

Darshan Jain

20BCE2657

Title: Linux Command List Assessment

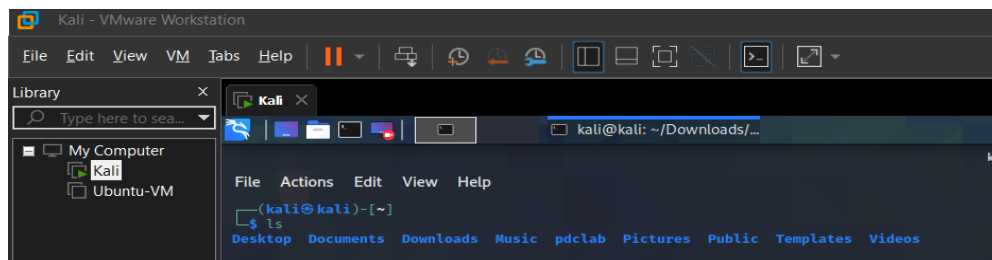
Instructions:-

The following assessment aims to test your understanding and practical knowledge of various Linux commands. Perform the tasks given below using the appropriate commands. Write down the command(s) used to complete each task. You can use any Linux distribution or command-line interface of your choice. Ensure that you provide the correct output or results for each task.

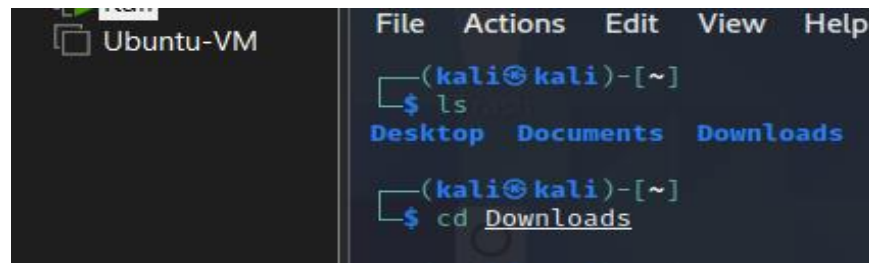
Note: It is recommended to perform this assessment on a Linux machine or virtual environment.

File and Directory Operations:

ls: List files and directories



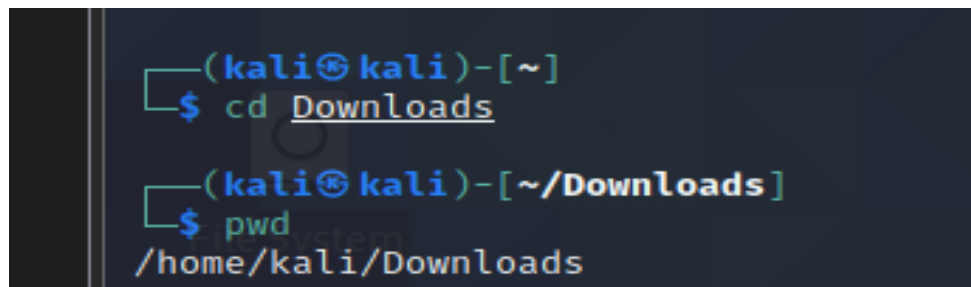
cd: Change directory



A terminal window titled 'Ubuntu-VM' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(kali@kali)-[~]'. The user enters '\$ ls', and the output shows 'Desktop Documents Downloads'. The user then enters '\$ cd Downloads'.

```
(kali@kali)-[~]  
$ ls  
Desktop Documents Downloads  
  
(kali@kali)-[~]  
$ cd Downloads
```

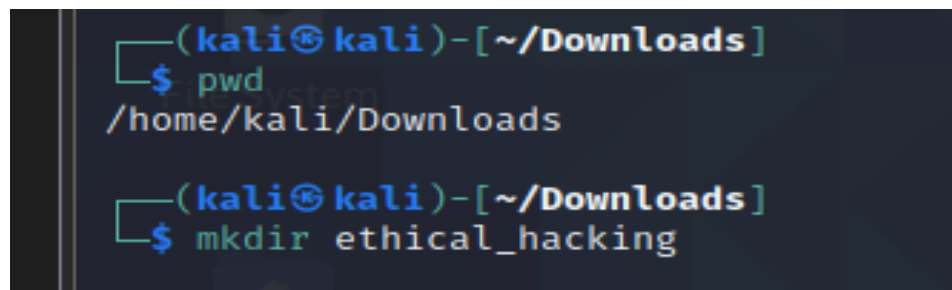
pwd: Print working directory



A terminal window showing the prompt '(kali@kali)-[~]'. The user enters '\$ cd Downloads'. The prompt changes to '(kali@kali)-[~/Downloads]'. The user then enters '\$ pwd', and the output is '/home/kali/Downloads'.

```
(kali@kali)-[~]  
$ cd Downloads  
  
(kali@kali)-[~/Downloads]  
$ pwd  
/home/kali/Downloads
```

