Computer Network (01CE0410)

Lab Manual (2024-25)

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Practical 3: Demonstrate basic networking commands and Network configuration commands.

1. **ipconfig – Displays basic IP configuration details of the system's network adapters.**

```
Command Prompt

Microsoft Windows [Version 10.0.19045.4598]
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Z:\>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet 2:

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

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::78d6:53f4:8389:46ee%14
   IPv4 Address. . . . . . . . . . . : 172.21.31.130
   Subnet Mask . . . . . . . . . . . : 255.255.254.0
   Default Gateway . . . . . . . . . : 192.168.16.3

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3161:aa1c:18f:4bd7%16
   IPv4 Address. . . . . . . . . . . : 192.168.209.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::2602:103:6ce5:ef9e%13
   IPv4 Address. . . . . . . . . . . : 192.168.223.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Z:\>_
```

2. ipconfig /all – Shows detailed information about all network interfaces, including MAC addresses and DNS servers.
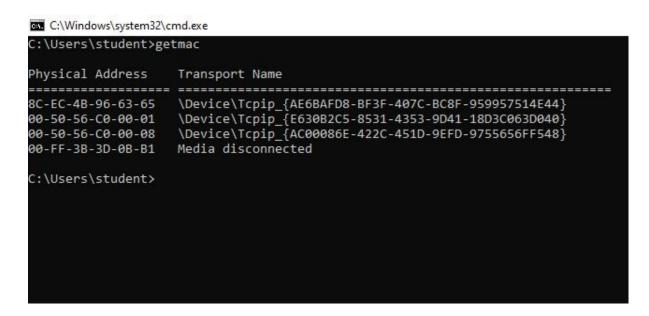
```
C:\Windows\system32\cmd.exe

C:\Users\student>ipconfig/all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : MC220-CL141
   Primary Dns Suffix  . . . . . . . : mefgi.com
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : mefgi.com

Ethernet adapter Ethernet 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Sophos TAP Adapter
   Physical Address. . . . . . . . . : 00-FF-3B-3D-0B-B1
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GbE Family Controller
   Physical Address. . . . . . . . . : 8C-EC-4B-96-63-65
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::5649:3dcc:cfa6:9a23%14(Preferred)
   IPv4 Address. . . . . . . . . . . : 172.21.31.141(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.254.0
   Default Gateway . . . . . . . . . : 192.168.16.3
   DHCPv6 IAID . . . . . . . . . . . : 227339339
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2E-11-8B-28-8C-EC-4B-96-63-65
   DNS Servers . . . . . . . . . . . : 192.168.12.101
                                       192.168.12.201
                                       192.168.12.203
                                       119.160.192.2
                                       119.160.192.3
   NetBIOS over Tcpip. . . . . . . . : Enabled

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet1
   Physical Address. . . . . . . . . : 00-50-56-C0-00-01
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::3161:aa1c:18f:4bd7%16(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.209.1(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : 27 January 2025 13:24:32
```

```
C:\Windows\system32\cmd.exe
   NetBIOS over Tcpip. . . . . . . . : Enabled

Ethernet adapter VMware Network Adapter VMnet1:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet1
   Physical Address. . . . . . . . . : 00-50-56-C0-00-01
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::3161:aa1c:18f:4bd7%16(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.209.1(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : 27 January 2025 13:24:32
   Lease Expires . . . . . . . . . . : 27 January 2025 14:09:24
   Default Gateway . . . . . . . . . :
   DHCP Server . . . . . . . . . . . : 192.168.209.254
   DHCPv6 IAID . . . . . . . . . . . : 469782614
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2E-11-8B-28-8C-EC-4B-96-63-65
   DNS Servers . . . . . . . . . . . : fec0:0:0:ffff::1%1
                                       fec0:0:0:ffff::2%1
                                       fec0:0:0:ffff::3%1
   NetBIOS over Tcpip. . . . . . . . : Enabled

Ethernet adapter VMware Network Adapter VMnet8:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet8
   Physical Address. . . . . . . . . : 00-50-56-C0-00-08
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::2602:103:6ce5:ef9e%13(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.223.1(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : 27 January 2025 13:24:24
   Lease Expires . . . . . . . . . . : 27 January 2025 14:09:23
   Default Gateway . . . . . . . . . :
   DHCP Server . . . . . . . . . . . : 192.168.223.254
   DHCPv6 IAID . . . . . . . . . . . : 503337046
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2E-11-8B-28-8C-EC-4B-96-63-65
   DNS Servers . . . . . . . . . . . : fec0:0:0:ffff::1%1
                                       fec0:0:0:ffff::2%1
                                       fec0:0:0:ffff::3%1
   Primary WINS Server . . . . . . . : 192.168.223.2
   NetBIOS over Tcpip. . . . . . . . : Enabled

C:\Users\student>
```

