

Lab Activity - 6

-Networking & System Administration Lab

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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 .

Windows

a) Ping :

```
C:\Users\anjali>ping google.com

Pinging google.com [2404:6800:4002:826::200e] with 32 bytes of data:
Reply from 2404:6800:4002:826::200e: time=100ms
Reply from 2404:6800:4002:826::200e: time=90ms
Reply from 2404:6800:4002:826::200e: time=85ms
Reply from 2404:6800:4002:826::200e: time=95ms

Ping statistics for 2404:6800:4002:826::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 85ms, Maximum = 100ms, Average = 92ms
```

```
C:\Users\anjali>ping -a google.com

Pinging google.com [2404:6800:4002:826::200e] with 32 bytes of data:
Reply from 2404:6800:4002:826::200e: time=84ms
Reply from 2404:6800:4002:826::200e: time=109ms
Reply from 2404:6800:4002:826::200e: time=86ms
Reply from 2404:6800:4002:826::200e: time=108ms

Ping statistics for 2404:6800:4002:826::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 84ms, Maximum = 109ms, Average = 96ms
```

```
C:\Users\anjali>ping -t google.com

Pinging google.com [2404:6800:4002:826::200e] with 32 bytes of data:
Reply from 2404:6800:4002:826::200e: time=106ms
Reply from 2404:6800:4002:826::200e: time=84ms
Reply from 2404:6800:4002:826::200e: time=93ms
Reply from 2404:6800:4002:826::200e: time=97ms
Reply from 2404:6800:4002:826::200e: time=97ms
Reply from 2404:6800:4002:826::200e: time=102ms
Reply from 2404:6800:4002:826::200e: time=87ms
Reply from 2404:6800:4002:826::200e: time=99ms
Reply from 2404:6800:4002:826::200e: time=98ms
Reply from 2404:6800:4002:826::200e: time=90ms
Reply from 2404:6800:4002:826::200e: time=92ms
Reply from 2404:6800:4002:826::200e: time=99ms
Reply from 2404:6800:4002:826::200e: time=92ms
Reply from 2404:6800:4002:826::200e: time=96ms
Reply from 2404:6800:4002:826::200e: time=102ms
Reply from 2404:6800:4002:826::200e: time=91ms
Reply from 2404:6800:4002:826::200e: time=86ms
Reply from 2404:6800:4002:826::200e: time=88ms
Reply from 2404:6800:4002:826::200e: time=94ms
Reply from 2404:6800:4002:826::200e: time=104ms
Reply from 2404:6800:4002:826::200e: time=108ms
Reply from 2404:6800:4002:826::200e: time=114ms
Reply from 2404:6800:4002:826::200e: time=105ms
Reply from 2404:6800:4002:826::200e: time=118ms

Ping statistics for 2404:6800:4002:826::200e:
    Packets: Sent = 24, Received = 24, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 84ms, Maximum = 118ms, Average = 97ms
```

```
C:\Users\anjali>ping -j google.com

Pinging google.com [142.250.195.142] with 32 bytes of data:
General failure.
General failure.
General failure.
General failure.

Ping statistics for 142.250.195.142:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
C:\Users\anjali>ping -f google.com

Pinging google.com [142.250.195.142] with 32 bytes of data:
Reply from 142.250.195.142: bytes=32 time=572ms TTL=112
Reply from 142.250.195.142: bytes=32 time=67ms TTL=112
Reply from 142.250.195.142: bytes=32 time=61ms TTL=112
Reply from 142.250.195.142: bytes=32 time=71ms TTL=112

Ping statistics for 142.250.195.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 61ms, Maximum = 572ms, Average = 192ms
```

