

# **Assignment - 1**

of

## **Cyber Security Laboratory**

### **(CSE612)**

**Bachelor of Technology (CSE)**

By

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**Q1. Using appropriate command, find out the IP address/es, Default Gateway IP address, Subnet Mask, Primary DNS Server IP address, DHCP Server IP address (if any), MAC address and NIC Card Description of your PC. Identify each IP address shown as an IPv4 or an IPv6 IP address**

**Input:**

ipconfig /all

**Output:**

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

Windows IP Configuration

    Host Name . . . . . : LAPTOP-HTHH8URV
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No

Wireless LAN adapter Local Area Connection* 3:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #3
    Physical Address. . . . . : 2E-3B-70-64-6D-F9
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 4:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #4
    Physical Address. . . . . : AE-3B-70-64-6D-F9
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes


Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . :
    Description . . . . . : Realtek RTL8821CE 802.11ac PCIe Adapter
    Physical Address. . . . . : 2C-3B-70-64-6D-F9
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    IPv6 Address. . . . . : 2401:4900:1f3f:c6c:5569:7729:5dab:a2b5(Preferred)
    Temporary IPv6 Address. . . . . : 2401:4900:1f3f:c6c:6170:5465:9b95:7e45(Preferred)
    Link-local IPv6 Address . . . . . : fe80::2054:ca96:64ec:3fd2%18(Preferred)
    IPv4 Address. . . . . : 192.168.1.4(Preferred)
    Subnet Mask . . . . . : 255.255.255.0
    Lease Obtained. . . . . : 07 April 2025 17:48:15
    Lease Expires . . . . . : 08 April 2025 22:37:20
    Default Gateway . . . . . : fe80::1%18
                                192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DHCPv6 IAID . . . . . : 86784880
    DHCPv6 Client DUID. . . . . : 00-01-00-01-2C-CA-17-8B-2C-3B-70-64-6D-F9
    DNS Servers . . . . . : 2401:4900:50:9::9
                                192.168.1.1
    Primary WINS Server . . . . . : 192.168.1.1
    NetBIOS over Tcpip. . . . . : Enabled

C:\Users\kaush>
```

**Information to Collect (from output):**

Parameter	Value Example (from output)	Explanation
IPv4 Address	192.168.1.4	IPv4 Address assigned to the PC
IPv6 Address	2401:4900:1f3f:c6c:5569:7729:5dab:a2b5	IPv6 Address of the PC
Default Gateway	192.168.1.1	IP of the router
Subnet Mask	255.255.255.0	Defines IP range of the subnet
Primary DNS Server	2401:4900:50:9::9	Google DNS or ISP DNS
DHCP Server	192.168.1.1	Server that provides IP dynamically
MAC Address (Physical Addr.)	2C-3B-70-64-6D-F9	Unique hardware ID of NIC card

**Identifying IP Address Type:**

- **IPv4 Address** → 192.168.1.4
- **IPv6 Address** → 2401:4900:1f3f:c6c:5569:7729:5dab:a2b5

**Q2. Determine, using appropriate command, whether your Device is having IP level connectivity with the machine hosting [www.yahoo.com](http://www.yahoo.com).**

**Input:**

ping [www.yahoo.com](http://www.yahoo.com)

**Output:**

```
C:\Users\kaush>ping www.yahoo.com

Pinging me-ycpi-cf-www.g06.yahoodns.net [2406:8600:f03f:1fa::2000] with 32 bytes of data:
Reply from 2406:8600:f03f:1fa::2000: time=14ms
Reply from 2406:8600:f03f:1fa::2000: time=16ms
Reply from 2406:8600:f03f:1fa::2000: time=18ms
Reply from 2406:8600:f03f:1fa::2000: time=17ms

Ping statistics for 2406:8600:f03f:1fa::2000:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 18ms, Average = 16ms

C:\Users\kaush>
```

Since all packets were received and loss = 0%, your device has IP-level connectivity with [www.yahoo.com](http://www.yahoo.com).

The IP address 2406:8600:f03f:1fa::2000 is the IPv4 address of Yahoo's server.

**Q3. Based on above exercise 2,  
determine:**

**a) The % packet loss**

**b) The Average RTT**

**a) The % packet loss**

Answer: 0% packet loss

**b) The Average RTT**

Average = 16ms

**Q4. Identify the IP address and its type (4 or 6) for www.yahoo.com based on the results obtained in 2.**

**IP Address Identified:**

- IP Address of www.yahoo.com: 2406:8600:f03f:1fa::2000

**Type of IP Address:**

- Eight groups separated by colons (:), possibly shortened using ::.
- Includes hexadecimal characters (0–9 and a–f).
- This is the IPv6 address.

**Q5. Find out the IPv4 address of the machine hosting [www.bata.com](http://www.bata.com)**

**Input:**

nslookup [www.bata.com](http://www.bata.com)

**Output:**

