Cyber Security And Ethical Hacking

Assignment-1: Linux Command List

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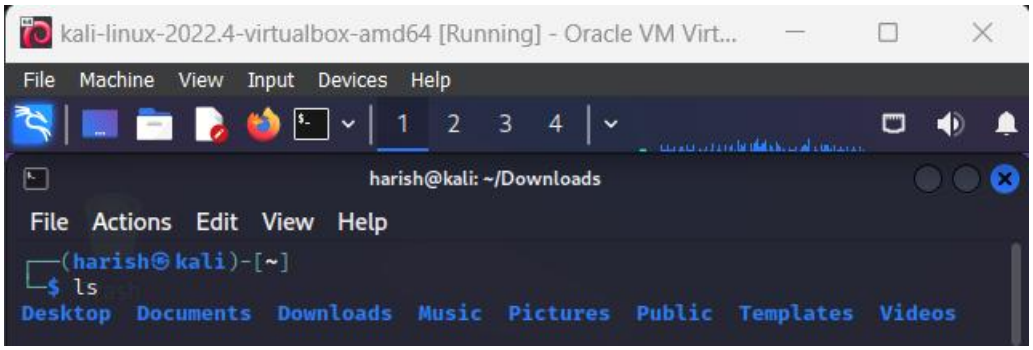
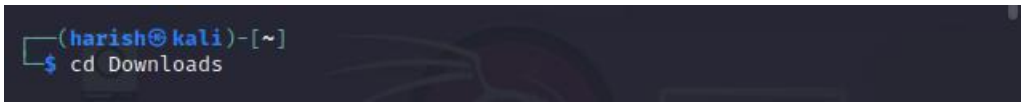
A. File and Directory Operations:

1. ls (used to list all the folders and files in the current directory)



Here in the home directory of the kali linux, these are the folderes that are present and each folder contains different files.

2. cd (Used to enter into the folder present in the current directory to perform operations on the files present in the folder)



Here using the cd command I have navigated to the Downloads folder.

Note: Names of files and folders are case sensitive in linux and we have to enter the exact combination of words to open a file or the folder.

3. pwd (Displays the current directory and the folder we are currently in**)**

As we changed the directory to the downloads, we can see the path to it.

4. mkdir (Creates a new directory in the current directory **)**

```
┌──(harish㉿kali)-[~/Downloads]
└─$ mkdir testdirectory

┌──(harish㉿kali)-[~/Downloads]
└─$ ls
sqlinj.pdf  testdirectory
```

Here we have created a new directory called “testdirectory” and we can see that it is present using the “ls” command.

5. touch (Creates an empty file**)**

```
┌──(harish㉿kali)-[~/Downloads]
└─$ touch testfile

┌──(harish㉿kali)-[~/Downloads]
└─$ ls
sqlinj.pdf  testdirectory  testfile
```

Here we have made a new empty file clled “testfile” and we can see that it is present using the “ls” command.

```
┌──(harish㉿kali)-[~/Downloads]
└─$ nano testfile

┌──(harish㉿kali)-[~/Downloads]
└─$ cat testfile
hello this is harish and currently in the" testfile" file once we use the cp
the contents of this file into another file named "testfile2"
```

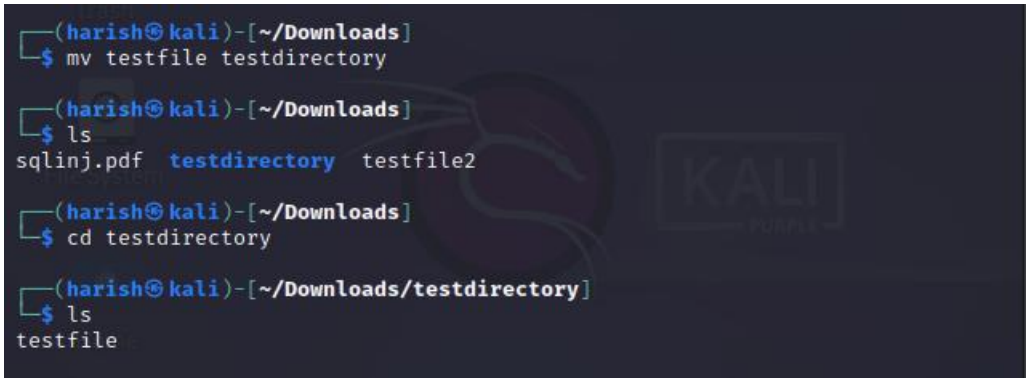
Some content was added to the fie using the “nano” command and is displayed using the “cat” command. So that we can do the next steps.

