ASSIGNMENT

NETWORKING&SYSTEM ADMINISTRATION LAB

Submitted by:

Jisha Chacko

S2RMCA:A batch

Rollno:44

1. Try out these network commands in Window as well as in Linux and perform at least 4 options with each command: ping route traceroute, nslookup,Ip Config, NetStat

Ipconfig

ifconfig

```
jisha@jisha-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::f7c3:6a7a:9d6b:876a  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:3b:54:e4  txqueuelen 1000  (Ethernet)
        RX packets 44  bytes 5759 (5.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 112  bytes 12865 (12.8 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 152  bytes 13406 (13.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 152  bytes 13406 (13.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

jisha@jisha-VirtualBox:~$ ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3     1500      44      0      0 0           112      0      0      0 BMRU
lo        65536     152      0      0 0           152      0      0      0 LRU
jisha@jisha-VirtualBox:~$ ifconfig -v
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::f7c3:6a7a:9d6b:876a  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:3b:54:e4  txqueuelen 1000  (Ethernet)
        RX packets 44  bytes 5759 (5.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 112  bytes 12865 (12.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
jisha@jisha-VirtualBox:~$ ifconfig --help
Usage:
  ifconfig [-a] [-v] [-s] <interface> [[<AF>] <address>]
  [add <address>[/<prefixlen>]]
  [del <address>[/<prefixlen>]]
  [[-]broadcast [<address>]]  [[-]pointopoint [<address>]]
  [netmask <address>]  [dstaddr <address>]  [tunnel <address>]
  [outfill <NN>] [keepalive <NN>]
  [hw <HW> <address>]  [mtu <NN>]
  [[-]trailers]  [[-]arp]  [[-]allmulti]
  [multicast]  [[-]promisc]
  [mem_start <NN>]  [io_addr <NN>]  [irq <NN>]  [media <type>]
  [txqueuelen <NN>]
  [[-]dynamic]
  [up|down] ...

  <HW>=Hardware Type.
  List of possible hardware types:
    loop (Local Loopback) slip (Serial Line IP) cslip (VJ Serial Line IP)
    slip6 (6-bit Serial Line IP) cslip6 (VJ 6-bit Serial Line IP) adaptive (Adaptive
    ash (Ash) ether (Ethernet) ax25 (AMPR AX.25)
    netrom (AMPR NET/ROM) rose (AMPR ROSE) tunnel (IPIP Tunnel)
    ppp (Point-to-Point Protocol) hdlc ((Cisco)-HDLC) lapb (LAPB)
    arcnet (ARCnet) dlci (Frame Relay DLCI) frad (Frame Relay Access Device)
    sit (IPv6-in-IPv4) fddi (Fiber Distributed Data Interface) hippi (HIPPI)
    irda (IrLAP) ec (Econet) x25 (generic X.25)
    eui64 (Generic EUI-64)
  <AF>=Address family. Default: inet
  List of possible address families:
```