3. **hostname – Displays the computer's hostname (system name) on the network.**

```
Z:\>hostname
MC221-CL130

Z:\>
```

4. **getmac – Displays the MAC address of the network interfaces on the system.**

```
C:\Windows\system32\cmd.exe
C:\Users\student>getmac

Physical Address     Transport Name
==================   ========================================================
8C-EC-4B-96-63-65    \Device\Tcpip_{AE6BAFD8-BF3F-407C-BC8F-959957514E44}
00-50-56-C0-00-01    \Device\Tcpip_{E630B2C5-8531-4353-9D41-18D3C063D040}
00-50-56-C0-00-08    \Device\Tcpip_{AC00086E-422C-451D-9EFD-9755656FF548}
00-FF-3B-3D-0B-B1    Media disconnected

C:\Users\student>
```

5.systeminfo – Provides detailed information about the system configuration, including OS, memory, and network adapter info.

6.ping – Sends an ICMP echo request to check connectivity to a remote host.

```
Z:\>ping www.google.com

Pinging www.google.com [142.250.192.4] with 32 bytes of data:
Reply from 142.250.192.4: bytes=32 time=16ms TTL=58
Reply from 142.250.192.4: bytes=32 time=15ms TTL=58
Reply from 142.250.192.4: bytes=32 time=16ms TTL=58
Reply from 142.250.192.4: bytes=32 time=15ms TTL=58

Ping statistics for 142.250.192.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 15ms, Maximum = 16ms, Average = 15ms
```

7. ping {ip addr} – Pings a specific IP address to test connectivity to that address.

```
Z:\>ping 142.250.192.4

Pinging 142.250.192.4 with 32 bytes of data:
Reply from 142.250.192.4: bytes=32 time=16ms TTL=58
Reply from 142.250.192.4: bytes=32 time=16ms TTL=58
Reply from 142.250.192.4: bytes=32 time=15ms TTL=58
Reply from 142.250.192.4: bytes=32 time=15ms TTL=58

Ping statistics for 142.250.192.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 15ms, Maximum = 16ms, Average = 15ms
```

8. tracert – Traces the route packets take to reach a destination, showing the hops along the way.

```
C:\Users\student>tracert www.google.com

Tracing route to www.google.com [142.250.192.4]
over a maximum of 30 hops:

  1      6 ms      7 ms      5 ms  172.21.30.1
  2     <1 ms     <1 ms     <1 ms  192.168.15.91
  3      1 ms     <1 ms     <1 ms  119.160.199.81
  4      2 ms      2 ms      1 ms  10.50.79.1
  5     15 ms     15 ms     15 ms  10.250.10.205
  6     16 ms     16 ms     16 ms  72.14.202.41
  7     17 ms     15 ms     22 ms  74.125.37.7
  8     15 ms     15 ms     15 ms  108.170.231.79
  9     14 ms     14 ms     14 ms  bom12s14-in-f4.1e100.net [142.250.192.4]

Trace complete.
```

9. route print – Displays the routing table, showing routes and associated network interfaces.

```
Z:\>route print
===========================================================================
Interface List
  8...00 ff 5f 73 0d 0c ......Sophos TAP Adapter
 14...8c ec 4b 96 88 2a ......Realtek PCIe GbE Family Controller
 16...00 50 56 c0 00 01 ......VMware Virtual Ethernet Adapter for VMnet1
 13...00 50 56 c0 00 08 ......VMware Virtual Ethernet Adapter for VMnet8
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0     192.168.16.3    172.21.31.130    281
        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
       172.21.30.0    255.255.254.0         On-link     172.21.31.130    281
     172.21.31.130  255.255.255.255         On-link     172.21.31.130    281
     172.21.31.255  255.255.255.255         On-link     172.21.31.130    281
     192.168.209.0    255.255.255.0         On-link     192.168.209.1    291
     192.168.209.1  255.255.255.255         On-link     192.168.209.1    291
   192.168.209.255  255.255.255.255         On-link     192.168.209.1    291
     192.168.223.0    255.255.255.0         On-link     192.168.223.1    291
     192.168.223.1  255.255.255.255         On-link     192.168.223.1    291
   192.168.223.255  255.255.255.255         On-link     192.168.223.1    291
         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     192.168.209.1    291
         224.0.0.0        240.0.0.0         On-link     192.168.223.1    291
         224.0.0.0        240.0.0.0         On-link     172.21.31.130    281
   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     192.168.209.1    291
   255.255.255.255  255.255.255.255         On-link     192.168.223.1    291
   255.255.255.255  255.255.255.255         On-link     172.21.31.130    281
===========================================================================
Persistent Routes:
  Network Address          Netmask  Gateway Address  Metric
          0.0.0.0          0.0.0.0     192.168.16.3  Default
===========================================================================

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
 16    291 fe80::/64                On-link
 13    291 fe80::/64                On-link
 14    281 fe80::/64                On-link
```

