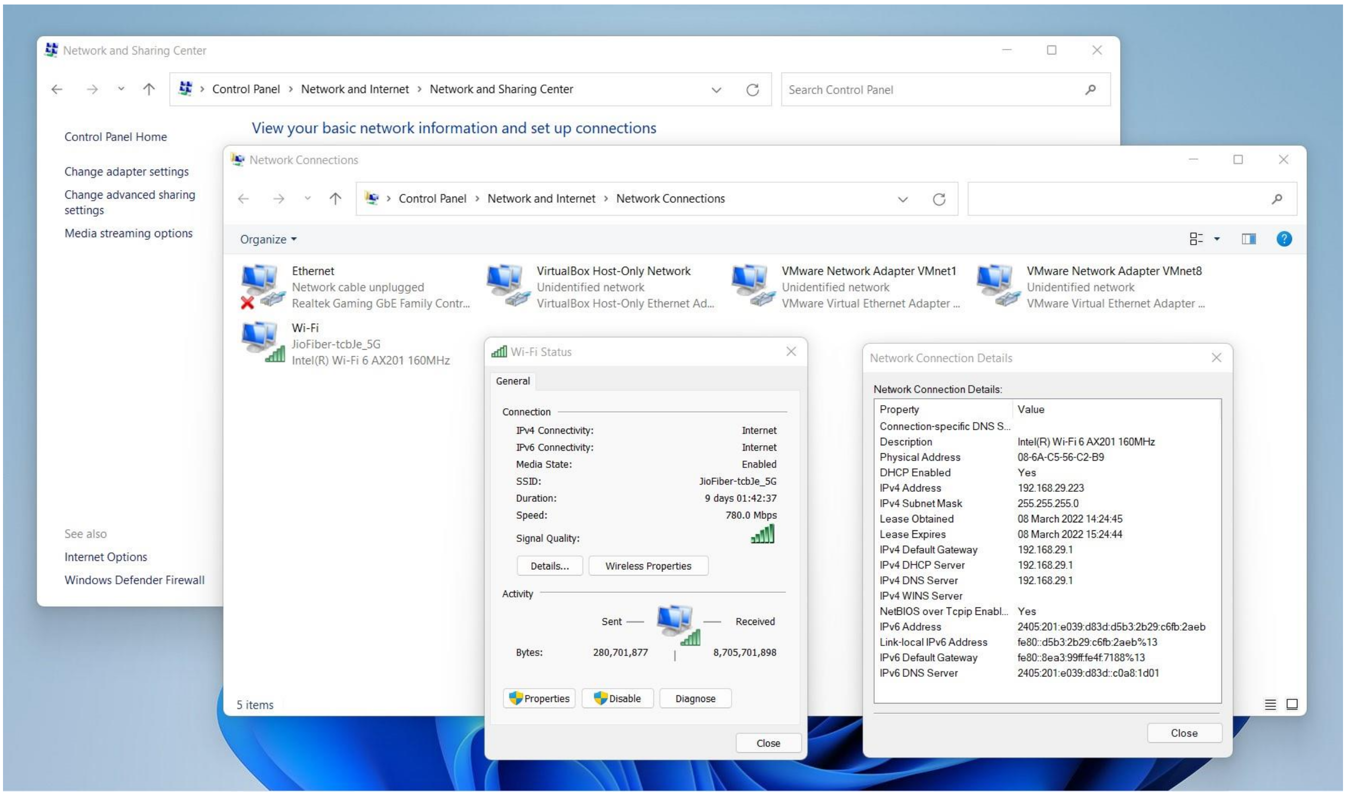
20CYS114 - Cyber Security Essentials Labs

Lab 1 - Computer Network Fundamentals

Task 1: Find the status of your Active network.

Steps followed: Go to Control Panel-> Network and Internet Settings -> View Network Status and Tasks -> Change Adapter Settings -> Right Click on your adapter (Either ethernet or Wi-Fi) -> Click status -> Click Details.

Output:


Network and Sharing Center
Control Panel › Network and Internet › Network and Sharing Center
Search Control Panel
View your basic network information and set up connections
Control Panel Home
Change adapter settings
Change advanced sharing settings
Media streaming options
See also
Internet Options
Windows Defender Firewall
Network Connections
Control Panel › Network and Internet › Network Connections
Organize ▾
5 items

Ethernet
Network cable unplugged
Realtek Gaming GbE Family Contr...

VirtualBox Host-Only Network
Unidentified network
VirtualBox Host-Only Ethernet Ad...

VMware Network Adapter VMnet1
Unidentified network
VMware Virtual Ethernet Adapter ...

VMware Network Adapter VMnet8
Unidentified network
VMware Virtual Ethernet Adapter ...

Wi-Fi
JioFiber-tcbJe_5G
Intel(R) Wi-Fi 6 AX201 160MHz

Wi-Fi Status

General

Connection

```
IPv4 Connectivity:                    Internet
IPv6 Connectivity:                    Internet
Media State:                           Enabled
SSID:                          JioFiber-tcbJe_5G
Duration:                     9 days 01:42:37
Speed:                             780.0 Mbps
Signal Quality:
```

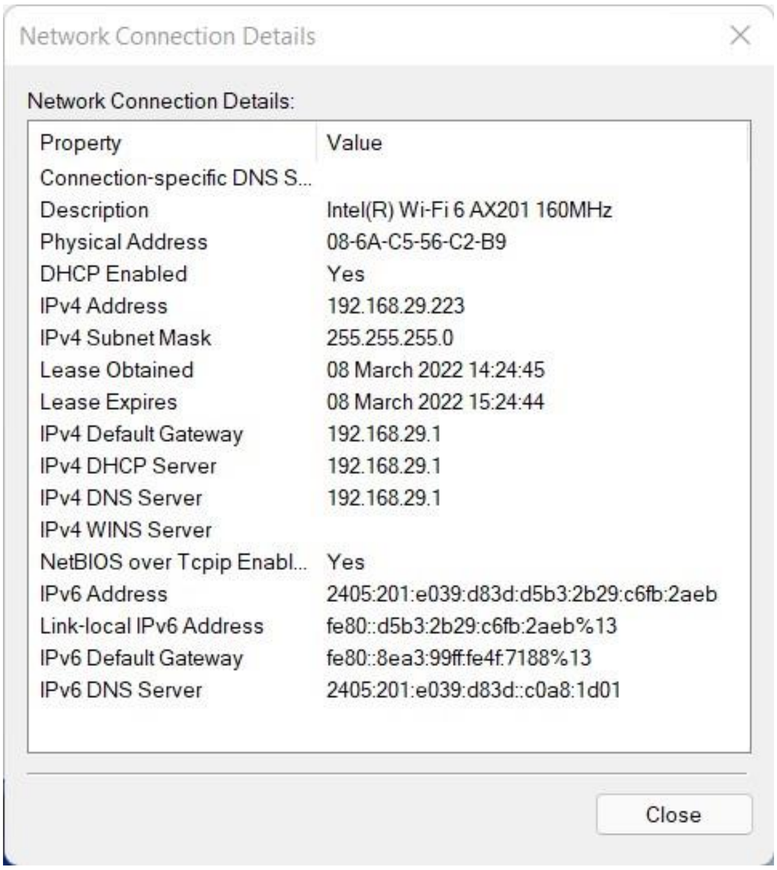
Activity

```
                 Sent  —        —  Received
Bytes:    280,701,877    |    8,705,701,898
```

Network Connection Details

Network Connection Details:

Property	Value
Connection-specific DNS S...	
Description	Intel(R) Wi-Fi 6 AX201 160MHz
Physical Address	08-6A-C5-56-C2-B9
DHCP Enabled	Yes
IPv4 Address	192.168.29.223
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	08 March 2022 14:24:45
Lease Expires	08 March 2022 15:24:44
IPv4 Default Gateway	192.168.29.1
IPv4 DHCP Server	192.168.29.1
IPv4 DNS Server	192.168.29.1
IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb
Link-local IPv6 Address	fe80::d5b3:2b29:c6fb:2aeb%13
IPv6 Default Gateway	fe80::8ea3:99ff:fe4f:7188%13
IPv6 DNS Server	2405:201:e039:d83d::c0a8:1d01



Network Connection Details:

Property	Value
Connection-specific DNS S...	
Description	Intel(R) Wi-Fi 6 AX201 160MHz
Physical Address	08-6A-C5-56-C2-B9
DHCP Enabled	Yes
IPv4 Address	192.168.29.223
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	08 March 2022 14:24:45
Lease Expires	08 March 2022 15:24:44
IPv4 Default Gateway	192.168.29.1
IPv4 DHCP Server	192.168.29.1
IPv4 DNS Server	192.168.29.1
IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb
Link-local IPv6 Address	fe80::d5b3:2b29:c6fb:2aeb%13
IPv6 Default Gateway	fe80::8ea3:99ff:fe4f:7188%13
IPv6 DNS Server	2405:201:e039:d83d::c0a8:1d01

<u>Observations:</u>

- The network connection window gives the details about physical address, IPv4 and IPv6 address, lease obtained and lease expired, its network type and its availability in the current windows system.

- The physical address, also known as the link address, is the address of a node as defined by its LAN or WAN.

- When you enable DHCP, it means you allow DHCP server to automatically assign IP address for your device, so you don't need to manually type the IP address and DNS for your computer from time to time.

- The IPv4 address is a 32-bit number that uniquely identifies a network interface on a machine.

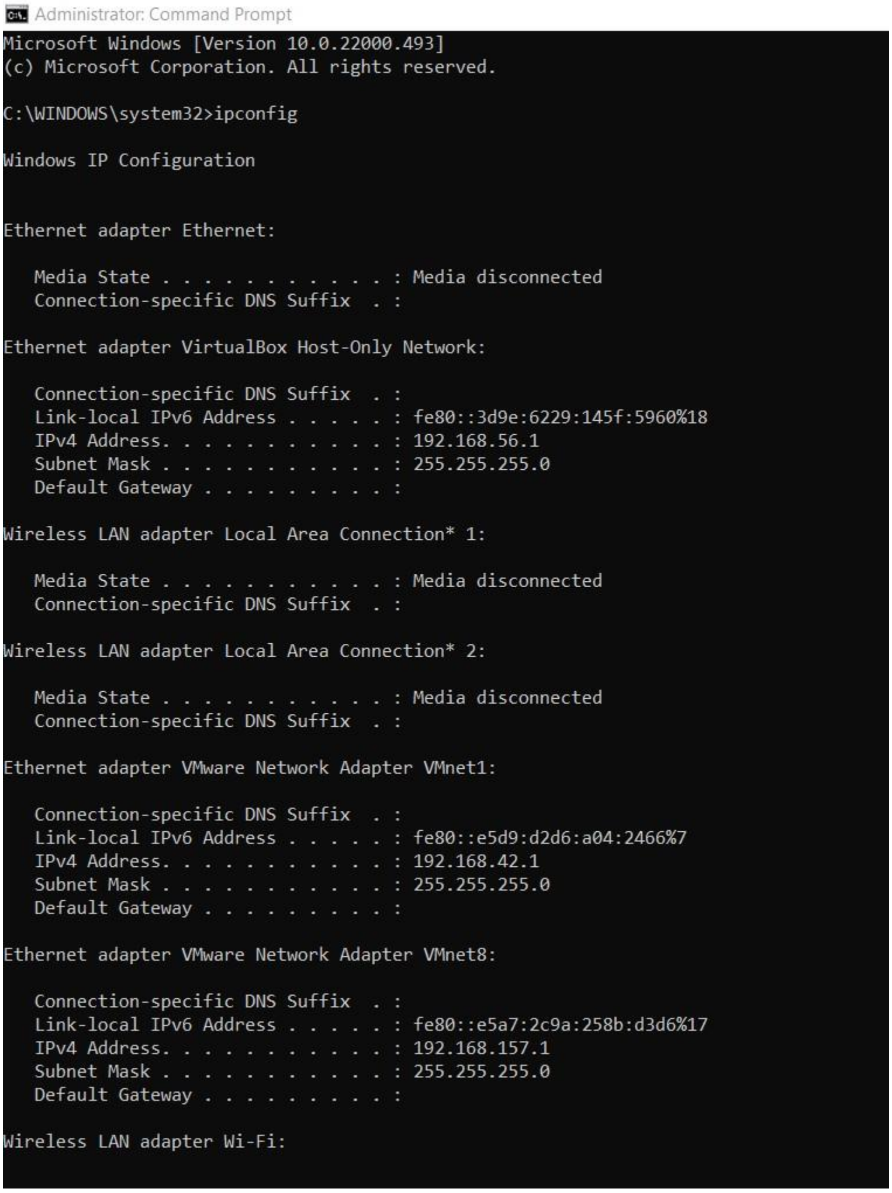
- IPv6 (Internet Protocol version 6) is the sixth revision to the Internet Protocol and the successor to IPv4. It functions similarly to IPv4 in that it provides the unique IP addresses necessary for Internet-enabled devices to communicate.
- Subnet masks (IPv4) and prefixes (IPv6) identify the range of IP addresses that make up a subnet, or group of IP addresses on the same network.

- The lease obtained is simply stating when your computer received it's IP address. The lease expiration is when your computer will renew it's IP address with the DHCP server.

- A default gateway is the node in a computer network using the Internet protocol suite that serves as the forwarding host to other networks when no other route specification matches the destination IP address of a packet.

- Domain Name System is the Internet's system for converting alphabetic names into numeric IP addresses.

