

Practical: 3

AIM: Studying Windows network commands.

ping, pathping, ipconfig/ifconfig, arp, netstat, nbtstat, nslookup, route, traceroute/tracert, nmap.



**Ganpat
University**

॥ विद्यया समाजोत्कर्षः ॥

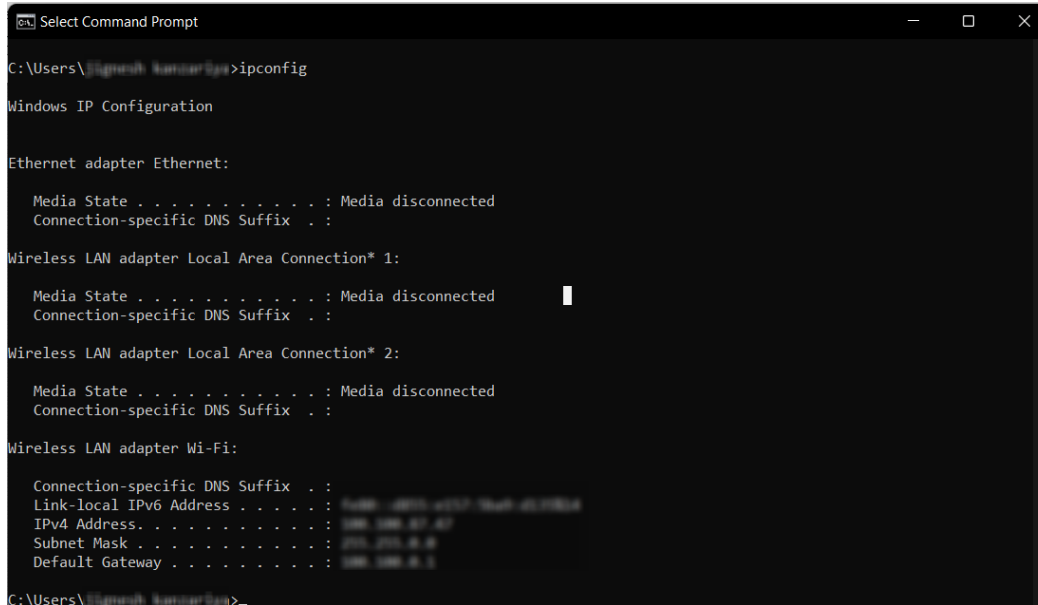
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Department of Computer
Engineering/Information Technology

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Ipconfig :

The ipconfig command is a fast way of determining your computer's IP address and other information, such as the address of its default gateway useful if you want to know the IP address of your router's web interface.



```
Select Command Prompt

C:\Users\jignesh.kanzariya>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

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

Wireless LAN adapter Local Area Connection* 1:

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

Wireless LAN adapter Local Area Connection* 2:

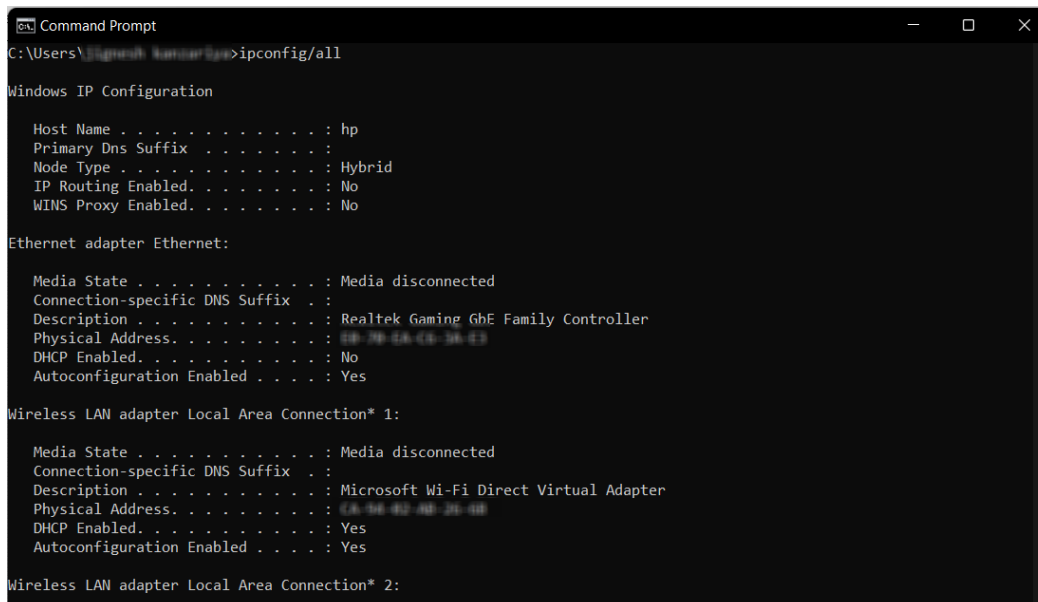
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::4b75:c757:9a4b:dc35%4
    IPv4 Address. . . . . : 192.168.87.87
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 192.168.8.1

C:\Users\jignesh.kanzariya>
```

