

EXPERIMENT-1

COMPUTER HARDWARE

Mother Board:-

A motherboard (also called mainboard, main circuit board, mb, mboard, backplane board, base board, system board, logic board (only in Apple PCs) or mobo) is the main printed circuit board (PCB) in general-purpose computers and other expandable systems. It holds and allows communication between many of the crucial electronic components of a system, such as the central processing unit (CPU) and memory, and provides connectors for other peripherals. Unlike a backplane, a motherboard usually contains significant sub-systems, such as the central processor, the chipset's input/output and memory controllers, interface connectors, and other components integrated for general use.

The motherboard is mounted inside the case and is securely attached via small screws through pre-drilled holes. Motherboard contains ports to connect all of the internal components. It provides a single socket for CPU, whereas for memory, normally one or more slots are available. Motherboards provide ports to attach the floppy drive, hard drive, and optical drives via ribbon cables. Motherboard carries fans and a special port designed for power supply.

There is a peripheral card slot in front of the motherboard using which video cards, sound cards, and other expansion cards can be connected to the motherboard.

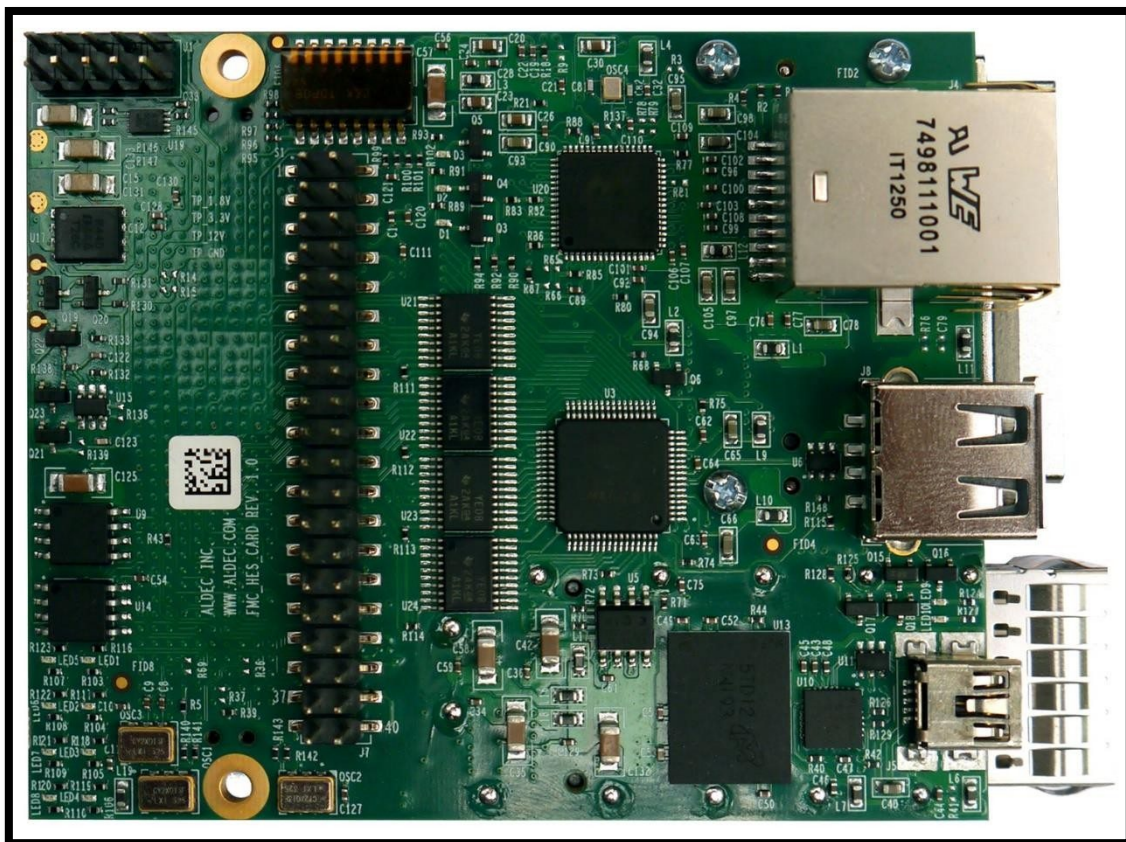
On the left side, motherboards carry a number of ports to connect the monitor, printer, mouse, keyboard, speaker, and network cables. Motherboards also provide USB ports, which allow compatible devices to be connected in plug-in/plug-out fashion. For example, pen drive, digital cameras, etc.





Daughter Cards:-

A daughterboard is type of circuit board that plugs in or is attached to the motherboard or similar expansion card to extend its features and services. A daughterboard complements the existing functionality of a motherboard or an expansion card. A daughterboard is also known as daughter card, piggyback board, riser card or mezzanine board. A daughterboard is connected directly to the motherboard. Unlike expansion cards, which connect with the motherboard using bus and other serial interfaces, daughterboards are usually directly embedded through soldering. Like a motherboard, a daughterboard has sockets, pins, plugs and connectors to be attached to other boards. Typically, daughterboards are released as a post-launch update to a motherboard or expansion card. For example, a MIDI daughterboard is used to add on the functionality of the sound card.



Bus Slots:-

An expansion slot refers to any of the slots on a motherboard that can hold an expansion card to expand the computer's functionality, like a video card, network card, or sound card. The expansion card is plugged directly into the expansion port so that the motherboard has direct access to the hardware. However, since all computers have a limited number of expansion slots, it's important to open your computer and check what's available before you buy one. Some older systems require the use of a riser board to add additional expansion cards; however, modern computers not only usually have enough expansion slot options, but they also have features integrated directly into the motherboard, eliminating the need for so many expansion cards. There are three different types of expansion slots: PCI Express, PCI, and AGP.

PCI (Peripheral Component Interconnect) Slot : The PCI slot is the most common form of internal expansion for a PC. Some PCs have a mixture of PCI and PCI Express slots.

PCI express (PCIe) Slots : The best type of expansion slot to have in your PC is the PCI Express. The PCI Express type of expansion slot communicates with the motherboard, and therefore with the microprocessor, both quickly and efficiently.

AGP (Accelerated Graphics Port) Slot : This type of expansion slot was specifically designed to deal with graphics adapters. In fact, AGP stands for Accelerated Graphics Port. Older PCs may sport this expansion slot, but the best video cards use PCI Express.



SMPS:-

A switched-mode power supply (SMPS) is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

Switching power supplies have high efficiency and are widely used in a variety of electronic equipment, including computers and other sensitive equipment requiring stable and efficient power supply.

A switched-mode power supply is also known as a switch-mode power supply or switching- mode power supply.

Switched-mode power supplies are classified according to the type of input and output voltages. The four major categories are:

- AC to DC
- DC to DC
- DC to AC
- AC to AC



Internal Storage Devices:-

Some storage devices are classed as 'internal' which means they are inside the computer case. Most computers have some form of internal storage. The most common type of internal storage is the hard disk. At the most basic level, internal storage is needed to hold the operating system so that the computer is able to access the input and output devices. It will also be used to store the applications software that you use and more than likely, the original copies of your data files. Internal storage allows the data and applications to be loaded very rapidly into memory, ready for use. The data can be accessed much faster than data which is stored on an external storage device. This is because internal storage devices are connected directly to the motherboard and its data bus whereas external devices are connected through a hardware interface such as USB, which means they are considerably slower to access. Internal storage also means that if the computer is moved around, it will still retain its most commonly used data. The main disadvantage of internal storage is that when the hard disk fails (and it will), all the data and applications may be lost. This can be avoided to some extent by using more than one hard disk within the machine. Each hard disk has a copy of all the data, so if one fails the other can carry on. This is called a RAID array. An alternative is to use external drives for backup.



Interfacing Ports:-

A Computer Port is an interface or a point of connection between the computer and its peripheral devices. Some of the common peripherals are mouse, keyboard, monitor or display unit, printer, speaker, flash drive etc. The main function of a computer port is to act as a point of attachment, where the cable from the peripheral can be plugged in and allows data to flow from and to the device.

Types of ports:

Serial Port - used for external modems and older computer mouse.

Parallel Port - used for scanners and printers.

PS/2 Port- used for old computer keyboard and mouse.

Universal Serial Bus (or USB) Port - It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc.

VGA Port -connects monitor to a computer's video card. It has 15 holes. Similar to the serial port connector. However, serial port connector has pins, VGA port has holes.

Power Connector -connects to the computer's power cable that plugs into a power bar or wall socket.

Modem Port - connects a PC's modem to the telephone network.

Ethernet Port - connects to a network and high speed Internet. Connects the network cable to a computer.

Game Port - connect a joystick to a PC. Now replaced by USB Digital Video Interface

DVI port - connects Flat panel LCD monitor to the computer's high-end video graphic cards.

Sockets - sockets connect the microphone and speakers to the sound card of the computer.

Ports



EXPERIMENT-2

LINUX COMMANDS

Man

LS(1)

User Commands

LS(1)

NAME

`ls` - list directory contents

SYNOPSIS

`ls` [OPTION]... [FILE]...

DESCRIPTION

List information about the FILES (the current directory by default). Sort entries alphabetically if none of **-cftuvSUX** nor **--sort** is specified.

Mandatory arguments to long options are mandatory for short options too.

-a, --all

do not ignore entries starting with `.`

-A, --almost-all

do not list implied `.` and `..`

--author

Manual page ls(1) line 1 (press h for help or q to quit)

Ls

```

stud@debian:~$ ls
stud@debian:~/network$ echo 'network works'
network l45
stud@debian:~/network$ 
LAB_1.SH
tures
lic
public.html
anila10 nome python_45
anagha india python_45.py
anagha02 jane python_46
Anusree37 java_45 python_54
ayana LAB python_54
b MASM shadasm45.java
bivina mca Templates
de45 minwa test
de45.java Music Videos
Desktop n 'VirtualBox VMs'
dev network_45
stud@debian:~$ 

```

Echo

```

user@user:~/network$ echo 'enter your name'
enter your name
user@user:~/network$ read name
user
user@user:~/network$ echo $name
user

```

Read

Cat

```

stud@debian:~/networks$ cat >file1
Computer networks
stud@debian:~/networks$ cat file1
Computer networks

```

```

stud@debian:~$ more file3
kerala
tamilnadu
stud@debian:~$ 

```

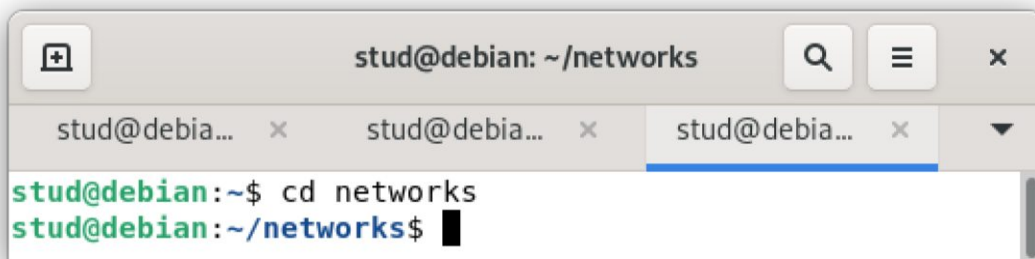
More

Less

Cat

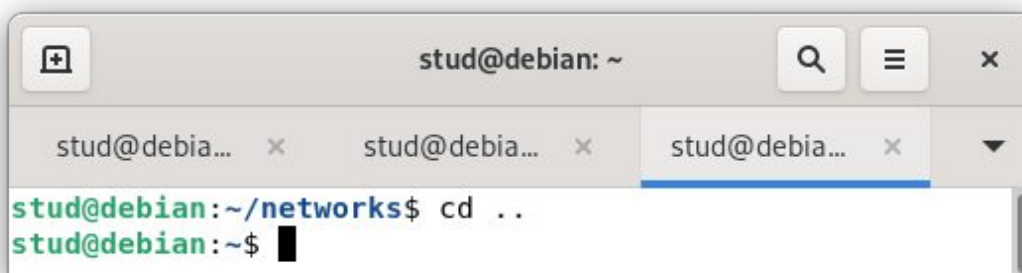
```
stud@debian:~/networks$ cat >file1
Computer networks
stud@debian:~/networks$ cat file1
Computer networks
stud@debian:~/networks$
```

Cd



A terminal window titled "stud@debian: ~/networks" with a search icon, a menu icon, and a close button. It has three tabs, all labeled "stud@debia...". The terminal shows the command "cd networks" being entered and executed, changing the prompt to "stud@debian:~/networks\$".

