

### 1) Command: **ifconfig**

Use: check current IP address or see which network connections are active.

My IP: 192.168.123.1

Name of the interface : vxlan.calico

### 2) Find the IP and hardware addresses of your machine using ifconfig command.

IP-10.1.76.64

Mac address - 66:39:44:f9:3f:e1

### 3) Command: **ping google.com**

```
karank@hamsa:~$ ping google.com
PING google.com (142.250.194.174) 56(84) bytes of data.
64 bytes from dell2s06-in-f14.1e100.net (142.250.194.174): icmp_seq=1 ttl=58 time=157 ms
64 bytes from dell2s06-in-f14.1e100.net (142.250.194.174): icmp_seq=2 ttl=58 time=539 ms
64 bytes from dell2s06-in-f14.1e100.net (142.250.194.174): icmp_seq=3 ttl=58 time=85.6 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2001ms
rtt min/avg/max/mdev = 85.657/260.700/539.183/199.075 ms
```

Here, destination is dell2s06-in-f14.1e100.net

IP address : 142.250.194.174

the average RTT(round trip time) :  $157+539+85.6/3$  ms = 260.533

0% packet loss

size of packet that is sent to "google.com" server : 3

size of packet that is received by your machine : 3

### 4) dig : domain information proper

Command: **dig google.com**

```
karank@hamsa:~$ dig google.com

; <<>> DiG 9.11.3-1ubuntu1.18-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 54720
;; 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.                 85      IN      A      172.217.31.206

;; Query time: 1 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Fri Jan 10 15:17:48 IST 2025
;; MSG SIZE rcvd: 55
```

The IP address of "google.com" is 172.217.31.206

The IP addresses of local DNS servers of IIEST : 127.0.0.53

SERVER: 127.0.0.53#53(127.0.0.53)

5) **Traceroute** : It examines how the data moves through the internet.