```
C:\Users\kaush>nslookup www.bata.com
Server: UnKnown
Address: 2401:4900:50:9::9

Non-authoritative answer:
Name: e180486.dsca.akamaiedge.net
Addresses: 2600:140f:2e00::172c:ecf8
           2600:140f:2e00::b856:7071
           23.64.1.216
           96.17.194.233
Aliases: www.bata.com
          www.bata.com.edgekey.net

C:\Users\kaush>
```

**IPv4 Address of [www.bata.com](http://www.bata.com):**

From the list, the IPv4 addresses are:

- 96.17.194.233
- 23.64.1.216

**Final Answer:**

IP Address	Type
2600:140f:2e00::b856:7071	IPv6
2600:140f:2e00::172c:ecf8	IPv6
96.17.194.233	IPv4
23.64.1.216	IPv4

**Q6. Find out the IPv6 address of the machine hosting [www.bata.com](http://www.bata.com)**

**Identify IPv6 Addresses:**

**IPv6 addresses have:**

- Hexadecimal values
- Colons (:) as separators
- Can use double colons :: to compress consecutive zeros

**So, these are IPv6:**

- 2600:140f:2e00::b856:7071
- 2600:140f:2e00::172c:ecf8



**Q7. Construct and execute a command to continuously bombard www.bata.com with ICMP echo request messages. The bombarding should stop only with manual intervention.**

**Input:**

ping www.bata.com -t

**Explanation:**

Part	Meaning
ping	Command to send ICMP echo request
www.bata.com	Target hostname
-t	Tells Windows to <b>ping continuously</b> until stopped

**Output:**

```
C:\Users\kaush>ping www.bata.com -t

Pinging e180486.dsca.akamaiedge.net [2600:140f:2e00::172c:ecf8] with 32 bytes of data:
Reply from 2600:140f:2e00::172c:ecf8: time=55ms
Reply from 2600:140f:2e00::172c:ecf8: time=54ms
Reply from 2600:140f:2e00::172c:ecf8: time=63ms
Reply from 2600:140f:2e00::172c:ecf8: time=55ms
Reply from 2600:140f:2e00::172c:ecf8: time=63ms
Reply from 2600:140f:2e00::172c:ecf8: time=59ms
Reply from 2600:140f:2e00::172c:ecf8: time=209ms
Reply from 2600:140f:2e00::172c:ecf8: time=360ms
Reply from 2600:140f:2e00::172c:ecf8: time=159ms
Reply from 2600:140f:2e00::172c:ecf8: time=378ms
Reply from 2600:140f:2e00::172c:ecf8: time=206ms
Reply from 2600:140f:2e00::172c:ecf8: time=465ms
Request timed out.
Request timed out.
Reply from 2600:140f:2e00::172c:ecf8: time=251ms
Reply from 2600:140f:2e00::172c:ecf8: time=189ms
Reply from 2600:140f:2e00::172c:ecf8: time=57ms
Reply from 2600:140f:2e00::172c:ecf8: time=55ms
Reply from 2600:140f:2e00::172c:ecf8: time=58ms
Reply from 2600:140f:2e00::172c:ecf8: time=137ms
Reply from 2600:140f:2e00::172c:ecf8: time=100ms
Reply from 2600:140f:2e00::172c:ecf8: time=55ms
Reply from 2600:140f:2e00::172c:ecf8: time=345ms
Reply from 2600:140f:2e00::172c:ecf8: time=349ms
Reply from 2600:140f:2e00::172c:ecf8: time=300ms
Reply from 2600:140f:2e00::172c:ecf8: time=422ms
Request timed out.
Reply from 2600:140f:2e00::172c:ecf8: time=62ms
Reply from 2600:140f:2e00::172c:ecf8: time=54ms
Reply from 2600:140f:2e00::172c:ecf8: time=53ms