b) Route:

```
C:\Users\anjali>route print
=====
Interface List
  3...30 d0 42 37 48 2d .....Realtek PCIe FE Family Controller
 12...0a 00 27 00 00 0c .....VirtualBox Host-Only Ethernet Adapter
  7...a6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter
 10...b6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter #2
 13...a4 97 b1 dc f1 4d .....Qualcomm QCA9377 802.11ac Wireless Adapter
 14...a4 97 b1 dc f1 4e .....Bluetooth Device (Personal Area Network)
  1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway             Interface           Metric
0.0.0.0                    0.0.0.0          192.168.95.120      192.168.95.6         55
127.0.0.0                  255.0.0.0        On-link             127.0.0.1            331
127.0.0.1                  255.255.255.255  On-link             127.0.0.1            331
127.255.255.255            255.255.255.255  On-link             127.0.0.1            331
192.168.56.0                255.255.255.0    On-link             192.168.56.1         281
192.168.56.1                255.255.255.255  On-link             192.168.56.1         281
192.168.56.255              255.255.255.255  On-link             192.168.56.1         281
192.168.95.0                255.255.255.0    On-link             192.168.95.6         311
192.168.95.6                255.255.255.255  On-link             192.168.95.6         311
192.168.95.255              255.255.255.255  On-link             192.168.95.6         311
224.0.0.0                  240.0.0.0        On-link             127.0.0.1            331
224.0.0.0                  240.0.0.0        On-link             192.168.56.1         281
224.0.0.0                  240.0.0.0        On-link             192.168.95.6         311
255.255.255.255            255.255.255.255  On-link             127.0.0.1            331
255.255.255.255            255.255.255.255  On-link             192.168.56.1         281
255.255.255.255            255.255.255.255  On-link             192.168.95.6         311
=====
Persistent Routes:
    None
```

```
IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
13      71 ::/0 fe80::8c42:19ff:fed0:3ce2
1       331 ::1/128 On-link
13      71 2409:4073:2189:f3dc::/64 On-link
13      311 2409:4073:2189:f3dc:2537:744e:a7be:b7b2/128 On-link
13      311 2409:4073:2189:f3dc:bd92:7db6:fcfc:9cfb/128 On-link
12      281 fe80::/64 On-link
13      311 fe80::/64 On-link
12      281 fe80::a5ba:13df:e5e9:1ef8/128 On-link
13      311 fe80::bd92:7db6:fcfc:9cfb/128 On-link
1       331 ff00::/8 On-link
12      281 ff00::/8 On-link
13      311 ff00::/8 On-link
=====
Persistent Routes:
    None
```

```
C:\Users\anjali>route print -4
=====
Interface List
3...30 d0 42 37 48 2d .....Realtek PCIe FE Family Controller
12...0a 00 27 00 00 0c .....VirtualBox Host-Only Ethernet Adapter
7...a6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter
10...b6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter #2
13...a4 97 b1 dc f1 4d .....Qualcomm QCA9377 802.11ac Wireless Adapter
14...a4 97 b1 dc f1 4e .....Bluetooth Device (Personal Area Network)
1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.95.120   192.168.95.6     55
127.0.0.0                  255.0.0.0        On-link          127.0.0.1        331
127.0.0.1                  255.255.255.255  On-link          127.0.0.1        331
127.255.255.255            255.255.255.255  On-link          127.0.0.1        331
192.168.56.0                255.255.255.0    On-link          192.168.56.1     281
192.168.56.1                255.255.255.255  On-link          192.168.56.1     281
192.168.56.255              255.255.255.255  On-link          192.168.56.1     281
192.168.95.0                255.255.255.0    On-link          192.168.95.6     311
192.168.95.6                255.255.255.255  On-link          192.168.95.6     311
192.168.95.255              255.255.255.255  On-link          192.168.95.6     311
224.0.0.0                  240.0.0.0        On-link          127.0.0.1        331
224.0.0.0                  240.0.0.0        On-link          192.168.56.1     281
224.0.0.0                  240.0.0.0        On-link          192.168.95.6     311
255.255.255.255            255.255.255.255  On-link          127.0.0.1        331
255.255.255.255            255.255.255.255  On-link          192.168.56.1     281
255.255.255.255            255.255.255.255  On-link          192.168.95.6     311
=====
Persistent Routes:
None
```

```
C:\Users\anjali>route print -6
=====
Interface List
3...30 d0 42 37 48 2d .....Realtek PCIe FE Family Controller
12...0a 00 27 00 00 0c .....VirtualBox Host-Only Ethernet Adapter
7...a6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter
10...b6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter #2
13...a4 97 b1 dc f1 4d .....Qualcomm QCA9377 802.11ac Wireless Adapter
14...a4 97 b1 dc f1 4e .....Bluetooth Device (Personal Area Network)
1.....Software Loopback Interface 1
=====

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
13       71 :::/0                fe80::8c42:19ff:fed0:3ce2
1        331 ::1/128              On-link
13       71 2409:4073:2189:f3dc::/64 On-link
13      311 2409:4073:2189:f3dc:2537:744e:a7be:b7b2/128
On-link
13      311 2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb/128
On-link
12      281 fe80::/64                On-link
13      311 fe80::/64                On-link
12      281 fe80::a5ba:13df:e5e9:1ef8/128
On-link
13      311 fe80::bd92:7db6:fccf:9cfb/128
On-link
1        331 ff00::/8                On-link
12      281 ff00::/8                On-link
13      311 ff00::/8                On-link
=====
Persistent Routes:
None
```

```
C:\Users\anjali>route print -p
=====
Interface List
3...30 d0 42 37 48 2d .....Realtek PCIe FE Family Controller
12...0a 00 27 00 00 0c .....VirtualBox Host-Only Ethernet Adapter
7...a6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter
10...b6 97 b1 dc f1 4d .....Microsoft Wi-Fi Direct Virtual Adapter #2
13...a4 97 b1 dc f1 4d .....Qualcomm QCA9377 802.11ac Wireless Adapter
14...a4 97 b1 dc f1 4e .....Bluetooth Device (Personal Area Network)
1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.95.120   192.168.95.6     55
127.0.0.0                  255.0.0.0        On-link          127.0.0.1        331
127.0.0.1                  255.255.255.255  On-link          127.0.0.1        331
127.255.255.255            255.255.255.255  On-link          127.0.0.1        331
192.168.56.0                255.255.255.0    On-link          192.168.56.1     281
192.168.56.1                255.255.255.255  On-link          192.168.56.1     281
192.168.56.255              255.255.255.255  On-link          192.168.56.1     281
192.168.95.0                255.255.255.0    On-link          192.168.95.6     311
192.168.95.6                255.255.255.255  On-link          192.168.95.6     311
192.168.95.255              255.255.255.255  On-link          192.168.95.6     311
224.0.0.0                  240.0.0.0        On-link          127.0.0.1        331
224.0.0.0                  240.0.0.0        On-link          192.168.56.1     281
224.0.0.0                  240.0.0.0        On-link          192.168.95.6     311
255.255.255.255            255.255.255.255  On-link          127.0.0.1        331
255.255.255.255            255.255.255.255  On-link          192.168.56.1     281
255.255.255.255            255.255.255.255  On-link          192.168.95.6     311
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
13       71 :::/0                fe80::8c42:19ff:fed0:3ce2
1        331 ::1/128              On-link
13       71 2409:4073:2189:f3dc::/64 On-link
13      311 2409:4073:2189:f3dc:2537:744e:a7be:b7b2/128
On-link
13      311 2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb/128
On-link
12      281 fe80::/64                On-link
13      311 fe80::/64                On-link
```

```

12    201 fe80::/64          On-link
13    311 fe80::/64          On-link
12    281 fe80::a5ba:13df:e5e9:1ef8/128
      On-link
13    311 fe80::bd92:7db6:fccf:9cfb/128
      On-link
1     331 ff00::/8          On-link
12    281 ff00::/8          On-link
13    311 ff00::/8          On-link
=====
Persistent Routes:
None

```

c) Tracert:

```
C:\Users\anjali>tracert google.com
```

```
Tracing route to google.com [2404:6800:4002:820::200e]
over a maximum of 30 hops:
```

```

 1    477 ms    5 ms    3 ms    2409:4073:2189:f3dc::c4
 2    *        *        *        Request timed out.
 3    48 ms    48 ms    48 ms    2405:200:366:a168:4::ff05
 4    61 ms    43 ms    58 ms    2405:200:801:3500::1e4
 5    68 ms    41 ms    58 ms    2405:200:801:3500::1e7
 6    52 ms    62 ms    61 ms    2405:200:801:3500::1e9
 7    78 ms    68 ms    58 ms    2001:4860:1:1::171
 8    64 ms    54 ms    60 ms    2001:4860:1:1::170
 9    60 ms    63 ms    49 ms    2404:6800:810c::1
10    *        *        65 ms    2001:4860:0:1::67e
11    83 ms    68 ms    61 ms    2001:4860:0:e00::a
12    95 ms    104 ms   93 ms    2001:4860::9:4001:67bd
13    *        87 ms    *        2001:4860::1c:4000:eaf6
14    89 ms    105 ms   92 ms    2001:4860:0:1::53cf
15    102 ms   100 ms   91 ms    del12s03-in-x0e.1e100.net [2404:6800:4002:820::200e]

```

Trace complete.

```
C:\Users\anjali>tracert -d google.com
```

```
Tracing route to google.com [2404:6800:4002:820::200e]
over a maximum of 30 hops:
```

```

 1     4 ms     4 ms     5 ms    2409:4073:2189:f3dc::c4
 2    *        *        *        Request timed out.
 3    49 ms    46 ms    50 ms    2405:200:366:a168:4::ff05
 4    36 ms    50 ms    46 ms    2405:200:801:3500::1e4
 5    53 ms    38 ms    38 ms    2405:200:801:3500::1e7
 6    52 ms    46 ms    48 ms    2405:200:801:3500::1e9
 7    62 ms    59 ms    66 ms    2001:4860:1:1::171
 8    65 ms    49 ms    62 ms    2001:4860:1:1::170
 9    72 ms    64 ms    51 ms    2404:6800:810c::1
10    84 ms    *        61 ms    2001:4860:0:1::67e
11    65 ms    *        59 ms    2001:4860:0:e00::a
12    97 ms    104 ms   100 ms    2001:4860::9:4001:d9e7
13    *        *        *        Request timed out.
14    86 ms    82 ms    84 ms    2001:4860:0:1::53cd
15    92 ms    96 ms    90 ms    2404:6800:4002:820::200e

