

# **20MCA136 - NETWORKING & SYSTEM ADMINISTRATION LAB RECORD**

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## 1. Basic Linux Commands Explain Linux commands

**pwd,history,man,ls,cd,mkdir,rmdir,touch,rm,cat with Examples**

### Pwd

The pwd command to find out the path of the current working directory (folder) you're in. The command will return an absolute (full) path, which is basically a path of all the directories that starts with a forward slash (/).

```
ashish@ashish-VirtualBox:~$ pwd
/home/ashish
```

### History

History command is particularly useful if you want to review the commands you have entered before.

```
ashish@ashish-VirtualBox:~$ history
 1  cd
 2  cd..
 3  ls
 4  cd Desktop
 5  cd
 6  exit
 7  pwd
 8  history
 9  cd
10  clear
11  history
12  clear
13  pwd
14  history
```

### Man

Man command in Linux is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command.

```
ashish@ashish-VirtualBox:~/Desktop$ man touch
```

```

TOUCH(1)                                User Commands                                TOUCH(1)

NAME
    touch - change file timestamps

SYNOPSIS
    touch [OPTION]... FILE...

DESCRIPTION
    Update the access and modification times of each FILE to the current
    time.

    A FILE argument that does not exist is created empty, unless -c or -h
    is supplied.

    A FILE argument string of - is handled specially and causes touch to
    change the times of the file associated with standard output.

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

    -a      change only the access time

    -c, --no-create
            do not create any files

    -d, --date=STRING
            parse STRING and use it instead of current time
Manual page touch(1) line 1 (press h for help or q to quit)

```

## Cd

Linux cd command is used to change the current working directory ( i.e., in which the current user is working). The "cd" stands for 'change directory'.

## Ls

The ls command is used to view the contents of a directory. By default, this command will display the contents of your current working directory.

```

ashish@ashish-VirtualBox:~/Documents/cn_lab$ cd lab
ashish@ashish-VirtualBox:~/Documents/cn_lab/lab$ ls
lab1

```

## Mkdir

mkdir command in Linux allows the user to create directories

```

ashish@ashish-VirtualBox:~/Documents$ mkdir cn_lab
ashish@ashish-VirtualBox:~/Documents$ ls
cn_lab

```

## Rmdir

rmdir command is used to remove empty directories from the filesystem in Linux. The rmdir command removes each and every directory specified in the command line only if these directories are empty.

```
ashish@ashish-VirtualBox:~/Documents/cn_lab/lab$ rmdir lab1
ashish@ashish-VirtualBox:~/Documents/cn_lab/lab$ ls
```

## Touch

The touch command allows you to create a blank new file through the Linux command line.

```
ashish@ashish-VirtualBox:~$ touch index.html
```



## Rm

The rm command is used to delete directories and the contents within them. If you only want to delete the directory

```
ashish@ashish-VirtualBox:~$ rm index.html
```

## Cat

cat (short for concatenate) is one of the most frequently used commands in Linux. It is used to list the contents of a file on the standard output stdout .

```
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat l2
ashish
hello
```

**cat > filename** creates a new file

```
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat >l3
good
cn lab
^C
```

**cat filename1 filename2>filename3** joins two files (1 and 2) and stores the output of them in a new file(3)

```
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat l2 l3 >l4
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat l4
ashish
hello
good
cn lab
happy
```

to convert a file to upper or lower case use

```
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat l4 |tr a-z A-Z >output.txt
ashish@ashish-VirtualBox:~/Documents/cn_lab$ ls output.txt
output.txt
ashish@ashish-VirtualBox:~/Documents/cn_lab$ cat output.txt
ASHISH
HELLO
GOOD
CN LAB
HAPPY
```

### Echo

- echo command is used to move some data into a file.

```
ashish@ashish-VirtualBox:~$ echo hello how are you? >>sam.txt
ashish@ashish-VirtualBox:~$ cat sam.txt
hello how are you?
```

### Head

- The head command is used to view the first lines of any text file.

```
ashish@ashish-VirtualBox:~/Documents$ head /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
```

### Tail

- This one has a similar function to the head command, but instead of showing the first lines, the tail command will display the last ten lines of a text file.

```
ashish@ashish-VirtualBox:~/Documents$ tail /etc/passwd
nm-openvpn:x:118:124:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbi
n/nologin
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/sbin/n
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
ashish:x:1000:1000:ashish,,,:/home/ashish:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:./usr/sbin/nologin
```



## Read

- read the contents of a line into a variable.
- The read command can be used with and without arguments

```
ashish@ashish-VirtualBox:~$ read v1 v2 v3
hi ashish wilson
ashish@ashish-VirtualBox:~$ echo "[$v1] [$v2] [$v3]"
[hi] [ashish] [wilson]
```

## More

- Like cat command, more command displays the content of a 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

```
ashish@ashish-VirtualBox:~$ more sam.txt
hello how are you?
```

## Less

- The 'less' command is same as 'more' command but include some more features.

```
ashish@ashish-VirtualBox:~$ less /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:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
```

## Cut

- The cut command is used for cutting out the sections from each line of files and writing the result to standard output.

```
ashish@ashish-VirtualBox:~$ cut -b 1,2 sam.txt
he
```

### Paste

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

```
ashish@ashish-VirtualBox:~$ paste sam.txt h.txt
hello how are you?
```

### Uname

- The uname command, short for Unix Name, will print detailed information about your Linux system like the machine name, operating system, kernel, and so on

```
ashish@ashish-VirtualBox:~$ uname
Linux
ashish@ashish-VirtualBox:~$ uname -r
5.8.0-53-generic
```

### Cp

- cp command is 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 files' mode, ownership and timestamp.
- 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.

```
ashish@ashish-VirtualBox:~/Documents$ cp q1.txt q2.txt
ashish@ashish-VirtualBox:~/Documents$ cat q2.txt
ashish
ashish@ashish-VirtualBox:~/Documents$ cat q1.txt
ashish
ashish@ashish-VirtualBox:~/Documents$ cp -i q1.txt q2.txt
cp: overwrite 'q2.txt'? y
ashish@ashish-VirtualBox:~/Documents$ cp -r q1.txt q2.txt
ashish@ashish-VirtualBox:~/Documents$ cp -p q1.txt q2.txt
ashish@ashish-VirtualBox:~/Documents$ cp -u q1.txt q2.txt
ashish@ashish-VirtualBox:~/Documents$
```

### Mv

- The primary use of the mv command is to move files, it can also be used to rename files.

```
ashish@ashish-VirtualBox:~/Documents$ mv q1.txt /home/ashish/Desktop/
```

```
ashish@ashish-VirtualBox:~$ ls Desktop/  
q1.txt
```

### Locate

- To locate a file, just like the search command in Windows
- locate -i filename (make it case insensitive you can search file if you don't remember its exact name)

```
ashish@ashish-VirtualBox:~$ locate q1.txt  
/home/ashish/Desktop/q1.txt  
ashish@ashish-VirtualBox:~$ locate -i where  
/snap/core18/1988/usr/bin/whereis  
/snap/core18/1988/usr/share/bash-completion/completions/whereis  
/snap/core18/2066/usr/bin/whereis  
/snap/core18/2066/usr/share/bash-completion/completions/whereis  
/usr/bin/whereis  
/usr/lib/modules/5.8.0-43-generic/kernel/drivers/media/rc/keymaps/rc-msi-tvanyw  
here-plus.ko  
/usr/lib/modules/5.8.0-43-generic/kernel/drivers/media/rc/keymaps/rc-msi-tvanyw  
here.ko  
/usr/lib/modules/5.8.0-53-generic/kernel/drivers/media/rc/keymaps/rc-msi-tvanyw  
here-plus.ko  
/usr/lib/modules/5.8.0-53-generic/kernel/drivers/media/rc/keymaps/rc-msi-tvanyw  
here.ko  
/usr/share/bash-completion/completions/whereis  
/usr/share/cups/ippool/ipp-everywhere.test  
/usr/share/help/C/gnome-help/backup-where.page  
/usr/share/help/C/orca/commands_where_am_i.page  
/usr/share/help/C/orca/howto_whereami.page
```

### Find

- Similar to the locate command, using find also searches for files and directories.

```
ashish@ashish-VirtualBox:~/Documents$ find q2.txt  
q2.txt
```

### Grep

- It lets you search through all the text in a given file

```
ashish@ashish-VirtualBox:~/Documents$ grep blue q1.txt  
blue black
```

### Df

- Use df command to get a report on the system's disk space usage, shown in percentage and KBS



```
ashish@ashish-VirtualBox:~/Documents$ df -m
Filesystem      1M-blocks    Used Available Use% Mounted on
udev              462         0        462   0% /dev
tmpfs             99          2         97   2% /run
/dev/sda5        9509       7242       1765  81% /
tmpfs            491         0        491   0% /dev/shm
tmpfs             5          1          5   1% /run/lock
tmpfs            491         0        491   0% /sys/fs/cgroup
Ubuntu Software  56          56          0 100% /snap/core18/2066
/dev/loop1       56          56          0 100% /snap/core18/1988
/dev/loop0       56          56          0 100% /snap/gnome-3-34-1804/72
/dev/loop3       219        219          0 100% /snap/gnome-3-34-1804/66
/dev/loop2       219        219          0 100% /snap/gtk-common-themes/1514
/dev/loop4       65          65          0 100% /snap/gtk-common-themes/1515
/dev/loop5       66          66          0 100% /snap/snap-store/542
/dev/loop6       51          51          0 100% /snap/snap-store/547
/dev/loop7       51          51          0 100% /snap/snapd/12057
/dev/loop8       33          33          0 100% /snap/snapd/12159
/dev/sda1        511         1        511   1% /boot/efi
tmpfs Applications 99          1         99   1% /run/user/1000
```

### Du

- check how much space a file or a directory takes

```
ashish@ashish-VirtualBox:~/Documents$ du -h
20K    ./cn_lab
32K    .
```

### Useradd

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

```
ashish@ashish-VirtualBox:~$ sudo useradd sam
[sudo] password for ashish:
```

### Userdel

- Remove a user is very similar to adding a new user.

```
ashish@ashish-VirtualBox:~$ sudo userdel sam
```

### Sudo

- Short for “SuperUser Do”, this command enables you to perform tasks that require administrative or root permissions.

```
ashish@ashish-VirtualBox:~$ sudo useradd maria
```

### Passwd

- Changes passwords for user accounts

```
ashish@ashish-VirtualBox:~$ sudo passwd ashish
New password:
Retype new password:
passwd: password updated successfully
```

### usermod

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

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -u 3000 ashis
ashish@ashish-VirtualBox:~/Desktop$ id ashis
uid=3000(ashis) gid=1004(ashis) groups=1004(ashis)
```

### Groupadd

- Groupadd command creates a new group account using the values specified on the command line and the default values from the system.