Ping statistics for 2600:140f:2e00::172c:ecf8:
    Packets: Sent = 30, Received = 27, Lost = 3 (10% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 53ms, Maximum = 465ms, Average = 170ms
Reply from 2600:140f:2e00::172c:ecf8: Control-C
^C
C:\Users\kaush>
```

**Q8. Identify the host name of the machine whose IPv4 address is 27.123.43.205 using appropriate command.**

**Input:**

nslookup 27.123.43.205

**Output:**

```
C:\Users\kaush>nslookup 27.123.43.205
Server: UnKnown
Address: 2401:4900:50:9::9

Name: e2-ha.ycpi.inb.yahoo.com
Address: 27.123.43.205

C:\Users\kaush>
```

Parameter	Value
IP Address	27.123.43.205
Command Used	nslookup 27.123.43.205
Host Name	e2-ha.ycpi.inb.yahoo.com

**Q9. Determine, using appropriate command, whether your Device is having IP level connectivity with the machine hosting www.yahoo.com. You are restricted to using up-to sending test packets two times only.**

**Input:**

```
ping www.yahoo.com -n 2
```

**Explanation:**

Part	Meaning
ping	ICMP echo request
www.yahoo.com	The destination hostname
-n 2	Send only <b>2 packets</b> (test packets)

**Output:**

```
C:\Users\kaush>ping www.yahoo.com -n 2

Pinging me-ycpi-cf-www.g06.yahoodns.net [2406:2000:e4:1604::1001] with 32 bytes of data:
Reply from 2406:2000:e4:1604::1001: time=72ms
Reply from 2406:2000:e4:1604::1001: time=71ms

Ping statistics for 2406:2000:e4:1604::1001:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 71ms, Maximum = 72ms, Average = 71ms

C:\Users\kaush>
```

Parameter	Value
Command Used	ping www.yahoo.com -n 2
Packets Sent	2
Packets Received	2
Packet Loss	0%

**Q.10 What is the default size of the test packet in exercise 2? Now override the default packet size to 128 bytes and repeat the same exercise of 2.**

**Part A: Default Size of Ping Packets**

**Input:**

ping www.yahoo.com -n 2

**Output:**

```
C:\Users\kaush>ping www.yahoo.com -n 2

Pinging me-ycpi-cf-www.g06.yahoodns.net [2406:2000:e4:1604::1000] with 32 bytes of data:
Reply from 2406:2000:e4:1604::1000: time=338ms
Reply from 2406:2000:e4:1604::1000: time=258ms

Ping statistics for 2406:2000:e4:1604::1000:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 258ms, Maximum = 338ms, Average = 298ms

C:\Users\kaush>
```

So the default size is 32 bytes on Windows systems.

**Part B: Override to 128 Bytes**

**Input:**

ping www.yahoo.com -n 2 -l 128

**Explanation of Flags:**

**Flag    Function**

-n 2    Send exactly 2 echo requests

-l 128 Set packet size to 128 bytes

**Output:**

```
C:\Users\kaush>ping www.yahoo.com -n 2 -l 128

Pinging me-ycpi-cf-www.g06.yahoodns.net [2406:2000:e4:1604::1000] with 128 bytes of data:
Reply from 2406:2000:e4:1604::1000: time=389ms
Reply from 2406:2000:e4:1604::1000: time=299ms

Ping statistics for 2406:2000:e4:1604::1000:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 299ms, Maximum = 389ms, Average = 344ms

C:\Users\kaush>
```

Parameter	Value
Default Packet Size	32 bytes
Command Used (Custom Size)	ping www.yahoo.com -n 2 -l 128
Custom Packet Size	128 bytes
Packets Sent/Received	2 / 2
Packet Loss	0%

**Q11. Check whether it is possible to reach the website of 'PGP glass' without fragmentation.**

**Input:**

```
ping www.pgplglass.com -f -l 1472
```

**Explanation:**

Flag	Meaning
-f	Don't Fragment
-l 1472	Set payload size to 1472 bytes
1472 + 28	= 1500 bytes (max MTU size for Ethernet)

**Output:**

```
C:\Users\kaush>ping www.pgpfirfirst.com -f -l 1472

Pinging pgpfirfirst.com [199.16.173.154] with 1472 bytes of data:
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.