```

Trace complete.

```
C:\Users\anjali>tracert -4 google.com
```

```
Tracing route to google.com [142.250.195.14]
over a maximum of 30 hops:
```

```

 1    104 ms    3 ms     3 ms    192.168.95.120
 2    *        *        *        Request timed out.
 3    49 ms    37 ms    51 ms    10.72.238.165
 4    62 ms    48 ms    59 ms    192.168.35.236
 5    57 ms    30 ms    47 ms    192.168.35.239
 6    54 ms    38 ms    49 ms    172.26.76.4
 7    52 ms    50 ms    46 ms    172.26.76.18
 8    48 ms    51 ms    55 ms    192.168.64.8
 9    46 ms    55 ms    49 ms    192.168.64.9
10    57 ms    55 ms    69 ms    172.31.2.67
11    76 ms    53 ms    57 ms    209.85.175.48
12    58 ms    57 ms    69 ms    74.125.242.129
13    73 ms    58 ms    62 ms    74.125.242.130
14    185 ms    95 ms    90 ms    72.14.239.10
15    94 ms    101 ms    90 ms    108.170.251.97
16    93 ms    102 ms    97 ms    142.251.52.211
17    92 ms    100 ms    98 ms    del12s09-in-f14.1e100.net [142.250.195.14]

```

Trace complete.

```
C:\Users\anjali>tracert -6 google.com
```

```
Tracing route to google.com [2404:6800:4007:81d::200e]
over a maximum of 30 hops:
```

```

 1    99 ms     4 ms     3 ms    2409:4073:2189:f3dc::c4
 2    *        *        *        Request timed out.
 3    54 ms    64 ms    51 ms    2405:200:366:a168:4::ff05
 4    50 ms    37 ms    49 ms    2405:200:801:3500::1e4
 5    42 ms    42 ms    58 ms    2405:200:801:3500::1e7
 6    54 ms    41 ms    57 ms    2405:200:801:3500::1e9
 7    67 ms    59 ms    57 ms    2001:4860:1:1::171
 8    76 ms    59 ms    56 ms    2001:4860:1:1::170
 9    83 ms    77 ms    59 ms    2404:6800:8123::1
10    *        66 ms    *        2001:4860:0:1::564e
11    48 ms    48 ms    49 ms    2001:4860:0:1::67d
12    92 ms    53 ms    63 ms    maa05s22-in-x0e.1e100.net [2404:6800:4007:81d::200e]

```

Trace complete.

```
C:\Users\anjali>tracert -h 3 google.com

Tracing route to google.com [2404:6800:4002:820::200e]
over a maximum of 3 hops:

  1      4 ms      4 ms      3 ms    2409:4073:2189:f3dc::c4
  2      *        *        *        Request timed out.
  3     48 ms     38 ms     60 ms    2405:200:366:a168:4::ff05

Trace complete.
```

d) Nslookup:

```
C:\Users\anjali>nslookup
Default Server:  UnKnown
Address:  192.168.95.120
```

```
C:\Users\anjali>nslookup google.com
Server:  UnKnown
Address:  192.168.95.120

Non-authoritative answer:
Name:     google.com
Addresses: 2404:6800:4007:825::200e
          142.250.183.238
```

```
C:\Users\anjali>nslookup -q=MX google.com
Server:  UnKnown
Address:  192.168.95.120

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

```
C:\Users\anjali>nslookup -type=ns google.com
Server:  UnKnown
Address:  192.168.95.120

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

e) Ip config :

```
C:\Users\anjali>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter Ethernet:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

```
Ethernet adapter VirtualBox Host-Only Network:
```

```
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::a5ba:13df:e5e9:1ef8%12
IPv4 Address. . . . . : 192.168.56.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
```

```
Wireless LAN adapter Local Area Connection* 1:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

```
Wireless LAN adapter Local Area Connection* 2:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

```
Wireless LAN adapter Wi-Fi:
```

```
Connection-specific DNS Suffix . :
IPv6 Address. . . . . : 2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb
Temporary IPv6 Address. . . . . : 2409:4073:2189:f3dc:1994:327f:ede9:a06d
Link-local IPv6 Address . . . . . : fe80::bd92:7db6:fccf:9cfb%13
IPv4 Address. . . . . : 192.168.95.6
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : fe80::8c42:19ff:fed0:3ce2%13
                          192.168.95.120
```

```
Ethernet adapter Bluetooth Network Connection:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

```
C:\Users\anjali>ipconfig /all
```

```
Windows IP Configuration
```

```
Host Name . . . . . : Anjali
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
```

```
Ethernet adapter Ethernet:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Realtek PCIe FE Family Controller
Physical Address. . . . . : 30-D0-42-37-48-2D
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

```
Ethernet adapter VirtualBox Host-Only Network:
```

```
Connection-specific DNS Suffix . :
Description . . . . . : VirtualBox Host-Only Ethernet Adapter
Physical Address. . . . . : 0A-00-27-00-00-0C
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::a5ba:13df:e5e9:1ef8%12(Preferred)
IPv4 Address. . . . . : 192.168.56.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 688521255
DHCPv6 Client DUID. . . . . : 00-01-00-01-27-95-16-C0-30-D0-42-37-48-2D
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                          fec0:0:0:ffff::2%1
                          fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled
```

```
Wireless LAN adapter Local Area Connection* 1:
```

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : A6-97-B1-DC-F1-4D
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

