NETWORKING & SYSTEM ADMINISTRATION LAB

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Roll No: 20
Batch: RMCA-A
Date: 09/06/2022

Experiment No: 16

Aim

Networking commands and utilities

Procedure

$ifconfig - To list the network interfaces and its ip, net mask and other details

[options]

-s – To list interface ith mtu ,flag,etc

$ip addr show- To list network devices ip with numbered list

$ping <ip> - To test connection

[option]

-D - with timestamp

-i - wait optional seconds between sending each packet

-I - to check the connection through an interface

Traceroute

$sudo apt install traceroute - Installation

$traceroute <ip> - To trace route.

[option]

-T – list route packets using tcp protocol

-I - list packet route using icmp protocol

-i – route packets through specified interface

syn: traceroute -i <interface_name>

-r - Bypass normal routing tables

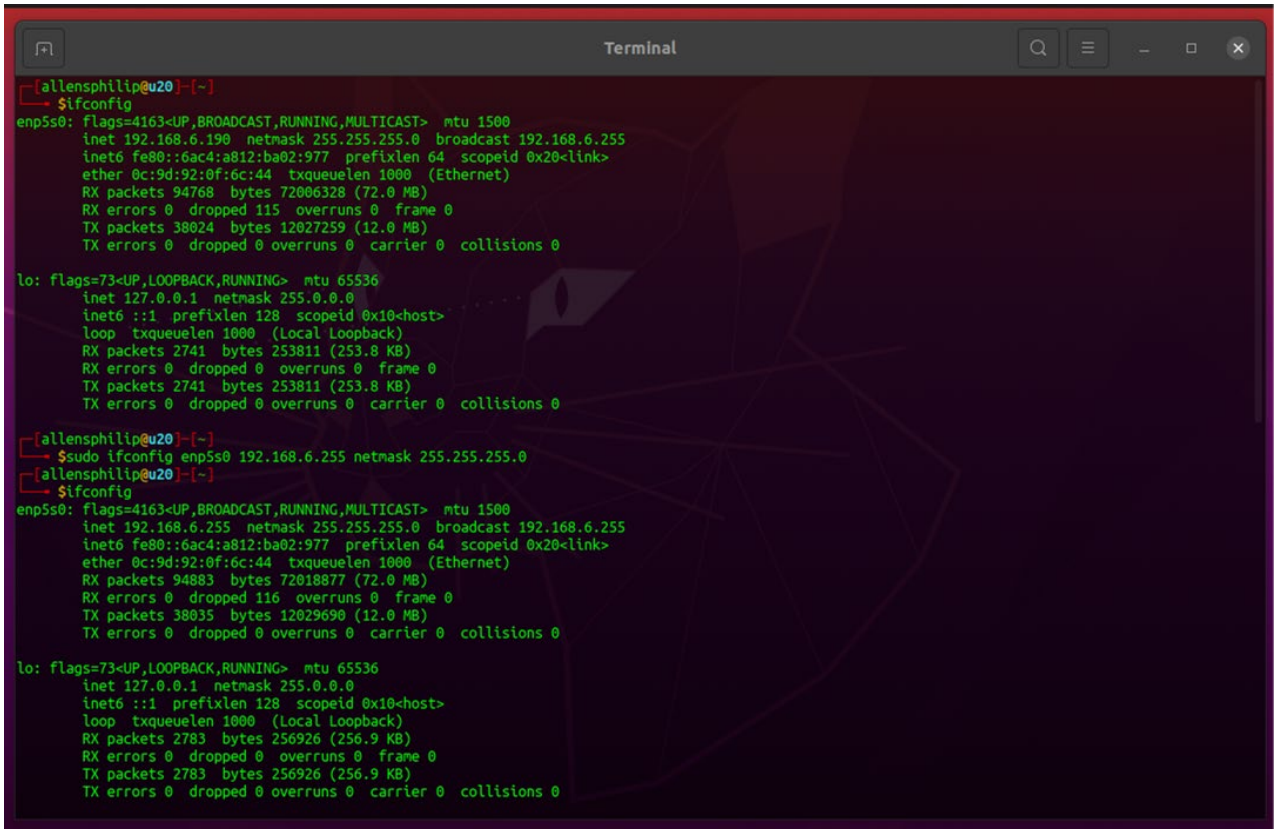
ex: traceroute 8.8.8.8

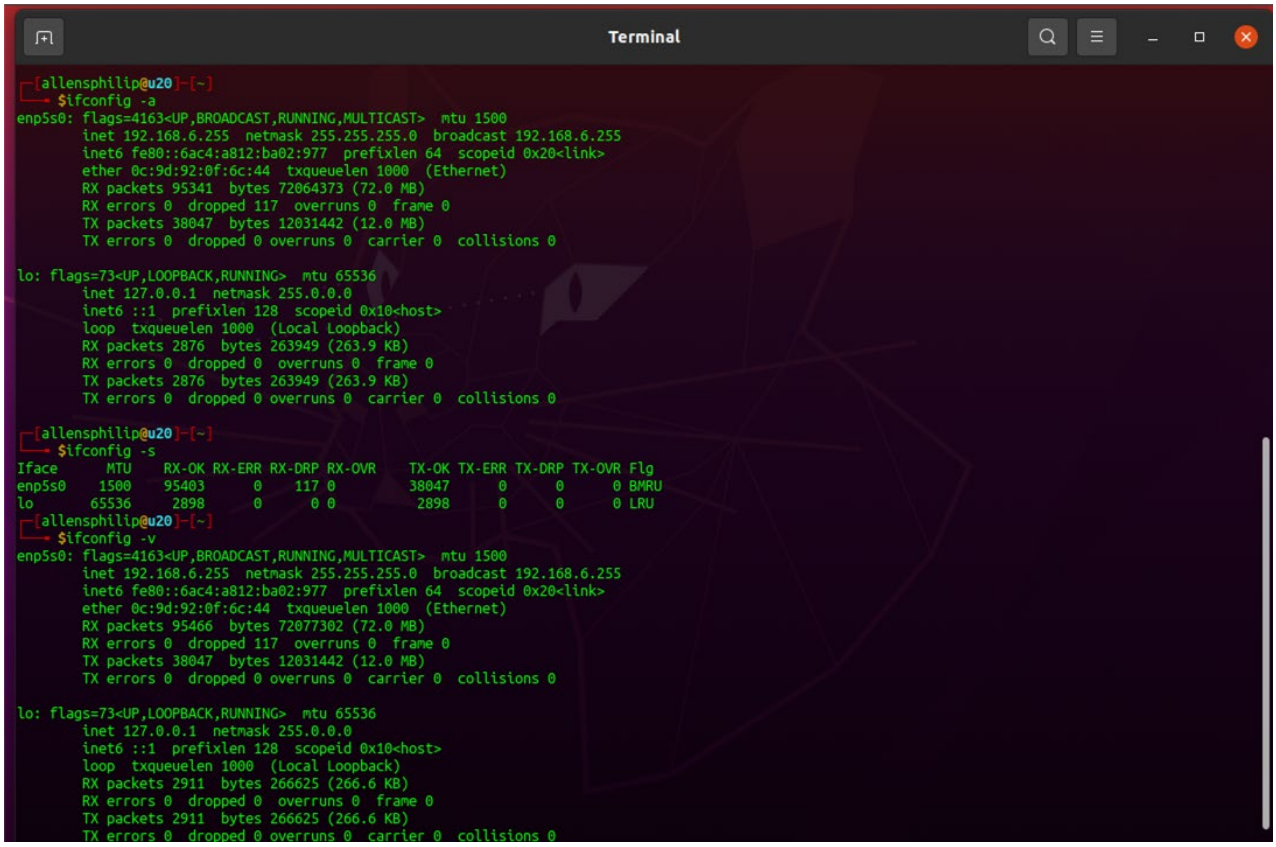
$netstat -tnlp - network statitics

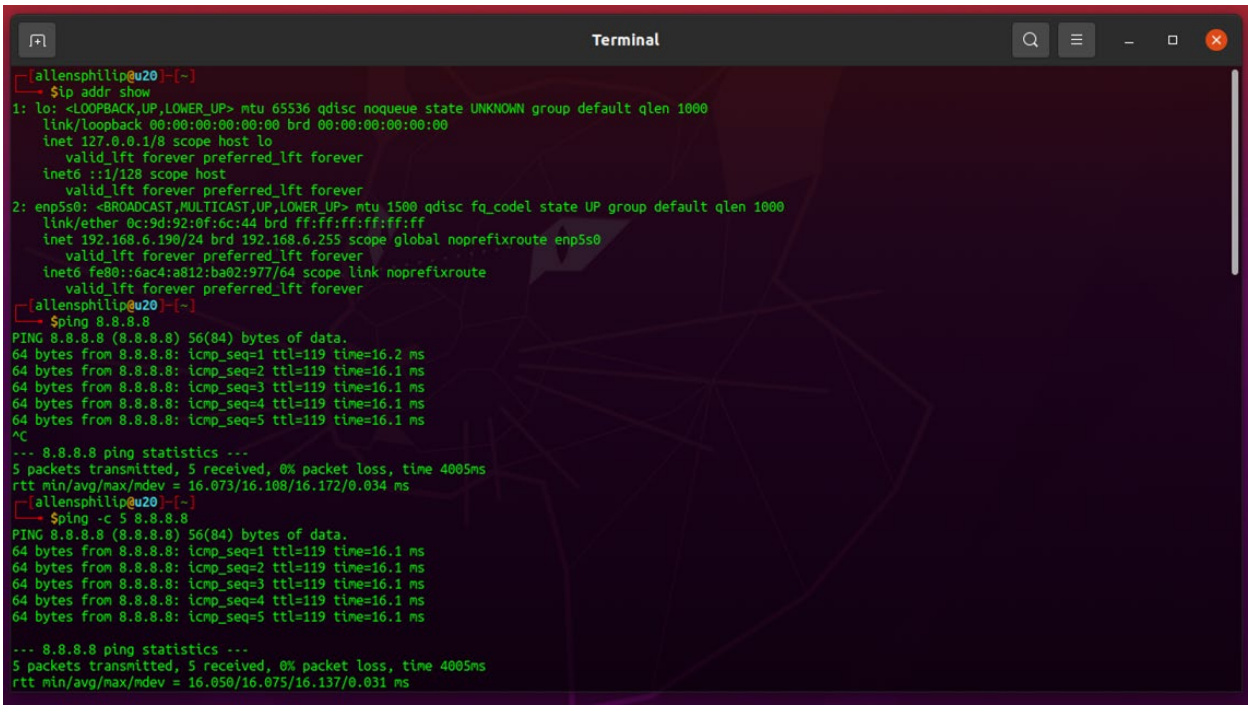
$ss (socket statitics) - info about sockets

