

Demonstration Of Basic Commands

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Class: 3 H

1. ipconfig

· Syntax:

```
ipconfig [options]
```

Example:

```
ipconfig /all
```

· What It's Used For:

- Displays network configuration details like IP address, subnet mask, and default gateway.
- Can be used to release or renew IP addresses (/release, /renew).

· Why It's Important:

- Helps diagnose and resolve network configuration issues, such as incorrect IP settings or connectivity problems.

```
Command Prompt
Microsoft Windows [Version 10.0.22631.4602]
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C:\Users\rohan>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::ffff:53:fccb:6acf%11
    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 Wi-Fi:

    Connection-specific DNS Suffix  . : pdc.local
    Link-local IPv6 Address . . . . . : fe80::25ab:780c:b84a:5355%10
    IPv4 Address. . . . . : 10.1.2.246
    Subnet Mask . . . . . : 255.255.248.0
    Default Gateway . . . . . : 10.1.0.1

Ethernet adapter Ethernet:

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

C:\Users\rohan>ipconfig /all

Windows IP Configuration

Host Name . . . . . : Rohan
Primary Dns Suffix . . . . . : 
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : pdc.local

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix  . : 
    Description . . . . . : VirtualBox Host-Only Ethernet Adapter
    Physical Address. . . . . : 0A-00-27-00-00-0B
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::ffff:53:fccb:6acf%11(Preferred)
    IPv4 Address. . . . . : 192.168.56.1(Preferred)
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 
    DHCPv6 IAID . . . . . : 906625063
    DHCPv6 Client DUID. . . . . : 00-01-00-01-2B-A3-39-2D-58-11-22-88-D9-97
    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. . . . . : 2C-33-58-3F-32-3A
```

```
Command Prompt

Ethernet adapter Ethernet:

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

C:\Users\rohan>ipconfig /all

Windows IP Configuration

Host Name . . . . . : Rohan
Primary Dns Suffix . . . . . : 
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : pdc.local

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix  . : 
    Description . . . . . : VirtualBox Host-Only Ethernet Adapter
    Physical Address. . . . . : 0A-00-27-00-00-0B
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::ffff:53:fccb:6acf%11(Preferred)
    IPv4 Address. . . . . : 192.168.56.1(Preferred)
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 
    DHCPv6 IAID . . . . . : 906625063
    DHCPv6 Client DUID. . . . . : 00-01-00-01-2B-A3-39-2D-58-11-22-88-D9-97
    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. . . . . : 2C-33-58-3F-32-3A
```

```
Command Prompt
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : 2C-33-S8-3F-32-3A
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . : pdc.local
Description . . . . . : Intel(R) Wi-Fi 6E AX211 160MHz
Physical Address. . . . . : 2C-33-S8-3F-32-39
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::25ab:780c:b84a:5355%10(Preferred)
IPv4 Address. . . . . : 10.1.2.246(Preferred)
Subnet Mask . . . . . : 255.255.248.0
Lease Obtained. . . . . : 13 January 2025 02:40:19 PM
Lease Expires . . . . . : 14 January 2025 02:46:12 PM
Default Gateway . . . . . : 10.1.0.1
DHCP Server . . . . . : 192.168.3.2
DHCPv6 IAID . . . . . : 103560024
DHCPv6 Client DUID. . . . . : 00-01-00-01-2B-A3-39-2D-S8-11-22-88-D9-97
DNS Servers . . . . . : 192.168.3.2
                        8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : hgu_lan
Description . . . . . : Realtek PCIe GbE Family Controller
Physical Address. . . . . : 58-11-22-88-D9-97
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

C:\Users\rohan>Ping 127.0.0.1
```

2. ping

· Syntax:

ping [hostname or IP address]

Example:

ping google.com

· What It's Used For:

- Tests connectivity between your computer and a remote server.
- Measures packet loss and latency.

· Why It's Important:

- Quickly identifies if a host is reachable and helps troubleshoot connection problems.

```
Command Prompt
C:\Users\rohan>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:\Users\rohan>Ping www.gmail.com

Pinging www.gmail.com [142.250.183.165] with 32 bytes of data:
Reply from 142.250.183.165: bytes=32 time=17ms TTL=117
Reply from 142.250.183.165: bytes=32 time=19ms TTL=117
Reply from 142.250.183.165: bytes=32 time=26ms TTL=117
Reply from 142.250.183.165: bytes=32 time=18ms TTL=117

Ping statistics for 142.250.183.165:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 17ms, Maximum = 26ms, Average = 20ms

C:\Users\rohan>Ping www.pesuacademy.com

Pinging pesu-academy-prd-pub-alb-313146315.ap-south-1.elb.amazonaws.com [3.111.68.138] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 3.111.68.138:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

Reply from 142.250.196.4: bytes=32 time=17ms TTL=52

Ping statistics for 142.250.196.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 17ms, Average = 14ms

C:\Users\rohan>www.linkedin.com
'www.linkedin.com' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\rohan>Ping www.linkedin.com

Pinging l-0085.l-msedge.net [13.107.42.14] with 32 bytes of data:
Reply from 13.107.42.14: bytes=32 time=13ms TTL=112
Reply from 13.107.42.14: bytes=32 time=14ms TTL=112
Reply from 13.107.42.14: bytes=32 time=13ms TTL=112
Reply from 13.107.42.14: bytes=32 time=15ms TTL=112

Ping statistics for 13.107.42.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 13ms, Maximum = 15ms, Average = 13ms

C:\Users\rohan>Ping https://www.pesuacademy.com/Academy/
Ping request could not find host https://www.pesuacademy.com/Academy/. Please check the name and try again.

C:\Users\rohan>Ping www.pesuacademy.com/Academy/
Ping request could not find host www.pesuacademy.com/Academy/. Please check the name and try again.

C:\Users\rohan>Ping www.pesuacademy.com

Pinging pesu-academy-prd-pub-alb-313146315.ap-south-1.elb.amazonaws.com [15.206.46.9] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

3. netstat

· Syntax:

```
netstat [options]
```

Example:

```
netstat -an
```

· **What It's Used For:**

- Displays active network connections, listening ports, and protocol statistics. ○
Can show processes using specific ports with -b option.

· **Why It's Important:**

- Useful for monitoring network activity and identifying applications consuming bandwidth or exposing vulnerabilities.