Ping statistics for 199.16.173.154:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\kaush>
```

Parameter	Value
-----------	-------

Website Tested	<a href="http://www.pgplglass.com">www.pgplglass.com</a> (also tried pgplglass.com)
----------------	---

Command Used	ping www.pgplglass.com -f -l 1472
--------------	-----------------------------------

**Conclusion:**

A ping test was performed using the command ping www.pgpfirfirst.com -f -l 1472 to check if packets can reach the PGP Glass website without fragmentation.

The result showed the message "Packet needs to be fragmented but DF set", indicating that the packets of size 1472 bytes could not be transmitted without fragmentation.

Therefore, it is not possible to reach the website of PGP Glass without fragmentation.

**Q12. Determine, using appropriate command, whether it is possible from your Device to have IP level connectivity with the machine hosting [www.yahoo.com](http://www.yahoo.com) using IPv4 only.**

**Step 1: Find the IPv4 address of [www.yahoo.com](http://www.yahoo.com)**

**Input:**

nslookup [www.yahoo.com](http://www.yahoo.com)

**Output:**

```
C:\Users\kaush>nslookup www.yahoo.com
Server: UnKnown
Address: 2401:4900:50:9::9

Non-authoritative answer:
Name: me-ycpi-cf-www.g06.yahoodns.net
Addresses: 2406:2000:98:800::e6
           2406:2000:e4:1604::1000
           2406:2000:98:800::e5
           2406:2000:e4:1604::1001
           106.10.236.37
           106.10.236.40
           180.222.114.12
           180.222.114.11
Aliases: www.yahoo.com

C:\Users\kaush>
```

Look for the IPv4 address in the output.

**Step 2: Ping the IPv4 address directly**

**Input:**

ping 106.10.236.37 -n 2

**Output:**

```
C:\Users\kaush>ping 106.10.236.37 -n 2

Pinging 106.10.236.37 with 32 bytes of data:
Reply from 106.10.236.37: bytes=32 time=291ms TTL=54
Reply from 106.10.236.37: bytes=32 time=197ms TTL=54

Ping statistics for 106.10.236.37:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 197ms, Maximum = 291ms, Average = 244ms

C:\Users\kaush>
```

**Q13. Determine, using appropriate command, whether it is possible from your Device to have IP level connectivity with the machine hosting [www.bata.com](http://www.bata.com) using IPv6 only.**

**Step 1: Use nslookup to find the IPv6 address of [www.bata.com](http://www.bata.com)**

**Input:**

nslookup [www.bata.com](http://www.bata.com)

**Output:**

```
C:\Users\kaush>nslookup www.bata.com
Server: UnKnown
Address: 2401:4900:50:9::9

Non-authoritative answer:
Name: e180486.dsca.akamaiedge.net
Addresses: 2600:140f:2e00::172c:ece0
           2600:140f:2e00::172c:ece8
           23.44.236.232
           23.44.236.224
Aliases: www.bata.com
          www.bata.com.edgekey.net

C:\Users\kaush>
```

**Two IPv6 addresses were identified:**

- 2600:140f:2e00::172c:ece0
- 2600:140f:2e00::172c:ece8

**Step 2: Use ping with IPv6-only option**

**Input:**

ping -6 2600:140f:2e00::172c:ece0 -n 2

**Output:**

```
C:\Users\kaush>ping -6 2600:140f:2e00::172c:ece0 -n 2

Pinging 2600:140f:2e00::172c:ece0 with 32 bytes of data:
Reply from 2600:140f:2e00::172c:ece0: time=45ms
Reply from 2600:140f:2e00::172c:ece0: time=45ms

Ping statistics for 2600:140f:2e00::172c:ece0:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 45ms, Maximum = 45ms, Average = 45ms

C:\Users\kaush>
```



**Q14. Find out whether it is possible to reach [www.bata.com](http://www.bata.com) from your machine within 3 hops only.**

**Input:**

tracert -h 3 [www.bata.com](http://www.bata.com)

- tracert: Traceroute command in Windows to trace the path.
- -h 3: Limits the number of hops to **3**.

**Output:**

```
C:\Users\kaush>tracert -h 3 www.bata.com

Tracing route to e180486.dsca.akamaiedge.net [2600:140f:2e00::172c:ecf8]
over a maximum of 3 hops:

  1  253 ms  251 ms   6 ms  2401:4900:1f3f:c6c:b6a7:c6ff:fe1a:aa50
  2  192 ms   14 ms  293 ms  2401:4900:1f3e:8fff::1
  3   11 ms  207 ms  501 ms  2404:a800:2a00:105::41

Trace complete.

