20MCA136 - NETWORKING & SYSTEM ADMINISTRATION LAB

RECORD

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ROLL NO :05

BASIC LINUX COMMANDS

1. pwd — When you first open the terminal, you are in the home directory of your user. To know which directory you are in, you can use the **"pwd"** command. It gives us the absolute path, which means the path that starts from the root. The root is the base of the Linux file system. It is denoted by a forward slash(/). The user directory is usually something like "/home/username".

2. ls — Use the **"ls"** command to know what files are in the directory you are in. You can see all the hidden files by using the command **"ls -a"**.

3. cd — Use the **"cd"** command to go to a directory.

4. mkdir & rmdir — Use the **mkdir** command when you need to create a folder or a directory.Use **rmdir** to delete a directory. But **rmdir** can only be used to delete an empty directory. To delete a directory containing files, use **rm**.

5. rm - Use the **rm** command to delete files and directories

6. touch — The **touch** command is used to create a file. It can be anything, from an empty txt file to an empty zip file

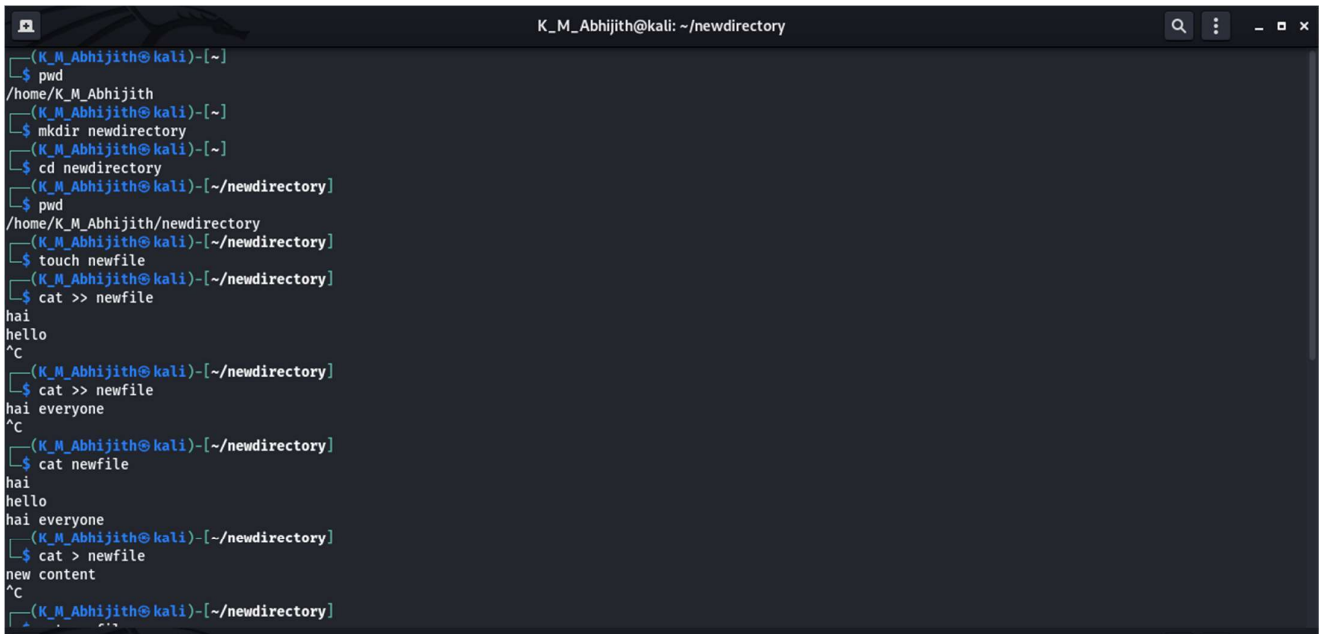
7.Use the **cat** command to display the contents of a file. It is usually used to easily view programs.

Cat >> filename : append new content to existing content in a file.

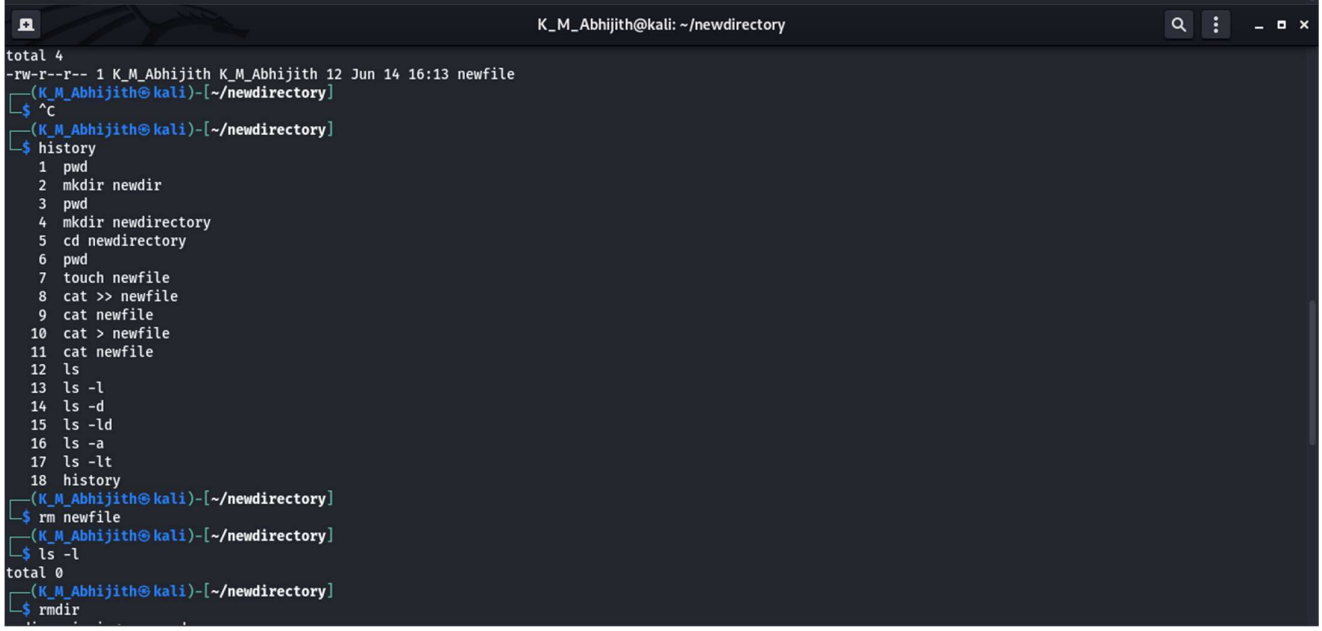
Cat>filename: overwrite existing content in a file

8. man— To know more about a command and how to use it, use the **man** command. It shows the manual pages of the command. For example, "**man cd**" shows the manual pages of the **cd** command.

9. history: this command is used to get command history


K_M_Abhijith@kali: ~/newdirectory
┌──(K_M_Abhijith㉿kali)-[~]
└─$ pwd
/home/K_M_Abhijith
┌──(K_M_Abhijith㉿kali)-[~]
└─$ mkdir newdirectory
┌──(K_M_Abhijith㉿kali)-[~]
└─$ cd newdirectory
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ pwd
/home/K_M_Abhijith/newdirectory
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ touch newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat >> newfile
hai
hello
^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat >> newfile
hai everyone
^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat newfile
hai
hello
hai everyone
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat > newfile
new content
^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]


K_M_Abhijith@kali: ~/newdirectory
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat > newfile
new content
^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ cat newfile
new content
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls
newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -l
total 4
-rw-r--r-- 1 K_M_Abhijith K_M_Abhijith 12 Jun 14 16:13 newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -d
.
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -ld
drwxr-xr-x 2 K_M_Abhijith K_M_Abhijith 4096 Jun 14 16:09 .
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -a
. .. newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -lt
total 4
-rw-r--r-- 1 K_M_Abhijith K_M_Abhijith 12 Jun 14 16:13 newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$


K_M_Abhijith@kali: ~/newdirectory
total 4
-rw-r--r-- 1 K_M_Abhijith K_M_Abhijith 12 Jun 14 16:13 newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ^C
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ history
1 pwd
2 mkdir newdir
3 pwd
4 mkdir newdirectory
5 cd newdirectory
6 pwd
7 touch newfile
8 cat >> newfile
9 cat newfile
10 cat > newfile
11 cat newfile
12 ls
13 ls -l
14 ls -d
15 ls -ld
16 ls -a
17 ls -lt
18 history
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ rm newfile
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ ls -l
total 0
┌──(K_M_Abhijith㉿kali)-[~/newdirectory]
└─$ rmdir

1) echo

- to move some data into a file
- to add a text

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ echo "enter your name";read name;echo "i am $name"
enter your name
abhijith
i am abhijith
```

2) head

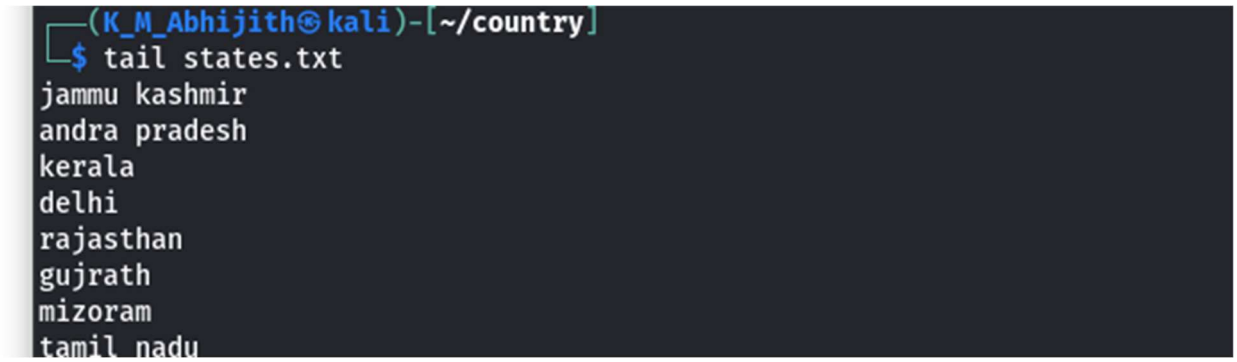
- used to view the first lines of any text file
- default it shows 10 lines

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ touch states.txt
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ cat >> states.txt
jammu kashmir
andra pradesh
kerala
delhi
rajasthan
gujrath
mizoram
tamil nadu
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ head states.txt
jammu kashmir
andra pradesh
kerala
delhi
rajasthan
gujrath
mizoram
```

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ head -n 5 states.txt
jammu kashmir
andra pradesh
kerala
delhi
rajasthan
```

3) tail

- will display the last ten lines of a text files

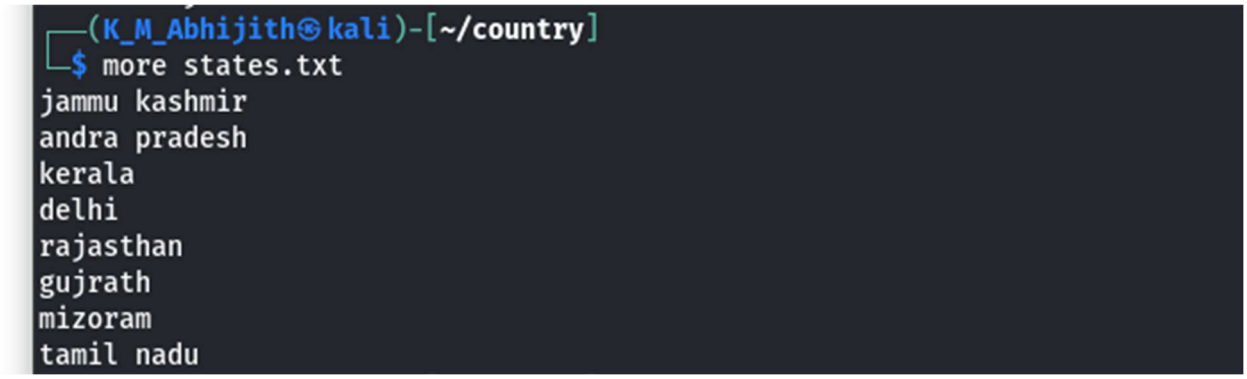


4) read

- read the contents of a line into a variable

5) more

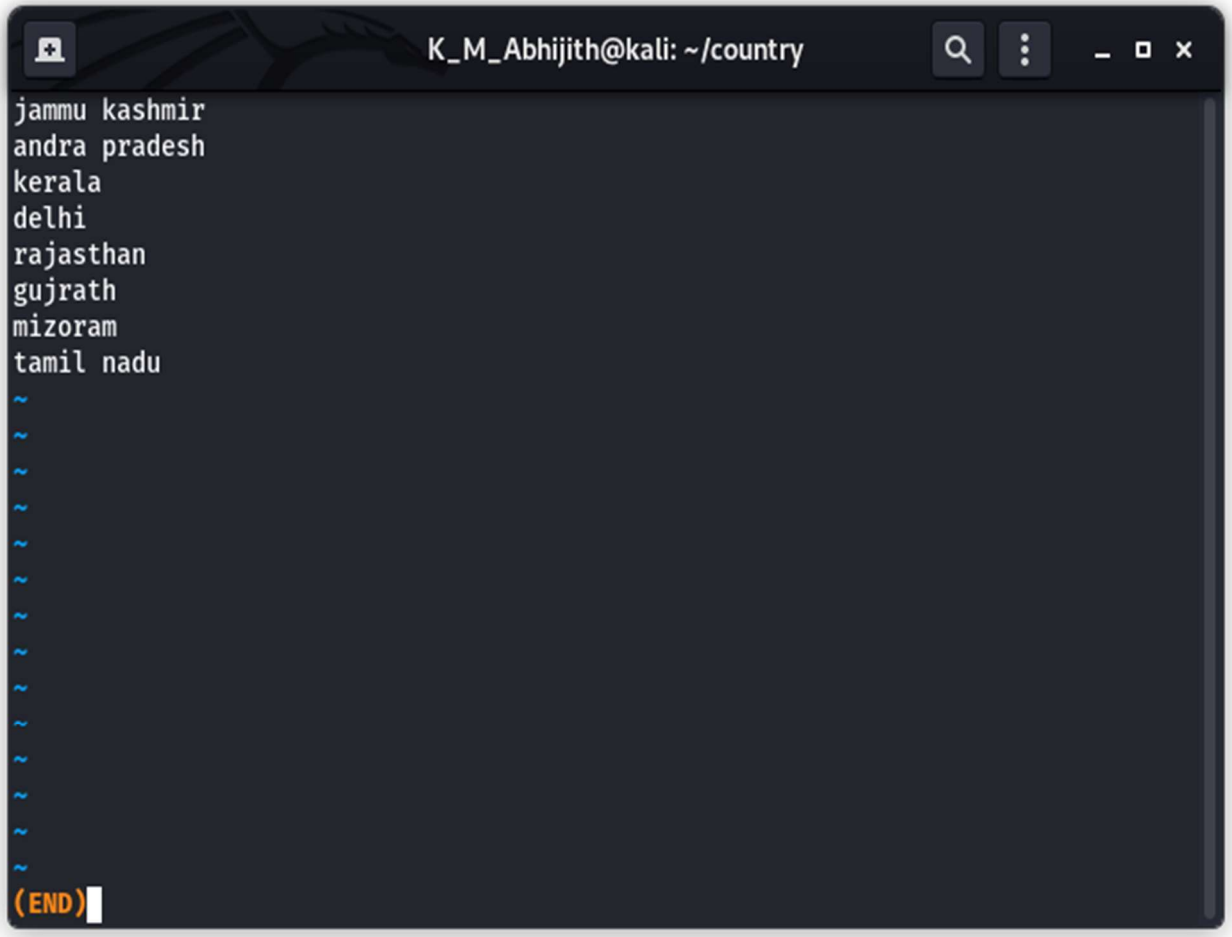
- displays content of the file.Only difference is that in case of larger files cat command output will scroll off your screen while more command displays output one screenful at a time.
- Enter key : to scroll down page line by line
- Space bar : to go to next page
- b key : to go to the backward page
- /key : to search string



6) less

- Automatically adjust with the width and height of terminal window

```
tamil nadu
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ less states.txt
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ touch file.txt
```



7) cut

- used for cutting out the section from each lines of files and writing the standard output.
- It can be used to cut parts of a line by byte position character and field

```
┌──(K_M_Abhijith㉿kali)-[~]
└─$ cd country
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ cat > name.txt
abhijith
sam
joice
nimisha
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ cut -b 1,2,3 name.txt
abh
sam
joi
nim
```

8) paste

- used to join files horizontaly by outputting lines consisting of lines from each file specified,separated by tab as delimiter,to the standard output.

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ paste states.txt region.txt
jammu kashmir   north
andra pradesh   south
kerala  south
delhi   north
rajasthan       north
gujrath north
mizoram north
tamil nadu      south
```

9) uname

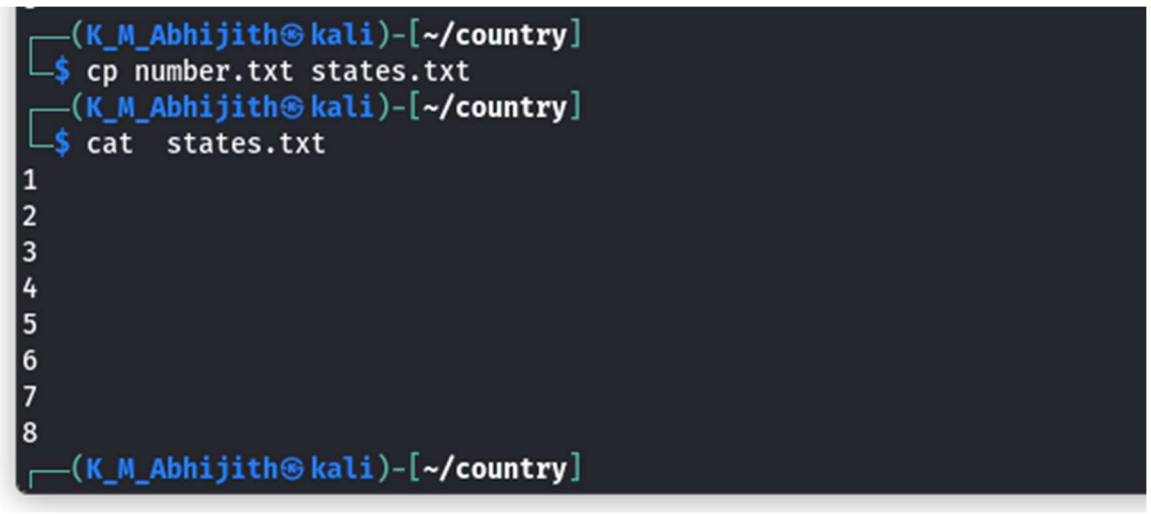
- will print detailed information about your linux system like machine name,operating system,kernel etc..