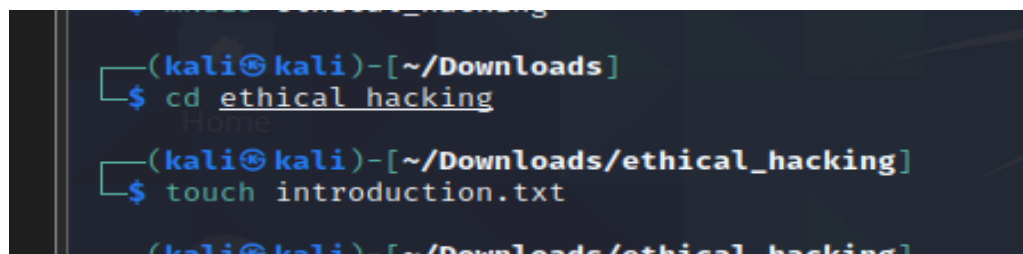
mkdir: Make directory



A terminal window showing the prompt '(kali@kali)-[~/Downloads]'. The user enters '\$ pwd', and the output is '/home/kali/Downloads'. The user then enters '\$ mkdir ethical_hacking'.

```
(kali@kali)-[~/Downloads]  
$ pwd  
/home/kali/Downloads  
  
(kali@kali)-[~/Downloads]  
$ mkdir ethical_hacking
```

touch: Create an empty file



A terminal window showing the prompt '(kali@kali)-[~/Downloads]'. The user enters '\$ cd ethical_hacking'. The prompt changes to '(kali@kali)-[~/Downloads/ethical_hacking]'. The user then enters '\$ touch introduction.txt'.

```
(kali@kali)-[~/Downloads]  
$ cd ethical_hacking  
  
(kali@kali)-[~/Downloads/ethical_hacking]  
$ touch introduction.txt  
  
(kali@kali)-[~/Downloads/ethical_hacking]
```

cp: Copy files and directories

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ touch introduction.txt

(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ cp introduction.txt conclusion.txt
```

mv: Move or rename files and directories

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ cp introduction.txt conclusion.txt

(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ mv introduction.txt intro.txt
```

rm: Remove files and directories

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ mv introduction.txt intro.txt

(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ ls
conclusion.txt  intro.txt

(kali㉿kali)-[~/Downloads/ethical_hacking]
└─$ rm conclusion.txt
```

find: Search for files and directories

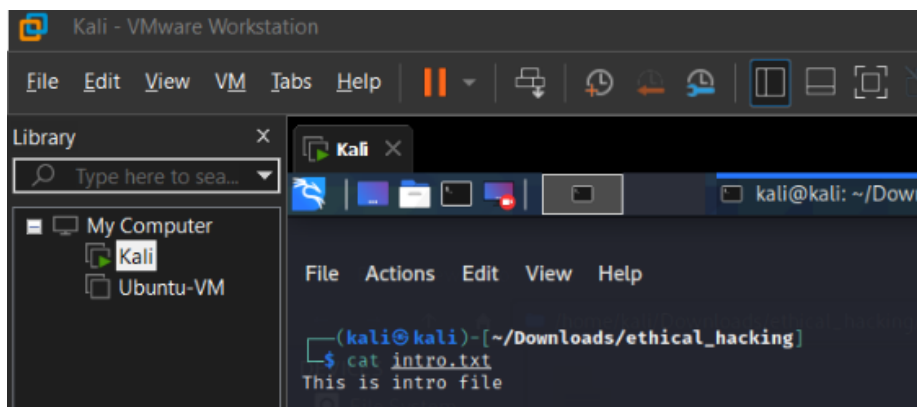
```
find: ./ethical_hacking: No such file or directory