Netstat

```
Command Prompt

Connection-specific DNS Suffix  . :

C:\Users\micromedia02>NetStat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.43.220:49505   137:https              TIME_WAIT
  TCP    192.168.43.220:49552   20.197.71.89:https     ESTABLISHED
  TCP    192.168.43.220:49663   ec2-52-202-128-45:https  TIME_WAIT
  TCP    192.168.43.220:49723   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:49899   76:https               TIME_WAIT
  TCP    192.168.43.220:50259   maa05s21-in-f4:https   TIME_WAIT
  TCP    192.168.43.220:50328   40.119.205.193:https   TIME_WAIT
  TCP    192.168.43.220:50444   ec2-52-202-128-45:https  TIME_WAIT
  TCP    192.168.43.220:50504   a97adde81b00f2ca4:https  TIME_WAIT
  TCP    192.168.43.220:51178   ec2-52-221-144-69:https  TIME_WAIT
  TCP    192.168.43.220:51271   90:https               TIME_WAIT
  TCP    192.168.43.220:52050   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:52345   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:52727   204.79.197.222:https   ESTABLISHED
  TCP    192.168.43.220:52729   20.38.0.3:https        ESTABLISHED
  TCP    192.168.43.220:52730   117.18.237.29:http     ESTABLISHED
  TCP    192.168.43.220:52731   13.107.6.254:https     ESTABLISHED
  TCP    192.168.43.220:52966   ec2-34-235-197-155:https  TIME_WAIT
  TCP    192.168.43.220:53793   maa05s19-in-f6:https   TIME_WAIT
  TCP    192.168.43.220:54843   111:https              TIME_WAIT
  TCP    192.168.43.220:55949   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:56201   121:https              TIME_WAIT
  TCP    192.168.43.220:56495   server-13-225-255-71:https  TIME_WAIT
  TCP    192.168.43.220:56839   server-13-225-255-71:https  TIME_WAIT
  TCP    192.168.43.220:57288   51.104.167.255:https   TIME_WAIT
  TCP    192.168.43.220:57289   20.198.162.76:https    ESTABLISHED
  TCP    192.168.43.220:58705   ec2-3-222-213-29:https  TIME_WAIT
  TCP    192.168.43.220:58953   maa05s21-in-f4:https   TIME_WAIT
  TCP    192.168.43.220:59313   ec2-34-235-197-155:https  TIME_WAIT
  TCP    192.168.43.220:60049   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:60111   maa03s43-in-f2:https   TIME_WAIT
  TCP    192.168.43.220:60251   ec2-3-215-64-185:https  TIME_WAIT
  TCP    192.168.43.220:60465   ec2-3-222-213-29:https  TIME_WAIT
  TCP    192.168.43.220:60969   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:61126   maa03s43-in-f2:https   TIME_WAIT
  TCP    192.168.43.220:61570   ec2-3-215-64-185:https  TIME_WAIT
  TCP    192.168.43.220:61658   ec2-34-235-197-155:https  TIME_WAIT
  TCP    192.168.43.220:62024   121:https              TIME_WAIT
  TCP    192.168.43.220:62800   ec2-3-222-213-29:https  TIME_WAIT
  TCP    192.168.43.220:62801   20.44.10.123:https     ESTABLISHED
  TCP    192.168.43.220:62803   ec2-52-45-61-27:https  TIME_WAIT
  TCP    192.168.43.220:63358   ec2-3-222-213-29:https  ESTABLISHED
  TCP    192.168.43.220:63654   40.79.197.35:https     ESTABLISHED
```

```
C:\Users\micromedia02>netstat -n

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.43.220:51178   20.197.71.89:443       ESTABLISHED
  TCP    192.168.43.220:62193   20.198.162.78:443      ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED

C:\Users\micromedia02>netstat -n 5

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.43.220:51178   20.197.71.89:443       ESTABLISHED
  TCP    192.168.43.220:62193   20.198.162.78:443      ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.43.220:51178   20.197.71.89:443       ESTABLISHED
  TCP    192.168.43.220:62193   20.198.162.78:443      ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443  ESTABLISHED

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.43.220:51178   20.197.71.89:443       ESTABLISHED
  TCP    192.168.43.220:62193   20.198.162.78:443      ESTABLISHED
```

```
C:\Users\micromedia02>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:445            LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:5040           LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:49664          LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:49665          LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:49666          LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:49667          LAPTOP-HIR5TON1:0       LISTENING
  TCP    0.0.0.0:49669          LAPTOP-HIR5TON1:0       LISTENING
  TCP    127.0.0.1:5939         LAPTOP-HIR5TON1:0       LISTENING
  TCP    127.0.0.1:27017        LAPTOP-HIR5TON1:0       LISTENING
  TCP    127.0.0.1:37014        LAPTOP-HIR5TON1:0       LISTENING
  TCP    127.0.0.1:37114        LAPTOP-HIR5TON1:0       LISTENING
  TCP    192.168.43.220:139     LAPTOP-HIR5TON1:0       LISTENING
  TCP    192.168.43.220:51178   20.197.71.89:https      ESTABLISHED
  TCP    192.168.43.220:62193   20.198.162.78:https     ESTABLISHED
  TCP    192.168.56.1:139       LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:135               LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:445               LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:49664             LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:49665             LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:49666             LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:49667             LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::]:49669             LAPTOP-HIR5TON1:0       LISTENING
  TCP    [::1]:49668            LAPTOP-HIR5TON1:0       LISTENING
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:ht
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:ht
  UDP    0.0.0.0:3702           *:*
  UDP    0.0.0.0:3702           *:*
  UDP    0.0.0.0:5050           *:*
```

