

Name : RAHUL M. S. PAL

Std. : TYCS Div. : _____ Roll No. : 31011122059

Sub. : _____

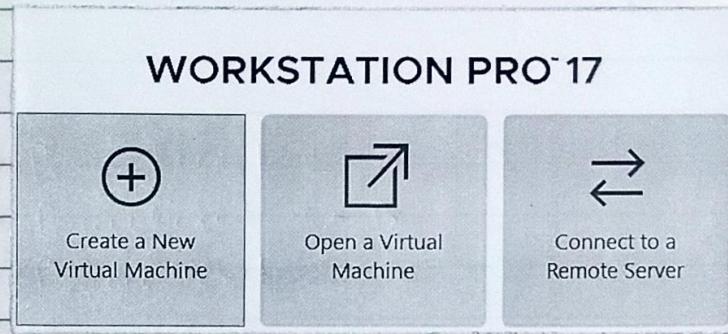
School / College : SKSC

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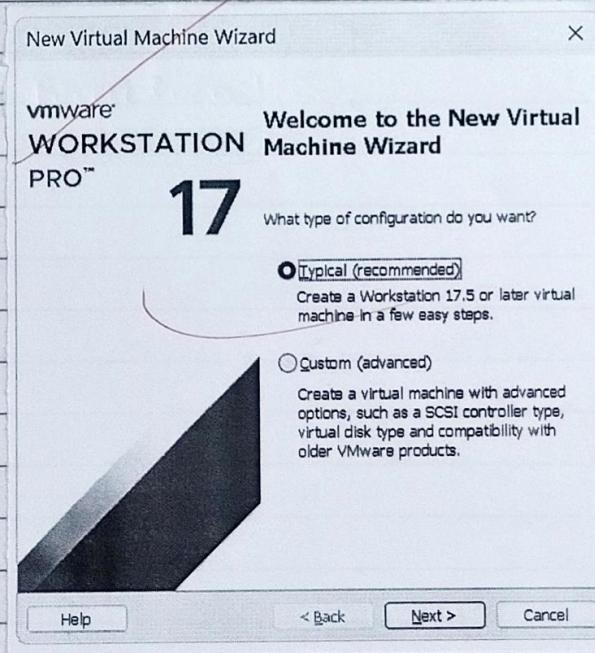
Practical - 1A

Aim: Installation of UBUNTU
Good submission

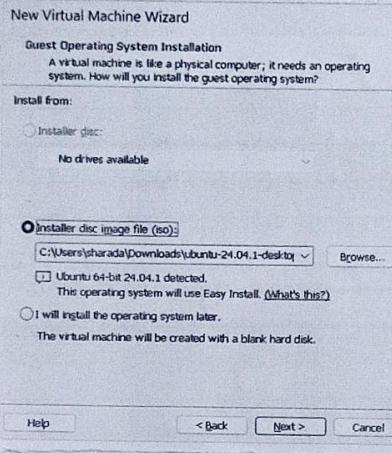
Step 1: Once you downloaded the img file of ubuntu. Open VMWARE workstation Pro.



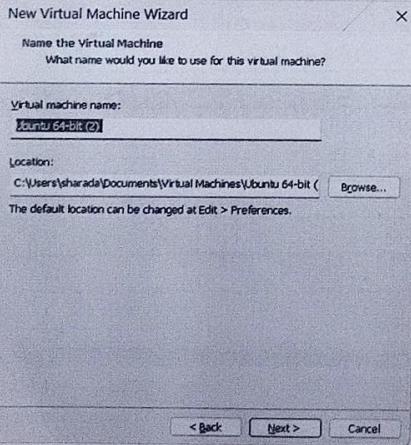
Step 2: click on "Create a new virtual machine" select "Typical"



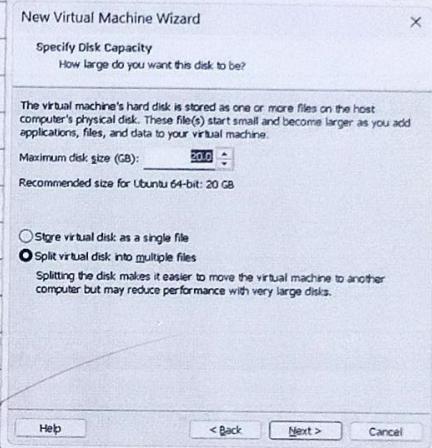
step 3: select Installer disc img file & browse the recently downloaded Ubuntu img file > Next



step 4: give name for VM > Next



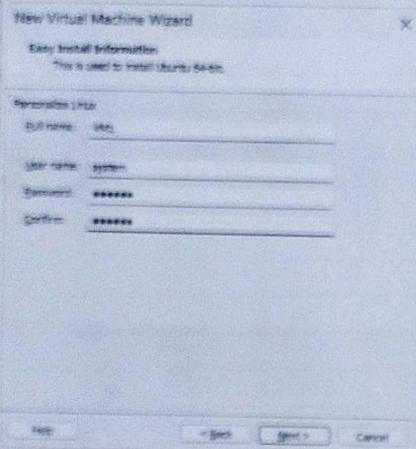
step 5: select the size



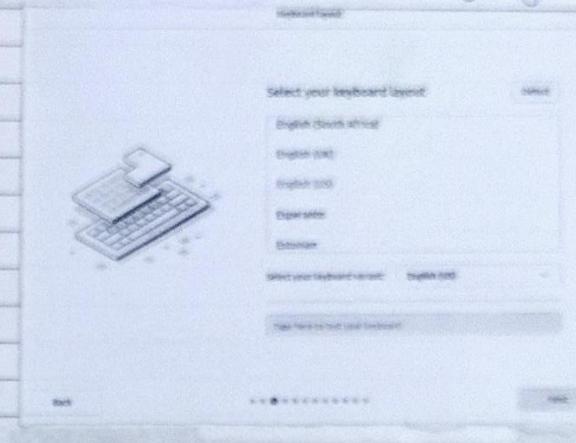
step 6: Review all the info related to be created VM > Finish