(kali㉿kali)-[~/Downloads/ethical_hacking]
$ find -name intro.txt
./intro.txt

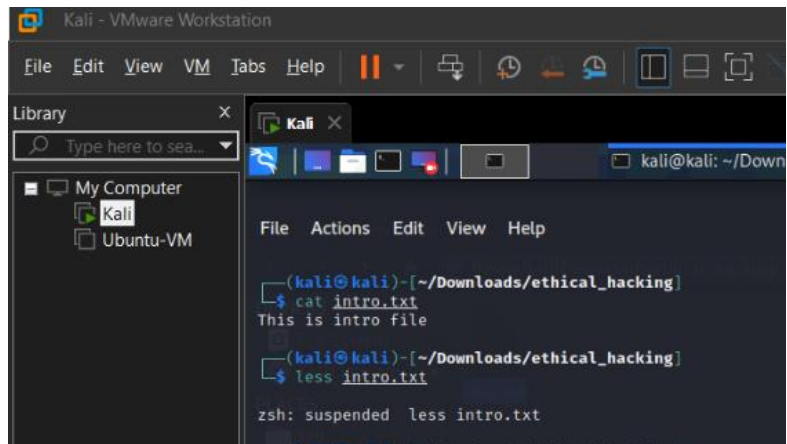
(kali㉿kali)-[~/Downloads/ethical_hacking]
$
```

File Viewing and Editing:

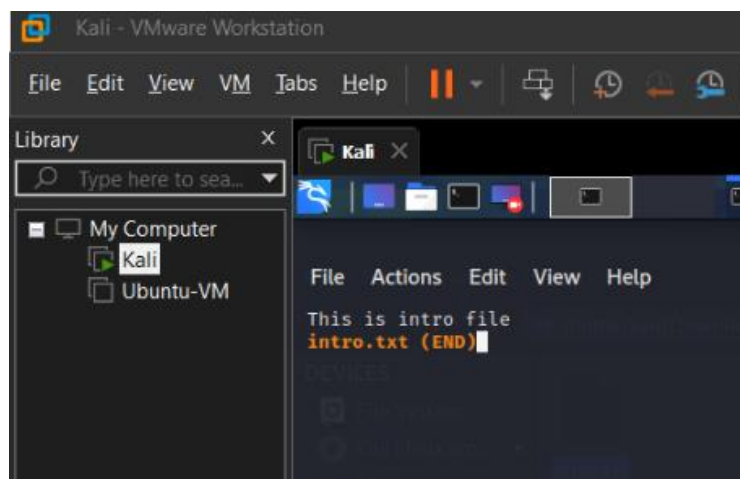
cat: Concatenate and display file content



less: View file content with pagination

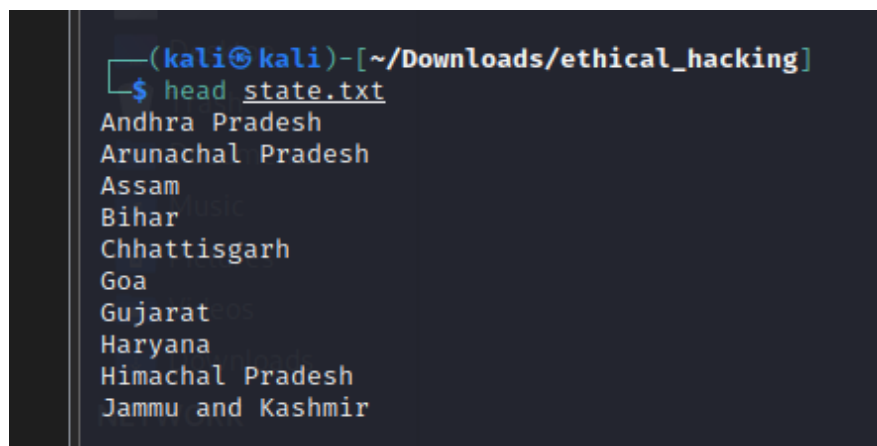


The screenshot shows a Kali Linux terminal window within a VMware Workstation. The terminal prompt is `(kali@kali)-[~/Downloads/ethical_hacking]`. The user has executed `cat intro.txt`, which outputs `This is intro file`. Then, the user has executed `less intro.txt`, which has started the `less` pager. The terminal shows `zsh: suspended less intro.txt`, indicating the command was interrupted.



This screenshot shows the same Kali Linux terminal window. The `less` pager is now displaying the content of `intro.txt`, which is `This is intro file`. The prompt is `intro.txt (END)`, indicating the end of the file has been reached.

head: Display the beginning of a file



The screenshot shows a Kali Linux terminal window. The prompt is `(kali@kali)-[~/Downloads/ethical_hacking]`. The user has executed `head state.txt`. The output displays the first few lines of the file `state.txt`, which are the names of Indian states: `Andhra Pradesh`, `Arunachal Pradesh`, `Assam`, `Bihar`, `Chhattisgarh`, `Goa`, `Gujarat`, `Haryana`, `Himachal Pradesh`, and `Jammu and Kashmir`.

tail: Display the end of a file

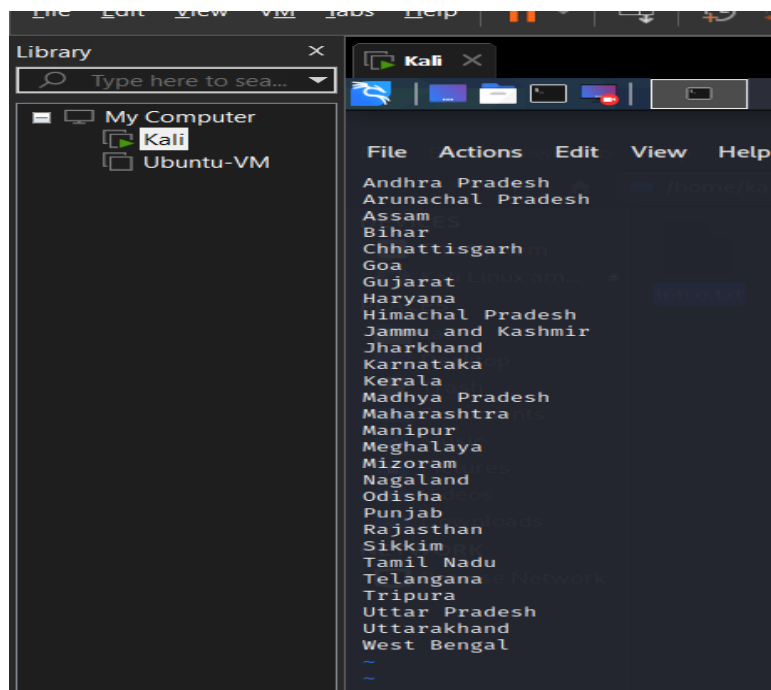
```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ tail state.txt
Odisha
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttar Pradesh
Uttarakhand
West Bengal
(kali㉿kali)-[~/Downloads/ethical_hacking]
```

nano: Text editor for creating and editing files

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ nano state.txt
(kali㉿kali)-[~/Downloads/ethical_hacking]
```