Ipconfig/all : all information about system.



```
Command Prompt

C:\Users\jignesh.kanzariya>ipconfig/all

Windows IP Configuration

    Host Name . . . . . : hp
    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. . . . . : 88-E8-46-43-3A-E3
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
    Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
    Physical Address. . . . . : 8A-9B-42-4B-35-08
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

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

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```
Command Prompt

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. . . . . : 5A-9A-42-40-26-08
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : 
    Description . . . . . : Realtek RTL8852AE WiFi 6 802.11ax PCIe Adapter
    Physical Address. . . . . : 5A-9A-42-40-26-08
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::d95c:a557:104b:4c398346(preferred)
    IPv4 Address. . . . . : 192.168.1.7(preferred)
    Subnet Mask . . . . . : 255.255.0.0
    Lease Obtained. . . . . : Sunday, September 11, 2022 5:00:36 PM
    Lease Expires . . . . . : Wednesday, October 18, 2158 11:35:44 PM
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DHCPv6 IAID . . . . . : 315134978
    DHCPv6 Client DUID. . . . . : 00-01-00-01-29-17-EB-13-E0-70-EA-C6-3A-E3
    DNS Servers . . . . . : 192.168.1.1
    NetBIOS over Tcpip. . . . . : Enabled

C:\Users\Signedh_Kanzariya>
```

Ping :

Ping is an old Unix tool that has been around for a long time but many PC users are unfamiliar with the Windows version. Ping sends out a packet to a designated internet host or network computer and measures its response time. Use ping whenever you need to verify that a host computer can connect to the TCP/IP network and network resources.

```
Command Prompt

Microsoft Windows [Version 10.0.22000.856]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Signedh_Kanzariya>ping 202.131.126.215

Pinging 202.131.126.215 with 32 bytes of data:
Reply from 202.131.126.215: bytes=32 time=40ms TTL=48
Reply from 202.131.126.215: bytes=32 time=31ms TTL=48
Reply from 202.131.126.215: bytes=32 time=42ms TTL=48
Reply from 202.131.126.215: bytes=32 time=30ms TTL=48

Ping statistics for 202.131.126.215:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 30ms, Maximum = 42ms, Average = 35ms

C:\Users\Signedh_Kanzariya>
```

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Arp -a: Displays and modifies the IP-to-Physical address translation tables used by address resolution protocol (ARP).

```
Command Prompt
C:\Users\Sagnish Kanwar>arp -a

Interface: 100.100.87.47 --- 0xe
Internet Address      Physical Address      Type
100.100.0.1           fe-ff-0a-46-10-33    dynamic
100.100.255.255       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
239.255.102.18        01-00-5e-7f-66-12    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

C:\Users\Sagnish Kanwar>
```

Netstat :

