

Practical 1

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Roll No:- 19BCE248

Course No:- 2CS502 Computer Networks

AIM: Basics of network commands: ping, ipconfig, netstat, traceroute, nslookup, finger, fping, and Arp

- **ipconfig**

ifconfig(interface configuration) command is used to configure the kernel-resident network interfaces. It is used at the boot time to set up the interfaces as necessary.

```
C:\Users\Admin>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 2:

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

Wireless LAN adapter Local Area Connection* 1:

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

Wireless LAN adapter Local Area Connection* 2:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    IPv6 Address. . . . . : 2405:201:2018:5032:4de3:6a46:6a5a:857d
    Temporary IPv6 Address. . . . . : 2405:201:2018:5032:5597:c242:31d5:5e0a
    Link-local IPv6 Address . . . . . : fe80::4de3:6a46:6a5a:857d%4
    IPv4 Address. . . . . : 192.168.29.112
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::aada:cff:feb4:c328%4
                                192.168.29.1
```

- **Getmac**

The getmac is a Windows command-line utility used typically when troubleshooting network issues to retrieve the MAC address, also known as the physical address, of network adapters in a computer.

```
C:\Users\Admin>
C:\Users\Admin>getmac

Physical Address      Transport Name
=====
10-3D-1C-42-8F-B5    \Device\NPF{1023931B-303C-4F12-ADDB-3676A2AF9872}
00-FF-0B-AD-90-AA    Media disconnected

C:\Users\Admin>
```

- **Hostname**

hostname command in Linux is used to obtain the DNS(Domain Name System) name and set the system's hostname or NIS(Network Information System) domain name.

```
C:\Users\Admin>hostname
LAPTOP-ESBI255B
```

- **Ping**

this command is used to test both the computer name and the IP address of the computer

```
C:\Users\Admin>ping google.com

Pinging google.com [2404:6800:4009:80b::200e] with 32 bytes of data:
Request timed out.
Reply from 2404:6800:4009:80b::200e: time=31ms
Reply from 2404:6800:4009:80b::200e: time=28ms
Reply from 2404:6800:4009:80b::200e: time=30ms

Ping statistics for 2404:6800:4009:80b::200e:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 28ms, Maximum = 31ms, Average = 29ms
```

- **Tracert**

tracert are computer network diagnostic commands for displaying possible routes (paths) and measuring transit delays of packets across an Internet Protocol (IP) network.

```
C:\Users\Admin>tracert www.facebook.com
```

```
Tracing route to star-mini.c10r.facebook.com [2a03:2880:f12f:83:face:b00c:0:25de]
over a maximum of 30 hops:
```

```
 1  84 ms    2 ms     2 ms    2405:201:2018:5032:aada:cff:feb4:c328
 2      *      *      *      Request timed out.
 3  11 ms    14 ms    10 ms    2405:200:801:b00::1d
 4      *      *      *      Request timed out.
 5  20 ms    47 ms    18 ms    ae22.pr04.bom1.tfbnw.net [2620:0:1cff:dead:beee::9be]
 6  20 ms    18 ms    17 ms    po104.psw03.bom1.tfbnw.net [2620:0:1cff:dead:bef0::d3]
 7  25 ms    24 ms    23 ms    po3.msw1ax.01.bom1.tfbnw.net [2a03:2880:f02f:ffff::97]
 8  22 ms    20 ms    19 ms    edge-star-mini6-shv-01-bom1.facebook.com [2a03:2880:f12f:83:face:b00c:0:25de]
```

```
Trace complete.
```

- **Pathping**

The PathPing command is a command-line network utility supplied in Windows 2000 and beyond that combines the functionality of ping with that of tracert.

```
C:\Users\Admin>pathping www.youtube.com
```

```
Tracing route to youtube-ui.l.google.com [2404:6800:4009:81e::200e]
over a maximum of 30 hops:
```

```
 0  LAPTOP-ESBI255B [2405:201:2018:5032:5597:c242:31d5:5e0a]
 1  2405:201:2018:5032:aada:cff:feb4:c328
 2      *      *      *
```

```
Computing statistics for 25 seconds...
```

Hop	RTT	Source to Here Lost/Sent = Pct	This Node/Link Lost/Sent = Pct	Address
0				LAPTOP-ESBI255B [2405:201:2018:5032:5597:c242:31d5:5e0a]
1	3ms	0/ 100 = 0%	0/ 100 = 0%	2405:201:2018:5032:aada:cff:feb4:c328

```
Trace complete.
```

- **Netstat**

netstat is a command-line network utility that displays network connections for Transmission Control Protocol, routing tables, and a number of network interface and network protocol statistics

```
Active Connections
```

