

## Computer Networks

### Experiment 1

Aim: To study different networking commands.

1. `ifconfig` / `ipconfig`: Displays and configures the network interfaces on Unix-like (`ifconfig`) and Windows (`ipconfig`) systems, showing IP address, subnet mask, and gateway.

Eg: `ifconfig /all`

2. `ping`: Tests the reachability of a host on an IP network by sending ICMP echo request packets and measuring the response time.

Eg: `ping example.com`

3. `nslookup`: Queries the DNS to find the IP address associated with a domain name or vice versa, useful for troubleshooting DNS issues.

Eg: `nslookup example.com`

4. `hostname`: Displays or sets the hostname of the system, which is the name used to identify the device on a network.

Eg: `hostname`

5. `netstat`: Displays network connections, routing tables, interface statistics, masquerade connections, and multicast device memberships.

Eg: `netstat -an`

6. `nbtstat`: Displays NetBIOS over TCP/IP protocol statistics for Windows, showing details like the table of NetBIOS names and the status of NetBIOS connections.



7. net: Used to manage network resources, including network shares, user, and services on Windows.

Eg: net use Z:\server\share

8. tracert: Traces the path that packets take from the source to the destination, showing each hop on the route and its response time.

Eg: tracert example.com

9. arp: Displays or modifies the ARP table, which maps IP addresses to MAC addresses.

Eg: arp -a

10. getmac: Retrieves the MAC addresses of all network interfaces on the system.

Eg: getmac

Conclusion: Thus we



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**Class: T.Y. B.Tech.**

**Semester: V**

**Course Name: Computer Networks Lab**

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## Experiment No: 1

**Aim:** To study different networking commands.

### ipconfig:-

```
C:\Users\djsce.student>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

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

Ethernet adapter Ethernet 2:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::a3ce:e43a:ade3:8981%5
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 1:

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

Wireless LAN adapter Local Area Connection* 2:

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

Ethernet adapter VMware Network Adapter VMnet1:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::41b4:3d3d:51ee:be0b%4
    IPv4 Address. . . . . : 192.168.204.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Ethernet adapter VMware Network Adapter VMnet8:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::c47a:2ab3:86:2bee%10
    IPv4 Address. . . . . : 192.168.126.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::78d6:e0e6:879:88c6%3
    IPv4 Address. . . . . : 10.120.112.232
    Subnet Mask . . . . . : 255.255.254.0
    Default Gateway . . . . . : 10.120.112.1
```



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➤ **ipconfig /all :-**

```
C:\Users\djsce.student>ipconfig /all

Windows IP Configuration

Host Name . . . . . : MUM0922CPU0418
Primary Dns Suffix . . . . . : SVKMGRP.COM
Node Type . . . . . : Mixed
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : SVKMGRP.COM


Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : 
Description . . . . . : Intel(R) Ethernet Connection (11) I219-LM
Physical Address. . . . . : 84-69-93-95-25-98
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes


Ethernet adapter Ethernet 2:

Connection-specific DNS Suffix . : 
Description . . . . . : VirtualBox Host-Only Ethernet Adapter
Physical Address. . . . . : 0A-00-27-00-00-05
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::a3ce:e43a:ade3:8981%5(Preferred)
IPv4 Address. . . . . : 192.168.56.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 
DHCPv6 IAID . . . . . : 839516199
DHCPv6 Client DUID. . . . . : 00-01-00-01-29-E0-C1-84-84-69-93-95-25-98
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                       fec0:0:0:ffff::2%1
                       fec0:0:0:ffff::3%1
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. . . . . : BC-09-1B-26-97-98
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes


Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : 
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : BE-09-1B-26-97-97
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes


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
```





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➤ **ipconfig /release :-**

```
C:\Users\Acer>ipconfig /release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 3 while it has its media disconnected.

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* 3:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::18ab:f686:78af:609d%14
    Default Gateway . . . . . :
```