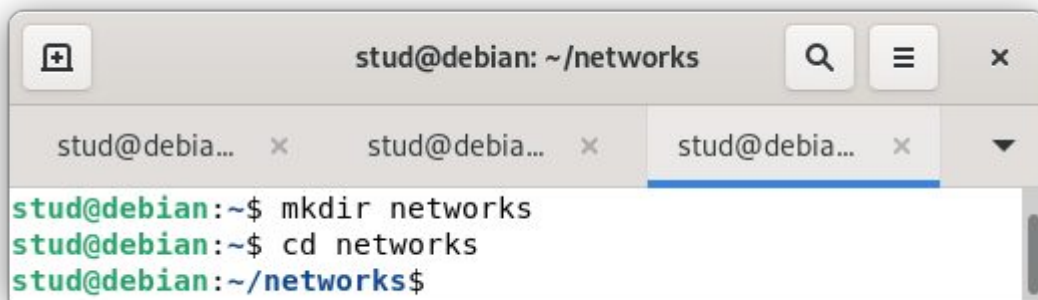
```
stud@debian:~$ cd networks
stud@debian:~/networks$
```



A terminal window titled "stud@debian: ~" with a search icon, a menu icon, and a close button. It has three tabs, all labeled "stud@debia...". The terminal shows the command "cd .." being entered and executed, changing the prompt back to "stud@debian:~\$".

```
stud@debian:~/networks$ cd ..
stud@debian:~$
```

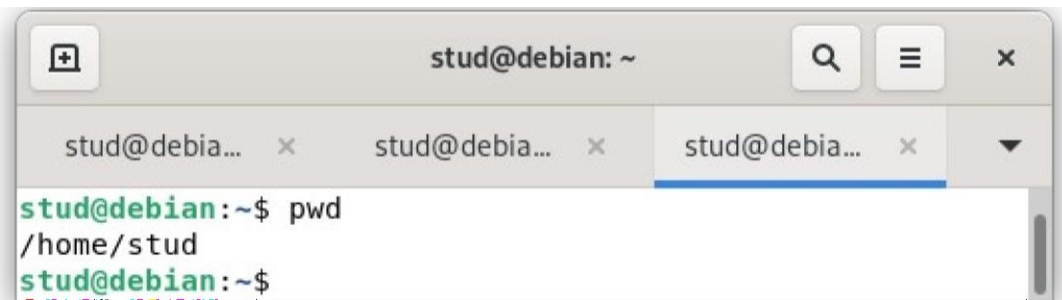
Mkdir



A terminal window titled "stud@debian: ~/networks" with three tabs. The active tab shows the following commands and output:

```
stud@debian:~$ mkdir networks
stud@debian:~$ cd networks
stud@debian:~/networks$
```

Pwd

A terminal window titled 'stud@debian: ~' with three tabs. The active tab shows the command 'pwd' being executed, with the output '/home/stud' displayed below it.

```
stud@debian:~$ pwd
/home/stud
stud@debian:~$
```

Find

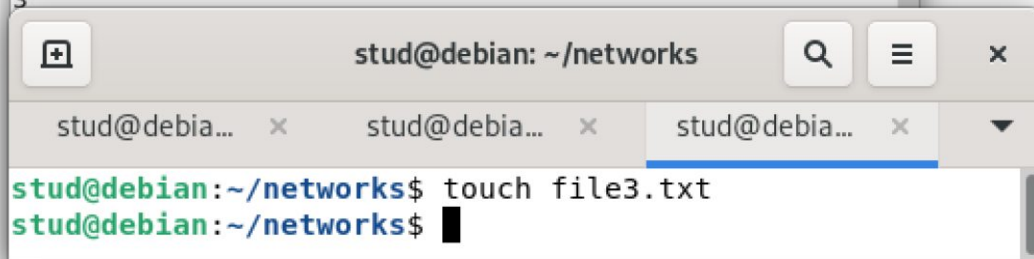
```
stud@debian:~$ cd ACN
stud@debian:~/ACN$ touch f1 f2
stud@debian:~/ACN$ cd ..
stud@debian:~$
stud@debian:~$ find ./ACN -name f1
./ACN/f1
```

Mv

```
stud@debian:~$ mkdir ACN
stud@debian:~$ touch f1.txt
stud@debian:~$ touch f2.txt
stud@debian:~$ mv f1.txt ./ACN
stud@debian:~$ cd ACN
stud@debian:~/ACN$ ls
f1.txt
stud@debian:~/ACN$
```

Cp


```
stud@debian:~/networks$ cp file4 file3
stud@debian:~/networks$ cat file3
1
2
3
```



Rm

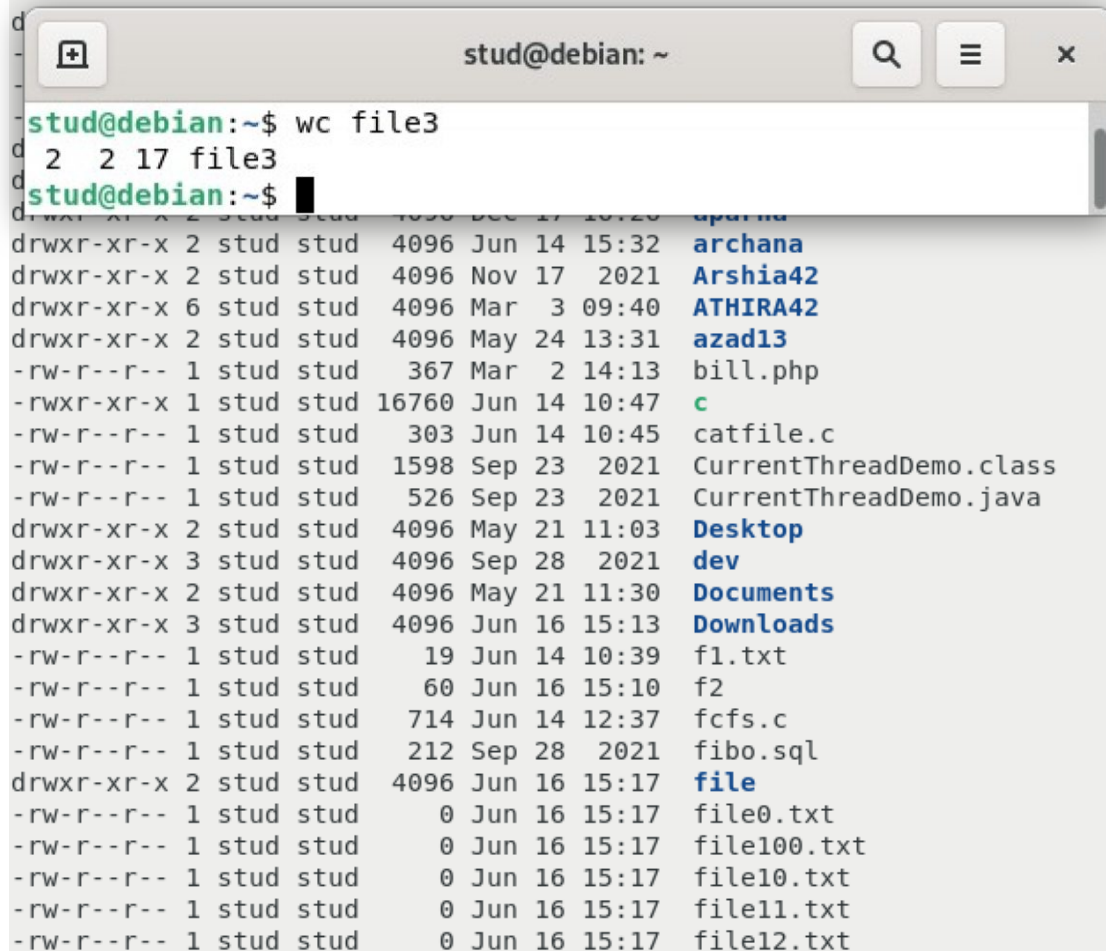
Tar

```
stud@debian:~$ touch file{0..100}.txt
```

```
stud@debian:~$ tar cf file.tar file
```

```
stud@debian:~$ ls -l
```

```
total 348
```



The image shows a terminal window titled 'stud@debian: ~' with a search icon, a menu icon, and a close button. The terminal displays the output of the 'ls -l' command, listing files and directories in the current directory. The files are listed in a table-like format with permissions, owner, group, size, date, time, and filename. The files include 'archana', 'Arshia42', 'ATHIRA42', 'azad13', 'bill.php', 'c', 'catfile.c', 'CurrentThreadDemo.class', 'CurrentThreadDemo.java', 'Desktop', 'dev', 'Documents', 'Downloads', 'f1.txt', 'f2', 'fcfs.c', 'fibonacci.sql', 'file', 'file0.txt', 'file100.txt', 'file10.txt', 'file11.txt', and 'file12.txt'. The 'wc file3' command is also shown, outputting '2 2 17 file3'.

```
stud@debian:~$ wc file3
2 2 17 file3
stud@debian:~$
```

Permissions	Owner	Group	Size	Date	Time	Filename
drwxr-xr-x	2	stud	stud	4096	Jun 14 15:32	archana
drwxr-xr-x	2	stud	stud	4096	Nov 17 2021	Arshia42
drwxr-xr-x	6	stud	stud	4096	Mar 3 09:40	ATHIRA42
drwxr-xr-x	2	stud	stud	4096	May 24 13:31	azad13
-rw-r--r--	1	stud	stud	367	Mar 2 14:13	bill.php
-rwxr-xr-x	1	stud	stud	16760	Jun 14 10:47	c
-rw-r--r--	1	stud	stud	303	Jun 14 10:45	catfile.c
-rw-r--r--	1	stud	stud	1598	Sep 23 2021	CurrentThreadDemo.class
-rw-r--r--	1	stud	stud	526	Sep 23 2021	CurrentThreadDemo.java
drwxr-xr-x	2	stud	stud	4096	May 21 11:03	Desktop
drwxr-xr-x	3	stud	stud	4096	Sep 28 2021	dev
drwxr-xr-x	2	stud	stud	4096	May 21 11:30	Documents
drwxr-xr-x	3	stud	stud	4096	Jun 16 15:13	Downloads
-rw-r--r--	1	stud	stud	19	Jun 14 10:39	f1.txt
-rw-r--r--	1	stud	stud	60	Jun 16 15:10	f2
-rw-r--r--	1	stud	stud	714	Jun 14 12:37	fcfs.c
-rw-r--r--	1	stud	stud	212	Sep 28 2021	fibonacci.sql
drwxr-xr-x	2	stud	stud	4096	Jun 16 15:17	file
-rw-r--r--	1	stud	stud	0	Jun 16 15:17	file0.txt
-rw-r--r--	1	stud	stud	0	Jun 16 15:17	file100.txt
-rw-r--r--	1	stud	stud	0	Jun 16 15:17	file10.txt
-rw-r--r--	1	stud	stud	0	Jun 16 15:17	file11.txt
-rw-r--r--	1	stud	stud	0	Jun 16 15:17	file12.txt