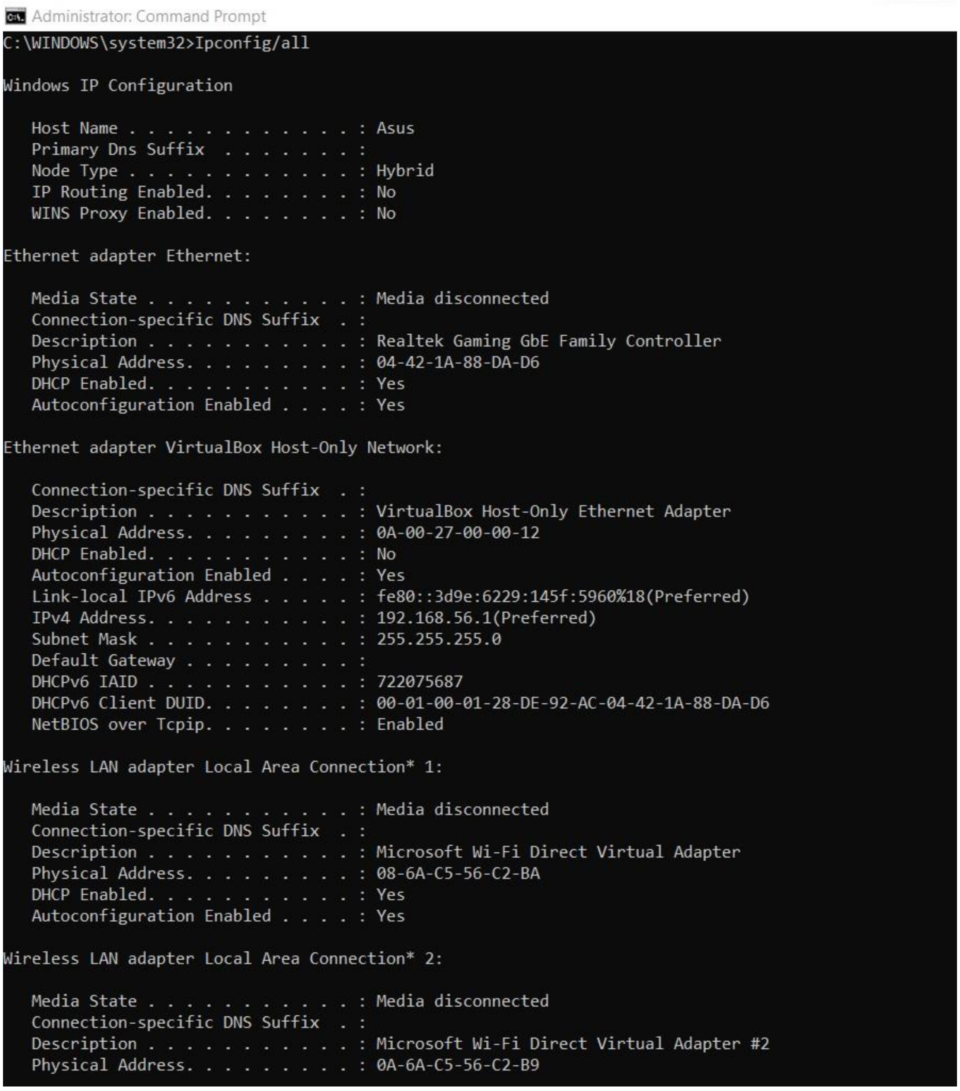
Task 2: Identifying current TCP/IP network configuration values using IPCONFIG



```
Microsoft Windows [Version 10.0.22000.493]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>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::3d9e:6229:145f:5960%18
   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  . :

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e5d9:d2d6:a04:2466%7
   IPv4 Address. . . . . . . . . . . : 192.168.42.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e5a7:2c9a:258b:d3d6%17
   IPv4 Address. . . . . . . . . . . : 192.168.157.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Wi-Fi:
```

This command (ipconfig) allows you to get the IP address information of a Windows computer. It also allows some control over active TCP/IP connections.

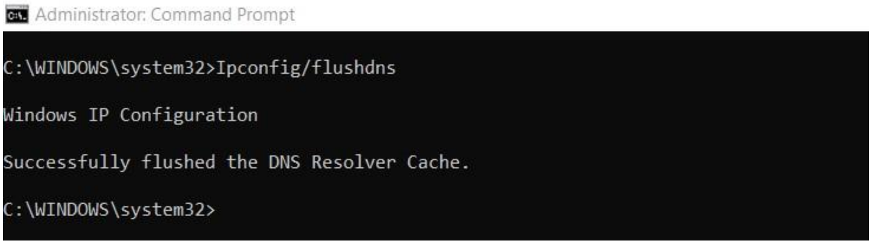
a. Ipconfig/all



```
C:\WINDOWS\system32>Ipconfig/all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : Asus
   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 Gaming GbE Family Controller
   Physical Address. . . . . . . . . : 04-42-1A-88-DA-D6
   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-00-27-00-00-12
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::3d9e:6229:145f:5960%18(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.56.1(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
   DHCPv6 IAID . . . . . . . . . . . : 722075687
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-28-DE-92-AC-04-42-1A-88-DA-D6
   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. . . . . . . . . : 08-6A-C5-56-C2-BA
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes

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. . . . . . . . . : 0A-6A-C5-56-C2-B9
```

The ipconfig /all command displays all configuration information for each adapter bound to TCP/IP.

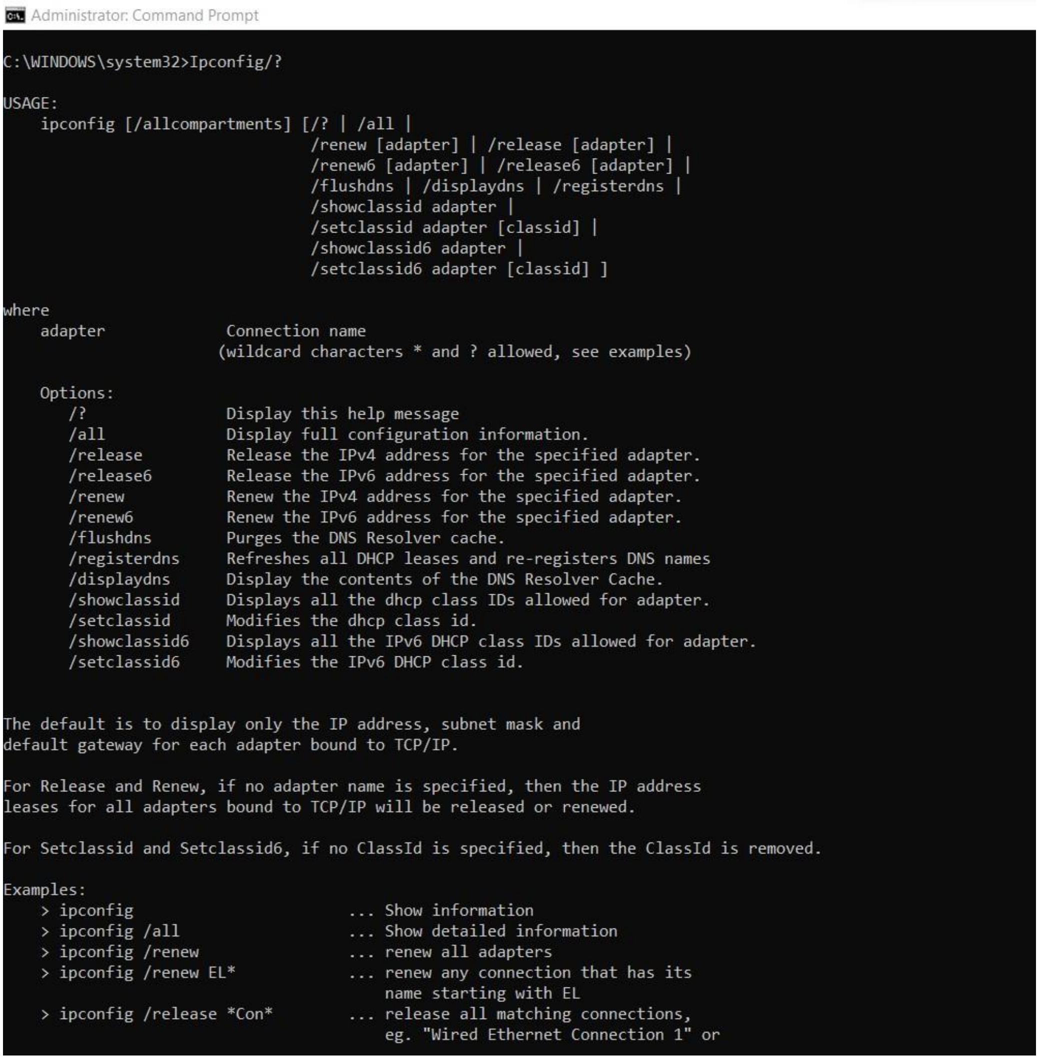
b. Ipconfig/flushdns



```
C:\WINDOWS\system32>Ipconfig/flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\WINDOWS\system32>
```

The ipconfig /flushdns command clears the cache of name to IP entries and reloads them from the connected DNS server.

c. Ipconfig/?