```
Command Prompt
C:\Users\rohan>netstat -an

Active Connections

Proto Local Address          Foreign Address         State
TCP   0.0.0.0:135             0.0.0.0:0              LISTENING
TCP   0.0.0.0:445             0.0.0.0:0              LISTENING
TCP   0.0.0.0:5040            0.0.0.0:0              LISTENING
TCP   0.0.0.0:7680            0.0.0.0:0              LISTENING
TCP   0.0.0.0:8090            0.0.0.0:0              LISTENING
TCP   0.0.0.0:49664           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49665           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49666           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49669           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49670           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49682           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49685           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49686           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49687           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49690           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49693           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49694           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49697           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49698           0.0.0.0:0              LISTENING
TCP   0.0.0.0:49703           0.0.0.0:0              LISTENING
TCP   10.1.2.246:139          0.0.0.0:0              LISTENING
TCP   10.1.2.246:7680         10.1.1.165:59679       TIME_WAIT
TCP   10.1.2.246:7680         10.1.1.191:51481       TIME_WAIT
TCP   10.1.2.246:7680         10.1.1.191:53106       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.152:61545       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.152:62202       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.176:59477       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.176:59694       ESTABLISHED
TCP   10.1.2.246:7680         10.1.2.182:51705       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.220:56828       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.220:57616       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.249:51734       TIME_WAIT
TCP   10.1.2.246:7680         10.1.2.249:51883       TIME_WAIT
```

```
Command Prompt

TCP   10.1.2.246:51091         142.250.199.170:443    TIME_WAIT
TCP   10.1.2.246:51092         142.250.199.170:443    TIME_WAIT
TCP   10.1.2.246:51093         142.250.199.170:443    TIME_WAIT
TCP   10.1.2.246:51094         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51095         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51096         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51097         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51098         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51099         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51100         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51103         142.250.199.170:443    TIME_WAIT
TCP   10.1.2.246:51104         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51105         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51106         172.217.174.74:443     TIME_WAIT
TCP   10.1.2.246:51107         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51108         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51109         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51110         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51111         8.8.8.8:443            TIME_WAIT
TCP   10.1.2.246:51112         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51113         142.250.199.163:443    TIME_WAIT
TCP   10.1.2.246:51115         8.8.8.8:443            ESTABLISHED
TCP   10.1.2.246:51116         142.250.196.70:443     ESTABLISHED
TCP   10.1.2.246:51117         142.250.193.106:443    ESTABLISHED
TCP   10.1.2.246:51118         221.135.111.120:80     ESTABLISHED
TCP   10.1.2.246:51120         103.95.85.221:443      ESTABLISHED
TCP   10.1.2.246:51121         204.79.197.203:443     ESTABLISHED
TCP   10.1.2.246:51122         18.172.64.37:443       ESTABLISHED
TCP   10.1.2.246:51123         52.231.230.148:443     ESTABLISHED
TCP   10.1.2.246:51124         204.79.197.237:443     ESTABLISHED
TCP   10.1.2.246:51125         23.32.28.137:443       ESTABLISHED
TCP   10.1.2.246:51126         23.32.28.137:443       ESTABLISHED
TCP   10.1.2.246:51128         221.135.111.122:443    ESTABLISHED
TCP   10.1.2.246:51129         204.79.197.203:443     ESTABLISHED
TCP   10.1.2.246:51130         20.189.173.24:443      ESTABLISHED
TCP   10.1.2.246:51132         23.212.254.72:443      ESTABLISHED
TCP   10.1.2.246:51133         204.79.197.203:443     ESTABLISHED
TCP   10.1.2.246:51134         172.67.41.60:443       ESTABLISHED
```

```
Command Prompt
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 0.0.0.0:5353 **
UDP 0.0.0.0:5353 **
UDP 0.0.0.0:5353 **
UDP 0.0.0.0:5355 **
UDP 10.1.2.246:137 **
UDP 10.1.2.246:138 **
UDP 10.1.2.246:1900 **
UDP 10.1.2.246:52053 **
UDP 127.0.0.1:1900 **
UDP 127.0.0.1:10010 **
UDP 127.0.0.1:52054 **
UDP 127.0.0.1:54665 127.0.0.1:54665
UDP 127.0.0.1:55459 **
UDP 127.0.0.1:56682 127.0.0.1:56682
UDP 192.168.56.1:137 **
UDP 192.168.56.1:138 **
UDP 192.168.56.1:1900 **
UDP 192.168.56.1:52052 **
UDP [::]:500 **
UDP [::]:4500 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5355 **
UDP [::1]:1900 **
UDP [::1]:52051 **
UDP [fe80::25ab:780c:b84a:5355%10]:1900 **
UDP [fe80::25ab:780c:b84a:5355%10]:52050 **
UDP [fe80::fffe:53:fcdb:6acf%11]:1900 **
UDP [fe80::fffe:53:fcdb:6acf%11]:52049 **

C:\Users\rohan>
```

```
Command Prompt
TCP [::]:49669 [::]:0 LISTENING
TCP [::]:49670 [::]:0 LISTENING
TCP [::]:49703 [::]:0 LISTENING
TCP [::1]:42050 [::]:0 LISTENING
TCP [::1]:49677 [::]:0 LISTENING
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 0.0.0.0:5353 **
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 10.1.2.246:137 **
UDP 10.1.2.246:138 **
UDP 10.1.2.246:1900 **
UDP 10.1.2.246:52053 **
UDP 127.0.0.1:1900 **
UDP 127.0.0.1:10010 **
UDP 127.0.0.1:52054 **
UDP 127.0.0.1:54665 127.0.0.1:54665
UDP 127.0.0.1:55459 **
UDP 127.0.0.1:56682 127.0.0.1:56682
UDP 192.168.56.1:137 **
UDP 192.168.56.1:138 **
UDP 192.168.56.1:1900 **
UDP 192.168.56.1:52052 **
UDP [::]:500 **
UDP [::]:4500 **
UDP [::]:5353 **
UDP [::]:5353 **
UDP [::]:5353 **
```

```
Command Prompt
C:\Users\rohan>tracert www.google.com

Tracing route to www.google.com [142.250.182.228]
over a maximum of 30 hops:

  1  8 ms    23 ms    6 ms    10.1.0.1
  2  2 ms    4 ms     2 ms    192.168.5.1
  3  2 ms    2 ms     2 ms    192.168.254.1
  4  6 ms    5 ms     5 ms    static-161.83.12.61-tataidc.co.in [61.12.83.161]
  5  *        *        *        Request timed out.
  6  5 ms    4 ms     5 ms    10.129.33.45
  7  *        32 ms    7 ms    115.111.221.61.static-banglore.vsnl.net.in [115.111.221.61]
  8  18 ms   12 ms   13 ms    172.28.117.90
  9  11 ms   17 ms   11 ms    115.112.15.114.static-chennai.vsnl.net.in [115.112.15.114]
 10  62 ms   34 ms   12 ms    142.251.227.217
 11  11 ms   12 ms   11 ms    142.251.230.90
 12  12 ms   11 ms   11 ms    64.233.174.2
 13  26 ms   25 ms   27 ms    142.250.238.206
 14  26 ms   26 ms   25 ms    192.178.110.249
 15  35 ms   75 ms   97 ms    142.250.214.103
 16  25 ms   28 ms   30 ms    bom07s29-in-f4.1e100.net [142.250.182.228]

Trace complete.

C:\Users\rohan>tracert www.pesu.edu
Unable to resolve target system name www.pesu.edu.

C:\Users\rohan>tracert www.gmail.com

Tracing route to www.gmail.com [142.250.192.101]
over a maximum of 30 hops:

  1  25 ms    23 ms    4 ms    10.1.0.1
  2  3 ms     5 ms    13 ms    192.168.5.1
  3  3 ms     1 ms     1 ms    192.168.254.1
  4  5 ms     2 ms     3 ms    1.6.222.153
  5  14 ms    11 ms    11 ms    100.70.137.132
```

4. tracert

· Syntax:

```
tracert [hostname or IP address]
```

Example:

```
tracert google.com
```

· What It's Used For:

- Traces the route packets take to reach a remote host.
- Displays each hop and its response time.

· Why It's Important:

- Helps identify network bottlenecks or misconfigured routers on the path to the destination.


```

C:\Users\rohan>tracert www.gmail.com

Tracing route to www.gmail.com [142.250.192.101]
over a maximum of 30 hops:

  1    25 ms    23 ms     4 ms    10.1.0.1
  2     3 ms     5 ms    13 ms    192.168.5.1
  3     3 ms     1 ms     1 ms    192.168.254.1
  4     5 ms     2 ms     3 ms    1.6.222.153
  5    14 ms    11 ms    11 ms    100.70.137.132
  6    14 ms    15 ms    13 ms    100.70.136.115
  7    20 ms    13 ms    13 ms    100.70.136.109
  8    12 ms    16 ms    13 ms    100.70.138.77
  9    15 ms    19 ms    22 ms    100.70.136.28
 10     *       *       *      Request timed out.
 11     *       *       *      Request timed out.
 12    12 ms    12 ms    12 ms    72.14.219.169
 13    12 ms    12 ms    12 ms    216.239.43.131
 14    13 ms    13 ms    15 ms    142.250.239.228
 15    26 ms    24 ms    24 ms    72.14.232.50
 16    24 ms    25 ms    24 ms    216.239.48.64
 17    27 ms    26 ms    26 ms    192.178.110.111
 18    25 ms    24 ms    25 ms    72.14.237.139
 19    24 ms    23 ms    23 ms    bom12s17-in-f5.1e100.net [142.250.192.101]

Trace complete.

```

5. nslookup

· Syntax:

```
nslookup [hostname or IP address]
```

Example:

```
nslookup example.com
```

· What It's Used For:

- Queries the DNS to resolve domain names into IP addresses and vice versa.
- Provides DNS record details.

· Why It's Important:

- Diagnoses DNS-related issues like domain resolution failures or DNS server unavailability.

```
C:\Users\rohan>nslookup www.google.com
Server:  PESUEC.pdc.local
Address:  192.168.3.2

Non-authoritative answer:
Name:     www.google.com
Addresses: 2404:6800:4007:824::2004
          142.250.199.164
```

6. arp

· Syntax:

```
arp [options]
```

Example:

```
arp -a
```

· What It's Used For:

- Displays or modifies the ARP (Address Resolution Protocol) cache.
- Shows mappings between IP addresses and MAC addresses.

· Why It's Important:

- Helps troubleshoot issues with device communication on a local network.

```

C:\Users\rohan>arp -a

Interface: 10.1.2.246 --- 0xa
Internet Address      Physical Address      Type
10.1.0.1              3c-a8-2a-4a-d7-80    dynamic
10.1.0.18             00-d4-9e-b7-cd-34    dynamic
10.1.0.65             7c-70-db-2c-c9-64    dynamic
10.1.0.66             94-bb-42-42-99-79    dynamic
10.1.0.126            10-68-38-a3-88-a9    dynamic
10.1.0.142            20-1e-88-ee-3f-4a    dynamic
10.1.0.147            10-68-38-40-77-a5    dynamic
10.1.0.148            10-68-38-3e-7b-79    dynamic
10.1.0.157            b4-0e-de-1f-67-06    dynamic
10.1.0.175            f8-54-f6-3b-dd-9f    dynamic
10.1.0.176            ec-2e-98-e0-33-e5    dynamic
10.1.0.182            c0-35-32-d6-38-d5    dynamic
10.1.0.186            b4-8c-9d-a3-cc-15    dynamic
10.1.0.196            3e-a9-9f-b9-42-58    dynamic
10.1.1.2              00-e9-3a-b1-9e-23    dynamic
10.1.1.3              50-c2-e8-c2-5d-d3    dynamic
10.1.1.10             c8-e2-65-3f-ed-05    dynamic
10.1.1.26             40-1a-58-35-84-00    dynamic
10.1.1.42             c0-e4-34-b1-da-57    dynamic
10.1.1.52             c0-35-32-5e-06-fd    dynamic
10.1.1.62             4c-d5-77-77-40-1f    dynamic
10.1.1.103            4c-5f-70-75-ad-6e    dynamic
10.1.1.110            8c-c6-81-e3-86-72    dynamic
10.1.1.126            10-5f-ad-ba-6f-df    dynamic
10.1.1.133            40-1a-58-20-9c-8a    dynamic
10.1.1.135            64-6c-80-53-7b-d3    dynamic
10.1.1.155            e0-2b-e9-1e-3e-df    dynamic
10.1.1.165            3a-47-12-0d-bb-f9    dynamic
10.1.1.191            b0-dc-ef-db-49-d5    dynamic
10.1.1.208            34-c9-3d-61-f5-0d    dynamic
10.1.2.6              e0-2e-0b-05-8f-67    dynamic
10.1.2.19             dc-1b-a1-aa-5d-9d    dynamic
10.1.2.43             14-d4-24-1b-8d-19    dynamic
10.1.2.45             40-1c-83-d1-3f-71    dynamic