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:52315	LAPTOP-ESBI255B:52316	ESTABLISHED
TCP	127.0.0.1:52316	LAPTOP-ESBI255B:52315	ESTABLISHED
TCP	127.0.0.1:52317	LAPTOP-ESBI255B:52318	ESTABLISHED
TCP	127.0.0.1:52318	LAPTOP-ESBI255B:52317	ESTABLISHED
TCP	127.0.0.1:52319	LAPTOP-ESBI255B:52320	ESTABLISHED
TCP	127.0.0.1:52320	LAPTOP-ESBI255B:52319	ESTABLISHED
TCP	127.0.0.1:52321	LAPTOP-ESBI255B:52322	ESTABLISHED
TCP	127.0.0.1:52322	LAPTOP-ESBI255B:52321	ESTABLISHED
TCP	127.0.0.1:52325	LAPTOP-ESBI255B:52326	ESTABLISHED
TCP	127.0.0.1:52326	LAPTOP-ESBI255B:52325	ESTABLISHED
TCP	127.0.0.1:53158	LAPTOP-ESBI255B:53159	ESTABLISHED
TCP	127.0.0.1:53159	LAPTOP-ESBI255B:53158	ESTABLISHED
TCP	127.0.0.1:53160	LAPTOP-ESBI255B:53161	ESTABLISHED
TCP	127.0.0.1:53161	LAPTOP-ESBI255B:53160	ESTABLISHED
TCP	127.0.0.1:53162	LAPTOP-ESBI255B:53163	ESTABLISHED
TCP	127.0.0.1:53163	LAPTOP-ESBI255B:53162	ESTABLISHED
TCP	127.0.0.1:53164	LAPTOP-ESBI255B:53165	ESTABLISHED
TCP	127.0.0.1:53165	LAPTOP-ESBI255B:53164	ESTABLISHED
TCP	127.0.0.1:54039	LAPTOP-ESBI255B:54041	ESTABLISHED
TCP	127.0.0.1:54041	LAPTOP-ESBI255B:54039	ESTABLISHED
TCP	127.0.0.1:58815	LAPTOP-ESBI255B:58814	TIME_WAIT
TCP	192.168.29.112:49411	20.198.162.78:https	ESTABLISHED
TCP	192.168.29.112:49894	52.152.90.172:https	TIME_WAIT
TCP	192.168.29.112:49895	20.44.229.112:https	ESTABLISHED
TCP	192.168.29.112:50338	170.72.230.131:https	ESTABLISHED

```

TCP 192.168.29.112:58833 relay-5166bfb0:http ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:49784 bom12s13-in-x0a:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:49893 bom07s31-in-x0a:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:51058 bom07s20-in-x0a:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:52743 bom12s09-in-x0e:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:52824 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:52826 [2405:200:1630:99c::3114]:http CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:52827 [2405:200:1630:99c::3114]:http CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:55248 bom12s16-in-x0e:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:55377 bom12s14-in-x0e:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:57683 bom12s08-in-x0e:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:57717 [2405:200:1630:9bf::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:57777 bom07s35-in-x0a:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:59171 bom07s33-in-x0a:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:60694 bom12s14-in-x0e:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:60789 bom12s01-in-x05:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61129 bom12s19-in-x0e:https TIME_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61448 bom12s19-in-x03:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61449 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61450 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61451 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61452 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:61453 [2405:200:1630:986::4106]:https CLOSE_WAIT
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:64405 sa-in-xbc:5228 ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:64899 bom12s19-in-x0e:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:65429 [2603:1046:c04:800::2]:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:65430 [2603:1046:c04:800::2]:https ESTABLISHED
TCP [2405:201:2018:5032:5597:c242:31d5:5e0a]:65431 [2603:1046:c04:800::2]:https ESTABLISHED

```

- **Nbstat**

The Nbstat command is a great command to use when you need to display the NetBIOS over TCP/IP protocol statistics.

```

C:\Users\Admin>nbtstat /A 10.0.0.99

Ethernet 2:
Node IpAddress: [0.0.0.0] Scope Id: []

    Host not found.

Wi-Fi:
Node IpAddress: [192.168.29.112] Scope Id: []

    Host not found.

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

    Host not found.

Local Area Connection* 2:
Node IpAddress: [0.0.0.0] Scope Id: []

    Host not found.

```

- **nslookup**

Nslookup (stands for “Name Server Lookup”) is a useful command for getting information from DNS server

```
C:\Users\Admin>nslookup
DNS request timed out.
    timeout was 2 seconds.
Default Server:  UnKnown
Address:  2405:201:2018:5032::c0a8:1d01
```

- **Arp -a**

ARP Command is a TCP/IP utility and Microsoft Windows command for viewing and modifying the local Address Resolution Protocol (ARP) cache, which contains recently resolved MAC addresses of Internet Protocol (IP) hosts on the network.

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

Interface: 192.168.29.112 --- 0x4
   Internet Address      Physical Address      Type
192.168.29.1             a8-da-0c-b4-c3-28     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
239.255.102.18           01-00-5e-7f-66-12     static
239.255.255.250          01-00-5e-7f-ff-fa     static
255.255.255.255          ff-ff-ff-ff-ff-ff     static
```

- **Finger user**

Finger command is a user information lookup command which gives details of all the users logged in. This tool is generally used by system administrators. It provides details like login name, user name, idle time, login time, and in some cases their email address even.

```
C:\Users\Admin>finger user

[LAPTOP-ESBI255B]
> Finger: connect::Connection refused
```

- **Fping**

fping is a small command line tool to send ICMP (Internet Control Message Protocol) echo request to network hosts, similar to ping, but much higher performing when pinging multiple hosts

```
C:\Users\Admin>fping
'fping' is not recognized as an internal or external command,
operable program or batch file.
```