6. cp (Used to copy the contents of source file to destination file)

```
┌──(harish㉿kali)-[~/Downloads]
└─$ touch testfile2

┌──(harish㉿kali)-[~/Downloads]
└─$ cat testfile2

┌──(harish㉿kali)-[~/Downloads]
└─$ cp testfile testfile2

┌──(harish㉿kali)-[~/Downloads]
└─$ cat testfile2
hello this is harish and currently in the" testfile" file once we use the cp
 command, we can copy
the contents of this file into another file named "testfile2"
```

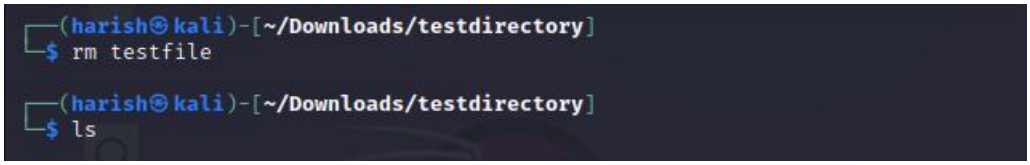
For this a new empty file named “testfile2” was created and the contents of the “testfile” are copied to the “testfile2”

7. mv (This command is used to move the files or directories from the source directory to the destination directory**)**



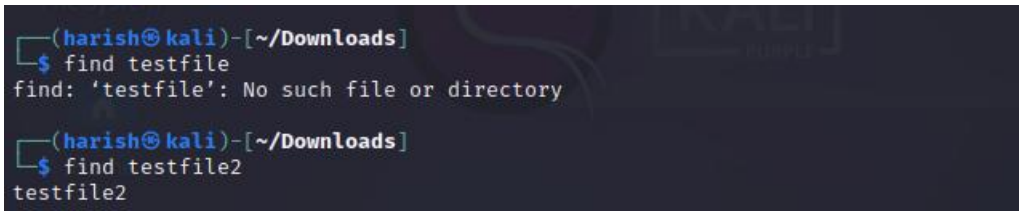
Here “testfile”is moved from the Downloads directory to the “testdirectory” and the same is shown using the ‘ls’ command.

8. rm (This command is used to remove the file or directory.**)**



We have removed the testfile from the testdirectory.

9. find (This command is used to find the files or directories in the current working directory**)**



We moved the “testfile” and then we delete so we cannot find it but we can find the “testfile2” in the current directory.

B. File viewing and editing

1. cat (This command is used to concatinate and view the contents of the file**)**

```
┌──(harish㉿kali)-[~]
└─$ cd Downloads

┌──(harish㉿kali)-[~/Downloads]
└─$ cat testfile2
hello this is harish and currently in the" testfile" file once we use the cp command
the contents of this file into another file named "testfile2"

┌──(harish㉿kali)-[~/Downloads]
└─$
```

We created the testfile2 above and the contents of the file are viewed using the 'cat' command

2. less (view the file content with pagination**)**

```
┌──(harish㉿kali)-[~/Downloads]
└─$ less testfile2
```

```
hello this is harish and currently in the" testfile" file once we use the cp comma
nd, we can copy
the contents of this file into another file named "testfile2"
testfile2 (END)
```

In this way less command is used and we can navigate through the contents of the file

3. head (This command is used to print the head of the file and we can even specify the number of lines we want to print from the beginning.)