C:\Users\rohan>netsh wlan show profiles

Profiles on interface Wi-Fi:

Group policy profiles (read only)

<None>

```

7. netsh

· Syntax:

```
netsh [context]
```

Example:

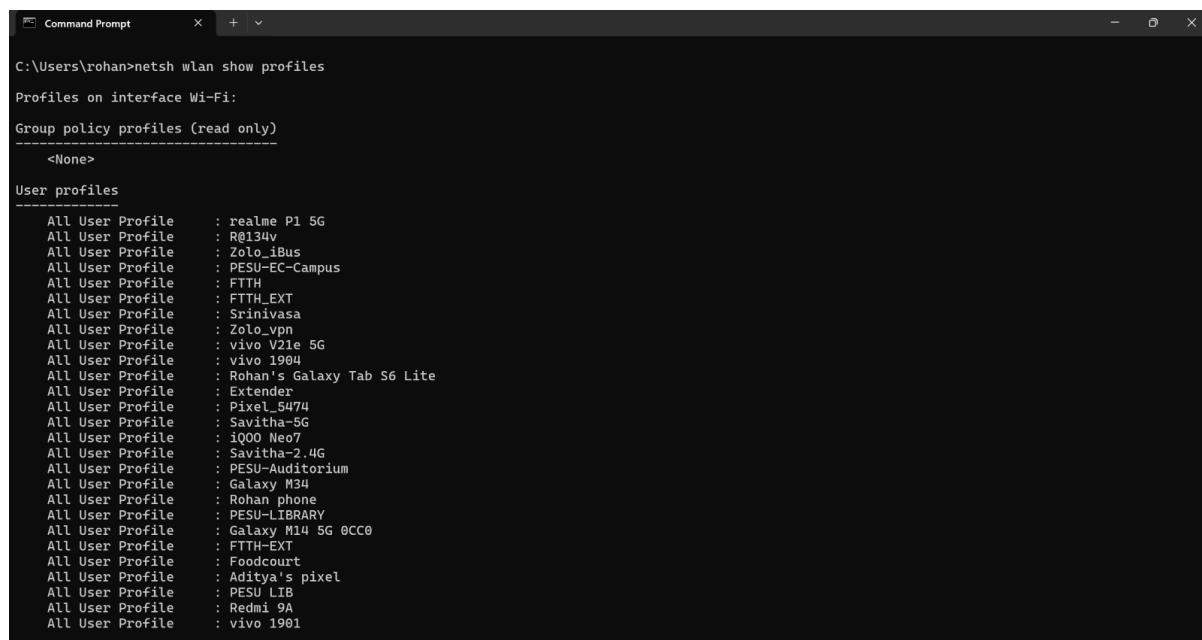
```
netsh wlan show profiles
```

· What It's Used For:

- Configures and monitors Windows networking settings.
- Useful for managing wireless profiles, firewall rules, and network adapters.

Why It's Important:

- Enables advanced network troubleshooting and configuration directly from the command line.



```
Command Prompt
C:\Users\rohan>netsh wlan show profiles

Profiles on interface Wi-Fi:

Group policy profiles (read only)
-----
<None>

User profiles
-----
All User Profile : realme P1 5G
All User Profile : R@134v
All User Profile : Zolo_iBus
All User Profile : PESU-EC-Campus
All User Profile : FTTH
All User Profile : FTTH_EXT
All User Profile : Srinivasa
All User Profile : Zolo_vpn
All User Profile : vivo V21e 5G
All User Profile : vivo 1904
All User Profile : Rohan's Galaxy Tab S6 Lite
All User Profile : Extender
All User Profile : Pixel_S474
All User Profile : Savitha-5G
All User Profile : 1000 Neo7
All User Profile : Savitha-2.4G
All User Profile : PESU-Auditorium
All User Profile : Galaxy M34
All User Profile : Rohan phone
All User Profile : PESU-LIBRARY
All User Profile : Galaxy M14 5G 0CC0
All User Profile : FTTH-EXT
All User Profile : Foodcourt
All User Profile : Aditya's pixel
All User Profile : PESU LIB
All User Profile : Redmi 9A
All User Profile : vivo 1901
```

8. getmac

· Syntax:

```
getmac [options]
```

Example:

```
getmac /v
```

· **What It's Used For:**

- Displays the MAC addresses of network interfaces.
- Shows details of enabled network adapters.

· **Why It's Important:**

- Essential for verifying the hardware addresses of network cards, especially when troubleshooting connectivity or security issues.

