

# UBUNTU & CENTOS SERVER ADMINISTRATION

*This is the keyword-rich, attention-grabbing subtitle*

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*To my niece Safiyah Nawar and Nujaira Zaynab*

# UBUNTU & CENTOS SERVER ADMINISTRATION

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# INTRODUCTION

## *subtitle*

An operating system is a software that runs on our computer. Handling all the instructions between a user and the Computer hardware .But the operating system is not just one software it also consists of a lot of other smaller program that runs on this operating system to that helps users to do their work. we run this smaller program on top of this operating system to do everything.

Liunix is just another operating system. Its a rock solid operating system. Linux work both as a server and Desktop operating system.

Linux operating system is great for a lot of reason . thease are the following

\* **Multi user OS:** Linux is a multi user operating system. That means more than one user can work on a system at the same name

\* **Multi tasking OS:** Linux is a multi taking operating system you can run multiple program at once .this allows the operating system to run several process all at once.

\* **Multi Platform OS:** Linux can run currently more that 24 types of platform and 64-bit Intel based personal computer .All variants of Apple mac,Sun Spark and ipod ,even the Microsoft xbox.

\* **Interoprable OS:** Linux can operate with most network protocols and also most Language it can easily interact with Windows OS,NOVEL,UNIX and other operating system that has a smaller market

\* **Scalabel OS:** Linux operating system has support for even Raspberry pi which is a credit card size computer to Very powerful Server. Most of the server of the world is running Linux OS. They have also run in low power computer

\* **Portable OS:** Linux is portable operating system. Linux is mostly written in C programming language .C is a language that is specially for writing operating system level software. And it can be ported to run on a new computer.

\* **Flexible OS:** Linux operating system can be used to make a router, graphical workstation, home entertainment computer, file server, web server, mail server, cluster, just any computing purpose.

\* **Stable:** Linux kernel is very mature. For being stable it is used for most of the server in the world.

\* **Efficient:** The design of the Linux enables you to include only the thing you needed that's why it can run on both raspberry pi to a big server.

\* **Free :** Linux is a Free operating system.

## GNU PROJECT

GNU Stands for (GNU is NOT UNIX). To make a free clone of the UNIX OS GNU project started 1984.To maintain the free software FSF(Free Software Foundation) is created. It Creates the GNU C compiler ,EMACS Text editor and many other software.

The GNU General Public License (GPL) is a very creative license that used to copyright to protected the freedom of the software user. When a software is licensed under the GPL recipients are bound by the copyright to respect freedom of anyone to use and share the software and also change the source code if necessary.



## HISTORY OF LINUX

Linux is a clone of the UNIX based operating system. Unix is created at BEL LABS for AT&T corporation. To make a free clone of the unix Linus Trovalds created a minix .he wrote the kernel which is the heart of the linux .After that a lot of developer helped him to add more feature and functionality .and at that time the GNU Project was making free software for the computer and to make an OS they need a functional kernel which can communicate with the hardware .They took the linux kernel and add the GNU software on top of the kernel and made the GNU/LINUX Operating system.

Linux Trovalds is still considered as the dictator of the Linux kernel. He ultimately determines which feature will be added in the linux kernel and what features are not.

## Packaging Linux:Distribution

A complete linux system is called distribution. A linux distribution contains the Linux kernel and the GNU project Tools and any number of software that can make the OS diverse functionality.

There are a lot of distribution on linux .Some of them specifically for servers and some of them are Desktop. Every customized distribution includes software packages for different users.

A single linux distribution often appears in different version .For example CENTOS distribution comes with a full core distribution and a LIVE CD version.

Ubuntu is based on Debian Distribution And Centos is community version of the Commercial RED HAT linux distribution.

## Core Linux Distribution

Core linux distribution contains the Linux Kernel and GNU operating system one or more DE(Desktop Environment) and application that is available ready to install and run. The core linux Distribution are the compete linux distribution. These are the popular distribution

- \* Red Hat linux
- \* Fedora Core
- \* Centos Linux
- \* SUSE linux
- \* Ubuntu Linux
- \* Gentoo Linux
- \* Debian Linux
- \* Slackware Linux
- \* Mandriva Linux
- \* Turbo Linux
- \* Puppy Linux

we use the ***UBUNTU linux*** and the ***CENTOS linux*** to illustrate how the servers work.