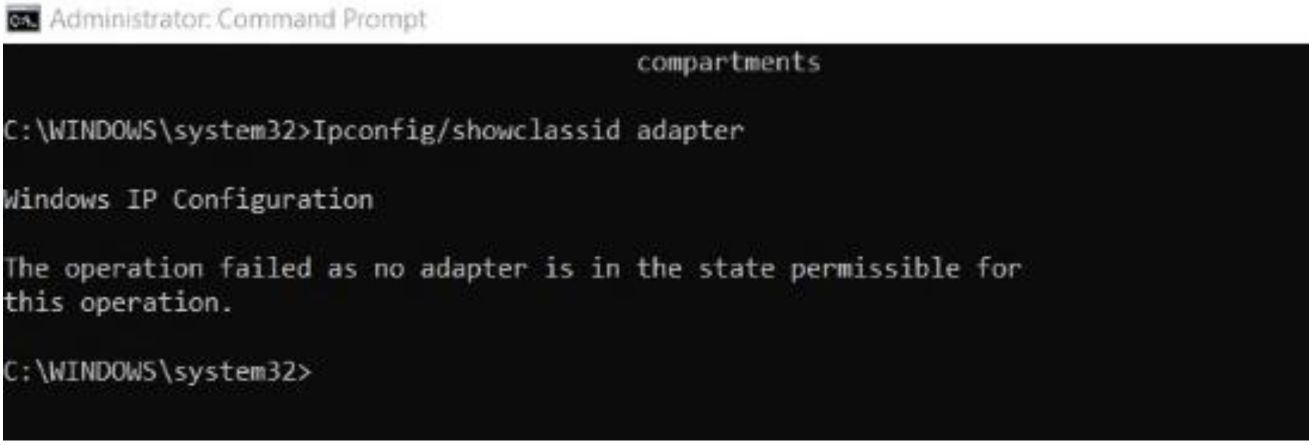


Administrator: Command Prompt

```
C:\WINDOWS\system32>Ipconfig/?

USAGE:
    ipconfig [/allcompartments] [/? | /all |
                                 /renew [adapter] | /release [adapter] |
                                 /renew6 [adapter] | /release6 [adapter] |
                                 /flushdns | /displaydns | /registerdns |
                                 /showclassid adapter |
                                 /setclassid adapter [classid] |
                                 /showclassid6 adapter |
                                 /setclassid6 adapter [classid] ]

where
    adapter             Connection name
                       (wildcard characters * and ? allowed, see examples)

    Options:
       /?               Display this help message
       /all             Display full configuration information.
       /release         Release the IPv4 address for the specified adapter.
       /release6        Release the IPv6 address for the specified adapter.
       /renew           Renew the IPv4 address for the specified adapter.
       /renew6          Renew the IPv6 address for the specified adapter.
       /flushdns        Purges the DNS Resolver cache.
       /registerdns     Refreshes all DHCP leases and re-registers DNS names
       /displaydns      Display the contents of the DNS Resolver Cache.
       /showclassid     Displays all the dhcp class IDs allowed for adapter.
       /setclassid      Modifies the dhcp class id.
       /showclassid6    Displays all the IPv6 DHCP class IDs allowed for adapter.
       /setclassid6     Modifies the IPv6 DHCP class id.


The default is to display only the IP address, subnet mask and
default gateway for each adapter bound to TCP/IP.

For Release and Renew, if no adapter name is specified, then the IP address
leases for all adapters bound to TCP/IP will be released or renewed.

For Setclassid and Setclassid6, if no ClassId is specified, then the ClassId is removed.

Examples:
    > ipconfig                       ... Show information
    > ipconfig /all                  ... Show detailed information
    > ipconfig /renew                ... renew all adapters
    > ipconfig /renew EL*            ... renew any connection that has its
                                         name starting with EL
    > ipconfig /release *Con*        ... release all matching connections,
                                         eg. "Wired Ethernet Connection 1" or
```

The ipconfig/? command shows the small description of the ipconfig command with all of it’s arguments.

d. Ipconfig/showclassid adapter



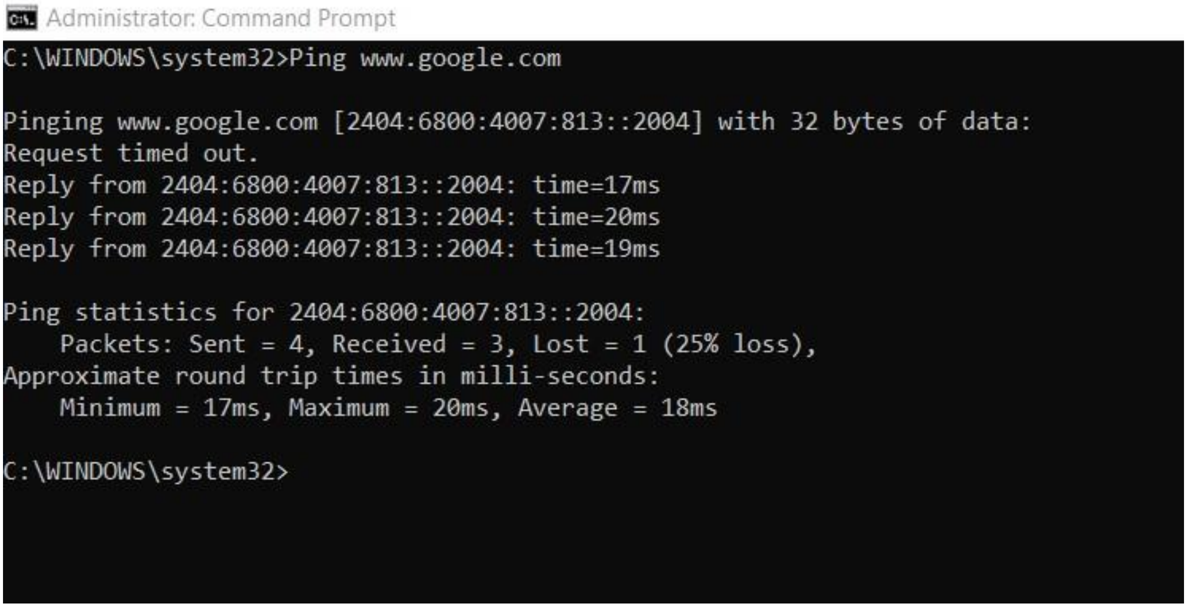
Administrator: Command Prompt

```
                                                     compartments

C:\WINDOWS\system32>Ipconfig/showclassid adapter

Windows IP Configuration

The operation failed as no adapter is in the state permissible for
this operation.

C:\WINDOWS\system32>
```

The ipconfig/showclassid adapter command displays the DHCP class IDs allowed for the current adapter, as my current adapter is not state permissible this action has failed.