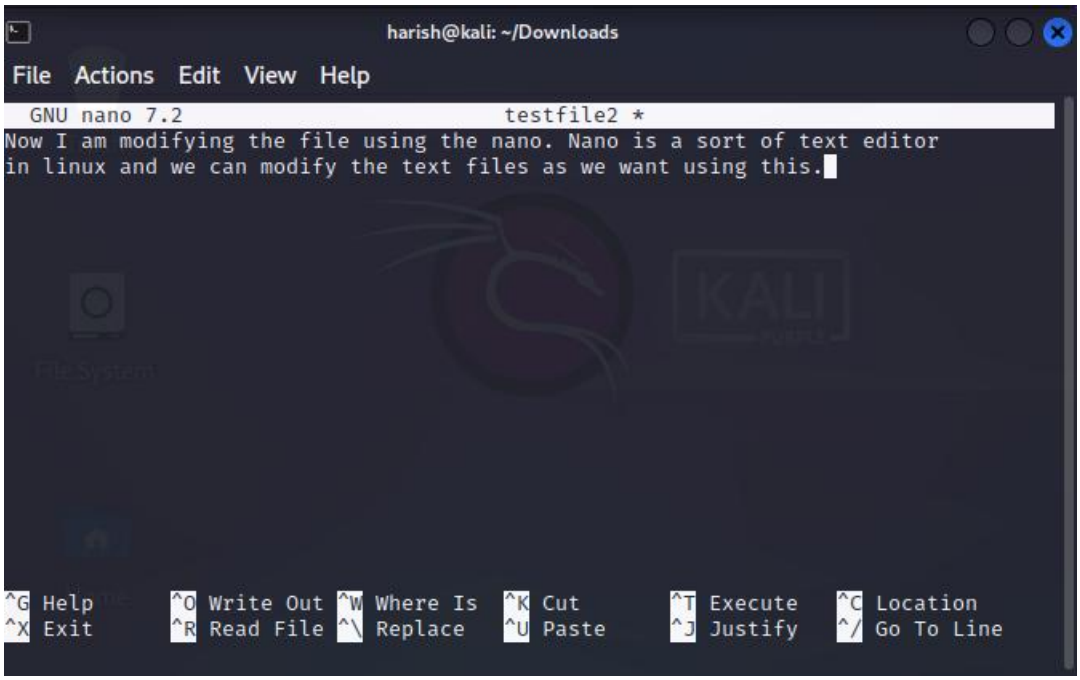
```
┌──(harish㉿kali)-[~/Downloads]
└─$ cat testfile2
This is the beggining of the file.

hello this is harish and currently in the" testfile" file once we use the cp comma
nd, we can copy
the contents of this file into another file named "testfile2"

This is the end of the file.

┌──(harish㉿kali)-[~/Downloads]
└─$ head -n 1 testfile2
This is the beggining of the file.
```

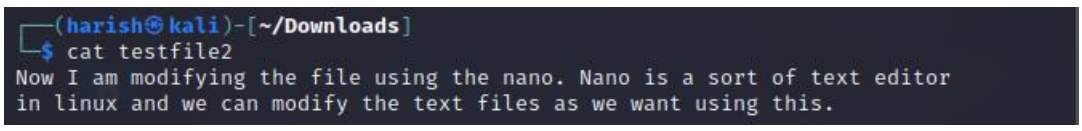
We can see the difference using the cat and head command.

4. tail (Display the end of the file and we can mention how many lines we want to display from the end.**)**

We can see the difference from the cat command.

5. nano (Text editor for creating and editing files.**)**





In this way we can use nano command to view and modify the contents of the file and we can see that the contents of the testfile2 have been changed.

C. File permissions.

1. chmod (this command is used to change the permissions of file or directory so that only a particular group or a particular person will have the permissions to view or edit or execute the file.)

```
┌──(harish㉿kali)-[~]
└─$ cd Downloads

┌──(harish㉿kali)-[~/Downloads]
└─$ ls -l
total 4472
-rw-r--r-- 1 harish harish 4569662 Feb  8 17:00 sqlinj.pdf
drwxr-xr-x 2 harish harish    4096 May 30 11:31 testdirectory
-rw-r--r-- 1 harish harish     139 May 30 13:10 testfile2
```

```
┌──(harish㉿kali)-[~/Downloads]
└─$ chmod 644 testdirectory

┌──(harish㉿kali)-[~/Downloads]
└─$ ls -l
total 4472
-rw-r--r-- 1 harish harish 4569662 Feb  8 17:00 sqlinj.pdf
drw-r--r-- 2 harish harish    4096 May 30 11:31 testdirectory
-rw-r--r-- 1 harish harish     139 May 30 13:10 testfile2
```

Ear each write, read, and execute permissions have the following number value

r (read) = 4

w (write) = 2

x (execute) = 1

no permissions = 0

To find out the file's permissions in numeric mode simply calculate the totals for all users classes. For example, to give read, write and execute permission to the file's owner, read and execute permissions to the file's group and only read permissions to all other users you would do the following:

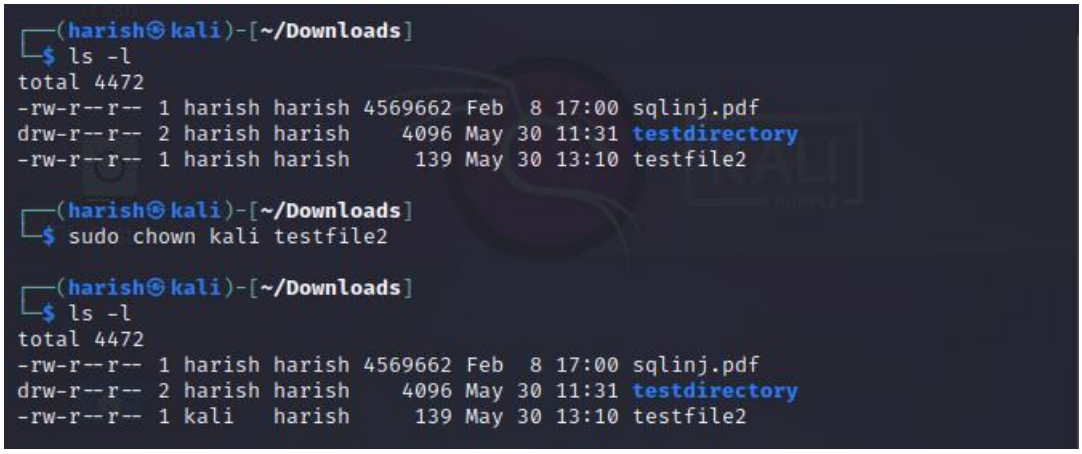
Owner: rwx=4+2+1=7

Group: r-x=4+0+1=5

Others: r-x=4+0+0=4

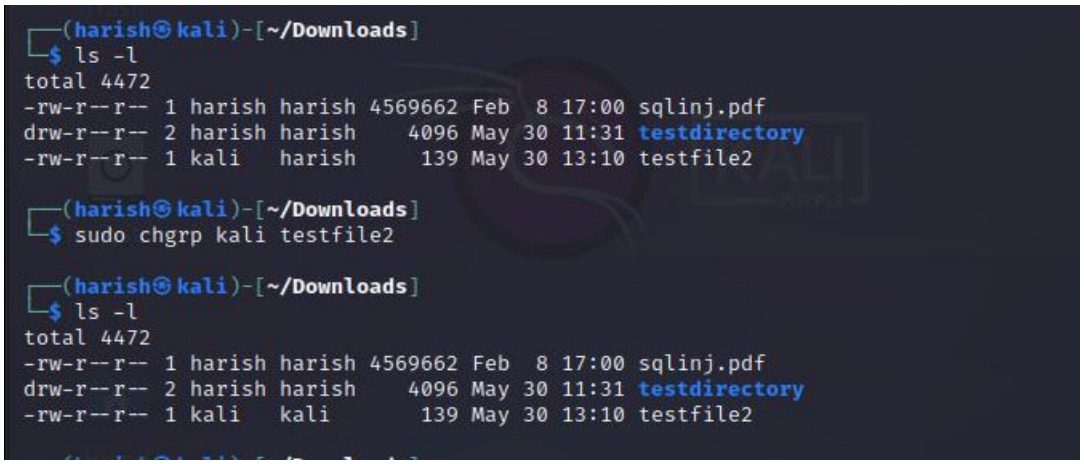
So in our example we have given 644 to the testdirectory and we can see that the execution of the file permission to the harish(owner) is lost and only viewing permission is given to other groups and all other users.

2. chown (this command is used to change the owner of the file**)**



We can see that the ownership of the file testfile2 has changed from harish to kali.