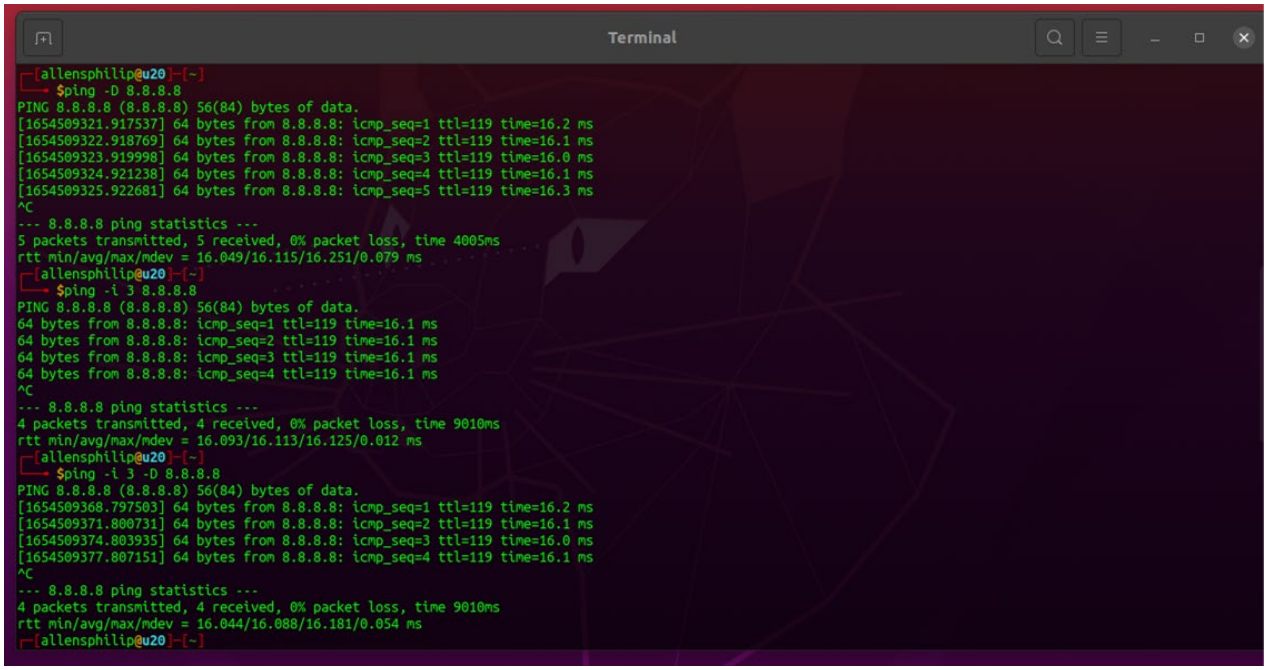
$nslookup <domain> - show information from name servers