Netstat stands for network statistics. This command displays incoming and outgoing network connections as well as other network information. The netstat utility can show you the open connections on your computer, which programs are making which connections, how much data is being transmitted, and other information. The netstat command is used to display very detailed information about how your computer is communicating with other computers or network devices.

```
Command Prompt
C:\Users\Sagnish Kanwar>netstat

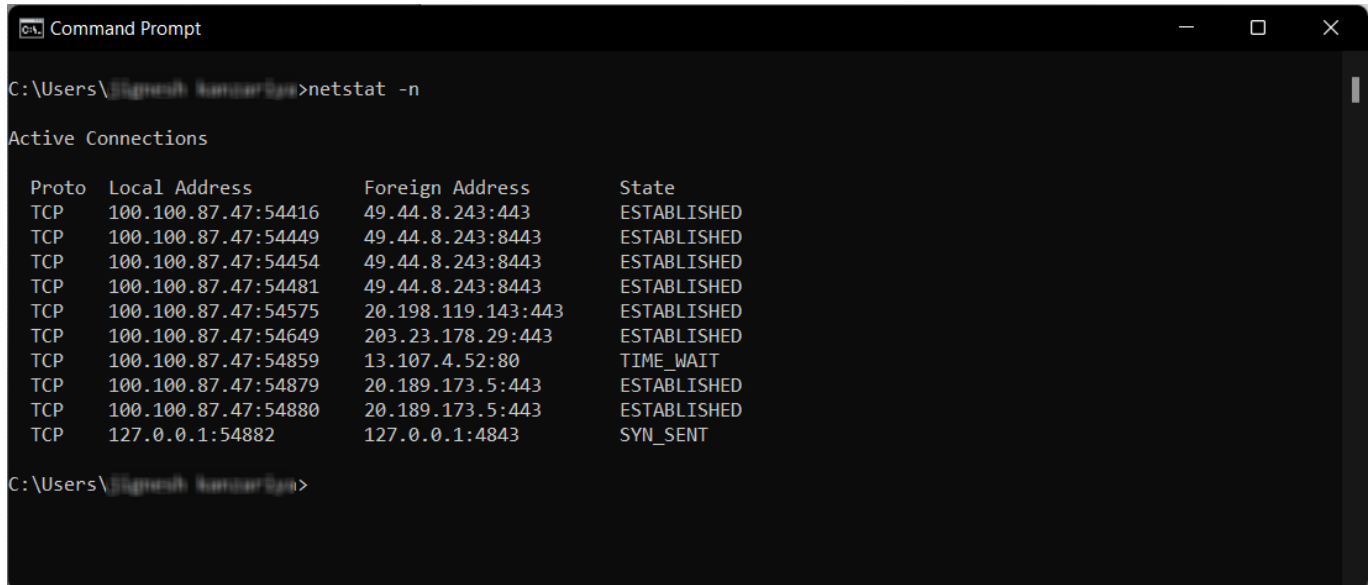
Active Connections

Proto Local Address           Foreign Address         State
TCP    100.100.87.47:54416      49.44.8.243:https       ESTABLISHED
TCP    100.100.87.47:54449      49.44.8.243:8443        ESTABLISHED
TCP    100.100.87.47:54454      49.44.8.243:8443        ESTABLISHED
TCP    100.100.87.47:54481      49.44.8.243:8443        ESTABLISHED
TCP    100.100.87.47:54575      20.198.119.143:https     ESTABLISHED
TCP    100.100.87.47:54631      20.189.173.6:https      ESTABLISHED
TCP    100.100.87.47:54635      20.189.173.6:https      ESTABLISHED
TCP    100.100.87.47:54649      relay-fcac249d:https     ESTABLISHED
TCP    100.100.87.47:54694      a-0003:https            TIME_WAIT
TCP    100.100.87.47:54706      a23-15-195-72:http      TIME_WAIT
TCP    100.100.87.47:54720      a-0001:https            ESTABLISHED
TCP    100.100.87.47:54723      a-0001:https            ESTABLISHED
TCP    100.100.87.47:54766      13.107.4.52:http        TIME_WAIT

^C
C:\Users\Sagnish Kanwar>
```