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -a
Linux kali 5.10.0-kali3-amd64 #1 SMP Debian 5.10.13-1kali1 (2021-02-08) x86_64 G
NU/Linux
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -s
Linux
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -n
kali
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -v
```

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -v
#1 SMP Debian 5.10.13-1kali1 (2021-02-08)
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -r
5.10.0-kali3-amd64
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -p
unknown
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -m
x86_64
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -i
unknown
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ uname -o
GNU/Linux
```

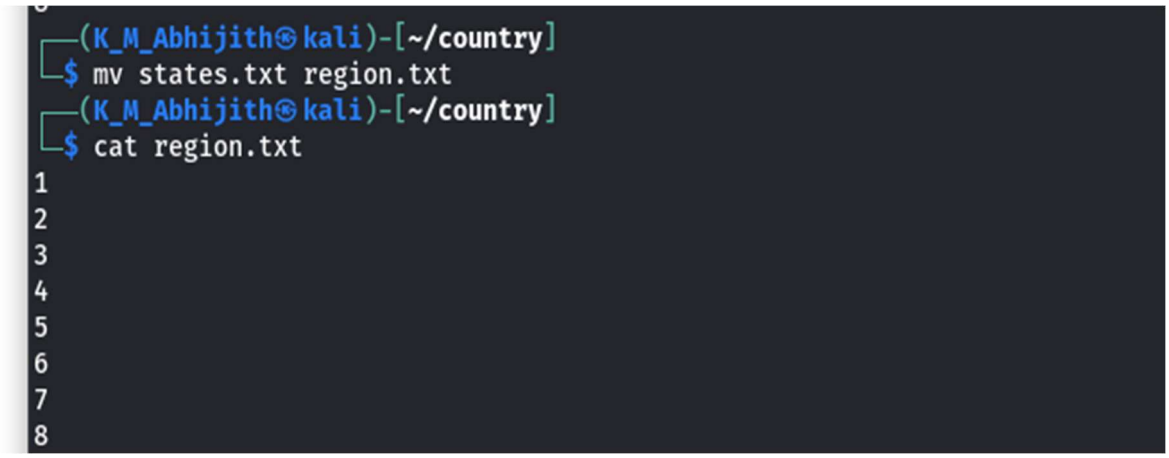
10) cp

- used to copy files from the current directory to a different directory
- cp -i (will ask for user's consent in case of a potential file overwrite.)
- cp -p (will preserve source file mode, ownership and time stamp)
- cp -r (will copy directories recursively)
- cp -u (copies files only if the destination file is not existing or the source file is newer than the destination file)



11) mv

- to move files
- rename files



12)locate

- to find a file
- locate -i filename (make it case insensitive you can search file if you don't remember its exact name)
- * (to search for a file that contains two or more words)

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ locate ".txt"
/boot/grub/themes/kali/theme.txt
/etc/X11/rgb.txt
/etc/java-11-openjdk/security/policy/README.txt
```

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ locate -c  ".txt"
31312
┌──(K_M_Abhijith㉿kali)-[~/country]
```

13)find

- To search for files or directories
- Find. -name filename (to find files in the current directory)

```
31312
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ find . -name number.txt
./number.txt
┌──(K_M_Abhijith㉿kali)-[~/country]
```

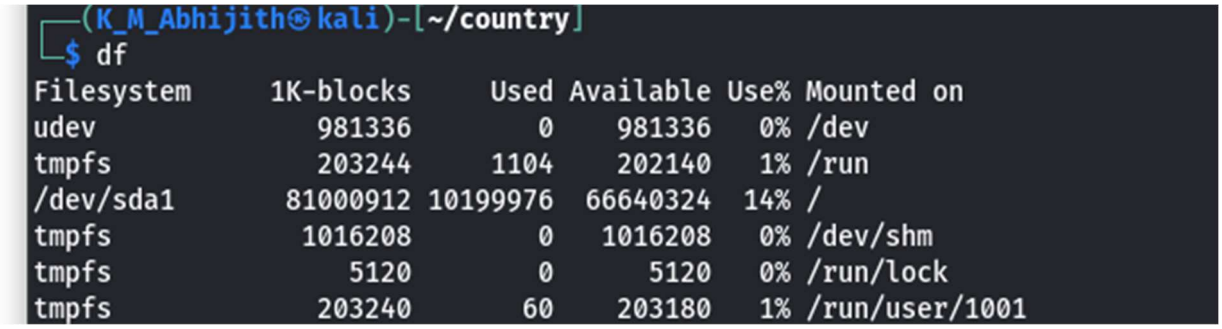
14)grep

- Search through all the text in a given file

```
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ grep -i "1" states.txt
grep: states.txt: No such file or directory
┌──(K_M_Abhijith㉿kali)-[~/country]
└─$ grep -i "1" region.txt
1
```

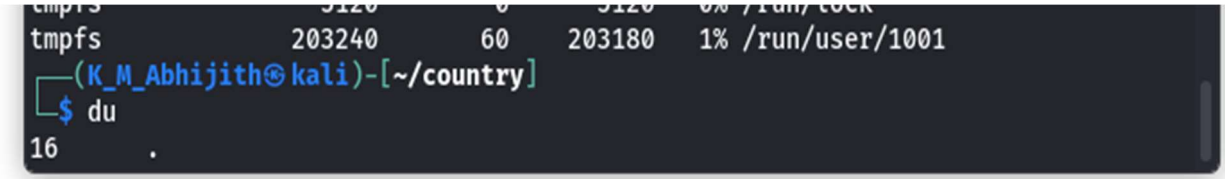
15) df

- To get report on the system's disk space usage shows in percentage and kbs.



16) du

- to check how many space a file or directory takes.



17) useradd

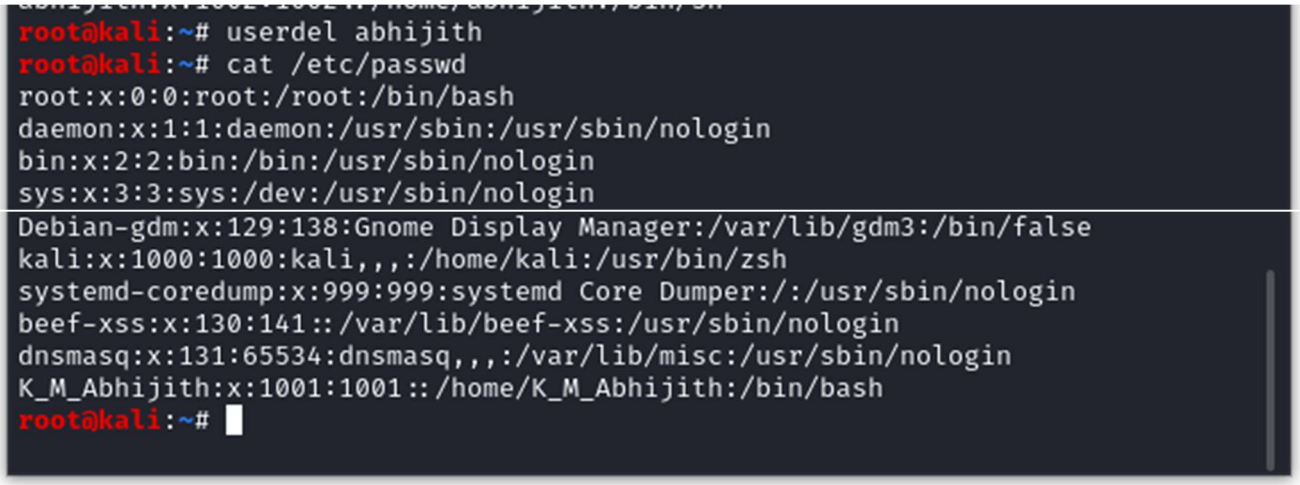
- available only for system admins.
- To create new user

```
root@kali:~# useradd abhijith
root@kali:~# cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nol
ogin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
_apt:x:100:65534::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:101:101:systemd Time Synchronization,,,:/run/systemd:/usr/
sbin/nologin
systemd-network:x:102:103:systemd Network Management,,,:/run/systemd:/usr/sbi
n/nologin
systemd-resolve:x:103:104:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
```

```
kali:x:1000:1000:kali,,,:/home/kali:/usr/bin/zsh
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
beef-xss:x:130:141::/var/lib/beef-xss:/usr/sbin/nologin
dnsmasq:x:131:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
K_M_Abhijith:x:1001:1001::/home/K_M_Abhijith:/bin/bash
abhijith:x:1002:1002::/home/abhijith:/bin/sh
```

18) userdel

- remove user or delete user account



19) sudo

- SuperUserDo ,enables you to perform tasks that require administrativeq or root permissions.

```
root@kali:~# sudo -V
Sudo version 1.9.5p2
Configure options: --build=x86_64-linux-gnu --prefix=/usr --includedir=${pref
ix}/include --mandir=${prefix}/share/man --infodir=${prefix}/share/info --sys
confdir=/etc --localstatedir=/var --disable-option-checking --disable-silent-
rules --libdir=${prefix}/lib/x86_64-linux-gnu --libexecdir=${prefix}/lib/x86_
64-linux-gnu --disable-maintainer-mode --disable-dependency-tracking -v --wit
h-all-insults --with-pam --with-fqdn --with-logging=syslog --with-logfac=auth
priv --with-env-editor --with-editor=/usr/bin/editor --with-exampledir=/usr/s
hare/doc/sudo/examples --with-timeout=15 --with-password-timeout=0 --with-pas
sprompt=[sudo] password for %p:  --disable-root-mailer --with-sendmail=/usr/s
bin/sendmail --with-rundir=/run/sudo --libexecdir=/usr/lib --with-sssd --with
-sssd-lib=/usr/lib/x86_64-linux-gnu --enable-zlib=system --with-selinux --wit
h-linux-audit --enable-tmpfiles.d=yes MVPROG=/bin/mv
Sudoers policy plugin version 1.9.5p2
Sudoers file grammar version 48

Sudoers path: /etc/sudoers
Authentication methods: 'pam'
Syslog facility if syslog is being used for logging: authpriv
Syslog priority to use when user authenticates successfully: notice
Syslog priority to use when user authenticates unsuccessfully: alert
Send mail if user authentication fails
Send mail if the user is not in sudoers
Lecture user the first time they run sudo
```

```
root@kali:~# sudo -l
Matching Defaults entries for root on kali:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin
/bin

User root may run the following commands on kali:
    (ALL : ALL) ALL
root@kali:~# sudo -k
```

20) passwd

- to change passwords for user account.

```
root@kali:~# passwd
New password:
Retype new password:
passwd: password updated successfully
root@kali:~#
```

- **groupadd :**

- **groupadd** command creates a new group account using the values specified on the command line and the default values from the system.
- #gropuadd student

```
user1:x:1007:1007::/home/user1:/bin/sh
root@kali:~# groupadd usrgrp
root@kali:~# groups
root
root@kali:~# cat /etc/groups
cat: /etc/groups: No such file or directory
root@kali:~# cat /etc/group
```

```
kaboxer:x:140:kali
systemd-coredump:x
beef-xss:x:141:
K_M_Abhijith:x:100
user2:x:1003:
usr1:x:1005:user3
user3:x:1006:
user1:x:1007:
usrgrp:x:1008:
```

- **groupdel:**

groupdel command is used to delete a existing group. It will delete all entry that refers to the group, modifies the system account files, and it is handled by superuser or root user.

```
root@kali:~# groupdel newusergrp
root@kali:~# cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:
tty:x:5:
disk:x:6:
```

- **usermod:**

usermod command is used to change the properties of a user in Linux through the commandline

- command-line utility that allows you to modify a user's login information
- #usermod --help
- #usermod –u 2000 Tom

```
root@kali:~# usermod -c "hello" K_M_Abhijith
root@kali:~# cat /etc/passwd
K_M_Abhijith:x:1001:1001:hello:/home/K_M_Abhijith:/bin/bash
```

- **groups:**
- print the groups a user is in
- #groups alice

```
root@kali:~# groups
root
```

- **groupmod:**
- The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.
- # groupmod -n group1 group2

```
root@kali:~# groupmod -n newusergrp usrgrp
root@kali:~# cat /etc/group
root:x:0:
daemon:x:1:
user3:x:1006:
user1:x:1007:
user:x:1009:
newusergrp:x:1008:user
```

- **chmod:**
- To change directory permissions of file/ Directory in Linux.

  #chmod whowhatwhich file/directory
- **chmod +rwx filename** // To add permissions.
- **chmod -rwx directoryname** // To remove permissions.
- **chmod +x filename** //To allow executable permissions.
- **chmod -wx filename** // to take out write and executable permissions.

  #chmod u+x test

  #chmod g-rwx test

  #chmod o-r test

```
-rw-r--r-- 1 root root    10 Aug 12 13:01 myfile2.txt
root@kali:~# chmod g+rw myfile2.txt
-rw-rw-r-- 1 root root    10 Aug 12 13:01 myfile2.txt
```

- **ps:**

- The ps command, **short for Process Status**, is a command line utility that is used to display or view information related to the processes running in a Linux system.
- PID – This is the unique process ID
- TTY – This is the type of terminal that the user is logged in to
- TIME – This is the time in minutes and seconds that the process has been running
- CMD – The command that launched the process #ps -a

```
root@kali:~# ps
    PID TTY          TIME CMD
   3714 pts/0    00:00:00 bash
   3716 pts/0    00:00:00 ps
root@kali:~# id
uid=0(root) gid=0(root) groups=0(root)
root@kali:~#
```

- **chown:**

The chown command allows you to change the user and/or group ownership of a given file, directory.

- #chown Tom Test

```
-rwxrwxr-- 1 root root    59 Aug 12 12:55 myfile.txt
root@kali:~# chown K_M_Abhijith myfile.txt
-rwxrwxr-- 1 K_M_Abhijith root    59 Aug 12 12:55 myfile.txt
```

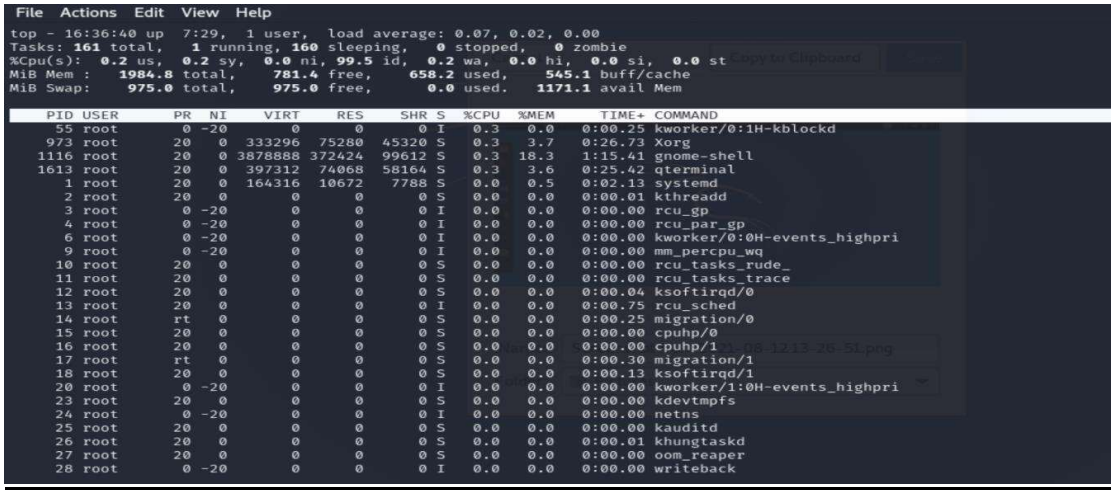
- **id:**

id command in Linux is **used to find out user and group names** and numeric ID's (UID or group ID) of the current user or any other user in the server. List out all the groups a user belongs to. Display security context of the current user

```
root@kali:~# id
uid=0(root) gid=0(root) groups=0(root)
root@kali:~#
```

- **top:**

  top command is used to show the Linux processes. It provides a dynamic real-time view of the running system. Usually, this command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.



```
File  Actions  Edit  View  Help
top - 16:36:40 up  7:29,  1 user,  load average: 0.07, 0.02, 0.00
Tasks: 161 total,   1 running, 160 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.2 us,  0.2 sy,  0.0 ni, 99.5 id,  0.2 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   1984.8 total,    781.4 free,    658.2 used,    545.1 buff/cache
MiB Swap:    975.0 total,    975.0 free,      0.0 used.   1171.1 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
     55 root       0 -20       0      0      0 I   0.3   0.0   0:00.25 kworker/0:1H-kblockd
    973 root      20   0  333296  75280  45320 S   0.3   3.7   0:26.73 Xorg
   1116 root      20   0 3878888 372424  99612 S   0.3  18.3   1:15.41 gnome-shell
   1613 root      20   0  397312  74068  58164 S   0.3   3.6   0:25.42 qterminal
      1 root      20   0  164316  10672   7788 S   0.0   0.5   0:02.13 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.01 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
     11 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_trace
     12 root      20   0       0      0      0 S   0.0   0.0   0:00.04 ksoftirqd/0
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.75 rcu_sched
     14 root      rt   0       0      0      0 S   0.0   0.0   0:00.25 migration/0
     15 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
     16 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
     17 root      rt   0       0      0      0 S   0.0   0.0   0:00.30 migration/1
     18 root      20   0       0      0      0 S   0.0   0.0   0:00.13 ksoftirqd/1
     20 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-events_highpri
     23 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kdevtmpfs
     24 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
     25 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kauditd
     26 root      20   0       0      0      0 S   0.0   0.0   0:00.01 khungtaskd
     27 root      20   0       0      0      0 S   0.0   0.0   0:00.00 oom_reaper
     28 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 writeback
```

wc:

wc stands for word count.