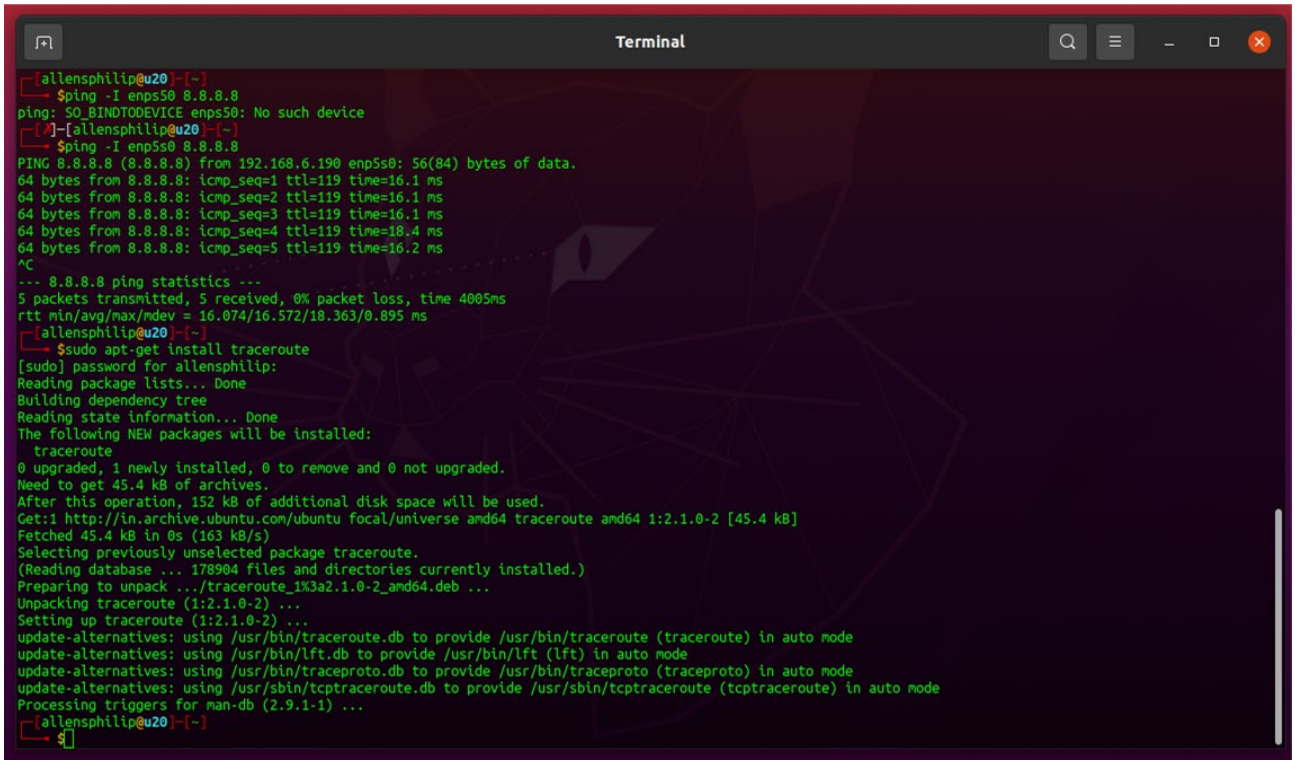
Output Screenshot

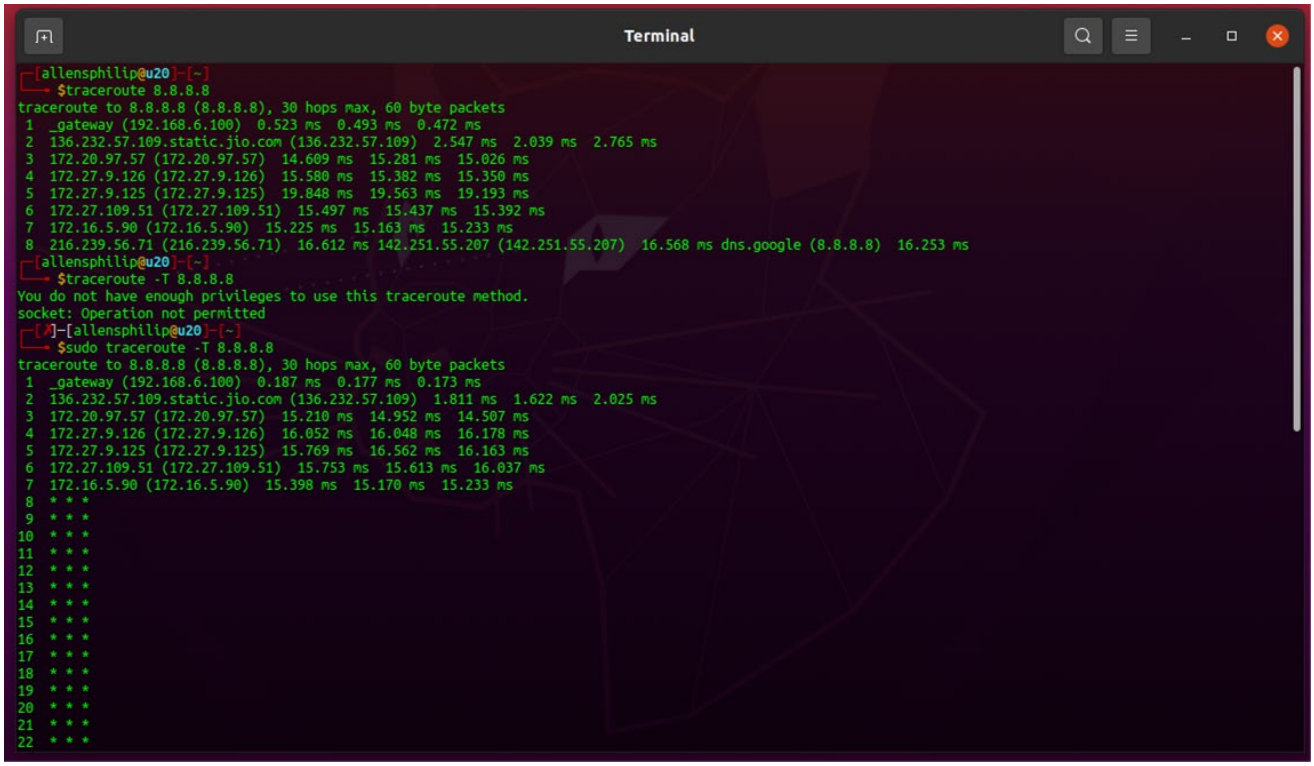


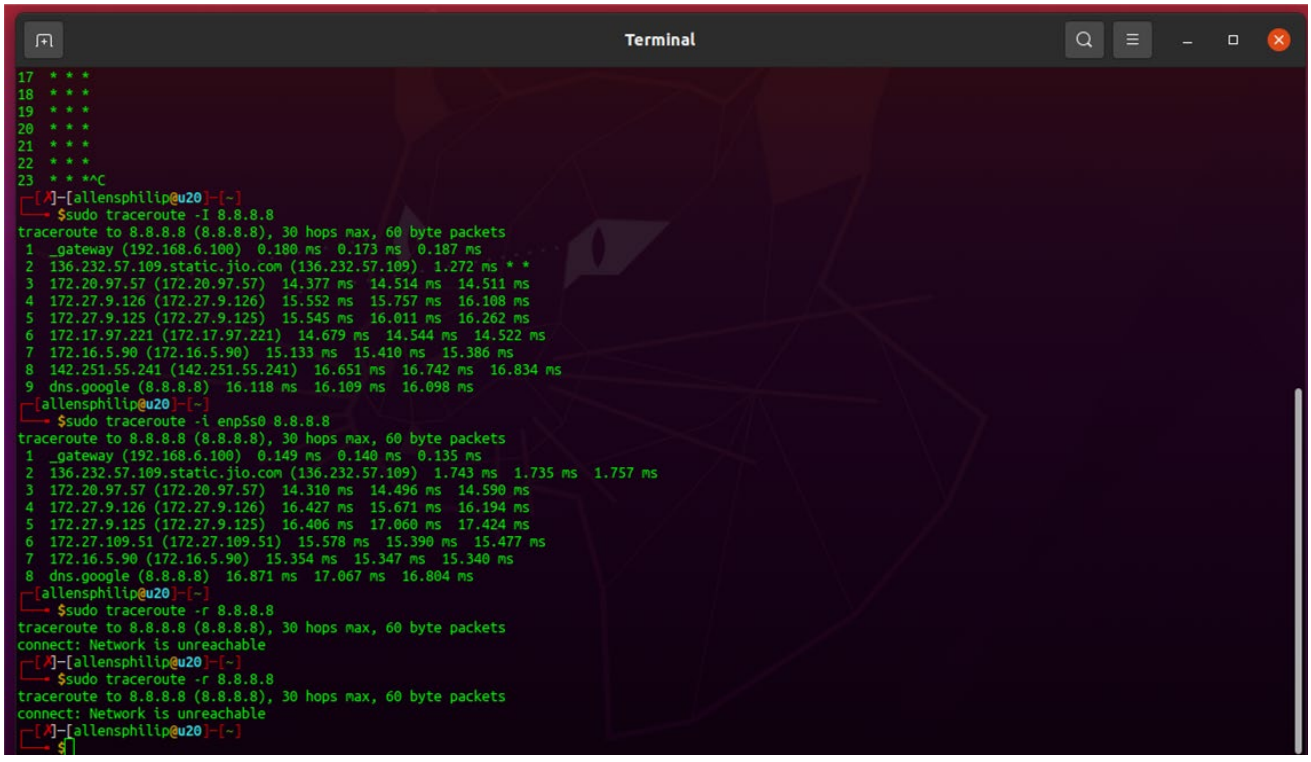

Terminal
[allensphilip@u20]-[~]
$ifconfig -a
enp5s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.6.255 netmask 255.255.255.0 broadcast 192.168.6.255
inet6 fe80::6ac4:a812:ba02:977 prefixlen 64 scopeid 0x20<link>
ether 0c:9d:92:0f:6c:44 txqueuelen 1000 (Ethernet)
RX packets 95341 bytes 72064373 (72.0 MB)
RX errors 0 dropped 117 overruns 0 frame 0
TX packets 38047 bytes 12031442 (12.0 MB)
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 2876 bytes 263949 (263.9 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 2876 bytes 263949 (263.9 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
[allensphilip@u20]-[~]
$ifconfig -s
Iface MTU RX-OK RX-ERR RX-DRP RX-OVR TX-OK TX-ERR TX-DRP TX-OVR Flg
enp5s0 1500 95403 0 117 0 38047 0 0 0 BMRU
lo 65536 2898 0 0 0 2898 0 0 0 LRU
[allensphilip@u20]-[~]
$ifconfig -v
enp5s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.6.255 netmask 255.255.255.0 broadcast 192.168.6.255
inet6 fe80::6ac4:a812:ba02:977 prefixlen 64 scopeid 0x20<link>
ether 0c:9d:92:0f:6c:44 txqueuelen 1000 (Ethernet)
RX packets 95466 bytes 72077302 (72.0 MB)
RX errors 0 dropped 117 overruns 0 frame 0
TX packets 38047 bytes 12031442 (12.0 MB)
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 2911 bytes 266625 (266.6 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 2911 bytes 266625 (266.6 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