Task 3: Test the reachability of a host on an Internet using PING

a. Ping www.google.com

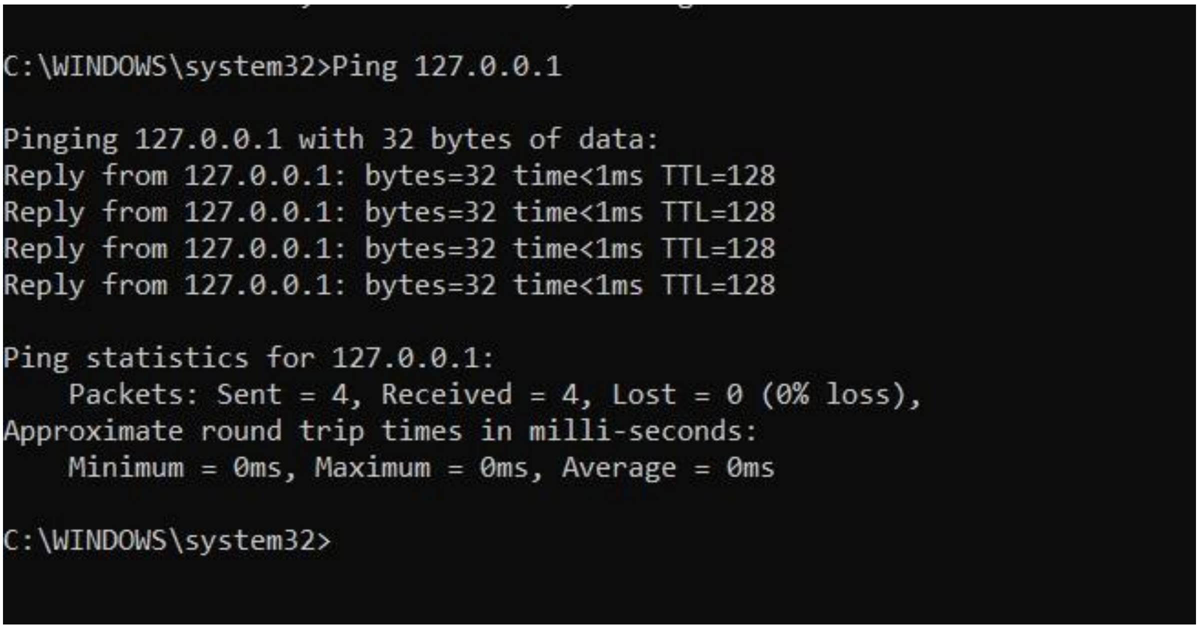


Administrator: Command Prompt

```
C:\WINDOWS\system32>Ping www.google.com

Pinging www.google.com [2404:6800:4007:813::2004] with 32 bytes of data:
Request timed out.
Reply from 2404:6800:4007:813::2004: time=17ms
Reply from 2404:6800:4007:813::2004: time=20ms
Reply from 2404:6800:4007:813::2004: time=19ms

Ping statistics for 2404:6800:4007:813::2004:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 17ms, Maximum = 20ms, Average = 18ms

C:\WINDOWS\system32>
```

The ping command is used to test if you can reach your target and how much time it will take to do it. When you use this command, you will send few echo requests, usually 4. Then you will receive a result for each of them, that indicates if they were successful, how much data was received, the time it took for the response and TTL (Time to live).

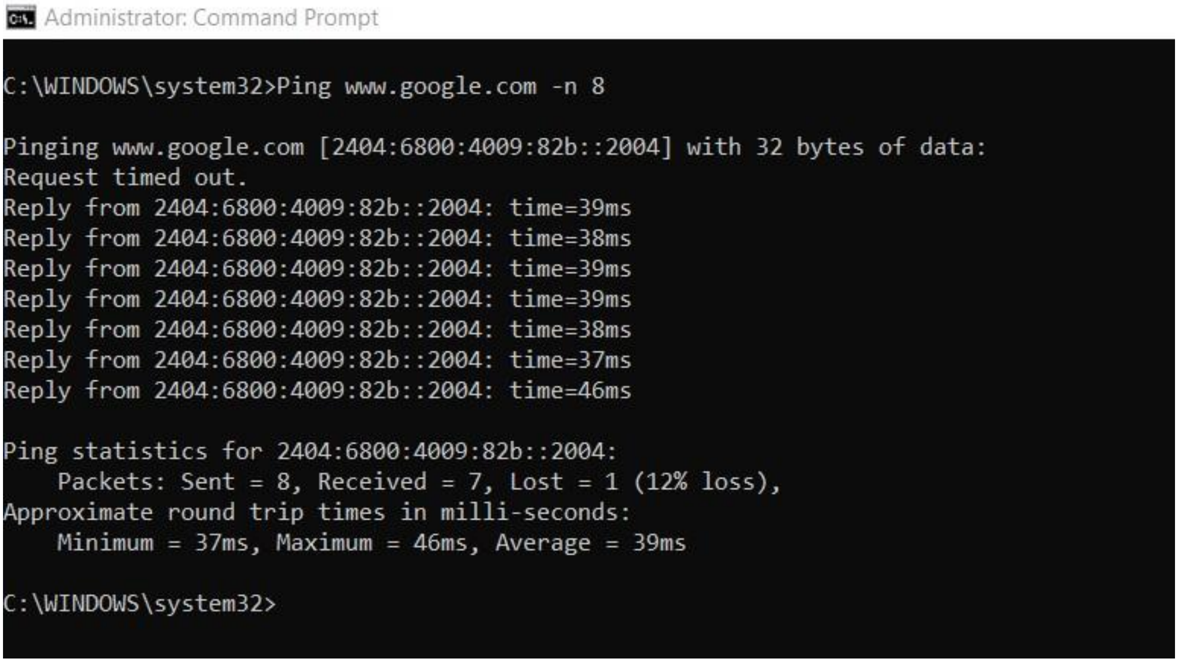
b. Ping 127.0.0.1



```
C:\WINDOWS\system32>Ping 127.0.0.1

Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\WINDOWS\system32>
```

The ping command pings the given 127.0.0.1 and sends packets of data to which we get replies from the machine with that IP address, with the important information about the packet loss and the minimum and maximum time taken by that packet.

c. Ping www.google.com -n 8

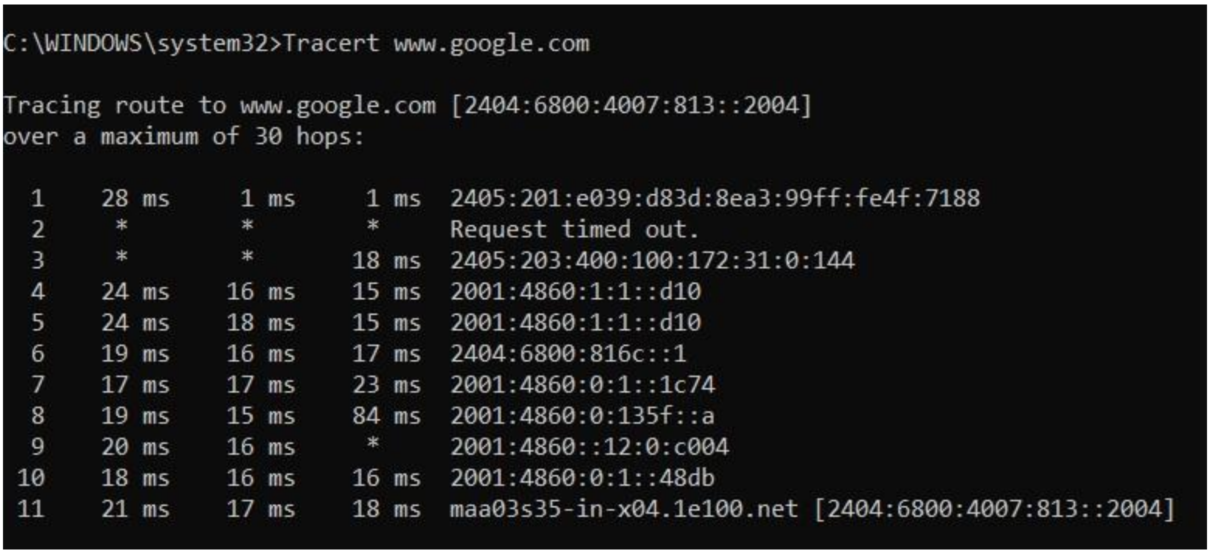


```
C:\WINDOWS\system32>Ping www.google.com -n 8

Pinging www.google.com [2404:6800:4009:82b::2004] with 32 bytes of data:
Request timed out.
Reply from 2404:6800:4009:82b::2004: time=39ms
Reply from 2404:6800:4009:82b::2004: time=38ms
Reply from 2404:6800:4009:82b::2004: time=39ms
Reply from 2404:6800:4009:82b::2004: time=39ms
Reply from 2404:6800:4009:82b::2004: time=38ms
Reply from 2404:6800:4009:82b::2004: time=37ms
Reply from 2404:6800:4009:82b::2004: time=46ms

Ping statistics for 2404:6800:4009:82b::2004:
    Packets: Sent = 8, Received = 7, Lost = 1 (12% loss),
Approximate round trip times in milli-seconds:
    Minimum = 37ms, Maximum = 46ms, Average = 39ms

C:\WINDOWS\system32>
```