## PRINCIPLE OF LINUX

- \* Everything works as a file , even the system hardware
- \* Small work is done by the individual program
- \* Any complected work will be divided into smaller part and then process this by different different module.
- \* All the configuration will be stored in a text file
- \* linux OS use a standard hierarchical file structure in which the files/user files are arranged

\* \* \*

## UBUNTU SERVER

Ubuntu is built on the Debian architecture and comprised linux server and Dsktop. Ubuntu release updates every six months Ubuntu packages are based on packages from Debians unstable branch. Ubuntu is currently funded by the Canonical LTD.And GENOME 3 is the default GUI interface for the ubuntu from 17.10 version. We are goinf to use Ubuntu Server 18.04.3 LTS for our work.you can download the latest long term version of ubuntu server in this URL

<https://ubuntu.com/download/server>

## CENTOS SERVER

Ubuntu is built on the Debian architecture and comprised linux server and Dsktop. Ubuntu release updates every six months. Ubuntu packages are based on packages from Debians unstable branch. Ubuntu is currently funded by the Canonical LTD. And GENOME 3 is the default GUI interface for the ubuntu from 17.10 version. We are goinf to use Ubuntu Server 18.04.3 LTS for our work. you can download the latest long term varsion of ubuntu server in this URL

<https://ubuntu.com/download/server>

# VMWARE INSTALLATION

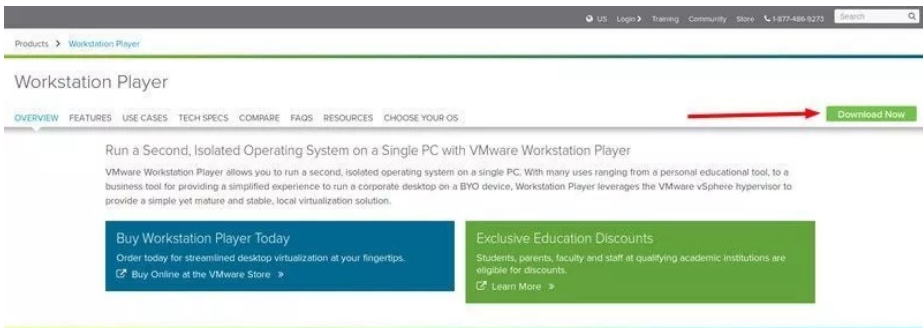
## Step 1:

install the required build packages

=> **sudo apt install build-essential**

## Step 2:

Download VMware workstation player from the website.