```
ashish@ashish-VirtualBox:~/Desktop$ sudo groupadd student
[sudo] password for ashish:
ashish@ashish-VirtualBox:~/Desktop$
```

### Groups

- print the groups a user

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G student ashis
[sudo] password for ashish:
ashish@ashish-VirtualBox:~/Desktop$ groups ashis
ashis : ashis student
```

### groupdel

- groupdel command modifies the system account files, deleting all entries that refer to group. The named group must exist

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G tree,plant,flower ashis
ashish@ashish-VirtualBox:~/Desktop$ groups ashis
ashis : student tree plant flower
ashish@ashish-VirtualBox:~/Desktop$ sudo groupdel flower
ashish@ashish-VirtualBox:~/Desktop$ groups ashis
ashis : student tree plant
```

### groupmod

- The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group datab

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G tree,plant,flower ashis
ashish@ashish-VirtualBox:~/Desktop$ groups ashis
ashis : student tree plant flower
```

## chmod

- To change directory permissions of file/ Directory in Linux. #chmod whowhatwhich file/directory

```
ashish@ashish-VirtualBox:~/Desktop$ mkdir Books
ashish@ashish-VirtualBox:~/Desktop$ ls -ld Books
drwxrwxr-x 2 ashish ashish 4096 Aug  6 09:57 Books
ashish@ashish-VirtualBox:~/Desktop$ chmod g-w Books
ashish@ashish-VirtualBox:~/Desktop$ ls -ld Books
drwxr-xr-x 2 ashish ashish 4096 Aug  6 09:57 Books
ashish@ashish-VirtualBox:~/Desktop$ chmod o+w Books
ashish@ashish-VirtualBox:~/Desktop$ ls -ld Books
drwxr-xrwx 2 ashish ashish 4096 Aug  6 09:57 Books
ashish@ashish-VirtualBox:~/Desktop$
```

## Chown

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

```
ashish@ashish-VirtualBox:~/Desktop$ sudo chown ashis q1.txt
ashish@ashish-VirtualBox:~/Desktop$ ls -ld q1.txt
-rw-rw-r-- 1 ashis ashish 7 Jun 15 15:26 q1.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.

```
ashish@ashish-VirtualBox:~/Desktop$ id ashis
uid=3000(ashis) gid=1002(student) groups=1002(student),1005(tree),1006(plant)
```

## 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.

```
ashish@ashish-VirtualBox:~/Desktop$ ps
  PID TTY          TIME CMD
 1984 pts/0        00:00:00 bash
 3868 pts/0        00:00:00 ps
ashish@ashish-VirtualBox:~/Desktop$ ps -a
  PID TTY          TIME CMD
  776 tty2        00:00:13 Xorg
  869 tty2        00:00:00 gnome-session-b
 3869 pts/0        00:00:00 ps
```



**top**

- top command is used to show the Linux processes. It provides a dynamic real-time view of the running system

```
ashish@ashish-VirtualBox:~/Desktop$ top -u ashis
```

```
top - 12:06:58 up 2:40, 1 user, load average: 0.00, 0.00, 0.03
Tasks: 164 total, 1 running, 163 sleeping, 0 stopped, 0 zombie
%Cpu(s): 3.0 us, 0.7 sy, 0.0 ni, 96.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 980.8 total, 84.3 free, 490.5 used, 406.0 buff/cache
MiB Swap: 448.5 total, 293.1 free, 155.4 used, 341.8 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
-----	------	----	----	------	-----	-----	---	------	------	-------	---------

**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.

```
ashish@ashish-VirtualBox:~/Desktop$ cat >> class1.txt
```

```
ashish
wilson
anu
joy
^Z
```

```
[2]+ Stopped cat >> class1.txt
```

```
ashish@ashish-VirtualBox:~/Desktop$ wc class1.txt
```

```
4 4 22 class1.txt
```

```
ashish@ashish-VirtualBox:~/Desktop$ wc class1.txt class.txt
```

```
6 8 50 class1.txt
```

```
4 2 16 class.txt
```

```
10 10 66 total
```

**tar(create, extract using gzip, xz, bzip2)**

- 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

```
ashish@ashish-VirtualBox:~/Desktop$ tar cf all.tar class.txt class1.txt q1.txt
```

```
ashish@ashish-VirtualBox:~/Desktop$ ls
```

```
all.tar class1.txt class.txt q1.txt
```

```
ashish@ashish-VirtualBox:~/Desktop/allfloder$ tar xf /home/ashish/Desktop/all.t
ar
```



## Create Bzip2(bz2) & gzip(gz)

```
ashish@ashish-VirtualBox:~/Desktop$ sudo tar czf mca.tar.gz /etc/
[sudo] password for ashish:
tar: Removing leading `/' from member names
ashish@ashish-VirtualBox:~/Desktop$ sudo tar cjf mcareg.tar.bzz /etc/
tar: Removing leading `/' from member names
ashish@ashish-VirtualBox:~/Desktop$ ls
allfloder  root  class.txt  mca.tar.gz
all.tar    class1.txt  mcareg.tar.bzz  q1.txt
ashish@ashish-VirtualBox:~/Desktop$ sudo tar cjf mcareg.tar.bz2 /etc/
tar: Removing leading `/' from member names
ashish@ashish-VirtualBox:~/Desktop$ ls
allfloder  root  class.txt  mcareg.tar.bzz  q1.txt
all.tar    class1.txt  mcareg.tar.bz2  mca.tar.gz
ashish@ashish-VirtualBox:~/Desktop$
```

## Extract Bzip2

```
ashish@ashish-VirtualBox:~/backup1$ sudo tar xjf ~/mcareg.tar.bz2
ashish@ashish-VirtualBox:~/backup1$ ls
etc
```

## Extract gz

```
ashish@ashish-VirtualBox:~/Desktop/ash$ sudo tar xzf /home/ashish/Desktop/mca.t
ar.gz
ashish@ashish-VirtualBox:~/Desktop/ash$ ls
etc
```

## Create Xz

```
ashish@ashish-VirtualBox:~/Desktop$ sudo tar cjf mca.tar.xz /etc
[sudo] password for ashish:
tar: Removing leading `/' from member names
ashish@ashish-VirtualBox:~/Desktop$ ls
etc  mca.tar.xz  root  root.pub
```

## Extract Xz

```
ashish@ashish-VirtualBox:~/Desktop/backup$ sudo tar xjf ~/Desktop/mca.tar.xz
ashish@ashish-VirtualBox:~/Desktop/backup$ ls
etc
```

## 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.

```
ashish@ashish-VirtualBox:~/Desktop/ash$ expr 10 + 12
22
```

### 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.

```
ashish@ashish-VirtualBox:~/Desktop$ ls -l
total 4312
drwxrwxr-x  2 ashish ashish  4096 Aug  6 15:07 allfloder
-rw-rw-r--  1 ashish ashish 10240 Aug  6 14:58 all.tar
drwxrwxr-x  3 ashish ashish  4096 Aug  6 15:23 ash
drwxr-xrwx  2 ashish ashish  4096 Aug  6 09:57 Books
-rw-rw-r--  1 ashish ashish   50 Aug  6 14:45 class1.txt
-rw-rw-r--  1 ashish ashish   16 Aug  6 14:44 class.txt
drwxr-xr-x 129 root   root   12288 Aug  6 09:50 etc
-rw-r--r--  1 root   root  1043016 Aug  6 15:20 mcareg1.tar.xz
-rw-r--r--  1 root   root  1043016 Aug  6 15:16 mcareg.tar.bz2
-rw-r--r--  1 root   root  1043016 Aug  6 15:16 mcareg.tar.bzz
-rw-r--r--  1 root   root  1229546 Aug  6 15:15 mca.tar.gz
-rw-rw-r--  1 ashis  ashish    7 Jun 15 15:26 q1.txt
ashish@ashish-VirtualBox:~/Desktop$ ls -l | wc -l
13
ashish@ashish-VirtualBox:~/Desktop$ cat /etc/passwd | head -5
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
```

### 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.

```
ashish@ashish-VirtualBox:~/Desktop$ ssh
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]
```

### 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.

```
ashish@ashish-VirtualBox:~/Desktop$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ashish/.ssh/id_rsa): root
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Passphrases do not match. Try again.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in root
Your public key has been saved in root.pub
The key fingerprint is:
SHA256:qapqan9ANaH6+epdETQrD166CrLJpB5czhAZTeD2TC8 ashish@ashish-VirtualBox
The key's randomart image is:
+---[RSA 3072]-----+
|  o+.  ..o          |
| . o..o. o          |
| = o.o.+           |
| . *.o * ..        |
| o.E + oS          |
| . *.o ...         |
| .= =...          |
| ==o +o.          |
| @++*+o           |
+---[SHA256]-----+
```

### 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.

### 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



1.a. Create six files with name of the form songX.mp3

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ touch song1.mp3 song2.mp3 song3.mp3
song4.mp3 song5.mp3 song6.mp3
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
```

1.b. Create six files with name of the form snapX.mp3

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ touch snap1.mp3 snap2.mp3 snap3.mp3
snap4.mp3 snap5.mp3 snap6.mp3
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
snap1.mp3 snap3.mp3 snap5.mp3 song1.mp3 song3.mp3 song5.mp3
snap2.mp3 snap4.mp3 snap6.mp3 song2.mp3 song4.mp3 song6.mp3
```

1.c. Create six files with name of the form filmX.mp3

(In each set, replace X with the numbers 1 through 6)

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ touch film1.mp3 film2.mp3 film3.mp3
film4.mp3 film5.mp3 film6.mp3
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
film1.mp3 film4.mp3 snap1.mp3 snap4.mp3 song1.mp3 song4.mp3
film2.mp3 film5.mp3 snap2.mp3 snap5.mp3 song2.mp3 song5.mp3
film3.mp3 film6.mp3 snap3.mp3 snap6.mp3 song3.mp3 song6.mp3
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mkdir music
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mkdir pictures
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mkdir video

ashish@ashish-VirtualBox:~/Desktop/cn_act$ mv song1.mp3 song2.mp3 song3.mp3 so
ng4.mp3 song5.mp3 song6.mp3 music
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
film1.mp3 film4.mp3 music snap2.mp3 snap5.mp3
film2.mp3 film5.mp3 pictures snap3.mp3 snap6.mp3
film3.mp3 film6.mp3 snap1.mp3 snap4.mp3 video
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mv snap1.mp3 snap2.mp3 snap3.mp3 sn
ap4.mp3 snap5.mp3 snap6.mp3 pictures
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mv film1.mp3 film2.mp3 film3.mp3 fi
lm4.mp3 film5.mp3 film6.mp3 video
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
music pictures video
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ mkdir friends family work
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
family friends music pictures video work
```



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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act/friends$ cp ../music/song1.mp3 ../music/song2.mp3 ../music/song3.mp3 ../music/song4.mp3 ../music/song5.mp3 ../music/song6.mp3 .
ashish@ashish-VirtualBox:~/Desktop/cn_act/friends$ ls
song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
ashish@ashish-VirtualBox:~/Desktop/cn_act$ cd family/
ashish@ashish-VirtualBox:~/Desktop/cn_act/family$ cp ../pictures/snap1.mp3 ../pictures/snap2.mp3 ../pictures/snap3.mp3 ../pictures/snap4.mp3 ../pictures/snap5.mp3 ../pictures/snap6.mp3 .
ashish@ashish-VirtualBox:~/Desktop/cn_act/family$ ls
snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ rmdir family friends/
rmdir: failed to remove 'family': Directory not empty
rmdir: failed to remove 'friends/': Directory not empty
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ rm -r family friends
ashish@ashish-VirtualBox:~/Desktop/cn_act$ ls
music pictures video work
```