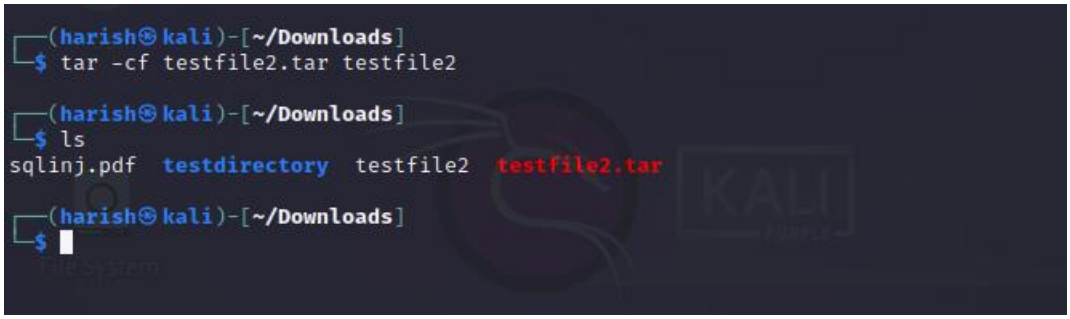
3. chgrp (This command is used to change the group.**)**



We can see the group of testfile2 has changed from harish to kali.

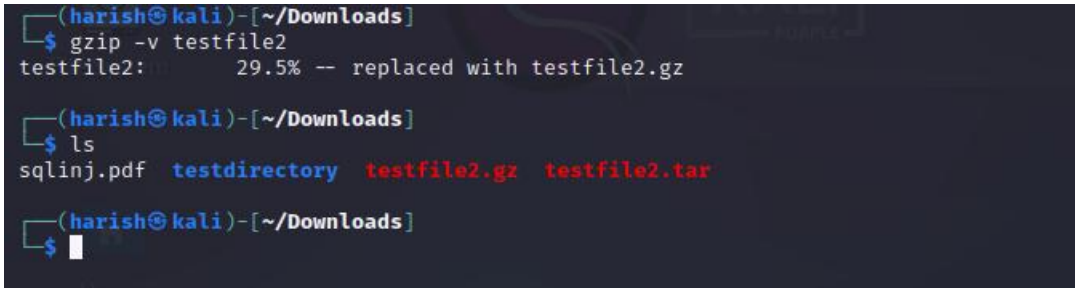
D. File compression and Archiving

1. tar (This command is used to archive the files present in the directory.**)**



We have created an archived folder using the following command where testfile2 have been archived.

2. gzip (This command is used to compress the file size.**)**



We can see that testfile2 have been compressed by 29.5 percent and have been replaced by testfile2.gz.

3. unzip (This command is used to unzip the files from the zip archive.**)**

We have to download an zip file and then we can unzip the file contents using the unzip command it works similar to winrar software in the windows. And thare are a lot of options available.

E. Process Management

1. ps (this command is used to list all the running processes.**)**

```
┌──(harish㉿kali)-[~/Downloads]
└─$ ps
    PID TTY          TIME CMD
  15794 pts/0    00:00:00 bash
  36461 pts/0    00:00:00 ps
```