```
C:\Users\rohan>getmac /v

Connection Name Network Adapter Physical Address Transport Name
=====
Ethernet        Realtek PCIe Gb 58-11-22-88-D9-97 Media disconnected
Wi-Fi           Intel(R) Wi-Fi  2C-33-58-3F-32-39 \Device\Tcpip_{74EE88FB-459F-4A85-BDEA-31762320D84C}
Ethernet 3      VirtualBox Host 0A-00-27-00-00-0B \Device\Tcpip_{76DD41B8-8EC9-4FC1-9046-7A96786E11AE}
```

9. tasklist

· **Syntax:**

```
tasklist [options]
```

Example:

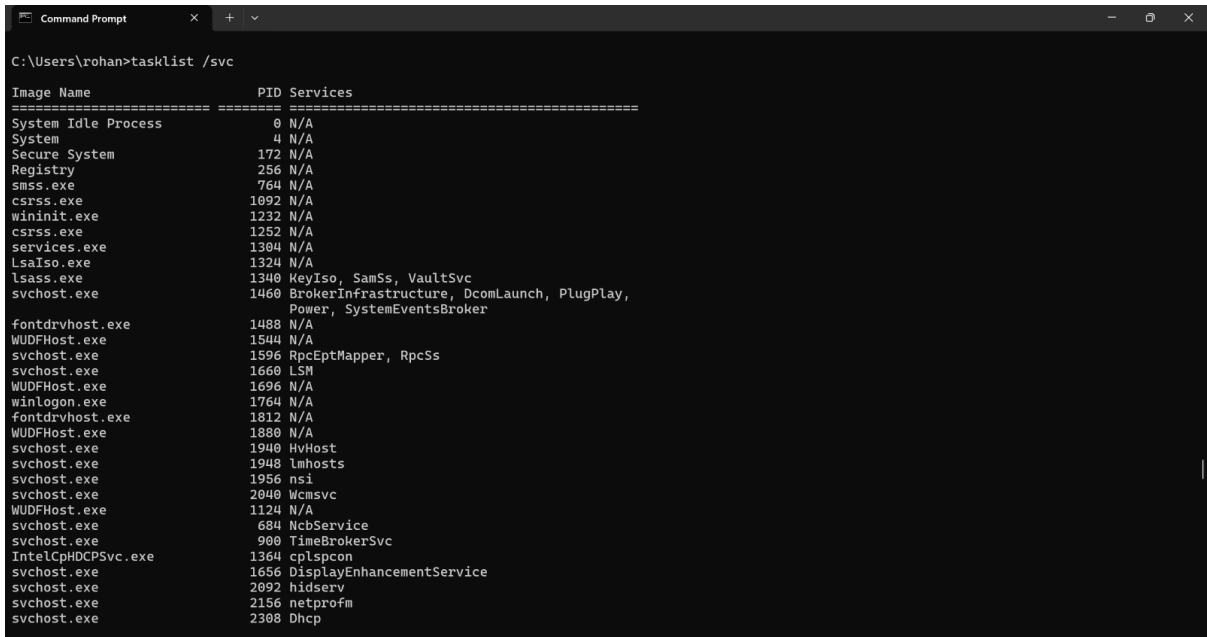
```
tasklist /svc
```

· **What It's Used For:**

- Lists all running processes on the system, including those associated with networking tasks.

· **Why It's Important:**

- Identifies processes using high network resources or conflicting with other applications.



```
C:\Users\rohan>tasklist /svc

Image Name                      PID  Services
=====
System Idle Process             0    N/A
System                          4    N/A
Secure System                   172  N/A
Registry                       256  N/A
smss.exe                        764  N/A
csrss.exe                       1092 N/A
wininit.exe                     1232 N/A
csrss.exe                       1252 N/A
services.exe                   1304 N/A
lsass.exe                       1324 N/A
svchost.exe                     1340 KeyIso, SamSs, VaultSvc
svchost.exe                     1460 BrokerInfrastructure, DcomLaunch, PlugPlay,
Power, SystemEventsBroker
fontdrvhost.exe                 1488 N/A
WUDFHost.exe                    1544 N/A
svchost.exe                     1596 RpcEptMapper, RpcSs
svchost.exe                     1660 LSM
WUDFHost.exe                    1696 N/A
winlogon.exe                    1764 N/A
fontdrvhost.exe                 1812 N/A
WUDFHost.exe                    1880 N/A
svchost.exe                     1940 HvHost
svchost.exe                     1948 lmhosts
svchost.exe                     1956 nsi
svchost.exe                     2040 Wcmsvc
WUDFHost.exe                    1124 N/A
svchost.exe                     684 NcbService
svchost.exe                     900 TimeBrokerSvc
IntelCpHDCPSvc.exe             1364 cplspcon
svchost.exe                     1656 DisplayEnhancementService
svchost.exe                     2092 hidserv
svchost.exe                     2156 netprofm
svchost.exe                     2308 Dhcp
```

10. route

· **Syntax:**

route [options]

Example:

route print

· **What It's Used For:**

- Displays and modifies the routing table.
- Can be used to add or delete static routes.

· **Why It's Important:**

- Helps troubleshoot routing issues in complex network setups, such as multiple gateways or VPN connections.

```

C:\Users\rohan>route print
=====
Interface List
11...0a 00 27 00 0b .....VirtualBox Host-Only Ethernet Adapter
20...2c 33 58 3f 32 3a .....Microsoft Wi-Fi Direct Virtual Adapter
10...2c 33 58 3f 32 39 .....Intel(R) Wi-Fi 6E AX211 160MHz
17...58 11 22 88 d9 97 .....Realtek PCIe GbE Family Controller
1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          10.1.0.1          10.1.2.246       30
10.1.0.0                   255.255.248.0    On-link           10.1.2.246       286
10.1.2.246                 255.255.255.255  On-link           10.1.2.246       286
10.1.7.255                 255.255.255.255  On-link           10.1.2.246       286
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
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           10.1.2.246       286
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           10.1.2.246       286
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
=====
10.1.0.0                   255.255.248.0    On-link           10.1.2.246       286
10.1.2.246                 255.255.255.255  On-link           10.1.2.246       286
10.1.7.255                 255.255.255.255  On-link           10.1.2.246       286
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
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           10.1.2.246       286
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           10.1.2.246       286
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1       331 ::1/128                      On-link
11      281 fe80::/64                      On-link
10      286 fe80::/64                      On-link
10      286 fe80::25ab:780c:b84a:5355/128 On-link
11      281 fe80::ffff:53:fccb:6acf/128 On-link
1       331 ff00::/8                      On-link
11      281 ff00::/8                      On-link
10      286 ff00::/8                      On-link
=====
Persistent Routes:
None
C:\Users\rohan>

```

11. whoami

· Syntax:

```
whoami
```

· **What It's Used For:**

- Displays the username and domain of the currently logged-in user.

· **Why It's Important:**

- Helps verify identity and permissions, especially when troubleshooting user specific network or access issues.