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

```
ashish@ashish-VirtualBox:~/Desktop$ cd
ashish@ashish-VirtualBox:~$ ls -al>allfiles.txt
ashish@ashish-VirtualBox:~$ cat allfiles.txt
total 4400
drwxr-xr-x 21 ashish ashish 4096 Aug 17 18:29 .
drwxr-xr-x 3 root root 4096 Jun 1 16:02 ..
-rw-rw-r-- 1 ashish ashish 0 Aug 17 18:29 allfiles.txt
drwxrwxr-x 2 ashish ashish 4096 Aug 6 15:07 allfolder
-rw-rw-r-- 1 ashish ashish 10240 Aug 6 14:50 all.tar
drwxrwxr-x 3 ashish ashish 4096 Aug 6 15:23 ash
drwxrwxr-x 3 ashish ashish 4096 Aug 13 12:12 backup1
-rw-r----- 1 ashish ashish 8576 Aug 17 17:33 .bash_history
-rw-r--r-- 1 ashish ashish 220 Jun 1 16:02 .bash_logout
-rw-r--r-- 1 ashish ashish 3771 Jun 1 16:02 .bashrc
drwxr-xrwx 2 ashish ashish 4096 Aug 6 09:57 Books
drwx----- 10 ashish ashish 4096 Jun 21 19:21 .cache
-rw-rw-r-- 1 ashish ashish 50 Aug 6 14:45 class1.txt
-rw-rw-r-- 1 ashish ashish 16 Aug 6 14:44 class.txt
drwxrwxr-x 2 ashish ashish 4096 Jun 21 19:25 cn
drwx----- 15 ashish ashish 4096 Aug 6 12:06 .config
drwxr-xr-x 5 ashish ashish 4096 Aug 17 14:14 Desktop
drwxr-xr-x 3 ashish ashish 4096 Jun 21 19:26 Documents
drwxr-xr-x 2 ashish ashish 4096 Jun 1 16:23 Downloads
drwx----- 3 ashish ashish 4096 Aug 10 15:36 .gnupg
-rw-rw-r-- 1 ashish ashish 0 Jun 20 19:24 h.txt
drwx----- 3 ashish ashish 4096 Jun 1 16:22 .local
-rw-r--r-- 1 root root 1043016 Aug 6 15:20 ncareg1.tar.xz
-rw-r--r-- 1 root root 1043016 Aug 6 15:16 ncareg.tar.bz2
-rw-r--r-- 1 root root 1043016 Aug 6 15:16 ncareg.tar.bz2
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ date "+%A %B %d %Y"  
Tuesday August 17 2021
```

Add the user Juliet

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ sudo useradd Juliet  
[sudo] password for ashish:
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ cat /etc/passwd  
ashish:x:1234:1234:/home/ashish:/bin/bash  
mysql:x:127:134:MySQL Server,,,:/nonexistent:/bin/false  
Juliet:x:3001:3001::/home/Juliet:/bin/sh
```

Use the passwd command to initialize Juliet's password

```
ashish@ashish-VirtualBox:~/Desktop$ sudo passwd juliet  
New password:  
Retype new password:  
passwd: password updated successfully
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ sudo groupadd -g 30000 Shakespeare
```

Create a supplementary group called artists.

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ sudo groupadd artists
```

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

```
ashish@ashish-VirtualBox:~/Desktop/cn_act$ less /etc/group  
Shakespeare:x:30000:  
artists:x:30001:
```

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

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G shakespeare juliet
```

Confirm that Juliet has been added using the id command.

```
ashish@ashish-VirtualBox:~/Desktop$ id juliet  
uid=30002(juliet) gid=30002(juliet) groups=30002(juliet),30000(shakespeare)
```

Add Romeo and Hamlet to the Shakespeare group.

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G shakespeare romeo
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G shakespeare hamlet
ashish@ashish-VirtualBox:~/Desktop$ id hamlet
uid=3004(hamlet) gid=3004(hamlet) groups=3004(hamlet),3000(shakespeare)
ashish@ashish-VirtualBox:~/Desktop$ id romeo
uid=3003(romeo) gid=3003(romeo) groups=3003(romeo),3000(shakespeare)
```

Add Reba, Dolly and Elvis to the artists group.

```
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G artist reba
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G artist dolly
ashish@ashish-VirtualBox:~/Desktop$ sudo usermod -G artist elvis
```

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

```
ashish@ashish-VirtualBox:~/Desktop$ tail -5 /etc/group
hamlet:x:3004:
reba:x:3005:
dolly:x:3006:
elvis:x:3007:
artist:x:30002:reba,dolly,elvis
```

Attempt to remove user Dolly.

```
ashish@ashish-VirtualBox:~/Desktop$ sudo userdel dolly
```

2. Try out these network commands in Windows as well as in Linux and perform at least 4 options with each command: ping route traceroute, nslookup, Ip Config, NetStat.

## WINDOWS

### ping

```
C:\WINDOWS\system32>ping www.google.com

Pinging www.google.com [142.250.77.164] with 32 bytes of data:
Reply from 142.250.77.164: bytes=32 time=18ms TTL=119
Reply from 142.250.77.164: bytes=32 time=18ms TTL=119
Reply from 142.250.77.164: bytes=32 time=18ms TTL=119
Reply from 142.250.77.164: bytes=32 time=18ms TTL=119

Ping statistics for 142.250.77.164:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 18ms, Average = 18ms
```

```
C:\WINDOWS\system32>ping /t 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=30ms TTL=119
Reply from 8.8.8.8: bytes=32 time=25ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=24ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=22ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=21ms TTL=119
Reply from 8.8.8.8: bytes=32 time=20ms TTL=119
Reply from 8.8.8.8: bytes=32 time=22ms TTL=119

Ping statistics for 8.8.8.8:
    Packets: Sent = 22, Received = 22, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 20ms, Maximum = 30ms, Average = 21ms
Control-C
^C
C:\WINDOWS\system32>
```



## Route

```
C:\WINDOWS\system32>route print
=====
Interface list
3...00 92 5a c5 c3 6a .....Realtek PCIe FE Family Controller
6...0a 00 27 00 00 06 .....VirtualBox Host-Only Ethernet Adapter
1.....Software Loopback Interface 1
4...00 00 00 00 00 00 80 Microsoft iSBXAP Adapter
5...00 00 00 00 00 00 80 Microsoft iSBXAP Adapter #2
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          192.168.18.1      192.168.18.02     20
127.0.0.0                  255.0.0.0        On-link           127.0.0.1         306
127.0.0.1                  255.255.255.255  On-link           127.0.0.1         306
127.255.255.255           255.255.255.255  On-link           127.0.0.1         306
192.168.18.0               255.255.255.0    On-link           192.168.18.02     276
192.168.18.02              255.255.255.255  On-link           192.168.18.02     276
192.168.18.255             255.255.255.255  On-link           192.168.18.02     276
192.168.56.0               255.255.255.0    On-link           192.168.56.1      266
192.168.56.1               255.255.255.255  On-link           192.168.56.1      266
192.168.56.255             255.255.255.255  On-link           192.168.56.1      266
224.0.0.0                  240.0.0.0        On-link           127.0.0.1         306
224.0.0.8                  240.0.0.0        On-link           192.168.56.1      266
224.0.0.0                  240.0.0.0        On-link           192.168.18.02     276
255.255.255.255           255.255.255.255  On-link           127.0.0.1         306
255.255.255.255           255.255.255.255  On-link           192.168.56.1      266
255.255.255.255           255.255.255.255  On-link           192.168.18.02     276
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 306 ::1/128 On-link
6 266 fe80::/64 On-link
3 276 fe80::/64 On-link
6 266 fe80::938:51cb:206a:1961/128 On-link
3 276 fe80::20c6:c847:b32a:tc68a/128 On-link
1 306 ff00::/8 On-link
6 266 ff00::/8 On-link
3 276 ff00::/8 On-link
=====
Persistent Routes:
None
```

```
C:\WINDOWS\system32>route -n
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
[MASK netmask] [gateway] [METRIC metric] [IF interface]

-f          Clears the routing tables of all gateway entries. If this is
            used in conjunction with one of the commands, the tables are
            cleared prior to running the command.

-p          When used with the ADD command, makes a route persistent across
            boots of the system. By default, routes are not preserved
            when the system is restarted. Ignored for all other commands,
            which always affect the appropriate persistent routes.

-4          Force using IPv4.

-6          Force using IPv6.

command    One of these:
            PRINT      Prints a route
            ADD        Adds a route
            DELETE     Deletes a route
            CHANGE     Modifies an existing route

destination Specifies the host.
MASK          Specifies that the next parameter is the 'netmask' value.
netmask       Specifies a subnet mask value for this route entry.
            If not specified, it defaults to 255.255.255.255.
gateway       Specifies gateway.
interface     the interface number for the specified route.
METRIC        specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE, Destination or gateway can be a wildcard.
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.

Diagnostic Notes:
Invalid MASK generates an error, that is when <DEST & MASK> != DEST.
Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
The route addition failed: The specified mask parameter is invalid.
<Destination & Mask> != Destination.
```

```

C:\WINDOWS\system32>route -cn
Manipulates network routing tables.
ROUTE [-f] [-p] [-4|-6] command [destination]
      [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f          Clears the routing tables of all gateway entries. If this is
            used in conjunction with one of the commands, the tables are
            cleared prior to running the command.

-p          When used with the ADD command, makes a route persistent across
            boots of the system. By default, routes are not preserved
            when the system is restarted. Ignored for all other commands,
            which always affect the appropriate persistent routes.

-4          Force using IPv4.

-6          Force using IPv6.

command     One of these:
            PRINT      Prints a route
            ADD        Adds a route
            DELETE     Deletes a route
            CHANGE     Modifies an existing route

destination Specifies the host.
MASK          Specifies that the next parameter is the 'netmask' value.
netmask       Specifies a subnet mask value for this route entry.
            If not specified, it defaults to 255.255.255.255.
gateway       Specifies gateway.
interface     the interface number for the specified route.
METRIC        specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE, Destination or gateway can be a wildcard.
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.
Diagnostic Notes:
    Invalid MASK generates an error, that is when <DEST & MASK> != DEST.
    Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
    The route addition failed: The specified mask parameter is invalid.
    <Destination & Mask> != Destination.

Examples:
    > route PRINT
    > route PRINT -4

```

## tracert

```

C:\WINDOWS\system32>tracert google.com

Tracing route to google.com [142.250.196.46]
over a maximum of 30 hops:

  1  <1 ms    1 ms    1 ms    192.168.18.1
  2  5 ms     5 ms     6 ms    100.78.192.1
  3  16 ms    15 ms    25 ms    10.1.3.14
  4  16 ms    15 ms    16 ms    72.14.212.92
  5  20 ms    20 ms    19 ms    216.239.47.9
  6  15 ms    16 ms    15 ms    142.251.55.31
  7  15 ms    15 ms    15 ms    maa03s45-in-f14.1e100.net [142.250.196.46]

Trace complete.