This ping command differs from the first subdivision (a. Ping www.google.com) as now the number of packets sent are controlled by the -n parameter, which here is 8 packets

Task 4: Diagnostic analysis of network using TRACERT

a. Tracert www.google.com

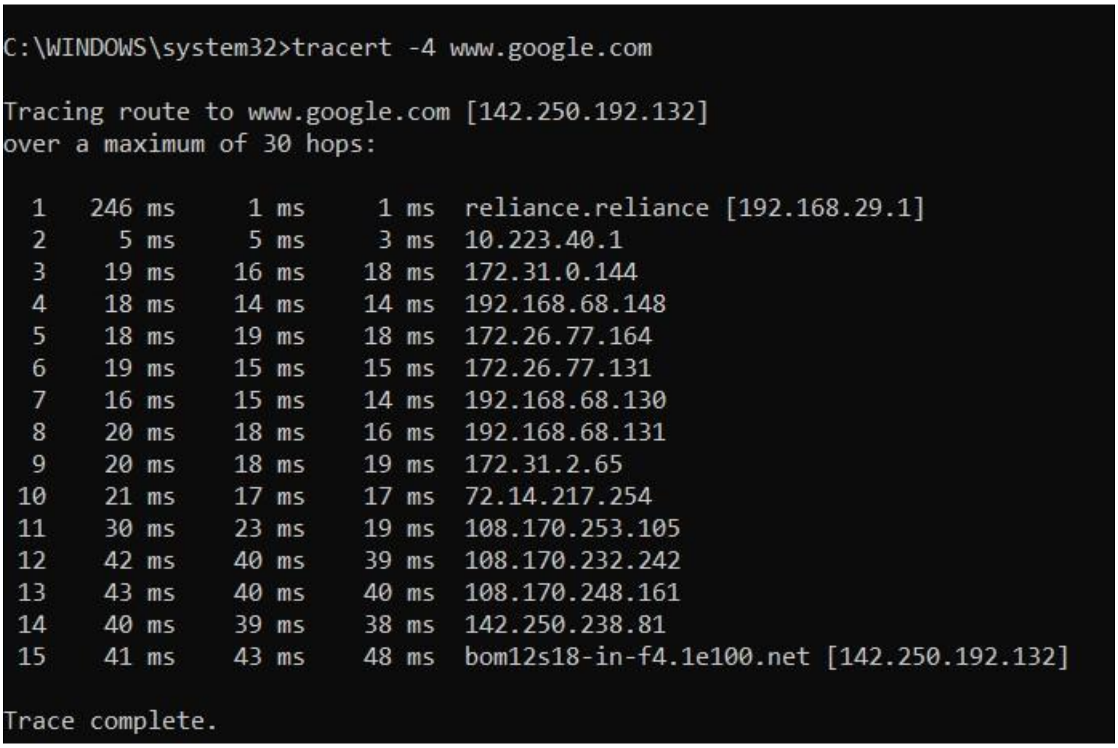


```
C:\WINDOWS\system32>Tracert www.google.com

Tracing route to www.google.com [2404:6800:4007:813::2004]
over a maximum of 30 hops:

  1    28 ms     1 ms     1 ms  2405:201:e039:d83d:8ea3:99ff:fe4f:7188
  2     *        *        *     Request timed out.
  3     *        *       18 ms  2405:203:400:100:172:31:0:144
  4    24 ms    16 ms    15 ms  2001:4860:1:1::d10
  5    24 ms    18 ms    15 ms  2001:4860:1:1::d10
  6    19 ms    16 ms    17 ms  2404:6800:816c::1
  7    17 ms    17 ms    23 ms  2001:4860:0:1::1c74
  8    19 ms    15 ms    84 ms  2001:4860:0:135f::a
  9    20 ms    16 ms     *     2001:4860::12:0:c004
 10    18 ms    16 ms    16 ms  2001:4860:0:1::48db
 11    21 ms    17 ms    18 ms  maa03s35-in-x04.1e100.net [2404:6800:4007:813::2004]
```

Tracert is a command for displaying possible routes (paths) and measuring transit delays of packets across an Internet Protocol (IP) network.

Here, the command gives the detailed information given above while tracerouting the given www.google.com and has shown the output and tabulates it.

b. Tracert -4 www.google.com

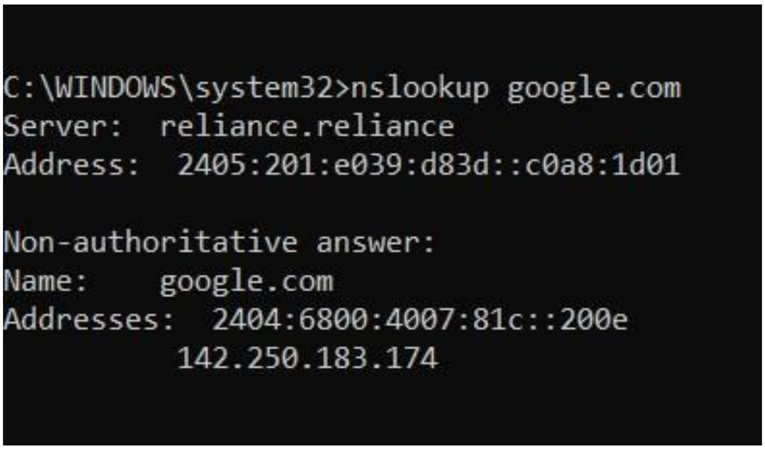


```
C:\WINDOWS\system32>tracert -4 www.google.com

Tracing route to www.google.com [142.250.192.132]
over a maximum of 30 hops:

  1   246 ms     1 ms     1 ms  reliance.reliance [192.168.29.1]
  2     5 ms     5 ms     3 ms  10.223.40.1
  3    19 ms    16 ms    18 ms  172.31.0.144
  4    18 ms    14 ms    14 ms  192.168.68.148
  5    18 ms    19 ms    18 ms  172.26.77.164
  6    19 ms    15 ms    15 ms  172.26.77.131
  7    16 ms    15 ms    14 ms  192.168.68.130
  8    20 ms    18 ms    16 ms  192.168.68.131
  9    20 ms    18 ms    19 ms  172.31.2.65
 10    21 ms    17 ms    17 ms  72.14.217.254
 11    30 ms    23 ms    19 ms  108.170.253.105
 12    42 ms    40 ms    39 ms  108.170.232.242
 13    43 ms    40 ms    40 ms  108.170.248.161
 14    40 ms    39 ms    38 ms  142.250.238.81
 15    41 ms    43 ms    48 ms  bom12s18-in-f4.1e100.net [142.250.192.132]

Trace complete.
```

The tracert orders the packets to use IPV4 address to travel from the local computer to the domain and displaying possible routes (paths) and measuring transit delays of packets across an IP.