➤ **ipconfig /renew :-**

```
C:\Users\Acer>ipconfig /renew

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 3 while it has its media disconnected.

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* 3:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::18ab:f686:78af:609d%14
    IPv4 Address. . . . . : 192.168.0.104
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

C:\Users\Acer>
```



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### ➤ ipconfig /? :-

```
C:\Users\Acer>ipconfig /?

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

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

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

### ➤ ipconfig/flushdns :-

```
C:\Users\Acer>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\Users\Acer>
```



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Command : ping <url>

```
Windows IP Configuration
```

```
Successfully flushed the DNS Resolver Cache.
```

```
C:\Users\djsce.student>ping www.google.com
```

```
Pinging www.google.com [142.250.67.164] with 32 bytes of data:
```

```
Reply from 142.250.67.164: bytes=32 time=8ms TTL=115
```

```
Reply from 142.250.67.164: bytes=32 time=78ms TTL=116
```

```
Reply from 142.250.67.164: bytes=32 time=39ms TTL=116
```

```
Reply from 142.250.67.164: bytes=32 time=4ms TTL=115
```

```
Ping statistics for 142.250.67.164:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 4ms, Maximum = 78ms, Average = 32ms
```

```
C:\Users\djsce.student>
```

Other commands :

```
C:\Windows\System32>ping www.google.com -n 5
```

```
Pinging www.google.com [142.250.76.196] with 32 bytes of data:
```

```
Reply from 142.250.76.196: bytes=32 time=4ms TTL=60
```

```
Reply from 142.250.76.196: bytes=32 time=4ms TTL=60
```

```
Reply from 142.250.76.196: bytes=32 time=15ms TTL=60
```

```
Reply from 142.250.76.196: bytes=32 time=4ms TTL=60
```

```
Reply from 142.250.76.196: bytes=32 time=5ms TTL=60
```

```
Ping statistics for 142.250.76.196:
```

```
    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 4ms, Maximum = 15ms, Average = 6ms
```



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```
C:\Windows\System32>ping www.google.com -t

Pinging www.google.com [142.250.76.196] with 32 bytes of data:
Reply from 142.250.76.196: bytes=32 time=337ms TTL=60
Reply from 142.250.76.196: bytes=32 time=50ms TTL=60
Reply from 142.250.76.196: bytes=32 time=6ms TTL=60
Reply from 142.250.76.196: bytes=32 time=6ms TTL=60
Reply from 142.250.76.196: bytes=32 time=5ms TTL=60
Reply from 142.250.76.196: bytes=32 time=6ms TTL=60
Reply from 142.250.76.196: bytes=32 time=7ms TTL=60
Reply from 142.250.76.196: bytes=32 time=7ms TTL=60
Reply from 142.250.76.196: bytes=32 time=8ms TTL=60
Reply from 142.250.76.196: bytes=32 time=15ms TTL=60
Reply from 142.250.76.196: bytes=32 time=16ms TTL=60

Ping statistics for 142.250.76.196:
    Packets: Sent = 11, Received = 11, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 5ms, Maximum = 337ms, Average = 42ms
Control-C
^C
C:\Windows\System32>
```