```

```
C:\WINDOWS\system32>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
              [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d          Do not resolve addresses to hostnames.
    -h maximum_hops  Maximum number of hops to search for target.
    -j host-list  Loose source route along host-list (IPv4-only).
    -w timeout    Wait timeout milliseconds for each reply.
    -R          Trace round-trip path (IPv6-only).
    -S srcaddr    Source address to use (IPv6-only).
    -4          Force using IPv4.
    -6          Force using IPv6.
```

## nslookup

```
C:\WINDOWS\system32>nslookup
Default Server: UnKnown
Address: 192.168.18.1

>
> www.fb.com
Server: UnKnown
Address: 192.168.18.1

Non-authoritative answer:
Name:      star-mini.ci0r.facebook.com
Addresses: 2a03:2880:f137:182:face:b00c:0:25de
           157.240.192.35
Aliases:   www.fb.com
           www.facebook.com
```

```
C:\WINDOWS\system32>nslookup
Default Server: UnKnown
Address: 192.168.18.1
```

## ipconfig

```
C:\WINDOWS\system32>ipconfig /release

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::28c6:c847:b32e:c68a%3
    Default Gateway . . . . . : 

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::938:51cb:286c:1963%6
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

Tunnel adapter isatap.{49C72057-ECC6-46C0-BA6E-5E63196C4534}:

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

Tunnel adapter isatap.{7BD826CA-8525-4E57-BD0D-3B8C79C941E5}:

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

## NetStat

```

C:\WINDOWS\system32>netstat -r
=====
Interface List
3...b8 97 5a c5 e3 6a .....Realtek PCIe FE Family Controller
6...0a 00 27 00 00 06 .....VirtualBox Host-Only Ethernet Adapter
1.....Software Loopback Interface 1
4...00 00 00 00 00 00 e0 Microsoft i8011P Adapter
5...00 00 00 00 00 00 e0 Microsoft i8011P Adapter #2
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
127.0.0.0                  255.0.0.0        On-link           127.0.0.1         306
127.0.0.1                  255.255.255.255 On-link           127.0.0.1         306
127.255.255.255            255.255.255.255 On-link           127.0.0.1         306
169.254.198.138            255.255.255.255 On-link           169.254.198.138   276
169.254.198.138            255.255.255.255 On-link           169.254.198.138   276
169.254.255.255            255.255.255.255 On-link           169.254.198.138   276
192.168.56.1               255.255.255.0    On-link           192.168.56.1      266
192.168.56.1               255.255.255.255 On-link           192.168.56.1      266
192.168.56.255             255.255.255.255 On-link           192.168.56.1      266
224.0.0.0                  240.0.0.0        On-link           127.0.0.1         306
224.0.0.0                  240.0.0.0        On-link           192.168.56.1      266
224.0.0.0                  240.0.0.0        On-link           169.254.198.138   276
255.255.255.255            255.255.255.255 On-link           127.0.0.1         306
255.255.255.255            255.255.255.255 On-link           192.168.56.1      266
255.255.255.255            255.255.255.255 On-link           169.254.198.138   276
=====

Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 306 ::1/128 On-link
6 266 fe80::1/64 On-link
3 276 fe80::1/64 On-link
6 266 fe80::938:51cb:286c:1963/128 On-link
3 276 fe80::28c6:c047:b32e:c68a/128 On-link
1 306 ff00::8 On-link
6 266 ff00::8 On-link
3 276 ff00::8 On-link
=====

Persistent Routes:
None

```

```

C:\WINDOWS\system32>netstat -n
Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.18.82:3319     74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10178   74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10285   20.197.71.89:443       ESTABLISHED
TCP   192.168.18.82:12460   23.207.154.12:80       ESTABLISHED
TCP   192.168.18.82:12461   23.206.204.92:80       ESTABLISHED
TCP   192.168.18.82:14031   157.240.192.52:443     ESTABLISHED

```

```

C:\WINDOWS\system32>netstat -n 5
Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.18.82:3319     74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10178   74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10285   20.197.71.89:443       ESTABLISHED
TCP   192.168.18.82:12460   23.207.154.12:80       ESTABLISHED
TCP   192.168.18.82:12461   23.206.204.92:80       ESTABLISHED
TCP   192.168.18.82:14031   157.240.192.52:443     ESTABLISHED

Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.18.82:3319     74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10178   74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10285   20.197.71.89:443       ESTABLISHED
TCP   192.168.18.82:12460   23.207.154.12:80       ESTABLISHED
TCP   192.168.18.82:12461   23.206.204.92:80       ESTABLISHED
TCP   192.168.18.82:14031   157.240.192.52:443     ESTABLISHED

Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.18.82:3319     74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10178   74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10285   20.197.71.89:443       ESTABLISHED
TCP   192.168.18.82:12460   23.207.154.12:80       ESTABLISHED
TCP   192.168.18.82:12461   23.206.204.92:80       ESTABLISHED
TCP   192.168.18.82:14031   157.240.192.52:443     ESTABLISHED

Active Connections

Proto Local Address          Foreign Address         State
TCP   192.168.18.82:3319     74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10178   74.125.68.188:5228     ESTABLISHED
TCP   192.168.18.82:10285   20.197.71.89:443       ESTABLISHED
TCP   192.168.18.82:12460   23.207.154.12:80       ESTABLISHED
TCP   192.168.18.82:12461   23.206.204.92:80       ESTABLISHED
TCP   192.168.18.82:14031   157.240.192.52:443     ESTABLISHED

```



```
C:\WINDOWS\system32>netstat
```

#### Active Connections

Proto	Local Address	Foreign Address	State
TCP	192.168.18.82:3319	sc-in-f188:5228	ESTABLISHED
TCP	192.168.18.82:10178	sc-in-f188:5228	ESTABLISHED
TCP	192.168.18.82:10285	20.197.71.89:https	ESTABLISHED
TCP	192.168.18.82:12460	a23-207-154-12:http	ESTABLISHED
TCP	192.168.18.82:12461	a23-206-204-92:http	ESTABLISHED
TCP	192.168.18.82:14031	whatsapp-cdn-shv-02-maa2:https	ESTABLISHED

## LINUX

### Ping

```
ashish@ashish-VirtualBox:~/Desktop$ ping google.com
PING google.com (142.250.182.110) 56(84) bytes of data.
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=1 ttl=118 t
ime=19.7 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=2 ttl=118 t
ime=19.7 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=3 ttl=118 t
ime=19.8 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=4 ttl=118 t
ime=19.9 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=5 ttl=118 t
ime=20.0 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=6 ttl=118 t
ime=19.5 ms
64 bytes from maa05s21-in-f14.1e100.net (142.250.182.110): icmp_seq=7 ttl=118 t
ime=20.2 ms
```

```
ashish@ashish-VirtualBox:~/Desktop$ ping 0
PING 0 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.027 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.035 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.051 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.047 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.053 ms
^X64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.053 ms

64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.037 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.053 ms
```

```
ashish@ashish-VirtualBox:~/Desktop$ ping fb.com
PING fb.com (31.13.79.35) 56(84) bytes of data.
64 bytes from edge-star-mini-shv-02-bom1.facebook.com (31.13.79.35): icmp_seq=1
ttl=57 time=34.6 ms
64 bytes from edge-star-mini-shv-02-bom1.facebook.com (31.13.79.35): icmp_seq=2
ttl=57 time=35.4 ms
64 bytes from edge-star-mini-shv-02-bom1.facebook.com (31.13.79.35): icmp_seq=3
ttl=57 time=34.8 ms
^Z
[2]+  Stopped                  ping fb.com
```

```

ashish@ashish-VirtualBox:~/Desktop$ ping -c
ping: option requires an argument -- 'c'

Usage
  ping [options] <destination>

Options:
  <destination>      dns name or ip address
  -a                  use audible ping
  -A                  use adaptive ping
  -B                  sticky source address
  -c <count>          stop after <count> replies
  -D                  print timestamps
  -d                  use SO_DEBUG socket option
  -f                  flood ping
  -h                  print help and exit
  -I <interface>      either interface name or address
  -i <interval>        seconds between sending each packet
  -L                  suppress loopback of multicast packets
  -l <preload>         send <preload> number of packages while waiting replies
  -m <mark>           tag the packets going out
  -M <pmtud opt>       define mtu discovery, can be one of <do|dont|want>
  -n                  no dns name resolution
  -O                  report outstanding replies
  -p <pattern>         contents of padding byte
  -q                  quiet output

```

## Route

```

x25 (CCITT X.25)
ashish@ashish-VirtualBox:~/Desktop$ route
Kernel IP routing table
Destination    Gateway         Genmask         Flags Metric Ref    Use Iface
default        _gateway        0.0.0.0         UG    100    0      0 enp0s3
10.0.2.0       0.0.0.0         255.255.255.0   U     100    0      0 enp0s3
link-local     0.0.0.0         255.255.0.0     U     1000   0      0 enp0s3

```

```

ashish@ashish-VirtualBox:~/Desktop$ route -cn
route: invalid option -- 'c'
Usage: route [-nNvee] [-FC] [<AF>]
        route [-V] [-FC] {add|del|flush} ...  Modify routing table for AF.

        route {-h|--help} [<AF>]            Detailed usage syntax for specific
d AF.
        route {-V|--version}                Display version/author and exit.

        -v, --verbose                        be verbose
        -n, --numeric                        don't resolve names
        -e, --extend                        display other/more information
        -F, --fib                           display Forwarding Information Base (default)
        -C, --cache                         display routing cache instead of FIB

<AF>=Use -4, -6, '-A <af>' or '--<af>'; default: inet
List of possible address families (which support routing):
inet (DARPA Internet) inet6 (IPv6) ax25 (AMPR AX.25)
netrom (AMPR NET/ROM) ipx (Novell IPX) ddp (Appletalk DDP)
x25 (CCITT X.25)

```

## Traceroute

```

ashish@ashish-VirtualBox:~/Desktop$ traceroute www.fb.com
traceroute to www.fb.com (157.240.192.35), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  0.766 ms  0.713 ms  0.684 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *

```

## nslookup



```
ashish@ashish-VirtualBox:~/Desktop$ nslookup
> www.google.com
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
Name:   www.google.com
Address: 142.250.183.228
Name:   www.google.com
Address: 2404:6800:4007:81e::2004
```

```
ashish@ashish-VirtualBox:~/Desktop$ nslookup -type=mx 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 = 30 alt2.aspmx.l.google.com.
google.com      mail exchanger = 20 alt1.aspmx.l.google.com.
google.com      mail exchanger = 50 alt4.aspmx.l.google.com.
google.com      mail exchanger = 10 aspmx.l.google.com.

Authoritative answers can be found from:
```

```
ashish@ashish-VirtualBox:~/Desktop$ nslookup -type=txt google.com
;; Truncated, retrying in TCP mode.
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
google.com      text = "v=spf1 include:_spf.google.com ~all"
google.com      text = "globalsign-smime-dv=CDYX+XFHUw2wml6/Gb8+59BSH31KzUr6c1l
2BPvqKX8="
google.com      text = "MS=E4A68B9AB2BB9670BCE15412F62916164C0B20BB"
google.com      text = "google-site-verification=TV9-DBe4R80X4v0M4U_bd_J9cp0JM0
nikft0jAgjmsQ"
google.com      text = "facebook-domain-verification=22rm551cu4k0ab0bxsw536tlds
4h95"
google.com      text = "docuSign=1b0a6754-49b1-4db5-8540-d2c12664b289"
google.com      text = "apple-domain-verification=30afIBcvSuDV2PLX"
google.com      text = "docuSign=05958488-4752-4ef2-95eb-aa7ba8a3bd0e"
google.com      text = "google-site-verification=wD8N7i1JTNTkezJ49swvWW48f8_9xv
eREV4oB-0Hf5o"

Authoritative answers can be found from:
```

```
ashish@ashish-VirtualBox:~/Desktop$ nslookup -type=ns google.com
Server:          127.0.0.53
Address:         127.0.0.53#53

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

Authoritative answers can be found from:
```

## Ifconfig

```
ashish@ashish-VirtualBox:~/Desktop$ 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::30a8:2c95:65b6:ce0e prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:05:f2:7f txqueuelen 1000 (Ethernet)
    RX packets 4710 bytes 6486439 (6.4 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1800 bytes 123806 (123.8 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 216 bytes 18754 (18.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 216 bytes 18754 (18.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
ashish@ashish-VirtualBox:~/Desktop$ ifconfig -a
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::30a8:2c95:65b6:ce0e prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:05:f2:7f txqueuelen 1000 (Ethernet)
    RX packets 772 bytes 919996 (919.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 402 bytes 37925 (37.9 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 226 bytes 19728 (19.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 226 bytes 19728 (19.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```



```
ashish@ashish-VirtualBox:~/Desktop$ ifconfig -s
```

