NIST College
Banpea
BScCSIT

Computer Network (CSC258)

LAB 2
Linux OS(Ubuntu/CentOS) installation, practice on the basic Linux commands and Networking commands

Objective:
1. To install Linux operating system in the computer.
2. To understand basic commands line operation with Linux operating system and network configuration, testing and verification

Materials: Oracle virtual box, or VMware Workstation, Ubuntu or CentOS disk images.

Theory:
Introduction of Linux
Linux is an operating system kernel first released on September 17, 1991, by Linus Torvalds, while attending the University of Helsinki. Linux is a UNIX clone. Linux is of the most prominent examples of free and open-source software collaboration. The source code may be used, modified, and distributed commercially or non-commercially by anyone under the terms of its respective licenses, such as GNU General Public License.

There are several distribution of Linux such as Ubuntu, Red Hat Enterprise, Linux Mint, Debian, Fedora etc.

Linux is mainly used in servers; about 96% of the internet in powered by Linux servers as Linux is fast, secure, and free. Also, Linux runs on embedded systems such as in routers, automation control, televisions, automobiles, digital video recorders, video game consoles, and smartwatch. *Andriod*, which is one of the most popular mobile operating system is also made from the modified version of Linux kernel.

Ubuntu

Ubuntu is a Linux distribution based on Debain architecture and composed of mostly of free and open-source software. It can run on the computer alone, or in virtual machine. 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".

Ubuntu has officially three editions: Desktop, Server and Core that runs on Internet of Things (IoTs) and robots. Ubuntu is popular OS for cloud computing tooUbuntu updates is released every six months, with long-term support (LTS) releases every two years. As of 22 April 2021, the most recent long-term support release if 20.04 (“Focal Fossa”).

Figure 2: Linux Torvalds, developer of the Linux Kernel.

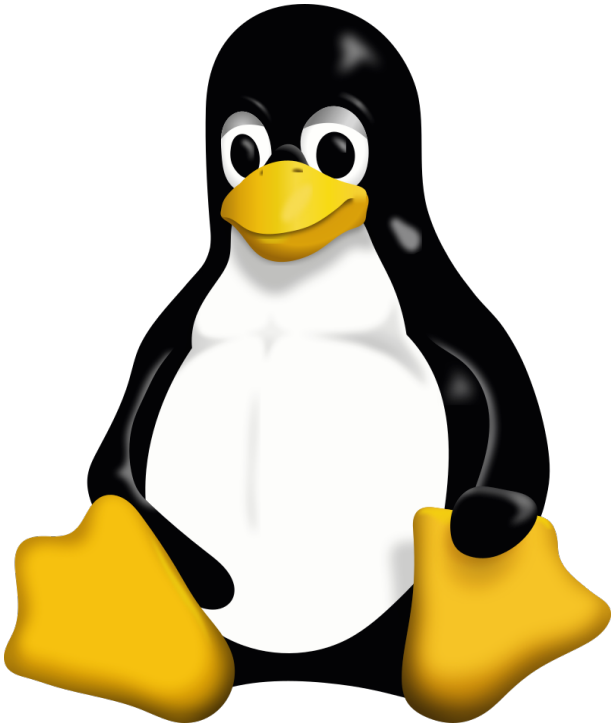

Figure 1: Tux the penguine, mascot of Linux

<u>Linux Shell or “Terminal”</u>

A shell is a program that receives commands from the user and gives it to the OS to process, and it shows the output. Linux's shell is its main part. Its distros come in GUI (graphical user interface), but basically, Linux has a CLI (command line interface).

To open the terminal, press Ctrl+Alt+T in Ubuntu, or press Alt+F2, type in gnome-terminal, and press enter. Also, we can open Terminal in GUI way.