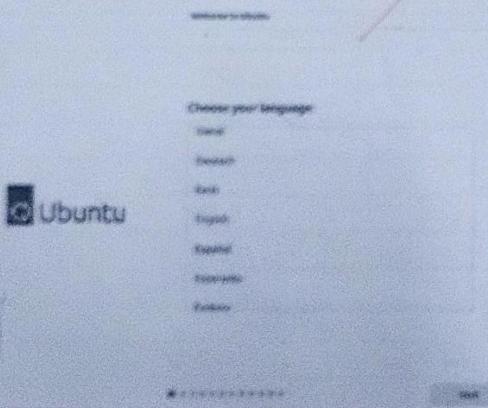
step 7: set username full name & password > next



step 9: choose keyboard language



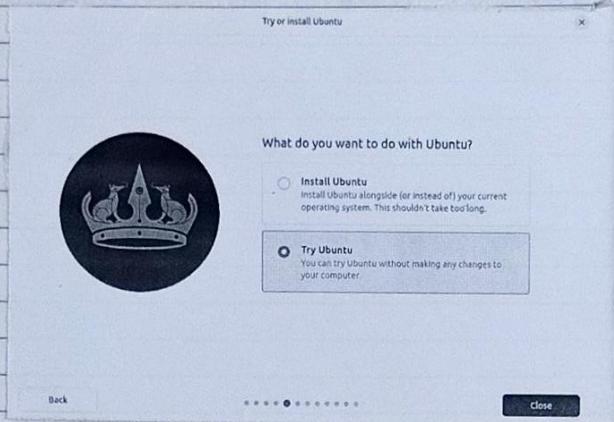
step 8: choose language



step 10: select appropriate info about internet



Step 11: Select "Try UBUNTU" > close.



Practical - 1B

Aim: To learn how to use Linux command line interface & practice my Linux skills.

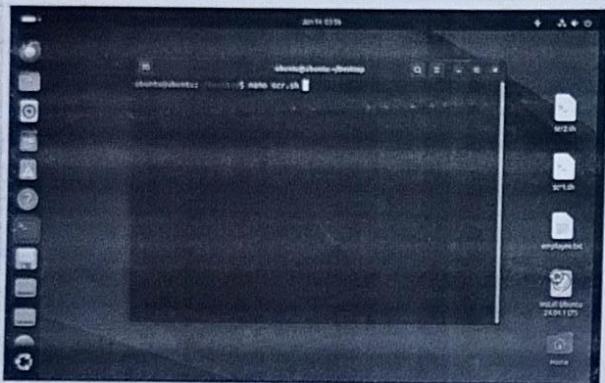
Name	Id	Dept	Basic Salary	Gross Salary
John	001	Computer	5000	6000
Sara	002	HR	4500	5400
Silvia	003	IT	12000	14400
Mark	004	Sales	4000	5000
Doris	005	Marketing	5000	6000

Step 12: Installation of UBUNTU as a VM is completed successfully.



Touch command is used to create file. Here we are creating a .txt file called 'employee'.

Step 2: By using nano cmd we are invoking nano editor for creating a shell script.



Step 3: writing the file driven operation using grep cmd.

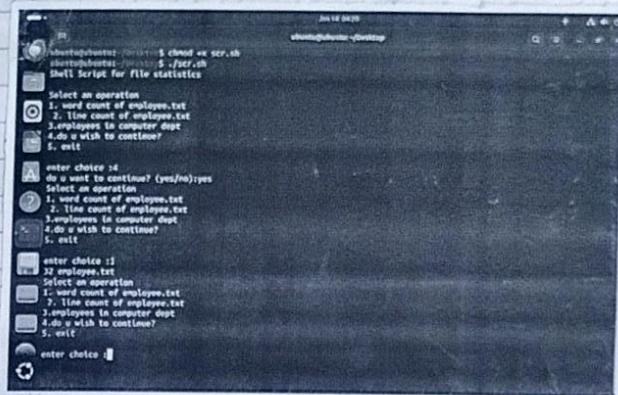
```

Jan 14 03:59
/home/krishna
krishna@krishna-Lenovo: ~$ nano scr.sh
#!/bin/bash
echo "Select an operation"
echo "1. word count of employee.txt"
echo "2. line count of employee.txt"
echo "3. employees in computer dept"
echo "4. do u wish to continue?"
echo "5. exit"
echo
read -p "Enter choice : " user_choice
if [ $user_choice -eq 1 ]; then
    wc -w employee.txt
    echo "1 word count of employee.txt"
elif [ $user_choice -eq 2 ]; then
    wc -l employee.txt
    echo "1 line count of employee.txt"
elif [ $user_choice -eq 3 ]; then
    grep "Computer" employee.txt | wc -l
    echo "3 employees in computer dept"
elif [ $user_choice -eq 4 ]; then
    echo "Do you want to continue? (yes/no):"
    read -p " " user_choice
    if [ $user_choice == "yes" ]; then
        echo "Continuing the script"
    else
        exit 0
    fi
else
    echo "Invalid choice"
fi
krishna@krishna-Lenovo: ~$ ./scr.sh

```

Step 4: for executing shell script first we need to change mode , using chmod
-x is for execution mode .

./ is for executing the file once it is in executable mode .



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Practical - 2

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1) pwd - Display current working directory

```
rahul@rahul-virtual-machine: ~ $ pwd
/home/rahul/Desktop
rahul@rahul-virtual-machine: ~/Desktop $
```



2) touch <filename> - Create a file

```
rahul@rahul-virtual-machine: ~ $ touch emp.txt
rahul@rahul-virtual-machine: ~ $
```

3) cat <filename> - Display file content

```
rahul@rahul-virtual-machine: ~ $ cat emp.txt
GOOD MORNING,
LT. PILOT RAHUL PAL THIS SIDE
IF DEATH STRIKES ME BEFORE I PROVE MY BLOOD, I SWEAR I WILL KILL DEATH
rahul@rahul-virtual-machine: ~ $
```



4) wc <filename>

```
rahul@rahul-virtual-machine: ~ $ wc emp.txt
3 23 116 emp.txt
rahul@rahul-virtual-machine: ~ $
```

5) mkdir < name directory > → Creates directory

```
rahul@rahul-virtual-machine: ~ $ mkdir Pract2
rahul@rahul-virtual-machine: ~ $
```

6) ls -l

```
rahul@rahul-virtual-machine: ~ $ ls -l
total 8
-rw-rw-r-- 1 rahul rahul 116 Feb  9 21:03 emp.txt
drwxrwxr-x 2 rahul rahul 4096 Feb  9 21:07 Pract2
rahul@rahul-virtual-machine: ~ $
```

7) grep -a 'A' <filename>

```
rahul@rahul-virtual-machine: ~ $ grep -a 'A' emp.txt
LT. PILOT R HUL PAL THIS SIDE
IF DEATH STRIKES ME BEFORE I PROVE MY BLOOD, I SWE R I WILL
KILL DEATH.
rahul@rahul-virtual-machine: ~ $
```

grep -i 'a' <filename>

```
rahul@rahul-virtual-machine: ~ $ grep -i 'a' emp.txt
LT. PILOT RAHUL P L THIS SIDE
IF DEATH STRIKES ME BEFORE I PROVE MY BLOOD, I SWEAR I WILL
KILL DE TH.
rahul@rahul-virtual-machine: ~ $
```