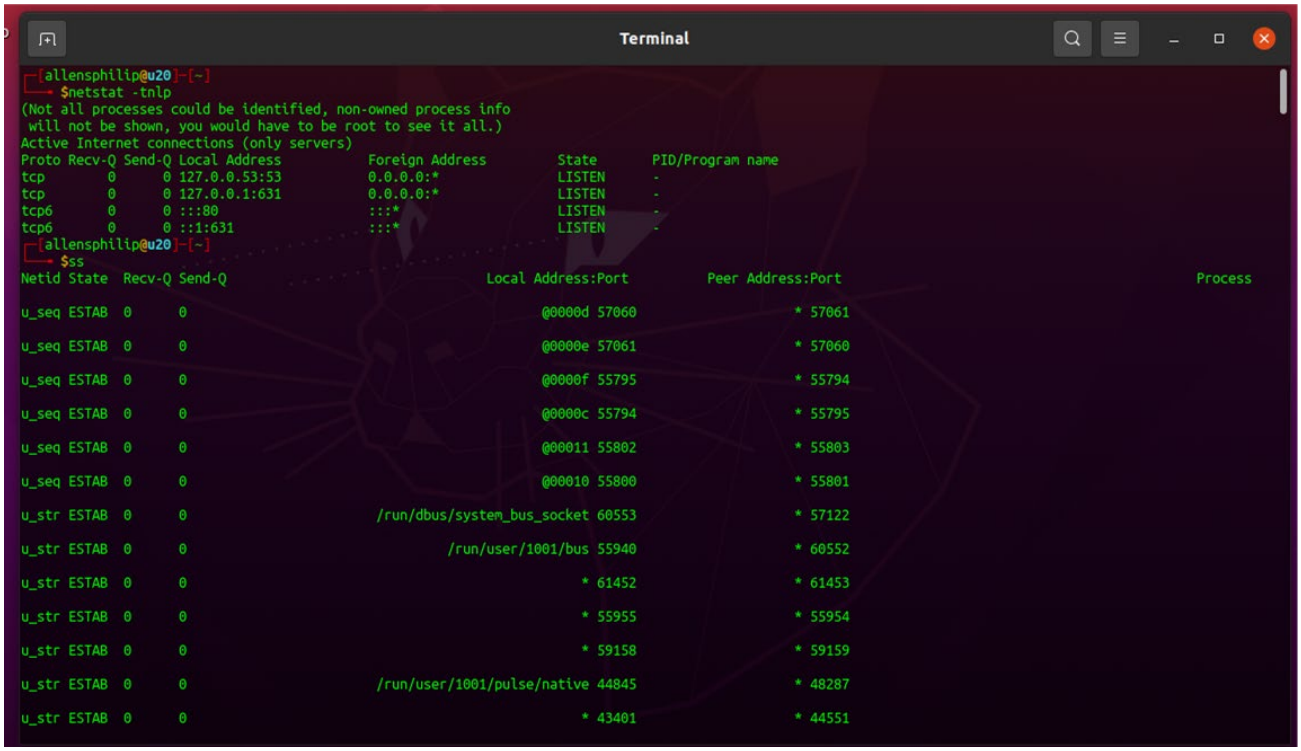

Terminal
[allensphilip@u20]-[~]
$ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp5s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 0c:9d:92:0f:6c:44 brd ff:ff:ff:ff:ff:ff
inet 192.168.6.190/24 brd 192.168.6.255 scope global noprefixroute enp5s0
valid_lft forever preferred_lft forever
inet6 fe80::6ac4:a812:ba02:977/64 scope link noprefixroute
valid_lft forever preferred_lft forever
[allensphilip@u20]-[~]
$ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.2 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=119 time=16.1 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 16.073/16.108/16.172/0.034 ms
[allensphilip@u20]-[~]
$ping -c 5 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=119 time=16.1 ms
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 16.050/16.075/16.137/0.031 ms