vi/vim: Powerful text editor for experienced users

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ vim state.txt
```



File Permissions:

chmod: Change file permissions

```
(kali㉿kali)-[~/Downloads/ethical_hacking]  
└─$ chmod u=rwx,g=rx,o=r intro.txt
```

chown: Change file owner

```
(kali㉿kali)-[~/Downloads/ethical_hacking]  
└─$ sudo chown test_user intro.txt  
[sudo] password for kali:
```

chgrp: Change file group

```
(kali㉿kali)-[~/Downloads/ethical_hacking]  
└─$ sudo chgrp test_group intro.txt
```

File Compression and Archiving:

tar: Archive files

```
(kali@kali)-[~/Downloads/ethical_hacking]
$ tar cvf file.tar *.txt
intro.txt
state.txt
```

gzip: Compress files

```
(kali@kali)-[~/Downloads/ethical_hacking]
$ gzip state.txt
```

unzip: Extract files from a ZIP archive

```
(kali@kali)-[~/Downloads/ethical_hacking]
$ touch file{1..5}.txt

(kali@kali)-[~/Downloads/ethical_hacking]
$ zip files file1.txt file2.txt file3.txt file4.txt file5.txt
adding: file1.txt (stored 0%)
adding: file2.txt (stored 0%)
adding: file3.txt (stored 0%)
adding: file4.txt (stored 0%)
adding: file5.txt (stored 0%)