2. top (display realtime system information and processes.**)**

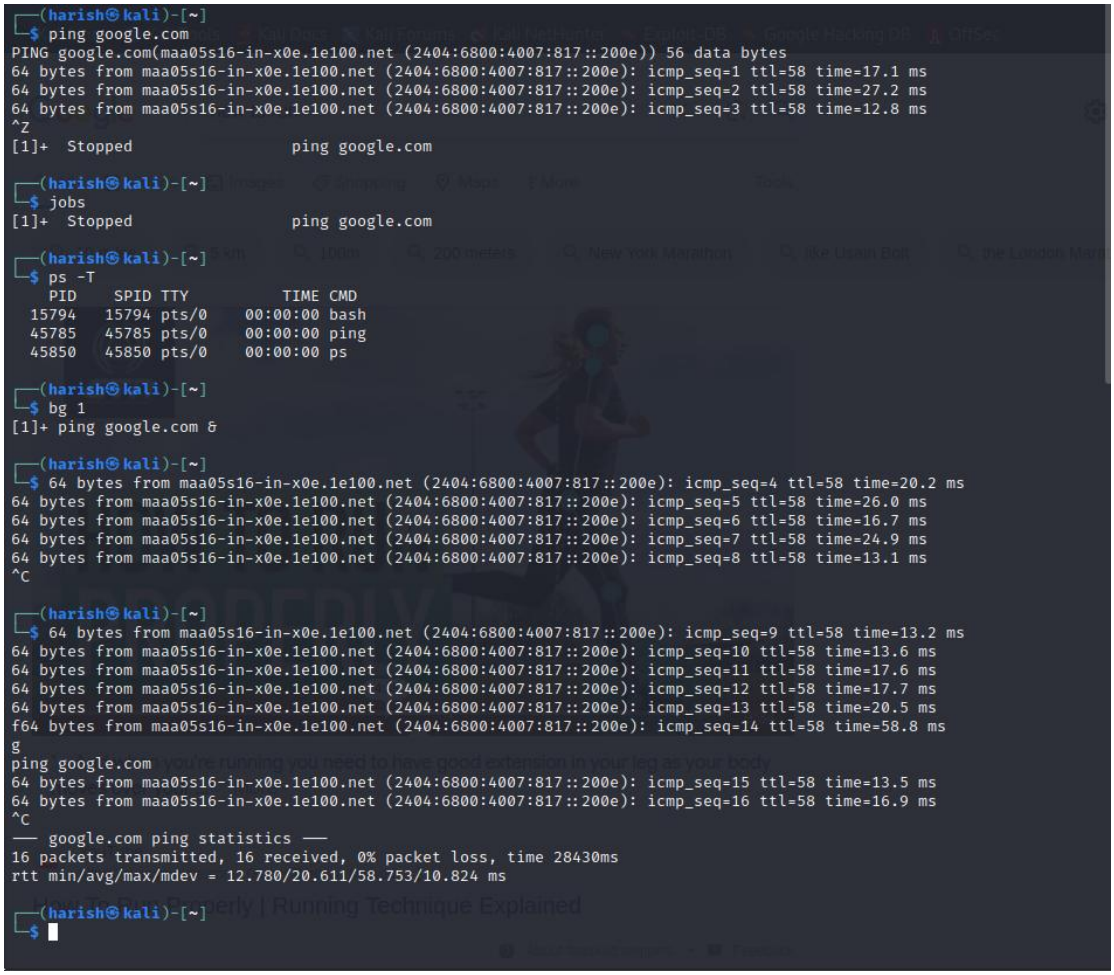
```
top - 13:59:05 up  1:18,  1 user,  load average: 0.23, 0.24, 0.19
Tasks: 167 total,   1 running, 166 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.8 us,  2.5 sy,  0.0 ni, 95.3 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
MiB Mem :   3093.5 total,   1390.8 free,   1200.1 used,    696.4 buff/cache
MiB Swap:   1024.0 total,   1024.0 free,      0.0 used.   1893.3 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    615 root      20   0  444148 136524  84536 S   5.0   4.3   1:26.16 Xorg
   1095 harish    20   0 1014860 112620  77828 S   1.0   3.6   0:27.57 xfwm4
   1156 harish    20   0  469304  42860  34408 S   1.0   1.4   0:05.30 panel-16-+
   1032 harish    20   0  217956   2388   2040 S   0.7   0.1   0:15.66 VBoxClient
   1153 harish    20   0  425808  36032  21820 S   0.7   1.1   0:20.90 panel-13-+
  15791 harish    20   0  440304 103608  83836 S   0.7   3.3   0:06.09 qterminal
  35606 harish    20   0 2976832 315096 159208 S   0.7   9.9   0:13.56 firefox-e+
     15 root      20   0       0      0      0 I   0.3   0.0   0:04.76 rcu_preem+
    177 root     -51   0       0      0      0 S   0.3   0.0   0:03.32 irq/18-vm+
   1023 harish    20   0  217440   2364   2016 S   0.3   0.1   0:05.97 VBoxClient
   1134 harish    20   0  550876  46284  35628 S   0.3   1.5   0:02.13 xfce4-pan+
   1146 harish    20   0  744180 126224  50280 S   0.3   4.0   0:04.88 xfdesktop
   1155 harish    20   0  423620  30232  20884 S   0.3   1.0   0:15.96 panel-15-+
  22579 root      20   0       0      0      0 I   0.3   0.0   0:03.92 kworker/1+
```

With this we have listed all the processes that are running in the system.

3. kill (This command is used to kill a processes that is running.**)**

```
┌──(harish㉿kali)-[~/Downloads]
└─$ ps
    PID TTY          TIME CMD
  15794 pts/0    00:00:00 bash
  40326 pts/0    00:00:00 ps

┌──(harish㉿kali)-[~/Downloads]
└─$ kill 15794

┌──(harish㉿kali)-[~/Downloads]
└─$
```

4. bg and fg (used to run the processes in backgrond and foreground)



We have created a new job ping google.com

Then we have taken the job number which is in [] and then we started running the program in the background using the bg

We can see the results of the ping and even we terminated the processes using ctrl + c it didn't stop

Then we used fg to bring the processes to foreground and then we have terminated the processes.