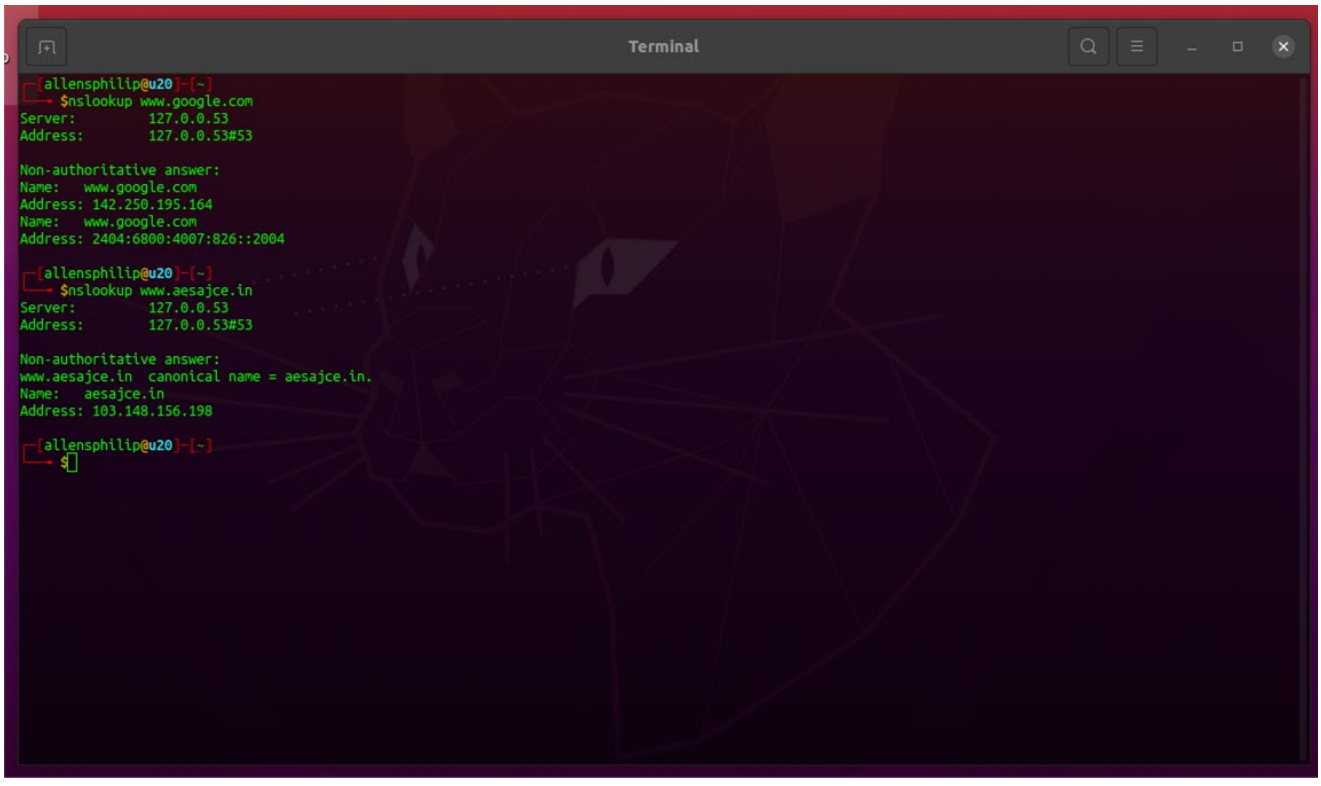

Terminal
[allensphilip@u20]-[~]
$ping -D 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
[1654509321.917537] 64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.2 ms
[1654509322.918769] 64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
[1654509323.919998] 64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.0 ms
[1654509324.921238] 64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=16.1 ms
[1654509325.922681] 64 bytes from 8.8.8.8: icmp_seq=5 ttl=119 time=16.3 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 16.049/16.115/16.251/0.079 ms
[allensphilip@u20]-[~]
$ping -i 3 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=16.1 ms
^C
--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 9010ms
rtt min/avg/max/mdev = 16.093/16.113/16.125/0.012 ms
[allensphilip@u20]-[~]
$ping -i 3 -D 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
[1654509368.797503] 64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.2 ms
[1654509371.800731] 64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
[1654509374.803935] 64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.0 ms
[1654509377.807151] 64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=16.1 ms
^C
--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 9010ms
rtt min/avg/max/mdev = 16.044/16.088/16.181/0.054 ms
[allensphilip@u20]-[~]


Terminal
[allensphilip@u20]-[~]
$ping -I enps50 8.8.8.8
ping: SO_BINDTODEVICE enps50: No such device
[✗]-[allensphilip@u20]-[~]
$ping -I enp5s0 8.8.8.8
PING 8.8.8.8 (8.8.8.8) from 192.168.6.190 enp5s0: 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=16.1 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=18.4 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=119 time=16.2 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 16.074/16.572/18.363/0.895 ms
[allensphilip@u20]-[~]
$sudo apt-get install traceroute
[sudo] password for allensphilip:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
traceroute
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 45.4 kB of archives.
After this operation, 152 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 traceroute amd64 1:2.1.0-2 [45.4 kB]
Fetched 45.4 kB in 0s (163 kB/s)
Selecting previously unselected package traceroute.
(Reading database ... 178904 files and directories currently installed.)
Preparing to unpack .../traceroute_1%3a2.1.0-2_amd64.deb ...
Unpacking traceroute (1:2.1.0-2) ...
Setting up traceroute (1:2.1.0-2) ...
update-alternatives: using /usr/bin/traceroute.db to provide /usr/bin/traceroute (traceroute) in auto mode
update-alternatives: using /usr/bin/lft.db to provide /usr/bin/lft (lft) in auto mode
update-alternatives: using /usr/bin/traceproto.db to provide /usr/bin/traceproto (traceproto) in auto mode
update-alternatives: using /usr/sbin/tcptraceroute.db to provide /usr/sbin/tcptraceroute (tcptraceroute) in auto mode
Processing triggers for man-db (2.9.1-1) ...
[allensphilip@u20]-[~]
$


Terminal
[allensphilip@u20]~[~]
$traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
1 _gateway (192.168.6.100) 0.523 ms 0.493 ms 0.472 ms
2 136.232.57.109.static.jio.com (136.232.57.109) 2.547 ms 2.039 ms 2.765 ms
3 172.20.97.57 (172.20.97.57) 14.609 ms 15.281 ms 15.026 ms
4 172.27.9.126 (172.27.9.126) 15.580 ms 15.382 ms 15.350 ms
5 172.27.9.125 (172.27.9.125) 19.848 ms 19.563 ms 19.193 ms
6 172.27.109.51 (172.27.109.51) 15.497 ms 15.437 ms 15.392 ms
7 172.16.5.90 (172.16.5.90) 15.225 ms 15.163 ms 15.233 ms
8 216.239.56.71 (216.239.56.71) 16.612 ms 142.251.55.207 (142.251.55.207) 16.568 ms dns.google (8.8.8.8) 16.253 ms
[allensphilip@u20]~[~]
$traceroute -T 8.8.8.8
You do not have enough privileges to use this traceroute method.
socket: Operation not permitted
[✗]-[allensphilip@u20]~[~]
$sudo traceroute -T 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
1 _gateway (192.168.6.100) 0.187 ms 0.177 ms 0.173 ms
2 136.232.57.109.static.jio.com (136.232.57.109) 1.811 ms 1.622 ms 2.025 ms
3 172.20.97.57 (172.20.97.57) 15.210 ms 14.952 ms 14.507 ms
4 172.27.9.126 (172.27.9.126) 16.052 ms 16.048 ms 16.178 ms
5 172.27.9.125 (172.27.9.125) 15.769 ms 16.562 ms 16.163 ms
6 172.27.109.51 (172.27.109.51) 15.753 ms 15.613 ms 16.037 ms
7 172.16.5.90 (172.16.5.90) 15.398 ms 15.170 ms 15.233 ms
8 * * *
9 * * *
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *
20 * * *
21 * * *
22 * * *