```
Wireless LAN adapter Local Area Connection* 2:
```

```
Media State . . . . . : Media disconnected
```

Wireless LAN adapter Local Area Connection* 2:

Media State : Media disconnected
Connection-specific DNS Suffix . :
Description : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. : B6-97-B1-DC-F1-4D
DHCP Enabled. : Yes
Autoconfiguration Enabled : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
Description : Qualcomm QCA9377 802.11ac Wireless Adapter
Physical Address. : A4-97-B1-DC-F1-4D
DHCP Enabled. : Yes
Autoconfiguration Enabled : Yes
IPv6 Address. : 2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb(Preferred)
Temporary IPv6 Address. : 2409:4073:2189:f3dc:1994:327f:ede9:a06d(Preferred)
Link-local IPv6 Address : fe80::bd92:7db6:fccf:9cfb%13(Preferred)
IPv4 Address. : 192.168.95.6(Preferred)
Subnet Mask : 255.255.255.0
Lease Obtained. : 13 September 2021 08:08:56
Lease Expires : 13 September 2021 09:08:54
Default Gateway : fe80::8c42:19ff:fed0:3ce2%13
192.168.95.120
DHCP Server : 192.168.95.120
DHCPv6 IAID : 145004465
DHCPv6 Client DUID. : 00-01-00-01-27-95-16-C0-30-D0-42-37-48-2D
DNS Servers : 192.168.95.120
NetBIOS over Tcpip. : Enabled

Ethernet adapter Bluetooth Network Connection:

Media State : Media disconnected
Connection-specific DNS Suffix . :
Description : Bluetooth Device (Personal Area Network)
Physical Address. : A4-97-B1-DC-F1-4E
DHCP Enabled. : Yes
Autoconfiguration Enabled : Yes

C:\Users\anjali>ipconfig /renew

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 2 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Ethernet adapter VirtualBox Host-Only Network:

Connection-specific DNS Suffix . :
Link-local IPv6 Address : fe80::a5ba:13df:e5e9:1ef8%12
IPv4 Address. : 192.168.56.1
Subnet Mask : 255.255.255.0
Default Gateway :

Wireless LAN adapter Local Area Connection* 1:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
IPv6 Address. : 2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb
Temporary IPv6 Address. : 2409:4073:2189:f3dc:1994:327f:ede9:a06d
Link-local IPv6 Address : fe80::bd92:7db6:fccf:9cfb%13
IPv4 Address. : 192.168.95.6
Subnet Mask : 255.255.255.0
Default Gateway : fe80::8c42:19ff:fed0:3ce2%13
192.168.95.120

Ethernet adapter Bluetooth Network Connection:

Media State : Media disconnected
Connection-specific DNS Suffix . :


```
C:\Users\anjali>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\Users\anjali>_
```

f) Netstat :

```
C:\Users\anjali>netstat

Active Connections

Proto Local Address Foreign Address State
TCP 127.0.0.1:49679 Anjali:49680 ESTABLISHED
TCP 127.0.0.1:49680 Anjali:49679 ESTABLISHED
TCP 127.0.0.1:49681 Anjali:49682 ESTABLISHED
TCP 127.0.0.1:49682 Anjali:49681 ESTABLISHED
TCP 127.0.0.1:60461 Anjali:60462 ESTABLISHED
TCP 127.0.0.1:60462 Anjali:60461 ESTABLISHED
TCP 127.0.0.1:60463 Anjali:60464 ESTABLISHED
TCP 127.0.0.1:60464 Anjali:60463 ESTABLISHED
TCP 127.0.0.1:60465 Anjali:60466 ESTABLISHED
TCP 127.0.0.1:60466 Anjali:60465 ESTABLISHED
TCP 127.0.0.1:60467 Anjali:60468 ESTABLISHED
TCP 127.0.0.1:60468 Anjali:60467 ESTABLISHED
TCP 192.168.95.6:49806 relay-5166bfb0:http ESTABLISHED
TCP 192.168.95.6:51165 52.109.124.39:https TIME_WAIT
TCP 192.168.95.6:51171 52.109.88.35:https ESTABLISHED
TCP 192.168.95.6:51172 219:https ESTABLISHED
TCP 192.168.95.6:51173 52.109.56.20:https TIME_WAIT
TCP 192.168.95.6:51475 20.197.71.89:https ESTABLISHED
TCP 192.168.95.6:59015 23.98.104.196:https ESTABLISHED
TCP 192.168.95.6:59037 49.44.144.214:https CLOSE_WAIT
TCP 192.168.95.6:59042 91.108.56.198:https ESTABLISHED
TCP 192.168.95.6:62568 52.184.220.11:https ESTABLISHED
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:50835 sb-in-f188:5228 ESTABLISHED
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:51157 del03s17-in-x03:https TIME_WAIT
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:62567 del11s18-in-x0e:https ESTABLISHED
```

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

Active Connections

Proto Local Address Foreign Address State
TCP 127.0.0.1:49679 127.0.0.1:49680 ESTABLISHED
TCP 127.0.0.1:49680 127.0.0.1:49679 ESTABLISHED
TCP 127.0.0.1:49681 127.0.0.1:49682 ESTABLISHED
TCP 127.0.0.1:49682 127.0.0.1:49681 ESTABLISHED
TCP 127.0.0.1:60461 127.0.0.1:60462 ESTABLISHED
TCP 127.0.0.1:60462 127.0.0.1:60461 ESTABLISHED
TCP 127.0.0.1:60463 127.0.0.1:60464 ESTABLISHED
TCP 127.0.0.1:60464 127.0.0.1:60463 ESTABLISHED
TCP 127.0.0.1:60465 127.0.0.1:60466 ESTABLISHED
TCP 127.0.0.1:60466 127.0.0.1:60465 ESTABLISHED
TCP 127.0.0.1:60467 127.0.0.1:60468 ESTABLISHED
TCP 127.0.0.1:60468 127.0.0.1:60467 ESTABLISHED
TCP 192.168.95.6:49806 46.4.60.45:80 ESTABLISHED
TCP 192.168.95.6:51165 52.109.124.39:443 TIME_WAIT
TCP 192.168.95.6:51172 35.247.144.219:443 ESTABLISHED
TCP 192.168.95.6:51173 52.109.56.20:443 TIME_WAIT
TCP 192.168.95.6:51475 20.197.71.89:443 ESTABLISHED
TCP 192.168.95.6:59015 23.98.104.196:443 ESTABLISHED
TCP 192.168.95.6:59037 49.44.144.214:443 CLOSE_WAIT
TCP 192.168.95.6:59042 91.108.56.198:443 ESTABLISHED
TCP 192.168.95.6:62568 52.184.220.11:443 TIME_WAIT
TCP 192.168.95.6:62570 13.33.146.4:443 TIME_WAIT
TCP 192.168.95.6:62571 13.33.146.4:443 TIME_WAIT
TCP 192.168.95.6:62572 52.184.214.53:443 ESTABLISHED
TCP 192.168.95.6:62573 52.137.110.235:443 TIME_WAIT
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:50835 [2404:6800:4003:c01::bc]:5228 ESTABLISHED
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:51157 [2404:6800:4002:80c::2003]:443 TIME_WAIT
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:62567 [2404:6800:4002:81d::200e]:443 ESTABLISHED
```

```
C:\Users\anjali>netstat -v

Active Connections

Proto Local Address Foreign Address State
TCP 127.0.0.1:49679 Anjali:49680 ESTABLISHED
TCP 127.0.0.1:49680 Anjali:49679 ESTABLISHED
TCP 127.0.0.1:49681 Anjali:49682 ESTABLISHED
TCP 127.0.0.1:49682 Anjali:49681 ESTABLISHED
TCP 127.0.0.1:60461 Anjali:60462 ESTABLISHED
TCP 127.0.0.1:60462 Anjali:60461 ESTABLISHED
TCP 127.0.0.1:60463 Anjali:60464 ESTABLISHED
TCP 127.0.0.1:60464 Anjali:60463 ESTABLISHED
TCP 127.0.0.1:60465 Anjali:60466 ESTABLISHED
TCP 127.0.0.1:60466 Anjali:60465 ESTABLISHED
TCP 127.0.0.1:60467 Anjali:60468 ESTABLISHED
TCP 127.0.0.1:60468 Anjali:60467 ESTABLISHED
TCP 192.168.95.6:49806 relay-5166bfb0:http ESTABLISHED
TCP 192.168.95.6:51172 219:https ESTABLISHED
TCP 192.168.95.6:51475 20.197.71.89:https ESTABLISHED
TCP 192.168.95.6:59015 23.98.104.196:https ESTABLISHED
TCP 192.168.95.6:59037 49.44.144.214:https CLOSE_WAIT
TCP 192.168.95.6:59042 91.108.56.198:https ESTABLISHED
TCP 192.168.95.6:62574 20.50.73.9:https TIME_WAIT
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:50835 sb-in-f188:5228 ESTABLISHED
TCP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:62567 del11s18-in-x0e:https CLOSE_WAIT
```

```
C:\Users\anjali>netstat -o
```

```
Active Connections
```