- Used for counting purpose.
- It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.
- #wc state.txt 6 8 54 state.txt
- #wc state.txt capital.txt
- wc -l state.txt
- wc -w state.txt capital.txt
- wc -c state.txt
- wc -m state.txt

```
root@kali:~# cat > myfile.txt
helloeveryone
hope u all are fine
hai hello,helllo hi
hehe
root@kali:~# cat > myfile2.txt
hai hello
root@kali:~# wc myfile.txt
 4 10 59 myfile.txt
root@kali:~# wc myfile2.txt
 1  2 10 myfile2.txt
root@kali:~# wc -l myfile.txt
4 myfile.txt
root@kali:~# wc -w myfile.txt myfile2.txt
10 myfile.txt
 2 myfile2.txt
12 total
root@kali:~# wc -c myfile.txt
59 myfile.txt
root@kali:~# wc -m myfile.txt
59 myfile.txt
```

Tar:

• The Linux 'tar'stands for tape archive, is used to create Archive and extract the Archive files • Linux tar command to create compressed or uncompressed Archive files • Options:

- -c : Creates Archive
- -x : Extract the archive
- -f : creates archive with given filename
- -t: displays or lists files in archived file
- -u: archives and adds to an existing archive file
- -v: Displays Verbose Information
- -A : Concatenates the archive files
- -z : zip, tells tar command that creates tar file using gzip

- -j : filter archive tar file using tbzip
- -W : Verify a archive file
- -r : update or add file or directory in already existed .tar file

#tar cf archive.tar state.txt capital.txt //create archive file

#ls archive.tar

#tar tf /archive.tar // list contents of tar archive file

- Extract an archive created with tar

#mkdir backup

#cd backup

#tar xf/home/meera/Documents/Meera_Linux/archive.tar

➢ **Compression Types**

gzip(z),bzip2(j), xz(J) #tar czf /abc.tar.gz /etc

#tar cjf /abcd.tar.bz2 /etc

#tar cJf /abcde.tar.xz /etc

➢ **Extract an archive**

#mkdir backup1

#cd backup1

#tar xzf /abc.tar.gz

#mkdir backup2

#cd backup2

#tar xjf /abcd.tar.bz2

#mkdir backup3

#cd backup3

#tar xJf /abcde.tar.xz

- **Bzip2**

```
root@kali:~# ls
Desktop                          f3.txt.gz    myfile2.txt.xz
Documents                        f3.txt.xz    myfile.txt.gz
Downloads                        file1.gz     new.tar
embedded-browser-no-sandbox.json file2.gz     Pictures
f1.txt                           file3.gz     Public
f2.txt.gz                        Music        Templates
f3.txt                           myfile2.txt  Videos
root@kali:~# bzip2 f1.txt
root@kali:~# bzip2 -cc f3.txt > f3.txt.bz
root@kali:~# ls
Desktop                          f3.txt.gz      myfile.txt.gz
Documents                        f3.txt.xz      new.tar
Downloads                        file1.gz       Pictures
embedded-browser-no-sandbox.json file2.gz       Public
f1.txt.bz2                       file3.gz       Templates
f2.txt.gz                        Music          Videos
f3.txt                           myfile2.txt
f3.txt.bz                        myfile2.txt.xz
```

```
Desktop    embedded-browser-no-sandbox.json  f3.txt     f3.txt.xz  file1.gz  Music          myfile.txt.gz  Public
Documents  f1.txt                            f3.txt.bz  ff1.bz2    file2.gz  myfile2.txt    new.tar        Templates
Downloads  f2.txt.gz                         f3.txt.gz  ff2.bz2    file3.gz  myfile2.txt.xz Pictures       Videos
root@kali:~# bzip2 -d ff1.bz2
root@kali:~# bunzip2 -c ff2.txt.bz2 > ff2.txt
bunzip2: Can't open input file ff2.txt.bz2: No such file or directory.
root@kali:~# bunzip2 -c ff2.bz2 > ff2
root@kali:~# ls
Desktop    embedded-browser-no-sandbox.json  f3.txt     f3.txt.xz  ff2.bz2   file2.gz  myfile2.txt    new.tar   Templates
Documents  f1.txt                            f3.txt.bz  ff1        ff2.txt   file3.gz  myfile2.txt.xz Pictures  Videos
Downloads  f2.txt.gz                         f3.txt.gz  ff2        file1.gz  Music     myfile.txt.gz  Public
root@kali:~#
```

gzip

```
root@kali:~# apt-get install gzip
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
gzip is already the newest version (1.10-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@kali:~# ls
Desktop                            f2.txt          new.tar
Documents                          f3.txt          Pictures
Downloads                          Music           Public
embedded-browser-no-sandbox.json   myfile2.txt     Templates
f1.txt.gz                          myfile.txt.gz   Videos
root@kali:~# gzip f2.txt
root@kali:~# ls
Desktop                            f2.txt.gz       new.tar
Documents                          f3.txt          Pictures
Downloads                          Music           Public
embedded-browser-no-sandbox.json   myfile2.txt     Templates
f1.txt.gz                          myfile.txt.gz   Videos
root@kali:~# touch file1 file2 file3
root@kali:~# gzip file1.txt file2.txt file3.txt
gzip: file1.txt: No such file or directory
gzip: file2.txt: No such file or directory
gzip: file3.txt: No such file or directory
root@kali:~# gzip file1 file2 file3
root@kali:~# ls
Desktop                            f3.txt          myfile.txt.gz
Documents                          file1.gz        new.tar
Downloads                          file2.gz        Pictures
embedded-browser-no-sandbox.json   file3.gz        Public
f1.txt.gz                          Music           Templates
```

```
root@kali:~# gzip -c f3.txt > f3.txt.gz
root@kali:~# ls
Desktop                            f3.txt.gz       new.tar
Documents                          file1.gz        Pictures
Downloads                          file2.gz        Public
embedded-browser-no-sandbox.json   file3.gz        Templates
f1.txt.gz                          Music           Videos
f2.txt.gz                          myfile2.txt
f3.txt                             myfile.txt.gz
root@kali:~# gzip -d f1.txt.gz
root@kali:~# ls
Desktop                            f3.txt.gz       new.tar
Documents                          file1.gz        Pictures
Downloads                          file2.gz        Public
embedded-browser-no-sandbox.json   file3.gz        Templates
f1.txt                             Music           Videos
f2.txt.gz                          myfile2.txt
f3.txt                             myfile.txt.gz
root@kali:~# gzip -c f2.txt > f2.txt.gz
gzip: f2.txt: No such file or directory
root@kali:~# gzip -c f2.txt.gz  > f2.txt.gz
root@kali:~# ls
Desktop                            f3.txt.gz       new.tar
Documents                          file1.gz        Pictures
Downloads                          file2.gz        Public
embedded-browser-no-sandbox.json   file3.gz        Templates
f1.txt                             Music           Videos
f2.txt.gz                          myfile2.txt
f3.txt                             myfile.txt.gz
root@kali:~#
```

xz

```
root@kali:~# apt-get install xz-utils
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
xz-utils is already the newest version (5.2.5-1.0).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@kali:~# ls
Desktop                            f3.txt.gz       new.tar
Documents                          file1.gz        Pictures
Downloads                          file2.gz        Public
embedded-browser-no-sandbox.json   file3.gz        Templates
f1.txt                             Music           Videos
f2.txt.gz                          myfile2.txt
f3.txt                             myfile.txt.gz
root@kali:~# xz f1.txt
root@kali:~# xz -k f3.txt
root@kali:~# xz -c myfile2.txt > myfile2.txt.xz
root@kali:~# ls
Desktop                            f3.txt.gz       myfile2.txt.xz
Documents                          f3.txt.xz       myfile.txt.gz
Downloads                          file1.gz        new.tar
embedded-browser-no-sandbox.json   file2.gz        Pictures
f1.txt.xz                          file3.gz        Public
f2.txt.gz                          Music           Templates
f3.txt                             myfile2.txt     Videos
```

```
root@kali:~# xz -d f1.txt.xz
root@kali:~# unxz -k f2.txt.xz
unxz: f2.txt.xz: No such file or directory
root@kali:~#
root@kali:~# unxz -k f3.txt.xz
unxz: f3.txt: File exists
root@kali:~# ls
Desktop                          f3.txt.gz    myfile2.txt.xz
Documents                        f3.txt.xz    myfile.txt.gz
Downloads                        file1.gz     new.tar
embedded-browser-no-sandbox.json file2.gz     Pictures
f1.txt                           file3.gz     Public
f2.txt.gz                        Music        Templates
f3.txt                           myfile2.txt  Videos
root@kali:~#
```

- **expr**
  - The expr command evaluates a given expression and displays its corresponding output. It is used for:
  - Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
  - Evaluating regular expressions, string operations like substring, length of strings etc.
  - Performing operations on variables inside a shell script

  #expr 10 + 2

```
root@kali:~# expr 12 + 10
22
root@kali:~# expr 12 \* 10
120
root@kali:~# expr 12 - 10
2
```

- **Redirections & Piping :**
  - A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.
  - Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

  #ls -l | wc - l

  #cat /etc.passwd.txt | head -7 | tail -5

```
root@kali:~# cat /etc myfile.txt|head -5 | tail -3
cat: /etc: Is a directory
hope u all are fine
hai hello,helllo hi
hehe
root@kali:~#
```

- **ssh**
  - *ssh*stands for **"Secure Shell"**.
  - It is a protocol used to securely connect to a remote server/system.
  - ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.

- It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

#ssh user_name@host(IP/Domain_name)

#ssh –X root@server1.example.com

```
root@kali:~# ssh --help
unknown option -- -
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-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]
```

scp

- SCP (secure copy) is a command-line utility that allows you to securely
- copy files and directories between two locations.
- With scp, you can copy a file or directory:
- From your local system to a remote system.
- From a remote system to your local system.
- Between two remote systems from your local system.
- Remote file system locations are specified in format
- [user@]host:/path Syntax:

scp [OPTION] [user@]SRC_HOST:]file1 [user@]DEST_HOST:]file2

$scp/etc/yum.config/etc/hosts ServerX:/home/student

$scp ServerX:/etc/hostname /home/student

```
root@kali:~# ssh root@kali
ssh: connect to host kali port 22: Connection refused
```

ssh-keygen

ssh-keygen command to generate a public/private authentication key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.

$ssh-keygen -t rsa

```
root@kali:~# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa): rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in rsa
Your public key has been saved in rsa.pub
The key fingerprint is:
SHA256:Si7sd5154YckqJXUKTTLk0d4y66S9FBkcQilN3epryM root@kali
The key's randomart image is:
+---[RSA 3072]----+
|        .oo+.    |
|         .B.o   .|
|        •=oO.oo  |
|         .Oo*o   |
|        .oSB.    |
|     . oo.+ o.o  |
|      o.o* o *.o |
|     . •= E =.+ .|
|      .. o  ..o .|
+----[SHA256]-----+
```

- **ssh-copy-id**
  - The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.
  - This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.
  - $ssh-copy-id username@remote_host

Managing Files, Creating Users and Groups Using Command-line tools

1. a. Create six files with name of the form songX.mp3
b. Create six files with name of the form snapX.mp3
c. Create six files with name of the form filmX.mp3 (In each set, replace X with the numbers 1 through 6)

```
kmabhijith@kmabhijith-VirtualBox:~$ touch song1.mp3 song2.mp3 song3.mp3 song4.m
p3 song5.mp3 song6.mp3
kmabhijith@kmabhijith-VirtualBox:~$ touch snap1.mp3 snap2.mp3 snap3.mp3 snap4.m
p3 snap5.mp3 snap6.mp3
kmabhijith@kmabhijith-VirtualBox:~$ touch film1.mp3 film2.mp3 film3.mp3 film4.m
p3 film5.mp3 film6.mp3
```

2.From your home directory, move the song files into your music subdirectory, the snapshot files into your pictures subdirectory, and the movie files into videos subdirectory.

```
root@kmabhijith-VirtualBox:/home# mv snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 sn
ap5.mp3 snap6.mp3 kmabhijith/Pictures
root@kmabhijith-VirtualBox:/home# mv song1.mp3 song2.mp3 song3.mp3 song4.mp3 so
ng5.mp3 song6.mp3 kmabhijith/Music
```

3. In your home directory, create three subdirectories for organizing your files. Call these directories friends, family, and work. Create all three with one command

```
root@kmabhijith-VirtualBox:/home# mkdir {friends,family,works}
```

4. Copy song files to the friends folder and snap files to family folder

```
root@kmabhijith-VirtualBox:/home# cp Music/ song1.mp3 song2.mp3 song3.mp3 song4
.mp3 song5.mp3 song6.mp3 /friends
root@kmabhijith-VirtualBox:/home/friends# cp Pictures/ snap1.mp3 snap2.mp3 snap
3.mp3 snap4.mp3 snap5.mp3 snap6.mp3 /family
```

5. Attempt to delete both family and friends projects with a single rmdir command.

```
root@kmabhijith-VirtualBox:/home# rmdir family friends
```

6.Use another command that will succeed in deleting both the family and friends folder.

```
root@kmabhijith-VirtualBox:/home# rm -r family friends
```

7. Redirect a long listing of all home directory files, including hidden, into a file named allfiles.txt. Confirm that the file contains the listing.

```
root@kmabhijith-VirtualBox:/home# ls -a| >allfiles.txt
root@kmabhijith-VirtualBox:/home# ls
allfiles.txt  film2.mp3  film4.mp3  film6.mp3   work
film1.mp3     film3.mp3  film5.mp3  kmabhijith
root@kmabhijith-VirtualBox:/home# ls -al
total 16
drwxr-xr-x  4 root       root       4096 Aug 17 21:46 .
drwxr-xr-x 20 root       root       4096 Aug 16 22:21 ..
-rw-r--r--  1 root       root          0 Aug 17 21:46 allfiles.txt
-rw-r--r--  1 root       root          0 Aug 17 20:39 film1.mp3
-rw-r--r--  1 root       root          0 Aug 17 20:39 film2.mp3
-rw-r--r--  1 root       root          0 Aug 17 20:39 film3.mp3
-rw-r--r--  1 root       root          0 Aug 17 20:39 film4.mp3
-rw-r--r--  1 root       root          0 Aug 17 20:39 film5.mp3
-rw-r--r--  1 root       root          0 Aug 17 20:39 film6.mp3
drwxr-xr-x 16 kmabhijith kmabhijith 4096 Aug 17 20:32 kmabhijith
drwxr-xr-x  2 root       root       4096 Aug 17 20:40 work
```

8. In the command window, display today's date with day of the week, month, date and year

```
root@kmabhijith-VirtualBox:/home# date
Tuesday 17 August 2021 09:47:06 PM IST
```

9. Add the user Juliet

```
root@kmabhijith-VirtualBox:/home# useradd juliet
```

10. Confirm that Juliet has been added by examining the /etc/passwd file

```
root@kmabhijith-VirtualBox:/home# cat /etc/passwd
hplip:x:119:7:HPLIP system user,,,:/run/hplip:/bin/false
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbi
ologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
kmabhijith:x:1000:1000:K M Abhijith,,,:/home/kmabhijith:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
mysql:x:126:133:MySQL Server,,,:/nonexistent:/bin/false
lightdm:x:127:134:Light Display Manager:/var/lib/lightdm:/bin/false
juliet:x:1001:1001::/home/juliet:/bin/sh
```

11. Use the passwd command to initialize Juliet's password

```
root@kmabhijith-VirtualBox:/home# passwd juliet
New password:
Retype new password:
passwd: password updated successfully
```

12. Create a supplementary group called Shakespeare with a group id of 30000

```
root@kmabhijith-VirtualBox:/home# groupadd -g 3000 shakesphere
```

13. Create a supplementary group called artists.

```
root@kmabhijith-VirtualBox:/home# groupadd -g 20000 artists
```

14. Confirm that Shakespeare and artists have been added by examining the /etc/group file.

```
root@kmabhijith-VirtualBox:/home# cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,kmabhijith
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
ssl-cert:x:113:
uuidd:x:114:
tcpdump:x:115:
avahi-autoipd:x:116:
rtkit:x:117:
ssh:x:118:
netdev:x:119:
lpadmin:x:120:kmabhijith
avahi:x:121:
scanner:x:122:saned
saned:x:123:
nm-openvpn:x:124:
whoopsie:x:125:
colord:x:126:
geoclue:x:127:
pulse:x:128:
pulse-access:x:129:
gdm:x:130:
lxd:x:131:kmabhijith
kmabhijith:x:1000:
sambashare:x:132:kmabhijith
systemd-coredump:x:999:
mysql:x:133:
lightdm:x:134:
nopasswdlogin:x:135:
juliet:x:1001:
shakesphere:x:3000:
artists:x:20000:
```