## Step 3:

go to the installed directory make the file executable

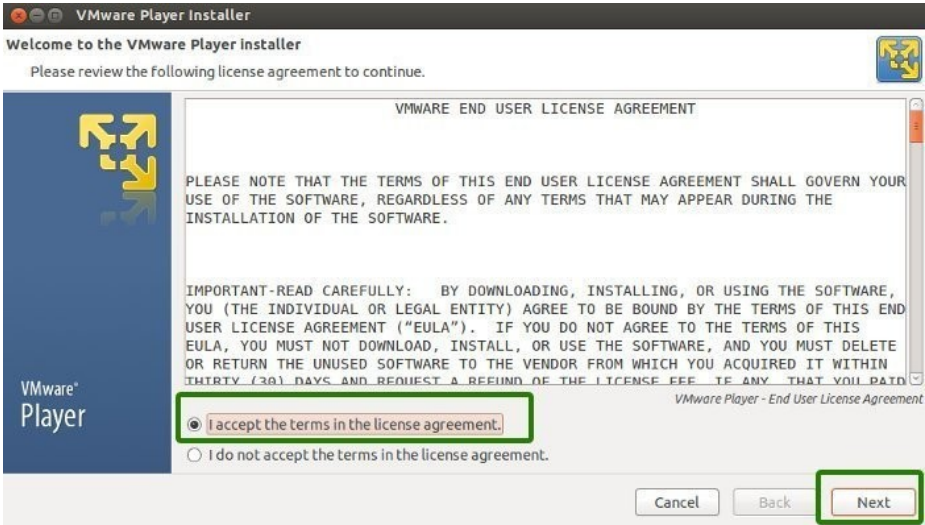
=> **chmod 777 Vmware-Player\***

**[we will talk about the chmod 777 later for now just use it]**

#### Step 4:

execute the program with **sudo**

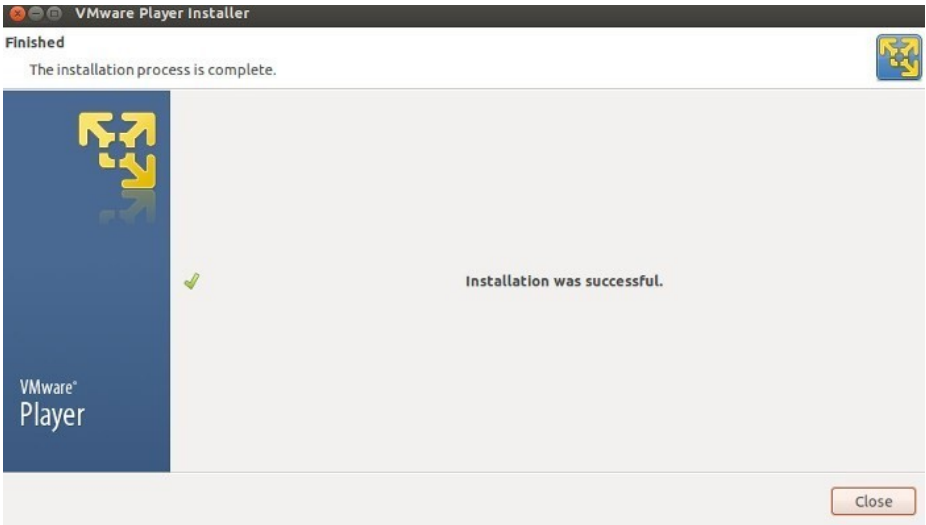
**=>sudo ./Vmware-Player\***



**[no license key is required .If you want to install vmware workstation instead of vmware player you need to have the license key]**

after a successful installation screen will show to you





\* \* \*

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# UBUNTU SERVER INSTALLATION

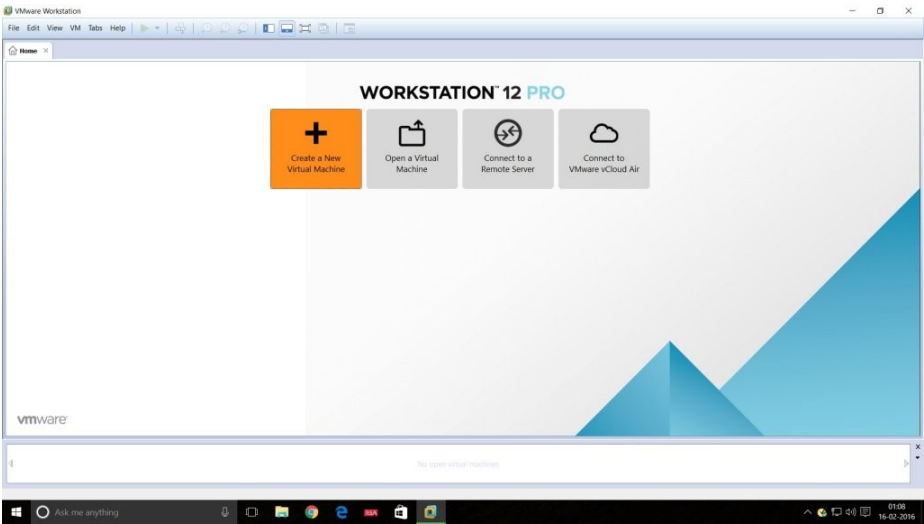
Ubuntu

## REQUIREMENTS:

- 1)HOST PC WITH AT LEAST 4GB OF RAM
- 2)VMWARE WORKSTATION/VIRTUALBOX
- 3)UBUNTU SERVER ISO IMAGE

## Step 1:

Lunch VMware Workstation New Virtual Machine Wizard



## Step 2:

Select the installation media or source and choose the disk size.