Linux Basic commands

Commands	Example	Description
pwd		Show the name of the current working directory. When you first open the terminal, you are in the home directory of your user
ls	ls	Show the files in the directory you are working in.
	ls -a	Show all the files including hidden files in the working directory
	ls -al	list all files in the current working directory in long listing format showing permissions, ownership, size, and time and date stamp
mkdir		Used to create a folder or a directrory.
	mkdir Linux	Make a folder “Linux” in a working directory
rmdir		Used to delete an empty directory.
	rmdir Linux	
rm		Delete the files and directories
	rm test.py	
rm -r		Use to delete just the directory
	rm -r New_Folder	
touch		Used to create a file of any extension.
	touch text.txt	Create a file “text.txt” in a working directory.
cd		Change directory
	cd /home	Change the current working directory to /home. The '/' indicates relative to root, and no matter what directory you are in when you execute this

		command, the directory will be changed to "/home".
	cd lab	Change the current working directory to httpd, relative to the current location which is "/home". The full path of the new working directory is "/home/lab".
	cd ..	Move to the parent directory of the current directory. This command will make the current working directory "/home.
	cd ~	Move to the user's home directory which is "/home/username". The '~' indicates the users home directory.
cp		Copy files. It takes two arguments: the first is the location of the file to be copied, the second is where to copy.
	cp myfile yourfile	Copy the files "myfile" to the file "yourfile" in the current working directory. This command will create the file "yourfile" if it doesn't exist. It will normally overwrite it without warning if it exists.
	cp -i myfile yourfile	With the "-i" option, if the file "yourfile" exists, you will be prompted before it is overwritten.
	cp -i /data/myfile	Copy the file "/data/myfile" to the current working directory and name it "myfile". Prompt before overwriting the file.
	cp -dpr srcdir destdir	Copy all files from the directory "srcdir" to the directory "destdir" preserving links (-p option), file attributes (-p option), and copy recursively (-r option). With these options, a directory and all it contents can be copied to another directory.
clear		Clear the screen
df		Show the amount of disk space used on each

		mounted file system.
logout		Logs the current user off the system.
more		Allows file contents or piped output to be sent to the screen on page at a time.
	more /journal /profile	Lists the contents of the "/journal/profile" file to the screen one page at a time.
mv		Mover or rename files
	mv -i myfile yourfile	Move the file from "myfile" to "yourfile". This effectively changes the name of "myfile" to "yourfile".
	mv -i /data/myfile	Move the file from "myfile" from the directory "/data" to the current working directory.
shutdown		Shuts the system down.
	shutdown -h now	Shuts the system down to halt immediately.
	shutdown -r now	Shuts the system down immediately and the system reboots.
uname		Show the information about the system your Linux distro is running.
	uname -a	Shows most of the information about the system.
locate		Used to search file just like search command in Windows. This command is useful when you don't know where a file is saved or the actual name of the file. Using the -i argument with the command helps to ignore the case (it doesn't matter if it is uppercase or lowercase)
	locate journals	Lists all the files containing word journals
	locate -i hello	list of all the files in your Linux system containing the word "hello"
	locate -i *journals *cybersecurity*	Locate the file containing the words “jouranals” and “cybersecurity”.
man and --help		Used to know more about commands and how to use t

	man ls	Show manual page of ls.
	cd --help	Show information about cd command.
echo		Helps us write some data usually text into a file.
	echo hello, my name is dinesh >>new.txt	
cat		Used to display the content of the file.
	cat new.txt	Display the content of file “new.txt”
nano, vi, jed		Text editors
	nano new.txt	Open the file “new.txt” in nano.
	jed new.text	Open the file “new.txt” in jed.
sudo		**Sudo** stands for "SuperUser Do". So, if you want any command to be done with administrative or root privileges, you can use the sudo command
	sudo passwd	Used to set a root password.
apt-get		Use apt to work with packages in the Linux command line. Use apt-get to install packages. This requires root privileges, so use the sudo command with it.
	sudo apt-get install jed	Install jed.

Linux Networking Commands
see:
https://mindmajix.com/linux-networking-commands-best-examples

Your Tasks:
Diagnose the output of the following nerwork related commands in linux/ubutnu.

#sudo ifconfig

#sudo ifdown eth0
#ifconfig eth0
#sudo ifup eth0
#man tcpdump //see manual information of tcpdump
#tcpdump -npi eth0
#netstat -ant
#dnsip
#hostname
#host *domainname*
#ping *ip or hostname*
#traceroute *hostname or IP*
#man route
//see route command manual
#finger
#nslookup www.facebook.com

Exercise:

1. Discuss different Linux commands and networking commands with syntax.
2. How do you troubleshoot the networking problems in Linux environment.