15. Add the Juliet user to the Shakespeare group as a supplementary group.

```
root@kmabhijith-VirtualBox:/home# groups juliet
juliet : juliet
root@kmabhijith-VirtualBox:/home# usermod -a -G shakesphere juliet
root@kmabhijith-VirtualBox:/home#
```

16. Confirm that Juliet has been added using the id command.

```
root@kmabhijith-VirtualBox:/home# id juliet
uid=1001(juliet) gid=1001(juliet) groups=1001(juliet),3000(shakesphere)
```

17. Add Romeo and Hamlet to the Shakespeare group.

```
root@kmabhijith-VirtualBox:/home# useradd romeo
root@kmabhijith-VirtualBox:/home# useradd hamlet
root@kmabhijith-VirtualBox:/home# usermod -a -G shakesphere romeo
root@kmabhijith-VirtualBox:/home# usermod -a -G shakesphere hamlet
root@kmabhijith-VirtualBox:/home# id romeo
uid=1002(romeo) gid=1002(romeo) groups=1002(romeo),3000(shakesphere)
root@kmabhijith-VirtualBox:/home# id hamlet
uid=1003(hamlet) gid=1003(hamlet) groups=1003(hamlet),3000(shakesphere)
root@kmabhijith-VirtualBox:/home#
```

18. Add Reba, Dolly and Elvis to the artists group

```
root@kmabhijith-VirtualBox:/home# useradd reba
root@kmabhijith-VirtualBox:/home# useradd dolly
root@kmabhijith-VirtualBox:/home# useradd elvis
root@kmabhijith-VirtualBox:/home# usermod -a -G artists reba
root@kmabhijith-VirtualBox:/home# usermod -a -G artists dolly
root@kmabhijith-VirtualBox:/home# usermod -a -G artists elvis
root@kmabhijith-VirtualBox:/home# id reba
uid=1004(reba) gid=1004(reba) groups=1004(reba),20000(artists)
root@kmabhijith-VirtualBox:/home# id dolly
uid=1005(dolly) gid=1005(dolly) groups=1005(dolly),20000(artists)
root@kmabhijith-VirtualBox:/home# id elvis
uid=1006(elvis) gid=1006(elvis) groups=1006(elvis),20000(artists)
```

19. Verify the supplemental group memberships by examining the /etc/group file

```
root@kmabhijith-VirtualBox:/home# cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,kmabhijith
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
```

```
avahi:x:121:
scanner:x:122:saned
saned:x:123:
nm-openvpn:x:124:
whoopsie:x:125:
colord:x:126:
geoclue:x:127:
pulse:x:128:
pulse-access:x:129:
gdm:x:130:
lxd:x:131:kmabhijith
kmabhijith:x:1000:
sambashare:x:132:kmabhijith
systemd-coredump:x:999:
mysql:x:133:
lightdm:x:134:
nopasswdlogin:x:135:
juliet:x:1001:
shakesphere:x:3000:juliet,romeo,hamlet
artists:x:20000:reba,dolly,elvis
romeo:x:1002:
hamlet:x:1003:
reba:x:1004:
dolly:x:1005:
elvis:x:1006:
```

20. Attempt to remove user Dolly.

```
root@kmabhijith-VirtualBox:/home# userdel -r dolly
userdel: dolly mail spool (/var/mail/dolly) not found
userdel: dolly home directory (/home/dolly) not found
```

NETWORK COMMANDS

WINDOWS

1. Ping & traceroute tests

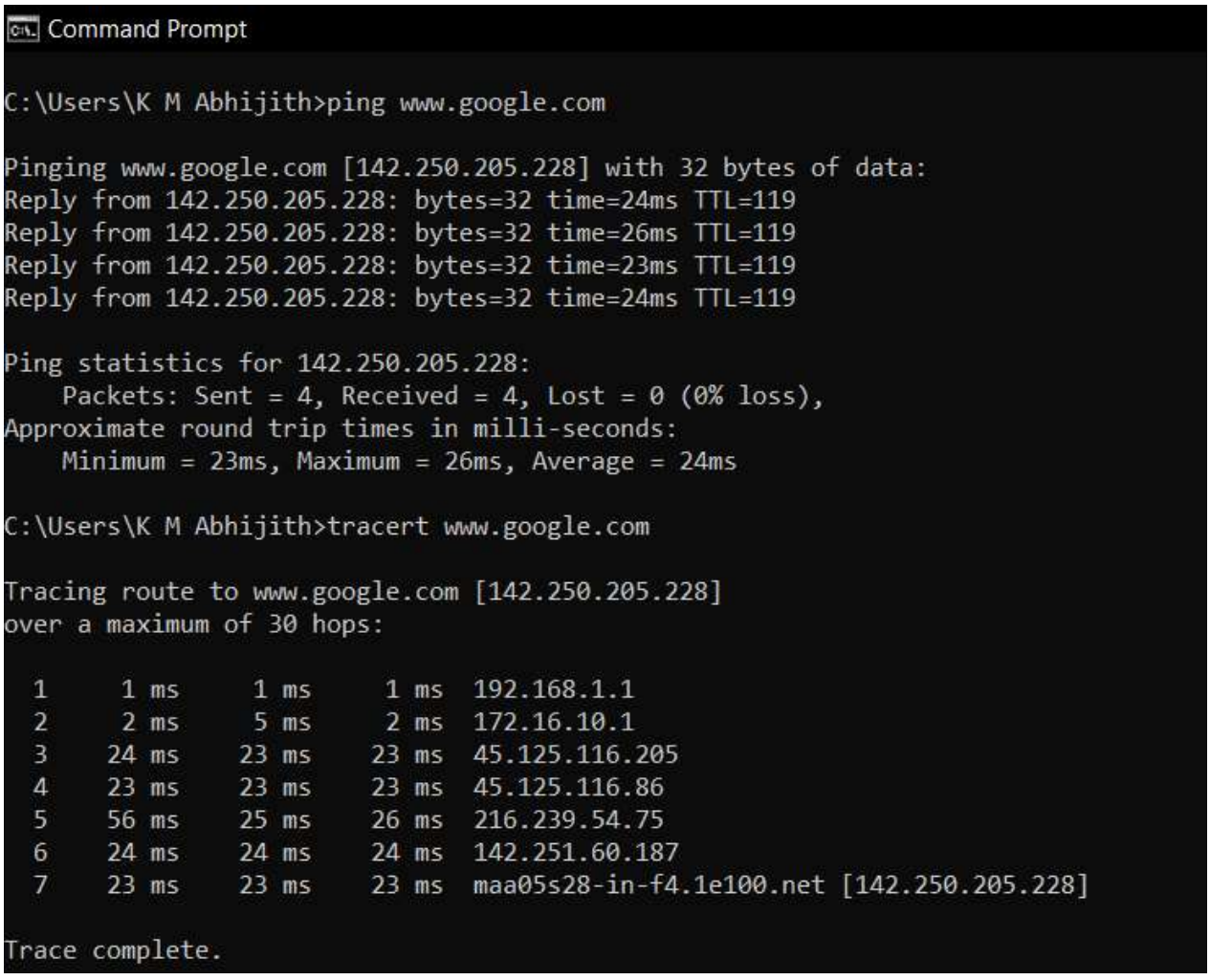
Ping and Trace Route tests can help to identify any connection issues between your network and a specified server (or website) address.

PING test:

The PING command is used to test the connection and latency between two network connections. The PING command sends packets of information to a specified IP Address and then measures the time it takes to get a response from the specified computer or device.

Trace Route test:

The TRACERT command is used to conduct a similar test to PING, but instead of displaying the time it takes to connect, it looks at the exact server hops required to connect your computer to the server.
You should already have the CMD prompt dialogue box open, after performing the PING test above.



1. Nslookup

Microsoft Windows includes a tool called NSLOOKUP that you can use via the command prompt. This tool can be used to check DNS records propagation and resolution using different servers, and perform other troubleshooting steps.

```
C:\Users\K M Abhijith>nslookup aesajce.in
Server:  ns3.blss.in
Address:  45.125.117.250

Non-authoritative answer:
Name:    aesajce.in
Address:  103.120.179.46
```

- Type nslookup -q=XX where XX is a type of a DNS record. Some of the available types are MX, A, CNAME, and TXT. The records are then displayed, to exit the tool type exit

```
C:\Users\K M Abhijith>nslookup -type=ns aesajce.in
Server:  ns3.blss.in
Address:  45.125.117.250

Non-authoritative answer:
aesajce.in      nameserver = ns2.ajcemca.in
aesajce.in      nameserver = ns1.ajcemca.in
aesajce.in      nameserver = ns1.aessas.com
aesajce.in      nameserver = ns2.aessas.com

ns2.aessas.com  internet address = 103.120.179.46
ns1.aessas.com  internet address = 103.120.179.46
ns2.ajcemca.in  internet address = 103.120.179.46
ns1.ajcemca.in  internet address = 103.120.179.46

C:\Users\K M Abhijith>
```

- To use **nslookup** as a troubleshooting tool, you can set the specific type of record to lookup for a domain by using the **-type=record_type** where **record_type** is A, CNAME, MX, PTR, NS, ANY.
  Type **nslookup -type=ns domain_name** where domain_name is the domain for your query and hit **Enter.** Now the tool will display the name servers for the domain you specified.

```
C:\Users\K M Abhijith>nslookup -q=MX  aesajce.in
Server:  ns3.blss.in
Address:  45.125.117.250

Non-authoritative answer:
aesajce.in      MX preference = 1, mail exchanger = aspmx.l.google.com
aesajce.in      MX preference = 10, mail exchanger = aspmx3.googlemail.com
aesajce.in      MX preference = 5, mail exchanger = alt2.aspmx.l.google.com
aesajce.in      MX preference = 5, mail exchanger = alt1.aspmx.l.google.com
aesajce.in      MX preference = 10, mail exchanger = aspmx2.googlemail.com

aesajce.in      nameserver = ns1.ajcemca.in
aesajce.in      nameserver = ns2.ajcemca.in
aesajce.in      nameserver = ns2.aessas.com
aesajce.in      nameserver = ns1.aessas.com
ASPMX.l.google.com      internet address = 142.250.4.27
ns1.ajcemca.in  internet address = 103.120.179.46
ns2.aessas.com  internet address = 103.120.179.46
ns1.aessas.com  internet address = 103.120.179.46
ns2.ajcemca.in  internet address = 103.120.179.46

C:\Users\K M Abhijith>
```

2. Netstat

On Windows 10, netstat (network statistics) has been around for a long time, and it's a command-line tool that you can use in Command Prompt to display statistics for all network connections. It allows you to understand open and connected ports to monitor and troubleshoot networking problems for system or applications.

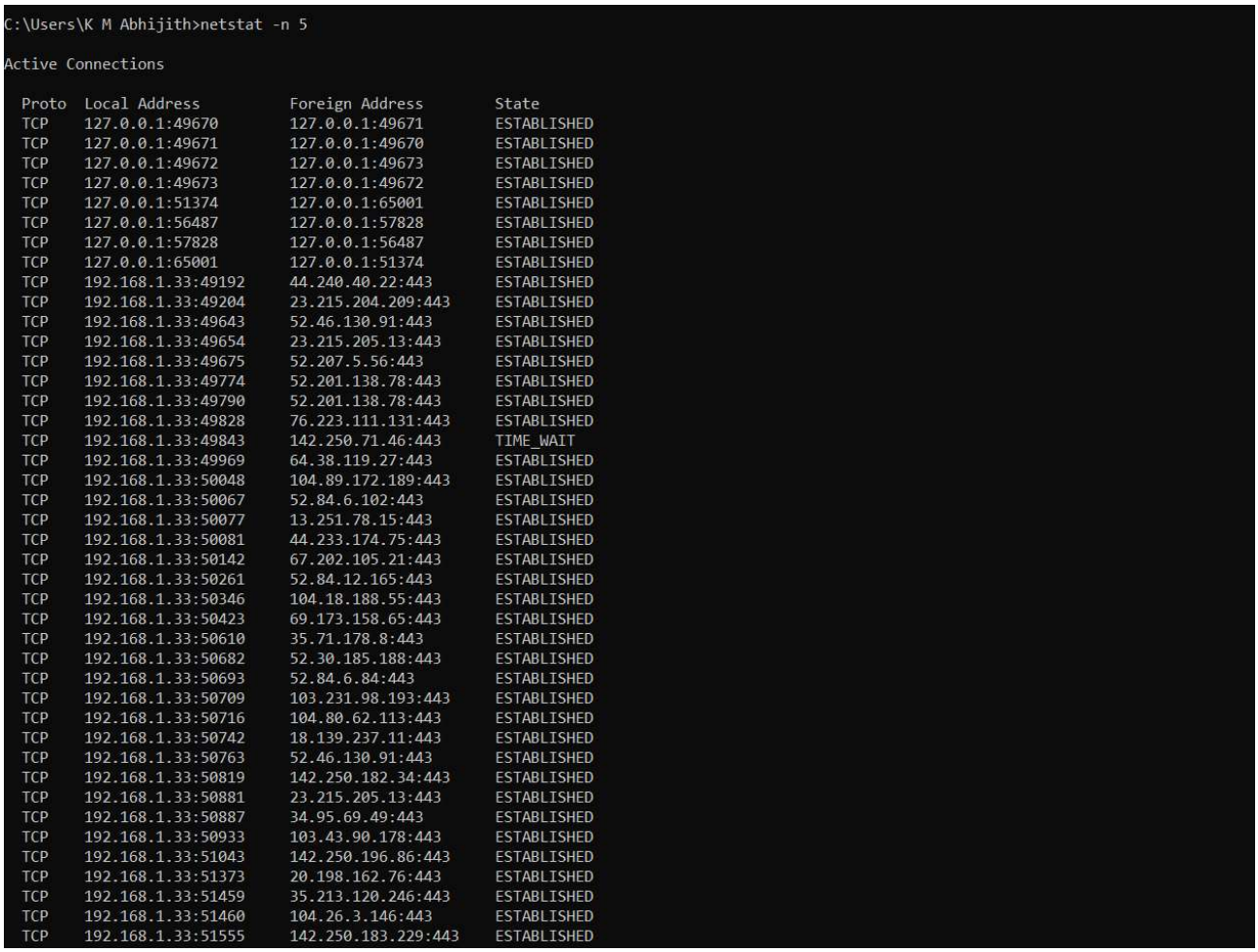
```
C:\Users\K M Abhijith>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49670        DESKTOP-ILB31AE:49671  ESTABLISHED
  TCP    127.0.0.1:49671        DESKTOP-ILB31AE:49670  ESTABLISHED
  TCP    127.0.0.1:49672        DESKTOP-ILB31AE:49673  ESTABLISHED
  TCP    127.0.0.1:49673        DESKTOP-ILB31AE:49672  ESTABLISHED
  TCP    127.0.0.1:51374        DESKTOP-ILB31AE:65001  ESTABLISHED
  TCP    127.0.0.1:56487        DESKTOP-ILB31AE:57828  ESTABLISHED
  TCP    127.0.0.1:57828        DESKTOP-ILB31AE:56487  ESTABLISHED
  TCP    127.0.0.1:65001        DESKTOP-ILB31AE:51374  ESTABLISHED
  TCP    192.168.1.33:49494     ec2-35-169-11-179:https  CLOSE_WAIT
  TCP    192.168.1.33:49495     52.242.17.32:https     ESTABLISHED
  TCP    192.168.1.33:49496     13.107.3.254:https     ESTABLISHED
```

netstat -n

command to display active connections showing numeric IP address and port number instead of trying to determine the names .

netstat -n INTERVAL

In the command, make sure to replace INTERVAL for the number (in seconds) you want to redisplay the information.



netstat -a

The netstat -a command displays all active and inactive connections, and the TCP and UDP ports the device is currently listening.