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**Netstat:-**

**Active Connections**

Proto	Local Address	Foreign Address	State
TCP	10.120.112.232:49180	a23-223-244-161:https	CLOSE_WAIT
TCP	10.120.112.232:49185	168.149.132.144:https	CLOSE_WAIT
TCP	10.120.112.232:49186	13.107.246.72:https	CLOSE_WAIT
TCP	10.120.112.232:49193	bom12s07-in-f4:https	ESTABLISHED
TCP	10.120.112.232:49196	216.239.32.181:https	TIME_WAIT
TCP	10.120.112.232:49197	bom12s05-in-f3:https	TIME_WAIT
TCP	10.120.112.232:49208	104.19.222.79:https	ESTABLISHED
TCP	10.120.112.232:49210	151.101.129.91:https	ESTABLISHED
TCP	10.120.112.232:49214	bom12s14-in-f8:https	TIME_WAIT
TCP	10.120.112.232:49219	104.26.13.133:https	ESTABLISHED
TCP	10.120.112.232:49220	104.18.20.206:https	ESTABLISHED
TCP	10.120.112.232:49221	31:https	ESTABLISHED
TCP	10.120.112.232:49225	172.66.41.8:https	ESTABLISHED
TCP	10.120.112.232:49228	104.26.13.133:https	ESTABLISHED
TCP	10.120.112.232:49230	112:https	ESTABLISHED
TCP	10.120.112.232:49234	104.18.20.97:https	ESTABLISHED
TCP	10.120.112.232:49236	31:https	ESTABLISHED
TCP	10.120.112.232:49241	pnbomb-ab-in-f10:https	TIME_WAIT
TCP	10.120.112.232:49296	160:https	ESTABLISHED
TCP	10.120.112.232:49299	kul01s09-in-f67:https	ESTABLISHED
TCP	10.120.112.232:49300	pnbomb-aa-in-f14:https	TIME_WAIT
TCP	10.120.112.232:49301	160:https	ESTABLISHED
TCP	10.120.112.232:49314	kul01s09-in-f67:https	ESTABLISHED
TCP	10.120.112.232:49319	pnbomb-aa-in-f14:https	ESTABLISHED
TCP	10.120.112.232:49321	52.158.227.125:https	TIME_WAIT
TCP	10.120.112.232:49342	bom07s29-in-f14:https	ESTABLISHED
TCP	10.120.112.232:49345	52.143.124.236:https	TIME_WAIT
TCP	10.120.112.232:49347	52.143.124.236:https	TIME_WAIT
TCP	10.120.112.232:49349	20.187.53.93:https	TIME_WAIT
TCP	10.120.112.232:49362	e2a:https	ESTABLISHED
TCP	10.120.112.232:49374	pnbomb-aa-in-f14:https	ESTABLISHED
TCP	10.120.112.232:49376	10.125.145.97:ms-do	SYN_SENT
TCP	10.120.112.232:49377	10.200.200.41:ms-do	ESTABLISHED
TCP	10.120.112.232:49379	20.114.189.135:https	CLOSE_WAIT
TCP	10.120.112.232:64220	13.107.246.254:https	CLOSE_WAIT
TCP	10.120.112.232:64223	13.107.226.254:https	CLOSE_WAIT
TCP	10.120.112.232:64227	20.198.118.190:https	ESTABLISHED
TCP	10.120.112.232:64908	ec2-18-205-203-229:https	CLOSE_WAIT
TCP	10.120.112.232:65419	a23-193-114-56:https	ESTABLISHED
TCP	10.120.112.232:65510	a23-193-114-56:https	CLOSE_WAIT
TCP	10.120.112.232:65511	a23-193-114-56:https	CLOSE_WAIT
TCP	127.0.0.1:49675	MUM0922CPU0418:49676	ESTABLISHED
TCP	127.0.0.1:49676	MUM0922CPU0418:49675	ESTABLISHED
TCP	127.0.0.1:49708	MUM0922CPU0418:49709	ESTABLISHED
TCP	127.0.0.1:49709	MUM0922CPU0418:49708	ESTABLISHED
TCP	127.0.0.1:49710	MUM0922CPU0418:49711	ESTABLISHED
TCP	127.0.0.1:49711	MUM0922CPU0418:49710	ESTABLISHED
TCP	127.0.0.1:60708	MUM0922CPU0418:60709	ESTABLISHED
TCP	127.0.0.1:60709	MUM0922CPU0418:60708	ESTABLISHED
TCP	127.0.0.1:60710	MUM0922CPU0418:60711	ESTABLISHED
TCP	127.0.0.1:60711	MUM0922CPU0418:60710	ESTABLISHED
TCP	127.0.0.1:60712	MUM0922CPU0418:60713	ESTABLISHED
TCP	127.0.0.1:60713	MUM0922CPU0418:60712	ESTABLISHED
TCP	127.0.0.1:60722	MUM0922CPU0418:60723	ESTABLISHED
TCP	127.0.0.1:60723	MUM0922CPU0418:60722	ESTABLISHED