Iface	MTU	RX-OK	RX-ERR	RX-DRP	RX-OVR	TX-OK	TX-ERR	TX-DRP	TX-OVR	Flg
enp0s3	1500	772	0	0	0	402	0	0	0	BMRU
lo	65536	226	0	0	0	226	0	0	0	LRU

```
ashish@ashish-VirtualBox:~/Desktop$ ifconfig -help
Usage:
  ifconfig [-a] [-v] [-s] <interface> [[<AF>] <address>]
  [add <address>[/<prefixlen>]]
  [del <address>[/<prefixlen>]]
  [[-]broadcast <address>]] [[-]pointopoint <address>]]
  [netmask <address>] [dstaddr <address>] [tunnel <address>]
  [outfill <NN>] [keepalive <NN>]
  [hw <HW> <address>] [mtu <NN>]
  [[-]trailers] [[-]arp] [[-]allmulti]
  [multicast] [[-]promisc]
  [mem_start <NN>] [io_addr <NN>] [irq <NN>] [media <type>]
  [txqueuelen <NN>]
  [[-]dynamic]
  [up|down] ...
```

## netstat

```
ashish@ashish-VirtualBox:~/Desktop$ netstat -r
```

Destination	Gateway	Genmask	Flags	MSS	Window	irrt	Iface
default	_gateway	0.0.0.0	UG	0	0	0	enp0s3
10.0.2.0	0.0.0.0	255.255.255.0	U	0	0	0	enp0s3
link-local	0.0.0.0	255.255.0.0	U	0	0	0	enp0s3

```
ashish@ashish-VirtualBox:~/Desktop$ netstat -t
```

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
-------	--------	--------	---------------	-----------------	-------

```
ashish@ashish-VirtualBox:~/Desktop$ netstat -s
```

Ip:

- Forwarding: 2
- 583 total packets received
- 1 with invalid addresses
- 0 forwarded
- 0 incoming packets discarded
- 580 incoming packets delivered
- 576 requests sent out
- 20 outgoing packets dropped

Icmp:

- 62 ICMP messages received
- 0 input ICMP message failed
- ICMP input histogram:

  - destination unreachable: 40
  - echo requests: 9
  - echo replies: 13

- 75 ICMP messages sent
- 0 ICMP messages failed
- ICMP output histogram:

  - destination unreachable: 40
  - echo requests: 26
  - echo replies: 9

IcmpMsg:

- InType0: 13
- InType3: 40
- InType8: 9
- OutType0: 9
- OutType3: 40

## 1. Identify and perform 5 more network commands and it's working.

### 1. Hostname Command

A very simple command that displays the host name of your machine.

#### Windows

```
C:\WINDOWS\system32>hostname
HOME
```

#### Linux

```
ashish@ashish-VirtualBox:~/Desktop$ hostname
ashish-VirtualBox
```

### 2. getmac Command

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

```
C:\WINDOWS\system32>getmac

Physical Address      Transport Name
=====
B8-97-5A-C5-C3-6A    \Device\Tcpip_{49C72057-ECC6-46C0-BA6E-5E63196C4534}
0A-00-27-00-00-06    \Device\Tcpip_{7BD826CA-8525-4E57-BD0D-3B8C79C941E5}
```

### 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.

#### Windows

```
C:\WINDOWS\system32>arp -a

Interface: 192.168.10.02 --- Bc3
Internet Address      Physical Address      Type
-----
192.168.10.1          08-3f-95-9b-00-01    dynamic
192.168.10.255        ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-00    static
224.0.0.251           01-00-5e-00-00-00    static
224.0.0.252           01-00-5e-00-00-00    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 --- Bc3
Internet Address      Physical Address      Type
-----
192.168.56.255        01-00-5e-00-00-00    static
224.0.0.22            01-00-5e-00-00-00    static
224.0.0.251           01-00-5e-00-00-00    static
224.0.0.252           01-00-5e-00-00-00    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static
```



## Linux

```
ashish@ashish-VirtualBox:~/Desktop$ arp -a
_gateway (10.0.2.2) at 52:54:00:12:35:02 [ether] on enp0s3
```

## 4.TaskKill Command

View a list of running tasks using the **tasklist** command and kill them by name or processor ID using the **taskKill** command.

```
C:\WINDOWS\system32>tasklist
```

Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	0	Services	0	4 K
System	4	Services	0	2,004 K
smss.exe	304	Services	0	724 K
csrss.exe	456	Services	0	3,108 K
wininit.exe	520	Services	0	2,648 K
services.exe	612	Services	0	4,268 K
lsass.exe	628	Services	0	2,952 K
svchost.exe	684	Services	0	2,692 K
svchost.exe	716	Services	0	6,796 K
svchost.exe	816	Services	0	11,336 K
svchost.exe	872	Services	0	57,788 K
svchost.exe	888	Services	0	21,784 K
svchost.exe	912	Services	0	9,676 K
svchost.exe	512	Services	0	15,808 K
spoolsv.exe	1040	Services	0	6,496 K
svchost.exe	1108	Services	0	13,700 K
armasmc.exe	1220	Services	0	3,296 K
svchost.exe	1248	Services	0	2,728 K
TeamViewer_Service.exe	1720	Services	0	8,884 K
SearchIndexer.exe	2528	Services	0	15,620 K
svchost.exe	2760	Services	0	2,572 K
svchost.exe	2048	Services	0	3,712 K
GoogleCrashHandler.exe	2560	Services	0	0 K
GoogleCrashHandler64.exe	2584	Services	0	4 K
csrss.exe	5172	Console	4	34,092 K
winlogon.exe	4792	Console	4	4,700 K
dmv.exe	2272	Console	4	22,788 K
taskhost.exe	3676	Console	4	9,144 K
explorer.exe	3304	Console	4	74,848 K
igmpxray.exe	2900	Console	4	4,916 K
hkcmd.exe	3352	Console	4	4,700 K
igmpxray.exe	1884	Console	4	6,484 K
RunCp164.exe	4980	Console	4	6,892 K
ijlcam.exe	2256	Console	4	13,576 K
lsass.exe	5168	Console	4	2,592 K
chrome.exe	1464	Console	4	244,248 K
chrome.exe	7080	Console	4	5,804 K

## 5. pathping Command

The pathping command which provides a combination of the best aspects of Tracert and Ping.

```
C:\WINDOWS\system32>pathping
```

Usage: pathping [-g host-list] [-h maximum\_hops] [-i address] [-n] [-p period] [-q num\_queries] [-w timeout] [-4] [-6] target\_name

Options:

- g host-list Loose source route along host-list.
- h maximum\_hops Maximum number of hops to search for target.
- i address Use the specified source address.
- n Do not resolve addresses to hostnames.
- p period Wait period milliseconds between pings.
- q num\_queries Number of queries per hop.
- w timeout Wait timeout milliseconds for each reply.
- 4 Force using IPv4.
- 6 Force using IPv6.

## Systeminfo

```
C:\WINDOWS\system32>Systeminfo

Host Name:                HOME
OS Name:                  Microsoft Windows 8.1 Pro
OS Version:               6.3.9600 N/A Build 9600
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         HOMEPC
Registered Organization:
Product ID:               00261-50000-00000-AA989
Original Install Date:    2/27/2021, 11:28:37 AM
System Boot Time:         9/4/2021, 9:18:40 AM
System Manufacturer:      BIOSIAR Group
System Model:              H61MLU3
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 42 Stepping 7 GenuineInt
                           el ~1600 Mhz
BIOS Version:              American Megatrends Inc. 4.6.5, 3/20/2014
Windows Directory:        C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume6
System Locale:              en-us;English (United States)
Input Locale:              en-us;English (United States)
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:     3,989 MB
Available Physical Memory: 917 MB
Virtual Memory: Max Size: 5,591 MB
Virtual Memory: Available: 1,191 MB
Virtual Memory: In Use:    4,400 MB
Page File Location(s):     C:\pagefile.sys
Domain:                    WORKGROUP
Logon Server:              \\HOME
Hotfix(s):                 145 Hotfix(s) Installed.
                           [01]: KB2899189_Microsoft-Windows-CameraCodec-Package
```

## Linux commands

```
ashish@ashish-VirtualBox:~/Desktop$ dig google.com

; <<>> DiG 9.16.1-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41405
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

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

;; ANSWER SECTION:
google.com.                        250     IN      A      142.250.196.78

;; Query time: 11 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Sun Sep 12 21:20:08 IST 2021
;; MSG SIZE rcvd: 55
```

## Apache Installation

### Steps

1. Update your system

Update the system using command `sudo apt update`

2. Install Apache using apt:

Install apache using the command `sudo apt install apache2`

3. Start apache

Using the command `sudo service apache2 start`

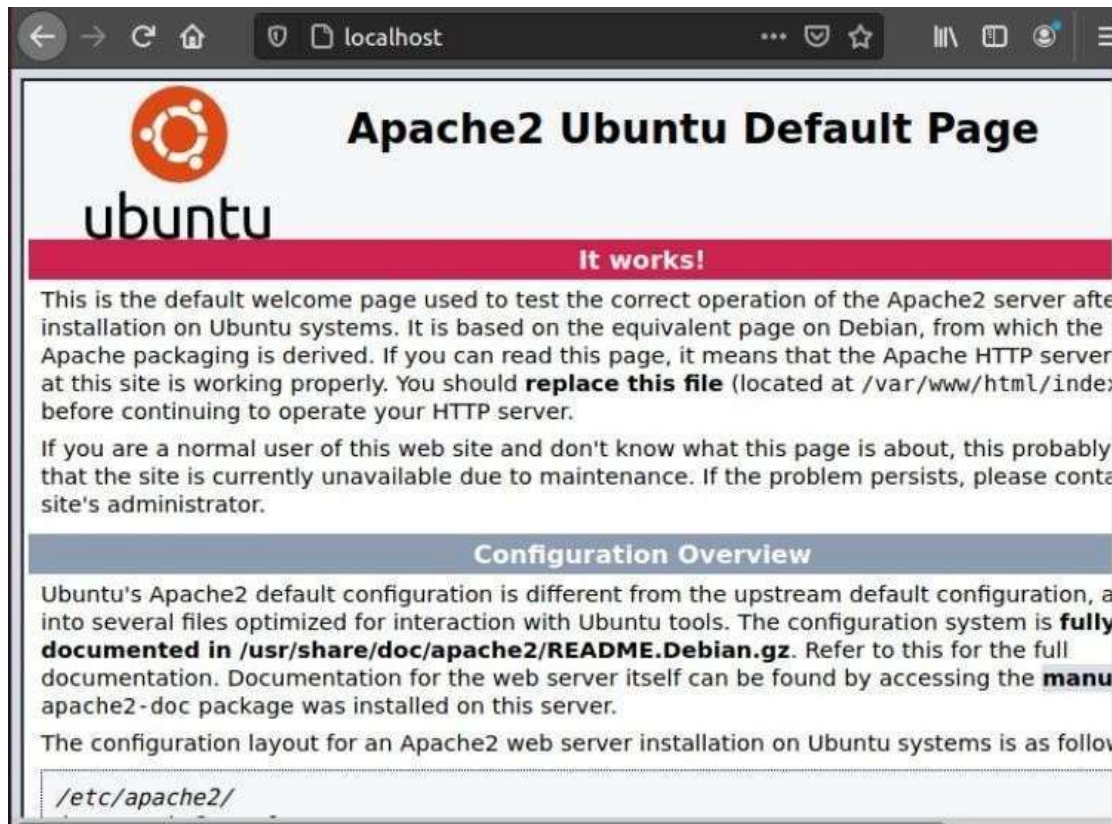
4. Confirm that Apache is now running with the following command:

Check the status of apache `sudo systemctl status apache2`

```
ashish@ubuntu:~/Desktop$ sudo systemctl status apache2
[sudo] password for ashish:
Unit apache2.service could not be found.
ashish@ubuntu:~/Desktop$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese>
   Active: active (running) since Wed 2021-09-29 05:38:37 PDT; 2min 27s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 856 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUC>
  Main PID: 1078 (apache2)
    Tasks: 6 (limit: 2273)
   Memory: 18.9M
    CGroup: /system.slice/apache2.service
            └─1078 /usr/sbin/apache2 -k start
              └─1084 /usr/sbin/apache2 -k start
                └─1085 /usr/sbin/apache2 -k start
                  └─1086 /usr/sbin/apache2 -k start
                    └─1087 /usr/sbin/apache2 -k start
                      └─1088 /usr/sbin/apache2 -k start

Sep 29 05:38:28 ubuntu systemd[1]: Starting The Apache HTTP Server...
Sep 29 05:38:36 ubuntu apachectl[892]: AH00558: apache2: Could not reliably det>
Sep 29 05:38:37 ubuntu systemd[1]: Started The Apache HTTP Server.
lines 1-19/19 (END)
```





## Maria dB Installation

### Steps

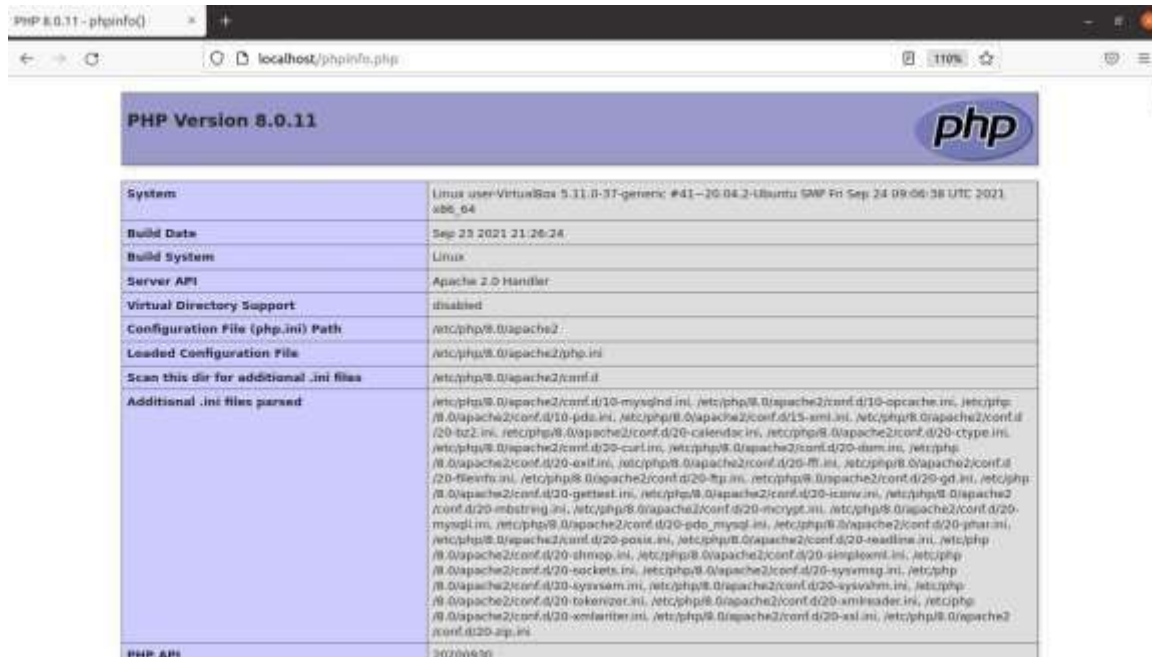
1. Install Maria dB using the command `sudo apt install mariadb-server mariadb-client`
2. Check the status of the Maria dB using `sudo systemctl status mysql`

```
ashish@ubuntu:~/Desktop$ sudo systemctl start mysql
ashish@ubuntu:~/Desktop$ 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 Wed 2021-09-29 05:38:45 PDT; 4min 19s ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 857 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/
   Process: 871 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_STA
   Process: 873 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && V
   Process: 1242 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_S
   Process: 1244 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/
   Main PID: 965 (mysqld)
     Status: "Taking your SQL requests now..."
     Tasks: 31 (limit: 2273)
```



### Installing PHP and commonly used modules

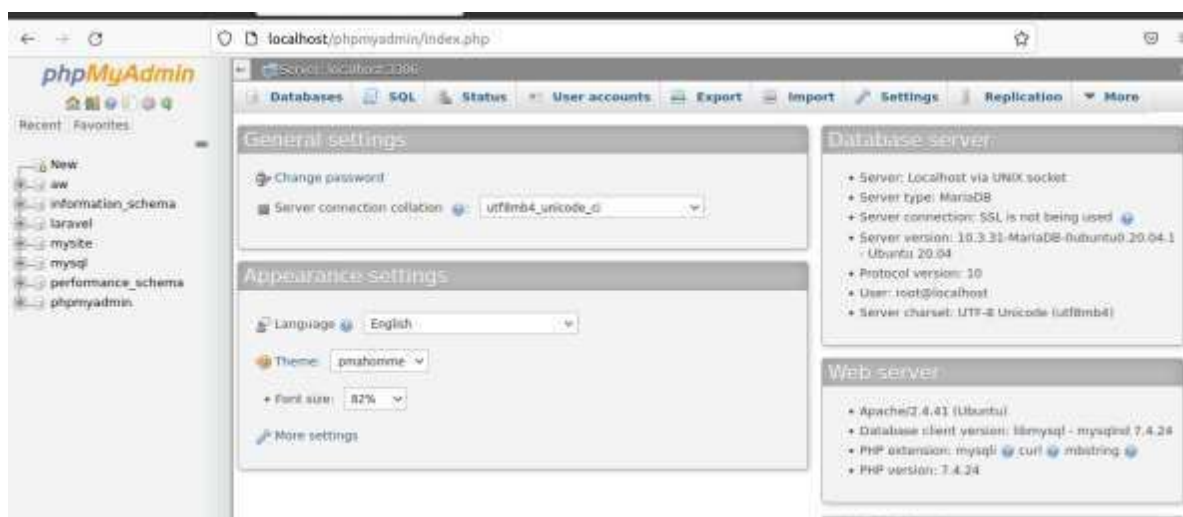
1. Install php using `sudo apt install php libapache2-mod-php php-openssl php-cli php-gd php-curl php-mysql`
2. Restart apache2 using the command `sudo systemctl restart apache2`
3. Check the php installation by using `localhost/phpinfo.php`



```
ashish@ubuntu:~/Desktop$ php --version
PHP 7.4.24 (cli) (built: Sep 23 2021 21:36:11) ( NTS )
Copyright (c) The PHP Group
Zend Engine v3.4.0, Copyright (c) Zend Technologies
with Zend OPcache v7.4.24, Copyright (c), by Zend Technologies
```

### Installing phpmyadmin

1. Install phpmyadmin using `sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl`
2. Restart apache2 `sudo systemctl restart apache2`
3. Check phpmyadmin by opening a browser and typing `http://localhost/phpmyadmin`



## 1.Explain the steps for the installation of Ansible with your own screenshots.

sudo apt install ansible

```
ashish@ubuntu:~/Desktop$ sudo apt install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  librips
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-distutils python3-dnspython python3-jinja2 python3-jmespath python3-kerberos python3-libcloud python3-netaddr
  python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux python3-wiresh python3-xmldict
Suggested packages:
  cowsay sshpass python-jinja2-doc ipython python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-distutils python3-dnspython python3-jinja2 python3-jmespath python3-kerberos python3-libcloud python3-netaddr
  python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux python3-wiresh python3-xmldict
0 upgraded, 17 newly installed, 0 to remove and 24 not upgraded.
Need to get 9,865 kB of archives.
After this operation, 92.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/main amd64 python3-jinja2 all 2.10.1-2 [55.5 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal/main amd64 python3-crypto amd64 2.6.1-13ubuntu2 [237 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-distutils all 3.8.10-0ubuntu1-20.04 [141 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu focal/main amd64 python3-dnspython all 1.16.0-1build1 [89.1 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu focal/main amd64 ieee-data all 20180805.1 [1,589 kB]
Get:6 http://us.archive.ubuntu.com/ubuntu focal/main amd64 python3-netaddr all 0.7.19-1 [235 kB]
Get:7 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5,794 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-argcomplete all 1.8.1-1.3ubuntu1 [27.2 kB]
Get:9 http://us.archive.ubuntu.com/ubuntu focal/main amd64 python3-jmespath all 0.9.4-2 [21.3 kB]
Get:10 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-kerberos amd64 1.1.14-3.1build1 [22.6 kB]
Get:11 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-libcloud all 2.6.0-1 [1,403 kB]
Get:12 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-ntlm-auth all 1.1.0-1 [19.6 kB]
Get:13 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:14 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-ntlm all 1.1.0-1 [6,004 B]
Get:15 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-selinux amd64 3.0-1build2 [139 kB]
Get:16 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-xmldict all 0.12.0-1 [12.6 kB]
Get:17 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 python3-wiresh all 0.3.0-2 [21.7 kB]
Fetched 9,865 kB in 1min 1s (163 kB/s)
Selecting previously unselected package python3-jinja2.
(Reading database ... 285593 files and directories currently installed.)
Preparing to unpack .../00-python3-jinja2_2.10.1-2_all.deb ...
Unpacking python3-jinja2 (2.10.1-2) ...
Selecting previously unselected package python3-crypto.
Preparing to unpack .../01-python3-crypto_2.6.1-13ubuntu2_amd64.deb ...
```

## Ansible --version

```
ashish@ubuntu:~/Desktop$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/ashish/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Jun 2 2021, 10:49:15) [GCC 9.4.0]
```

## 1.Install Docker application to your system and run a docker image instance in your system from docker hub

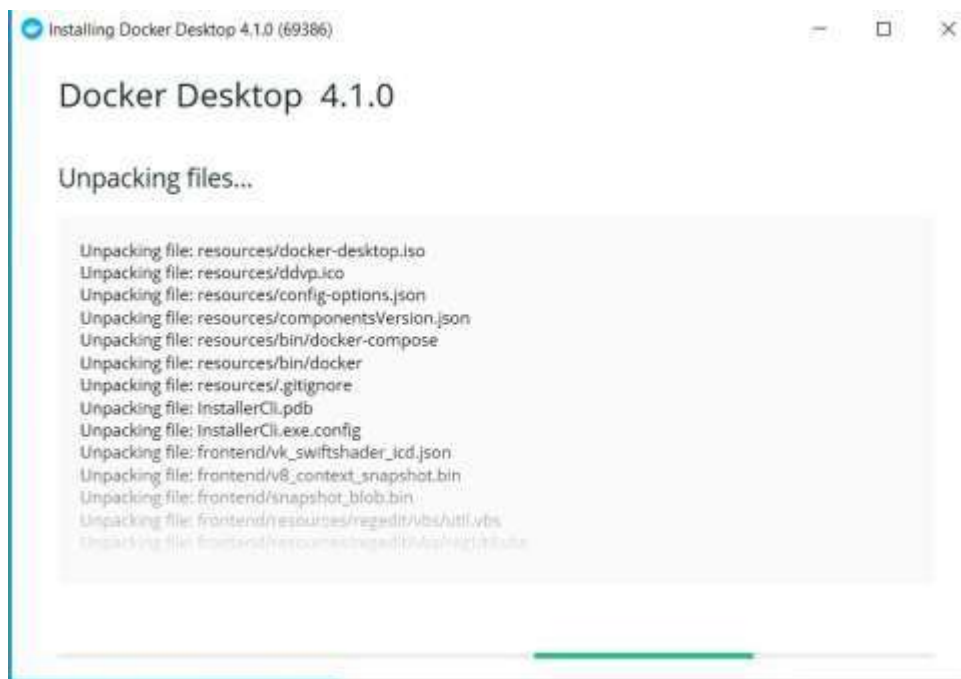
### Step-I

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.