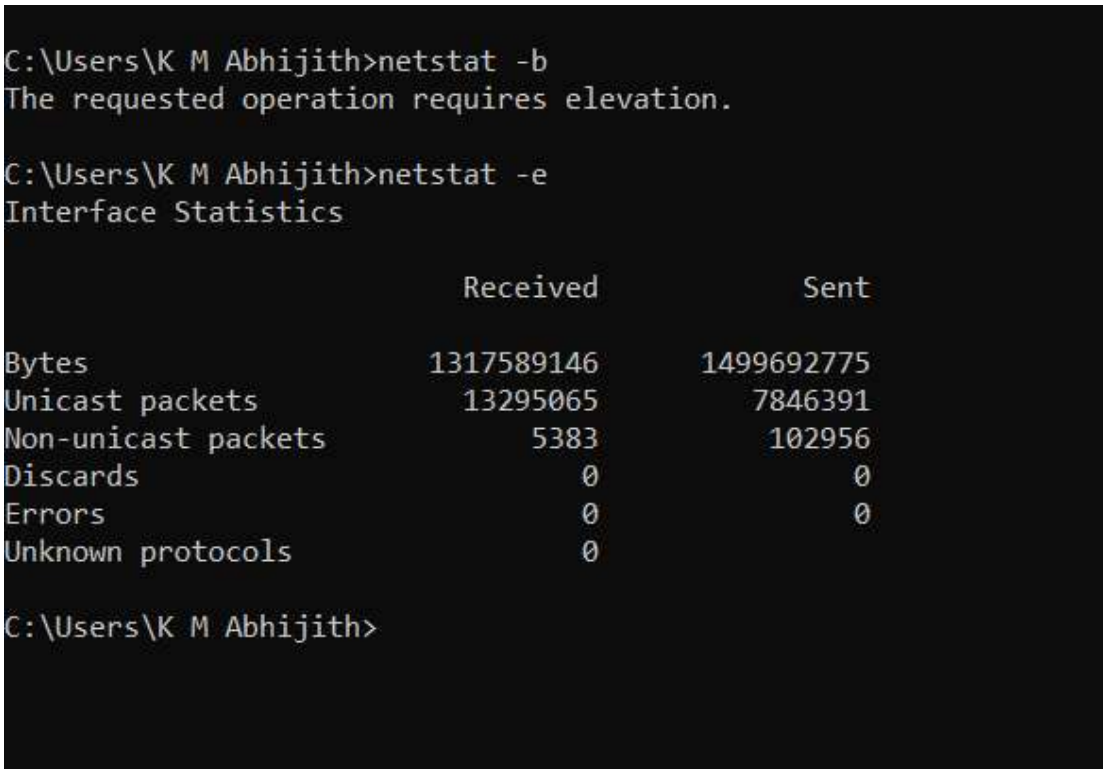
```
C:\Users\K M Abhijith>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:445            DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:3305           DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:5040           DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:5357           DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:7680           DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:33060          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49664          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49665          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49666          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49667          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49668          DESKTOP-ILB31AE:0      LISTENING
  TCP    0.0.0.0:49669          DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:1001         DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:27017        DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:49670        DESKTOP-ILB31AE:49671  ESTABLISHED
  TCP    127.0.0.1:49671        DESKTOP-ILB31AE:49670  ESTABLISHED
  TCP    127.0.0.1:49672        DESKTOP-ILB31AE:49673  ESTABLISHED
  TCP    127.0.0.1:49673        DESKTOP-ILB31AE:49672  ESTABLISHED
  TCP    127.0.0.1:51374        DESKTOP-ILB31AE:65001  ESTABLISHED
  TCP    127.0.0.1:56487        DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:56487        DESKTOP-ILB31AE:57828  ESTABLISHED
  TCP    127.0.0.1:56525        DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:57828        DESKTOP-ILB31AE:56487  ESTABLISHED
  TCP    127.0.0.1:65001        DESKTOP-ILB31AE:0      LISTENING
  TCP    127.0.0.1:65001        DESKTOP-ILB31AE:51374  ESTABLISHED
  TCP    192.168.1.33:139       DESKTOP-ILB31AE:0      LISTENING
  TCP    192.168.1.33:49265     103.229.205.243:https  ESTABLISHED
```

netstat -b

The netstat -b command lists all the executables (applications) associated with each connection. Sometimes, applications may open multiple connections.

netstat -e

The netstat -e command generates a statistic of the network interface, which shows information like the number of bytes, unicast and non-unicast sent and received packets. You can also see discarded packets and errors and unknown protocols, which can you troubleshoot networking problems.



3. ipconfig

Displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, ipconfig displays Internet Protocol version 4 (IPv4) and IPv6 addresses, subnet mask, and default gateway for all adapters.

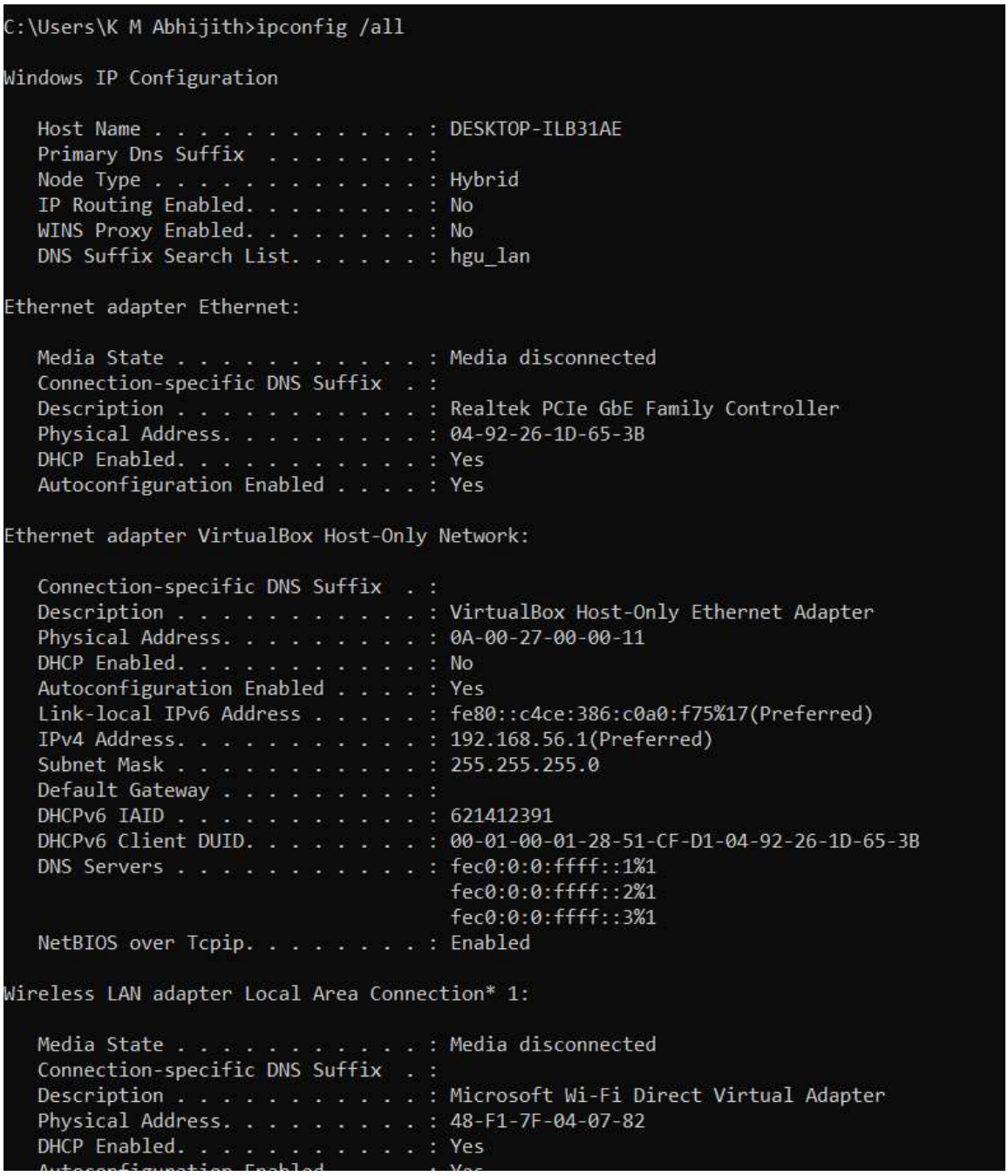
PARAMETERS:

/all: Displays the full TCP/IP configuration for all adapters. Adapters can represent physical interfaces, such as installed network adapters, or logical interfaces, such as dial-up connections.

/displaydns: Displays the contents of the DNS client resolver cache, which includes both entries preloaded from the local Hosts file and any recently obtained resource records for name queries resolved by the computer. The DNS Client service uses this information to resolve frequently queried names quickly, before querying its configured DNS servers.

/flushdns: Flushes and resets the contents of the DNS client resolver cache. During DNS troubleshooting, you can use this procedure to discard negative cache entries from the cache, as well as any other entries that have been added dynamically.

/registerdns: Initiates manual dynamic registration for the DNS names and IP addresses that are configured at a computer. You can use this parameter to troubleshoot a failed DNS name registration or resolve a dynamic update problem between a client and the DNS server without rebooting the client computer. The DNS settings in the advanced properties of the TCP/IP protocol determine which names are registered in DNS.



```
C:\Users\K M Abhijith>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

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

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::c4ce:386:c0a0:f75%17
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

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  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : hgu_lan
   Link-local IPv6 Address . . . . . : fe80::fc84:9747:b0c8:3f89%4
   IPv4 Address. . . . . . . . . . . : 192.168.1.33
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

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

Other Networking Commands

1. Hostname Command

A very simple command that displays the host name of your machine. This is much quicker than going to the control **panel>system** route.

2. getmac Command

Another very simple command that shows the MAC address of your network interfaces

3.arp Command

This is used for showing the address resolution cache. This command must be used with a command line switch arp -a is the most common.

4. Nbtstat

Diagnostic tool for troubleshooting netBIOS problems.

5. Net Command

Used for managing users,service,shares etc..

```
H:\>net
The syntax of this command is:

NET
    [ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |
      HELPMSG | LOCALGROUP | PAUSE | SESSION | SHARE | START |
      STATISTICS | STOP | TIME | USE | USER | VIEW ]

H:\>hostname
DESKTOP-ILB31AE

H:\>_
```

```
H:\>nbtstat

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
        [-r] [-R] [-RR] [-s] [-S] [interval] ]

  -a   (adapter status) Lists the remote machine's name table given its name
  -A   (Adapter status) Lists the remote machine's name table given its
                        IP address.
  -c   (cache)          Lists NBT's cache of remote [machine] names and their IP addresses
  -n   (names)          Lists local NetBIOS names.
  -r   (resolved)       Lists names resolved by broadcast and via WINS
  -R   (Reload)         Purges and reloads the remote cache name table
  -S   (Sessions)       Lists sessions table with the destination IP addresses
  -s   (sessions)       Lists sessions table converting destination IP
                        addresses to computer NETBIOS names.
  -RR  (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

  RemoteName   Remote host machine name.
  IP address   Dotted decimal representation of the IP address.
  interval     Redisplays selected statistics, pausing interval seconds
               between each display. Press Ctrl+C to stop redisplaying
               statistics.


H:\>
```

```
H:\>getmac

Physical Address    Transport Name
=================== ============================================================
48-F1-7F-04-07-81   \Device\Tcpip_{083275F0-5D75-483E-9CA1-5D2B536909B7}
04-92-26-1D-65-3B   Media disconnected
48-F1-7F-04-07-85   Media disconnected
0A-00-27-00-00-11   \Device\Tcpip_{A74689BB-EA25-4EFA-8DC2-57AA7FC4E351}

H:\>arp -a

Interface: 192.168.1.33 --- 0x4
  Internet Address      Physical Address      Type
  192.168.1.1           14-a7-2b-83-03-34     dynamic
  192.168.1.255         ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.56.1 --- 0x11
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
```

LINUX

Ifconfig:

ifconfig is used to configure, or view the configuration of, a network interface.

```
root@kmabhijith-VirtualBox:~# ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3    1500      323      0      0 0           238      0      0      0 BMRU
lo       65536      178      0      0 0           178      0      0      0 LRU
```

```
root@kmabhijith-VirtualBox:~# ifconfig -v
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::a179:f201:9541:fa3c  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:2c:9c:0c  txqueuelen 1000  (Ethernet)
        RX packets 323  bytes 252665 (252.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 238  bytes 34544 (34.5 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 178  bytes 15314 (15.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 178  bytes 15314 (15.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@kmabhijith-VirtualBox:~# ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3    1500      323      0      0 0           238      0      0      0 BMRU
lo       65536      178      0      0 0           178      0      0      0 LRU
root@kmabhijith-VirtualBox:~# ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::a179:f201:9541:fa3c  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:2c:9c:0c  txqueuelen 1000  (Ethernet)
        RX packets 305  bytes 250421 (250.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 215  bytes 32491 (32.4 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 168  bytes 14448 (14.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 168  bytes 14448 (14.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Traceroute:

traceroute command in Linux prints the route that a packet takes to reach the host.

```
root@kmabhijith-VirtualBox:~# traceroute google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  4.080 ms  3.998 ms  3.924 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
```

Netstat:

The network statistics (netstat) command is a networking tool used for troubleshooting and configuration, that can also serve as a monitoring tool for connections over the network.

```
root@kmabhijith-VirtualBox:~# netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 kmabhijith-Virtu:bootpc _gateway:bootps         ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    29915    /run/user/0/systemd/n
otify
unix  3      [ ]         DGRAM                    15454    /run/systemd/notify
unix  2      [ ]         DGRAM                    15468    /run/systemd/journal/
syslog
unix  15     [ ]         DGRAM                    15478    /run/systemd/journal/
dev-log
unix  8      [ ]         DGRAM                    15482    /run/systemd/journal/
socket
unix  3      [ ]         STREAM     CONNECTED     30870
```

```
root@kmabhijith-VirtualBox:~# netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 kmabhijith-Virtu:bootpc _gateway:bootps         ESTABLISHED
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:36230           0.0.0.0:*
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:45477              [::]:*
root@kmabhijith-VirtualBox:~#
```

```
root@kmabhijith-VirtualBox:~# netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:mysql         0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http               [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 kmabhijith-Virtu:bootpc _gateway:bootps         ESTABLISHED
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:36230           0.0.0.0:*
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:45477              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   Path
```

```
root@kmabhijith-VirtualBox:~# netstat -at
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:mysql         0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http               [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
root@kmabhijith-VirtualBox:~#
```

Nslookup:

Nslookup (stands for "Name Server Lookup") is a useful command for getting information from DNS server. It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record.

```
root@kmabhijith-VirtualBox:~# nslookup
> google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.196.78
Name:   google.com
Address: 2404:6800:4007:82b::200e
```

```
root@kmabhijith-VirtualBox:~# nslookup -type=any google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com      mail exchanger = 40 alt3.aspmx.l.google.com.
google.com      mail exchanger = 50 alt4.aspmx.l.google.com.
google.com      mail exchanger = 30 alt2.aspmx.l.google.com.
google.com      mail exchanger = 10 aspmx.l.google.com.
google.com      mail exchanger = 20 alt1.aspmx.l.google.com.
google.com
        origin = ns1.google.com
        mail addr = dns-admin.google.com
        serial = 396194125
        refresh = 900
        retry = 900
        expire = 1800
        minimum = 60
Name:   google.com
Address: 2404:6800:4007:822::200e
Name:   google.com
Address: 172.217.167.142
google.com      nameserver = ns2.google.com.
google.com      nameserver = ns4.google.com.
```

```
root@kmabhijith-VirtualBox:~# nslookup -type=soa google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com
        origin = ns1.google.com
        mail addr = dns-admin.google.com
        serial = 396194125
        refresh = 900
        retry = 900
        expire = 1800
        minimum = 60

Authoritative answers can be found from:
```

```
root@kmabhijith-VirtualBox:~# nslookup -type=ns google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com      nameserver = ns1.google.com.
google.com      nameserver = ns3.google.com.
google.com      nameserver = ns4.google.com.
google.com      nameserver = ns2.google.com.

Authoritative answers can be found from:
```

Ping:

PING (Packet Internet Groper) command is used to check the network connectivity between host and server/host.

```
root@kmabhijith-VirtualBox:~# ping aesajce.in
PING aesajce.in (103.120.179.46) 56(84) bytes of data.
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=1 ttl=54 time
=80.1 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=2 ttl=54 time
=70.6 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=3 ttl=54 time
=69.8 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=4 ttl=54 time
=72.8 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=5 ttl=54 time
=70.3 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=6 ttl=54 time
=70.0 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=7 ttl=54 time
=70.6 ms
64 bytes from newvps.greenmatrimony.com (103.120.179.46): icmp_seq=8 ttl=54 time
```

Other Networking Commands

ip route

Use the IP route to print or display the routing table. The following command displays the contents of the routing table:

```
root@kmabhijith-VirtualBox:~# ip route show
default via 10.0.2.2 dev enp0s3 proto dhcp metric 100
10.0.2.0/24 dev enp0s3 proto kernel scope link src 10.0.2.15 metric 100
169.254.0.0/16 dev enp0s3 scope link metric 1000
root@kmabhijith-VirtualBox:~#
```

nmap:

nmap ("Network Mapper") is a powerful utility used for network discovery, security auditing, and administration. Many system admins use it to determine which of their systems are online, and also for OS detection and service detection.

```
root@kmabhijith-VirtualBox:~# nmap 10.0.0.05
Starting Nmap 7.80 ( https://nmap.org ) at 2021-09-14 19:31 IST
Nmap scan report for 10.0.0.5
Host is up (0.0011s latency).
All 1000 scanned ports on 10.0.0.5 are filtered

Nmap done: 1 IP address (1 host up) scanned in 4.25 seconds
```

ipref:

While ping verifies the availability of a host, iPerf helps analyze and measure network performance between two hosts. With iPerf, you open a connection between two hosts and send some data. iPerf then shows the bandwidth available between the two hosts.

```
root@kmabhijith-VirtualBox:~# iperf -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  128 KByte (default)
------------------------------------------------------------
```

dig:

dig (Domain Information Groper) is a flexible tool for interrogating DNS name servers.