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8) `grep "20000" <filename>`

```
rahul@rahul-virtual-machine:~/Desktop$ grep "1999" emp.txt
QUOTE BY CAPT. MANOJ KUMAR PANDEY WARRIOR OF KARGIL WAR 1999.
rahul@rahul-virtual-machine:~/Desktop$
```

Practical-3

* Network Configuration

1) `ip -v` : show the version of ip.

```
rahul@rahul-virtual-machine:~/Desktop$ ip -v
ip utility, iproute2-5.15.0, libbbpf 0.5.0
```

2) `sudo apt install net-tools` : It installs net-tools packages

```
rahul@rahul-virtual-machine:~/Desktop$ sudo apt install net-tools
[sudo] password for rahul:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
net-tools is already the newest version (1.60+git20191103.8eebece-1ubuntu5).
0 upgraded, 0 newly installed, 0 to remove and 216 not upgraded.
```

< command > 'A' D = grep &

< command > 'D' -a &

3) `ifconfig` : show the system ip address

```
rahul@rahul-virtual-machine:~/Desktop$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.222.138 netmask 255.255.255.0 broadcast 192.168.222.255
              ether 00:0c:29:3d:4b:bc txqueuelen 1000 (Ethernet)
                    RX packets 36 bytes 6796 (6.7 KB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 98 bytes 11740 (11.7 KB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
              inet6 ::1 prefixlen 128 scopeid 0x10<host>
                    loop txqueuelen 1000 (Local Loopback)
                    RX packets 113 bytes 9815 (9.8 KB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 113 bytes 9815 (9.8 KB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

4) ipconfig (in computer cmd) : shows ip addr of Computer.

```
C:\Users\Rahul Pal>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Ethernet adapter VMware Network Adapter VMnet1:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::da2:3c36:eb8f:c1cf%8
    IPv4 Address . . . . . : 192.168.145.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
```

5) ping <ip addr> : ping the VM with your computer.

```
rahul@rahul-virtual-machine:~/Desktop$ ping 192.168.145.1
PING 192.168.145.1 (192.168.145.1) 56(84) bytes of data.
64 bytes from 192.168.145.1: icmp_seq=1 ttl=128 time=2.62 ms
64 bytes from 192.168.145.1: icmp_seq=2 ttl=128 time=1.82 ms
64 bytes from 192.168.145.1: icmp_seq=3 ttl=128 time=2.03 ms
64 bytes from 192.168.145.1: icmp_seq=4 ttl=128 time=2.68 ms
```

6) hostname : shows the hostname of VM.

```
^Crahul@rahul-virtual-machine:~/Desktop$ hostname
rahul-virtual-machine
```

7) ping <ipaddr> : it will ping the computer to VM.

```
C:\Users\Rahul Pal>ping 192.168.222.138

Pinging 192.168.222.138 with 32 bytes of data:
Reply from 192.168.222.138: bytes=32 time=2ms TTL=64
Reply from 192.168.222.138: bytes=32 time=1ms TTL=64
Reply from 192.168.222.138: bytes=32 time=1ms TTL=64
Reply from 192.168.222.138: bytes=32 time=3ms TTL=64

Ping statistics for 192.168.222.138:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms
```

8) ping -c 5 www.google.com : This will ping the packets to google.com (64 bytes)

```
rahul@rahul-virtual-machine:~/Desktop$ ping -c 5 www.google.com
PING www.google.com (172.217.166.4) 56(84) bytes of data:
64 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=1 ttl=128 time=185 ms
64 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=2 ttl=128 time=122 ms
64 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=3 ttl=128 time=144 ms
64 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=4 ttl=128 time=166 ms
64 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=5 ttl=128 time=85.2 ms

--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 400ms
rtt min/avg/max/mdev = 85.204/140.508/185.046/34.726 ms
```

9) ping -c 5 -s www.google.com : This will ping the google.com (13 bytes).

```
rahul@rahul-virtual-machine:~/Desktop$ ping -c 5 -s www.google.com
ping: invalid argument: 'www.google.com'
rahul@rahul-virtual-machine:~/Desktop$ ping -c 5 -s www.google.com
ping: invalid argument: '-s': out of range: 1 <= value <= 922372036854775807
rahul@rahul-virtual-machine:~/Desktop$ ping -c 5 -s 5 www.google.com
PING www.google.com (172.217.166.4) 5(33) bytes of data.
13 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=1 ttl=128
13 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=2 ttl=128
13 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=3 ttl=128
13 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=4 ttl=128
13 bytes from de03s17-in-f4.1e100.net (172.217.166.4): icmp_seq=5 ttl=128

--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4007ms
```

10) route : This will show the route configuration.

```
rahul@rahul-virtual-machine:~/Desktop$ route
Kernel IP routing table
Destination     Gateway      Genmask      Flags Metric Ref Use Iface
default         _gateway    0.0.0.0      UG 100    0      0 ens33
link-local     0.0.0.0      255.255.0.0  U   1000   0      0 ens33
192.168.222.0  0.0.0.0      255.255.255.0 U   100    0      0 ens33
```

11) sudo apt install traceroute : This will install the traceroute package.

```
rahul@rahul-virtual-machine:~/Desktop$ sudo apt install traceroute
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
traceroute
0 upgraded, 1 newly installed, 0 to remove and 216 not upgraded.
Need to get 45.4 kB of archives.
After this operation, 152 kB of additional disk space will be used.
Get:1 http://In.archive.ubuntu.com/ubuntu jammy/universe amd64 traceroute amd64 1:2.1.0-2 [45.4 kB]
Fetched 45.4 kB in 2s (23.7 kB/s)
Selecting previously unselected package traceroute.
(Reading database ... 201955 files and directories currently installed.)
Preparing to unpack .../traceroute_1x3a2.1.0-2_amd64.deb ...
Unpacking traceroute (1:2.1.0-2) ...
Setting up traceroute (1:2.1.0-2) ...
update-alternatives: using /usr/bin/traceroute.db to provide /usr/bin/traceroute
(traceroute) in auto mode
update-alternatives: using /usr/bin/traceroute6.db to provide /usr/bin/tracerout
e6 (traceroute6) in auto mode
update-alternatives: using /usr/bin/lft.db to provide /usr/bin/lft (lft) in auto
mode
update-alternatives: using /usr/bin/traceproto.db to provide /usr/bin/traceproto
(traceproto) in auto mode
update-alternatives: using /usr/sbin/tcptraceroute.db to provide /usr/sbin/tcptr
aceroute (tcptraceroute) in auto mode
Processing triggers for man-db (2.10.2-1) ...
```

12) traceroute : shows the traceroute configuration