Task 5: Diagnostic analysis of Domain Name service using NSLOOKUP

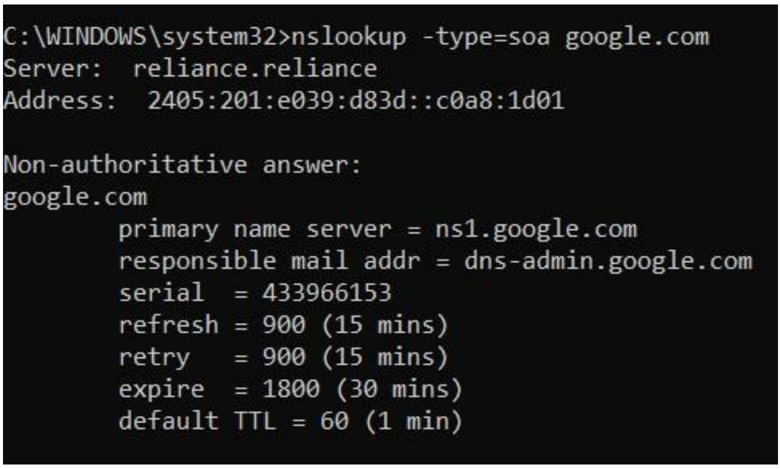
a. nslookup google.com



```
C:\WINDOWS\system32>nslookup google.com
Server:  reliance.reliance
Address:  2405:201:e039:d83d::c0a8:1d01

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4007:81c::200e
          142.250.183.174
```

The nslookup command retrieves the relevant address information directly from the DNS cache of name servers, a process which can be achieved through two different modes that the user can choose from. Here it is google and displays the relevant address information.

b. nslookup -type=soa google.com

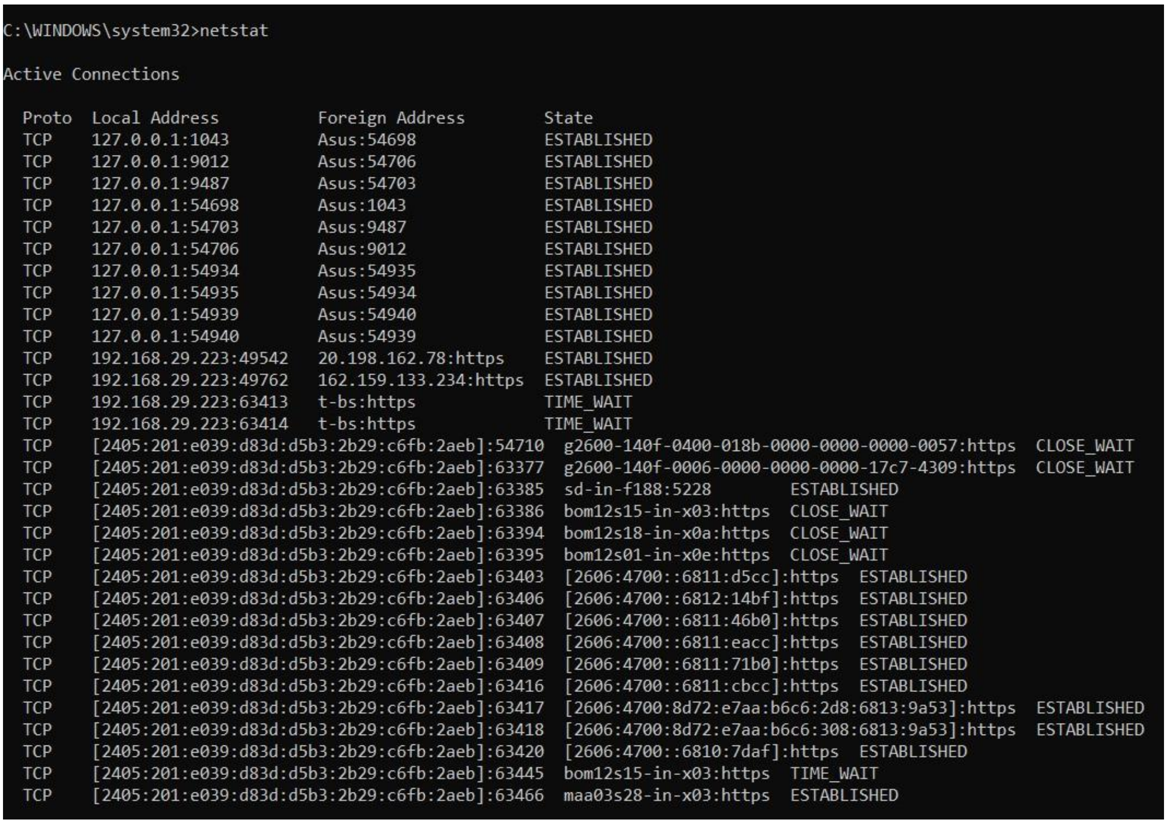


```
C:\WINDOWS\system32>nslookup -type=soa google.com
Server:  reliance.reliance
Address:  2405:201:e039:d83d::c0a8:1d01

Non-authoritative answer:
google.com
        primary name server = ns1.google.com
        responsible mail addr = dns-admin.google.com
        serial  = 433966153
        refresh = 900 (15 mins)
        retry   = 900 (15 mins)
        expire  = 1800 (30 mins)
        default TTL = 60 (1 min)
```

This command queries the DNS server for a resource record of a domain and displays it.

Task 6: Analyzing Network Statistics using NETSTAT, ARP

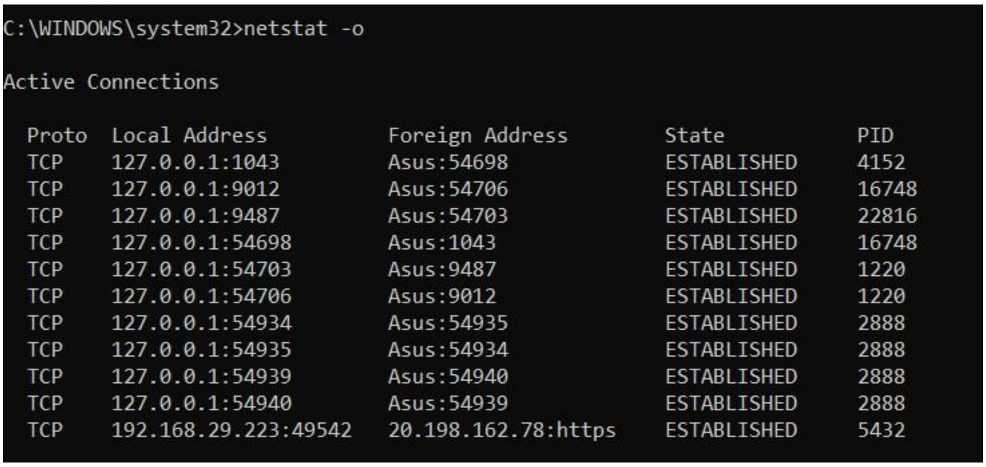
a. Netstat



```
C:\WINDOWS\system32>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:1043         Asus:54698             ESTABLISHED
  TCP    127.0.0.1:9012         Asus:54706             ESTABLISHED
  TCP    127.0.0.1:9487         Asus:54703             ESTABLISHED
  TCP    127.0.0.1:54698        Asus:1043              ESTABLISHED
  TCP    127.0.0.1:54703        Asus:9487              ESTABLISHED
  TCP    127.0.0.1:54706        Asus:9012              ESTABLISHED
  TCP    127.0.0.1:54934        Asus:54935             ESTABLISHED
  TCP    127.0.0.1:54935        Asus:54934             ESTABLISHED
  TCP    127.0.0.1:54939        Asus:54940             ESTABLISHED
  TCP    127.0.0.1:54940        Asus:54939             ESTABLISHED
  TCP    192.168.29.223:49542   20.198.162.78:https    ESTABLISHED
  TCP    192.168.29.223:49762   162.159.133.234:https  ESTABLISHED
  TCP    192.168.29.223:63413   t-bs:https             TIME_WAIT
  TCP    192.168.29.223:63414   t-bs:https             TIME_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:54710  g2600-140f-0400-018b-0000-0000-0000-0057:https  CLOSE_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63377  g2600-140f-0006-0000-0000-0000-17c7-4309:https  CLOSE_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63385  sd-in-f188:5228        ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63386  bom12s15-in-x03:https  CLOSE_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63394  bom12s18-in-x0a:https  CLOSE_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63395  bom12s01-in-x0e:https  CLOSE_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63403  [2606:4700::6811:d5cc]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63406  [2606:4700::6812:14bf]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63407  [2606:4700::6811:46b0]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63408  [2606:4700::6811:eacc]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63409  [2606:4700::6811:71b0]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63416  [2606:4700::6811:cbcc]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63417  [2606:4700:8d72:e7aa:b6c6:2d8:6813:9a53]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63418  [2606:4700:8d72:e7aa:b6c6:308:6813:9a53]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63420  [2606:4700::6810:7daf]:https  ESTABLISHED
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63445  bom12s15-in-x03:https  TIME_WAIT
  TCP    [2405:201:e039:d83d:d5b3:2b29:c6fb:2aeb]:63466  maa03s28-in-x03:https  ESTABLISHED
```

