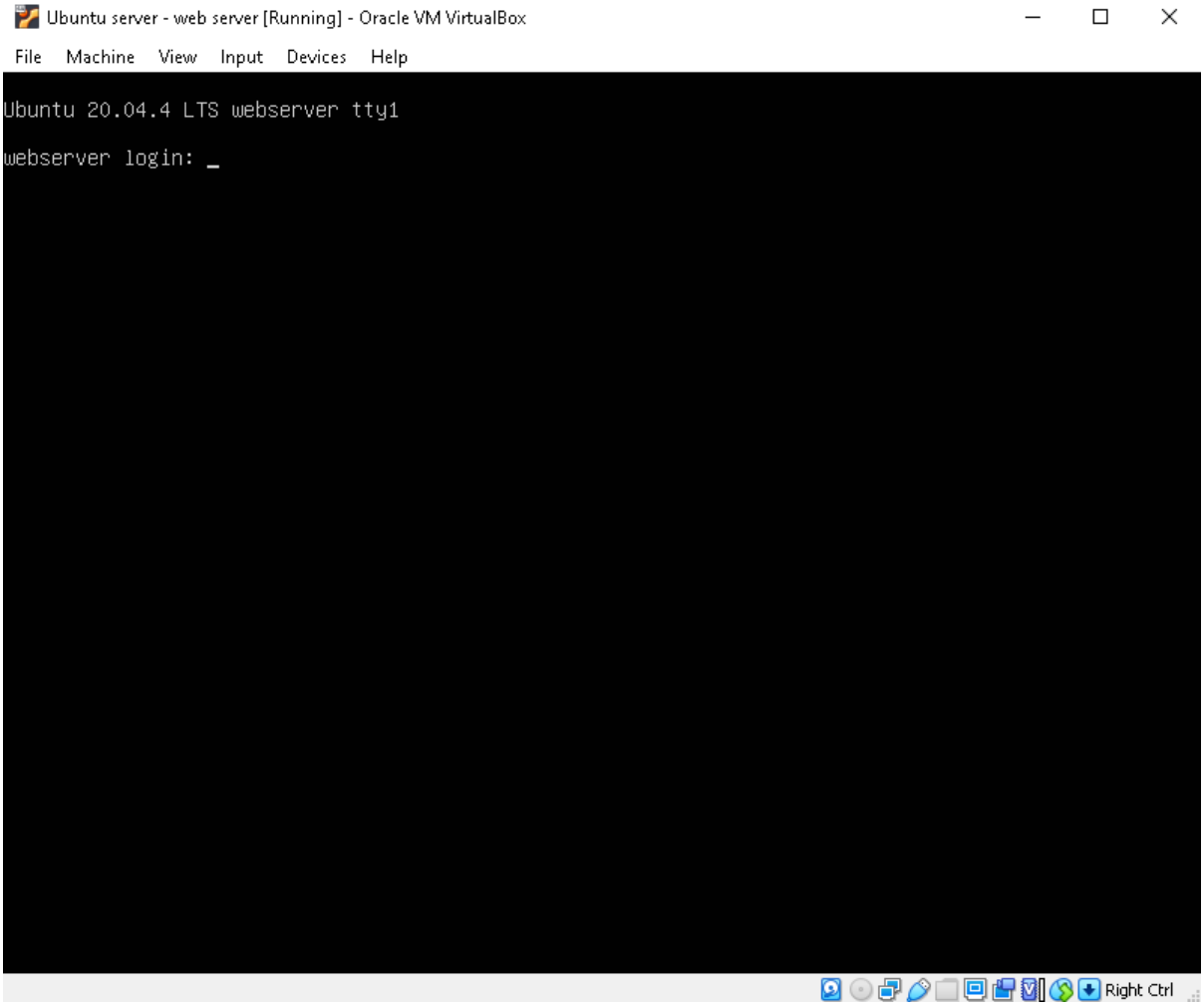
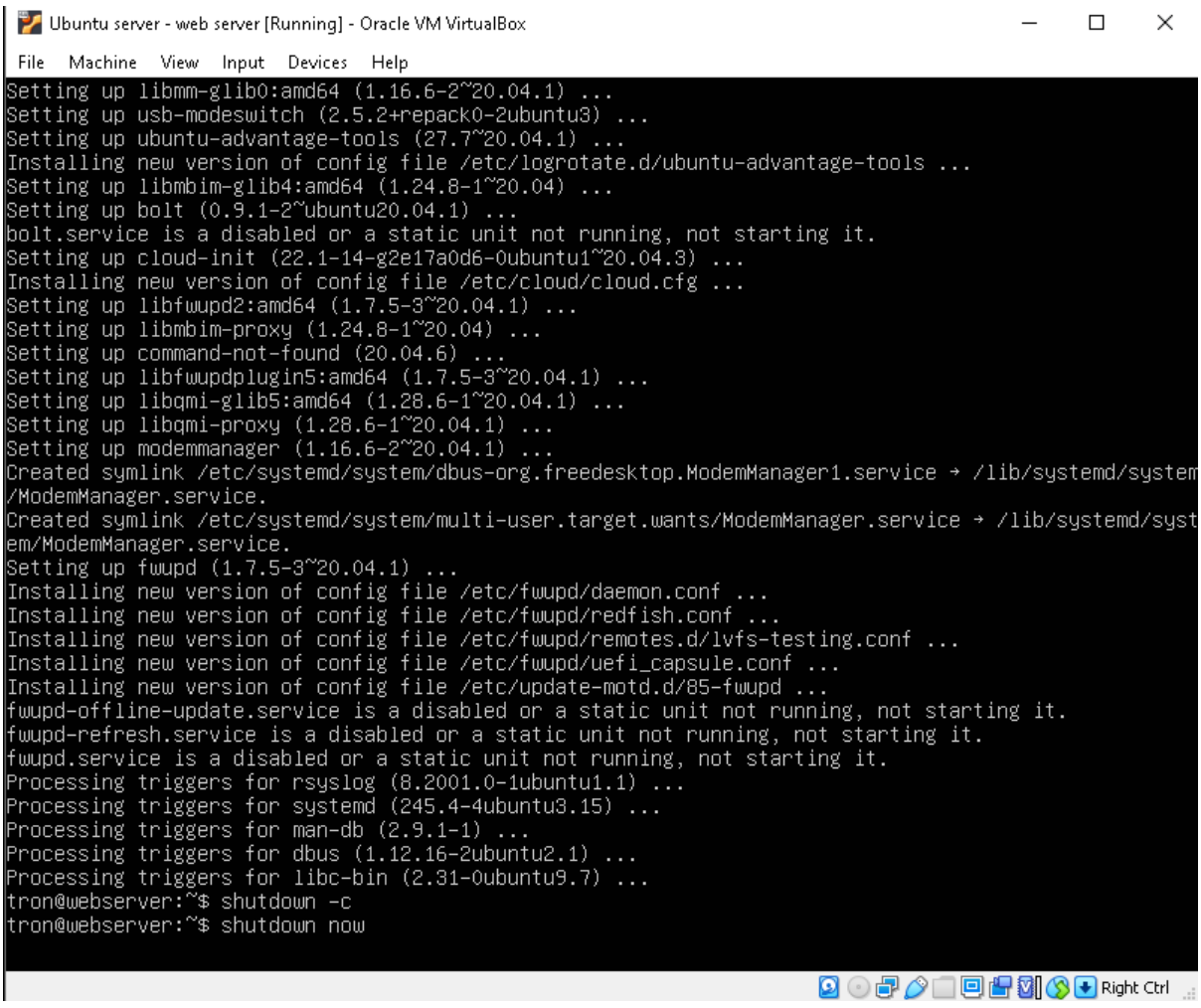
[FAILED] Failed unmounting /cdrom.
Right Ctrl