```
rahul@rahul-virtual-machine:~/Desktop$ traceroute
Usage:
 traceroute [ -46dFITnreAUDV ] [ -f first_ttl ] [ -g gate,... ] [ -i device ]
 [ndwait] [ --fwmark=num ] host [ packetlen ]
Options:
 -4           Use IPv4
 -6           Use IPv6
 -d --debug   Enable socket level debugging
 -F --dont-fragment Do not fragment packets
 -f first_ttl --first=first_ttl
               Start from the first_ttl hop (instead from 1)
```

13) dig : It is used to see the Domain name system (DNS) info.

```
rahul@rahul-virtual-machine:~/Desktop$ dig
; <>> DiG 9.18.30-0ubuntu0.22.04.2-Ubuntu <>>
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 27569
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 16
;OPT PSEUDOSECTION:
;EDNS: version: 0, flags:; udp: 65494
;QUESTION SECTION:
;.
;ANSWER SECTION:
.          IN      NS   f.root-servers.net.
.          IN      NS   g.root-servers.net.
.          IN      NS   h.root-servers.net.
.          IN      NS   i.root-servers.net.
.          IN      NS   j.root-servers.net.
.          IN      NS   k.root-servers.net.
.          IN      NS   l.root-servers.net.
.          IN      NS   m.root-servers.net.
.          IN      NS   a.root-servers.net.
.          IN      NS   b.root-servers.net.
.          IN      NS   c.root-servers.net.
.          IN      NS   d.root-servers.net.
.          IN      NS   e.root-servers.net.
;ADDITIONAL SECTION:
a.root-servers.net. 5 IN A 198.41.0.4
b.root-servers.net. 5 IN A 178.247.170.2
c.root-servers.net. 5 IN A 192.33.4.12
d.root-servers.net. 5 IN A 199.7.91.131
e.root-servers.net. 5 IN A 192.203.230.10
f.root-servers.net. 5 IN A 192.5.5.241
g.root-servers.net. 5 IN A 192.112.36.4
h.root-servers.net. 5 IN A 198.59.190.53
i.root-servers.net. 5 IN A 192.36.148.17
j.root-servers.net. 5 IN A 192.58.128.30
k.root-servers.net. 5 IN A 193.0.14.129
l.root-servers.net. 5 IN A 199.7.83.42
m.root-servers.net. 5 IN AAAA 2001:503:ba3e::2:30
a.root-servers.net. 5 IN AAAA 2001:1bb:10::b
;Query time: 81 msec
; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
; WHEN: Wed Feb 12 20:24:44 IST 2025
; MSG SIZE rcvd: 503
```

14) dig www.facebook.com

```
rahul@rahul-virtual-machine: ~/Desktop $ dtg www.facebook.com
; <>> DIG 9.18.30-Ubuntu0.22.04.2-Ubuntu <>> www.facebook.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 28496
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;www.facebook.com. IN A

;; ANSWER SECTION:
www.facebook.com. 5 IN CNAME star-mini.c10r.facebook.com.
star-mini.c10r.facebook.com. 5 IN A 57.144.124.1

;; Query time: 134 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Wed Feb 12 20:25:07 IST 2025
;; MSG SIZE rcvd: 90
```

15) dig www.google.com +short

```
rahul@rahul-virtual-machine: ~/Desktop $ dig www.google.com +short
172.217.166.4
```

16) dig www.google.com +no comments

```
rahul@rahul-virtual-machine: ~/Desktop $ dig www.google.com +nocomments
```

17) dig www.google.com + no comments

```
rahul@rahul-virtual-machine: ~/Desktop $ dig www.google.com +nocomments
; <>> DIG 9.18.30-Ubuntu0.22.04.2-Ubuntu <>> www.google.com +nocomments
;; global options: +cmd
;www.google.com. IN A 172.217.166.4
;; Query time: 15 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Wed Feb 12 20:26:01 IST 2025
;; MSG SIZE rcvd: 59
```

18) dig www.google.com +noall +answer

```
rahul@rahul-virtual-machine: ~/Desktop $ dig www.google.com +noall +answer
www.google.com. 5 IN A 172.217.166.4
```

19) sudo apt install ifplugd

```
rahul@rahul-virtual-machine: ~ $ sudo apt install ifplugd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
ifdown
Suggested packages:
ifnames
The following NEW packages will be installed:
ifplugd ifdown
0 upgraded, 2 newly installed, 0 to remove and 210 not upgraded.
Need to get 223 kB of archives.
After this operation, 474 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 ifplugd amd64 0.28-19.5ubuntu3.1 [49.1 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 ifdown amd64 0.8.36+nm1ubuntu3.1 [46.5 kB]
Fetched 223 kB in 3s (46.5 kB/s)
Preconfiguring packages...
Selecting previously unselected package ifplugd.
(Needed for: ifdown 0.8.36+nm1ubuntu3.1) [49.1 kB]
Unpacking ifplugd (0.28-19.5) ...
Selecting previously unselected package ifdown.
Preparing to unpack .../ifdown_0.8.36+nm1ubuntu3.1_amd64.deb...
Unpacking ifdown (0.8.36+nm1ubuntu3.1) ...
Setting up ifdown (0.8.36+nm1ubuntu3.1) ...
Creating /etc/network/interfaces...
Created symlink /etc/systemd/system/multi-user.target.wants/networking.service →
/lib/systemd/system/networking.service.
Created symlink /etc/systemd/system/network-online.target.wants/networking.service.
Setting up ifplugd (0.28-19.5) ...
Processing triggers for man-db (2.10.2-1) ...
```

20) arp

Address	Hwtype	Hwaddress	Flags	Mask	Iface
192.168.222.254	ether	00:50:56:ed:7c:d9	C		ens33
192.168.222.1	ether	00:50:56:c0:00:08	C		ens33
gateway	ether	00:50:56:ed:a8:01	C		ens33

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Practical-4 A

- * Write a shell script for Menu Driven to perform following actions.

- 1) To check if base machine & ubuntu communicating , to check this in 5 count.
- 2) set Data packet size 128.
- 3) change the frequency of sending data
- 4) Query working of google.com
- 5) check the statistic of network.
- 6) check working of current host.
- 7) Find out current user.
- 8) Display only hidden file sort out in display.txt.
- 9) ask user to create your Dir & get dir name
- 10) Ask user to continue.

→ code:

```
#!/bin/bash

while true; do
echo "\nMenu:"
echo "1. check base machine & ubuntu communication"
echo "2. check connectivity with 5 count"
echo "3. set data packets size to 128."
echo "4. change frequency of sending data"
echo "5. Query working of google.com."
echo "6. check the statistic of network."
echo "7. check working of current host."
```

```
echo "8. find out current user"
echo "9. Display only hidden files sorted in display.txt"
echo "10. Ask user to create a dir."
echo ". Exit"

read -p "Enter your choice : " choice

case $choice in
    1) echo "Checking base machine & Ubuntu communication.."
       ping -c 5 8.8.8.8;;
    2) echo "Checking connectivity with 5 counts"
       ping -c 5 google.com;;
    3) echo "Setting data packet size 128."
       ping -c 5 -s 128 google.com;;
    4) echo "changing frequency of data."
       ping -i 0.5 -e 1 google.com;;
    5) echo "Querying working of google.com.."
       nslookup google.com;;
    6) echo "Checking net network statistic.."
       ss -s;;
    7) echo "Checking working of current host.."
       hostnamectl;;
    8) echo "Finding out current user"
       whoami;;
```

9) echo "Displaying only hidden files
sorted in display.txt..."
ls -ld .??* | sort > display.txt
cat display.txt ;;

10) read -p "Enter directory name:"
dirname
mkdir -p "\$dirname"
echo "Directory '\$dirname' created." ;;

11) echo "Exiting"
exit 0 ;;
12) echo "Invalid choice. Please try
again." ;;

esac

done

output:

```
rahul@rahul-virtual-machine:~/Desktop$ chmod +x Pract4.sh
rahul@rahul-virtual-machine:~/Desktop$ ./Pract4.sh
\nMenu:
1. Check base machine and Ubuntu communication
2. Check connectivity with 5 counts
3. Set data packet size to 128
4. Change frequency of sending data
5. Query working of google.com
6. Check network statistics
7. Check working of current host
8. Find out current user
9. Display only hidden files sorted in display.txt
10. Ask user to create a directory
11. Exit
Enter your choice: 5
```

Enter your choice: 5
Querying working of google.com...
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:

Name: google.com
Address: 142.250.183.46
Name: google.com
Address: 2404:6800:4009:821::200e

status of my tip at pifwif

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Practical - 4B

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- * Configure SSH server to manage a server from the remote computer, SSH client. [UBUNTU AND WINDOWS]

1) Installing SSH

```
rahul@rahul-virtual-machine:~$ ssh
usage: ssh [-46aacfGgKkMmNnqTtVvXxYy] [-B bind_interface]
           [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
           [-E log_file] [-e escape_char] [-F configfile] [-i pkcs11]
           [-I identity_file] [-J [user@]host[:port]] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
           [-w local_tun[:remote_tun]] destination [command [argument ...]]
```

2) sudo apt-get install openssh-server

```
rahul@rahul-virtual-machine:~$ sudo apt-get install openssh-server
Reading package lists...
Building dependency tree...
Reading status information...
0 upgraded, 0 newly installed, 0 to remove and 216 not upgraded.
rhel@rahul-virtual-machine:~$ sudo service ssh status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-07-12 19:27:32 IST; 1min ago
     Docs: man:sshd(8)
          man:sshd_config(5)
  Process: 3840 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
  Tasks: 1 (limit: 2212)
    Memory: 1.7M
       CPU: 202ms
      CGroup: /system.slice/ssh.service
             └─ 3841 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Feb 12 10:25:32 rahul-virtual-machine systemd[1]: Started OpenBSD Secure Shell server.
Feb 12 19:27:50 rahul-virtual-machine sshd[3840]: pam_unix(sshd:auth): check pass; user unknown
Feb 12 19:27:55 rahul-virtual-machine sshd[3863]: pam_unix(sshd:auth): check pass; user unknown
Feb 12 19:27:55 rahul-virtual-machine sshd[3863]: pam_unix(sshd:auth): authentication failure; logname=video uid=0 euid=0 tty=tty1 rhost=192.168.222.1 port 55186 ssh2
Feb 12 19:27:55 rahul-virtual-machine sshd[3863]: pam_unix(sshd:auth): check pass; user unknown
Feb 12 19:27:55 rahul-virtual-machine sshd[3863]: pam_unix(sshd:auth): authentication failure; logname=video uid=0 euid=0 tty=tty1 rhost=192.168.222.1 port 55186 ssh2
Feb 12 19:35:46 rahul-virtual-machine sshd[3880]: invalid user system from 192.168.222.1 port 55186 ssh2
Feb 12 19:35:49 rahul-virtual-machine sshd[3880]: pam_unix(sshd:auth): check pass; user unknown
Feb 12 19:35:51 rahul-virtual-machine sshd[3880]: pam_unix(sshd:auth): authentication failure; logname=video uid=0 euid=0 tty=tty1 rhost=192.168.222.1 port 58243 ssh2
Feb 12 19:36:22 rahul-virtual-machine sshd[3880]: Connection reset by invalid user system from 192.168.222.1 port 58243 (preauth)
```

3) To check the states of server

4) ifconfig to get your ip add.

```
rahul@rahul-virtual-machine:~$ ifconfig
eth0: flags=4164<LOOPBACK,BROADCAST,MULTICAST> mtu 65536
      inet 192.168.222.198 netmask 255.255.255.0 broadcast 192.168.222.255
            link layer 00:0c:29:3d:40:01 brd 00:0c:29:3d:40:01
      RX packets 4539 bytes 1394715 (1.3 MB)
      TX packets 416 bytes 449 (41.8 B)
      RX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

5) whoami

```
rahul@rahul-virtual-machine:~$ whoami
rahul
```

6) Open WINDOWS CMD & enter the following to establish the SSH connection

```
ssh rahul @ 192.168.222.138
```

Microsoft Windows [Version 10.0.26100.3037]
(c) Microsoft Corporation. All rights reserved.

```
C:\Users\Rahul Pal>ssh rahul@192.168.222.138
rahul@192.168.222.138's password:
Welcome to Ubuntu 22.04.1 LTS (GNU/Linux 6.10.0-52-generic x86_64)
```

- * Documentation: <https://help.ubuntu.com>
- * Management: <https://landscape.canonical.com>
- * Support: <https://ubuntu.com/advantage>