Netstat in linux

```
jisha@jisha-VirtualBox:~$ sudo netstat
[sudo] password for jisha:
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 jisha-VirtualBox:bootpc _gateway:bootps         ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                     25065    /run/user/1000/systemd/notify
unix  2      [ ]         DGRAM                     15163    /run/systemd/journal/syslog
unix  16     [ ]         DGRAM                     15173    /run/systemd/journal/dev-log
unix  8      [ ]         DGRAM                     15177    /run/systemd/journal/socket
unix  3      [ ]         DGRAM                     15149    /run/systemd/notify
unix  3      [ ]         STREAM     CONNECTED      31986
unix  3      [ ]         STREAM     CONNECTED      28502    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED      30760
unix  3      [ ]         STREAM     CONNECTED      32000
unix  3      [ ]         STREAM     CONNECTED      29165
unix  3      [ ]         STREAM     CONNECTED      25890    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED      31917
unix  3      [ ]         STREAM     CONNECTED      25837
unix  3      [ ]         STREAM     CONNECTED      30547
unix  3      [ ]         STREAM     CONNECTED      29168    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED      28905    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED      31987    /run/systemd/journal/stdout
unix  2      [ ]         DGRAM                     25832
unix  3      [ ]         STREAM     CONNECTED      30736    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED      31697    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED      28904    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED      18638
```

```
jisha@jisha-VirtualBox:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address         Foreign Address         State
tcp        0      0 localhost:mysql        0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain       0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp          0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http              [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp      [::]:*                  LISTEN
udp        0      0 0.0.0.0:631            0.0.0.0:*
udp        0      0 localhost:domain       0.0.0.0:*
udp        0      0 jisha-VirtualBox:bootpc _gateway:bootps        ESTABLISHED
udp        0      0 0.0.0.0:mdns           0.0.0.0:*
udp        0      0 0.0.0.0:50518          0.0.0.0:*
udp6       0      0 [::]:56526             [::]:*
udp6       0      0 [::]:mdns              [::]:*
raw6       0      0 [::]:ipv6-icmp         [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ACC ]     STREAM     LISTENING     27744    @/tmp/.ICE-unix/1104
unix  2      [ ACC ]     SEQPACKET  LISTENING     15174    /run/udev/control
unix  2      [ ACC ]     STREAM     LISTENING     15147    /run/systemd/private
unix  2      [ ]         DGRAM                    24942    /run/user/1000/systemd/notify
unix  2      [ ACC ]     STREAM     LISTENING     15149    /run/systemd/userdb/io.systemd.DynamicUser
unix  2      [ ACC ]     STREAM     LISTENING     24945    /run/user/1000/systemd/private
unix  2      [ ACC ]     STREAM     LISTENING     24971    /run/user/1000/bus
unix  2      [ ]         DGRAM                    15158    /run/systemd/journal/syslog
unix  2      [ ACC ]     STREAM     LISTENING     15160    /run/systemd/fsck.progress
unix  2      [ ACC ]     STREAM     LISTENING     24972    /run/user/1000/gnupg/S.dirmngr
jisha@jisha-VirtualBox:~$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address         Foreign Address         State
jisha@jisha-VirtualBox:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address         Foreign Address         State
tcp        0      0 localhost:mysql        0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain       0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp          0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http              [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp      [::]:*                  LISTEN
udp        0      0 0.0.0.0:631            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:*
udp        0      0 0.0.0.0:50518          0.0.0.0:*
```

```
jtsna@jtsna-VirtualBox:~$ netstat -s
Ip:
    Forwarding: 2
    258 total packets received
    1 with invalid addresses
    0 forwarded
    0 incoming packets discarded
    255 incoming packets delivered
    269 requests sent out
    20 outgoing packets dropped
Icmp:
    40 ICMP messages received
    0 input ICMP message failed
    ICMP input histogram:
        destination unreachable: 40
    40 ICMP messages sent
    0 ICMP messages failed
    ICMP output histogram:
        destination unreachable: 40
IcmpMsg:
        InType3: 40
        OutType3: 40
Tcp:
    7 active connection openings
    0 passive connection openings
    2 failed connection attempts
    1 connection resets received
    0 connections established
```