Terminal
17 * * *
18 * * *
19 * * *
20 * * *
21 * * *
22 * * *
23 * * *^C
[✗]-[allensphilip@u20]~[~]
$sudo traceroute -I 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
1 _gateway (192.168.6.100) 0.180 ms 0.173 ms 0.187 ms
2 136.232.57.109.static.jio.com (136.232.57.109) 1.272 ms * *
3 172.20.97.57 (172.20.97.57) 14.377 ms 14.514 ms 14.511 ms
4 172.27.9.126 (172.27.9.126) 15.552 ms 15.757 ms 16.108 ms
5 172.27.9.125 (172.27.9.125) 15.545 ms 16.011 ms 16.262 ms
6 172.17.97.221 (172.17.97.221) 14.679 ms 14.544 ms 14.522 ms
7 172.16.5.90 (172.16.5.90) 15.133 ms 15.410 ms 15.386 ms
8 142.251.55.241 (142.251.55.241) 16.651 ms 16.742 ms 16.834 ms
9 dns.google (8.8.8.8) 16.118 ms 16.109 ms 16.098 ms
[allensphilip@u20]~[~]
$sudo traceroute -i enp5s0 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
1 _gateway (192.168.6.100) 0.149 ms 0.140 ms 0.135 ms
2 136.232.57.109.static.jio.com (136.232.57.109) 1.743 ms 1.735 ms 1.757 ms
3 172.20.97.57 (172.20.97.57) 14.310 ms 14.496 ms 14.590 ms
4 172.27.9.126 (172.27.9.126) 16.427 ms 15.671 ms 16.194 ms
5 172.27.9.125 (172.27.9.125) 16.406 ms 17.060 ms 17.424 ms
6 172.27.109.51 (172.27.109.51) 15.578 ms 15.390 ms 15.477 ms
7 172.16.5.90 (172.16.5.90) 15.354 ms 15.347 ms 15.340 ms
8 dns.google (8.8.8.8) 16.871 ms 17.067 ms 16.804 ms
[allensphilip@u20]~[~]
$sudo traceroute -r 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
connect: Network is unreachable
[✗]-[allensphilip@u20]~[~]
$sudo traceroute -r 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
connect: Network is unreachable
[✗]-[allensphilip@u20]~[~]
$


Terminal
[allensphilip@u20]-[~]
$netstat -tnlp
(Not all processes could be identified, non-owned process info
will not be shown, you would have to be root to see it all.)
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State PID/Program name
tcp 0 0 127.0.0.53:53 0.0.0.0:* LISTEN -
tcp 0 0 127.0.0.1:631 0.0.0.0:* LISTEN -
tcp6 0 0 :::80 :::* LISTEN -
tcp6 0 0 ::1:631 :::* LISTEN -
[allensphilip@u20]-[~]
$ss
Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port Process
u_seq ESTAB 0 0 @00000d 57060 * 57061
u_seq ESTAB 0 0 @00000e 57061 * 57060
u_seq ESTAB 0 0 @00000f 55795 * 55794
u_seq ESTAB 0 0 @00000c 55794 * 55795
u_seq ESTAB 0 0 @00011 55802 * 55803
u_seq ESTAB 0 0 @00010 55800 * 55801
u_str ESTAB 0 0 /run/dbus/system_bus_socket 60553 * 57122
u_str ESTAB 0 0 /run/user/1001/bus 55940 * 60552
u_str ESTAB 0 0 * 61452 * 61453
u_str ESTAB 0 0 * 55955 * 55954
u_str ESTAB 0 0 * 59158 * 59159
u_str ESTAB 0 0 /run/user/1001/pulse/native 44845 * 48287
u_str ESTAB 0 0 * 43401 * 44551


Terminal
[allensphilip@u20]-[~]
$nslookup www.google.com
Server: 127.0.0.53
Address: 127.0.0.53#53
Non-authoritative answer:
Name: www.google.com
Address: 142.250.195.164
Name: www.google.com
Address: 2404:6800:4007:826::2004
[allensphilip@u20]-[~]
$nslookup www.aesajce.in
Server: 127.0.0.53
Address: 127.0.0.53#53
Non-authoritative answer:
www.aesajce.in canonical name = aesajce.in.
Name: aesajce.in
Address: 103.148.156.198
[allensphilip@u20]-[~]
$