Updating Ubuntu

1. Open your terminal and enter this command `sudo apt upgrade; sudo apt upgrade -y; sudo apt full-upgrade -y` 2. `sudo` will allow you to run commands from the root user which is very important to use when updating or else you'll just won't be able to. 3. `apt` This command will let you update anything such as updating the system or other applications. 4. `update` This will give you all information from the sources you downloaded on your machine what I mean by sources is upgrading any applications. 5. `;` Is this to execute commands in one line it is very useful because in stead of typing the commands one by one you can just use a semicolon. 6. `upgrade` The upgrade command wll install any available packages upgrades. 7. `-y` This command will bypass asking if your sure you want to update it will instantly update.
2. There are other ways to update Ubuntu as well open software updater then any updates that need to be installed it will download it and give you an option if you want to install it now.

Installing Software in Ubuntu

1. Now in screenshot what we need to install software type the following. `sudo apt install synaptic` 2. synaptic is software that you can install where synaptic is you can put what ever name of the software you want to install there. 3. Type Y then press enter once when the terminal is done loading the information for the software

2. Then it will began installing the software.

3. To search for a software type this in your terminal 2. `apt search -n synaptic` 3.

4. To delete a software type this command `sudo apt remove synaptic`

Basic Linux commands

1. `ls` This command will list what ever is in a folder or directory. 2. `ls` + `Downloads/`

2. `man` The man command will display a manual for another command example.

3. `man ls`

Navigationg the file system

1. `cd` The cd command you can change to different directories. `cd` + `Music`
2. to go back to your previous directory do `cd` + `..//`

Managing files and directories

1. `mkdir` The mkdir command will make an directory.
    1. `mkdir -p Documents/cat jam`
    2. The `-p` command will make a subdirectory from the parent.
2. `touch` the touch command will make files.
3. `touch Documents/cat jam/file1.txt`
4.
5. `tree` the tree command will list what ever is in the directory in a tree format like this. Also here's an example how to use the command `tree Documents/cat jam/`