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netstat -n:



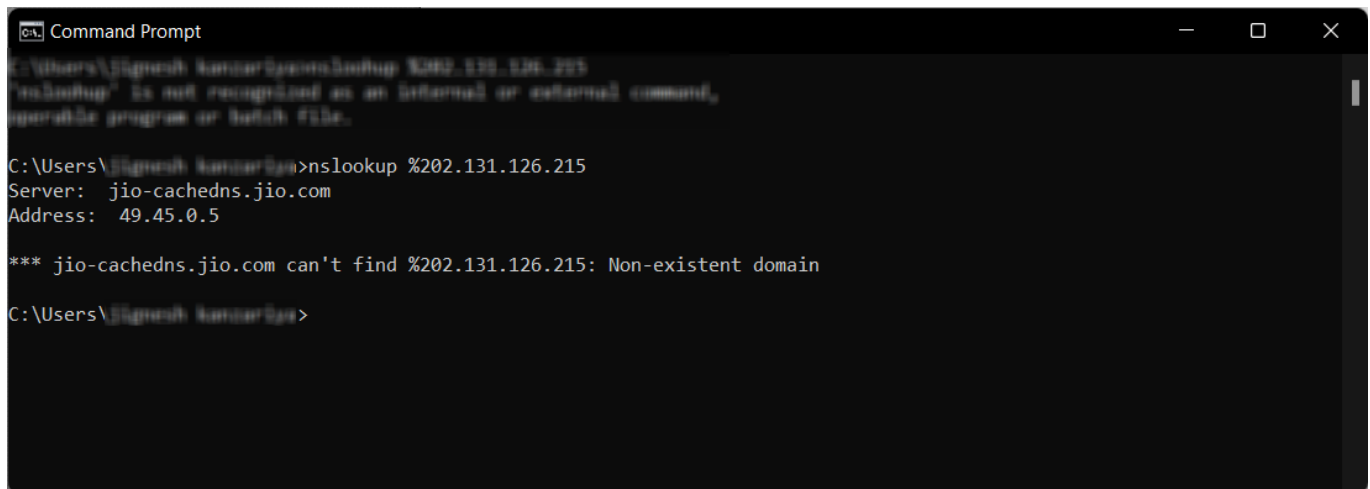
```
Command Prompt
C:\Users\Sagnesh Kanariga>netstat -n

Active Connections

 Proto Local Address          Foreign Address         State
    TCP 100.100.87.47:54416      49.44.8.243:443         ESTABLISHED
    TCP 100.100.87.47:54449      49.44.8.243:8443        ESTABLISHED
    TCP 100.100.87.47:54454      49.44.8.243:8443        ESTABLISHED
    TCP 100.100.87.47:54481      49.44.8.243:8443        ESTABLISHED
    TCP 100.100.87.47:54575      20.198.119.143:443      ESTABLISHED
    TCP 100.100.87.47:54649      203.23.178.29:443       ESTABLISHED
    TCP 100.100.87.47:54859      13.107.4.52:80          TIME_WAIT
    TCP 100.100.87.47:54879      20.189.173.5:443        ESTABLISHED
    TCP 100.100.87.47:54880      20.189.173.5:443        ESTABLISHED
    TCP 127.0.0.1:54882         127.0.0.1:4843         SYN_SENT

C:\Users\Sagnesh Kanariga>
```

Nslookup: nslookup, which stands for "name server lookup", is a useful tool for finding out information about a domain named . This command helps diagnose the Domain Name System (DNS) infrastructure and comes with a number of sub-commands. These are mainly for systems administrators. The primary interest for average PC users is its use to find the computer name corresponding to a numeric IP.



```
Command Prompt
C:\Users\Sagnesh Kanariga>nslookup 202.131.126.215
'nslookup' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Sagnesh Kanariga>nslookup %202.131.126.215
Server:      jio-cachedns.jio.com
Address:     49.45.0.5

*** jio-cachedns.jio.com can't find %202.131.126.215: Non-existent domain

C:\Users\Sagnesh Kanariga>
```