Traceroute

```
Address: fec0:0:0:ffff::1

>
C:\Users\micromedia02>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
```

```
C:\Users\micromedia02>tracert -R
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
    -6                 Force using IPv6.

C:\Users\micromedia02>tracert -S
A value must be supplied for option -S.

C:\Users\micromedia02>tracert -D
-D is not a valid command option.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
    -6                 Force using IPv6.

C:\Users\micromedia02>
```

```
C:\Users\micromedia02>tracert -j
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
    -6                 Force using IPv6.

C:\Users\micromedia02>tracert -w
A value must be supplied for option -w.

C:\Users\micromedia02>tracert -R
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                 Do not resolve addresses to hostnames.
    -h maximum_hops    Maximum number of hops to search for target.
    -j host-list       Loose source route along host-list (IPv4-only).
    -w timeout         Wait timeout milliseconds for each reply.
    -R                 Trace round-trip path (IPv6-only).
    -S srcaddr         Source address to use (IPv6-only).
    -4                 Force using IPv4.
    -6                 Force using IPv6.

C:\Users\micromedia02>tracert -S
A value must be supplied for option -S.
```
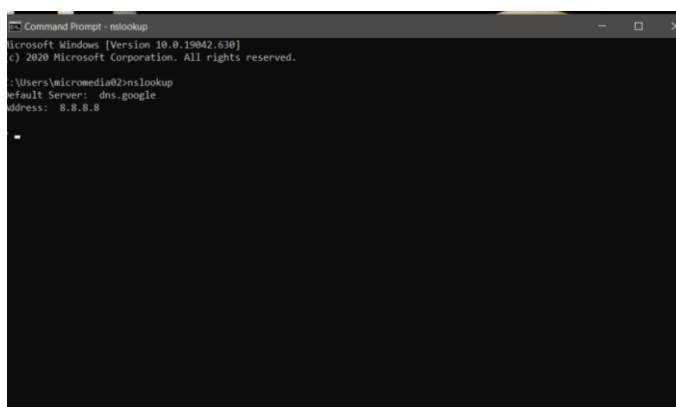
Traceroute in linux

```
jisha@jisha-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (142.250.182.4), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  1.613 ms  1.635 ms  1.620 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
```

```
jisha@jisha-VirtualBox:~$ traceroute -4 google.com
traceroute to google.com (142.250.196.14), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  1.864 ms  1.821 ms  1.799 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  *^C
```

```
jisha@jisha-VirtualBox:~$ traceroute -F google.com
traceroute to google.com (142.250.196.14), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  1.334 ms  1.376 ms  1.328 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * *^C
jisha@jisha-VirtualBox:~$ traceroute -N google.com
Cannot handle `-N' option with arg `google.com' (argc 2)
jisha@jisha-VirtualBox:~$ traceroute -n google.com
traceroute to google.com (142.250.196.14), 30 hops max, 60 byte packets
 1  10.0.2.2  0.583 ms  0.534 ms  0.513 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
jisha@jisha-VirtualBox:~$ traceroute --help
Usage:
  traceroute [ -46dFITnreAUDV ] [ -f first_ttl ] [ -g gate,... ] [ -i device ] [ -m max_ttl ] [ -
w_label ] [ -w MAX,HERE,NEAR ] [ -q nqueries ] [ -s src_addr ] [ -z sendwait ] [ --fwmark=num ] h
Options:
  -4                         Use IPv4
  -6                         Use IPv6
  -d  --debug                Enable socket level debugging
  -F  --dont-fragment        Do not fragment packets
  -f first_ttl  --first=first_ttl
                             Start from the first_ttl hop (instead from 1)
  -g gate,...  --gateway=gate,...
```