```
C:\Users\rohan>whoami
rohan\rohan

C:\Users\rohan>|
```

12. powercfg

· **Syntax:**

```
powercfg [options]
```

Example:

```
powercfg /energy
```

· **What It's Used For:**

- Analyzes power consumption and provides a report on energy efficiency.

· **Why It's Important:**

- Useful for diagnosing power issues that may affect network device performance, such as power-saving modes disabling network adapters.

13. systeminfo

· Syntax:

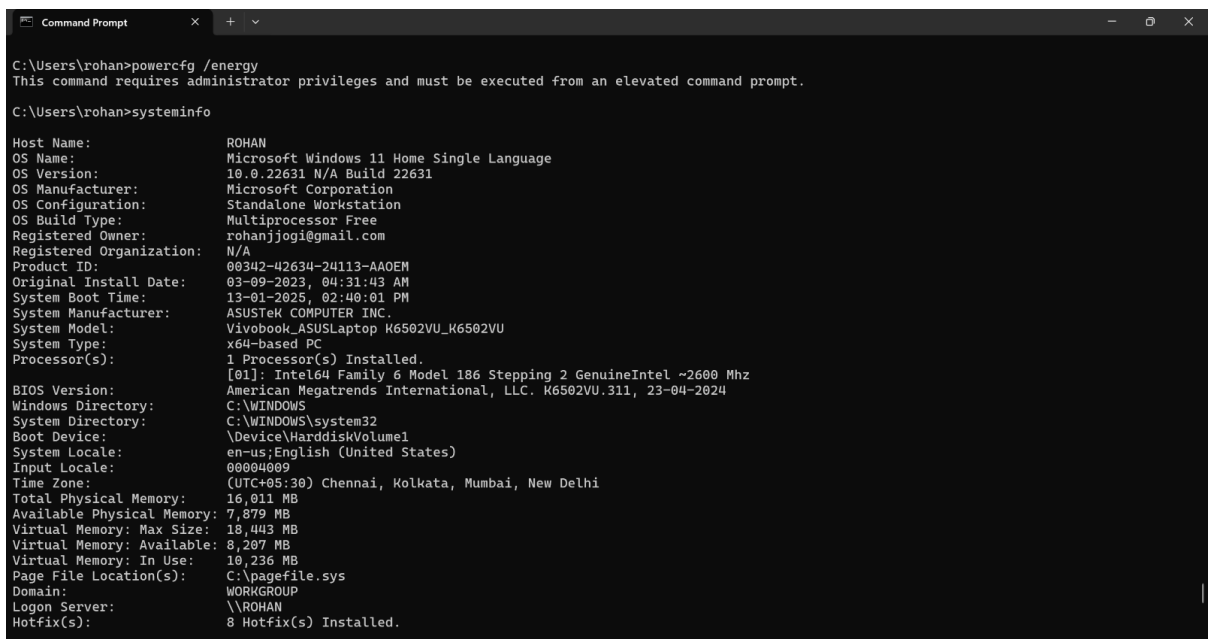
```
systeminfo
```

· What It's Used For:

- Displays detailed information about the system, including network configuration and updates.

· Why It's Important:

- Useful for gathering system details during network troubleshooting or hardware compatibility checks.



```
Command Prompt
C:\Users\rohan>powercfg /energy
This command requires administrator privileges and must be executed from an elevated command prompt.

C:\Users\rohan>systeminfo

Host Name:                             ROHAN
OS Name:                                Microsoft Windows 11 Home Single Language
OS Version:                             10.0.22631 N/A Build 22631
OS Manufacturer:                        Microsoft Corporation
OS Configuration:                       Standalone Workstation
OS Build Type:                           Multiprocessor Free
Registered Owner:                        rohanjjogi@gmail.com
Registered Organization:                  N/A
Product ID:                              00342-42634-24113-AAOEM
Original Install Date:                   03-09-2023, 04:31:43 AM
System Boot Time:                         13-01-2025, 02:40:01 PM
System Manufacturer:                     ASUSTeK COMPUTER INC.
System Model:                             Vivobook_ASUSLaptop K6502VU_K6502VU
System Type:                             x64-based PC
Processor(s):                             1 Processor(s) Installed.
[01]: Intel64 Family 6 Model 186 Stepping 2 GenuineIntel ~2600 Mhz
BIOS Version:                             American Megatrends International, LLC. K6502VU.311, 23-04-2024
Windows Directory:                       C:\WINDOWS
System Directory:                         C:\WINDOWS\system32
Boot Device:                             \Device\HarddiskVolume1
System Locale:                             en-us;English (United States)
Input Locale:                             00004009
Time Zone:                               (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:                    16,011 MB
Available Physical Memory:                 7,879 MB
Virtual Memory: Max Size:                 18,443 MB
Virtual Memory: Available:                 8,207 MB
Virtual Memory: In Use:                    10,236 MB
Page File Location(s):                    C:\pagefile.sys
Domain:                                  WORKGROUP
Logon Server:                             \\ROHAN
Hotfix(s):                                8 Hotfix(s) Installed.
```

14. sc

· **Syntax:**