216 updates can be applied immediately.
4 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

New release '24.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Wed Feb 12 18:59:52 2025 from 127.0.0.1
rahul@rahul-virtual-machine:~\$ |

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Practical - 5

ifconfig

```
system@server: ~ $ ifconfig
ens3: flags=4163UP BROADCAST RUNNING MULTICAST  mtu 1500
      netmask 255.255.255.0 broadcast 192.168.1
      ether 00:0c:29:ff:fe:18 brd 192.168.1.129
      RX packets 1770 bytes 1686698 (1.6 MB)
      TX packets 319 bytes 35837 (35.8 KB)
      TX errors 0 dropped 0 overruns 0 frame 0
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

whoami

hostname

hostnamectl

system@system-Virtual-Platform: ~ \$ whoami

system@system-Virtual-Platform: ~ \$ hostname

system@system-Virtual-Platform: ~ \$ hostnamectl

Static hostname: computer-vm

Icon name: computer-vm

Chassis: vm

Machine ID: 0173feb925045fc917f0ca37aaddc8e

Boot ID: 3fcdddfcd9949c7857603df1673b3de

Virtualization: VMware

Operating System: Ubuntu 24.04.1 LTS

Kernel: Linux 6.11.0-17-generic

Architecture: x86_64

Hardware Vendor: VMware, Inc.

Hardware Model: VMware Virtual Platform

Firmware Version: 6.00

Firmware Date: Thu 2020-11-12

Firmware Age: 4y 3month 5d

system@system-Virtual-Platform: ~ \$

hostnmectl set - hostname server.

example.com

```
system@system-Virtual-Platform: ~ $ hostnmectl set hostname server.example.com
system@system-Virtual-Platform: ~ $ hostnmectl
computer-vm
```

```
9173feb925045fc917f0ca37aaddc8e
3fcdddfcd9949c7857603df1673b3de
```

```
Ubuntu 24.04.1 LTS
Linux 6.11.0-17-generic
x86_64
VMware, Inc.
```

```
VMware Virtual Platform
6.00
Thu 2020-11-12
4y 3month 5d
```

```
system@system-Virtual-Platform: ~ $
```

cat > sample.txt

```
meeting package ~~~~~ cat > sample.txt
System@server: ~ $ cat > sample.txt
```

This is a sample file

^C

< ncr

```
system@server: ~ $ cp sample.txt sample1.txt
system@server: ~ $ cp sample.txt sample2.txt
system@server: ~ $ gzip sample.txt
system@server: ~ $ ls -l
```

total 12

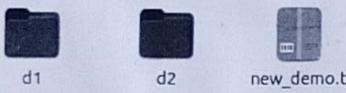
```
-rw-rw-r-- 1 system system 23 Feb 19 08:43 sample1.txt
-rw-rw-r-- 1 system system 23 Feb 18 08:44 sample2.txt
```

```
-rW-rW-r-- 1 system system 51 Feb 18 08:43
```

```
system@server: ~ $ gunzip sample.txt.gz
system@server: ~ $ cat sample.txt
This is a sample file
system@server: ~ $
```

```
system@server: ~ $ mkdir d1
system@server: ~ $ mkdir d2
system@server: ~ $ touch sample4.txt
system@server: ~ $ touch sample5.txt
system@server: ~ $ tar -cvf new_demo.tar d1
d1/
system@server: ~ $
```

Home / Desktop



```
system@server: ~ $ bzip2 new_demo.tar
Command 'bzip2' not found, but can be installed with:
sudo apt install bzip2
system@server: ~ $ sudo apt install bzip2
[sudo] password for system:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done.
```

```
[Processing triggers for man-db (2.12.0-1ubuntu2) ...]
system@server: ~ $ bzip2 new_demo.tar
system@server: ~ $ ls -l
total 28
drwxrwxr-x 2 system system 4096 Feb 18 09:26
drwxrwxr-x 2 system system 4096 Feb 18 09:26
-rw-rw-r-- 1 system system 114 Feb 18 09:28
-rwxrwxr-x 1 system system 676 Feb 18 09:23 prac.sh
-rw-rw-r-- 1 system system 23 Feb 18 08:43 sample1.txt
-rw-rw-r-- 1 system system 23 Feb 18 08:44 sample2.txt
-rw-rw-r-- 1 system system 0 Feb 18 09:27 sample4.txt
-rw-rw-r-- 1 system system 0 Feb 18 09:27 sample5.txt
-rw-rw-r-- 1 system system 23 Feb 18 08:43 sample.txt
system@server: ~ $
```

```
system@admin1-virtual-machine: ~ $ tar -cvf new_demo.tar demon1/
demon1/
demon1/demon2/
```

```
system@admin1-virtual-machine: ~ $ tar -xvf new_demo.tar demon1/
demon1/
demon1/demon2/
```

```
system@admin1-virtual-machine: ~ $ tar -tvf new_demo.tar demon1/
drwxrwxr-x system/system 0 2025-02-18 09:56 demon1/
drwxrwxr-x system/system 0 2025-02-18 09:06 demon1/demon2/
```

```
system@admin1-virtual-machine: ~ $ cd
system@admin1-virtual-machine: ~ $ bzip2 new_demo.tar
```

Practical-5 "B"

- 1) accept two no. from the user & compare

```
echo "Enter 1st number."
```

```
read n1
```

```
echo "Enter 2nd number."
```

```
read n2
```

```
if [ "$n1 -gt "$n2" ]; then
    echo "The greatest number is:$n1"
elif [ "$n1 -lt "$n2" ]; then
    echo "The greatest number is:$n2"
else
    echo "Both numbers are equal !."
fi
```

```
system@server: $ touch prac.sh
system@server: $ chmod +x prac.sh
system@server: $ ./prac.sh
bash: ./prac.sh: No such file or directory
system@server: $ ./prac.sh
Enter first number:
```

```
3
```

```
Enter second number:
```

```
5
```

```
The greatest number is: 5
```

```
system@server: ~ $
```

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2) Accept two numbers & check if it is even or odd. Display next 10 numbers from n1 & n2.

\Rightarrow echo "Enter 1st no."

read n1

echo "Enter 2nd no."

read n2

check - odd - or - even () {

if ((\$1 % 2 == 0)); then

echo "\$1 is Even"

else

echo "\$1 is Odd"

fi

}

check - odd - or - even \$n1

check - odd - or - even \$n2

echo "Next 10 no. from \$n1."

for ((i=1; i<=10; i++))

do

echo "\$((n1 + i))"

done

echo "Next 10 no. from \$n2."

for ((i=1; i<=10; i++))

do

echo "\$((n2 + i))"

done

