

SSN COLLEGE OF ENGINEERING, KALAVAKKAM  
(An Autonomous Institution, Affiliated to Anna University, Chennai)  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
UCS1511 – COMPUTER NETWORKS LAB

## Lab Exercise 1 – Network Commands

### Aim:

Learn and understand the use of commands like tcpdump, netstat, ifconfig, nslookup and traceroute, ping.

### Study: Network Commands

#### 1. **tcpdump** – dump traffic on a network

- Syntax: `sudo tcpdump [-options] [filter expression]`
- Description: tcpdump is a packet sniffing and packet analyzing tool for a *System Administrator* to troubleshoot connectivity issues in Linux. It is used to capture, filter, and analyze network traffic such as TCP/IP packets going through the system. It is many times used as a security tool as well.

```
aravind@aravind-VirtualBox:~$ sudo tcpdump
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:50:19.855745 IP aravind-VirtualBox > maa03s46-in-f14.1e100.net: ICMP echo request, id 2, seq 1, length 64
13:50:19.856594 IP aravind-VirtualBox.34649 > www.webgui.NokiaWifi.com.domain: 50139+ PTR? 15.2.0.10.in-addr.arpa. (40)
13:50:19.861924 IP maa03s46-in-f14.1e100.net > aravind-VirtualBox: ICMP echo reply, id 2, seq 1, length 64
13:50:20.106914 IP www.webgui.NokiaWifi.com.domain > aravind-VirtualBox.34649: 50139 NXDomain 0/1/0 (117)
13:50:20.108633 IP aravind-VirtualBox.56596 > www.webgui.NokiaWifi.com.domain: 14236+ PTR? 1.1.168.192.in-addr.arpa. (42)
13:50:20.111511 IP www.webgui.NokiaWifi.com.domain > aravind-VirtualBox.56596: 14236 1/0/0 PTR www.webgui.NokiaWifi.com. (80)
13:50:20.958051 IP aravind-VirtualBox > maa03s46-in-f14.1e100.net: ICMP echo request, id 2, seq 2, length 64
13:50:20.864120 IP maa03s46-in-f14.1e100.net > aravind-VirtualBox: ICMP echo reply, id 2, seq 2, length 64
13:50:24.952462 ARP, Request who-has_gateway tell aravind-VirtualBox, length 28
13:50:24.952633 ARP, Reply_gateway is-at 52:54:00:12:35:02 (out Unknown), length 46
13:50:24.952728 IP aravind-VirtualBox.55645 > www.webgui.NokiaWifi.com.domain: 17259+ PTR? 2.2.0.10.in-addr.arpa. (39)
13:50:25.204321 IP www.webgui.NokiaWifi.com.domain > aravind-VirtualBox.55645: 17259 NXDomain 0/1/0 (116)
13:50:26.575129 IP ec2-52-36-47-189.us-west-2.compute.amazonaws.com.https > aravind-VirtualBox.50262: Flags [P.], seq 10820084:10820115, ack 1590597244, win 65535, length 31
13:50:26.575414 IP aravind-VirtualBox.59325 > www.webgui.NokiaWifi.com.domain: 21246+ PTR? 189.47.36.52.in-addr.arpa. (43)
13:50:26.575507 IP aravind-VirtualBox.50262 > ec2-52-36-47-189.us-west-2.compute.amazonaws.com.https: Flags [P.], seq 1:36, ack 31, win 63900, length 35
13:50:26.575887 IP ec2-52-36-47-189.us-west-2.compute.amazonaws.com.https > aravind-VirtualBox.50262: Flags [..], ack 36, win 65535, length 0
13:50:26.622021 IP www.webgui.NokiaWifi.com.domain > aravind-VirtualBox.59325: 21246 1/5/0 PTR ec2-52-36-47-189.us-west-2.compute.amazonaws.com. (218)
^C
17 packets captured
17 packets received by filter
0 packets dropped by kernel
```

#### c. Options:

- D: Print the list of the network interfaces available on the system and on which tcpdump can capture packets. For each network interface, a number and an interface name, possibly followed by a text description of the interface, is printed.