Nslookup

```
Command Prompt - nslookup                                          —    □    ×
Microsoft Windows [Version 10.0.19042.630]
(c) 2020 Microsoft Corporation. All rights reserved.

:\Users\micromedia02>nslookup
Default Server:  dns.google
Address:  8.8.8.8

-
```

```
C:\Users\micromedia02>nslookup google.co
Server:  dns.google
Address:  8.8.8.8

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4007:829::200e
          172.217.163.174
```

Nslookup in linux

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

Non-authoritative answer:
Name:   google.com
Address: 142.250.196.14
Name:   google.com
Address: 2404:6800:4007:823::200e

jisha@jisha-VirtualBox:~$
```

```
jisha@jisha-VirtualBox:~$ nslookup -type=ns google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com      nameserver = ns4.google.com.
google.com      nameserver = ns1.google.com.
google.com      nameserver = ns3.google.com.
google.com      nameserver = ns2.google.com.

Authoritative answers can be found from:

jisha@jisha-VirtualBox:~$ nslookup -type=mx google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com      mail exchanger = 50 alt4.aspmx.l.google.com.
google.com      mail exchanger = 20 alt1.aspmx.l.google.com.
google.com      mail exchanger = 10 aspmx.l.google.com.
google.com      mail exchanger = 30 alt2.aspmx.l.google.com.
google.com      mail exchanger = 40 alt3.aspmx.l.google.com.

Authoritative answers can be found from:

jisha@jisha-VirtualBox:~$ nslookup -type=txt google.com
;; Truncated, retrying in TCP mode.
Server:         127.0.0.53
```

Route


```
C:\Users\micromedia02>route -n

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
                  [MASK netmask]  [gateway] [METRIC metric]  [IF interface]

 -f           Clears the routing tables of all gateway entries.  If this is
              used in conjunction with one of the commands, the tables are
              cleared prior to running the command.

 -p           When used with the ADD command, makes a route persistent across
              boots of the system. By default, routes are not preserved
              when the system is restarted. Ignored for all other commands,
              which always affect the appropriate persistent routes.

 -4           Force using IPv4.

 -6           Force using IPv6.

 command      One of these:
                  PRINT     Prints  a route
                  ADD       Adds    a route
                  DELETE    Deletes a route
                  CHANGE    Modifies an existing route
 destination  Specifies the host.
 MASK         Specifies that the next parameter is the 'netmask' value.
 netmask      Specifies a subnet mask value for this route entry.
              If not specified, it defaults to 255.255.255.255.
 gateway      Specifies gateway.
 interface    the interface number for the specified route.
 METRIC       specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
```

```
C:\Users\micromedia02>route -cn

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
                [MASK netmask]  [gateway] [METRIC metric]  [IF interface]

  -f          Clears the routing tables of all gateway entries.  If this is
              used in conjunction with one of the commands, the tables are
              cleared prior to running the command.

  -p          When used with the ADD command, makes a route persistent across
              boots of the system. By default, routes are not preserved
              when the system is restarted. Ignored for all other commands,
              which always affect the appropriate persistent routes.

  -4          Force using IPv4.