```
system@server: ~ $ chmod +x prac.sh
system@server: ~ $ ./prac.sh
```

Enter the first number:

4

4 is Even

5 is Odd

Next 10 numbers from 4:

5

6

7

8

9

10

11

12

13

14

Next 10 numbers from 5:

6

7

8

9

10

11

12

13

14

15

system@server: ~ \$

Practical - 6

* Install & Configure FTP Server

sudo apt-get install vsftpd

```
system@system-virtual-machine: ~ $ sudo apt-get install vsftpd
[sudo] password for system:
```

ip a

```
system@system-virtual-machine: ~ $ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 brd 127.255.255.255 scope host lo
            valid_lft forever preferred_lft forever
            netmask ::1/128 scope host
                valid_lft forever preferred_lft forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:f7:49:c6 brd ff:ff:ff:ff:ff:ff
        altname enp2s1
        inet 192.168.28.128/24 brd 192.168.28.255 scope global dynamic noprefixroute ens3
            valid_lft 1404sec preferred_lft 1404sec
            inet6 fe80::fb9e:87cf%enp2s1:6d05/64 scope link noprefixroute
                valid_lft forever preferred_lft forever
```

sudo adduser demo_tycs_user1

```
system@system-virtual-machine: ~ $ sudo adduser demo_tycs_user1
Adding user 'demo_tycs_user1' ...
Adding new group 'demo_tycs_user1' (1001) ...
Adding new user 'demo_tycs_user1' (1001) with group 'demo_tycs_user1' ...
Creating home directory '/home/demo_tycs_user1' ...
Copying files from '/etc/skel' ...
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: password updated successfully
Changing the user information for demo_tycs_user1
Enter the new value, or press ENTER for the default
    Full Name []: Saurabh Chopade
    Room Number []: 16
    Work Phone []: 9324895419
    Home Phone []: 1234567890
    Other []:
Is the information correct? [Y/n] y
```

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Date _____

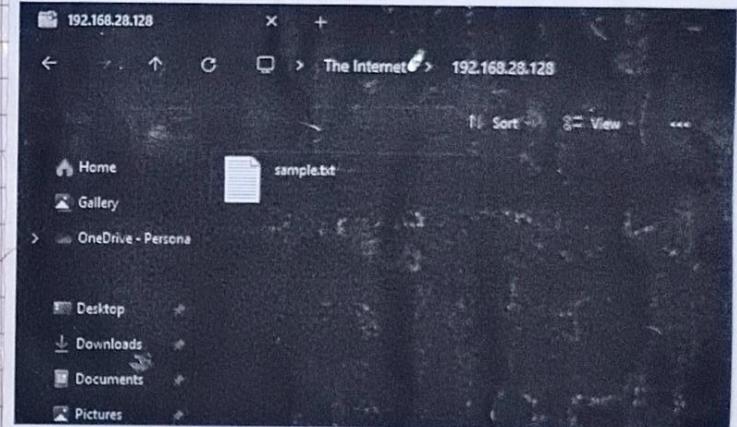
sudo adduser demo_tycs_user1

sudo -i -u demo_tycs_user1

```
system@system-virtual-machine: ~ $ sudo adduser demo_tycs_user1
adduser: The user 'demo_tycs_user1' already exists.
system@system-virtual-machine: ~ $ ^C
system@system-virtual-machine: ~ $ sudo -t -u demo_tycs_user1
[sudo] password for system:
demo_tycs_user1@system-virtual-machine: ~ $
```

cat > Sample.txt

```
demo_tycs_user1@system-virtual-machine: ~ $ cat > sample.txt
Its a demo file
^C
demo_tycs_user1@system-virtual-machine: ~ $
```



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Practical -7

Install & Configure NFS Server.

~~sudo apt-get install nfs-kernel-server~~

~~sudo nano /etc/exports~~

~~sudo systemctl start nfs-kernel-server
sudo systemctl enable nfs-kernel-server~~

~~sudo systemctl status nfs-kernel-server~~

```
system@system-virtual-machine: $ sudo apt-get install nfs-kernel-server
[sudo] password for system:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libevent-core-2.1-7 libnfsidmap1 nfs-common rpcbind
Suggested packages:
  libattr1

Processing triggers for man-db (2.7.0.2-1.1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.8) ...
system@system-virtual-machine: $ sudo nano /etc/exports
```

```
system@system-virtual-machine: $ sudo systemctl start nfs-kernel-server
system@system-virtual-machine: $ sudo systemctl enable nfs-kernel-server
Synchronizing state of nfs-kernel-server.service with /lib/systemd/system/
systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable nfs-kernel-server
system@system-virtual-machine: $ sudo systemctl status nfs-kernel-server
● nfs-server.service - NFS server and services
   Loaded: loaded (/lib/systemd/system/nfs-server.service; enabled; vendor preset: enabled)
   Drop-In: /run/systemd/generator/nfs-server.service.d
             └─order-with-mounts.conf
   Active: active (exited) since Sun 2025-02-23 22:52:09 EST; 14min ago
     Main PID: 5757 (code=exited, status=0/SUCCESS)
        CPU: 4ms

Feb 23 22:52:09 system-virtual-machine systemd[1]: Starting NFS server and services...
Feb 23 22:52:09 system-virtual-machine exportfs[5756]: exportfs: can't open /etc/exp
lines 1-11/11 (END)
```

~~sudo apt-get update
sudo apt-get install nfs-common
showmount -e 192.168.28.128
sudo mkdir /public
sudo mkdir /private
showmount -e 192.168.28.128~~