### Disk Size

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (in GB):  – +

Recommended size for Ubuntu 64-bit: 20 GB

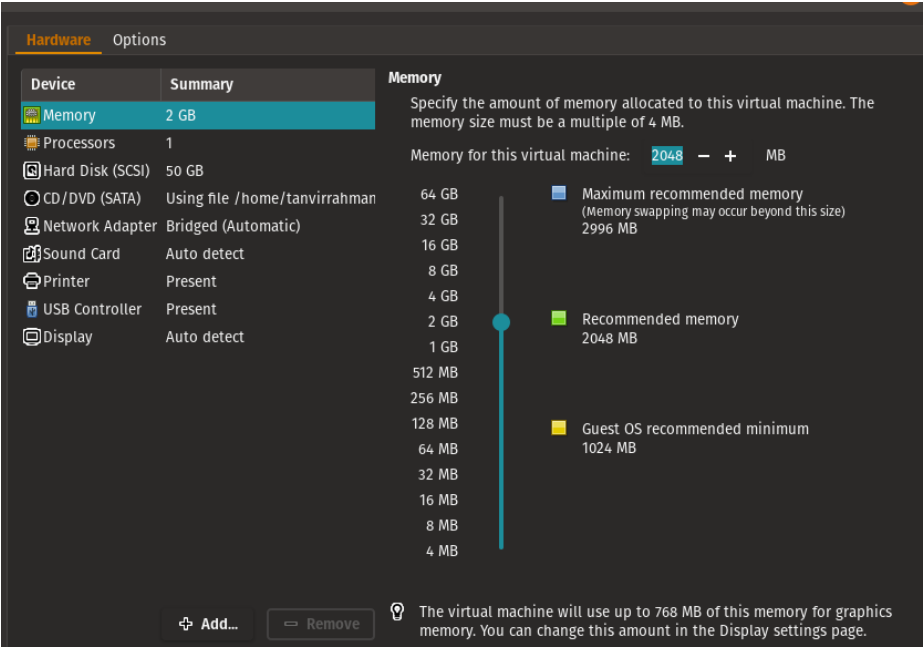
☐ Store virtual disk as a single file

☒ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

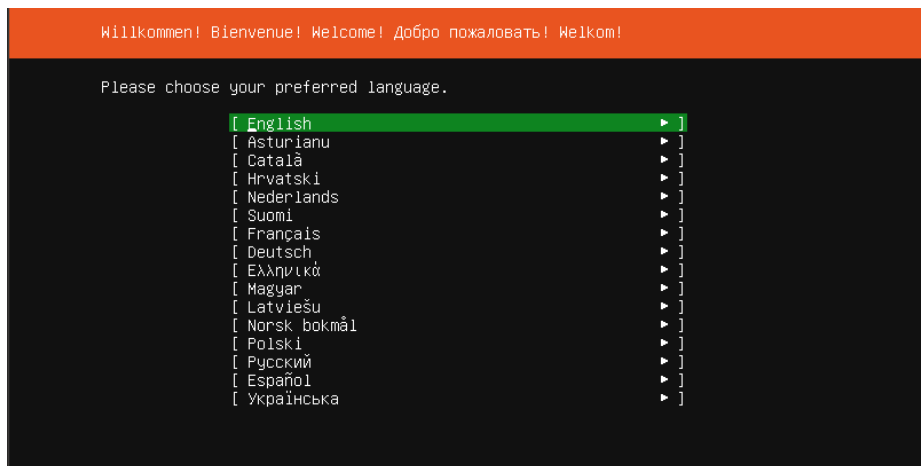
Step 3:

final configuration of the Vmware will be like this

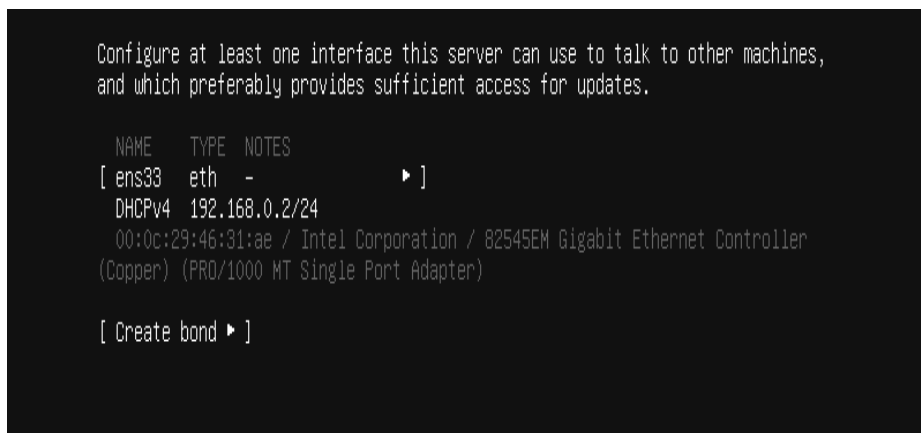


**Step 4:**

start the installation ,first set the language

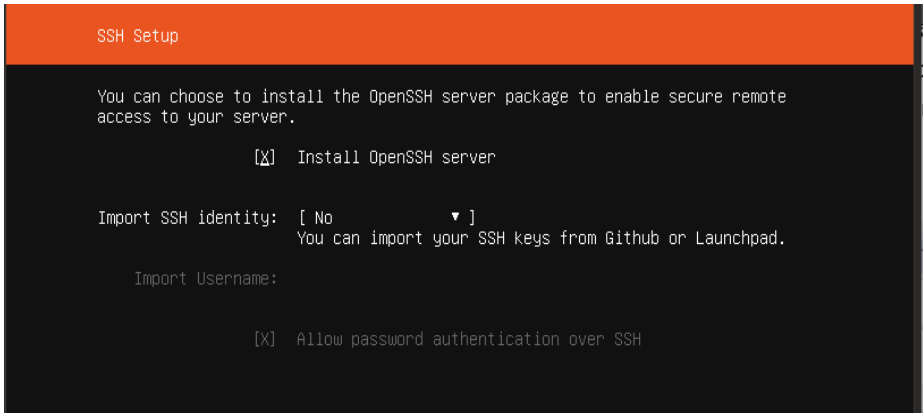
**Step 5:**

select DHCP for network for now .we change the ip address of the server later



### Step 5:

Select “install openSSH server” so we can connect to the computer with our hosts



### Step 6:

#### There are three types of partition

\* **Guided** : use entire disk : it use the entire disk with guided partition system

\* **Manual** : In manual partition user have to allocate the space manually.

For minimal settings three partition is a mandatory

**1) /boot**

**2) /swap**

**3) /root**

\* **Guided** : on LVM :this option allow user to set a LVM based partition

Select the entire disk for installation .we select the Entire disk guided partition will talk about the other boot system later.



### Step 7:

login to the system with your credential .

### SUMMARY:

we learn how to set up a ubuntu server on Vmware Virtual machine with a dhcp network. Using guided partition.

\* \* \*

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# CENTOS SERVER INSTALLATION

Centos

## REQUIREMENTS:

- 1)HOST PC WITH AT LEAST 4GB OF RAM
- 2)VMWAREWORKSTATION/VIRTUALBOX
- 3)CENTOS7 SERVER ISO IMAGE

### Step 1:

Lunch VMware Workstation New Virtual Machine Wizard

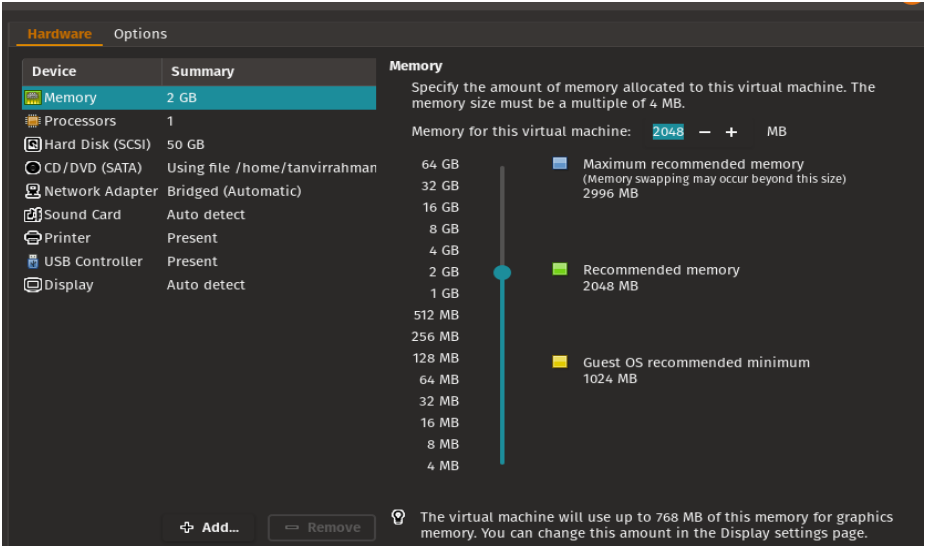
### Step 2:

Select the installation media or source and choose the disk size.

### Step 3:

final configuration of the VMware will be like this





**Step 4:**  
start the installation , First set the language




## Step 5:

From the **software selection** select server with a GUI

SOFTWARE SELECTION

Done

CENTOS 7 INSTALLATION

 us

Help! (F1)

Base Environment

☐ Minimal Install  
Basic functionality.

☐ Compute Node  
Installation for performing computation and processing.

☐ Infrastructure Server  
Server for operating network infrastructure services.

☐ File and Print Server  
File, print, and storage server for enterprises.

☐ Basic Web Server  
Server for serving static and dynamic internet content.