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Tracert : A tracert is a tracking of a packet sent to a server. During its route this packet goes through several network devices (routers, firewall, etc.) and then goes finally at the server. With the tracert you can see the IP as well as the response time between each barrier.

```
Command Prompt
C:\Users\Kanzariya>tracert 202.131.126.215

Tracing route to 202.131.126.215 over a maximum of 30 hops:

  0  *         *         *         Request timed out.
  1  43 ms     7 ms     7 ms     192.168.103.14
  2  16 ms     22 ms    19 ms     172.26.109.164
  3  10 ms     12 ms     6 ms     172.26.109.178
  4  396 ms    6 ms     173 ms    192.168.38.27
  5  *         *         *         Request timed out.
  6  *         *         *         Request timed out.
  7  *         *         *         Request timed out.
  8  31 ms     41 ms     44 ms    182.79.206.229
  9  *         *         *         Request timed out.
 10 174 ms    177 ms    338 ms    59.145.238.94
 11 447 ms     83 ms     69 ms    202.131.97.241
 12 72 ms     51 ms     46 ms    202.131.97.106
 13 52 ms     42 ms     40 ms    180.211.126.2
 14 *         *         *         Request timed out.
 15 82 ms     47 ms     77 ms    202.131.126.215

Trace complete.

C:\Users\Kanzariya>
```

Route: If this is used in conjunction with one of the commands (such as add, change, or delete), the table is cleared prior to running the command. -p : When used with the add command, the specified route is added to the registry and is used to initialize the IP routing table whenever the TCP/IP protocol is started.

```
Select Command Prompt
C:\Users\Kanzariya>route print

=====
Interface List
16...e0 70 ea c6 3a e3 .....Realtek Gaming GbE Family Controller
17...ca 94 02 ab 26 6b .....Microsoft Wi-Fi Direct Virtual Adapter
7...ea 94 02 ab 26 6b .....Microsoft Wi-Fi Direct Virtual Adapter #2
14...c8 94 02 ab 26 6b .....Realtek RTL8852AE WiFi 6 802.11ax PCIe Adapter
1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          100.100.0.1      100.100.87.47    50
100.100.0.0                255.255.0.0      On-link          100.100.87.47    306
100.100.87.47              255.255.255.255  On-link          100.100.87.47    306
100.100.255.255            255.255.255.255  On-link          100.100.87.47    306
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
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          100.100.87.47    306
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          100.100.87.47    306
=====
```

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```
Select Command Prompt

Persistent Routes:
  Network Address      Netmask  Gateway Address  Metric
      0.0.0.0          0.0.0.0    192.168.1.2     Default
=====

IPv6 Route Table
=====
Active Routes:
  If Metric Network Destination      Gateway
    1   331  ::1/128         On-link
   14   306  fe80::/64       On-link
   14   306  fe80::d855:e157:5ba9:d135/128 On-link
    1   331  ff00::/8         On-link
   14   306  ff00::/8         On-link
=====

Persistent Routes:
  None

C:\Users\Sigmesh_Kanzariya>
```

Ipconfig –flushdns : To ensure Windows is getting addresses from the new DNS servers instead of using old, cached entries, run the ipconfig /flushdns command after changing your DNS server.

```
Command Prompt

C:\Users\Sigmesh_Kanzariya>ipconfig -flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\Users\Sigmesh_Kanzariya>
```

Hostname: Useful to know machine name.