**Hop**: A step in the journey of data from one router to the next as it travels to its destination.

//Result

karank@hamsa:~\$ traceroute google.com

traceroute to google.com (142.250.199.174), 30 hops max, 60 byte packets

Here, **Hops** : 30 and **IP** : 142.250.199.174

6) **ARP(Address Resolution Protocol)** : Protocol or procedure that connects an ever-changing Internet Protocol (IP) address to a fixed physical machine address

```
karank@hamsa:~$ arp
Address      Hwtype      Hwaddress    Flags Mask      Iface
10.2.80.106   ether       10:bd:3a:81:f1:c4 C              eno1
10.2.61.26    ether       e8:9c:25:81:ea:c7 C              eno1
10.2.98.132   ether       40:b0:34:38:f8:ac C              eno1
10.1.76.108   ether       e6:82:5c:c8:4a:e7 C              calicd75401513c
10.2.76.211   (incomplete) eno1
10.2.61.73    ether       ac:17:02:07:b6:19 C              eno1
10.2.73.139   ether       58:11:22:3f:de:4b C              eno1
10.2.94.95    ether       3c:52:82:59:98:88 C              eno1
10.2.78.53    ether       2c:58:b9:0e:7f:86 C              eno1
10.2.85.6     ether       88:ae:dd:32:88:93 C              eno1
10.2.12.221   ether       e0:0a:f6:c5:ef:db C              eno1
10.2.74.1     ether       60:45:2e:6c:bd:03 C              eno1
10.2.74.2     ether       8c:c8:4b:88:4d:41 C              eno1
10.2.73.116   ether       cc:47:40:eb:45:71 C              eno1
10.2.64.128   ether       08:00:27:80:67:53 C              eno1
10.1.76.82    ether       b6:66:c2:ac:05:92 C              cali3b64329ae29
10.2.88.246   ether       70:f1:1c:47:84:f3 C              eno1
10.2.89.206   ether       80:e8:2c:cb:31:08 C              eno1
10.2.94.161   (incomplete) eno1
10.2.73.164   ether       a0:59:50:3a:74:d3 C              eno1
10.1.76.73    ether       82:a5:53:34:7d:ed C              cali174be0be387
10.2.81.57    ether       00:e0:4c:36:1c:eb C              eno1
10.2.58.132   ether       04:cf:4b:ac:0c:83 C              eno1
10.2.65.158   ether       e0:c2:64:da:fc:be C              eno1
10.2.81.99    ether       5e:f1:22:fe:fd:73 C              eno1
10.2.73.169   ether       4c:44:5b:b9:83:36 C              eno1
10.2.64.139   ether       52:17:61:74:99:02 C              eno1
10.2.61.210   ether       cc:47:40:5a:48:04 C              eno1
10.2.66.116   ether       f8:0d:ac:ca:7e:13 C              eno1
10.2.92.181   ether       04:ec:d8:54:36:0c C              eno1
10.2.61.28    (incomplete) eno1
10.2.98.134   ether       40:b0:34:38:f9:56 C              eno1
10.1.76.69    ether       c6:e8:aa:59:c0:d0 C              cali15f1956c1bc
10.2.88.4     ether       a0:1d:48:df:27:e5 C              eno1
10.2.85.22    ether       3c:52:82:4f:f6:63 C              eno1
10.2.73.175   ether       3c:52:82:4f:f6:fe C              eno1
10.2.66.48    (incomplete) eno1
10.2.61.181   (incomplete) eno1
10.2.81.71    ether       44:af:28:59:37:d8 C              eno1
teesta.cs.iiests.ac.in ether       b0:26:28:15:45:5f C              eno1
10.2.65.22    ether       08:00:27:af:00:a1 C              eno1
10.2.55.127   ether       40:b0:34:38:f9:42 C              eno1
10.2.75.84    ether       2c:58:b9:8b:c7:f6 C              eno1
10.2.73.73    ether       bc:03:58:0f:00:eb C              eno1
10.2.80.152   ether       6c:7e:67:d4:70:68 C              eno1
10.2.76.228   ether       3c:e9:f7:cf:b9:03 C              eno1
10.2.85.7     ether       88:ae:dd:32:89:bc C              eno1
_gateway     ether       00:1e:67:0e:86:df C              eno1
```

//Result

\_gateway ether 00:1e:67:0e:86:df C eno1

Here, MAC address is **00:1e:67:0e:86:df**.

**7) nslookup( Name Server Lookup) :** Network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record.

```
karank@hamsa:~$ nslookup classroom.google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

** server can't find classroom.google.com: SERVFAIL

karank@hamsa:~$ nslookup classroom.google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
Name:   classroom.google.com
Address: 142.251.42.78
Name:   classroom.google.com
Address: 2404:6800:4009:831::200e

karank@hamsa:~$ nslookup 142.251.42.78
78.42.251.142.in-addr.arpa      name = bom12s21-in-f14.1e100.net.

Authoritative answers can be found from:
```

//Results

```
karank@hamsa:~$ nslookup classroom.google.com
Server:      127.0.0.53
Address:     127.0.0.53#53
```

Non-authoritative answer:

```
Name: classroom.google.com
Address: 142.251.42.78
Name: classroom.google.com
Address: 2404:6800:4009:831::200e
Here, IP address is 142.251.42.78.
```

//Reverse domain lookup

```
karank@hamsa:~$ nslookup 142.251.42.78
78.42.251.142.in-addr.arpa      name = bom12s21-in-f14.1e100.net.
```