10. pathping – Combines the functionality of ping and tracert, providing packet loss and latency information at each hop.

```
Z:\>pathping www.google.com

Tracing route to www.google.com [142.250.192.4]
over a maximum of 30 hops:
  0  MC221-CL130.mefgi.com [172.21.31.130]
  1  172.21.30.1
  2  192.168.15.91
  3  119.160.199.81
  4  10.50.79.1
  5  10.250.10.205
  6  72.14.202.41
  7  74.125.37.7
  8  108.170.231.79
  9  bom12s14-in-f4.1e100.net [142.250.192.4]

Computing statistics for 225 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                            MC221-CL130.mefgi.com [172.21.31.130]
                                 0/ 100 =  0%   |
  1    8ms     0/ 100 =  0%     0/ 100 =  0%  172.21.30.1
                                 0/ 100 =  0%   |
  2    0ms     0/ 100 =  0%     0/ 100 =  0%  192.168.15.91
                                 0/ 100 =  0%   |
  3    1ms     0/ 100 =  0%     0/ 100 =  0%  119.160.199.81
                                 0/ 100 =  0%   |
  4    1ms     0/ 100 =  0%     0/ 100 =  0%  10.50.79.1
                                 0/ 100 =  0%   |
  5   14ms     0/ 100 =  0%     0/ 100 =  0%  10.250.10.205
                                 0/ 100 =  0%   |
  6   21ms     0/ 100 =  0%     0/ 100 =  0%  72.14.202.41
                                 0/ 100 =  0%   |
  7   15ms     0/ 100 =  0%     0/ 100 =  0%  74.125.37.7
                                 0/ 100 =  0%   |
  8   15ms     0/ 100 =  0%     0/ 100 =  0%  108.170.231.79
                                 0/ 100 =  0%   |
  9   14ms     0/ 100 =  0%     0/ 100 =  0%  bom12s14-in-f4.1e100.net [142.250.192.4]

Trace complete.
```

11. arp -a – Displays the current ARP (Address Resolution Protocol) table, mapping IP addresses to MAC addresses.

```
Z:\>arp -a

Interface: 192.168.223.1 --- 0xd
  Internet Address      Physical Address      Type
  192.168.223.254       00-50-56-e5-0e-00     dynamic
  192.168.223.255       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: 172.21.31.130 --- 0xe
  Internet Address      Physical Address      Type
  172.21.30.1           00-19-e8-f8-26-4f     dynamic
  172.21.31.69          44-37-e6-e2-81-25     dynamic
  172.21.31.194         8c-ec-4b-96-60-15     dynamic
  172.21.31.199         8c-ec-4b-96-01-aa     dynamic
  172.21.31.204         8c-ec-4b-96-62-3b     dynamic
  172.21.31.255         ff-ff-ff-ff-ff-ff     static
  192.168.16.3          00-19-e8-f8-26-4f     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

Interface: 192.168.209.1 --- 0x10
  Internet Address      Physical Address      Type
  192.168.209.254       00-50-56-e7-4a-9d     dynamic
  192.168.209.255       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
```

12. nslookup – Queries DNS servers to obtain domain name or IP address information.

```
Z:\>nslookup www.google.com
Server:  ADS-PRIMARY101.mefgi.com
Address:  192.168.12.101


Non-authoritative answer:
Name:    www.google.com
Addresses:  2404:6800:4009:827::2004
          142.250.192.4
```