Wc

Cut

```
stud@debian:~$ cat > marks
```

```
ammu-50
```

```
alex-30
```

```
arun-40
```

```
stud@debian:~$ cut -d- -f2 marks
```

```
50
```

```
30
```

```
40
```

```
stud@debian:~$
```

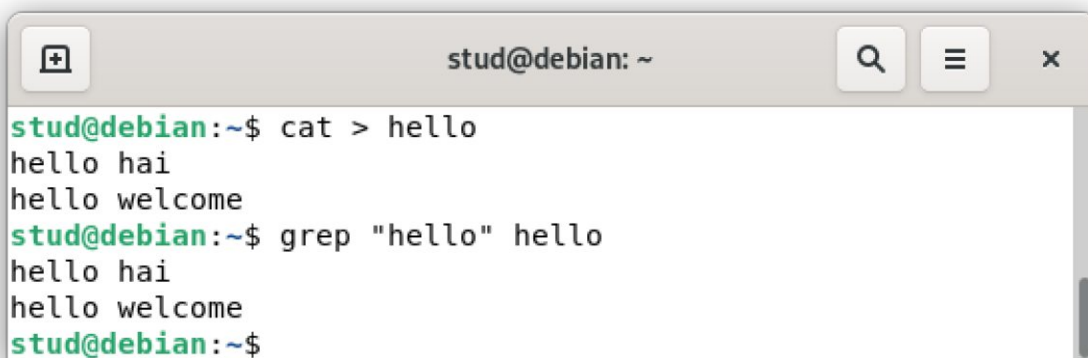
Paste

```
stud@debian:~/ACN$ cat f1
network
stud@debian:~/ACN$ cat f2
programming lab
stud@debian:~/ACN$ paste f1 f2
network programming lab
stud@debian:~/ACN$
```


Head and Tail

```
stud@debian:~/networks$ cat > file4
1
2
3
4
5
6
7
8
9
10
stud@debian:~/networks$ head -8 file4|tail -2
7
8
stud@debian:~/networks$
```

Grep

A terminal window titled 'stud@debian: ~' with search, menu, and close buttons. It shows the creation of a file 'hello' with two lines: 'hello hai' and 'hello welcome'. Then, the command 'grep "hello" hello' is executed, resulting in the same two lines being printed.

```
stud@debian: ~$ cat > hello
hello hai
hello welcome
stud@debian: ~$ grep "hello" hello
hello hai
hello welcome
stud@debian: ~$
```

Expr

```
user@user:~/network$ expr 4 + 5
9
user@user:~/network$ expr 10 - 5
5
user@user:~/network$ touch file1
```

Chmod

```
stud@debian: ~  
stud@debian:~$ chmod u+x state  
stud@debian:~$ ls -l  
total 208  
drwxr-xr-x 2 stud stud 4096 Sep 24 2021 24_ANGELDBMS  
  
stud@debian: ~  
stud@debian:~$ ls -l  
drwxr-xr-x 2 stud stud 4096 Apr 13 09:59 shadasm45.java  
-rwxrw-r-- 1 stud stud 18 May 30 12:31 state  
drwxr-xr-x 2 stud stud 4096 Sep 2 2021 Templates  
drwxr-xr-x 2 stud stud 4096 Apr 13 09:59 test  
drwxr-xr-x 2 stud stud 4096 Sep 2 2021 Videos  
drwxr-xr-x 5 stud stud 4096 May 30 11:16 'VirtualBox VMs'  
stud@debian:~$
```

Redirection

```
user@user:~/network$ ls -l >> q8.sh  
user@user:~/network$ cat q8.sh  
total 16  
-rwxrw-r-- 1 user user 61 Jun 9 21:39 f6.sh  
-rw-rw-r-- 1 user user 79 Jun 10 06:04 f7.sh  
-rwxrw-r-- 1 user user 248 Jun 16 11:55 q13.sh  
-rw-rw-r-- 1 user user 104 Jun 16 06:59 q4.sh  
-rw-rw-r-- 1 user user 0 Jun 16 12:20 q8.sh
```

Pipes

```
stud@debian:~$ ls *.sh | cat >f2  
stud@debian:~$ cat f2  
6.sh  
file1.sh  
if.sh  
leapyear.sh  
sintst.sh  
string.sh  
teat.sh  
stud@debian:~$
```

EXPERIMENT-3

SHELL SCRIPT

3.1 Write a shell script to implement factorial using if else

Program

```
echo "Enter a number"

read num

temp=$num

fact=1

while [ $num -ge 1 ]

do

fact=$((fact * $num)) num=$((num-1))

done

echo "The factorial of $temp is $fact"
```

Output

```
stud@debian:~$ vi 3B.sh
stud@debian:~$ bash 3B.sh
Enter a number
3
Factorial is 6
stud@debian:~$ █
```

3.2 Write a shell script to find the Fibonacci using while loop.

Program

```
echo "Enter no. of terms"
```

```
read n
```

```
a=0
```

```
b=1
```

```
echo "Enter i"
```

```
read i
```

```
echo "Fibonacci series:"
```

```
echo $a
```

```
echo $b
```

```
while [ $i -le $n ]
```

```
do
```

```
f=$((a + b))
```

```
a=$b
```

```
b=$f
```

```
echo $f
```

```
i=`expr $i + 1`
```

```
done
```

OUTPUT

```
mca@mca-OptiPlex-990:~/S2/NW/Hijas_Networking-main$ bash fibonacci.sh
Enter no. of terms
3
Enter i
2
Fibonacci series:
0
1
1
2
```

3.3 Write a shell script for print amstrong numbers

Program

```
echo "Enter the number"

read n

function ams
{
t=$n
s=0
b=0

while [ $n -gt $b ]

do

r=$((n % 10))

i=$((r * r * r))

s=$((s + i))

n=$((n / 10))

done

if [ $s == $t ]

then

echo "Amstrong number"

else

echo "Not an Armstrong number"

fi

}

result=`ams $n`

echo "$result"
```

```
mca@mca-OptiPlex-990:~/S2/NW/Hijas_Networking-main$ bash amstrong.sh
Enter the number
153
Amstrong number
mca@mca-OptiPlex-990:~/S2/NW/Hijas_Networking-main$
```

3.4 Write a shell script to print prime number

Program

```
prime
i=0
until [ $i -lt 20 ]
do
r=$(( $i % 2 ))
if [ $r -ne 0 ]
then
echo $i
fi
i=$((i+1))
done
```

Output

3.5 Write a shell script for print prize

Program

```
    echo "Enter your lucky number"

    read n

    case $n in
101)
    echo echo "You got 1st prize" ;;
510)
    echo "You got 2nd prize" ;;
999)
    echo "You got 3rd prize" ;;
*)
    echo "Sorry, try for the next time" ;;
    esac
```

Output

File Edit View Search Terminal Help

```
mca@mca-OptiPlex-990:~$ sh switch.sh
Enter your lucky number
101
echo You got 1st prize
mca@mca-OptiPlex-990:~$
```

3.6 Write a shell script for add two variables using function .

Program

```
function add()
{
    sum=$(( $1 + $2 ))
    echo "Sum = $sum"
}

a=10
b=20
```

Output

Sum=30

3.7 Write a shell script for find largest of 3 numbers

Program

```
echo "Enter 1st no"

read a

echo "Enter 2nd no"

read b

echo "Enter 3rd no"

read c

if [ $a -gt $b ] && [ $a -gt $c ]

then

echo "Largest is $a"

elif [ $b -gt $a ] && [ $b -gt $c ]

then

echo "Largest is $b"

else

echo "Largest is $c"

fi
```

Output

```
mca@mca-OptiPlex-990:~/S2/NW/Hijas_Networking-main$ bash largest.sh
Enter 1st no
23
Enter 2nd no
4
Enter 3rd no
55
Largest is 55
mca@mca-OptiPlex-990:~/S2/NW/Hijas_Networking-main$
```

3.8 Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.

Program

```
echo "Total number of arguments: $#"  
  
# Reading argument values individually  
echo "First argument value : $1"  
echo "Second argument value : $2"  
echo "Third argument value : $3"  
  
# Reading argument values using loop  
for argval in "$@"  
do  
    echo -n "$argval "  
done
```

3.9 Write a shell script to odd numbers

Program

```
for (( i = 1; i < 10; i=i+2 ))  
do  
echo $i  
done
```

Output

EXPERIMENT-4

INSTALLING LAMP ON UBUNTU

Step 1: Update Package Repository Cache

Before you begin:

1. Open the terminal either by using the **CTRL+ALT+T** keyboard shortcut or by searching for the word *terminal* in **Ubuntu**
2. Make sure to update the package repository cache to ensure it installs the latest versions of the software. To do so, type in the following command:

```
sudo apt-get update
```


Step 2: Install Apache

1. To install Apache, run the following command in the terminal:

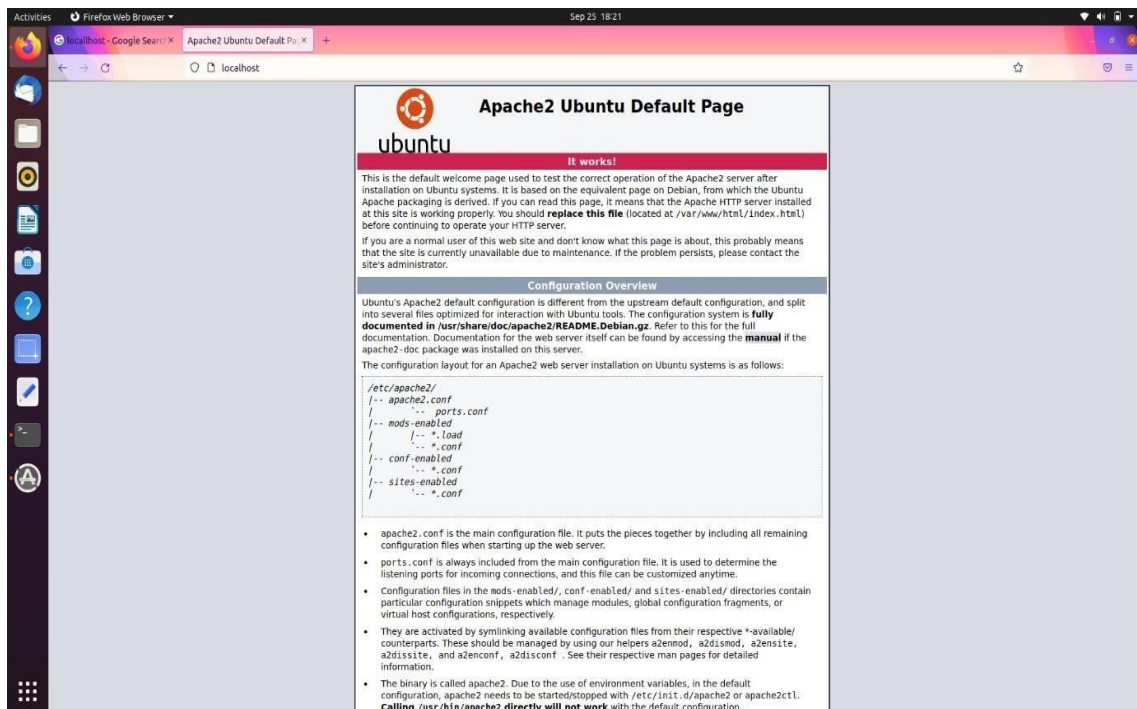
sudo apt-get install apache2

```
hp@hp-HP-Laptop-15s-du0xxx:~$ sudo apt-get update
Get:1 http://us.archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Reading package lists... Done
hp@hp-HP-Laptop-15s-du0xxx:~$ sudo apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  enchant geoip-database libbind9-161 libboost-filesystem1.67.0
  libboost-iostreams1.67.0 libdns-export1107 libdns1107 libdns1109 libenchantic2a
  libexiv2-14 libfprint0 libgeoip1 libgspell-1-1 libgutenprint-common
  libgutenprint9 libiptc0 libirs161 libisc-export1104 libisc1104 libisc1105
  libisccc161 libiscfg163 liblvm9 liblwres161 libnfs12 liboauth0
  printer-driver-gutenprint python3-asn1crypto shim ubuntu-software
  ubuntu-system-service
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
0 upgraded, 9 newly installed, 0 to remove and 66 not upgraded.
Need to get 1,819 kB of archives.
After this operation, 7,938 kB of additional disk space will be used.
Do you want to continue? [Y/n] ☐
```

Press **y** (yes) and hit **ENTER** to permit the installation.