(kali@kali)-[~/Downloads/ethical_hacking]
$ ls
file1.txt file2.txt file3.txt file4.txt file5.txt files.zip file.tar intro.txt st

(kali@kali)-[~/Downloads/ethical_hacking]
$ unzip files.zip
Archive: files.zip
replace file1.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: a
error: invalid response [a]
replace file1.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
extracting: file1.txt
extracting: file2.txt
extracting: file3.txt
extracting: file4.txt
extracting: file5.txt
```

Process Management:

ps: List running processes


```
File Actions Edit View Help

(kali㉿kali)-[~/Downloads/ethical_hacking]
$ ps
  PID TTY          TIME CMD
 1325 pts/0        00:00:02 zsh
 1470 pts/0        00:00:00 ps
```

top: Display real-time system information and processes

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ top -n 10
```

```
File Actions Edit View Help
MiB Mem : 3910.3 total, 2995.9 free, 499.2 used, 415.2 buff/cache
MiB Swap: 975.0 total, 975.0 free, 0.0 used, 3183.0 avail Mem

  PID USER      PR  NI   VIRT   RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 693 root        20   0 348076 113460 44116 S   0.3   2.8   0:05.07 Xorg
1142 kali       20   0 514652 38832 31380 S   0.3   1.0   0:00.77 panel-17-pulsea
1185 kali       20   0 292776 36296 28456 S   0.3   0.9   0:02.70 vmtotlsd
   1 root        20   0 168292 11608  8696 S   0.0   0.3   0:02.98 systemd
   2 root        20   0      0      0      0 S   0.0   0.0   0:00.02 kthreadd
   3 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 rcu_gp
   4 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
   6 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-kblockd
   7 root        20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/0:1-cgroup_destroy
   9 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
  10 root        20   0      0      0      0 S   0.0   0.0   0:00.02 ksoftirqd/0
  11 root        20   0      0      0      0 I   0.0   0.0   0:00.18 rcu_sched
  12 root        rt    0      0      0      0 S   0.0   0.0   0:00.00 migration/0
  13 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
  14 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
  15 root        rt    0      0      0      0 S   0.0   0.0   0:00.59 migration/1
  16 root        20   0      0      0      0 S   0.0   0.0   0:00.01 ksoftirqd/1
  18 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-kblockd
  19 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/2
  20 root        rt    0      0      0      0 S   0.0   0.0   0:00.59 migration/2
  21 root        20   0      0      0      0 S   0.0   0.0   0:00.01 ksoftirqd/2
  23 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kworker/2:0H-kblockd
  24 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/3
  25 root        rt    0      0      0      0 S   0.0   0.0   0:00.59 migration/3
  26 root        20   0      0      0      0 S   0.0   0.0   0:00.02 ksoftirqd/3
  28 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kworker/3:0H-kblockd
  33 root        20   0      0      0      0 S   0.0   0.0   0:00.00 kdevtmpfs
  34 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 netns
  35 root        20   0      0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
  36 root        20   0      0      0      0 S   0.0   0.0   0:00.00 kauditd
  37 root        20   0      0      0      0 I   0.0   0.0   0:00.48 kworker/0:2-events
  38 root        20   0      0      0      0 S   0.0   0.0   0:00.00 khungtaskd
  39 root        20   0      0      0      0 S   0.0   0.0   0:00.00 oom_reaper
  40 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 writeback
  41 root        20   0      0      0      0 S   0.0   0.0   0:00.03 kcompactd0
  42 root        25   5      0      0      0 S   0.0   0.0   0:00.00 ksmd
  43 root        39  19      0      0      0 S   0.0   0.0   0:01.05 khugepaged
  45 root        20   0      0      0      0 I   0.0   0.0   0:00.03 kworker/3:1-events
  58 root        20   0      0      0      0 I   0.0   0.0   0:00.18 kworker/1:1-rcu_par_gp
  63 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kintegrityd
  64 root        0 -20   0      0      0 I   0.0   0.0   0:00.00 kblockd

(kali㉿kali)-[~/Downloads/ethical_hacking]
$
```

kill: Terminate processes

bg: Run processes in the background

fg: Bring background processes to the foreground

System Information:

uname: Print system information

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ uname
Linux
```

df: Display disk space usage

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev             1968428         0   1968428  0% /dev
tmpfs             400416      1172    399244  1% /run
/dev/sda1       40036860 9818152  28155248 26% /
tmpfs            2002064         0   2002064  0% /dev/shm
tmpfs              5120         0         5120  0% /run/lock
tmpfs             4096         0         4096  0% /sys/fs/cgroup
tmpfs            400412         56    400356  1% /run/user/1000
```

free: Display memory usage

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ free
              total        used        free      shared  buff/cache   available
Mem:      4004132      528664      3048316        10020        427152        3048316
Swap:      998396           0         998396
```

uptime: Show system uptime

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ uptime
23:44:34 up 47 min, 1 user, load average: 0.00, 0.00, 0.00
```

who: Display logged-in users

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ free
```

	total	used	free	shared	buff/cache
Mem:	4004132	528664	3048316	10020	427152
Swap:	998396	0	998396		

w: Display logged-in users and their activities

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ w
```

23:44:45 up 47 min, 1 user, load average: 0.00, 0.00, 0.00

USER	TTY	FROM	LOGIN@	IDLE	JCPU	PCPU	WHAT
kali	tty7	:0	22:57	47:05	7.22s	0.36s	xfce4-session

Networking:

ss: Configure network interfaces

```
(kali㉿kali)-[~/my_directory]
$ ss -tln
```

State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port	Process
-------	--------	--------	--------------------	-------------------	---------

ping: Send ICMP echo requests to a network host

```
(kali㉿kali)-[~/my_directory]
$ ping www.google.com
PING www.google.com (142.250.194.196) 56(84) bytes of data.
64 bytes from del12s07-in-f4.1e100.net (142.250.194.196): icmp_seq=1 ttl=117 time=18.3 ms
64 bytes from 196.194.250.142.in-addr.arpa (142.250.194.196): icmp_seq=2 ttl=117 time=17.0 ms
64 bytes from 196.194.250.142.in-addr.arpa (142.250.194.196): icmp_seq=3 ttl=117 time=18.5 ms
64 bytes from 196.194.250.142.in-addr.arpa (142.250.194.196): icmp_seq=4 ttl=117 time=17.8 ms
64 bytes from 196.194.250.142.in-addr.arpa (142.250.194.196): icmp_seq=5 ttl=117 time=16.1 ms
^C
--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4007ms
rtt min/avg/max/mdev = 16.058/17.527/18.511/0.891 ms
```

ssh: Securely connect to a remote system

```
(kali㉿kali)-[~/my_directory]
$ ssh Linux@192.168.1.2
ssh: connect to host 192.168.1.2 port 22: No route to host
```

scp: Securely copy files between systems

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ scp state.txt kali@122.162.64.178:/home
ssh: connect to host 122.162.64.178 port 22: Connection refused
lost connection
```

wget: Download files from the web