```
system@system-virtual-machine: $ sudo apt-get update
[sudo] password for system:
Hit:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:2 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
system@system-virtual-machine: $ sudo apt-get install nfs-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
nfs-common is already the newest version (1:2.6.1-1ubuntu1.2).
nfs-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 276 not upgraded.
system@system-virtual-machine: $ showmount -e 192.168.28.128
Export list for 192.168.28.128:
system@system-virtual-machine: $ sudo mkdir /public
system@system-virtual-machine: $ sudo/mkdir /private
system@system-virtual-machine: $ showmount -e 192.168.28.128
Export list for 192.168.28.128:
system@system-virtual-machine: $
```

~~sudo chmod 755 /public
sudo chmod 777 /public/private
sudo nano /etc/exports
sudo nano /etc/exports
sudo exportfs -aruf~~

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```
[root@rhel7-virtual-machine ~]# $ sudo apt-get install nfs-kernel-server
[sudo] password for system:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
nfs-kernel-server is already the newest version (1:2.6.1-1ubuntu1.2).
0 upgraded, 0 newly installed, 0 to remove and 276 not upgraded.
[sudo] password for system:
mkdir: cannot create directory '/public': File exists
[root@rhel7-virtual-machine ~]# $ sudo mkdir /private
mkdir: cannot create directory '/private': File exists
[root@rhel7-virtual-machine ~]# $ sudo chmod 755 /public
[root@rhel7-virtual-machine ~]# $ sudo chmod 777 /private
[root@rhel7-virtual-machine ~]# $ sudo nano /ect(exports
[root@rhel7-virtual-machine ~]# $ sudo nano /etc/exports
[root@rhel7-virtual-machine ~]# $ sudo exportfs -arvf
exporting 192.168.28.128:/private
exporting *:/public
[root@rhel7-virtual-machine ~]# $ sudo systemctl start nfs-kernel-server
[root@rhel7-virtual-machine ~]# $ sudo systemctl enable nfs-kernel-server
Synchronizing state of nfs-kernel-server.service with SysV service script with /lib/systemd/systemctl-sysv-install.
Executing: /lib/systemd/systemctl-sysv-install enable nfs-kernel-server
[root@rhel7-virtual-machine ~]# $ sudo systemctl status nfs-kernel-server
```

*sudo mount -t nfs 192.168.28.128
: /public /mnt/public*

*sudo mount -t nfs 192.168.28.128
/public /mnt/private*

mount

```
[root@rhel7-virtual-machine ~]# $ sudo mkdir /mnt/public
mkdir: cannot create directory '/mnt/public': File exists
[root@rhel7-virtual-machine ~]# $ sudo mkdir /mnt/private
mkdir: cannot create directory '/mnt/private': File exists
[root@rhel7-virtual-machine ~]# $ sudo mount -t nfs 192.168.28.128:/public /mnt/public
[root@rhel7-virtual-machine ~]# $ sudo mount -t nfs 192.168.28.128:/public /mnt/private
[root@rhel7-virtual-machine ~]# $ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=1941888k,nr_inodes=485472,no
de755,inode64)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxco
de=800)
tmpfs on /run type tmpfs (rw,nosuid,nodev,noexec,relatime,size=396144k,mode=755,
inode64)
/dev/sda3 on / type ext4 (rw,relatime,errors=remount-ro)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relat
ime)
```

Practical - 8

* Installation of MySQL in UBUNTU

- 1 MySQL installation -
sudo apt-get install mysql-server

1. MySQL in UBUNTU:

```
[root@rhel7-virtual-machine ~]# $ sudo apt-get install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'mysql-server-5.5' for glob 'mysql-server'
Note, selecting 'mysql-server-5.6' for glob 'mysql-server'
Note, selecting 'mysql-server-5.7' for glob 'mysql-server'
Note, selecting 'mysql-server-8.0' for glob 'mysql-server'
Note, selecting 'mysql-server-core-5.5' for glob 'mysql-server'
Note, selecting 'mysql-server-core-5.6' for glob 'mysql-server'
Note, selecting 'mysql-server-core-5.7' for glob 'mysql-server'
Note, selecting 'mysql-server-core-8.0' for glob 'mysql-server'
The following additional packages will be installed:
libatomic-atomic-fast-perl libcurl-pm-perl libevent-core-2.1-7
libevent-pthreads-2.1-7 libfcgi-bin libfcgi-perl libfcgiutil
```

- 2 Check if it is installed or not
sudo mysql

```
[root@rhel7-virtual-machine ~]# $ sudo mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 5
Server version: 8.0.43-Ubuntu0.22.04.1 (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.
```

- 3 Create database
create database test;

Create database

```
mysql> create database test;
Query OK, 1 row affected (0.00 sec)
```

- 4 Use DB & Create Table

Use database and create table.

```
mysql> use test
Database changed
mysql> create table student(student_name varchar(100), roll_number varchar(5));
Query OK, 0 rows affected (0.01 sec)

mysql> exit
Bye
```

Installation of PHPMyAdmin (for this practical it is mandatory to do SQL)

- 1) sudo apt-get install phpmyadmin

```
rahul@rahul-virtual-machine: $ sudo apt-get install phpmyadmin
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils dbconfig-common dbconfig-
1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libjs-bootstrap4
```

- 2) Restart the apache 2
sudo systemctl restart apache2

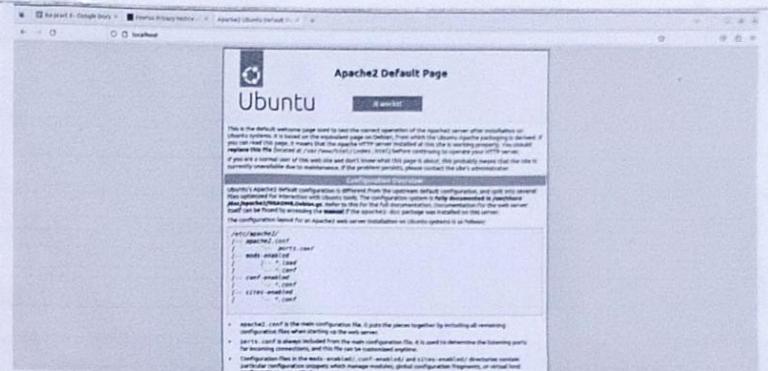
Restart the apache2

```
rahul@rahul-virtual-machine: $ sudo systemctl restart apache2
```

- 3) Check status of apache 2
sudo systemctl status apache2

```
Check status of apache2
rahul@rahul-virtual-machine: $ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
  Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
  Active: active (running) since Sun 2025-03-03 09:48:41 IST; 12s ago
    Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 18495 (apache2)
  Tasks: 55 (lrm: 4554)
    Memory: 5.3M
       CPU: 16ms
      CGroup: /system.slice/apache2.service
           └─18495 /usr/sbin/apache2 -k start
              ├─18495 /usr/sbin/apache2 -k start
              ├─18497 /usr/sbin/apache2 -k start
              ├─18497 /usr/sbin/apache2 -k start

Mar 03 09:48:41 rahul-virtual-machine systemd[1]: Starting The Apache HTTP Server...
Mar 03 09:48:41 rahul-virtual-machine apache2[18494]: AH00558: apache2: Could not reliably determine the server's fully qualified name, using 127.0.0.1 for port 80
Mar 03 09:48:41 rahul-virtual-machine systemd[1]: Started The Apache HTTP Server.
Lines 1-17/17 (END)
```



- 4) go to browser, type localhost in URL