F. System Information

1. uname (used to display the operating system info.**)**

```
┌──(harish㉿kali)-[~]
└─$ uname
Linux
```

2. df (Display the disk space usage**)**

```
┌──(harish㉿kali)-[~]
└─$ df
Filesystem     1K-blocks     Used Available Use% Mounted on
udev             1542732        0   1542732   0% /dev
tmpfs             316776     1008    315768   1% /run
/dev/sda1       82083148 17694732  60172868  23% /
tmpfs            1583864        0   1583864   0% /dev/shm
tmpfs               5120        0      5120   0% /run/lock
tmpfs             316772       84    316688   1% /run/user/1001
```

3. free (used to display the memory usage.**)**

```
┌──(harish㉿kali)-[~]
└─$ free
               total        used        free      shared  buff/cache   available
Mem:         3167728     1461232     1160332       54744      760508     1706496
Swap:        1048572           0     1048572
```

4. Uptime (used to display the uptime of the system.**)**

```
┌──(harish㉿kali)-[~]
└─$ uptime
 14:22:01 up  1:41,  1 user,  load average: 0.26, 0.32, 0.33
```

5. who (Displays who is logged in to the system.**)**

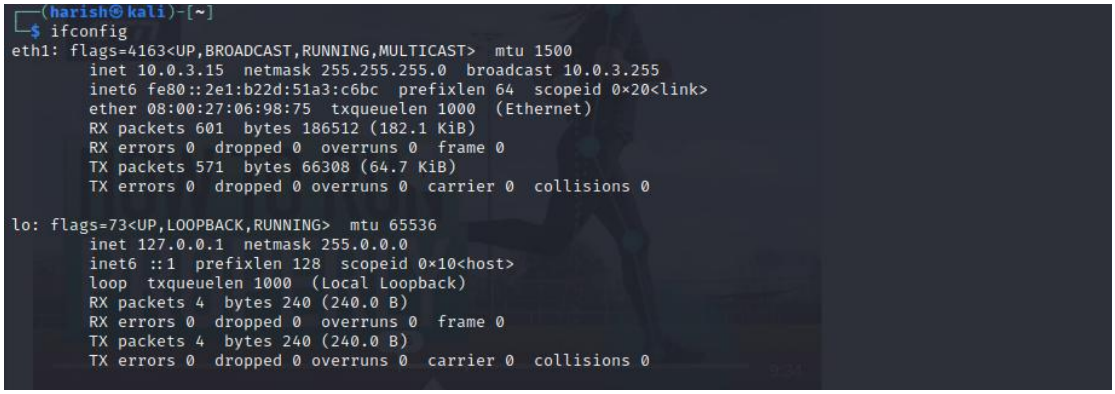
```
┌──(harish㉿kali)-[~]
└─$ who
harish   tty7         2023-05-30 12:41 (:0)
```

6. w (Displays the logged in users and their activities.**)**

```
┌──(harish㉿kali)-[~]
└─$ w
 14:22:08 up  1:41,  1 user,  load average: 0.32, 0.33, 0.34
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
harish   tty7     :0               12:41    2:35m  2:34   0.45s xfce4-session
```

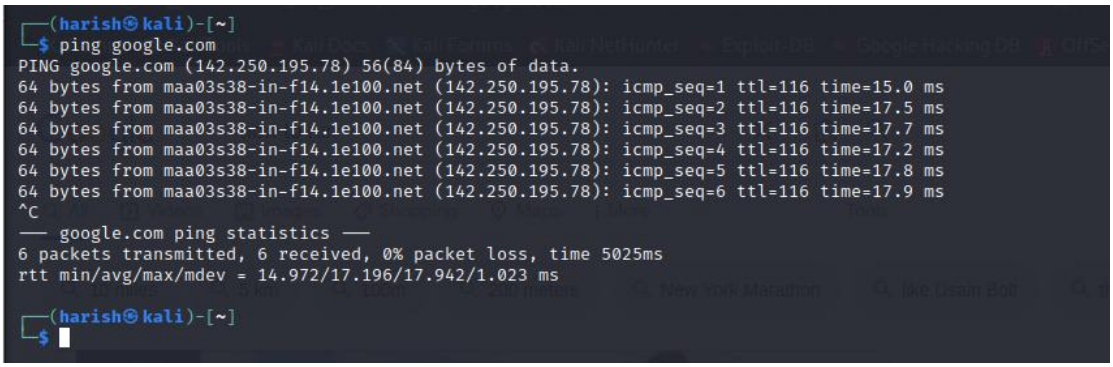
G. Networking

1. ifconfig (used to display all the network adapters and the assigned ip addresses of the system and to configure the network interfaces of the system.