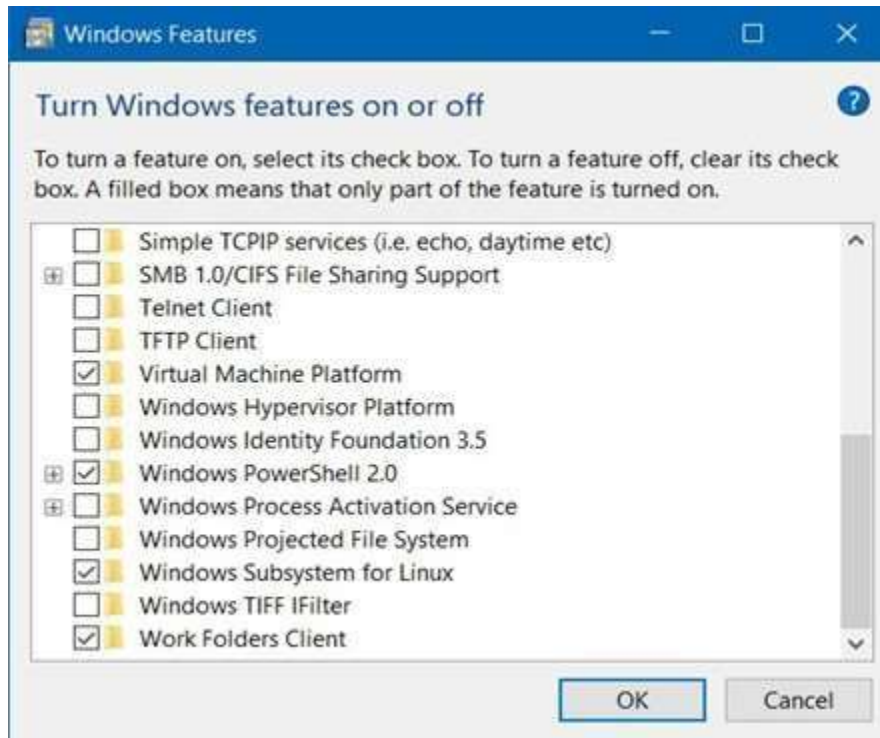




### Step-III

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 sign in 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)

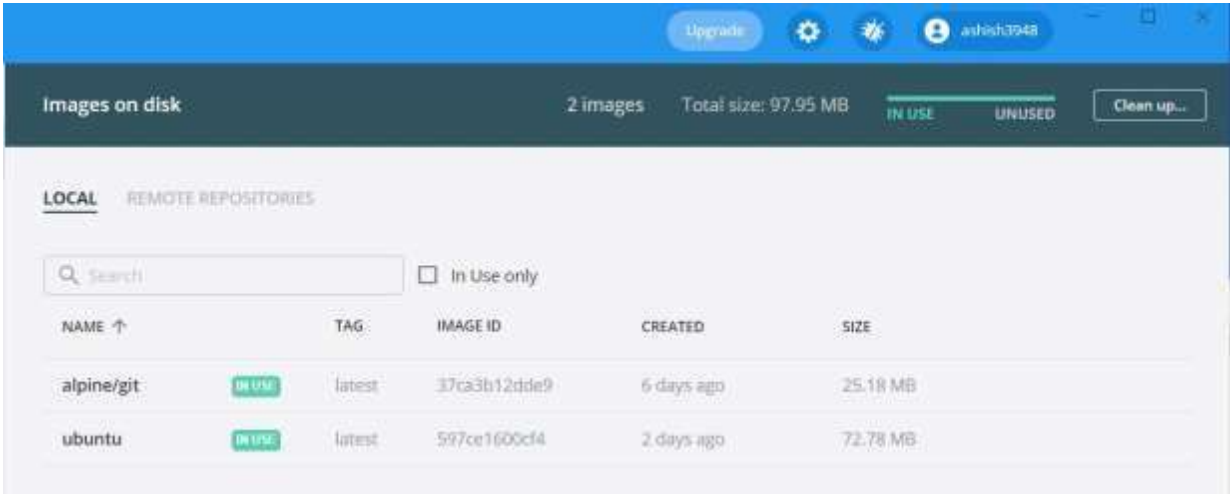
```
C:\WINDOWS\system32>docker login
Authenticating with existing credentials...
time="2021-10-03T10:55:35+05:30" level=error msg="(d4e4d903) 57ce7544-CredentialHelperPKG C<-S NoResponse POST /registry/credstore-updated (10.0035061s): Post \"http://ipc/registry/credstore-updated\": context deadline exceeded (Client.Timeout exceeded while awaiting headers)\"[[STACK]]"
time="2021-10-03T10:55:45+05:30" level=error msg="(e4430b7f) 57ce7544-CredentialHelperPKG C<-S NoResponse POST /registry/credstore-updated (10.0080481s): Post \"http://ipc/registry/credstore-updated\": context deadline exceeded (Client.Timeout exceeded while awaiting headers)\"[[STACK]]"
Login Succeeded

C:\WINDOWS\system32>docker pull ubuntu
Using default tag: latest
Error response from daemon: Get "https://registry-1.docker.io/v2/": net/http: request canceled while waiting for connection (Client.Timeout exceeded while awaiting headers)

C:\WINDOWS\system32>docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
f3ef4ff62e0d: Pull complete
Digest: sha256:44ab2c3b26363823dcb965498ab06abf74a1e6af20a732902250743df0d4172d
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

C:\WINDOWS\system32>docker run -it ubuntu
root@2533da433e39:/# echo ashish
ashish
```

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

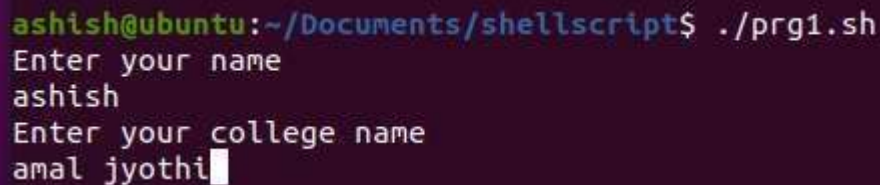


### Shell Scripting Lab Assignments

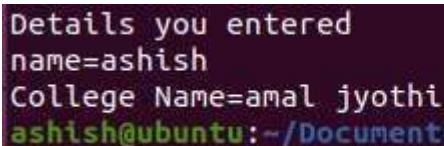
1. Write a shell script to ask your name, and college name and print it on the screen.

```
#!/bin/sh
echo "Enter your name"read name
echo "Enter your college name"
read clg
clear
echo "Details you entered"
echo "name=$name"
echo "College Name=$clg"
```

#### OUTPUT



```
ashish@ubuntu:~/Documents/shellscript$ ./prg1.sh
Enter your name
ashish
Enter your college name
amal jyothi
```



```
Details you entered
name=ashish
College Name=amal jyothi
ashish@ubuntu:~/Documents/shellscript$
```

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

```
#!/bin/sh
a=40
echo"a: " $a
```

#### OUTPUT



```
ashish@ubuntu:~/Documents/shellscript$ ./prg2.sh
a: 40
```

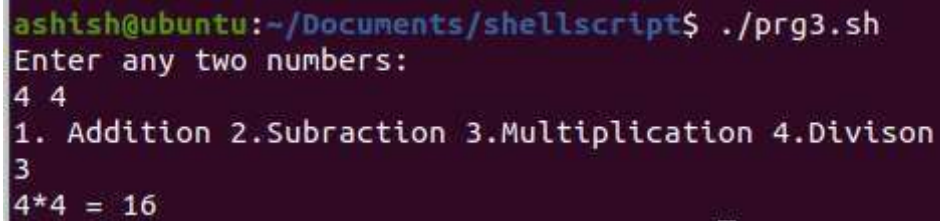
3. Write a shell script to perform addition, subtraction, multiplication, division with two numbers that is accepted from user.

```
#!/bin/sh
echo "Enter any two numbers: "
read a b
echo "1. Addition 2.Subtraction 3.Multiplication 4.Divison"
read op
case $op in
"1")echo "$a"+"$b" = "`expr $a + $b`";;
"2")echo "$a"-"$b" = "`expr $a - $b`";;
"3")echo "$a"*"$b" = "`expr $a \* $b`";;
"4")echo "$a"/"$b" = "`expr $a / $b`";;
```



```
"*")echo "Please enter a valid value";;  
esac
```

### **OUTPUT**



```
ashish@ubuntu:~/Documents/shellscript$ ./prg3.sh  
Enter any two numbers:  
4 4  
1. Addition 2.Subraction 3.Multiplication 4.Divison  
3  
4*4 = 16
```

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 num  
if [[ $num -eq 12 ]] ; then  
    echo "number found"  
    echo $num  
else  
    echo "number not found"  
    echo $num  
fi
```

### **OUTPUT**



```
ashish@ubuntu:~/Documents/shellscript$ ./prg4.sh  
Enter a number  
12  
number found  
12
```

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

```
#!/bin/sh  
echo "today Date:$(date)"  
echo "Calander"  
cal
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg5.sh
today Date:Sat 02 Oct 2021 02:17:21 AM PDT
Calander
    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
```

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

```
#!/bin/sh
echo "Enter a number : "
read n
rem=$(( $n % 2 ))
if [ $rem -eq 0 ]then
    echo "$n is even number"
else
    echo "$n is odd number"
fi
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg6.sh
Enter a number :
4
4 is even number
ashish@ubuntu:~/Documents/shellscript$ ./prg6.sh
Enter a number :
5
5 is odd number
```

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

```
#!/bin/sh
echo "Enter First number"
read a
echo "Enter Second number"
read b
if [ $a -eq $b ]then
    echo "$a = $b"
elif [ $a -gt $b ] then
    echo "$a is greater than $b"
else
    echo "$a is less than $b"
fi
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg7.sh
Enter First number
3
Enter Second number
3
3 is equal to 3
ashish@ubuntu:~/Documents/shellscript$ ./prg7.sh
Enter First number
5
Enter Second number
6
5 is less than 6
ashish@ubuntu:~/Documents/shellscript$ ./prg7.sh
Enter First number
6
Enter Second number
2
6 is greater than 2
```

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

```
#!/bin/bash
sum=0
for((i=0;i<10;i++))
do
  ((sum+=i))
done
echo "Sum : $sum"
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg8.sh
Sum : 55
```

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

```
#!/bin/sh
echo "Enter any four Integers "
read a
read b
read c
read d
sum=`expr $a + $b + $c + $d`
echo "The sum = $sum"
echo "Average = `expr $sum / 4`"
echo "Product = `expr $a \* $b \* $c \* $d`"
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg9.sh
Enter any four Integers
5
7
3
8
The sum = 23
Average =5
Product =840
```

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