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### Other commands :

```
C:\Windows\System32>netstat -r

Interface List
12...08 8F c3 08 f2 da .....Realtek PCIe GbE Family Controller
16...a8 64 f1 46 cf ee .....Microsoft Wi-Fi Direct Virtual Adapter
6...a8 64 f1 46 cf ef .....Microsoft Wi-Fi Direct Virtual Adapter #3
14...a8 64 f1 46 cf ee .....Intel(R) Wi-Fi 6 AX201 160MHz
1.....Software Loopback Interface 1

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
127.0.0.0                  0.0.0.0          192.168.0.1      192.168.0.104    40
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
192.168.0.0                255.255.255.0    On-link          192.168.0.104    296
192.168.0.104             255.255.255.255  On-link          192.168.0.104    296
192.168.0.255             255.255.255.255  On-link          192.168.0.104    296
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          192.168.0.104    296
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          192.168.0.104    296

Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 331 ::1/128 On-link
14 296 fe80::/64 On-link
14 296 fe80::18ab:f686:78af:609d/128 On-link
1 331 ff00::/8 On-link
14 296 ff00::/8 On-link

Persistent Routes:
None
```

```
C:\Windows\System32>netstat -t

Active Connections
Proto Local Address           Foreign Address         State           Offload State
TCP 127.0.0.1:49671          BlackBeast:49672       ESTABLISHED     InHost
TCP 127.0.0.1:49672          BlackBeast:49671       ESTABLISHED     InHost
TCP 127.0.0.1:49673          BlackBeast:49674       ESTABLISHED     InHost
TCP 127.0.0.1:49674          BlackBeast:49673       ESTABLISHED     InHost
TCP 127.0.0.1:49713          BlackBeast:51624       ESTABLISHED     InHost
TCP 127.0.0.1:51352          BlackBeast:65001       ESTABLISHED     InHost
TCP 127.0.0.1:51624          BlackBeast:49713       ESTABLISHED     InHost
TCP 127.0.0.1:65001          BlackBeast:51352       ESTABLISHED     InHost
TCP 192.168.0.104:49721      server-108-159-80-112:https CLOSE_WAIT      InHost
TCP 192.168.0.104:51103      server-108-159-80-30:https CLOSE_WAIT      InHost
TCP 192.168.0.104:51262      server-108-159-80-30:https CLOSE_WAIT      InHost
TCP 192.168.0.104:51349      bom07s31-in-f10:https ESTABLISHED     InHost
TCP 192.168.0.104:51355      relay-8a6d3372:https ESTABLISHED     InHost
TCP 192.168.0.104:51365      bom07s31-in-f10:https ESTABLISHED     InHost
TCP 192.168.0.104:51369      20.198.119.143:https ESTABLISHED     InHost
TCP 192.168.0.104:51614      162.159.135.234:https ESTABLISHED     InHost
TCP 192.168.0.104:55512      server-108-159-80-112:https CLOSE_WAIT      InHost
TCP 192.168.0.104:58337      20.198.119.143:https ESTABLISHED     InHost
TCP 192.168.0.104:58345      103-10-124-122:https ESTABLISHED     InHost
TCP 192.168.0.104:61055      server-108-159-80-30:https CLOSE_WAIT      InHost
TCP 192.168.0.104:62912      20.192.44.78:https ESTABLISHED     InHost
TCP 192.168.0.104:62922      whatsapp-chatd-edge-shv-02-bom1:5222 ESTABLISHED     InHost
TCP 192.168.0.104:62991      sl-in-f188:5228 ESTABLISHED     InHost
TCP 192.168.0.104:63004      102:https ESTABLISHED     InHost
TCP 192.168.0.104:63014      bom07s31-in-f10:https CLOSE_WAIT      InHost
TCP 192.168.0.104:63021      bom07s31-in-f10:https CLOSE_WAIT      InHost

C:\Windows\System32>
```