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

- i: Listen on interface. If unspecified, tcpdump searches the system interface list for the lowest numbered, configured up interface (excluding loopback), which may turn out to be, for example, ``eth0".

```

aravind@aravind-VirtualBox:~$ sudo tcpdump -i lo
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on lo, link-type EN10MB (Ethernet), capture size 262144 bytes
13:53:33.435698 IP localhost.50963 > localhost.50963: UDP, length 32
13:53:33.447085 IP localhost.50963 > localhost.50963: UDP, length 24
13:53:33.447773 IP localhost.50963 > localhost.50963: UDP, length 32
13:53:33.458471 IP localhost.50963 > localhost.50963: UDP, length 936
13:53:33.458481 IP localhost.50963 > localhost.50963: UDP, length 376
13:53:33.458484 IP localhost.50963 > localhost.50963: UDP, length 488
^C
6 packets captured
12 packets received by filter
0 packets dropped by kernel

```

iii. -c: Exit after receiving count packets.

```

aravind@aravind-VirtualBox:~$ sudo tcpdump -c 4 -i lo
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on lo, link-type EN10MB (Ethernet), capture size 262144 bytes
13:55:11.372359 IP localhost.50963 > localhost.50963: UDP, length 32
13:55:11.385741 IP localhost.50963 > localhost.50963: UDP, length 24
13:55:11.388936 IP localhost.50963 > localhost.50963: UDP, length 32
13:55:11.400120 IP localhost.50963 > localhost.50963: UDP, length 936
4 packets captured
12 packets received by filter
0 packets dropped by kernel

```

## 2. netstat

- Syntax: netstat [-options]
- Description: Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships

```

aravind@aravind-VirtualBox:~$ netstat
Active Internet connections (w/o servers)

```

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	aravind-VirtualBo:50262	ec2-52-36-47-189.:https	ESTABLISHED
udp	0	0	localhost:50963	localhost:50963	ESTABLISHED
udp	0	0	aravind-VirtualB:bootpc	_gateway:bootps	ESTABLISHED

```

Active UNIX domain sockets (w/o servers)

```

Proto	RefCnt	Flags	Type	State	I-Node	Path
unix	2	[ ]	DGRAM		32498	/run/user/1000/systemd/notify
unix	2	[ ]	DGRAM		15633	/run/systemd/journal/syslog
unix	17	[ ]	DGRAM		15643	/run/systemd/journal/dev-log
unix	8	[ ]	DGRAM		15647	/run/systemd/journal/socket
unix	4	[ ]	DGRAM		15619	/run/systemd/notify
unix	3	[ ]	STREAM	CONNECTED	57398	@/tmp/.ICE-unix/1737
unix	3	[ ]	STREAM	CONNECTED	40041	/run/systemd/journal/stdout
unix	3	[ ]	STREAM	CONNECTED	40043	/run/user/1000/bus
unix	3	[ ]	STREAM	CONNECTED	32647	/run/user/1000/bus
unix	3	[ ]	STREAM	CONNECTED	23724	/run/systemd/journal/stdout
unix	3	[ ]	STREAM	CONNECTED	50106	/run/systemd/journal/stdout
unix	3	[ ]	STREAM	CONNECTED	39854	
unix	3	[ ]	STREAM	CONNECTED	40380	/run/systemd/journal/stdout
unix	3	[ ]	STREAM	CONNECTED	37488	@/home/aravind/.cache/ibus/dbus-dcslq0Uf
unix	3	[ ]	STREAM	CONNECTED	34543	/run/user/1000/bus
unix	3	[ ]	STREAM	CONNECTED	35932	
unix	3	[ ]	STREAM	CONNECTED	57254	/run/user/1000/pulse/native
unix	3	[ ]	STREAM	CONNECTED	39605	
unix	3	[ ]	STREAM	CONNECTED	38154	/run/user/1000/bus
unix	3	[ ]	STREAM	CONNECTED	24430	/run/dbus/system_bus_socket
unix	3	[ ]	STREAM	CONNECTED	51148	
unix	3	[ ]	STREAM	CONNECTED	53646	
unix	3	[ ]	STREAM	CONNECTED	40096	/run/user/1000/bus