  -6          Force using IPv6.

  command     One of these:
                 PRINT     Prints   a route
                 ADD       Adds     a route
                 DELETE    Deletes a route
                 CHANGE    Modifies an existing route
  destination  Specifies the host.
  MASK         Specifies that the next parameter is the 'netmask' value.
  netmask      Specifies a subnet mask value for this route entry.
               If not specified, it defaults to 255.255.255.255.
  gateway      Specifies gateway.
  interface    the interface number for the specified route.
  METRIC       specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.
Diagnostic Notes:
    Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
    Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
```

Route in linux

```
jisha@jisha-VirtualBox:~$ sudo route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         _gateway        0.0.0.0         UG    100   0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100   0        0 enp0s3
link-local      0.0.0.0         255.255.0.0     U     1000  0        0 enp0s3
jisha@jisha-VirtualBox:~$
```

```
jisha@jisha-VirtualBox:~$ route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.0.2.2        0.0.0.0         UG    100   0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100   0        0 enp0s3
169.254.0.0     0.0.0.0         255.255.0.0     U     1000  0        0 enp0s3
jisha@jisha-VirtualBox:~$ route -cn
route: invalid option -- 'c'
Usage: route [-nNvee] [-FC] [<AF>]           List kernel routing tables
       route [-v] [-FC] {add|del|flush} ...  Modify routing table for AF.
```

```
jisha@jisha-VirtualBox:~$ route -cn
route: invalid option -- 'c'
Usage: route [-nNvee] [-FC] [<AF>]          List kernel routing table
       route [-v] [-FC] {add|del|flush} ... Modify routing table for

       route {-h|--help} [<AF>]             Detailed usage syntax for
       route {-V|--version}                 Display version/author an

          -v, --verbose        be verbose
          -n, --numeric        don't resolve names
          -e, --extend         display other/more information
          -F, --fib            display Forwarding Information Base (
          -C, --cache          display routing cache instead of FIB

    <AF>=Use -4, -6, '-A <af>' or '--<af>'; default: inet
    List of possible address families (which support routing):
      inet (DARPA Internet) inet6 (IPv6) ax25 (AMPR AX.25)
      netrom (AMPR NET/ROM) ipx (Novell IPX) ddp (Appletalk DDP)
```

Ping

```
C:\Users\micromedia02>ping /t
IP address must be specified.

C:\Users\micromedia02>ping /t 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=166ms TTL=112
Reply from 8.8.8.8: bytes=32 time=153ms TTL=112
Reply from 8.8.8.8: bytes=32 time=171ms TTL=112
Reply from 8.8.8.8: bytes=32 time=64ms TTL=112
Reply from 8.8.8.8: bytes=32 time=54ms TTL=112
Reply from 8.8.8.8: bytes=32 time=50ms TTL=112
Reply from 8.8.8.8: bytes=32 time=62ms TTL=112
Reply from 8.8.8.8: bytes=32 time=80ms TTL=112
Reply from 8.8.8.8: bytes=32 time=48ms TTL=112
Reply from 8.8.8.8: bytes=32 time=41ms TTL=112
Reply from 8.8.8.8: bytes=32 time=59ms TTL=112
Reply from 8.8.8.8: bytes=32 time=45ms TTL=112
Reply from 8.8.8.8: bytes=32 time=68ms TTL=112

Ping statistics for 8.8.8.8:
    Packets: Sent = 13, Received = 13, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 41ms, Maximum = 171ms, Average = 81ms
Control-C
^C
C:\Users\micromedia02>ping /v 8.8.8.8
```

Ping in linux

```
jisha@jisha-VirtualBox:~$ ping www.google.com
PING www.google.com (142.250.195.196) 56(84) bytes of data.
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=1 ttl=111 time=193 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=2 ttl=111 time=63.4 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=3 ttl=111 time=108 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=4 ttl=111 time=80.1 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=5 ttl=111 time=77.2 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=6 ttl=111 time=270 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=7 ttl=111 time=91.7 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=8 ttl=111 time=63.1 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=9 ttl=111 time=83.4 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=10 ttl=111 time=95.7 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=11 ttl=111 time=87.9 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=12 ttl=111 time=76.0 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=13 ttl=111 time=84.9 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=14 ttl=111 time=67.8 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=15 ttl=111 time=61.7 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=16 ttl=111 time=58.2 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=17 ttl=111 time=55.4 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=18 ttl=111 time=60.1 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=19 ttl=111 time=66.9 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=20 ttl=111 time=67.7 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=21 ttl=111 time=83.8 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=22 ttl=111 time=53.6 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=23 ttl=111 time=58.7 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=24 ttl=111 time=89.0 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=25 ttl=111 time=64.1 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=26 ttl=111 time=92.1 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=27 ttl=111 time=91.0 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=28 ttl=111 time=102 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=29 ttl=111 time=57.8 ms
64 bytes from maa03s42-in-f4.1e100.net (142.250.195.196): icmp_seq=30 ttl=111 time=81.8 ms
```