**SHRI VILEPARLE KELAVANI MANDAL'S  
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING**  
(Autonomous College Affiliated to the University of Mumbai)  
NAAC ACCREDITED with "A" GRADE (CGPA : 3.18)



**Department of Computer Engineering**

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**Semester: V**

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```
C:\Windows\System32>netstat -a
```

**Active Connections**

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	BlackBeast:0	LISTENING
TCP	0.0.0.0:445	BlackBeast:0	LISTENING
TCP	0.0.0.0:808	BlackBeast:0	LISTENING
TCP	0.0.0.0:3306	BlackBeast:0	LISTENING
TCP	0.0.0.0:5040	BlackBeast:0	LISTENING
TCP	0.0.0.0:5357	BlackBeast:0	LISTENING
TCP	0.0.0.0:7070	BlackBeast:0	LISTENING
TCP	0.0.0.0:27036	BlackBeast:0	LISTENING
TCP	0.0.0.0:33060	BlackBeast:0	LISTENING
TCP	0.0.0.0:49664	BlackBeast:0	LISTENING
TCP	0.0.0.0:49665	BlackBeast:0	LISTENING
TCP	0.0.0.0:49666	BlackBeast:0	LISTENING
TCP	0.0.0.0:49667	BlackBeast:0	LISTENING
TCP	0.0.0.0:49668	BlackBeast:0	LISTENING
TCP	0.0.0.0:49670	BlackBeast:0	LISTENING
TCP	127.0.0.1:6463	BlackBeast:0	LISTENING
TCP	127.0.0.1:27060	BlackBeast:0	LISTENING
TCP	127.0.0.1:49671	BlackBeast:49672	ESTABLISHED
TCP	127.0.0.1:49672	BlackBeast:49671	ESTABLISHED
TCP	127.0.0.1:49673	BlackBeast:49674	ESTABLISHED
TCP	127.0.0.1:49674	BlackBeast:49673	ESTABLISHED
TCP	127.0.0.1:49713	BlackBeast:0	LISTENING
TCP	127.0.0.1:49713	BlackBeast:51624	ESTABLISHED
TCP	127.0.0.1:51352	BlackBeast:65001	ESTABLISHED
TCP	127.0.0.1:51624	BlackBeast:49713	ESTABLISHED
TCP	127.0.0.1:55989	BlackBeast:0	LISTENING
TCP	127.0.0.1:56989	BlackBeast:0	LISTENING
TCP	127.0.0.1:65001	BlackBeast:0	LISTENING
TCP	127.0.0.1:65001	BlackBeast:51352	ESTABLISHED
TCP	192.168.0.104:139	BlackBeast:0	LISTENING
TCP	192.168.0.104:49721	server-108-159-80-112:https	CLOSE_WAIT
TCP	192.168.0.104:51103	server-108-159-80-30:https	CLOSE_WAIT
TCP	192.168.0.104:51262	server-108-159-80-30:https	CLOSE_WAIT
TCP	192.168.0.104:51349	bom07s31-in-f10:https	ESTABLISHED
TCP	192.168.0.104:51355	relay-8a6d3372:https	ESTABLISHED
TCP	192.168.0.104:51365	bom07s31-in-f10:https	ESTABLISHED
TCP	192.168.0.104:51369	20.198.119.143:https	ESTABLISHED
TCP	192.168.0.104:51614	162.159.135.234:https	ESTABLISHED
TCP	192.168.0.104:55512	server-108-159-80-112:https	CLOSE_WAIT
TCP	192.168.0.104:58337	20.198.119.143:https	ESTABLISHED
TCP	192.168.0.104:58345	103-10-124-122:https	ESTABLISHED
TCP	192.168.0.104:61055	server-108-159-80-30:https	CLOSE_WAIT
TCP	192.168.0.104:62912	20.192.44.78:https	ESTABLISHED
TCP	192.168.0.104:62922	whatsapp-chatd-edge-shv-02-bom1:5222	ESTABLISHED
TCP	192.168.0.104:62991	sl-in-f188:5228	ESTABLISHED
TCP	192.168.0.104:63004	102:https	ESTABLISHED
TCP	192.168.0.104:63014	bom07s31-in-f10:https	CLOSE_WAIT
TCP	192.168.0.104:63021	bom07s31-in-f10:https	CLOSE_WAIT
TCP	192.168.0.104:63023	bom07s27-in-f14:https	ESTABLISHED
TCP	192.168.0.104:63024	ec2-3-7-206-255:https	TIME_WAIT
TCP	192.168.0.104:63026	20.227.52.206:https	TIME_WAIT





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## Hostname