☐ Virtualization Host  
Minimal virtualization host.

☒ Server with GUI  
Server for operating network infrastructure services, with a GUI.

☐ GNOME Desktop  
GNOME is a highly intuitive and user friendly desktop environment.

☐ KDE Plasma Workspaces  
The KDE Plasma Workspaces, a highly-configurable graphical user interface which includes a panel, desktop, system icons and desktop widgets, and many powerful KDE applications.

Add-Ons for Selected Environment

☐ Backup Server  
Software to centralize your infrastructure's backups.

☐ DNS Name Server  
This package group allows you to run a DNS name server (BIND) on the system.

☐ E-mail Server  
Allows the system to act as a SMTP and/or IMAP e-mail server.

☐ FTP Server  
Allows the system to act as an FTP server.

☐ File and Storage Server  
CIFS, SMB, NFS, iSCSI, iSER, and iSNS network storage server.

☐ Hardware Monitoring Utilities  
A set of tools to monitor server hardware.

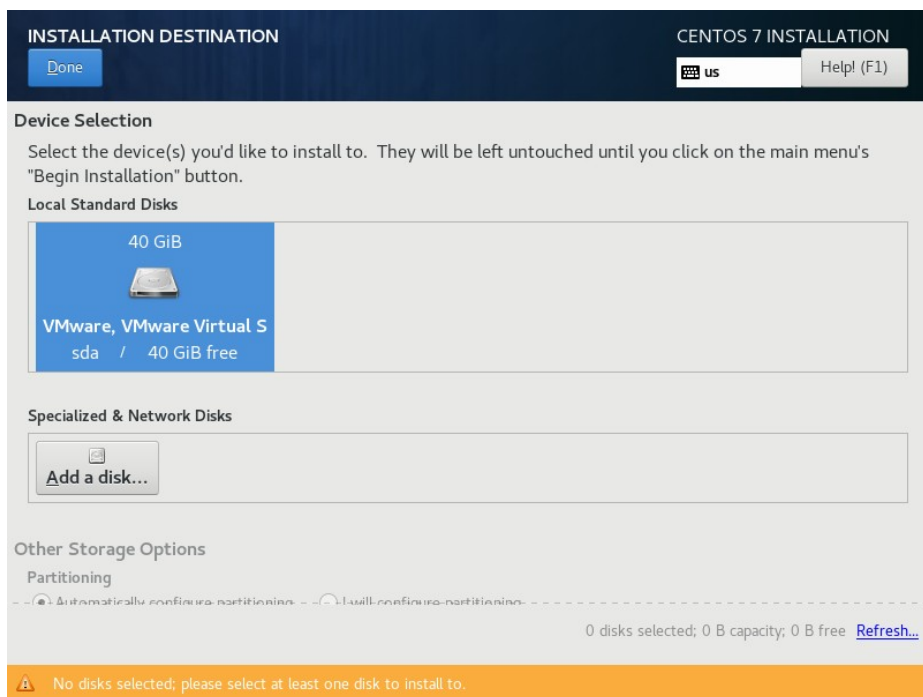
☐ High Availability  
Infrastructure for highly available services and/or shared storage.

☐ Identity Management Server  
Centralized management of users, servers and authentication policies.

☐ Infiniband Support  
Software designed for supporting clustering and grid

## Step 6:

Select the volume for installing .in this installation we go for the entire disk guided partition



## Step 7 :

Enter the root password and confirm it. and create a user and set password for the user

**CREATE USER** CENTOS 7 INSTALLATION

[Done](#) us [Help!](#)

Full name

User name

Tip: Keep your user name shorter than 32 characters and do not use spaces.

☐ Make this user administrator

☒ Require a password to use this account

Password

Too short

Confirm password

[Advanced...](#)

⚠ The password is too short. You will have to press Done twice to confirm it.

## Step 7 :

wait for the installation to finished. After that reboot the system

**Step 8 :**

login with root credentials

**SUMMARY:**

we learn how to set up a Centos server on Vmware Virtual machine with Using guided partition.

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# COMMAND LINE IN LINUX

Every workstation version of linux has a Beautiful GUI(Graphical User Interface ) but most of the server Ubuntu or CENTOS run on command line mode.you can add graphical user interface to that but without the command line you cant manage the server properly. Once you learn Command line you will find that it is more powerful and flexible for user to manage your server than a graphical mode.