## c. Options:

- i. -a: Show both listening and non-listening sockets.

```

aravind@aravind-VirtualBox:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp            0.0.0.0:*               LISTEN
tcp        0      0 localhost:postgresql    0.0.0.0:*               LISTEN
tcp        0      0 aravind-VirtualBo:39770 17.111.232.35.bc.g:http TIME_WAIT
tcp        0      0 aravind-VirtualBo:50262 ec2-52-36-47-189.:https ESTABLISHED
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 0.0.0.0:631             0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:47788           0.0.0.0:*               LISTEN
udp        0      0 localhost:50963          localhost:50963          ESTABLISHED
udp        0      0 localhost:domain        0.0.0.0:*               LISTEN
udp        0      0 aravind-VirtualB:bootpc _gateway:bootps         ESTABLISHED
udp        0      0 0.0.0.0:mdns            0.0.0.0:*               LISTEN
udp6       0      0 [::]:58129              [::]:*                  LISTEN
udp6       0      0 [::]:mdns                [::]:*                  LISTEN
raw6       0      0 [::]:ipv6-icmp          [::]:*                  LISTEN
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags   Type       State       I-Node  Path
unix  2      [ ACC ] SEQPACKET LISTENING   15649     /run/udev/control
unix  2      [ ]     DGRAM      LISTENING   32498     /run/user/1000/systemd/notify
unix  2      [ ACC ] STREAM     LISTENING   15622     /run/systemd/private
unix  2      [ ACC ] STREAM     LISTENING   32501     /run/user/1000/systemd/private
unix  2      [ ACC ] STREAM     LISTENING   32515     /run/user/1000/bus
unix  2      [ ACC ] STREAM     LISTENING   15624     /run/systemd/userdb/io.systemd.DynamicUser
unix  2      [ ACC ] STREAM     LISTENING   32516     /run/user/1000/gnupg/S.dirmgr
unix  2      [ ]     DGRAM      LISTENING   15633     /run/systemd/journal/syslog
unix  2      [ ACC ] STREAM     LISTENING   32517     /run/user/1000/gnupg/S.gpg-agent.browser
unix  2      [ ACC ] STREAM     LISTENING   15635     /run/systemd/fsck.progress

```

- ii. -s: Display summary statistics for each protocol.

```

aravind@aravind-VirtualBox:~$ netstat -s
Ip:
  Forwarding: 2
  5549 total packets received
  1 with invalid addresses
  0 forwarded
  0 incoming packets discarded
  5546 incoming packets delivered
  5210 requests sent out
  20 outgoing packets dropped
Icmp:
  96 ICMP messages received
  0 input ICMP message failed
  ICMP input histogram:
    destination unreachable: 40
    echo replies: 56
  154 ICMP messages sent
  0 ICMP messages failed
  ICMP output histogram:
    destination unreachable: 40
    echo requests: 114
IcmpMsg:
  InType0: 56
  InType3: 40
  OutType3: 40
  OutType8: 114
Tcp:
  110 active connection openings
  0 passive connection openings
  6 failed connection attempts
  0 connection resets received
  1 connections established
  2079 segments received
  2030 segments sent out
  19 segments retransmitted
  0 bad segments received
  41 resets sent
Udp:
  3331 packets received
  40 packets to unknown port received
  0 packet receive errors
  3074 packets sent
  0 receive buffer errors
  0 send buffer errors
  IgnoredMulti: 4

```

- iii. -at: To list all tcp ports.

```
aravind@aravind-VirtualBox:~$ netstat -at
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp      0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp      0      0 localhost:postgresql    0.0.0.0:*               LISTEN
tcp      0      0 aravind-VirtualBo:50262 ec2-52-36-47-189.:https ESTABLISHED
tcp6     0      0 ip6-localhost:ipp      [::]:*                  LISTEN
```

- iv. -au: To list all udp ports.

```
aravind@aravind-VirtualBox:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp      0      0 0.0.0.0:631            0.0.0.0:*               LISTEN
udp      0      0 0.0.0.0:47788          0.0.0.0:*               LISTEN
udp      0      0 localhost:50963         localhost:50963         ESTABLISHED
udp      0      0 localhost:domain        0.0.0.0:*               LISTEN
udp      0      0 aravind-VirtualB:bootpc _gateway:bootps        ESTABLISHED
udp      0      0 0.0.0.0:mdns            0.0.0.0:*               LISTEN
udp6     0      0 [::]:58129             [::]:*                  LISTEN
udp6     0      0 [::]:mdns               [::]:*                  LISTEN
```