It performs DNS lookups and displays the answers that are returned from the name servers.

```
root@kmabhijith-VirtualBox:~# dig aesajce.in

; <<>> DiG 9.16.1-Ubuntu <<>> aesajce.in
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45933
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;aesajce.in.                    IN      A

;; ANSWER SECTION:
aesajce.in.             8899    IN      A       103.120.179.46

;; Query time: 27 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Sep 14 19:40:30 IST 2021
;; MSG SIZE  rcvd: 55
```

telnet:

telnet connect destination's host and port via a telnet protocol if a connection establishes means connectivity between two hosts is working fine.

```
root@kmabhijith-VirtualBox:~# telnet aesajce.in 443
Trying 103.120.179.46...
Connected to aesajce.in.
Escape character is '^]'.
Connection closed by foreign host.
```

LAMP INSTALLATION PROCEDURE

Install Apache2

Update your system:

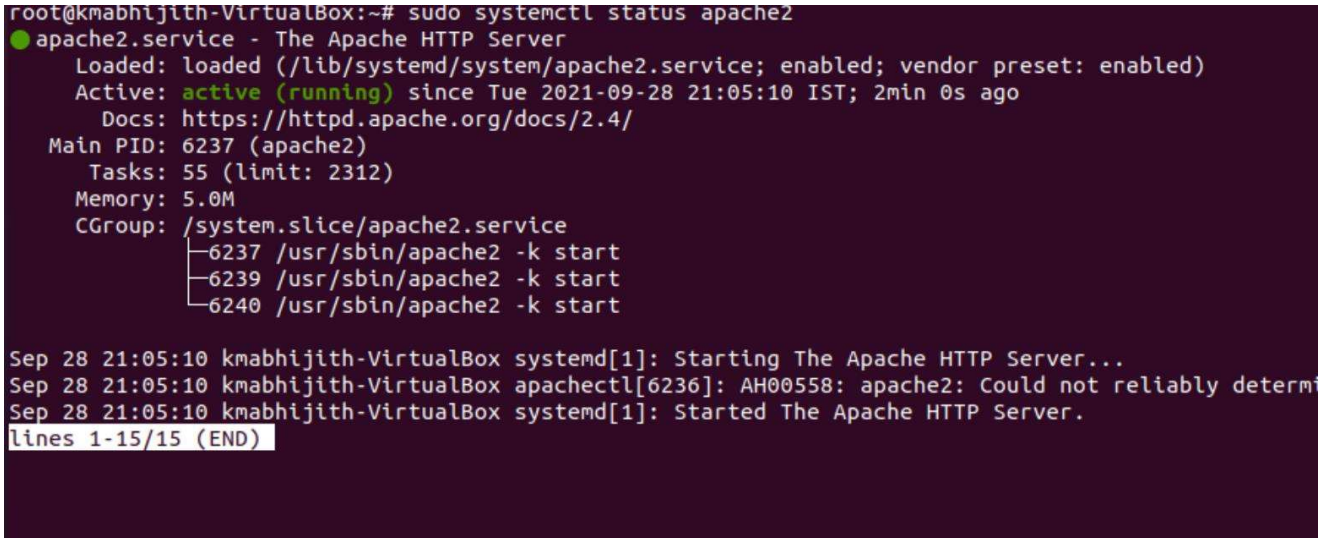
```
sudo apt update
```

Install Apache using apt:

```
sudo apt install apache2
```

Confirm that Apache is now running with the following command:

```
sudo systemctl status apache2
```



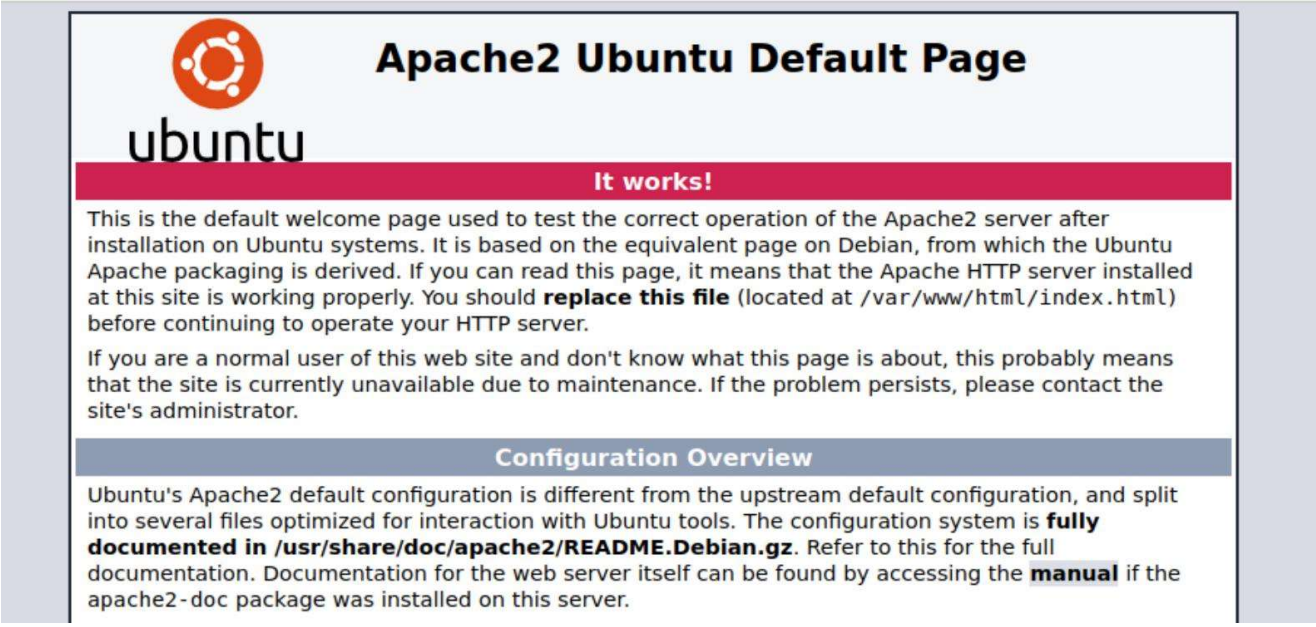
If it is not working !

```
sudo systemctl stop apache2  # to stop if running
sudo systemctl start apache2 # to start if not running
```

Once installed, test by accessing your server's IP in your browser:

```
http://127.0.0.1/
http://localhost/
```

OUTPUT :


Apache2 Ubuntu Default Page
ubuntu
It works!
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.
If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.
Configuration Overview
Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.

Install mariadb

```
sudo apt install mariadb-server mariadb-client

sudo systemctl status mysql     # to check status

sudo systemctl start mysql      # if not running

sudo mysql_secure_installation  # Secure your newly installed MariaDB servic
```

```
root@kmabhijith-VirtualBox:~# sudo systemctl status mysql
● mariadb.service - MariaDB 10.3.31 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2021-09-28 20:44:50 IST; 25min ago
       Docs: man:mysqld(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 672 (mysqld)
     Status: "Taking your SQL requests now..."
      Tasks: 30 (limit: 2312)
     Memory: 69.4M
     CGroup: /system.slice/mariadb.service
             └─672 /usr/sbin/mysqld
```

Install PHP and commonly used modules

```
sudo apt install php libapache2-mod-php php-opcache php-cli php-gd php-curl php-mysql

sudo systemctl restart apache2
```

Test PHP Processing on Web Server

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

Inside the file, type in the valid PHP code:

```
<?php
   phpinfo ();
?>
```

Press CTRL + X to save and close the file. Press y and ENTER to confirm
Open a browser and type in your IP address/phpinfo.php

```
http://127.0.0.1/phpinfo.php
```

OUTPUT :

PHP Version 7.4.3

System	Linux kmabhijith-VirtualBox 5.11.0-27-generic #29~20.04.1-Ubuntu SMP Wed Aug 11 15:58:17 UTC 2021 x86_64
Build Date	Aug 13 2021 05:39:12
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.4/apache2
Loaded Configuration File	/etc/php/7.4/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.4/apache2/conf.d
Additional .ini files parsed	/etc/php/7.4/apache2/conf.d/10-mysqlnd.ini, /etc/php/7.4/apache2/conf.d/10-opcache.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/15-xml.ini, /etc/php/7.4/apache2/conf.d/20-bz2.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-curl.ini, /etc/php/7.4/apache2/conf.d/20-dom.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-fileinfo.ini, /etc/php/7.4/apache2/conf.d/20-ftp.ini, /etc/php/7.4/apache2/conf.d/20-gd.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-json.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-

Install phpmyadmin

```
sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl
```

```
sudo systemctl restart apache2
```

Open a browser : http://localhost/phpmyadmin
username : root
password : yourpasswordIf phpmyadmin page not found :

```
nano /etc/apache2/apache2.conf
```

Add this line to last of the file.
Press CTRL + X to save and close the file. Press y and ENTER to confirm

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

restart apache2 - now try : http://localhost/phpmyadmin

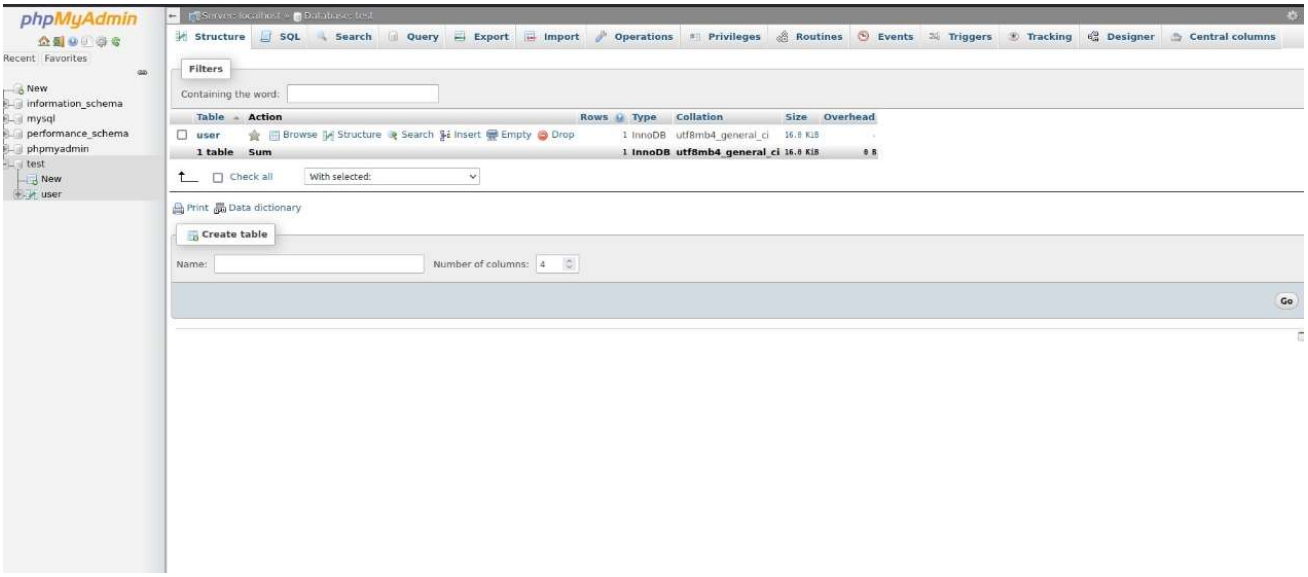
```
sudo systemctl restart apache2
```

If any problem for login run the following command

```
sudo mysql
ALTER USER root@localhost IDENTIFIED  BY "yourpassword";
```

OUTPUT :


phpMyAdmin
Welcome to phpMyAdmin
Language
English
Log in
Username:
root
Password:
Go


phpMyAdmin
Recent Favorites
New
information_schema
mysql
performance_schema
phpmyadmin
test
New
user
Structure SQL Search Query Export Import Operations Privileges Routines Events Triggers Tracking Designer Central columns
Filters
Containing the word:
Table Action Rows Type Collation Size Overhead
user Browse Structure Search Insert Empty Drop 1 InnoDB utf8mb4_general_ci 16.0 KiB
1 table Sum 1 InnoDB utf8mb4_general_ci 16.0 KiB 0 B
Check all With selected:
Print Data dictionary
Create table
Name:
Number of columns: 4
Go

ANSIBLE INSTALLATION

INSTALLATION:

STEP 1: sudo apt install ansible

```
root@kmabhijith-VirtualBox:~# apt install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-5.11.0-27-generic linux-hwe-5.11-headers-5.11.0-27 linux-image-5.11.0-27-generic
  linux-modules-5.11.0-27-generic linux-modules-extra-5.11.0-27-generic
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jinja2 python3-jmespath
  python3-kerberos python3-libcloud python3-lockfile python3-markupsafe python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm python3-xmltodict
Suggested packages:
  cowsay sshpass python-jinja2-doc python-lockfile-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jinja2 python3-jmespath
  python3-kerberos python3-libcloud python3-lockfile python3-markupsafe python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm python3-xmltodict
0 upgraded, 18 newly installed, 0 to remove and 181 not upgraded.
Need to get 9,753 kB of archives.
After this operation, 90.7 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

```
root@kmabhijith-VirtualBox: ~
  if x is 0 or x is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:32: SyntaxWarning: "is" with a literal. Did you mean "=="?
  if x is 0 or x is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:34: SyntaxWarning: "is" with a literal. Did you mean "=="?
  elif y is 0 or y is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:34: SyntaxWarning: "is" with a literal. Did you mean "=="?
  elif y is 0 or y is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:260: SyntaxWarning: "is" with a literal. Did you mean "=="?
  if original_result is 0:
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ieee-data (20180805.1) ...
Setting up python3-dnspython (1.16.0-1build1) ...
Setting up python3-selinux (3.0-1build2) ...
Setting up python3-crypto (2.6.1-13ubuntu2) ...
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (2.8.0-1) ...
Setting up python3-netaddr (0.7.19-3) ...
/usr/lib/python3/dist-packages/netaddr/strategy/__init__.py:189: SyntaxWarning: "is not" with a literal. Did you
 mean "!="?
  if word_sep is not '':
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...

Progress: [ 97%] [#########################################################################################...]
```

```
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ieee-data (20180805.1) ...
Setting up python3-dnspython (1.16.0-1build1) ...
Setting up python3-selinux (3.0-1build2) ...
Setting up python3-crypto (2.6.1-13ubuntu2) ...
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (2.8.0-1) ...
Setting up python3-netaddr (0.7.19-3) ...
/usr/lib/python3/dist-packages/netaddr/strategy/__init__.py:189: SyntaxWarning: "is not" with a literal. Did you
 mean "!="?
  if word_sep is not '':
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...
Processing triggers for man-db (2.9.1-1) ...
root@kmabhijith-VirtualBox:~#
```

CHECK INSTALLATION :

STEP 2: ansible –version

```
root@kmabhijith-VirtualBox:~# ansible --version
ansible [core 2.11.5]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/local/lib/python3.8/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/local/bin/ansible
  python version = 3.8.10 (default, Jun  2 2021, 10:49:15) [GCC 9.4.0]
  jinja version = 3.0.1
  libyaml = True
root@kmabhijith-VirtualBox:~#
```

ANALYZING NETWORK PACKET STREAM USING TCPDUMP

tcpdump

tcpdump is a most powerful and widely used command-line packets sniffer or package analyzer tool which is used to capture or filter TCP/IP packets that are received or transferred over a network on a specific interface.

1. **tcpdump -D** : Print all available interfaces for capture

```
root@kmabhijith-VirtualBox:~# tcpdump -D
1.enp0s3 [Up, Running]
2.lo [Up, Running, Loopback]
3.any (Pseudo-device that captures on all interfaces) [Up, Running]
4.bluetooth-monitor (Bluetooth Linux Monitor) [none]
5.nflog (Linux netfilter log (NFLOG) interface) [none]
6.nfqueue (Linux netfilter queue (NFQUEUE) interface) [none]
```

2. **tcpdump -XX -i eth0** :

The following command with option -XX capture the data of each packet, including its link level header in HEX and ASCII format.

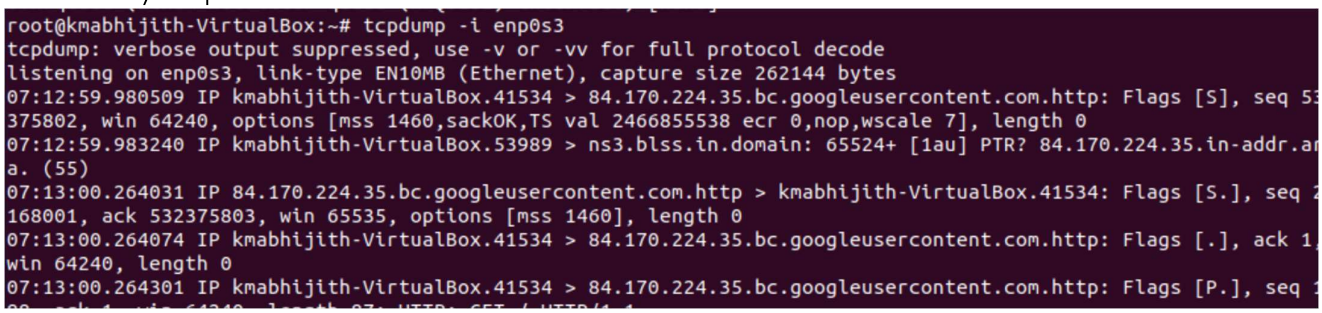
```
root@kmabhijith-VirtualBox:~# tcpdump -xx -i enp0s3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:02:55.720558 IP 32.121.122.34.bc.googleusercontent.com.http > kmabhijith-VirtualBox.41412: Flags [S.], seq
92001, ack 3194587439, win 65535, options [mss 1460], length 0
        0x0000:  0800 272c 9c0c 5254 0012 3502 0800 4500
        0x0010:  002c 21d4 0000 4006 b14f 227a 7920 0a00
        0x0020:  020f 0050 a1c4 0095 6a01 be69 892f 6012
        0x0030:  ffff 9c29 0000 0204 05b4 0000
13:02:55.720607 IP kmabhijith-VirtualBox.41412 > 32.121.122.34.bc.googleusercontent.com.http: Flags [R], seq
4587439, win 0, length 0
        0x0000:  5254 0012 3502 0800 272c 9c0c 0800 4500
        0x0010:  0028 0000 4000 4006 9327 0a00 020f 227a
        0x0020:  7920 a1c4 0050 be69 892f 0000 0000 5004
        0x0030:  0000 1e8a 0000
13:02:55.722591 IP kmabhijith-VirtualBox.51660 > ns3.blss.in.domain: 38223+ [1au] PTR? 15.2.0.10.in-addr.arpa
51)
        0x0000:  5254 0012 3502 0800 272c 9c0c 0800 4500
        0x0010:  004f c0b9 4000 4011 ca5e 0a00 020f 2d7d
        0x0020:  75fa c9cc 0035 003b afd2 954f 0100 0001
        0x0030:  0000 0000 0001 0231 3501 3201 3002 3130
        0x0040:  0769 6e2d 6164 6472 0461 7270 6100 000c
```

3. **tcpdump -n -i enp0s :**

To capture packets for a specific interface, run the following command with option -n.