## WORKING AS ROOT

By default every linux OS creates a user root.Many operating system like CENTOS ask for a root password .But Ubuntu server don't do that .There is a very good reason behind that .in Linux OS root has a limitless power .root can do anything ,change anything even can delete anything from the server .so it is very important to be careful when you work as

root .Thats why in ubuntu server every time you do anything that need superuser privileges you use the command '***sudo***' .This command allows the normal user so they can peform task that needs superuser privileges.you type sudo then your command it may ask for password after providing the password it will perform the action with the superuser privileges . But if you want the root shell then type this command

**=> sudo su**

But it is not recommended to work with the root shell .Do not use the root shell unless it is absolutely necessary . work with sudo if you need superuser privilege.

## TERMINAL & SHELL

### ***What is Terminal:***

Terminal is a program that opens a window and lets you play with the shell. There are a bunch of different terminal emulators that you can see in the linux Distribution. such as Gnome terminal, konsole ,xterm, rxvt ,nxterm ,eterm, Tilix etc. Terminal lets you interact with the shell

### ***What is shell :***

Shell itself is a program that takes command from the keyboard and gives them to the operating system to perform. You can work with the graphical user interface but if the server you are using has no graphical user interface this will be the only interface you got and you have to do all of your work in the CLI interface

there are different types of shell

\* ***tsh*** → ***tsh*** is a shell with a scripting language similar to the C programming language

\* ***sash*** → stand alone shell .its a very minimal shell runs almot



every system .it is basically popular for troubleshooting the system

\* ***zsh*** → ***zsh*** is a shell which is compatible with bash but has a lot of extra functionality

\* ***fish*** → ***fish*** stands for friendly interactive shell .mostly popular in desktop. It has a very good auto completion feature

\* ***Bash*** → ***bash*** stands for Bourne Again Shell that is the enhanced version of the original UNIX program ***sh*** .it is written by the Steve Bourne. It is the most popular shell and the default shell of the most linux operating system.

We will use the Bash all over the example.

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# BASIC LINUX COMMANDS

These are the basic command to operate a linux operating system

Command Name	Syntax	Description	Examples
<b>ls</b>	ls -[option] <directory>  1) <b>ls -m</b> will show the files and folder with comma  2) <b>ls -a</b> show the hidden files also	ls command used to see the files and folder inside a directory .it is the most used command in linux.	=> <b>ls -l m</b>  [root@localhost vagrant]# ls -m  file1, file2, file3, file4.txt, file5.py, file6.java, test1, test2, test3

	<p>3) <b><i>ls -l</i></b> will show the files and folder in a listing format</p> <p>4) <b><i>ls -lh</i></b> will show the file with listing and size</p> <p>5) <b><i>ls -i</i></b> will show the list of files and folders with Inode</p> <p>6) <b><i>ls -t</i></b> will show the modification time with directory listing</p>		
more	<p><b><i>More &lt;options&gt; &lt;file_name&gt;</i></b></p> <p>1) <b><i>more -d</i></b> will</p>	<p>It is used for many purpose.</p> <p>Is is used for displaying the</p>	<p>=&gt;<b><i>more more +30 sample.txt</i></b></p> <p>this is linux tutorial</p>

	<p>give you reading file one screen at a time</p> <p>2) <b>more -p</b> will clear the screen first then show the content</p> <p>3) <b>more +&lt;number&gt;</b> will display the line after the input line number</p> <p>5) <b>ls / more</b> will show the directory on screen at a time</p> <p>6) <b>cat &lt;file_name&gt; / more</b> read any file with one screen at a time</p>	<p>content inside a file.</p> <p>If any directory has many files you can see it with one screen at a time.</p> <p>It will also work with other command like ls and cat</p> <p>more +30 sample.txt</p>	<p>[root@localhost vagrant]# ls   more</p> <p>file1 file2 file3 file4.txt file5.py file6.java file.txt test1 test2 test3</p>
less	More <options>	It works like the more	=>dmesg   less -

<file_name>	command .it	E =>dmesg
	also give	less -N
less -E :	scroling	=>dmesg   less -
automatically	options	p systemd
exit the first		=>cat file.txt
time it reaches		less -F
end of file.		=>cat file.txt
		less -g
Less -f : forces		=>cat file.txt
non-regular file		less -E
to open.		
Less -F : exit if		
entire file can		
be displayed on		
first screen		
less -g :		
highlight the		
string which		
was found by		
last search		
command		
less -G :		
suppresses all		
highlighting of		