- v. -l: To list only the listening ports.

```
aravind@aravind-VirtualBox:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp      0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp      0      0 localhost:postgresql    0.0.0.0:*               LISTEN
tcp6     0      0 ip6-localhost:ipp      [::]:*                  LISTEN
udp      0      0 0.0.0.0:631            0.0.0.0:*               LISTEN
udp      0      0 0.0.0.0:47788          0.0.0.0:*               LISTEN
udp      0      0 localhost:domain        0.0.0.0:*               LISTEN
udp      0      0 0.0.0.0:mdns            0.0.0.0:*               LISTEN
udp6     0      0 [::]:58129             [::]:*                  LISTEN
udp6     0      0 [::]:mdns               [::]:*                  LISTEN
raw6     0      0 [::]:ipv6-icmp         [::]:*                  LISTEN

Active UNIX domain sockets (only servers)
Proto RefCnt Flags   Type       State       I-Node     Path
unix   2      [ ACC ] SEQPACKET LISTENING   15649      /run/udev/control
unix   2      [ ACC ] STREAM    LISTENING   15622      /run/systemd/private
unix   2      [ ACC ] STREAM    LISTENING   32501      /run/user/1000/systemd/private
unix   2      [ ACC ] STREAM    LISTENING   32515      /run/user/1000/bus
unix   2      [ ACC ] STREAM    LISTENING   15624      /run/systemd/userdb/io.systemd.DynamicUser
unix   2      [ ACC ] STREAM    LISTENING   32516      /run/user/1000/gnupg/S.dirmgr
unix   2      [ ACC ] STREAM    LISTENING   32517      /run/user/1000/gnupg/S.gpg-agent.browser
unix   2      [ ACC ] STREAM    LISTENING   15635      /run/systemd/fsck.progress
unix   2      [ ACC ] STREAM    LISTENING   32518      /run/user/1000/gnupg/S.gpg-agent.extra
unix   2      [ ACC ] STREAM    LISTENING   32519      /run/user/1000/gnupg/S.gpg-agent.ssh
unix   2      [ ACC ] STREAM    LISTENING   32520      /run/user/1000/gnupg/S.gpg-agent
unix   2      [ ACC ] STREAM    LISTENING   15645      /run/systemd/journal/stdout
unix   2      [ ACC ] STREAM    LISTENING   32521      /run/user/1000/pk-debconf-socket
unix   2      [ ACC ] STREAM    LISTENING   37306      @/tmp/.ICE-unix/1737
unix   2      [ ACC ] STREAM    LISTENING   32522      /run/user/1000/pulse/native
unix   2      [ ACC ] STREAM    LISTENING   32523      /run/user/1000/snapd-session-agent.socket
unix   2      [ ACC ] STREAM    LISTENING   15859      /run/systemd/journal/io.systemd.journal
unix   2      [ ACC ] STREAM    LISTENING   34368      /run/user/1000/keyring/control
unix   2      [ ACC ] STREAM    LISTENING   35236      @/tmp/.X11-unix/X0
unix   2      [ ACC ] STREAM    LISTENING   37280      /run/user/1000/keyring/pkcs11
```

- vi. -lt: To list only the listening ports.

```
aravind@aravind-VirtualBox:~$ netstat -lt
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp      0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp      0      0 localhost:postgresql    0.0.0.0:*               LISTEN
tcp6     0      0 ip6-localhost:ipp      [::]:*                  LISTEN
```



- vii. -lu: To list only the listening udp ports.

```
aravind@aravind-VirtualBox:~$ netstat -lu
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp        0      0 0.0.0.0:47788           0.0.0.0:*
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp6       0      0 [::]:58129              [::]:*
udp6       0      0 [::]:mdns                [::]:*
```

### 3. ifconfig

- Syntax: ifconfig [-options]
- Description: ifconfig is used to configure the kernel-resident network interfaces. It is used at boot time to set up interfaces as necessary. After that, it is usually only needed when debugging or when system tuning is needed.

```
aravind@aravind-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::2834:23ad:156b:d71c prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:a9:44:f3 txqueuelen 1000 (Ethernet)
    RX packets 7658 bytes 7611209 (7.6 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 3868 bytes 792710 (792.7 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 2917 bytes 669961 (669.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2917 bytes 669961 (669.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- Options:

- a: display all interfaces which are currently available, even if down

```
aravind@aravind-VirtualBox:~$ 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::2834:23ad:156b:d71c prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:a9:44:f3 txqueuelen 1000 (Ethernet)
    RX packets 7699 bytes 7633513 (7.6 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 3908 bytes 809596 (809.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 2990 bytes 693197 (693.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2990 bytes 693197 (693.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- ii. -s: display a short list (like netstat -i)

```
aravind@aravind-VirtualBox:~$ ifconfig -s
Iface      MTU      RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3     1500     7699    0      0  0      3908    0      0      0 BMRU
lo         65536    2990    0      0  0      2990    0      0      0 LRU
```