```
jisha@jisha-VirtualBox:~$ ping  google.com
PING google.com (172.217.163.206) 56(84) bytes of data.
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=1 ttl=112 time=22
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=2 ttl=112 time=56
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=3 ttl=112 time=73
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=4 ttl=112 time=53
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=5 ttl=112 time=51
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=6 ttl=112 time=50
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=7 ttl=112 time=83
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=8 ttl=112 time=53
64 bytes from maa05s06-in-f14.1e100.net (172.217.163.206): icmp_seq=9 ttl=112 time=48
^C
--- google.com ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8012ms
rtt min/avg/max/mdev = 48.589/76.725/220.185/51.917 ms
jisha@jisha-VirtualBox:~$ ping 0
PING 0 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.053 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.070 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.064 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.101 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.064 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.050 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.061 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.065 ms
```

```
jisha@jisha-VirtualBox:~$ ping -c
ping: option requires an argument -- 'c'

Usage
  ping [options] <destination>

Options:
  <destination>      dns name or ip address
  -a                 use audible ping
  -A                 use adaptive ping
  -B                 sticky source address
  -c <count>         stop after <count> replies
  -D                 print timestamps
  -d                 use SO_DEBUG socket option
  -f                 flood ping
  -h                 print help and exit
  -I <interface>     either interface name or address
  -i <interval>      seconds between sending each packet
  -L                 suppress loopback of multicast packets
```

2.Identify and perform 5 more network commands and it's working

Getmac

```
C:\Users\micromedia02>getmac

Physical Address    Transport Name
==================  ==========================================================
DC-F5-05-F4-B5-11   \Device\Tcpip_{D6C3EBFF-6ED4-430D-82F5-FC83D45A5BE3}
80-E8-2C-8D-21-99   Media disconnected
DC-F5-05-F4-B5-10   Media disconnected
0A-00-27-00-00-0D   \Device\Tcpip_{A42D1934-E311-4A22-8455-4E4C696D5120}

C:\Users\micromedia02>
```

Hostname

ARP

Systeminfo

Pathping

```
C:\Users\micromedia02>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
               [-p period] [-q num_queries] [-w timeout]
               [-4] [-6] target_name

Options:
    -g host-list     Loose source route along host-list.
    -h maximum_hops  Maximum number of hops to search for target.
    -i address       Use the specified source address.
    -n               Do not resolve addresses to hostnames.
    -p period        Wait period milliseconds between pings.
    -q num_queries   Number of queries per hop.
    -w timeout       Wait timeout milliseconds for each reply.
    -4               Force using IPv4.
    -6               Force using IPv6.

C:\Users\micromedia02>systeminfo

Host Name:                 LAPTOP-HIR5TON1
OS Name:                   Microsoft Windows 10 Home Single Language
OS Version:                10.0.19042 N/A Build 19042
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
```

Net


```
                    Connection Name: VirtualBox Host-Only Network
                    DHCP Enabled:    No
                    IP address(es)
                    [01]: 192.168.56.1
                    [02]: fe80::916d:54ef:c3d6:57b3
Hyper-V Requirements:    VM Monitor Mode Extensions: Yes
                         Virtualization Enabled In Firmware: Yes
                         Second Level Address Translation: Yes
                         Data Execution Prevention Available: Yes

C:\Users\micromedia02>nbstat
'nbstat' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\micromedia02>net
The syntax of this command is:

NET
    [ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |
      HELPMSG | LOCALGROUP | PAUSE | SESSION | SHARE | START |
      STATISTICS | STOP | TIME | USE | USER | VIEW ]

C:\Users\micromedia02>
```

Nbtstat


```
Type "TASKKILL /?" for usage.