Proto	Local Address	Foreign Address	State	PID
TCP	127.0.0.1:49679	Anjali:49680	ESTABLISHED	5600
TCP	127.0.0.1:49680	Anjali:49679	ESTABLISHED	5600
TCP	127.0.0.1:49681	Anjali:49682	ESTABLISHED	5600
TCP	127.0.0.1:49682	Anjali:49681	ESTABLISHED	5600
TCP	127.0.0.1:60461	Anjali:60462	ESTABLISHED	13332
TCP	127.0.0.1:60462	Anjali:60461	ESTABLISHED	13332
TCP	127.0.0.1:60463	Anjali:60464	ESTABLISHED	13332
TCP	127.0.0.1:60464	Anjali:60463	ESTABLISHED	13332
TCP	127.0.0.1:60465	Anjali:60466	ESTABLISHED	13332
TCP	127.0.0.1:60466	Anjali:60465	ESTABLISHED	13332
TCP	127.0.0.1:60467	Anjali:60468	ESTABLISHED	13332
TCP	127.0.0.1:60468	Anjali:60467	ESTABLISHED	13332
TCP	192.168.95.6:49806	relay-5166bfb0:https	ESTABLISHED	4304
TCP	192.168.95.6:51172	219:https	ESTABLISHED	8276
TCP	192.168.95.6:51475	20.197.71.89:https	ESTABLISHED	4676
TCP	192.168.95.6:59015	23.98.104.196:https	ESTABLISHED	2308
TCP	192.168.95.6:59037	49.44.144.214:https	CLOSE_WAIT	18492
TCP	192.168.95.6:59042	91.108.56.198:https	ESTABLISHED	18880
TCP	192.168.95.6:62574	20.50.73.9:https	ESTABLISHED	10908
TCP	[2409:4073:2189:f3dc:1994:327f:ede9:a06d]:50835	sb-in-f188:5228	ESTABLISHED	7680
TCP	[2409:4073:2189:f3dc:1994:327f:ede9:a06d]:62567	del11s18-in-x0e:https	CLOSE_WAIT	7680

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

```
Active Connections
```

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	Anjali:0	LISTENING
TCP	0.0.0.0:445	Anjali:0	LISTENING
TCP	0.0.0.0:3306	Anjali:0	LISTENING
TCP	0.0.0.0:5040	Anjali:0	LISTENING
TCP	0.0.0.0:5700	Anjali:0	LISTENING
TCP	0.0.0.0:6646	Anjali:0	LISTENING
TCP	0.0.0.0:7070	Anjali:0	LISTENING
TCP	0.0.0.0:7680	Anjali:0	LISTENING
TCP	0.0.0.0:33060	Anjali:0	LISTENING
TCP	0.0.0.0:49664	Anjali:0	LISTENING
TCP	0.0.0.0:49665	Anjali:0	LISTENING
TCP	0.0.0.0:49666	Anjali:0	LISTENING
TCP	0.0.0.0:49667	Anjali:0	LISTENING
TCP	0.0.0.0:49668	Anjali:0	LISTENING
TCP	0.0.0.0:49675	Anjali:0	LISTENING
TCP	127.0.0.1:8884	Anjali:0	LISTENING
TCP	127.0.0.1:9012	Anjali:0	LISTENING
TCP	127.0.0.1:27017	Anjali:0	LISTENING
TCP	127.0.0.1:49679	Anjali:49680	ESTABLISHED
TCP	127.0.0.1:49680	Anjali:49679	ESTABLISHED
TCP	127.0.0.1:49681	Anjali:49682	ESTABLISHED
TCP	127.0.0.1:49682	Anjali:49681	ESTABLISHED
TCP	127.0.0.1:49747	Anjali:0	LISTENING
TCP	127.0.0.1:60461	Anjali:60462	ESTABLISHED
TCP	127.0.0.1:60462	Anjali:60461	ESTABLISHED
TCP	127.0.0.1:60463	Anjali:60464	ESTABLISHED
TCP	127.0.0.1:60464	Anjali:60463	ESTABLISHED
TCP	127.0.0.1:60465	Anjali:60466	ESTABLISHED
TCP	127.0.0.1:60466	Anjali:60465	ESTABLISHED
TCP	127.0.0.1:60467	Anjali:60468	ESTABLISHED
TCP	127.0.0.1:60468	Anjali:60467	ESTABLISHED
TCP	192.168.56.1:139	Anjali:0	LISTENING
TCP	192.168.95.6:139	Anjali:0	LISTENING
TCP	192.168.95.6:49806	relay-5166bfb0:https	ESTABLISHED
TCP	192.168.95.6:51172	219:https	ESTABLISHED
TCP	192.168.95.6:51475	20.197.71.89:https	ESTABLISHED
TCP	192.168.95.6:59015	23.98.104.196:https	ESTABLISHED
TCP	192.168.95.6:59037	49.44.144.214:https	CLOSE_WAIT
TCP	192.168.95.6:59042	91.108.56.198:https	ESTABLISHED
TCP	192.168.95.6:62570	server-13-33-146-4:https	TIME_WAIT
TCP	192.168.95.6:62571	server-13-33-146-4:https	TIME_WAIT
TCP	192.168.95.6:62572	52.184.214.53:https	ESTABLISHED
TCP	192.168.95.6:62573	52.137.110.235:https	TIME_WAIT
TCP	[::]:135	Anjali:0	LISTENING