```
#!/bin/sh
echo "Enter three numbers "
read a b c
s=$a
if [ $b -lt $s ]then
s=$b
fi
if [ $c -lt $s ]then
s=$c
fi
echo Smallest of $a $b $c is $s
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg10.sh
Enter three numbers
4 2 6
Smallest of 4 2 6 is 2
```

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

```
#!/bin/bash
echo "Enter a number"
read num
fact=1
while [ $num -gt 1 ]do
fact=$((fact * num))
num=$((num - 1))
done
echo Factorial=$fact
```

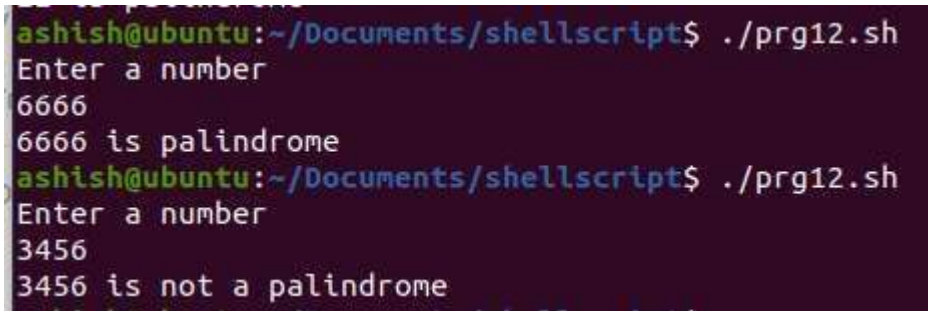
**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg11.sh
Enter a number
4
Factorial=24
```



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

```
#!/bin/sh
echo "Enter a number "
read a
rev=$(echo $a | rev)
if [ $a -eq $rev ] ; then
    echo "$a is palindrome"
else
    echo "$a is not a palindrome"
fi
```

**OUTPUT**A screenshot of a terminal window showing the execution of a shell script. The prompt is 'ashish@ubuntu:~/Documents/shellscript\$'. The user enters './prg12.sh'. The script prompts 'Enter a number' and the user enters '6666'. The script outputs '6666 is palindrome'. The user then enters './prg12.sh' again. The script prompts 'Enter a number' and the user enters '3456'. The script outputs '3456 is not a palindrome'.**13. Write a shell script to find the average of the numbers entered in command line.**

```
#!/bin/sh
echo "Enter number of Integers"
read n
i=1 sum=0
echo "Enter $n numbers: "
while [ $i -le $n ]
do
    read num sum=$((sum+num))
    i=$((i+1))
done

echo "Average :`expr $sum / $n`"
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg13.sh
Enter number of Integers
6
Enter 6 numbers:
4
2
2
8
8
4
Average :4
```

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

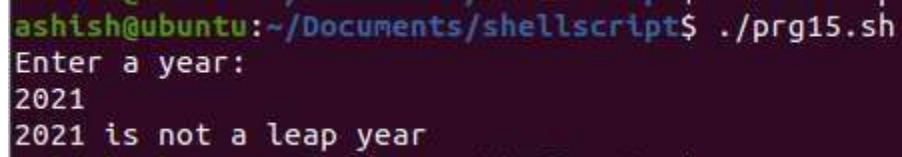
```
#!/bin/sh
echo "Enter a number: "
read n
s=0
while [ $n -gt 0 ]
do
    mod=$((n % 10))
    s=$((n + mod))
    n=$((n / 10))
done
echo "Sum of digits is $s"
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg14.sh
Enter a number:
3455
Sum of digits is 6
```

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

```
#!/bin/sh
echo "Enter a year:"
read year
if [ `expr $year % 4` -eq 0 ]then
    echo "$year is a leap year"
else
    echo "$year is not a leap year"
fi
```

**OUTPUT**

```
ashish@ubuntu:~/Documents/shellscript$ ./prg15.sh
Enter a year:
2021
2021 is not a leap year
```

A terminal window with a dark background. The prompt is 'ashish@ubuntu:~/Documents/shellscript\$'. The user enters './prg15.sh'. The script prompts 'Enter a year:'. The user enters '2021'. The script outputs '2021 is not a leap year'.

## WIRESHARK INSTALLTION

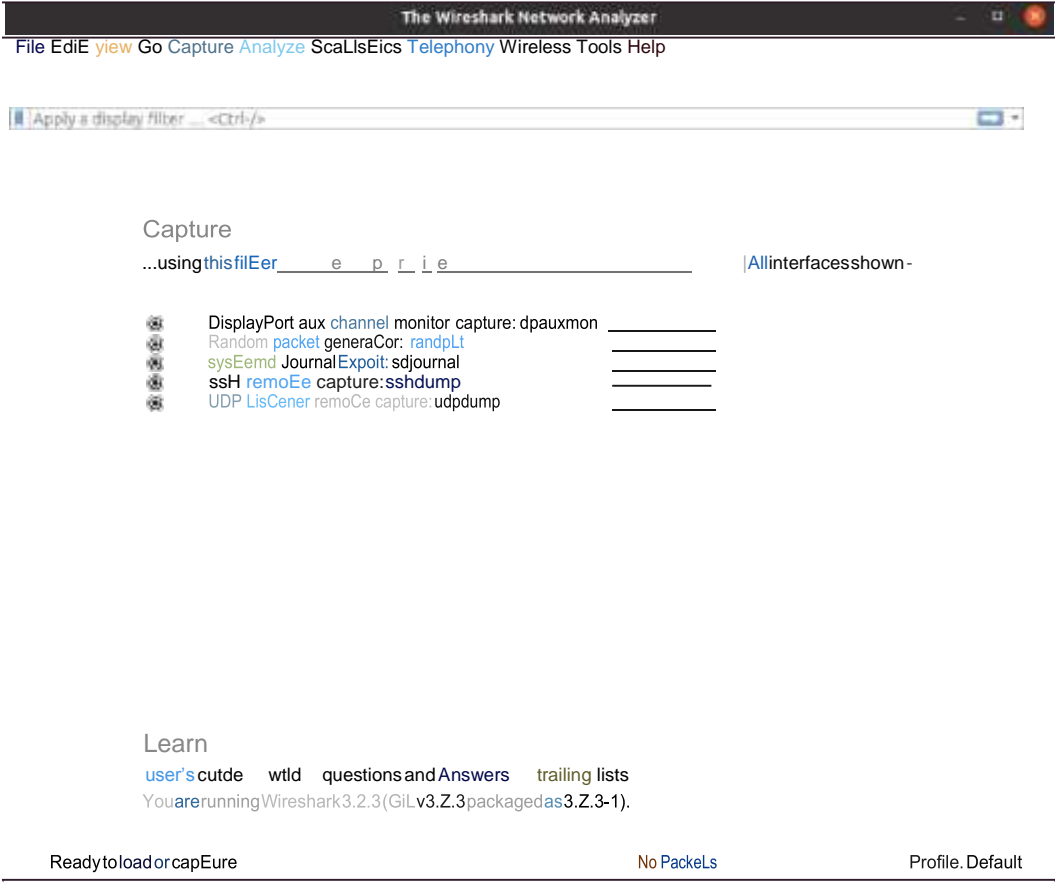
1. Analyzing network packet stream using wireshark. Perform basic network service tests using nc. sudo apt-get install wireshark

sudo dpkg-reconfigure wireshark-common

```
ashish@ubuntu:~$ sudo dpkg-reconfigure wireshark-common
ashish@ubuntu:~$
```

```
ashish@ubuntu:~$ sudo apt-get install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libzip5
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libdouble-conversion3 libpcr2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins libqt5multimedia5-gsttools5 libqt5multimedia5-qt5 libqt5network5 libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13 libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme qttranslations5-l10n wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qwayland5 snmp-mibs-downloader geopipupdate geopip-database geopip-database-extra libjs-leaflet libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
  libdouble-conversion3 libpcr2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins libqt5multimedia5-gsttools5 libqt5multimedia5-qt5 libqt5network5 libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13 libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme qttranslations5-l10n wireshark wireshark-common wireshark-qt
0 upgraded, 28 newly installed, 0 to remove and 25 not upgraded.
Need to get 2,190 kB/32.8 MB of archives.
After this operation, 163 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5core5a amd64 5.12.8+dfsg-0ubuntu1 [2,005 kB]
Get:2 http://ppa.launchpad.net/ondrej/php/ubuntu focal/main amd64 libpcr2-16-0 amd64 10.36-2+ubuntu20.04.1+deb.sury.org+2 [184 kB]
Fetched 2,092 kB in 11s (198 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libdouble-conversion3:amd64.
(Reading database ... 215187 files and directories currently installed.)
Preparing to unpack .../00-libdouble-conversion3_3.1.5-4ubuntu1_amd64.deb ...
Unpacking libdouble-conversion3:amd64 (3.1.5-4ubuntu1) ...
Selecting previously unselected package libpcr2-16-0:amd64.
Preparing to unpack .../01-libpcr2-16-0_10.36-2+ubuntu20.04.1+deb.sury.org+2_amd64.deb ...
Unpacking libpcr2-16-0:amd64 (10.36-2+ubuntu20.04.1+deb.sury.org+2) ...
Selecting previously unselected package libqt5core5a:amd64.
Preparing to unpack .../02-libqt5core5a_5.12.8+dfsg-0ubuntu1_amd64.deb ...
Unpacking libqt5core5a:amd64 (5.12.8+dfsg-0ubuntu1) ...
Selecting previously unselected package libqt5dbus5:amd64.
Preparing to unpack .../03-libqt5dbus5_5.12.8+dfsg-0ubuntu1_amd64.deb ...
Unpacking libqt5dbus5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Selecting previously unselected package libqt5network5:amd64.
Preparing to unpack .../04-libqt5network5_5.12.8+dfsg-0ubuntu1_amd64.deb ...
Unpacking libqt5network5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Selecting previously unselected package libxcb-xinerama0:amd64.
Preparing to unpack .../05-libxcb-xinerama0_1.14-2_amd64.deb ...
Unpacking libxcb-xinerama0:amd64 (1.14-2) ...
```





Ready to load or capture      No packets      Pwdl@e:Defwuk

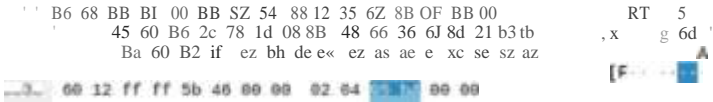
ale edit view go g,aptzire Analyze \$tatis€ics Tetephorjg ¥/ireI•ss



Ioot•b•ti•

784 Z. 941174457      16. 6.2.15  
13.33.146.48      TCP      54

- Praae S . 62 byLes on wlre (JB6 b1t s), 62 bytes captured (JB6 b1t s) on i nterlac
- Llinux cooked capture v1
- Internet Pratot Version 4, Src : 13. 33.t79.27, Dst : Ie. e . 2.15
- vss non1torIng Ethernet tra1\er, source Port: a



D ^enp0s3, any, and L...pture in progress Packets: 704 - Displayed: 704 (100.0%) Profile: Default

**nc -z -v 10.0.2.15 20-80**

```
ashish@ubuntu:~$ nc -z -v 10.0.2.15 20-80
nc: connect to 10.0.2.15 port 20 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 21 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 22 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 23 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 24 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 25 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 26 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 27 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 28 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 29 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 30 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 31 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 32 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 33 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 34 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 35 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 36 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 37 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 38 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 39 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 40 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 41 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 42 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 43 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 44 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 45 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 46 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 47 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 48 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 49 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 50 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 51 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 52 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 53 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 54 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 55 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 56 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 57 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 58 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 59 (tcp) failed: Connection refused
```