	<p>strings found by search commands less -i : cause sears line numbers</p> <p>less -p &lt;pattern&gt; : it tells less to start at the first occurrence of pattern in the file</p> <p>less -s : causes consecutive blank lines to be squeezed into a single blank line to ignore case</p> <p>less -n : suppresses line numbers</p> <p>less -p &lt;pattern&gt; : it</p>		
--	---	--	--

	<p>tells less to start at the first occurrence of pattern in the file</p> <p>less -s : causes consecutive blank lines to be squeezed</p> <p>less -N : shows line number</p>		
strings	<p><b><i>strings</i></b>  <b>&lt;filename&gt;</b></p>	To display the content of the file	String file.txt
tree	<p>Tree          &lt;directory&gt;          [you may have to tool with package manager]</p>	To display the Directory stricture in a tree format	tree /dev tree /home//user1
dir	<p>Dir          &lt;directory_name&gt;          [you have to</p>	To display the diles and folder inside the directory	dir /dev dir / dir /home

	install 'tree' tools before using this command]		
date			
cal			
clear			
bc			
rmdir			
mkdir			
file			
hwclock			
ln			
History			
locate			
uname			
tar			
gzip			
gunzip			
Lsmod			
rmmod			
Modprobe			
ps			
pstree			
top			
htop			
renice			
kill			
uptime			
iostat			



sar			
hostname			
Pwd			
dmesg			
Init			
Mkswap			
swapoff			
mkfs			
Poweroff			
whoami			
wc			
w			
unix2dos			
alias			
cfdisk			
cp			
echo			
eject			
env			
fc			
fdisk			
free			
lsblk			
lsmod			
lspci			
lshw			
lscpu			
grep			
hostnamectl			

ip			
lsusb			
man			
grep			
ifconfig			
ping			
reboot			
sudo			
tee			
touch			
traceroute			
vi			
Wget			
whatis			

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Vivamus mauris velit, congue eget ultrices eu, pharetra id nisi. Curabitur eget lacus quis justo ultricies consequat id ultricies lacus. Donec et tempor augue, at consequat ipsum. Donec sapien urna, feugiat id interdum vitae, pretium vel nisi. Nullam suscipit consectetur pulvinar. Aliquam ac libero nisl. Ut pretium nisi cursus scelerisque dictum. Sed vitae bibendum tortor.

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diam ut, euismod ornare arcu. Proin mollis justo ut nulla lacinia, at pellen- tesque sem fringilla. Donec vel feugiat odio, vel viverra sapien. Curabi- tur sed lacus enim.

*The rest of this **TEMPLATE** is just dummy text that you can replace or delete.*

Cras lectus ante, egestas quis blandit non, mattis quis metus. Viva- mus sapien dui, ornare nec massa eget, porttitor gravida tellus. Donec hendrerit posuere placerat. Nulla facilisi. Cras non orci at nisi rutrum sagittis ac congue dolor. Aliquam pellentesque libero sed libero male- suada laoreet. In venenatis dignissim sagittis. Mauris ligula elit, accum- san vel arcu et, dignissim rutrum dolor. Praesent vehicula lacus nunc, sed feugiat ligula semper et. Nunc id massa venenatis magna ornare faucibus quis sit amet arcu. Nam hendrerit mauris vitae urna pharetra lacinia. Aenean blandit nisi quis urna porta, id euismod magna condi- mentum.

Vivamus non arcu dolor. Integer in pulvinar orci, ac viverra purus. Pellentesque congue eleifend elit, et blandit arcu fringilla sit amet. Nulla blandit neque sed nisi tempus pretium. Aenean lacinia vel mau- ris sit amet tincidunt. Sed eget quam rhoncus, egestas mi id, facilisis sapien. Donec ut risus pulvinar enim imperdiet suscipit eget vitae lec- tus.

\* \* \*

Vestibulum vehicula tortor ut metus tincidunt, sed feugiat

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Praesent laoreet ante et ornare mollis. Mauris libero leo, accum- san vitae leo sit amet, aliquam bibendum diam. Sed in odio eget tel- lus tempus tincidunt. Aenean et nunc quis erat hendrerit imperdiet nec vitae felis. Vivamus pharetra diam aliquam nisi tempus gravida. Vestibulum posuere auctor iaculis. Etiam convallis nunc ac accumsan vehicula. Etiam varius bibendum nisl non molestie. Phasellus facilisis rhoncus suscipit. Donec vel felis eget quam imperdiet eleifend.

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