TCP	[::]:135	Anjali:0	LISTENING
TCP	[::]:445	Anjali:0	LISTENING
TCP	[::]:3306	Anjali:0	LISTENING
TCP	[::]:5700	Anjali:0	LISTENING
TCP	[::]:7680	Anjali:0	LISTENING
TCP	[::]:33060	Anjali:0	LISTENING
TCP	[::]:49664	Anjali:0	LISTENING
TCP	[::]:49665	Anjali:0	LISTENING
TCP	[::]:49666	Anjali:0	LISTENING
TCP	[::]:49667	Anjali:0	LISTENING
TCP	[::]:49668	Anjali:0	LISTENING
TCP	[::]:49675	Anjali:0	LISTENING
TCP	[2409:4073:2189:f3dc:1994:327f:ede9:a06d]:50835	sb-in-f188:5228	ESTABLISHED
TCP	[2409:4073:2189:f3dc:1994:327f:ede9:a06d]:62567	del11s18-in-x0e:https	ESTABLISHED
UDP	0.0.0.0:500	**	
UDP	0.0.0.0:4500	**	
UDP	0.0.0.0:5050	**	
UDP	0.0.0.0:5353	**	
UDP	0.0.0.0:5353	**	
UDP	0.0.0.0:5353	**	
UDP	0.0.0.0:5353	**	
UDP	0.0.0.0:5355	**	
UDP	0.0.0.0:6646	**	
UDP	0.0.0.0:50001	**	
UDP	127.0.0.1:1900	**	
UDP	127.0.0.1:53510	**	
UDP	127.0.0.1:60966	**	
UDP	192.168.56.1:137	**	
UDP	192.168.56.1:138	**	
UDP	192.168.56.1:1900	**	
UDP	192.168.56.1:2177	**	
UDP	192.168.56.1:60964	**	
UDP	192.168.95.6:137	**	
UDP	192.168.95.6:138	**	
UDP	192.168.95.6:1900	**	
UDP	192.168.95.6:2177	**	
UDP	192.168.95.6:60965	**	
UDP	[::]:500	**	
UDP	[::]:4500	**	
UDP	[::]:5353	**	
UDP	[::]:5353	**	
UDP	[::]:5353	**	
UDP	[::]:5355	**	
UDP	[::]:1900	**	
UDP	[::]:60963	**	

```

UDP [::1]:60963 *: *
UDP [2409:4073:2189:f3dc:1994:327f:ede9:a06d]:2177 *: *
UDP [2409:4073:2189:f3dc:bd92:7db6:fccf:9cfb]:2177 *: *
UDP [fe80::a5ba:13df:e5e9:1ef8%12]:1900 *: *
UDP [fe80::a5ba:13df:e5e9:1ef8%12]:2177 *: *
UDP [fe80::a5ba:13df:e5e9:1ef8%12]:60961 *: *
UDP [fe80::bd92:7db6:fccf:9cfb%13]:1900 *: *
UDP [fe80::bd92:7db6:fccf:9cfb%13]:2177 *: *
UDP [fe80::bd92:7db6:fccf:9cfb%13]:60962 *: *

```

Linux

a) Ping :

```

kunjuzz@kunjuzz-VirtualBox:~$ ping google.com
PING google.com (142.250.77.142) 56(84) bytes of data.
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=2 ttl=110 ti
me=1823 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=3 ttl=110 ti
me=1252 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=4 ttl=110 ti
me=480 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=5 ttl=110 ti
me=581 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=6 ttl=110 ti
me=763 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=7 ttl=110 ti
me=459 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=8 ttl=110 ti
me=145 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=9 ttl=110 ti
me=991 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=10 ttl=110 t
ime=601 ms
^C
--- google.com ping statistics ---
11 packets transmitted, 9 received, 18.1818% packet loss, time 10039ms
rtt min/avg/max/mdev = 144.603/788.308/1822.979/474.105 ms, pipe 2
kunjuzz@kunjuzz-VirtualBox:~$

```

```

kunjuzz@kunjuzz-VirtualBox:~$ ping -a google.com
PING google.com (142.250.77.142) 56(84) bytes of data.
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=2 ttl=110 ti
me=1500 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=3 ttl=110 ti
me=796 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=4 ttl=110 ti
me=1819 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=5 ttl=110 ti
me=1738 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=13 ttl=110 t
ime=1247 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=14 ttl=110 t
ime=1523 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=15 ttl=110 t
ime=1921 ms
^C
--- google.com ping statistics ---
22 packets transmitted, 7 received, 68.1818% packet loss, time 21329ms
rtt min/avg/max/mdev = 796.249/1506.287/1920.659/357.515 ms, pipe 2
kunjuzz@kunjuzz-VirtualBox:~$

```

```

kunjuzz@kunjuzz-VirtualBox:~$ ping -b google.com
PING google.com (142.250.77.142) 56(84) bytes of data.
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=1 ttl=110 ti
me=760 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=2 ttl=110 ti
me=1719 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=3 ttl=110 ti
me=1459 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=4 ttl=110 ti
me=1361 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=5 ttl=110 ti
me=1780 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=6 ttl=110 ti
me=2177 ms
64 bytes from maa05s16-in-f14.1e100.net (142.250.77.142): icmp_seq=7 ttl=110 ti
me=1745 ms
^C
--- google.com ping statistics ---
11 packets transmitted, 7 received, 36.3636% packet loss, time 10082ms
rtt min/avg/max/mdev = 759.545/1571.696/2176.791/410.255 ms, pipe 3
kunjuzz@kunjuzz-VirtualBox:~$

```



```
kunjuzz@kunjuzz-VirtualBox:~$ ping -f google.com
PING google.com (142.250.195.142) 56(84) bytes of data.
ping: cannot flood; minimal interval allowed for user is 200ms
kunjuzz@kunjuzz-VirtualBox:~$
```

b) Route :

```
kunjuzz@kunjuzz-VirtualBox:~$ 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
kunjuzz@kunjuzz-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
kunjuzz@kunjuzz-VirtualBox:~$ route -Cn
Kernel IP routing cache
Source           Destination      Gateway          Flags Metric Ref    Use Iface
kunjuzz@kunjuzz-VirtualBox:~$ route -4
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
kunjuzz@kunjuzz-VirtualBox:~$
```

c) Traceroute :

```
kunjuzz@kunjuzz-VirtualBox:~$ traceroute google.com
traceroute to google.com (142.250.195.14), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.983 ms 0.971 ms 0.961 ms
 2 _gateway (10.0.2.2) 7.700 ms 10.158 ms 10.237 ms
kunjuzz@kunjuzz-VirtualBox:~$ traceroute -4 google.com
traceroute to google.com (142.250.195.14), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.258 ms 0.214 ms 0.202 ms
 2 _gateway (10.0.2.2) 6.814 ms 6.803 ms 6.792 ms
kunjuzz@kunjuzz-VirtualBox:~$ traceroute -6 google.com
traceroute to google.com (2404:6800:4002:826::200e), 30 hops max, 80 byte packets
connect: Network is unreachable
kunjuzz@kunjuzz-VirtualBox:~$ traceroute -d google.com
traceroute to google.com (142.250.195.14), 30 hops max, 60 byte packets
setsockopt SO_DEBUG: Permission denied
kunjuzz@kunjuzz-VirtualBox:~$ traceroute -n google.com
traceroute to google.com (142.250.195.14), 30 hops max, 60 byte packets
 1 10.0.2.2 0.220 ms 0.175 ms 0.163 ms
 2 10.0.2.2 8.371 ms 8.307 ms 8.272 ms
kunjuzz@kunjuzz-VirtualBox:~$
```

d) Nslookup :

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

Non-authoritative answer:
Name:   google.com
Address: 142.250.195.14
Name:   google.com
Address: 2404:6800:4007:81e::200e

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

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

Authoritative answers can be found from:
```

```
kunjuzz@kunjuzz-VirtualBox:~$ nslookup -query=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 = ns3.google.com.
google.com      nameserver = ns1.google.com.
google.com      nameserver = ns2.google.com.