2. To ensure Apache is running, enter the Localhost of your server in the address bar and press **ENTER**.

The test Apache web server page should display as below.



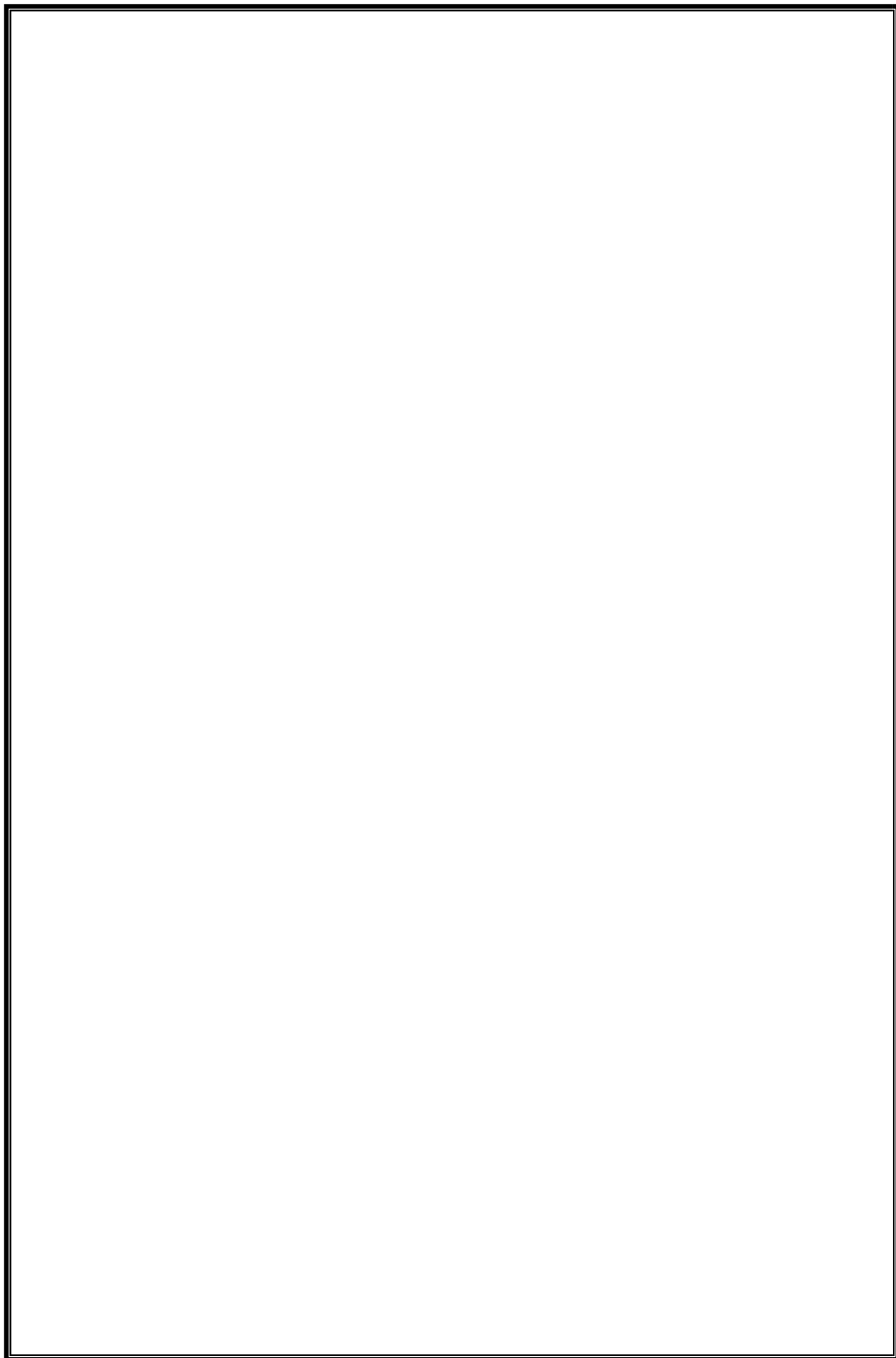
Step 3: Install PHP

1. To install PHP, run the following command:

\$ sudo apt-get install php7.4

```
mp@hp-Laptop-15s-d00xxx:~$ sudo apt-get install php7.4
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  enchant geoip-database libbind9-161 libboost-filesystem1.67.0 libboost-iostreams1.67.0 libdns-export1107 libdns107 libdns1109 libenchantic12a libexiv2-14 libfprint0 libgeoip1 libgspell-1-1
  libgutenprint-common libgutenprint9 libiptc0 libirs161 libisc-export1104 libisc1104 libisc1105 libiscccl161 libisccfg163 liblvm9 liblwres161 libnfs12 liboauth0 printer-driver-gutenprint
  python3-asn1crypto shim ubuntu-software ubuntu-system-service
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libapache2-mod-php7.4 php-common php7.4-cli php7.4-common php7.4-json php7.4-opcache php7.4-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  libapache2-mod-php7.4 php-common php7.4 php7.4-cli php7.4-common php7.4-json php7.4-opcache php7.4-readline
0 upgraded, 8 newly installed, 0 to remove and 60 not upgraded.
Need to get 4,015 kB of archives.
After this operation, 18.0 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Press **y** and **ENTER** to allow the installation.



Step 4: Restart Apache

After the php installation you must restart the Apache service.

Enter the command:

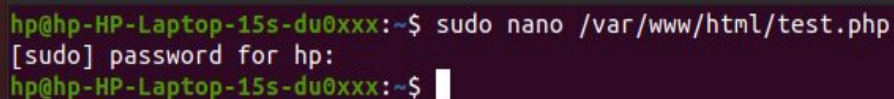
```
$ sudo /etc/init.d/apache2  
restart
```

Step 5: Test PHP Processing on Web Server

1. Create a basic **PHP script** and save it to the “web root” directory. This is necessary for Apache to find and serve the file correctly. This directory is located at **/var/www/html/**.

To create a file in that directory, type in the following command:

```
sudo nano  
/var/www/html/test.php
```



```
hp@hp-HP-Laptop-15s-du0xxx:~$ sudo nano /var/www/html/test.php  
[sudo] password for hp:  
hp@hp-HP-Laptop-15s-du0xxx:~$
```

This command opens the **bank file**.

2. Inside the file, type in the valid PHP code:

```
<?php  
Echo “ test php ”;?>
```



1. Press **CTRL + X** to save and close the file. Press **y** and **ENTER** to confirm.
2. Then check the code are run currently in php. Open the browser and enter the IP address (localhost/test.php).

Step 6: Install Mysql server

1. To install Mysql server, run the following command:

```
$ sudo apt-get install mysql-server
```

```
other options.  
hp@hp-HP-Laptop-15s-du0xxx:~$ sudo apt-get install mysql-server  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
  enchant geoip-database libbind9-161 libboost-filesystem1.67.0  
  libboost-iostreams1.67.0 libdns-export1107 libdns1107 libdns1109  
  libenchanted1c2a libexiv2-14 libfprint0 libgeoip1 libgspell-1-1  
  libgutenprint-common libgutenprint9 libiptc0 libirs161 libisc-export1104  
  libisc1104 libisc1105 libisccc161 libisccfg163 liblvm9 liblwres161 libnfs12  
  liboauth0 printer-driver-gutenprint python3-asn1crypto shim ubuntu-software  
  ubuntu-system-service  
Use 'sudo apt autoremove' to remove them.  
The following additional packages will be installed:  
  libaio1 libcgi-fast-perl libcgi-pm-perl libevent-core-2.1-7  
  libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libmecab2  
  mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0  
  mysql-client-core-8.0 mysql-server-8.0 mysql-server-core-8.0  
Suggested packages:
```

1. Then it's asking us for a root password. Enter the password. Again we get to repeat it

Step 7: Check the Mysql server

1. To check Mysql server, run the following command

\$ mysql -u root -p

- Enter the root password and press enter


```
hp@hp-HP-Laptop-15s-du0xxx:~$ mysql -u root -p
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
hp@hp-HP-Laptop-15s-du0xxx:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 19
Server version: 8.0.26-0ubuntu0.20.04.2 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database testdb;
Query OK, 1 row affected (0.01 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| testdb |
+-----+
5 rows in set (0.00 sec)

mysql> █
```

1. Create a database testdb and show it

- Enter the command
Create
database
testdb;

Show databases;
- So mysql is working then exit the mysql prompt just enter **exit**;

Step 8: Install PHP Myadmin

1. To install PHP Myadmin, run the following command:

```
$ sudo apt-get install  
phpmyadmin
```

```
hp@hp-Laptop-15s-dubxxx:~$ sudo apt-get install phpmyadmin
[sudo] password for hp:
Reading package lists... Done
Building dependency tree
Reading state information... Done

The following packages were automatically installed and are no longer required:
acl apg color-data enchant geoplib-database gnome-control-center-faces gnome-online-accounts gsfonts hplip-data libbind9-161 libboost-filesystem1.67.0 libboost-lostream1.67.0 libcolorl-gtk1
libcolorimg2 libdms-extract187 libdms187 libdns189 libenchant2a libexiv2-14 libfontconfig libfontgl libgsound libgspell-1-1 libgssdp-1.2-0 libgunp-1.2-0 libgunp-av-1.0-2 libgunp-dlna-2.0-3
libgutenprint-common libgutenprint9 libieee1284-3 libimagequant libiptc0 librsr161 libisc-exporter184 libisc184 libisc185 libiscccl61 libiscfr163 libllwn liblwres161 libnfs12 liboauth0
librygel-core-2.6-2 librygel-db-2.6-2 librygel-renderer-2.6-2 librygel-server-2.6-2 libsane-common libsnmp-base libwebpmux3 mobile-broadband-provider-info network-manager-gnome
printer-driver-gutenprint printer-driver-postscript-hp python3-asnicrypto python3-macaroombakery python3-olefile python3-pil python3-protobuf python3-pymcaroons python3-renderpp python3-reportlab
python3-reportlab-accel python3-rfc3339 python3-tz rygel shin ubuntu-software ubuntu-system-service

Use 'sudo apt autoremove' to remove them.