```
Command Prompt

C:\Users\Sigmesh_Kanzariya>getmac

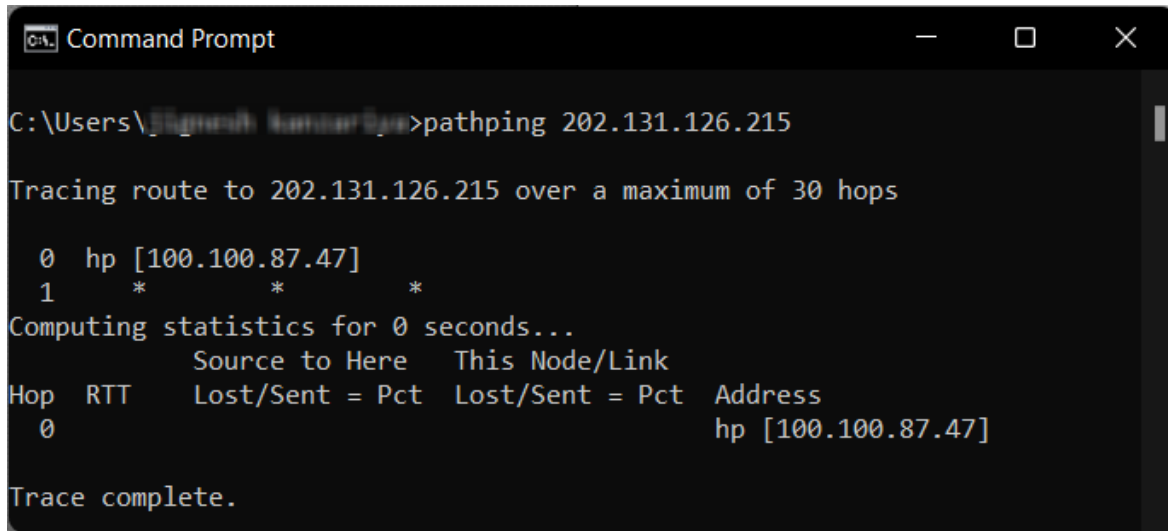
Physical Address      Transport Name
=====
08-00-43-48-3A-E3     Media disconnected
08-00-43-48-3A-E3     \Device\NPF{CECCFA44-1257-4CF9-A1E9-6D79B3D3B1A1}

C:\Users\Sigmesh_Kanzariya>hostname
hp

C:\Users\Sigmesh_Kanzariya>
```

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Pathping: The pathping command is a route tracing tool that combines features of the ping and traceroute commands with additional information that neither of those tools provides. The pathping command sends packets to each router on the way to a final destination over a period of time, and then computes results based on the packets returned from each hop. Since the command shows the degree of packet loss at any given router or link, it is easy to determine which routers or links might be causing network problems.



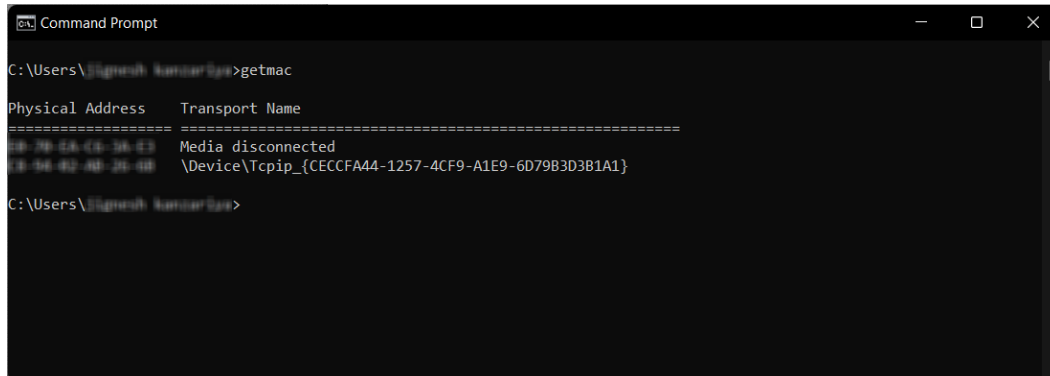
```
C:\Users\Sigmesh_Kanzariya>pathping 202.131.126.215

Tracing route to 202.131.126.215 over a maximum of 30 hops

  0  hp [100.100.87.47]
  1  *          *          *
Computing statistics for 0 seconds...
      Source to Here   This Node/Link
Hop  RTT      Lost/Sent = Pct   Lost/Sent = Pct   Address
  0                          hp [100.100.87.47]