Authoritative answers can be found from:
```

```
kunjuzz@kunjuzz-VirtualBox:~$ nslookup -query=soa google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
google.com
    origin = ns1.google.com
    mail addr = dns-admin.google.com
    serial = 396194125
    refresh = 900
    retry = 900
    expire = 1800
    minimum = 60

Authoritative answers can be found from:
```

```
kunjuzz@kunjuzz-VirtualBox:~$
```

e) Ifconfig :

```
kunjuzz@kunjuzz-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::bb99:f405:33da:69e7 prefixlen 64  scopeid 0x20<link>
    ether 08:00:27:75:8a:2f txqueuelen 1000  (Ethernet)
    RX packets 157748  bytes 221200924 (221.2 MB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 60549  bytes 3698300 (3.6 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 507  bytes 49595 (49.5 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 507  bytes 49595 (49.5 KB)
    TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

kunjuzz@kunjuzz-VirtualBox:~$
```



```
kunjuzz@kunjuzz-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::bb99:f405:33da:69e7 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:75:8a:2f txqueuelen 1000 (Ethernet)
    RX packets 157751 bytes 221201223 (221.2 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 60552 bytes 3698538 (3.6 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 509 bytes 49767 (49.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 509 bytes 49767 (49.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

kunjuzz@kunjuzz-VirtualBox:~$
```

```
kunjuzz@kunjuzz-VirtualBox:~$ ifconfig -s
Iface      MTU      RX-OK RX-ERR RX-DRP RX-OVR      TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3     1500     157758      0      0 0      60560      0      0      0 BMRU
lo         65536      509      0      0 0        509      0      0      0 LRU

kunjuzz@kunjuzz-VirtualBox:~$
```

```
kunjuzz@kunjuzz-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::bb99:f405:33da:69e7 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:75:8a:2f txqueuelen 1000 (Ethernet)
    RX packets 157752 bytes 221201313 (221.2 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 60553 bytes 3698628 (3.6 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 509 bytes 49767 (49.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 509 bytes 49767 (49.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

kunjuzz@kunjuzz-VirtualBox:~$
```

f) Netstat :

```
kunjuzz@kunjuzz-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 kunjuzz-VirtualB:bootpc _gateway:bootps        ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node  Path
unix    2      [ ]         DGRAM                    22063    /run/user/1000/systemd/notify
md/notify
unix    3      [ ]         DGRAM                    15440    /run/systemd/notify
unix    2      [ ]         DGRAM                    15454    /run/systemd/journal
/syslog
unix   18      [ ]         DGRAM                    15463    /run/systemd/journal
/dev-log
unix    8      [ ]         DGRAM                    15465    /run/systemd/journal
/socket
unix    3      [ ]         STREAM        CONNECTED      22437
unix    3      [ ]         STREAM        CONNECTED      18843
unix    3      [ ]         STREAM        CONNECTED      26164    /run/systemd/journal
/stdout
unix    3      [ ]         STREAM        CONNECTED      22327
unix    3      [ ]         STREAM        CONNECTED      18690
unix    3      [ ]         STREAM        CONNECTED      25251
unix    3      [ ]         STREAM        CONNECTED      18844    /run/dbus/system_bus
_socket
unix    3      [ ]         STREAM        CONNECTED      25405    /run/dbus/system_bus
_socket
unix    3      [ ]         STREAM        CONNECTED      26153    /run/systemd/journal
```

```
kunjuzz@kunjuzz-VirtualBox:~$ netstat -n
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 10.0.2.15:68            10.0.2.2:67            ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags               Type                   State                  I-Node   Path
unix    2      [ ]                  DGRAM                  -                  22063    /run/user/1000/syste
md/notify
unix    3      [ ]                  DGRAM                  -                  15440    /run/systemd/notify
unix    2      [ ]                  DGRAM                  -                  15454    /run/systemd/journal
/syslog
unix    18      [ ]                  DGRAM                  -                  15463    /run/systemd/journal
/dev-log
unix    8      [ ]                  DGRAM                  -                  15465    /run/systemd/journal
/socket
unix    3      [ ]                  STREAM                 CONNECTED            22437
unix    3      [ ]                  STREAM                 CONNECTED            18843
unix    3      [ ]                  STREAM                 CONNECTED            26164    /run/systemd/journal
/stdout
unix    3      [ ]                  STREAM                 CONNECTED            22327
unix    3      [ ]                  STREAM                 CONNECTED            18690
unix    3      [ ]                  STREAM                 CONNECTED            25251
unix    3      [ ]                  STREAM                 CONNECTED            18844    /run/dbus/system_bus
_socket
unix    3      [ ]                  STREAM                 CONNECTED            25405    /run/dbus/system_bus
_socket
unix    3      [ ]                  STREAM                 CONNECTED            26153    /run/systemd/journal
/stdout
```

```
kunjuzz@kunjuzz-VirtualBox:~$ netstat -o
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Timer
udp        0      0 kunjuzz-VirtualB:bootpc _gateway:bootps        ESTABLISHED
off (0.00/0/0)

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags               Type                   State                  I-Node   Path
unix    2      [ ]                  DGRAM                  -                  22063    /run/user/1000/syste
md/notify
unix    3      [ ]                  DGRAM                  -                  15440    /run/systemd/notify
unix    2      [ ]                  DGRAM                  -                  15454    /run/systemd/journal
/syslog
unix    18      [ ]                  DGRAM                  -                  15463    /run/systemd/journal
/dev-log
unix    8      [ ]                  DGRAM                  -                  15465    /run/systemd/journal
/socket
unix    3      [ ]                  STREAM                 CONNECTED            22437
unix    3      [ ]                  STREAM                 CONNECTED            18843
unix    3      [ ]                  STREAM                 CONNECTED            26164    /run/systemd/journal
/stdout
unix    3      [ ]                  STREAM                 CONNECTED            22327
unix    3      [ ]                  STREAM                 CONNECTED            18690
unix    3      [ ]                  STREAM                 CONNECTED            25251
unix    3      [ ]                  STREAM                 CONNECTED            18844    /run/dbus/system_bus
_socket
unix    3      [ ]                  STREAM                 CONNECTED            25405    /run/dbus/system_bus
_socket
unix    3      [ ]                  STREAM                 CONNECTED            26153    /run/systemd/journal
```