C:\Users\kaush>
```

- The traceroute successfully completed 3 hops.
- However, the final destination (i.e., [www.bata.com](http://www.bata.com) → 2600:140f:2e00::172c:ecf8) was not reached within those 3 hops.
- The 3rd hop is just an intermediate router, not the actual destination.

It is NOT possible to reach [www.bata.com](http://www.bata.com) within 3 hops

**Q15. Assuming you are in LAN, using appropriate command, find out the MAC address of your neighbor's PC remotely, without invoking any command on his/her PC or asking your neighbor.**

**Step A: Get Your Neighbor's IP Address.**

**Input:**

arp -a

**Output:**

```
C:\Users\Vishal>arp -a

Interface: 192.168.1.2 --- 0x11
Internet Address      Physical Address      Type
192.168.1.1           b4-a7-c6-1a-aa-50     dynamic
192.168.1.255         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
224.77.77.77          01-00-5e-4d-4d-4d     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\Vishal>
```

**Step B: Ping the Neighbor's Device to Populate the ARP Table**

**Input:**

ping 192.168.1.1

**Output:**

```
C:\Users\kaush>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 3ms, Average = 2ms

C:\Users\kaush>
```

**Step C: Use arp -a to View the MAC Address****Input:**

arp -a

**Output:**

```
C:\Users\kaush>arp -a

Interface: 192.168.1.7 --- 0x12
    Internet Address      Physical Address      Type
    192.168.1.1           b4-a7-c6-1a-aa-50     dynamic
    192.168.1.255         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
    255.255.255.255       ff-ff-ff-ff-ff-ff     static

C:\Users\kaush>
```

**Q16. Check whether it is possible to reach Indian Railways Website within 8 hops.**

**Input:**

tracert -h 8 www.indianrail.gov.in

**Output:**

```
C:\Users\kaush>tracert -h 8 www.indianrail.gov.in

Tracing route to indianrail.gov.in [203.176.113.78]
over a maximum of 8 hops:

  1    2 ms    5 ms    3 ms  192.168.1.1
  2   10 ms    7 ms    8 ms  117.99.111.255
  3    9 ms    9 ms    8 ms  182.66.231.117
  4    *      67 ms   *    116.119.44.2
  5    *      *      *    Request timed out.
  6    *      *      *    Request timed out.
  7    *      *      *    Request timed out.
  8    *      *      *    Request timed out.

Trace complete.

C:\Users\kaush>
```

Hop	Response	Status
1	192.168.1.1	Reached
2	117.99.111.255	Reached
3	182.66.231.117	Reached
4	116.119.44.2	Partial (1 reply)
5-8	* * *	Timed out

No, the Indian Railways website was *not* reachable within 8 hops.

**Q17. Using nslookup command, find out the IP address of the Indian Railways Website. Find out the IP address of the DNS server which gave you this reply. Also identify whether the reply was authoritative or not.**

**Input:**

nslookup www.indianrail.gov.in

**Output:**

```
C:\Users\kaush>nslookup www.indianrail.gov.in
Server: UnKnown
Address: 2401:4900:50:9::9

Non-authoritative answer:
Name:    indianrail.gov.in
Address: 203.176.113.78
Aliases: www.indianrail.gov.in

C:\Users\kaush>
```

- **IP address of Indian Railways Website:** 203.176.113.78
- **IP address of the DNS server used:** 2401:4900:50:9::9
- **Reply Type:** Non-authoritative

**Q18. Repeat exercise 17 using Google's DNS server.****Input:**

nslookup www.indianrail.gov.in 8.8.8.8

**Output:**

```
C:\Users\kaush>nslookup www.indianrail.gov.in 8.8.8.8
Server:  dns.google
Address:  8.8.8.8

Non-authoritative answer:
Name:    indianrail.gov.in
Address: 203.176.113.78
Aliases: www.indianrail.gov.in

C:\Users\kaush>
```

- **IP Address of Indian Railways Website:** 203.176.113.78
- **DNS Server Used:** 8.8.8.8 (Google Public DNS)
- **Type of Reply:** Non-authoritative

**Q19. Display all active TCP connections in your PC using appropriate command.**

**Input:**