The following additional packages will be installed:
dbconfig-common dbconfig-mysql icc-profiles-free javascript-common libjs-jquery libjs-openlayers libjs-sphinxdoc libjs-underscore libonig5 libzip5 php-bz2 php-curl php-gd php-google-recaptcha
php-mbstring php-mysql php-phpmyadmin-notranslator php-phpmyadmin-shapefile php-phpmyadmin-sql-parser php-phoseclib php-psr-cache php-psr-container php-psr-log php-symfony-cache
php-symfony-cache-contracts php-symfony-expression-language php-symfony-service-contracts php-symfony-var-exporter php-tpcdp php-twlg php-twlg-extensions php-xml php-zip php7.4-bz2 php7.4-curl
php7.4-gd php7.4-mbstring php7.4-mysql php7.4-xml php7.4-zip

Suggested packages:
php-base php-libiodbm php-mcrypt php-gmp php-symfony-service-implementaton php-inagick php-twlg-doc php-symfony-translation php-recode php-gd2 php-prgnarx-google2fa php-bacon-qrcode
php-sanyoul-u2f php-server

Recommended packages:
php-ncrypt

The following NEW packages will be installed:
dbconfig-common dbconfig-mysql icc-profiles-free javascript-common libjs-jquery libjs-openlayers libjs-sphinxdoc libjs-underscore libonig5 libzip5 php-bz2 php-curl php-gd php-google-recaptcha
php-mbstring php-mysql php-phpmyadmin-notranslator php-phpmyadmin-shapefile php-phpmyadmin-sql-parser php-phoseclib php-psr-cache php-psr-container php-psr-log php-symfony-cache
php-symfony-cache-contracts php-symfony-expression-language php-symfony-service-contracts php-symfony-var-exporter php-tpcdp php-twlg php-twlg-extensions php-xml php-zip php7.4-bz2 php7.4-curl
php7.4-gd php7.4-mbstring php7.4-mysql php7.4-xml php7.4-zip phpmyadmin

0 upgraded, 41 newly installed, 0 to remove and 61 not upgraded.
Need to get 16.0 MB of archives.
After this operation, 71.8 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Press **y** and **ENTER** to allow the installation

1. Then its ask what type of server, we have Apache2 is set by default that's what we want then press ok
2. Then a configuration prompt are open . here we're going to just choose yes and then it ask the input password for phpmyadmin
3. Then check it current . go to the localhost/phpmyadmin. Here we can not found it so

We have to actually edit the file php is located in Apache2 folder.

4. Enter the following command to edit the file

```
$ sudo nano/etc/php7.4/apache2.php.ini
```

5. Then we need to uncomment an **extension=mysql.so**. find it the file just remove the Semicolon.

1. Then enter `ctl+x` to save

Step 9: Restart Apache

After the php installation you must restart the Apache service. Enter the command:

```
$ sudo /etc/init.d/apache2 restart
```

Step 9.1: Include phpmyadmin in apache configuration

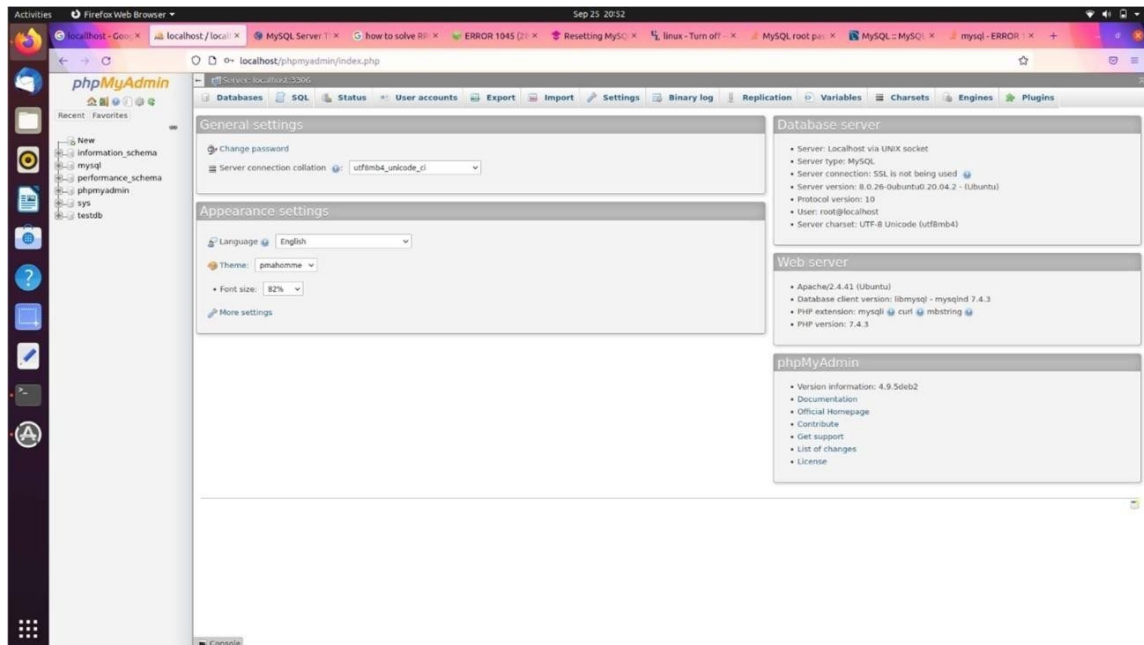
1. Enter the command:

```
$ sudo nano/etc/apache2/apache2.conf
```

2. Type the following command to the nano editor

```
Include /etc/phpmyadmin/apache.conf
```

3. Then enter `ctl+x` to save
4. Then again restart the apache



EXPERIMENT-5

WIRESHARK

Wireshark is an open-source packet analyzer, which is used for education, analysis, software development, communication protocol development, and network troubleshooting. It is used to track the packets so that each one is filtered to meet our specific needs. It is commonly called as a sniffer, network protocol analyzer, and network analyzer.

It is also used by network security engineers to examine security problems.

Wireshark is a data capturing program that "understands" the structure (encapsulation) of different networking protocols. It can parse and display the fields, along with their meanings as specified by different networking protocols. Wireshark uses pcap to capture packets, so it can only capture packets on the types of networks that pcap supports.

Installation of Wireshark Software

Downloading steps:-

1. Open a web browser.
2. Navigate to <http://www.wireshark.org>.
3. Select Download Wireshark.

4. Select the Wireshark Windows Installer matching your system type. Save the program in the Downloads folder.
5. Close the web browser.

Installation process:-

1. Double-click on the file to open it.
2. If you see a User Account Control dialog box, select Yes to allow the program to make changes to this computer.
3. Select Next to start the Setup Wizard.
4. Review the license agreement. If you agree, select I Agree to continue.

1. Select Next to accept the default components.
2. Select the shortcuts you would like to have created. Leave the file extensions selected. Select Next to continue.
3. Select Next to accept the default install location.
4. Select Install to begin installation.
5. Select Next to install WinPcap.
6. Select Next to start the Setup Wizard.
7. Review the license agreement. If you agree, select I Agree to continue.
8. Select Install to begin installation.
9. Select Finish to complete the installation of WinPcap.
10. Select Next to continue with the installation of Wireshark.
11. Select Finish to complete the installation of Wireshark.



Download Wireshark

The current stable release of Wireshark is 3.4.6. It supersedes all previous releases.

Stable Release (3.4.6)

- 📄 Windows Installer (64-bit)
- Windows Installer (32-bit)
- Windows PortableApps® (32-bit)
- macOS Intel 64-bit .dmg
- Source Code

Old Stable Release (3.2.14)

Documentation

Not What You're Looking For?

Older Releases

All present and past releases can be found in our download area.

Go Beyond with Riverbed Technology

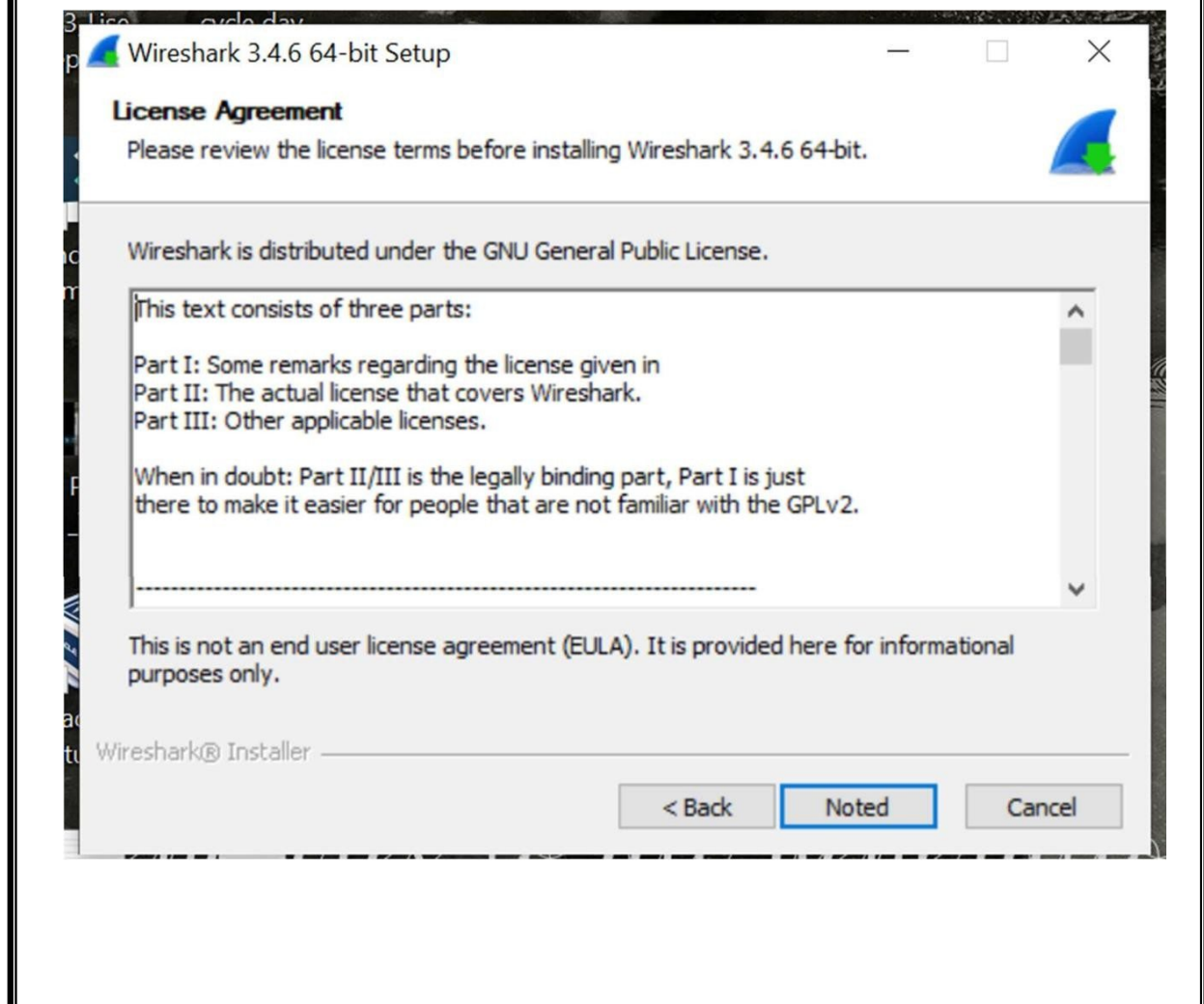
Riverbed is Wireshark's primary sponsor and provides our funding. They also make great products that fully integrate with Wireshark.