```
(kali㉿kali)-[~/Downloads/ethical_hacking]
$ wget http://google.com
--2023-05-21 23:59:44-- http://google.com/
Resolving google.com (google.com)... 142.250.194.206, 2404:6800:4002:824::200e
Connecting to google.com (google.com)|142.250.194.206|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: http://www.google.com/ [following]
--2023-05-21 23:59:45-- http://www.google.com/
Resolving www.google.com (www.google.com)... 142.250.193.228, 2404:6800:4002:81d::2004
Connecting to www.google.com (www.google.com)|142.250.193.228|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html                               [  => ]
2023-05-21 23:59:46 (826 KB/s) - 'index.html' saved [19454]
```

System Administration

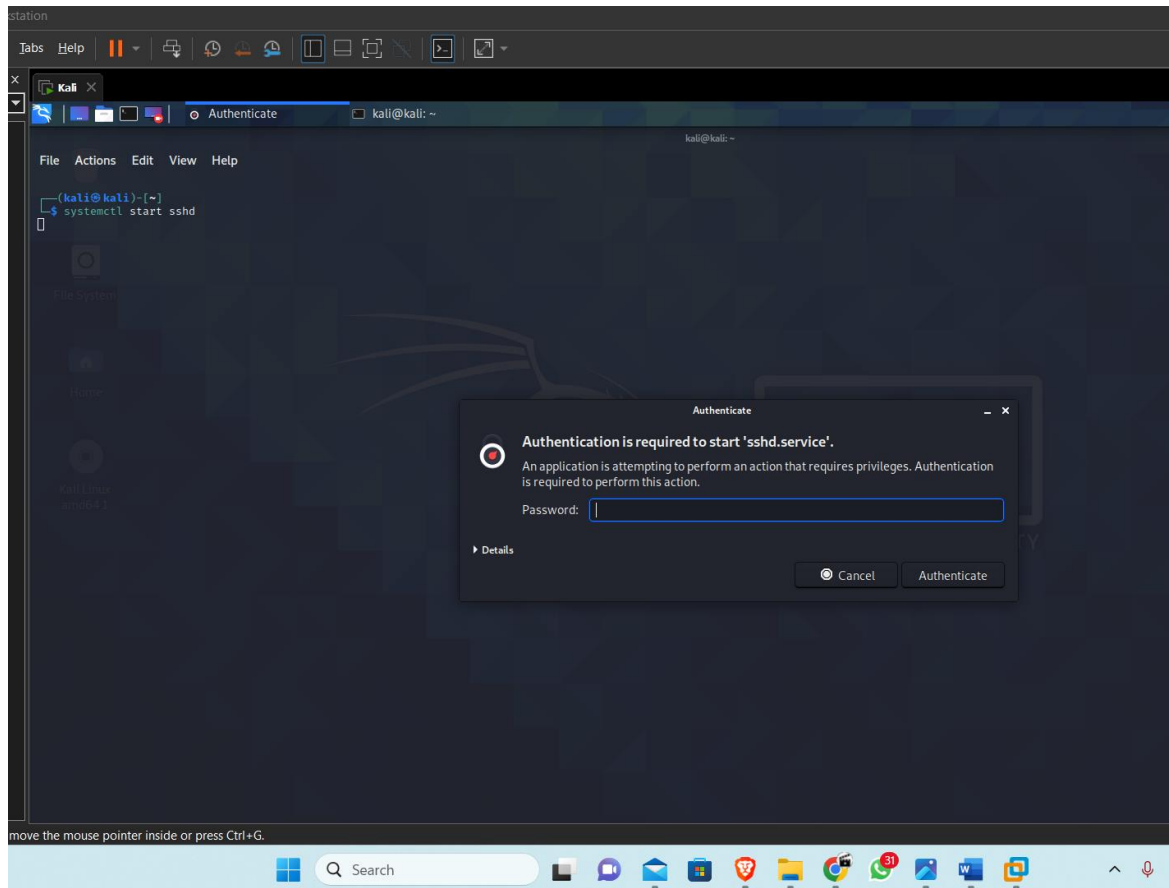
sudo: Execute commands with superuser privileges

```
File Actions Edit View Help
(kali@kali)-[~]
$ sudo -V
Sudo version 1.9.3p1
Sudoers policy plugin version 1.9.3p1
Sudoers file grammar version 48
Sudoers I/O plugin version 1.9.3p1
Sudoers audit plugin version 1.9.3p1
```

apt-get: Package management for Debian-based distributions

```
(kali@kali)-[~]
$ sudo apt-get update
[sudo] password for kali:
Get:1 https://kali.download/kali kali-rolling InRelease [41.2 kB]
Err:1 https://kali.download/kali kali-rolling InRelease
  The following signatures were invalid: EXPKEYSIG ED444FF07D8D0BF6 Kali Linux Repository <dev@kali.org>
Fetched 41.2 kB in 2s (19.5 kB/s)
Reading package lists... Done
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://kali.download/kali kali-rolling InRelease: The following signatures were invalid: EXPKEYSIG ED444FF07D8D0BF6 Kali Linux Repository <dev@kali.org>
W: Failed to fetch https://http.kali.org/kali/dists/kali-rolling/InRelease The following signatures were invalid: EXPKEYSIG ED444FF07D8D0BF6 Kali Linux Repository <dev@kali.org>
W: Some index files failed to download. They have been ignored, or old ones used instead.
```

systemctl: Manage system services



crontab: Schedule recurring tasks

```
(kali㉿kali)-[~]  
$ crontab -l  
no crontab for kali
```

useradd: Add a new user

```
(kali㉿kali)-[~]  
$ sudo useradd test_user
```

passwd: Change user password

```
(kali㉿kali)-[~]  
$ sudo passwd test_user  
New password:  
Retype new password:  
passwd: password updated successfully
```