```
sc [command] [service_name]
```

Example:

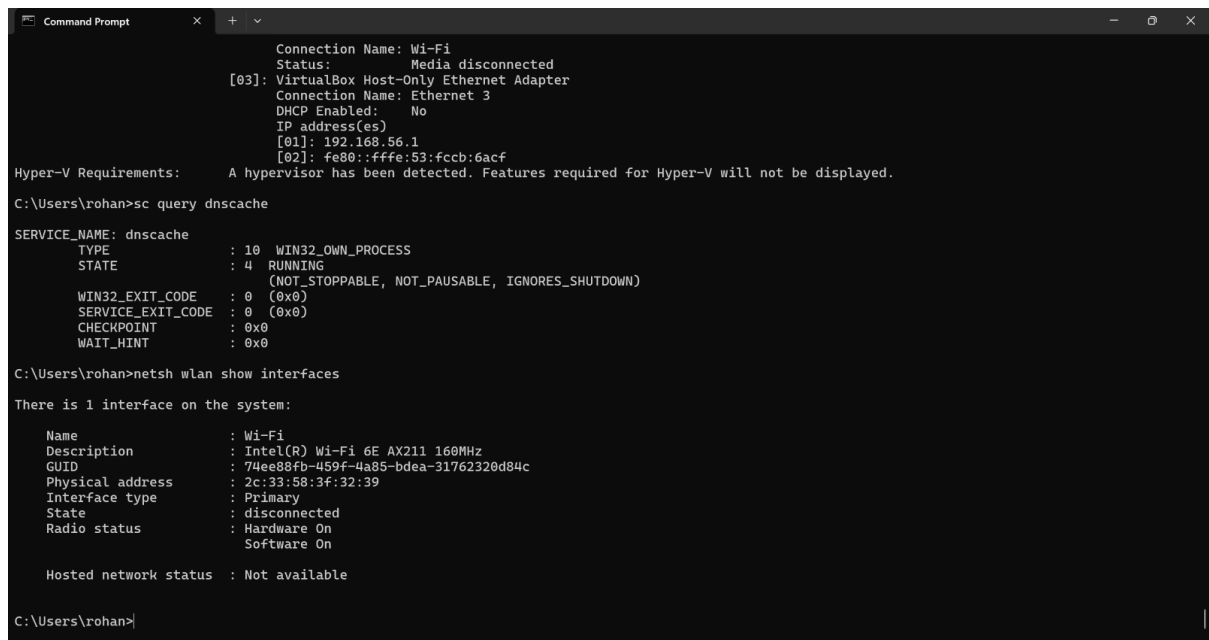
```
sc query dnscache
```

· **What It's Used For:**

- Manages Windows services, such as starting, stopping, or querying the status of networking-related services.

· **Why It's Important:**

- Critical for diagnosing issues with services like DNS, DHCP, or networking drivers.



```
Command Prompt
Connection Name: Wi-Fi
Status: Media disconnected
[03]: VirtualBox Host-Only Ethernet Adapter
Connection Name: Ethernet 3
DHCP Enabled: No
IP address(es)
[01]: 192.168.56.1
[02]: fe80::ffff:53:fcdb:6acf
Hyper-V Requirements: A hypervisor has been detected. Features required for Hyper-V will not be displayed.
C:\Users\rohan>sc query dnscache

SERVICE_NAME: dnscache
        TYPE               : 10  WIN32_OWN_PROCESS
        STATE                : 4   RUNNING
                        (NOT_STOPPABLE, NOT_PAUSABLE, IGNORES_SHUTDOWN)
        WIN32_EXIT_CODE       : 0    (0x0)
        SERVICE_EXIT_CODE   : 0    (0x0)
        CHECKPOINT           : 0x0
        WAIT_HINT            : 0x0

C:\Users\rohan>netsh wlan show interfaces

There is 1 interface on the system:

Name               : Wi-Fi
Description        : Intel(R) Wi-Fi 6E AX211 160MHz
GUID               : 74ee88fb-459f-4a85-bdea-31762320d84c
Physical address   : 2c:33:58:3f:32:39
Interface type     : Primary
State              : disconnected
Radio status       : Hardware On
                   : Software On

Hosted network status : Not available

C:\Users\rohan>
```

15. netsh wlan show interfaces

· **Syntax:**

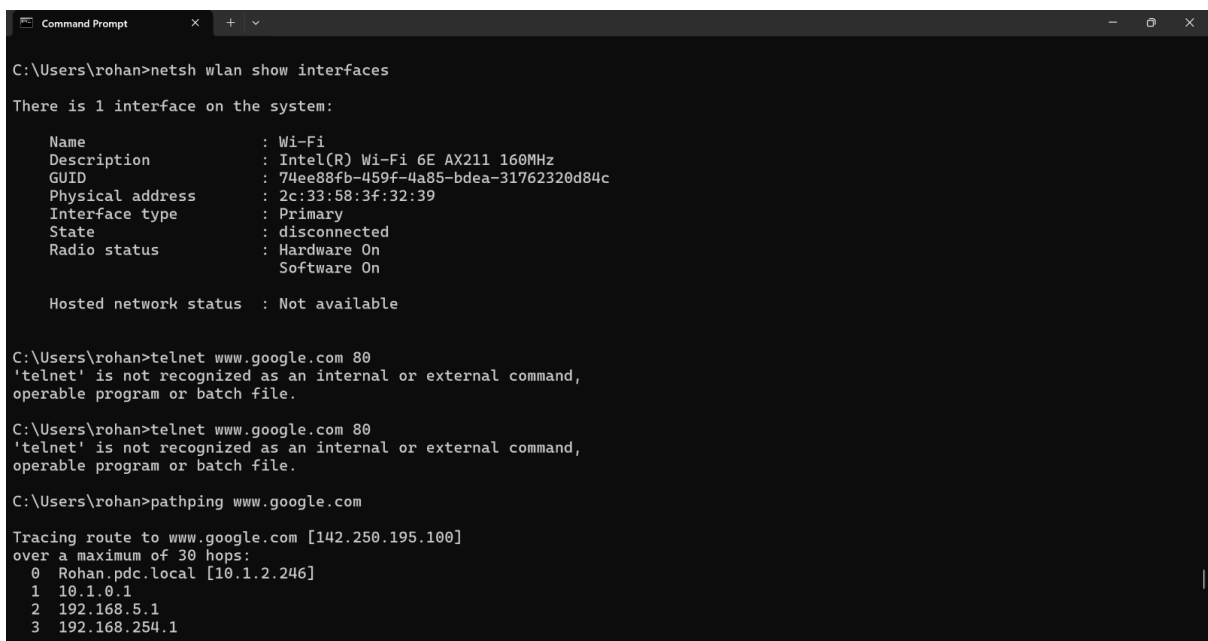
```
netsh wlan show interfaces
```

· **What It's Used For:**

- Displays detailed information about wireless network interfaces, including signal strength and SSID.

· **Why It's Important:**

- Helps troubleshoot wireless connectivity issues and monitor Wi-Fi performance.