```
C:\Users\djsce.student>  
C:\Users\djsce.student>hostname  
MUM0922CPU0418
```

## tracert:

```
C:\Windows\System32>tracert  
  
Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]  
              [-R] [-S srcaddr] [-4] [-6] target_name  
  
Options:  
  -d                Do not resolve addresses to hostnames.  
  -h maximum_hops  Maximum number of hops to search for target.  
  -j host-list      Loose source route along host-list (IPv4-only).  
  -w timeout        Wait timeout milliseconds for each reply.  
  -R                Trace round-trip path (IPv6-only).  
  -S srcaddr        Source address to use (IPv6-only).  
  -4                Force using IPv4.  
  -6                Force using IPv6.
```

```
C:\Windows\System32>tracert -d www.google.com  
  
Tracing route to www.google.com [142.250.76.196]  
over a maximum of 30 hops:  
  
  0  3 ms   1 ms   4 ms  192.168.0.1  
  1  4 ms   4 ms   8 ms  103.203.231.10  
  2  *      11 ms  *     103.203.231.9  
  3  17 ms  4 ms   6 ms  142.250.172.74  
  4  21 ms  36 ms  7 ms  72.14.238.215  
  5  9 ms   4 ms   3 ms  142.250.208.149  
  6  6 ms   4 ms   6 ms  142.250.76.196  
  
Trace complete.  
  
C:\Windows\System32>
```



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```
C:\Windows\System32>tracert -h 5 www.google.com
```

```
Tracing route to www.google.com [142.250.76.196]  
over a maximum of 5 hops:
```

1	3 ms	13 ms	1 ms	192.168.0.1
2	3 ms	3 ms	3 ms	103.203.231.10
3	*	4 ms	2 ms	103.203.231.9
4	7 ms	5 ms	4 ms	142.250.172.74
5	5 ms	6 ms	8 ms	72.14.238.215

```
Trace complete.
```



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## Command : getmac

```
255.255.255.255      ff-ff-ff-ff-ff-ff      static

C:\Users\djsce.student>getmac

Physical Address      Transport Name
=====
84-69-93-95-25-98     Media disconnected
62-03-75-48-6B-C5     \Device\NPF{082DEF58-7F3A-40DF-B6AA-3AEFAD014071}
00-50-56-C0-00-01     \Device\NPF{14E8D7C0-9D03-4137-98D6-FA25CCB33087}
00-50-56-C0-00-08     \Device\NPF{83797B65-776F-423D-8B8D-37562548C3F1}
0A-00-27-00-00-05     \Device\NPF{1E1E45A3-EF9F-42DE-8C52-E87CBD6F8ABD}

C:\Users\djsce.student>
```