**8) Netstat(network statistics) :** netstat - Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.

```

karank@hamsa:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:43556         localhost:19001         ESTABLISHED
tcp      0      0 localhost:40036         localhost:19001         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.81.57:60759        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:34914 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:19001         localhost:43556         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:55782 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:34500 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.12.221:53688        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:35140 10.152.183.1:https       ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:55778 10.1.76.75:8000          ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:35406 10.152.183.191:https     ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.81.71:32836        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:58658 10.1.76.82:8181          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:55780 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.58.132:53581        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.64.194:52194        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.65.158:47930        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:34496 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.83.79:62604         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.4.20:49707          ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:33061 hanau.cs.iiests.:sunrpc  TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:772 hanau.cs.iiests.ac.:965  TIME_WAIT
tcp      0      0 localhost:34702         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.85.39:48936         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.19.212:62657        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:39476 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:53218         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.66.116:49878        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:33960 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:33974 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:39140         localhost:9099          TIME_WAIT
tcp      0      0 localhost:40020         localhost:19001         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.58.128:55208        ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:33992 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:56620 10.1.76.82:8181          TIME_WAIT
tcp      0      0 localhost:34714         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:34508 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:56020         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:35128 10.152.183.1:https       ESTABLISHED
tcp      0      0 localhost:53232         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:58024 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:56032         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:43916 10.1.76.75:8000          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.79.93:54968         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.a:33268 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:36934 10.1.76.82:8181          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:58016 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:55372 10.1.76.82:http-alt      TIME_WAIT
tcp      0      0 localhost:59972         localhost:16443         ESTABLISHED
tcp      0      0 localhost:39130         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:34512 10.1.76.101:3000        TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.14.19:57662        ESTABLISHED
tcp      0      0 localhost:49638         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.58.203:53159        ESTABLISHED
tcp      0      0 localhost:54892         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:39448 10.1.76.101:3000        TIME_WAIT
tcp      0      0 localhost:59954         localhost:16443         ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:826 hanau.cs.iiests.ac.:nfs  ESTABLISHED
tcp      0      0 hamsa.cs.iiests.ac.:ssh 10.2.63.30:51894        ESTABLISHED
tcp      0      0 localhost:49636         localhost:9099          TIME_WAIT
tcp      0      0 hamsa.cs.iiests.a:34906 10.1.76.101:3000        TIME_WAIT

```

Active UNIX domain sockets (w/o servers)						
Proto	RefCnt	Flags	Type	State	I-Node	Path
unix	2	[ ]	DGRAM		43974433	/run/user/4331/systemd/notify
unix	2	[ ]	DGRAM		43969793	/run/user/4338/systemd/notify
unix	2	[ ]	DGRAM		43858934	/run/user/4333/systemd/notify
unix	2	[ ]	DGRAM		43869187	/run/user/4377/systemd/notify
unix	2	[ ]	DGRAM		43848739	/run/user/4342/systemd/notify
unix	2	[ ]	DGRAM		43803473	/run/user/4326/systemd/notify
unix	2	[ ]	DGRAM		43796938	/run/user/4327/systemd/notify
unix	2	[ ]	DGRAM		43671341	/run/user/4353/systemd/notify
unix	2	[ ]	DGRAM		43678047	/run/user/4368/systemd/notify
unix	2	[ ]	DGRAM		43664400	/run/user/4370/systemd/notify
unix	2	[ ]	DGRAM		43635189	/run/user/4359/systemd/notify
unix	2	[ ]	DGRAM		43630008	/run/user/4349/systemd/notify
unix	2	[ ]	DGRAM		43634015	/run/user/4371/systemd/notify
unix	2	[ ]	DGRAM		43622593	/run/user/4354/systemd/notify
unix	2	[ ]	DGRAM		43582922	/run/user/4298/systemd/notify
unix	2	[ ]	DGRAM		43560486	/run/user/4372/systemd/notify
unix	2	[ ]	DGRAM		43550642	/run/user/4381/systemd/notify
unix	2	[ ]	DGRAM		37476	/var/spool/postfix/dev/log
unix	2	[ ]	DGRAM		92493	@000ac
unix	2	[ ]	DGRAM		91475	@000ad
unix	2	[ ]	DGRAM		78788	@000ae
unix	2	[ ]	DGRAM		26182	/run/user/4331/systemd/notify