```
Command Prompt
C:\Users\rohan>netsh wlan show interfaces

There is 1 interface on the system:

Name                : Wi-Fi
Description          : Intel(R) Wi-Fi 6E AX211 160MHz
GUID                : 74ee88fb-459f-4a85-bdea-31762320d84c
Physical address     : 2c:33:58:3f:32:39
Interface type       : Primary
State                : disconnected
Radio status         : Hardware On
                     : Software On

Hosted network status : Not available

C:\Users\rohan>telnet www.google.com 80
'telnet' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\rohan>telnet www.google.com 80
'telnet' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\rohan>pathping www.google.com

Tracing route to www.google.com [142.250.195.100]
over a maximum of 30 hops:
 0  Rohan.pdc.local [10.1.2.246]
 1  10.1.0.1
 2  192.168.5.1
 3  192.168.254.1
```

16. telnet

· **Syntax:**

```
telnet [hostname or IP address] [port]
```

Example:

```
telnet example.com 80
```

· **What It's Used For:**

- Connects to remote servers using the Telnet protocol to test open ports or communicate with services.

· **Why It's Important:**

- Useful for diagnosing server communication or port accessibility issues.

17. pathping

· **Syntax:**

```
pathping [hostname or IP address]
```

Example:

```
pathping google.com
```

· **What It's Used For:**

- Combines the functionality of ping and tracert to analyze packet loss and latency across the route to a host.

· **Why It's Important:**

- Provides deeper insights into network performance and identifies problematic network hops.

18. fsutil

· **Syntax:**

```
fsutil behavior set disable8dot3 1
```

· **What It's Used For:**

- Performs advanced file and volume management tasks, such as managing filesystems that might interact with network shares.

· **Why It's Important:**

- Useful for ensuring optimal performance when using shared network drives or distributed filesystems.

```

Command Prompt
C:\Users\rohan>fsutil behavior set disable8dot3 1
Error: Access is denied.

C:\Users\rohan>fsutil behavior set disable8dot3
usage: fsutil 8dot3name set [0 through 3] | [<Volume Path> <0|1>]

When a volume is not specified the operation updates the registry value:

    0 - Enable 8dot3 name creation on all volumes on the system
    1 - Disable 8dot3 name creation on all volumes on the system
    2 - Set 8dot3 name creation on a per volume basis (default)
    3 - Disable 8dot3 name creation on all volumes except the
        system volume

When a volume is specified this operation updates the individual
volume's on disk state. This operation is only meaningful
if the registry value is set to 2.

    0 - Enable 8dot3 name creation on this volume
    1 - Disable 8dot3 name creation on this volume

This operation takes effect immediately (no reboot required)

Sample commands:
    "fsutil 8dot3name set 1"      - disable 8dot3 name creation on all volumes
    "fsutil 8dot3name set C: 1"  - disable 8dot3 name creation on c:

C:\Users\rohan>wmic nic get name, macaddress
MACAddress      Name
58:11:22:88:D9:97  Microsoft Kernel Debug Network Adapter
2C:33:58:3F:32:39  Realtek PCIe GbE Family Controller
2C:33:58:3F:32:39  Intel(R) Wi-Fi 6E AX211 160MHz
2C:33:58:3F:32:39  Bluetooth Device (Personal Area Network)

```

19. wmic

· **Syntax:**

```
wmic [context]
```

Example:

```
wmic nic get name, macaddress
```

· **What It's Used For:**

- Executes Windows Management Instrumentation (WMI) queries for detailed information about network adapters and other hardware.

· **Why It's Important:**

- Provides low-level details about hardware and network interfaces that can assist in troubleshooting.

```
Command Prompt
C:\Users\rohan>wmic nic get name, macaddress
MACAddress      Name
58:11:22:88:D9:97  Microsoft Kernel Debug Network Adapter
2C:33:58:3F:32:39  Realtek PCIe GbE Family Controller
2C:33:58:3F:32:3A  Intel(R) Wi-Fi 6E AX211 160MHz
                  Bluetooth Device (Personal Area Network)
2C:33:58:3F:32:3A  Microsoft Wi-Fi Direct Virtual Adapter
                  Microsoft Wi-Fi Direct Virtual Adapter
                  WAN Miniport (SSTP)
                  WAN Miniport (IKEv2)
                  WAN Miniport (L2TP)
                  WAN Miniport (PPTP)
                  WAN Miniport (PPPOE)
A8:2B:20:52:41:53  WAN Miniport (IP)
A8:04:20:52:41:53  WAN Miniport (IPv6)
AA:CD:20:52:41:53  WAN Miniport (Network Monitor)
0A:00:27:00:00:0B  VirtualBox Host-Only Ethernet Adapter

C:\Users\rohan>fsutil behavior set disable8dot3 1
Error: Access is denied.

C:\Users\rohan>net user Administrator
User name      Administrator
Full Name
Comment        Built-in account for administering the computer/domain
User's comment
Country/region code  000 (System Default)
Account active   No
Account expires   Never

Password last set  13-01-2025 04:18:55 PM
Password expires   Never
```

20. net user

· **Syntax:**

```
net user [username]
```

Example:

```
net user Administrator
```

· **What It's Used For:**

- Displays or manages user account details, such as permissions and login status.

· **Why It's Important:**

- Helps verify or configure user accounts that might impact network resource access or privileges.

```
Command Prompt
C:\Users\rohan>powercfg /energy
This command requires administrator privileges and must be executed from an elevated command prompt.

C:\Users\rohan>systeminfo

Host Name:                ROHAN
OS Name:                  Microsoft Windows 11 Home Single Language
OS Version:               10.0.22631 N/A Build 22631
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         rohanjjogi@gmail.com
Registered Organization:  N/A
Product ID:               00342-W263H-24113-AAOEM
Original Install Date:    03-09-2023, 04:31:43 AM
System Boot Time:         13-01-2025, 02:40:01 PM
System Manufacturer:      ASUSTek COMPUTER INC.
System Model:              Vivobook_ASUSLaptop K6502VU_K6502VU
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 186 Stepping 2 GenuineIntel ~2600 Mhz
BIOS Version:              American Megatrends International, LLC. K6502VU.311, 23-04-2024
Windows Directory:        C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:              en-us;English (United States)
Input Locale:              00004009
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:     16,011 MB
Available Physical Memory: 7,879 MB
Virtual Memory: Max Size:  18,443 MB
Virtual Memory: Available: 8,207 MB
Virtual Memory: In Use:    10,236 MB
Page File Location(s):     C:\pagefile.sys
Domain:                    WORKGROUP
Logon Server:               \\ROHAN
Hotfix(s):                  8 Hotfix(s) Installed.
```