```
netstat -an | find "TCP"
```

**Output:**

```
C:\Users\kaush>netstat -an | find "TCP"
TCP    0.0.0.0:135          0.0.0.0:*           LISTENING
TCP    0.0.0.0:445          0.0.0.0:*           LISTENING
TCP    0.0.0.0:3306         0.0.0.0:*           LISTENING
TCP    0.0.0.0:5040         0.0.0.0:*           LISTENING
TCP    0.0.0.0:33060        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49664        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49665        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49666        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49667        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49668        0.0.0.0:*           LISTENING
TCP    0.0.0.0:49673        0.0.0.0:*           LISTENING
TCP    127.0.0.1:27017      0.0.0.0:*           LISTENING
TCP    127.0.0.1:49669      127.0.0.1:49670     ESTABLISHED
TCP    127.0.0.1:49670      127.0.0.1:49669     ESTABLISHED
TCP    127.0.0.1:49671      127.0.0.1:49672     ESTABLISHED
TCP    127.0.0.1:49672      127.0.0.1:49671     ESTABLISHED
TCP    192.168.1.4:139      0.0.0.0:*           LISTENING
TCP    192.168.1.4:58314    172.172.255.217:443 ESTABLISHED
TCP    192.168.1.4:58805    35.174.127.31:443   ESTABLISHED
TCP    192.168.1.4:58810    52.187.79.109:443   ESTABLISHED
TCP    192.168.1.4:58834    34.193.80.228:443   ESTABLISHED
TCP    192.168.1.4:58874    34.195.194.204:443  ESTABLISHED
TCP    192.168.1.4:58898    20.189.173.6:443    ESTABLISHED
TCP    192.168.1.4:58903    52.104.66.55:443    TIME_WAIT
TCP    192.168.1.4:58907    20.189.173.13:443   TIME_WAIT
TCP    192.168.1.4:58908    52.168.112.66:443   TIME_WAIT
TCP    192.168.1.4:58909    54.192.142.120:443  ESTABLISHED
TCP    192.168.1.4:58916    3.233.158.25:443    ESTABLISHED
TCP    [::]:135            [::]:*              LISTENING
TCP    [::]:445            [::]:*              LISTENING
TCP    [::]:3306           [::]:*              LISTENING
TCP    [::]:33060          [::]:*              LISTENING
TCP    [::]:49664          [::]:*              LISTENING
TCP    [::]:49665          [::]:*              LISTENING
TCP    [::]:49666          [::]:*              LISTENING
TCP    [::]:49667          [::]:*              LISTENING
TCP    [::]:49668          [::]:*              LISTENING
TCP    [::]:49673          [::]:*              LISTENING
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:49700 [2603:1030:210:f::1]:443 ESTABLISHED
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:58809 [2404:6800:4003:c04::bc]:5228 ESTABLISHED
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:58879 [2606:4700:8392:7cbc:c239:496:5ff2:75c4]:443 ESTABLISHED
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:58880 [2606:4700:8392:7cbc:c239:496:5ff2:75c4]:443 ESTABLISHED
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:58887 [2a03:2880:f244:1c6:face:b00c:0:7260]:80 ESTABLISHED
TCP    [2401:4900:1f3f:c6c:c0e5:36d7:6cc6:cb7e]:58915 [2600:1f18:24e6:b900:2d16:a724:7ca3:5c63]:443 ESTABLISHED
C:\Users\kaush>
```

**This command displays all active TCP connections:**

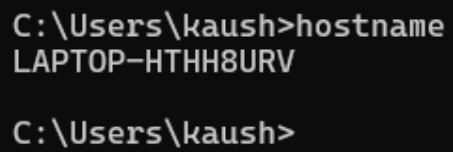
- **Protocol** (TCP in this case),
- **Local Address** (your PC),
- **Foreign Address** (remote IP or domain you are connected to),
- **State** (such as LISTENING, ESTABLISHED, TIME\_WAIT etc.).
- Loopback connections (127.0.0.1),
- Private network connections (192.168.x.x),
- IPv6 external connections.

**Q20. Display the hostname of your PC using an appropriate command.**

**Input:**

hostname

**Output:**



```
C:\Users\kaush>hostname  
LAPTOP-HTHH8URV  
  
C:\Users\kaush>
```

- The hostname command returns the name of the computer on the network.
- It's useful to identify your machine when working with networks, especially in LAN or domain setups.