Trace complete.
```

getmac: using this command we can get MAC address.



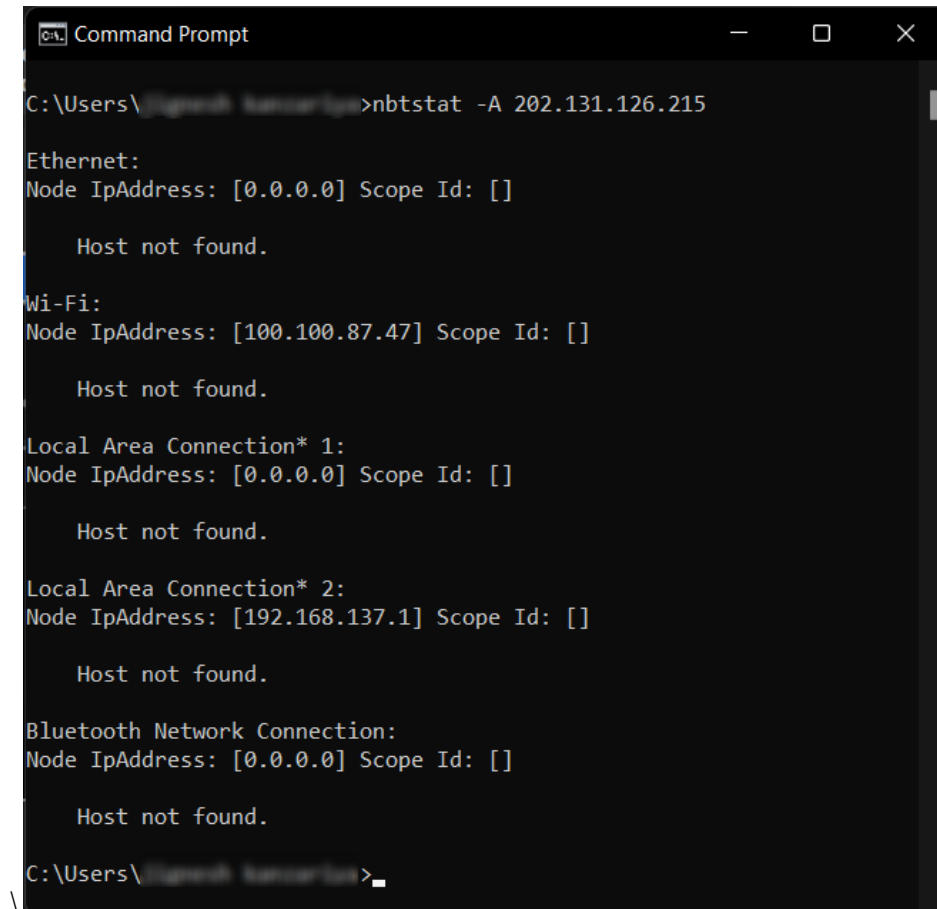
```
C:\Users\Sigmesh_Kanzariya>getmac

Physical Address      Transport Name
=====
00-70-43-40-3A-E3    Media disconnected
00-00-00-00-00-00    \Device\NPF{CECCFA44-1257-4CF9-A1E9-6D79B3D3B1A1}

C:\Users\Sigmesh_Kanzariya>
```


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Nbtstat : Displays protocol statistics and current TCP/IP connections using NBT(NetBIOS over TCP/IP). Lists the remote machine's name table given its name.



```
Command Prompt
C:\Users\Kanzariya_Dhavanik>nbtstat -A 202.131.126.215

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

    Host not found.

Wi-Fi:
Node IpAddress: [100.100.87.47] Scope Id: []

    Host not found.

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

    Host not found.

Local Area Connection* 2:
Node IpAddress: [192.168.137.1] Scope Id: []

    Host not found.

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

    Host not found.

C:\Users\Kanzariya_Dhavanik>
```