## Command :Pathping

```
C:\Users\djsce.student>pathping www.google.com

Tracing route to www.google.com [142.250.67.196]
over a maximum of 30 hops:
 0  MUM0922CPU0402.SVKMGRP.COM [10.120.106.241]
 1  10.120.96.1
 2  10.120.138.18
 3  mumbaicampus.svkm.ac.in [10.0.1.9]
 4  14.139.125.226
 5  10.152.12.117
 6  10.152.7.214
 7  142.250.172.80
 8  72.14.238.215
 9  142.250.235.11
10  bom12s08-in-f4.1e100.net [142.250.67.196]

C:\Windows\System32>pathping -h 1 www.google.in

Tracing route to www.google.in [142.250.76.195]
over a maximum of 1 hops:
 0  BlackBeast [192.168.0.104]
 1  192.168.0.1

Computing statistics for 25 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
 0                                     Lost/Sent = Pct  Lost/Sent = Pct  BlackBeast [192.168.0.104]
 1    6ms      0/ 100 = 0%      0/ 100 = 0%      | 192.168.0.1

Trace complete.
```







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Examples:

```
> route PRINT
> route PRINT -4
> route PRINT -6
> route PRINT 157*          .... Only prints those matching 157*

> route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
      destination^      ^mask      ^gateway      metric^      ^
                        Interface^

If IF is not given, it tries to find the best interface for a given
gateway.
> route ADD 3ffe::/32 3ffe::1

> route CHANGE 157.0.0.0 MASK 255.0.0.0 157.55.80.5 METRIC 2 IF 2

CHANGE is used to modify gateway and/or metric only.

> route DELETE 157.0.0.0
> route DELETE 3ffe::/32
```

```
*****
Persistent Routes:
Network Address      Netmask  Gateway Address  Metric
0.0.0.0              0.0.0.0   10.120.63.1     Default
0.0.0.0              0.0.0.0   10.120.63.1     Default
*****

IPv6 Route Table
*****
Active Routes:
If Metric Network Destination      Gateway
1 331 ::1/128          On-link
15 201 fe80::/64        On-link
6 201 fe80::/64        On-link
16 291 fe80::/64        On-link
9 291 fe80::/64        On-link
22 306 fe80::/64        On-link
15 201 fe80::b7:0f25:d7ad:1f4b/128
    On-link
22 306 fe80::18e1:2a87:58ef:de6a/128
    On-link
9 291 fe80::387c:5721:fc1b:f5da/128
    On-link
16 291 fe80::afcf:8019:64be:9638/128
    On-link
6 201 fe80::db49:a75e:7534:c9af/128
    On-link
1 331 ff00::/8          On-link
15 201 ff00::/8          On-link
6 201 ff00::/8          On-link
16 291 ff00::/8          On-link
9 291 ff00::/8          On-link
22 306 ff00::/8          On-link
*****
Persistent Routes:
None

C:\Users\djsce.student>
```



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## Command:-arp

```
C:\Users\djsce.student>arp -a

Interface: 10.120.112.232 --- 0x3
    Internet Address      Physical Address      Type
    10.120.112.1          00-87-31-c8-2a-c2     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
    255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.204.1 --- 0x4
    Internet Address      Physical Address      Type
    192.168.204.254       00-50-56-fb-e9-c5     dynamic
    192.168.204.255       ff-ff-ff-ff-ff-ff     static
    224.0.0.22            01-00-5e-00-00-16     static
    224.0.0.251           01-00-5e-00-00-fb     static
    224.0.0.252           01-00-5e-00-00-fc     static
    239.255.255.250       01-00-5e-7f-ff-fa     static
    255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.56.1 --- 0x5
    Internet Address      Physical Address      Type
    192.168.56.255        ff-ff-ff-ff-ff-ff     static
    224.0.0.22            01-00-5e-00-00-16     static
    224.0.0.251           01-00-5e-00-00-fb     static
    224.0.0.252           01-00-5e-00-00-fc     static
    239.255.255.250       01-00-5e-7f-ff-fa     static

Interface: 192.168.126.1 --- 0xa
    Internet Address      Physical Address      Type
    192.168.126.254       00-50-56-f9-a0-f5     dynamic
    192.168.126.255       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

C:\Users\djsce.student>
```





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**Conclusion:**

Thus, we have studied and used different networking commands.