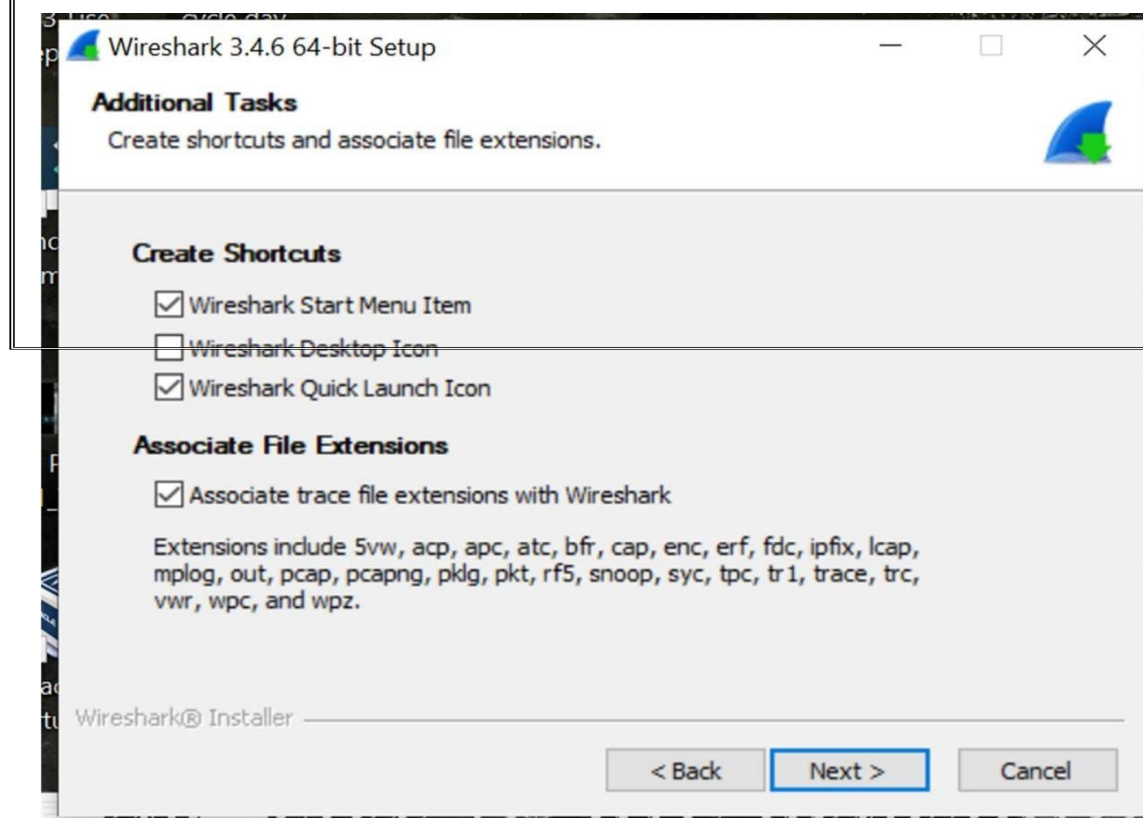
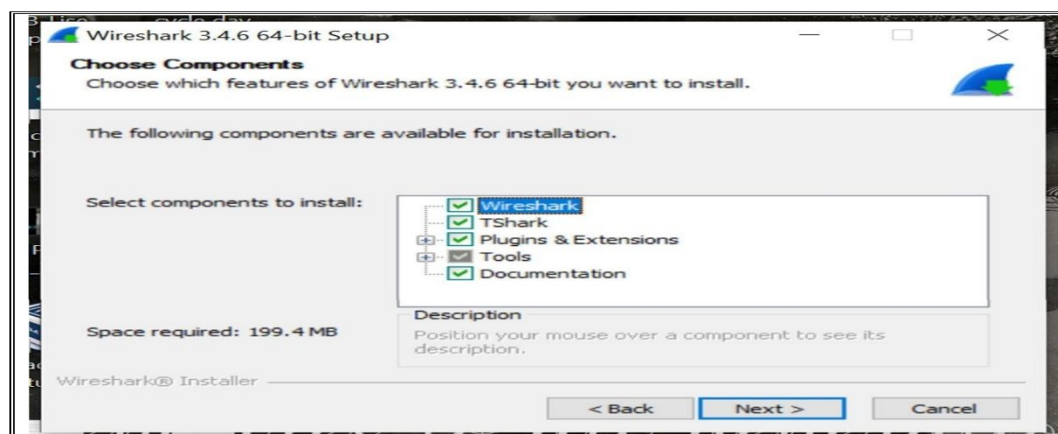
I have a lot of traffic...

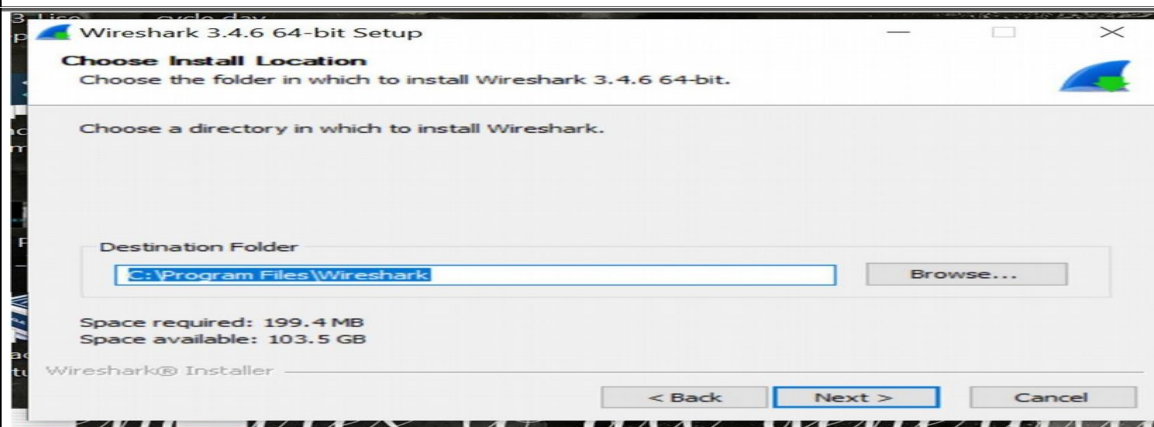
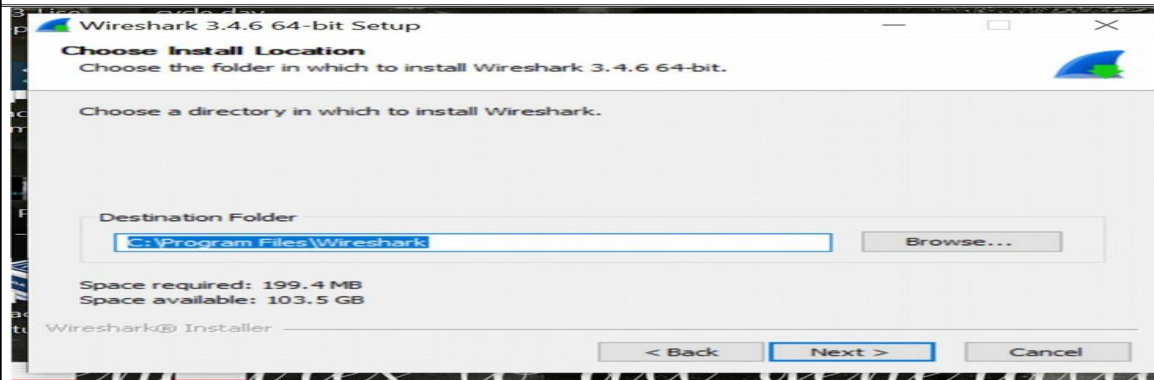
ANSWER: [SteelCentral™ AppResponse 11](#)

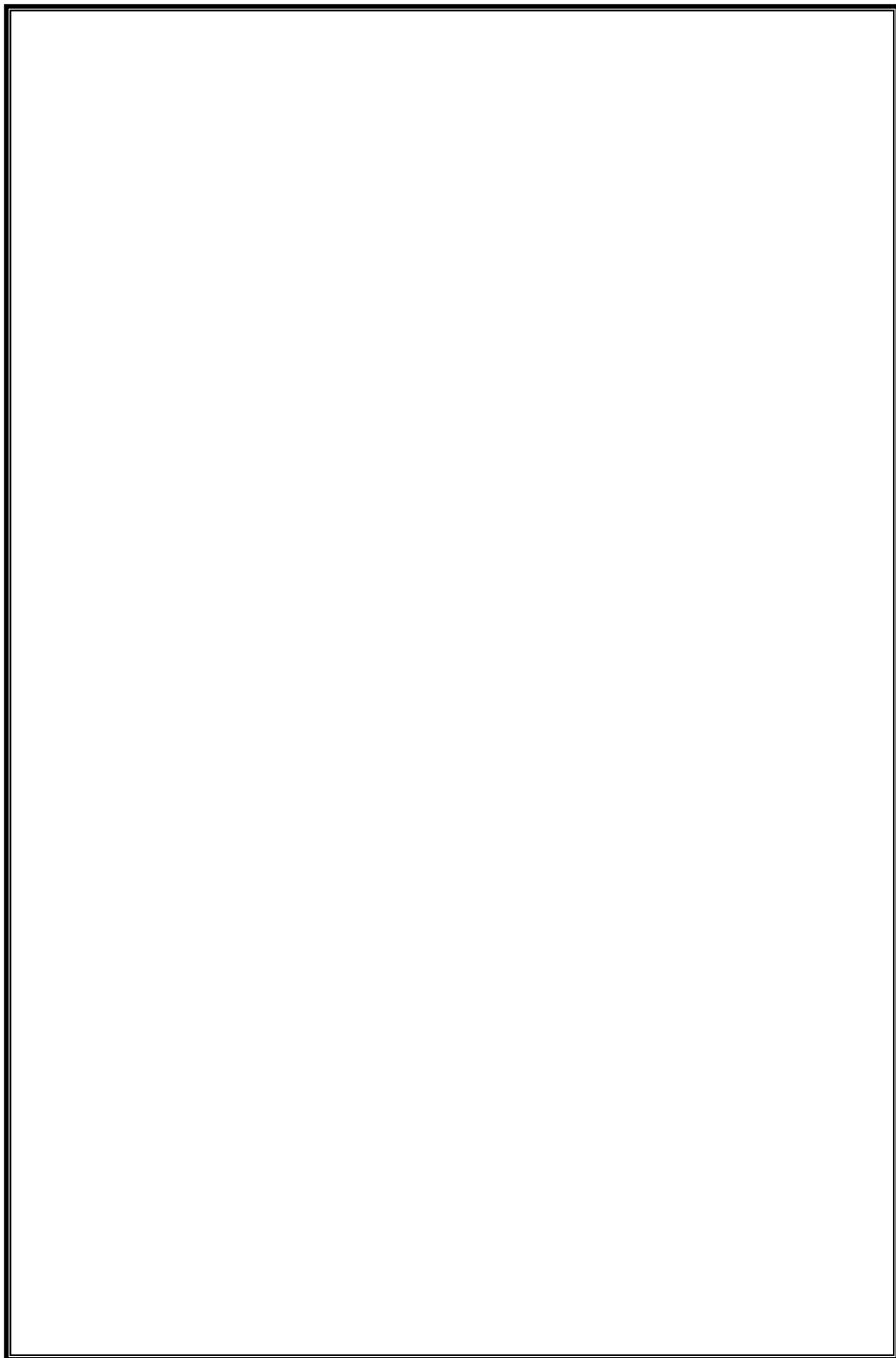
- Full stack analysis – from packets to pages
- Rich performance metrics & pre-defined insights for fast problem identification/resolution
- Modular, flexible solution for deeply-analyzing network & application performance