The netstat command delivers basic statistics on all network activities and informs users on which ports and addresses the corresponding connections (TCP, UDP) are running and which ports are open for tasks.

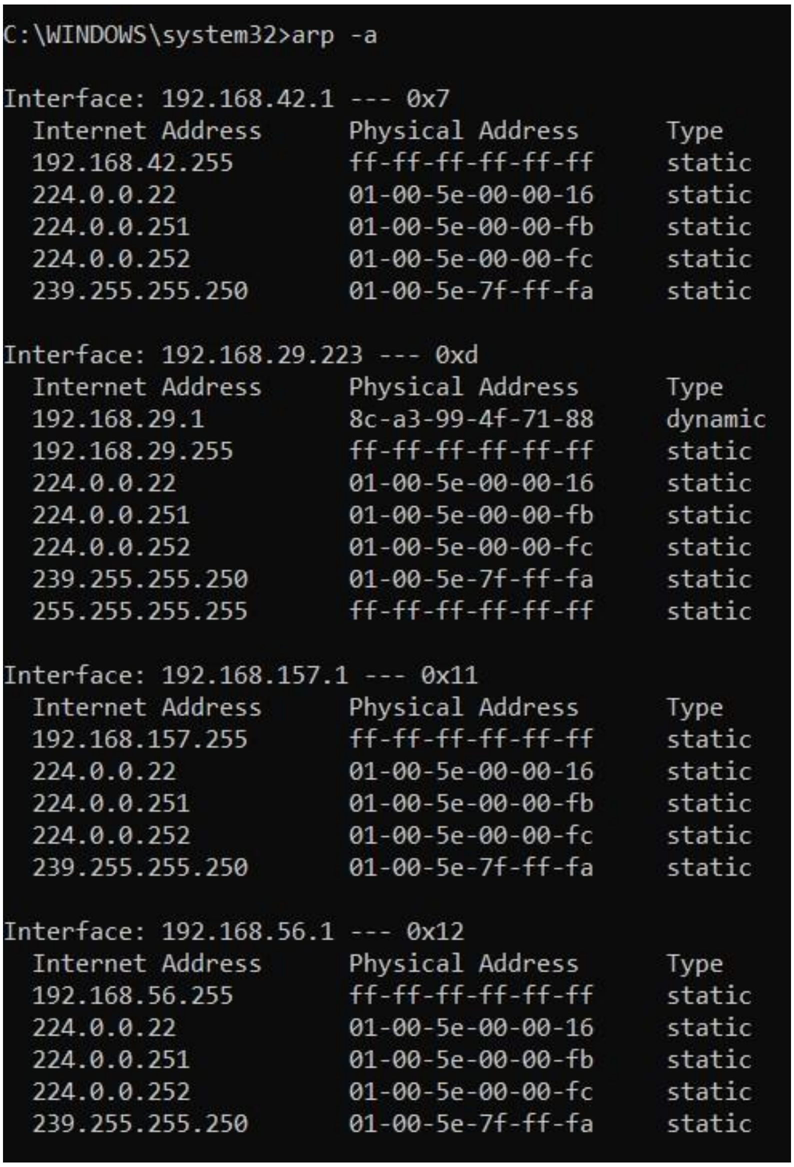
b. Netstat –o



```
C:\WINDOWS\system32>netstat -o

Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    127.0.0.1:1043         Asus:54698             ESTABLISHED     4152
  TCP    127.0.0.1:9012         Asus:54706             ESTABLISHED     16748
  TCP    127.0.0.1:9487         Asus:54703             ESTABLISHED     22816
  TCP    127.0.0.1:54698        Asus:1043              ESTABLISHED     16748
  TCP    127.0.0.1:54703        Asus:9487              ESTABLISHED     1220
  TCP    127.0.0.1:54706        Asus:9012              ESTABLISHED     1220
  TCP    127.0.0.1:54934        Asus:54935             ESTABLISHED     2888
  TCP    127.0.0.1:54935        Asus:54934             ESTABLISHED     2888
  TCP    127.0.0.1:54939        Asus:54940             ESTABLISHED     2888
  TCP    127.0.0.1:54940        Asus:54939             ESTABLISHED     2888
  TCP    192.168.29.223:49542   20.198.162.78:https    ESTABLISHED     5432
```

This command displays information same as netstat along with the process identifier (PID) associated with each displayed connection.

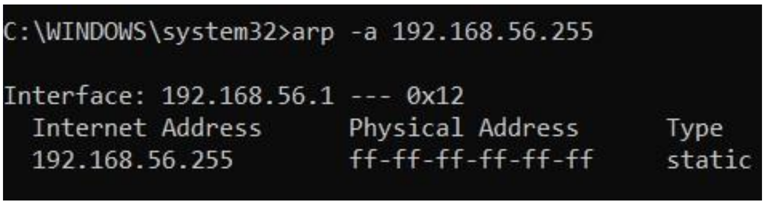
c. Arp –a



```
C:\WINDOWS\system32>arp -a

Interface: 192.168.42.1 --- 0x7
  Internet Address      Physical Address      Type
  192.168.42.255        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: 192.168.29.223 --- 0xd
  Internet Address      Physical Address      Type
  192.168.29.1          8c-a3-99-4f-71-88     dynamic
  192.168.29.255        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
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.157.1 --- 0x11
  Internet Address      Physical Address      Type
  192.168.157.255       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: 192.168.56.1 --- 0x12
  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
```

The arp command displays the internet to adapter address translation tables used by the address in networking, the -a parameter makes it display all the entries of the ARP table.

d. arp –a IP Address



```
C:\WINDOWS\system32>arp -a 192.168.56.255

Interface: 192.168.56.1 --- 0x12
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff     static
```

The arp command displays the internet to adapter address translation tables used by the address in networking , the -a parameter makes it display all the entries of the ARP table along with its physical address and it’s type.