#### 4. nslookup

- Syntax: nslookup [-options] [server]
- Description: nslookup is a program to query Internet domain name servers. nslookup has two modes: interactive and non-interactive. Interactive mode allows the user to query name servers for information about various hosts and domains or to print a list of hosts in a domain. Non-interactive mode is used to print just the name and requested information for a host or domain.

```
aravind@aravind-VirtualBox:~$ nslookup google.com
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.77.142
Name:   google.com
Address: 2404:6800:4007:826::200e

aravind@aravind-VirtualBox:~$ nslookup youtube.com
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
Name:   youtube.com
Address: 142.250.77.110
Name:   youtube.com
Address: 2404:6800:4007:808::200e

aravind@aravind-VirtualBox:~$ nslookup gmail.com
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
Name:   gmail.com
Address: 142.250.195.133
Name:   gmail.com
Address: 2404:6800:4007:80a::2005
```

#### 5. traceroute

- Syntax: traceroute [options] [server]
- Description: traceroute tracks the route packets taken from an IP network on their way to a given host. It utilizes the IP protocol's time to live (TTL)

field and attempts to elicit an ICMP TIME\_EXCEEDED from each gateway along the path to the host.

```
aravind@aravind-VirtualBox:~$ traceroute google.com
traceroute to google.com (216.58.196.174), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.273 ms 0.261 ms 0.254 ms
 2 _gateway (10.0.2.2) 41.337 ms 43.699 ms 43.660 ms
aravind@aravind-VirtualBox:~$ traceroute youtube.com
traceroute to youtube.com (142.250.77.110), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.340 ms 0.318 ms 0.306 ms
 2 _gateway (10.0.2.2) 43.164 ms 43.148 ms 43.631 ms
aravind@aravind-VirtualBox:~$ traceroute gmail.com
traceroute to gmail.com (142.250.195.133), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.265 ms 0.241 ms 0.208 ms
 2 _gateway (10.0.2.2) 41.811 ms 43.212 ms 42.625 ms
```

## 6. ping

- Syntax: traceroute [options] [server]
- Description: ping uses the ICMP protocol's mandatory ECHO\_REQUEST datagram to elicit an ICMP ECHO\_RESPONSE from a host or gateway. ECHO\_REQUEST datagrams ("pings") have an IP and ICMP header, followed by a struct timeval and then an arbitrary number of "pad" bytes used to fill out the packet.

```
aravind@aravind-VirtualBox:~$ ping google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=1 ttl=116 time=47.1 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=2 ttl=116 time=8.52 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=3 ttl=116 time=6.41 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=4 ttl=116 time=9.12 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=5 ttl=116 time=7.66 ms
^C
--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4015ms
rtt min/avg/max/mdev = 6.411/15.764/47.108/15.698 ms
aravind@aravind-VirtualBox:~$ ping youtube.com
PING youtube.com (142.250.193.110) 56(84) bytes of data.
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=1 ttl=117 time=47.2 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=2 ttl=117 time=8.15 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=3 ttl=117 time=6.05 ms
^C
--- youtube.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2009ms
rtt min/avg/max/mdev = 6.047/20.459/47.186/18.917 ms
aravind@aravind-VirtualBox:~$ ping gmail.com
PING gmail.com (142.250.195.229) 56(84) bytes of data.
64 bytes from maa03s43-in-f5.1e100.net (142.250.195.229): icmp_seq=1 ttl=116 time=47.6 ms
64 bytes from maa03s43-in-f5.1e100.net (142.250.195.229): icmp_seq=2 ttl=116 time=6.29 ms
64 bytes from maa03s43-in-f5.1e100.net (142.250.195.229): icmp_seq=3 ttl=116 time=9.13 ms
64 bytes from maa03s43-in-f5.1e100.net (142.250.195.229): icmp_seq=4 ttl=116 time=9.79 ms
^C
--- gmail.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3008ms
rtt min/avg/max/mdev = 6.293/18.197/47.586/17.017 ms
```

## Learning Outcomes:

1. Understood network commands.
2. Discovered their syntax, description and working.
3. Explored about their options.