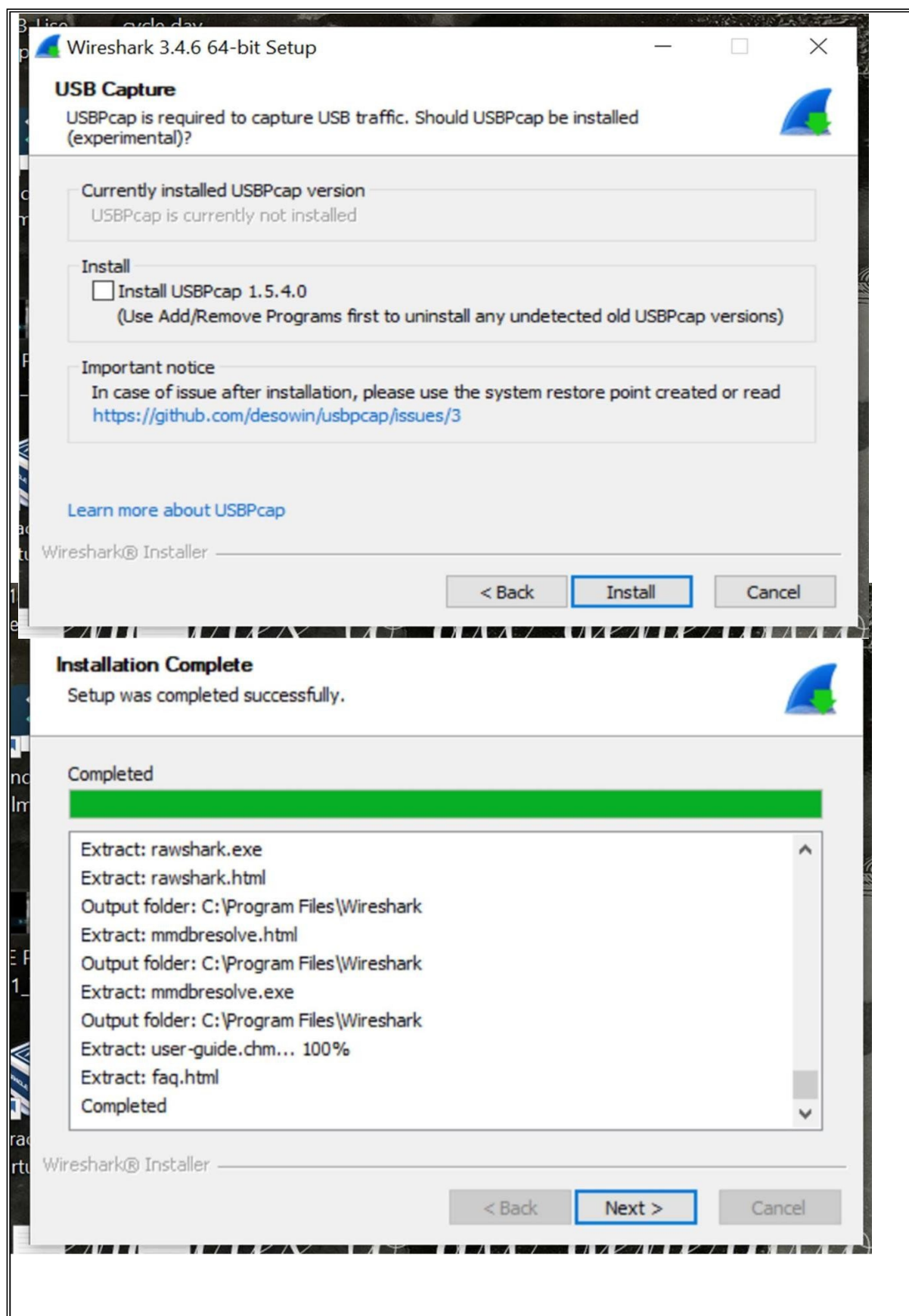
[Learn More](#)

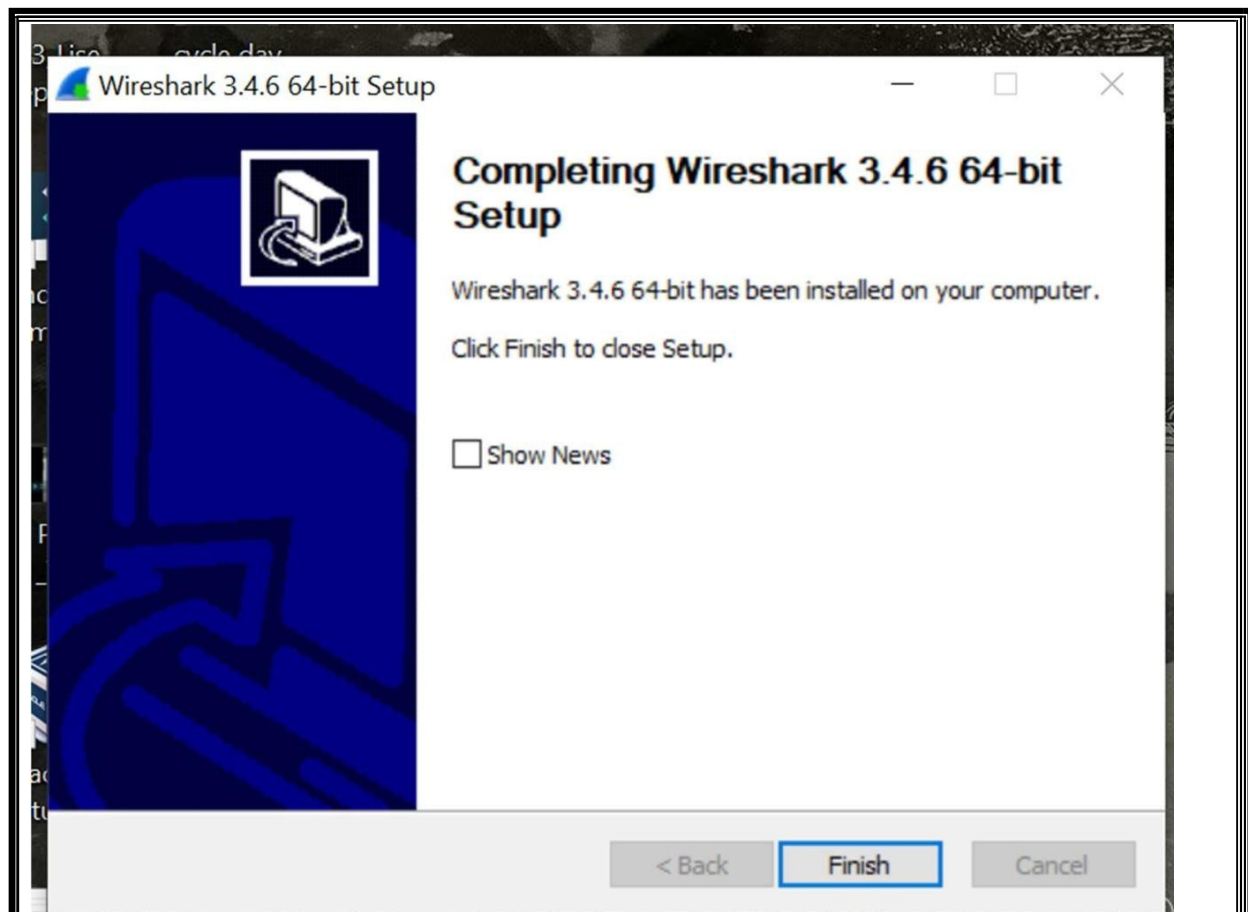












Filtering SMTP Packets

The Wireshark Network Analyzer

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

Welcome to Wireshark

Capture

...using this filter: All interfaces shown ▾

- Local Area Connection* 10
- Local Area Connection* 9
- Local Area Connection* 8
- Wi-Fi**
- Local Area Connection* 2
- Local Area Connection* 1
- VirtualBox Host-Only Network
- Adapter for loopback traffic capture
- Ethernet

Learn

[User's Guide](#) · [Wiki](#) · [Questions and Answers](#) · [Mailing Lists](#)

You are running Wireshark 3.4.6 (v3.4.6-0-g6357ac1405b8). You receive automatic updates.

[Window Snip](#)

Ethernet 2: <live capture in progress> | Packets: 160 · Displayed: 160 (100.0%) | Profile: Default

Capturing from Ethernet 2

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	77.234.45.88	192.168.1.7	TCP	60	80 → 49662 [ACK] Seq=1 Ack=1 Win=91 Len=0
2	0.000040	192.168.1.7	77.234.45.88	TCP	54	[TCP ACKed unseen segment] 49662 → 80 [ACK] Seq=1 Ack=2 Win=254 Len=0
3	1.984015	currentto_98:e7:57	Broadcast	0xffff	60	Ethernet II
4	2.984015	currentto_98:e7:57	Broadcast	ARP	60	ARP Announcement for 192.168.1.1
5	2.984015	currentto_98:e7:57	Broadcast	ARP	60	ARP Announcement for 192.168.1.1
6	6.214011	currentto_98:e7:57	Broadcast	0xffff	60	Ethernet II
7	7.753549	192.168.1.1	224.0.0.1	IGMPv3	60	Membership Query, general
8	7.753549	192.168.1.1	224.0.0.1	IGMPv3	60	Membership Query, general
9	8.134955	192.168.1.7	224.0.0.22	IGMPv3	70	Membership Report / Join group 224.0.0.252 for any sources / Join group 224.0.0.251 for any sources / Join group 224.0.0.250 for any sources
10	8.320114	173.223.51.172	192.168.1.7	TCP	60	80 → 49830 [ACK] Seq=1 Ack=1 Win=60 Len=0

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface \Device\NPF_{6C6007C8-9853-4E51-99F3-39723090F8F0}, id 0
Ethernet II, Src: currentto_98:e7:57 (14:a7:2b:98:e7:57), Dst: 0a:e0:af:c2:0a:37 (0a:e0:af:c2:0a:37)
Internet Protocol Version 4, Src: 77.234.45.88, Dst: 192.168.1.7
Transmission Control Protocol, Src Port: 80, Dst Port: 49662, Seq: 1, Ack: 1, Len: 0

Run

Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open:

[Window Snip](#)

Ethernet 2: <live capture in progress> | Packets: 502 · Displayed: 502 (100.0%) | Profile: Default


```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\useresq>telnet gmail-smtp-in.l.google.com 25
```

```
C:\Windows\system32\cmd.exe
220 mx.google.com ESMTP y16-20020a17090322d000b00158ba0afc1esi15170791plg.54 - g
smtp
helo
501-5.5.4 Empty HELO/EHLO argument not allowed, closing connection.
501 5.5.4 https://support.google.com/mail/?p=helo y16-20020a17090322d000b00158b
a0afc1esi15170791plg.54 - gsmtp

Connection to host lost.

C:\Users\useresq>
```

*Ethernet 2

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

smtp

No.	Time	Source	Destination	Protocol	Length	Info
674	275.547214	74.125.68.26	192.168.1.7	SMTP	140	S: 220 mx.google.com ESMTP e9-20020a63f54900000b003c659f2efe3si12087061pgk.245 - gsmt
1013	397.167862	172.217.194.26	192.168.1.7	SMTP	140	S: 220 mx.google.com ESMTP y16-20020a170903220000b00158ba0afcles115170791plg.54 - gsmt
1083	444.327542	192.168.1.7	172.217.194.26	SMTP	60	
1085	444.532059	172.217.194.26	192.168.1.7	SMTP	236	