Here we can see that the eth0 adapter is on and then the assigned ip of the adapter is 10.0.3.15

2. ping (this command is used to send the ICMP echo requests the specified network host.**)**



Here we have pinged google.com and then the stats of the eco requests have been displayed on the screen.

3. ssh - this command is used to connect to the remote linux servers in the most secure way. To demnstrate we need 2 linux system where one is running as the openssh server and the other is running openssh client software.

4. scp - this command is used to securely copy files between the systems where the ssh connection is established.

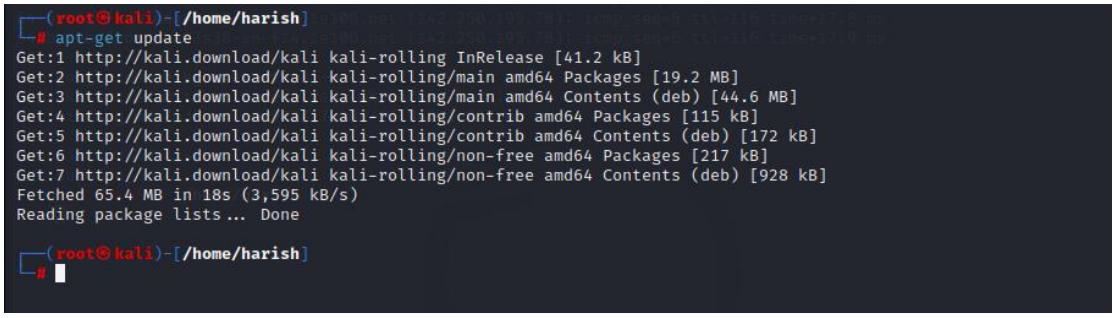
5. wget - this command is used to download the files from the web. Now we don't have an executable binaries as present in windows to install the software in linux distributions and to install any software from web we have to use the wget command and then download the binaries into the system.

H. System Administration

1. sudo - Execute commands with the superuser privileges ie root permissions

Here we can run the commands with the root previliges.

2. apt-get - package management for Debian-based distributions



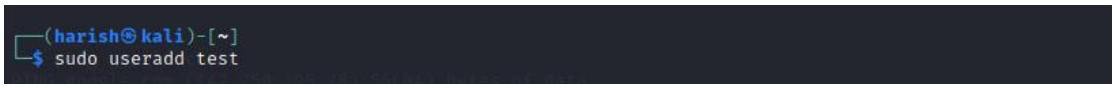
Using this command we have updated the package list and we can install the required packages from it using 'sudo apt-get install package name.'

3. yum - it is a package management for the Red Hat based distributions.

4. Systemctl - manage the system services such as setting time, turning off the system etc.

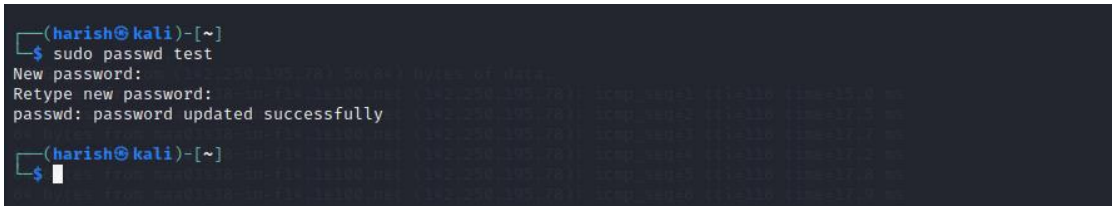
5. Crontab - this is used to schedule the recurring tasks.

6. useradd - this command is used to add a new user to the system.



We can see the added user in the list above using the following command.

7. passwd - used to change the password of a particular user.



With this command the password for the newly created user have been set.