```
root@kmabhijith-VirtualBox:~# tcpdump -n -i enp0s3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:17:52.481333 IP 10.0.2.15.42562 > 45.125.117.250.53: 46721+ [1au] A? connectivity-check.u
13:17:52.521974 IP 45.125.117.250.53 > 10.0.2.15.42562: 46721 3/0/1 A 34.122.121.32, A 35.22
11.17 (106)
13:17:52.523168 IP 10.0.2.15.51284 > 35.232.111.17.80: Flags [S], seq 2972868629, win 64240,
ackOK,TS val 2365974444 ecr 0,nop,wscale 7], length 0
13:17:52.777512 IP 35.232.111.17.80 > 10.0.2.15.51284: Flags [S.], seq 14208001, ack 2972868
ons [mss 1460], length 0
13:17:52.777578 IP 10.0.2.15.51284 > 35.232.111.17.80: Flags [.], ack 1, win 64240, length 0
13:17:52.778198 IP 10.0.2.15.51284 > 35.232.111.17.80: Flags [P.], seq 1:88, ack 1, win 6424
GET / HTTP/1.1
13:17:52.778738 IP 35.232.111.17.80 > 10.0.2.15.51284: Flags [.], ack 88, win 65535, length
13:17:53.029103 IP 35.232.111.17.80 > 10.0.2.15.51284: Flags [P.], seq 1:149, ack 88, win 65
P: HTTP/1.1 204 No Content
```

4. **tcpdump -i ens0p :**
   The command screen will scroll up until you interrupt and when we execute the tcpdump command it will captures from all the interfaces, however with -i switch only capture from the desired interface.



SHELL SCRIPTING

SHELL SCRIPTING

1. Write a shell script to ask your name, and college name and print it on the screen.

```
#!/bin/bash
echo "enter your name";read you;
echo "enter college name"; read college;
echo $you;
echo $college;
```

Output:

```
root@kmabhijith-VirtualBox:~# ./1.sh
enter your name
abhijith
enter college name
amal jyothi
abhijith
amal jyothi
root@kmabhijith-VirtualBox:~#
```

2. Write a shell script to set a value for a variable and display it on command line interface.

```
#!/bin/bash
((sum=10))
echo "number is $sum"
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 2.sh
root@kmabhijith-VirtualBox:~# chmod +x 2.sh
root@kmabhijith-VirtualBox:~# ./2.sh
number is 10
root@kmabhijith-VirtualBox:~#
```

3. Write a shell script to perform addition, substation, multiplication, division with two numbers that is accepted from user.

```
#!/bin/bash
echo "enter two numbers";
read a b;
echo "addition $((a+b))";
echo "subraction $((a-b))";
echo "division $((a/b))";
echo "multiplication $((a*b))";
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 3.sh
root@kmabhijith-VirtualBox:~# ./3.sh
enter two numbers
19 6
addition 25
subraction 13
division 3
multiplication 114
root@kmabhijith-VirtualBox:~#
```

4. Write a shell script to check the value of a given number and display whether the number is found or not.

```
#!/bin/bash
echo "enter a number"
read a
if [[ $a -eq 10 ]]
then
        echo "number  found"
else
        echo "number not found"
fi
```

Output:

```
root@kmabhijith-VirtualBox:~# ./4.sh
enter a number
10
number  found
root@kmabhijith-VirtualBox:~# ./4.sh
enter a number
2
number not found
root@kmabhijith-VirtualBox:~#
```

5. Write a shell script to display current date, calendar.

```
#!/bin/bash
echo "$(date)";
echo "calnder :";
cal
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 5.sh
root@kmabhijith-VirtualBox:~# ./5.sh
bash: ./5.sh: Permission denied
root@kmabhijith-VirtualBox:~# chmod +x 5.sh
root@kmabhijith-VirtualBox:~# ./5.sh
Saturday 02 October 2021 03:05:43 PM IST
calnder :
    October 2021
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
root@kmabhijith-VirtualBox:~#
```

6. Write a shell script to check a number is even or odd.

```
#!/bin/bash
echo "enter a number";
read a;
if [[ $((a%2)) -eq 0 ]]
then
        echo " $a is even";
else
        echo "$a is odd";
fi
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 6.sh
root@kmabhijith-VirtualBox:~# ./6.sh
enter a number
10
 10 is even
root@kmabhijith-VirtualBox:~# ./6.sh
enter a number
5
5 is odd
root@kmabhijith-VirtualBox:~#
```

7. Write a shell script to check a number is greater than, less than or equal to another number.

```
#!/bin/bash
echo "enter a number";
read a;
if [[ $a -gt 10 ]]
then
        echo "number is grater than 10";
fi

if [[ $a -le 10 ]]
then
        echo "number is less than or equal to 10"
fi
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 7.sh
root@kmabhijith-VirtualBox:~# ./7.sh
enter a number
12
number is grater than 10
root@kmabhijith-VirtualBox:~# ./7.sh
enter a number
9
number is less than or equal to 10
root@kmabhijith-VirtualBox:~#
```

8. Write a shell script to find the sum of first 10 numbers.

```
#!/bin/bash
sum=0
n=10
echo "sum of first 10 numbers";
for ((i=1;i <= $n;i++ ))
        do
                sum=$((sum+i))
        done
                echo "$sum";
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 8.sh
root@kmabhijith-VirtualBox:~# ./8.sh
sum of first 10 numbers
55
root@kmabhijith-VirtualBox:~#
```

9. Write a shell script to find the sum, the average and the product of the four integers entered.

```
#!/bin/bash
echo "enter four numbers";
read a b c d;
sum=$((a+b+c+d))
echo "sum is $sum";
avg=$((sum/4))
echo "average is $avg";
pro=$((a*b*c*d))
echo "product is $pro";
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 9.sh
root@kmabhijith-VirtualBox:~# ./9.sh
enter four numbers
10 34 56 33
sum is 133
average is 33
product is 628320
root@kmabhijith-VirtualBox:~#
```

10.Write a shell script to find the smallest of three numbers.

```
#!/bin/bash
echo "enter three numbers"
read a b c;
if [[ $a -lt  $b ]]
then
        echo "$a is smaller";

elif [[ $b -lt $c ]]
then
        echo "$b is smaller";
else
        echo "$c is smaller";
fi
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 10.sh
root@kmabhijith-VirtualBox:~# ./10.sh
enter three numbers
4 3 6
3 is smaller
root@kmabhijith-VirtualBox:~# ./10.sh
enter three numbers
5 7 9
5 is smaller
root@kmabhijith-VirtualBox:~# ./10.sh
enter three numbers
9 7 0
0 is smaller
root@kmabhijith-VirtualBox:~#
```

11.Write a shell program to find factorial of given number.

```
#!/bin/bash
echo "enter a number";
read a;
fact=1;
while [ $a -ge 1 ]
do
fact=$((fact * $a))
a=$((a-1))
done
echo "factorial is $fact";

~
```

Output:

```
root@kmabhijith-VirtualBox:~# ./11.sh
enter a number
5
factorial is 120
root@kmabhijith-VirtualBox:~#
```

12.Write a shell program to check a number is palindrome or not.

```
#!/bin/bash
echo "enter a number";
read a;
pali=$a;
num=0;
while [ $a -gt 0 ]
do
        digit=$((a%10));
        num=$((num*10))+$digit;
        a=$((a/10));

done
if [[ $num -eq $pali ]]
then
        echo "$pali is palindrome";
else
        echo "$pali is not palindrome";
fi
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 12.sh
root@kmabhijith-VirtualBox:~# ./12.sh
enter a number
121
121 is palindrome
root@kmabhijith-VirtualBox:~# ./12.sh
enter a number
231
231 is not palindrome
root@kmabhijith-VirtualBox:~#
```

13.Write a shell script to find the average of the numbers entered in command

line.

```
#!/bin/bash
echo "enter number  of numbers";
read n;
sum=0;
echo "enter numbers";
for((i=0;i<n;i++))
do
        read a;
        sum=$((sum + a));
done
avg=$((sum/n));
echo "average is $avg"
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 13.sh
root@kmabhijith-VirtualBox:~# ./13.sh
enter number  of numbers
5
enter numbers
23
12
45
43
23
average is 29
root@kmabhijith-VirtualBox:~#
```

14.Write a shell program to find the sum of all the digits in a number.

```
#!/bin/bash
echo "enter a number";
read a;
pali=$a;
num=0;
while [ $a -gt 0 ]
do
        digit=$((a%10));
        num=$((digit+num));
        a=$((a/10));
done
echo "sum of digits of $pali is $num";
~
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 14.sh
root@kmabhijith-VirtualBox:~# ./14.sh
enter a number
123
sum of digits of 123 is 6
```

15.Write a shell Script to check whether given year is leap year or not.

```
#!/bin/bash
echo "enter the year";
read a;
year=$((a%4));
if [[ $year -eq 0 ]]
then
        echo "$a is leap year";
else
        echo "$a is a normal year";
fi
```

Output:

```
root@kmabhijith-VirtualBox:~# vi 15.sh
root@kmabhijith-VirtualBox:~# ./15.sh
enter the year
2012
2012 is leap year
root@kmabhijith-VirtualBox:~# ./15.sh
enter the year
2007
2007 is a normal year
root@kmabhijith-VirtualBox:~#
```

INSTALLATION AND DEPLOYMENT OF DOCKER

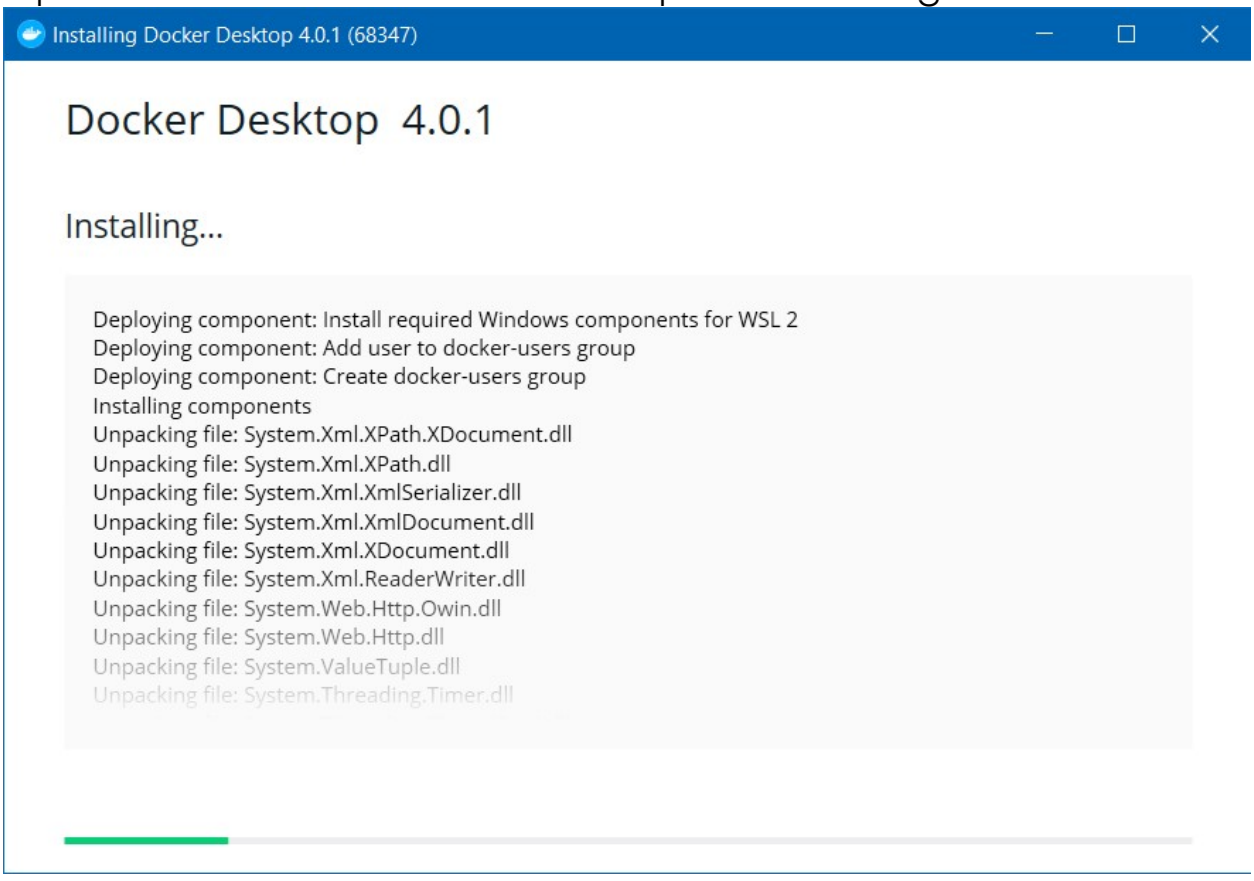
DOCKER INSTALLATION

Step-I

Download Docker Desktop installer for Windows from https://desktop.docker.com/win/main/amd64/Docker%20Desktop%20Installer.exe

Step-II

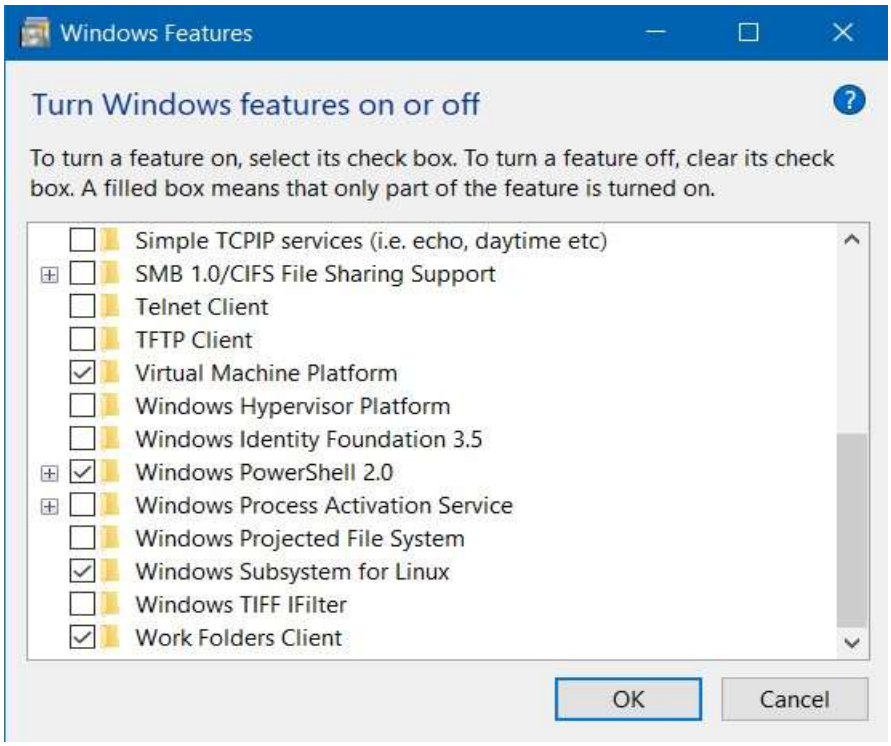
Open the .exe file and follow the steps after clicking install button.



Step-III

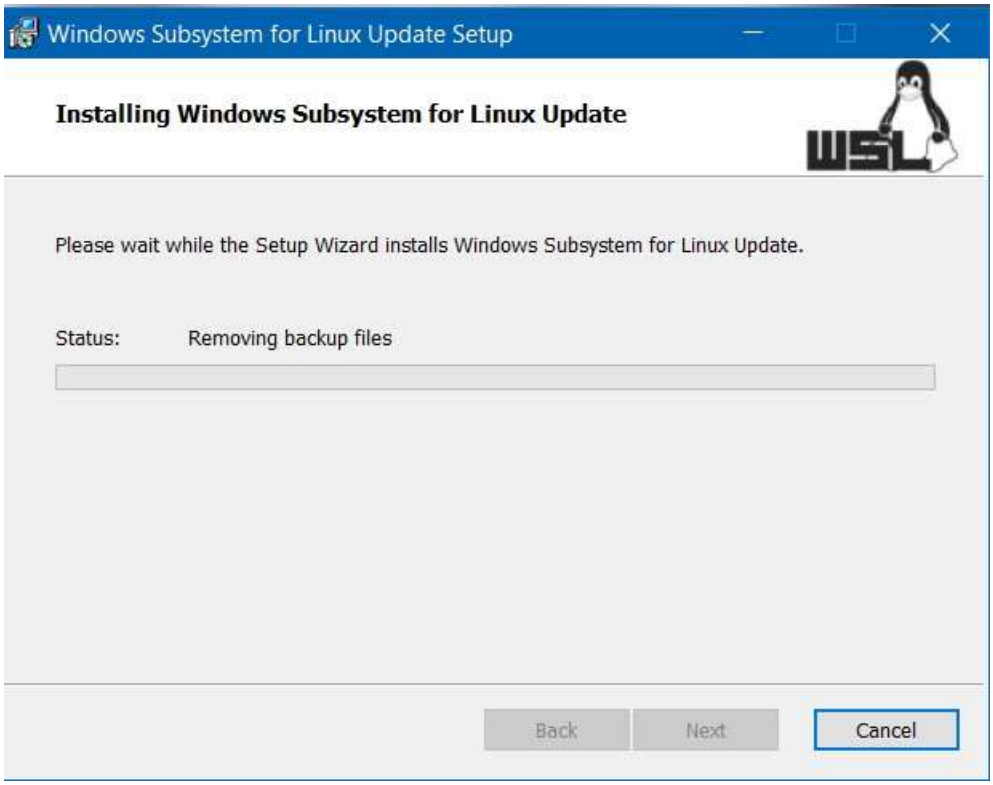
Once installed go to programs and features and click turn on windows features on or off

Scroll to the bottom and select windows subsystem for Linux



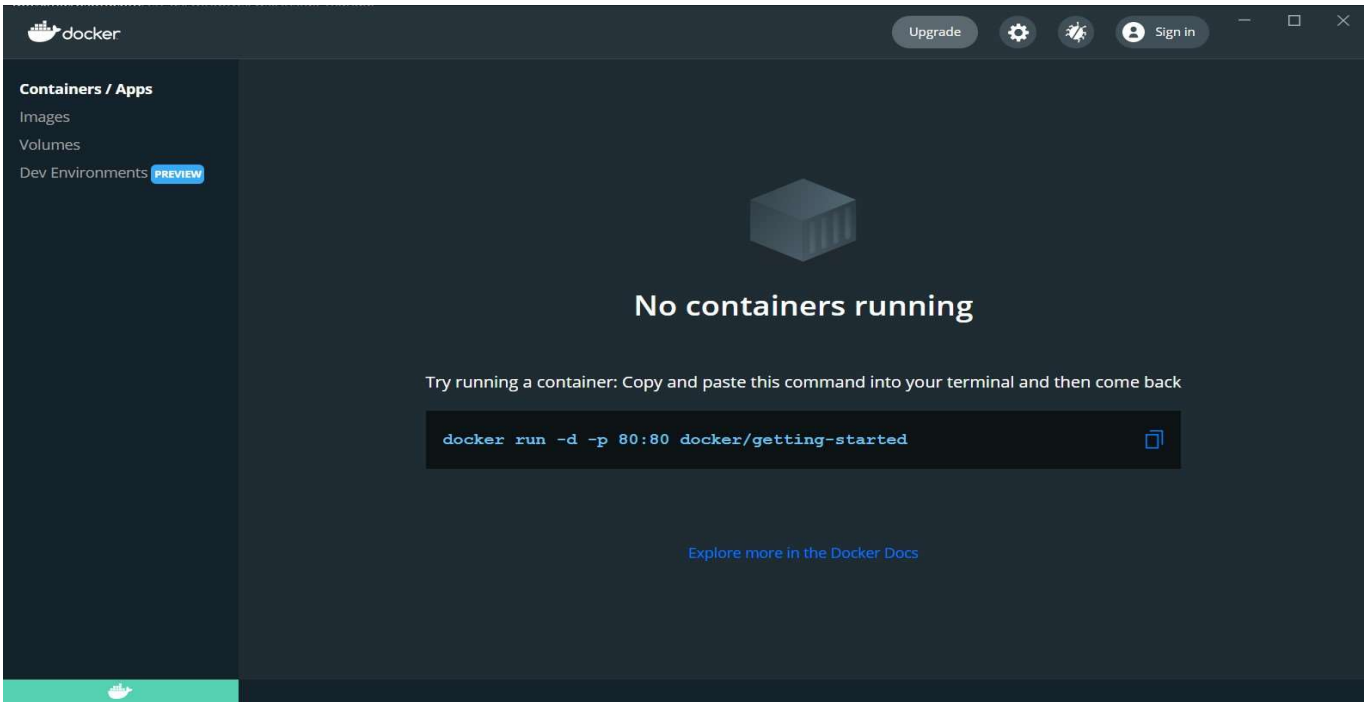
Step-IV

If any WSL 2 error occurs download windows subsystem for linux update package and install the .exe file, after the installation restart the windows device.



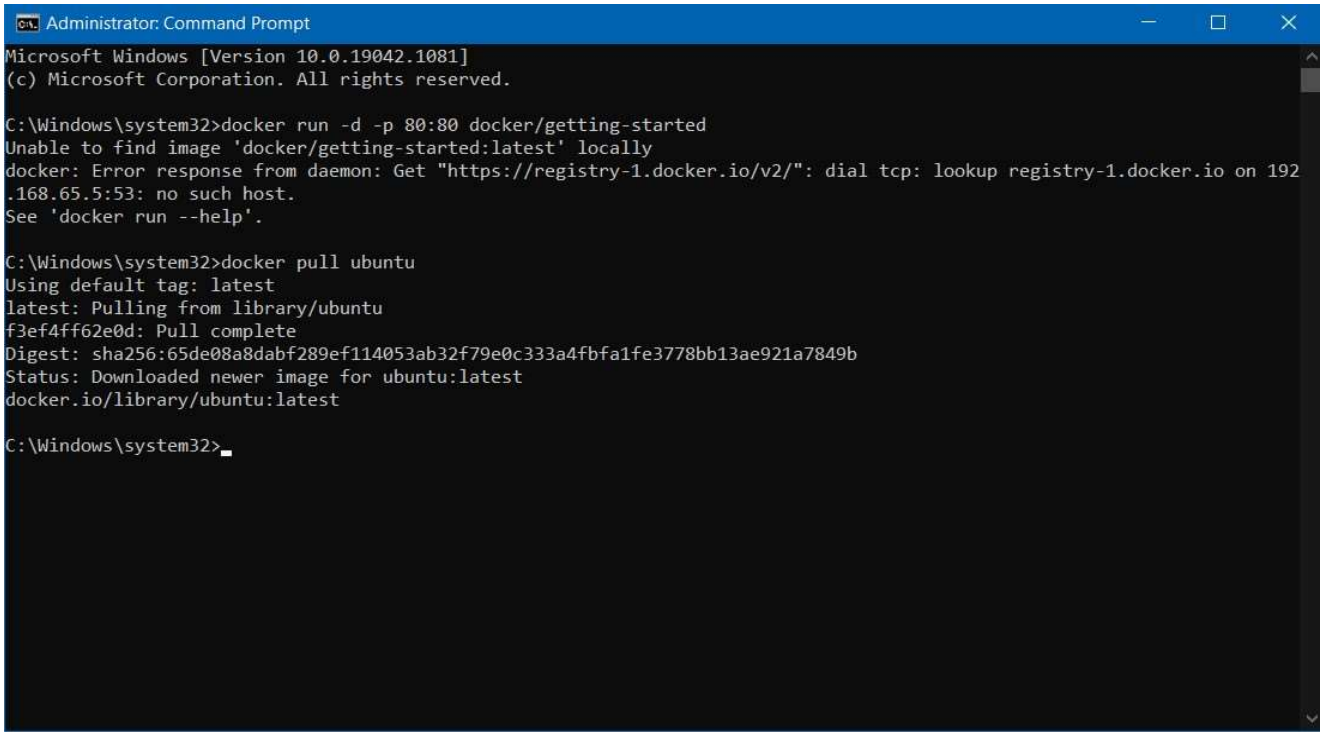
Step-V

Once installed, open the docker desktop app, and signin using the dockerID

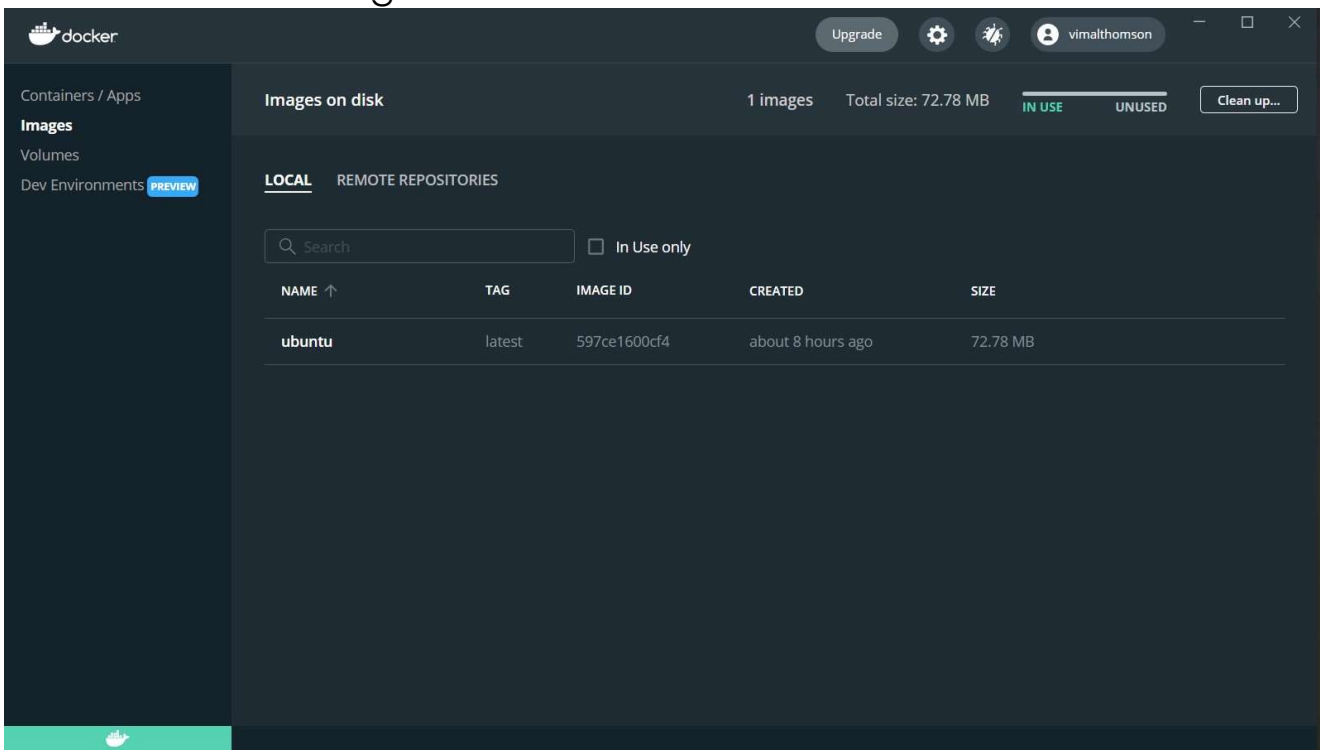


Step-VI

Now pull any image from docker hub using the docker pull command in the command prompt (eg: docker pull ubuntu)



Now in the images tab an image of ubuntu will be displayed, we can run the ubuntu instance using the cli.



ANALYZING NETWORK PACKET STREAM USING NC AND WIRESHARK

Wireshark installation

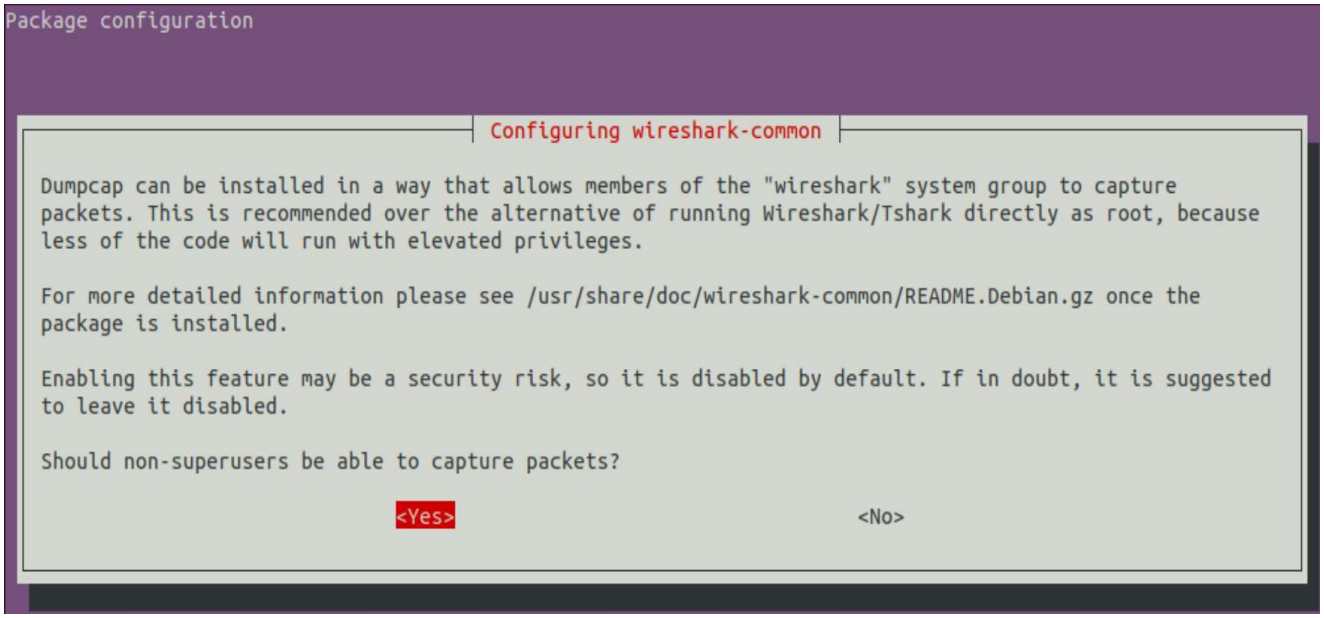
1. **Sudo apt-grt install wireshark**

```
root@kmabhijith-VirtualBox:~# sudo apt-get install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-5.11.0-27-generic linux-hwe-5.11-headers-5.11.0-27 linux-image-5.11.0-27-generic
  linux-modules-5.11.0-27-generic linux-modules-extra-5.11.0-27-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5
  libqt5multimedia5-plugins libqt5multimediagsttools5 libqt5multimediawidgets5 libqt5network5 libqt5op
  libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libssh-gcrypt-4 libwireshark-d
  libwireshark13 libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-l10n wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate geoip-database geoip-database-
  libjs-leaflet libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5
  libqt5multimedia5-plugins libqt5multimediagsttools5 libqt5multimediawidgets5 libqt5network5 libqt5op
  libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libssh-gcrypt-4 libwireshark-d
  libwireshark13 libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-l10n wireshark wireshark-common wireshark-qt
0 upgraded, 29 newly installed, 0 to remove and 181 not upgraded.
```

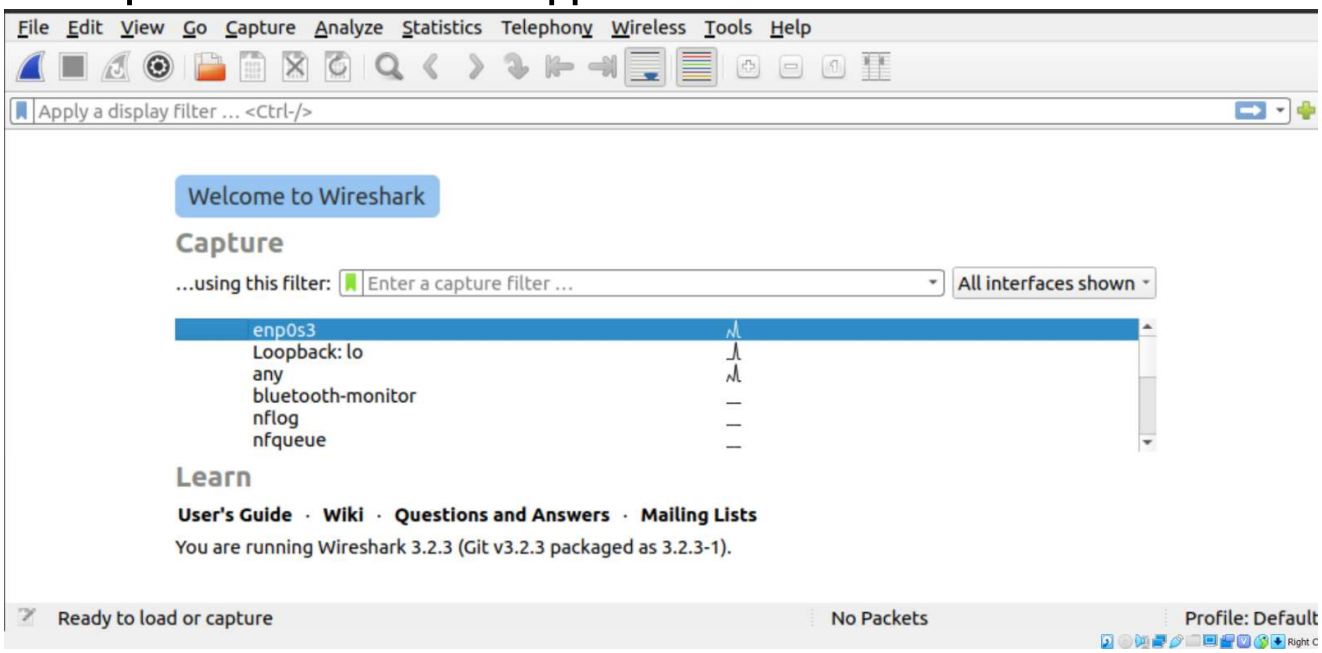
2. **sudo dkpg-reconfigure wireshark-common**

```
root@kmabhijith-VirtualBox:~# sudo dpkg-reconfigure wireshark-common
root@kmabhijith-VirtualBox:~#
```

3. Select Yes and press enter



4. Open wireshark from the applist



5. Analyzing network packet stream