```
kunjuzz@kunjuzz-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 0.0.0.0:ssh              0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp            0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http                [::]:*                  LISTEN
tcp6       0      0 [::]:ssh                  [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 0.0.0.0:631              0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:43230            0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:mdns              0.0.0.0:*               LISTEN
udp        0      0 localhost:domain        0.0.0.0:*               LISTEN
udp        0      0 kunjuzz-VirtualB:bootpc _gateway:bootps        ESTABLISHED
udp6       0      0 [::]:mdns                 [::]:*                  LISTEN
udp6       0      0 [::]:52541                 [::]:*                  LISTEN
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             25881    @/home/kunjuzz/.cach
e/ibus/dbus-se1hkFvE
unix    2      [ ACC ]              STREAM                 LISTENING             23387    @/tmp/.ICE-unix/1461
unix    2      [ ACC ]              STREAM                 LISTENING             24117    @/tmp/.X11-unix/X0
unix    2      [ ACC ]              STREAM                 LISTENING             24132    @/tmp/.X11-unix/X1
unix    2      [ ACC ]              STREAM                 LISTENING             18942    /run/cups/cups.sock
unix    2      [ ]                  DGRAM                  -                  22063    /run/user/1000/syste
md/notify
```


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

- i. **Getmac** : Returns the media access control (MAC) address and list of network protocols associated with each address for all network cards in each computer, either locally or across a network. This command is particularly useful either when you want to enter the MAC address into a network analyzer, or when you need to know what protocols are currently in use on each network adapter on a computer.

```
C:\Users\anjali>getmac

Physical Address      Transport Name
=====
30-D0-42-37-48-2D    Media disconnected
A4-97-B1-DC-F1-4D    \Device\Tcpip_{C6600145-9B01-4CD6-94EF-3322C691AE9A}
A4-97-B1-DC-F1-4E    Media disconnected
0A-00-27-00-00-0C    \Device\Tcpip_{ABB6FB59-3912-4755-AB85-78A9651C5341}
```

- ii. **HostName** : The command will simply display the current name of your Windows computer This is the name your computer uses to identify itself to the other devices and servers on your local network. You can find this name in the System information screen in the GUI, but this command is quicker.

```
C:\Users\anjali>hostname
Anjali
```

- iii. **PathPing** : Provides information about network latency and network loss at intermediate hops between a source and destination. This command sends multiple echo Request messages to each router between a source and destination, over a period of time, and then computes results based on the packets returned from each router. Because this command displays the degree of packet loss at any given router or link, you can determine which routers or subnets might be having network problems. Used without parameters, this command displays help.

```
C:\Users\anjali>pathping google.com

Tracing route to google.com [2404:6800:4007:825::200e]
over a maximum of 30 hops:
  0  Anjali [2409:4073:2189:f3dc:1994:327f:ede9:a06d]
  1  2409:4073:2189:f3dc::9c
  2  * * *
Computing statistics for 25 seconds...
      Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct    Lost/Sent = Pct    Address
  0              0/ 100 = 0%      0/ 100 = 0%      Anjali [2409:4073:2189:f3dc:1994:327f:ede9:a06d]
  1   10ms     0/ 100 = 0%      0/ 100 = 0%      2409:4073:2189:f3dc::9c
Trace complete.
```


- iv. Nbtstat :** Displays NetBIOS over TCP/IP (NetBT) protocol statistics, NetBIOS name tables for both the local computer and remote computers, and the NetBIOS name cache. This command also allows a refresh of the NetBIOS name cache and the names registered with Windows Internet Name Service (WINS).

```
C:\Users\anjali>nbtstat -s

VirtualBox Host-Only Network:
Node IpAddress: [192.168.56.1] Scope Id: []

    No Connections

Ethernet:
Node IpAddress: [0.0.0.0] Scope Id: []

    No Connections

Bluetooth Network Connection:
Node IpAddress: [0.0.0.0] Scope Id: []

    No Connections

Wi-Fi:
Node IpAddress: [192.168.95.6] Scope Id: []

    No Connections

Local Area Connection* 1:
Node IpAddress: [0.0.0.0] Scope Id: []

    No Connections

Local Area Connection* 2:
Node IpAddress: [0.0.0.0] Scope Id: []

    No Connections
```

```
C:\Users\anjali>nbtstat -n

VirtualBox Host-Only Network:
Node IpAddress: [192.168.56.1] Scope Id: []

    NetBIOS Local Name Table

    Name                Type                Status
    -----
    ANJALI                <20> UNIQUE          Registered
    ANJALI                <00> UNIQUE          Registered
    WORKGROUP             <00> GROUP           Registered

Ethernet:
Node IpAddress: [0.0.0.0] Scope Id: []

    No names in cache

Bluetooth Network Connection:
Node IpAddress: [0.0.0.0] Scope Id: []

    No names in cache

Wi-Fi:
Node IpAddress: [192.168.95.6] Scope Id: []

    NetBIOS Local Name Table

    Name                Type                Status
    -----
    ANJALI                <20> UNIQUE          Registered
    ANJALI                <00> UNIQUE          Registered
    WORKGROUP             <00> GROUP           Registered

Local Area Connection* 1:
Node IpAddress: [0.0.0.0] Scope Id: []

    No names in cache

Local Area Connection* 2:
Node IpAddress: [0.0.0.0] Scope Id: []

    No names in cache
```

- v. **Arp** : Displays and modifies entries in the Address Resolution Protocol (ARP) cache. The ARP cache contains one or more tables that are used to store IP addresses and their resolved Ethernet or Token Ring physical addresses. There is a separate table for each Ethernet or Token Ring network adapter installed on your computer. Used without parameters, arp displays help information. The most general parameter is /a, which displays current Arp cache tables for all interfaces.

```
C:\Users\anjali>arp /a

Interface: 192.168.56.1 --- 0xc
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff    static
  224.0.0.22            01-00-5e-00-00-16    static
  224.0.0.251           01-00-5e-00-00-fb    static
  224.0.0.252           01-00-5e-00-00-fc    static
  239.255.255.250       01-00-5e-7f-ff-fa    static

Interface: 192.168.95.6 --- 0xd
  Internet Address      Physical Address      Type
  192.168.95.120        8e-42-19-d0-3c-e2    dynamic
  224.0.0.22            01-00-5e-00-00-16    static
  224.0.0.251           01-00-5e-00-00-fb    static
  224.0.0.252           01-00-5e-00-00-fc    static
  239.255.255.250       01-00-5e-7f-ff-fa    static
  255.255.255.255       ff-ff-ff-ff-ff-ff    static
```