

## Lab 1 - CSE 3111 Computer Networking Lab

**PING:**checks if a host is reachable and shows latency + packet loss.

```
student@student-Veriton-N4660G:~$ ping google.com
PING google.com (142.250.193.142) 56(84) bytes of data.
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=1 ttl=113 time=34.1 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=2 ttl=113 time=34.2 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=3 ttl=113 time=34.0 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=4 ttl=113 time=34.1 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=5 ttl=113 time=34.3 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=6 ttl=113 time=34.1 ms
64 bytes from tzdelb-at-in-f14.1e100.net (142.250.193.142): icmp_seq=16
^C
--- google.com ping statistics ---
165 packets transmitted, 165 received, 0% packet loss, time 164190ms
rtt min/avg/max/mdev = 33.875/34.203/36.077/0.270 ms
student@student-Veriton-N4660G:~$ █
```

- PING google.com (142.250.193.142) → resolved IP of Google.
- 64 bytes from ... time=34.1 ms → reply received in ~34 ms.
- icmp\_seq → sequence number of the packet.
- ttl=113 → time-to-live (hops left before packet is dropped).
- 165 transmitted, 165 received, 0% loss → no packet loss.
- rtt min/avg/max/mdev → round-trip time stats (latency).

```
student@student-Veriton-N4660G:~$ traceroute google.com
traceroute to google.com (142.250.182.46), 30 hops max, 60 byte packets
1 * *
2 10.33.32.1 (10.33.32.1) 0.074 ms 0.088 ms 0.076 ms
3 103.221.253.97 (103.221.253.97) 1.665 ms 1.693 ms 2.271 ms
4 10.252.8.285 (10.252.8.285) 0.386 ms 0.291 ms 0.277 ms
5 100.100.1.45 (100.100.1.45) 1.158 ms 1.226 ms 1.254 ms
6 100.100.8.33 (100.100.8.33) 0.975 ms 0.974 ms 1.052 ms
7 100.211.162.109 (100.211.162.109) 1.436 ms 1.697 ms 1.708 ms
8 123.49.8.41 (123.49.8.41) 1.741 ms 1.969 ms 1.977 ms
9 123.49.13.89 (123.49.13.89) 6.262 ms 6.233 ms 6.825 ms
10 142.251.195.122 (142.251.195.122) 34.221 ms 34.120 ms 34.233 ms
11 * *
12 142.251.52.206 (142.251.52.206) 34.410 ms 172.253.58.156 (172.253.58.156) 35.068 ms 172.253.67.06 (172.253.67.06) 36.041 ms
13 142.251.76.169 (142.251.76.169) 34.917 ms 142.251.76.171 (142.251.76.171) 34.549 ms 192.178.82.238 (192.178.82.238) 34.635 ms
14 192.178.83.215 (192.178.83.215) 34.570 ms tzdelb-at-in-f14.1e100.net (142.250.182.46) 35.780 ms 192.178.83.225 (192.178.83.225) 35.609 ms
```

## TRACEROUTE:

### Hop 1:

\* \* \*

\*\*\* \* \* \*\*\*: This means that no response was received from the first hop. This could happen due to a firewall or a router configured to block ICMP packets, which are used by traceroute.

### Hop 2:

10.33.32.1 (10.33.32.1) 0.074 ms 0.088 ms 0.076 ms

**10.33.32.1:** This is likely the first router in your local network or an intermediate gateway. The three response times (0.074 ms, 0.088 ms, 0.076 ms) show the RTT for each of the three

packets sent. These are very low, indicating that the hop is very close to you (probably within your local network or ISP infrastructure).

**Ifconfig:** used for displaying current network configuration information, setting up an ip address, netmask, or broadcast address to a network interface, creating an alias for the network interface, setting up hardware address, and enabling or disabling network interfaces.

```
student@student:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        link: ethernet brd 00:0c:29:18:3d:28 broadcast 00:0c:29:ff:ff:ff
        ether 00:0c:29:18:3d:28 txqueuelen 1000 (Ethernet)
        RX packets 0 bytes 0 errors 0 dropped 0 overruns 0 carrier 0 collisions 0
        RX bytes 0 bytes 0 errors 0 dropped 0 overruns 0 carrier 0 collisions 0
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        link: loop brd 00:00:00:00:00:00
        inet 127.0.0.1/8 brd 127.255.255.255 scope host
           valid_lft forever
           link-layer brd 00:00:00:00:00:00
        loop txqueuelen 1000 (Local Loopback)
        RX packets 2084 bytes 238937 (236.9 kB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 2084 bytes 238937 (236.9 kB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
wlan0: flags=4163<UP,BROADCAST,MULTICAST> mtu 1500
        link: wireless brd ff:ff:ff:ff:ff:ff broadcast ff:ff:ff:ff:ff:ff
        ether 00:0c:29:18:3d:28 txqueuelen 1000 (Ethernet)
        RX packets 0 bytes 0 errors 0 dropped 0 overruns 0 carrier 0 collisions 0
        RX bytes 0 bytes 0 errors 0 dropped 0 overruns 0 carrier 0 collisions 0
        TX packets 0 bytes 0 errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

**ARP:** Displays and modifies address resolution, we can add and delete

```
student@student-Veriton-N4660G:~$ more /etc/hosts
127.0.0.1      localhost
127.0.1.1      student-Veriton-N4660G
```

**RARP:**

Client broadcasts its MAC address and requests an IP address, and the server responds with the corresponding IP address

```
student@student-Veriton-N4660G:~$ nslookup google.com
Server:  127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name:  google.com
Address: 142.250.193.142
Name:  google.com
Address: 2404:6800:4002:819::200e
```

**Nslookup :** tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record, we can also reverse DNS look-up by providing the IP

```
student@student-Veriton-N4660G:~$ nslookup 127.0.0.53
127.0.0.127.in-addr.arpa name = localhost.
```

address as an argument to nslookup.

**Netstat:** allows users to display network-related information and diagnose various networking issues.

```
student@student-Veriton-N4660G:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 localhost:ipp           0.0.0.0:*
tcp      0      0 localhost:domain        0.0.0.0:*
tcp      0      0 student-Veriton-N:34472 0.128.128.34.bc.g:https ESTABLISHED
tcp      0      0 student-Veriton-N:43988 tzdela-au-in-f3.1:https ESTABLISHED

Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type      State         I-Node    Path
unix  3      [ ]     SEQPACKET  CONNECTED   43834
unix  3      [ ]     STREAM    CONNECTED   13949
unix  2      [ ]     STREAM    CONNECTED   15489
unix  3      [ ]     STREAM    CONNECTED   49154
unix  3      [ ]     STREAM    CONNECTED   5850
unix  3      [ ]     STREAM    CONNECTED   54434
unix  3      [ ]     STREAM    CONNECTED   18783
unix  3      [ ]     STREAM    CONNECTED   16952
unix  3      [ ]     STREAM    CONNECTED   17667
unix  3      [ ]     SEQPACKET  CONNECTED   24214
unix  3      [ ]     STREAM    CONNECTED   13948
unix  2      [ ]     DGRAM     CONNECTED   17654
unix  3      [ ]     STREAM    CONNECTED   13877    /run/dbus/system_bus_socket
```