13. netstat – Displays active network connections, listening ports, and routing table.

```
Z:\>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49671        MC221-CL130:49672      ESTABLISHED
  TCP    127.0.0.1:49672        MC221-CL130:49671      ESTABLISHED
  TCP    127.0.0.1:53195        MC221-CL130:53196      ESTABLISHED
  TCP    127.0.0.1:53196        MC221-CL130:53195      ESTABLISHED
  TCP    172.21.31.130:7680     172.21.16.93:51091     TIME_WAIT
  TCP    172.21.31.130:7680     172.21.33.111:58371    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.114:58198    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.118:65424    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.129:49167    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.246:50389    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.251:51804    ESTABLISHED
  TCP    172.21.31.130:53060    ADS-PRIMARY101:microsoft-ds  ESTABLISHED
  TCP    172.21.31.130:57788    20.198.119.84:https    ESTABLISHED
  TCP    172.21.31.130:57909    208.71.185.241:https   CLOSE_WAIT
  TCP    172.21.31.130:57922    a184-29-24-167:https   CLOSE_WAIT
  TCP    172.21.31.130:57930    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57935    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57949    a23-38-59-250:http     CLOSE_WAIT
  TCP    172.21.31.130:57951    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57952    42.106.164.137:https   CLOSE_WAIT
  TCP    172.21.31.130:57953    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57954    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57955    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57956    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57957    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57958    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57959    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57960    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57961    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57962    a104-94-19-83:https    CLOSE_WAIT
  TCP    172.21.31.130:57974    208.71.185.246:https   CLOSE_WAIT
  TCP    172.21.31.130:57977    208.71.185.241:https   CLOSE_WAIT
  TCP    172.21.31.130:57983    13.107.246.48:https    CLOSE_WAIT
  TCP    172.21.31.130:58053    150.171.84.254:https   CLOSE_WAIT
  TCP    172.21.31.130:58315    a23-58-95-138:http     TIME_WAIT
  TCP    172.21.31.130:58317    52.123.128.254:https   ESTABLISHED
  TCP    172.21.31.130:58318    42.106.164.138:https   ESTABLISHED
  TCP    172.21.31.130:58320    ADS-203:epmap          TIME_WAIT
  TCP    172.21.31.130:58321    ADS-203:49675          TIME_WAIT
```
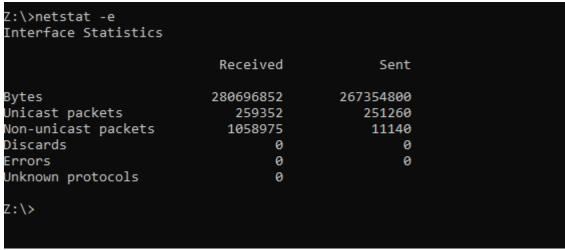
14. netstat -a – Shows all active connections and listening ports.

```
Z:\>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:80             MC221-CL130:0          LISTENING
  TCP    0.0.0.0:135            MC221-CL130:0          LISTENING
  TCP    0.0.0.0:445            MC221-CL130:0          LISTENING
  TCP    0.0.0.0:902            MC221-CL130:0          LISTENING
  TCP    0.0.0.0:912            MC221-CL130:0          LISTENING
  TCP    0.0.0.0:3389           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:5040           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:5560           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:5580           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:5800           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:5900           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:7680           MC221-CL130:0          LISTENING
  TCP    0.0.0.0:39000          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49664          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49665          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49666          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49667          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49668          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49669          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49670          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49673          MC221-CL130:0          LISTENING
  TCP    0.0.0.0:49674          MC221-CL130:0          LISTENING
  TCP    127.0.0.1:4502         MC221-CL130:0          LISTENING
  TCP    127.0.0.1:49671        MC221-CL130:49672      ESTABLISHED
  TCP    127.0.0.1:49672        MC221-CL130:49671      ESTABLISHED
  TCP    127.0.0.1:53195        MC221-CL130:53196      ESTABLISHED
  TCP    127.0.0.1:53196        MC221-CL130:53195      ESTABLISHED
  TCP    127.0.0.1:60110        MC221-CL130:0          LISTENING
  TCP    172.21.31.130:139      MC221-CL130:0          LISTENING
  TCP    172.21.31.130:7680     172.21.33.114:58198    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.118:65424    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.129:49167    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.246:50389    ESTABLISHED
  TCP    172.21.31.130:7680     172.21.33.251:51804    ESTABLISHED
  TCP    172.21.31.130:53060    ADS-PRIMARY101:microsoft-ds  ESTABLISHED
  TCP    172.21.31.130:57788    20.198.119.84:https    ESTABLISHED
  TCP    172.21.31.130:57909    208.71.185.241:https   CLOSE_WAIT
  TCP    172.21.31.130:57922    a184-29-24-167:https   CLOSE_WAIT
  TCP    172.21.31.130:57930    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57935    a23-203-37-111:https   CLOSE_WAIT
  TCP    172.21.31.130:57949    a23-38-59-250:http     CLOSE_WAIT
  TCP    172.21.31.130:57951    a23-203-38-65:https    CLOSE_WAIT
  TCP    172.21.31.130:57952    42.106.164.137:https   CLOSE_WAIT
```

15. netstat -e – Displays Ethernet statistics, such as the number of bytes and packets sent/received.

```
Z:\>netstat -e
Interface Statistics

                          Received            Sent

Bytes                   280696852       267354800
Unicast packets            259352          251260
Non-unicast packets       1058975           11140
Discards                        0               0
Errors                          0               0
Unknown protocols               0

Z:\>
```

16. ipconfig /flushdns – Clears the DNS resolver cache to force fresh DNS lookups.

```
Z:\>ipconfig/flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.
```

17. nbtstat -r – Displays NetBIOS over TCP/IP statistics, including the resolution of names from the NetBIOS name cache.

```
Z:\>nbtstat -r

    NetBIOS Names Resolution and Registration Statistics
    --------------------------------------------------

    Resolved By Broadcast     = 0
    Resolved By Name Server   = 0

    Registered By Broadcast   = 9
    Registered By Name Server = 0
```