Mark/Unmark Packet Ctrl+M
Ignore/Unignore Packet Ctrl+D
Set/Unset Time Reference Ctrl+T
Time Shift... Ctrl+Shift+T
Packet Comments
Edit Resolved Name
Apply as Filter
Prepare as Filter
Conversation Filter
Colorize Conversation
SCTP
Follow
Copy
Protocol Preferences
Decode As...
Show Packet in New Window

it allowed, closing connection. | 5.5.4 <https://support.google.com/mail/?...>
9F3-39723090F8F0}, 1d 0
TCP Stream Ctrl+Alt+Shift+T
UDP Stream Ctrl+Alt+Shift+U
DCCP Stream Ctrl+Alt+Shift+E
TLS Stream Ctrl+Alt+Shift+S
HTTP Stream Ctrl+Alt+Shift+H
HTTP/2 Stream
QUIC Stream
SIP Call

Frame 1083: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on int
Ethernet II, Src: 0a:e0:af:c2:0a:37 (0a:e0:af:c2:0a:37), Dst: currento_98:e:
Internet Protocol Version 4, Src: 192.168.1.7, Dst: 172.217.194.26
Transmission Control Protocol, Src Port: 49851, Dst Port: 25, Seq: 1, Ack: 6
Simple Mail Transfer Protocol

0000 14 a7 2b 98 e7 57 0a e0 af c2 0a 37 00 00 45 00 ..+..M...7..E..
0010 00 2e 06 54 40 00 00 00 00 00 c0 a0 01 07 ac d9 ...T@.....
0020 c2 1a c2 bb 00 19 77 0e 0c 0f a4 4e 10 dc 50 18w...N..P..
0030 40 27 30 c4 00 00 68 65 6c 6f 0d 0ahe lo..

Simple Mail Transfer Protocol: Protocol

Packets: 1334 · Displayed: 4 (0.3%) · Dropped: 0 (0.0%)

Profile: Default

14:32
16-05-2022

*Ethernet 2

[-] [x]

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

smtp[-] [x] [+]

No.	Time	Source	Destination	Protocol	Length	Info
674	275.547214	74.125.68.26	192.168.1.7	SMTP	140 S: 220 mx.google.com ESMTP e9-20020a63f54900000b003c659f2efe3si12087081pgk.245 - gsmt	
1013	397.167862	172.217.194.26	192.168.1.7	SMTP	140 S: 220 mx.google.com ESMTP y16-20020a17090322d000b00158ba0afc1es115170791pg.54 - gsmt	
1883	444.327542	192.168.1.7	172.217.194.26	SMTP	60 C: hello	
1885	444.532059	172.217.194.26	192.168.1.7	SMTP	236 S: 501-5.5.4 Empty HELO/EHLO argument not allowed, closing connection. 5.5.4 https://support.google.com/mail/?..	

> Frame 674: 140 bytes on wire (1120 bits), 140 bytes captured (1120 bits) on interface \Device\NPF_{6C6007C8-9853-4E51-99F3-39723090F8F0}, id 0

> Ethernet II, Src: currento_98:e7:57 (14:a7:2b:98:e7:57), Dst: 0a:e0:af:c2:0a:37 (0a:e0:af:c2:0a:37)

> Internet Protocol Version 4, Src: 74.125.68.26, Dst: 192.168.1.7

> Transmission Control Protocol, Src Port: 25, Dst Port: 49845, Seq: 1, Ack: 1, Len: 86

> Simple Mail Transfer Protocol

```
 0000  0a e0 af c2 0a 37 14 a7 2b 98 e7 57 08 00 45 40  ....7...+..W..E@
0010  00 7e 09 12 00 00 7a 06 e6 e1 4a 7d 44 1a c0 a8  ....z...J)D...
0020  01 07 00 19 c2 65 ee bd 19 30 79 91 7e 40 50 18  .......B...gP...
0030  01 00 51 81 00 00 32 32 30 20 6d 78 2e 67 6f 1f  ...Q...22 0 mx.goo
0040  67 6c 65 2e 63 6f 6d 20 45 53 4d 54 50 20 65 39  gle.com ESMTP e9
0050  2d 32 30 30 32 30 61 36 33 66 35 34 39 30 30 30  -20020a6 3f549000
0060  30 30 30 62 30 30 33 63 36 35 39 66 32 65 66 65  000b003c 659f2efe
0070  33 73 69 51 32 30 38 37 30 38 31 70 67 6b 2e 32  3s112087 081pgk.2
0080  34 35 20 2d 20 67 73 6d 74 70 6d 0a              45 - gsmt p...
```

Window smtp

Simple Mail Transfer Protocol: ProtocolPackets: 1334 · Displayed: 4 (0.3%) · Dropped: 0 (0.0%)Profile: Default

A screenshot of the Wireshark network protocol analyzer. The title bar reads "Wireshark · Follow TCP Stream (tcp.stream eq 22) · Ethernet 2". The main display area shows a packet list on the left with three entries: a GET request from 220 mx.google.com, a 501-5.5.4 error, and a 501 5.5.4 error with a URL. The packet details pane on the right shows the "Hypertext Transfer Protocol" section for the first packet, displaying the status "200 OK" and the "Server: Apache/2.4.18 (Ubuntu)" header. The packet bytes pane on the right shows the raw data of the first packet, which is a GET request for "/".

```
$ sudo apt update
```

```
$ sudo apt install -y qemu-kvm virt-manager libvirt-daemon-system virtinst libvirt-clients  
bridge-utils
```

```
$ sudo systemctl enable --now libvirtd
```

```
$ sudo systemctl start libvirtd
```

Confirm that the virtualization daemon is running as shown.

```
$ sudo systemctl status libvirtd
```

```
linuxtechi@ubuntu: ~  
linuxtechi@ubuntu:~$  
linuxtechi@ubuntu:~$  
linuxtechi@ubuntu:~$ sudo systemctl start libvirtd  
linuxtechi@ubuntu:~$  
linuxtechi@ubuntu:~$  
linuxtechi@ubuntu:~$ sudo systemctl status libvirtd  
● libvirtd.service - Virtualization daemon  
   Loaded: loaded (/lib/systemd/system/libvirtd.service; enabled; vendor preset: enabled)  
   Active: active (running) since Fri 2022-05-20 09:12:34 EDT; 34min ago  
TriggeredBy: ● libvirtd.socket  
              ● libvirtd-ro.socket  
              ● libvirtd-admin.socket  
   Docs: man:libvirtd(8)  
         https://libvirt.org  
 Main PID: 6155 (libvirtd)
```

4) Add the currently logged-in user to the kvm and libvirt groups so that they can create and manage virtual machines.

```
$ sudo usermod -aG kvm $USER
```

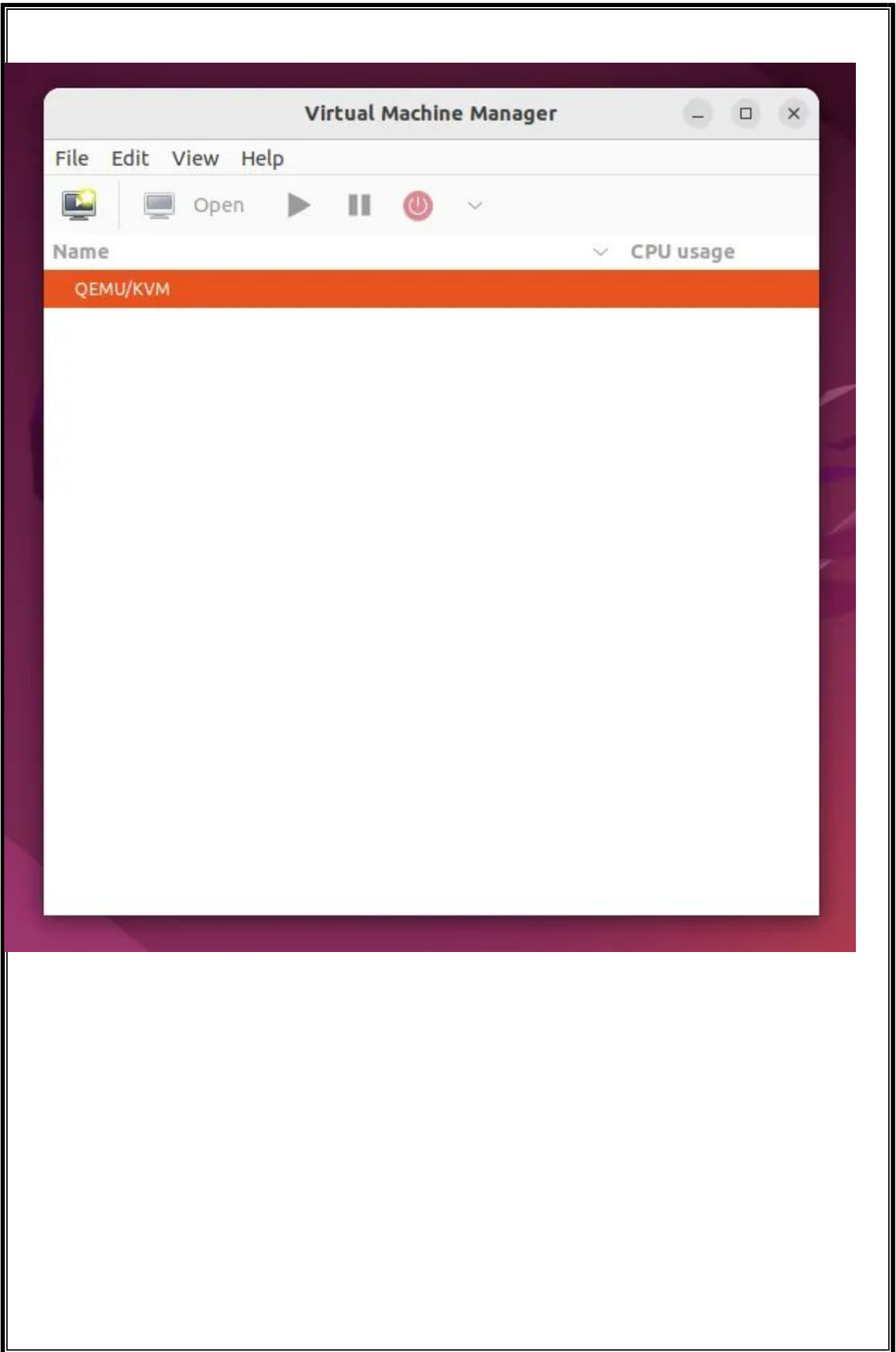
```
$ sudo usermod -aG libvirt $USER
```

5) Launch KVM Virtual Machines Manager

Search for 'Virtual machine Manager'.

Click on the icon that pops up.

If QEMU/KVM is not connected error appears then install all packages that are needed.



```
sudo apt-get install qemu virt-manager
```

```
sudo reboot)
```

6) Create new Virtual Machine

Click on “File” then select “New Virtual Machine”.

This pops open the virtual machine installation wizard which presents you with the following four options:

Local install Media (ISO image or CDROM

- Network Install (HTTP, HTTPS, and FTP)
- Import existing disk image
- Manual Install

7) Select: Local install Media (ISO image or CDROM)

Browse Local and select Linux OS iso file

8) Choose Memory and CPU settings and Disk Space and click Finish