C:\Users\micromedia02>nbtstat

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
          [-r] [-R] [-RR] [-s] [-S] [interval] ]

   -a   (adapter status) Lists the remote machine's name table given its name
   -A   (Adapter status) Lists the remote machine's name table given its
                         IP address.
   -c   (cache)          Lists NBT's cache of remote [machine] names and their IP addresses
   -n   (names)          Lists local NetBIOS names.
   -r   (resolved)       Lists names resolved by broadcast and via WINS
   -R   (Reload)         Purges and reloads the remote cache name table
   -S   (Sessions)       Lists sessions table with the destination IP addresses
   -s   (sessions)       Lists sessions table converting destination IP
                         addresses to computer NETBIOS names.
   -RR  (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

   RemoteName   Remote host machine name.
   IP address   Dotted decimal representation of the IP address.
   interval     Redisplays selected statistics, pausing interval seconds
                between each display. Press Ctrl+C to stop redisplaying
                statistics.

C:\Users\micromedia02>
```

Linux commands

ls


```
jisha@jisha-VirtualBox:~$ ls
allfiles.txt   appu        books       dai.txt    Documents   ha.pub     hi.txt      minnu       Pictures    Videos
allfolder      appu.txt    BOOKS       Desktop    Downloads   hello      h.txt       Music       Public      wordpress
ammu.txt       archieve.tar  class.txt  de.txt    ha          hello.txt  latest.tar.gz  number.txt  Templates  work
```

```
jisha@jisha-VirtualBox:~$ history
    1  ls
    2  pwd
    3  history
    4  man
    5  man ls
    6  cd
    7  cd .
    8  cd /
    9  ls
   10  mkdir jisha
   11  mkdir ammu
   12  mkdir -p jisha
   13  mkdir
   14  mkdir -m ammu
   15  mkdir jisha
   16  cd jisha
   17  cd desktop
   18  cd --
   19  mkdir minnu
   20  cd minnu
   21  rmdir minnu
```

```
jisha@jisha-VirtualBox:~$ touch test1.txt
jisha@jisha-VirtualBox:~$ mkdir book
jisha@jisha-VirtualBox:~$ ls
allfiles.txt   appu        book       class.txt   de.txt      ha         hello.txt    latest.tar.gz   number.txt   Templates   wordpress
allfolder      appu.txt    books      dai.txt     Documents   ha.pub     hi.txt       minnu           Pictures     test1.txt   work
ammu.txt       archieve.tar BOOKS     Desktop     Downloads   hello      h.txt        Music           Public       Videos
jisha@jisha-VirtualBox:~$ pwd
/home/jisha
jisha@jisha-VirtualBox:~$ sudo hostname
jisha-VirtualBox
```

dig

```
jisha@jisha-VirtualBox:~$ dig google.com

; <<>> DiG 9.16.1-Ubuntu <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 38604
;; 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.            224      IN      A       142.250.205.238

;; Query time: 71 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Sun Sep 12 14:41:33 IST 2021
;; MSG SIZE  rcvd: 55
```

arp

```
jisha@jisha-VirtualBox:~$ arp -e
Address                  HWtype  HWaddress          Flags Mask       Iface
_gateway                 ether   52:54:00:12:35:02  C                enp0s3
jisha@jisha-VirtualBox:~$
```

host

```
        -6 use IPv6 query transport only
jisha@jisha-VirtualBox:~$ host google.com
google.com has address 142.250.205.238
google.com has IPv6 address 2404:6800:4007:808::200e
google.com mail is handled by 10 aspmx.l.google.com.
google.com mail is handled by 20 alt1.aspmx.l.google.com.
google.com mail is handled by 30 alt2.aspmx.l.google.com.
google.com mail is handled by 50 alt4.aspmx.l.google.com.
google.com mail is handled by 40 alt3.aspmx.l.google.com.
jisha@jisha-VirtualBox:~$
```