Name : BOYAPATI MITHIL
Reg no: 22BCE0695
Course code : BCSE308P
Slot: L27+L28
Subject : Computer Networks Lab

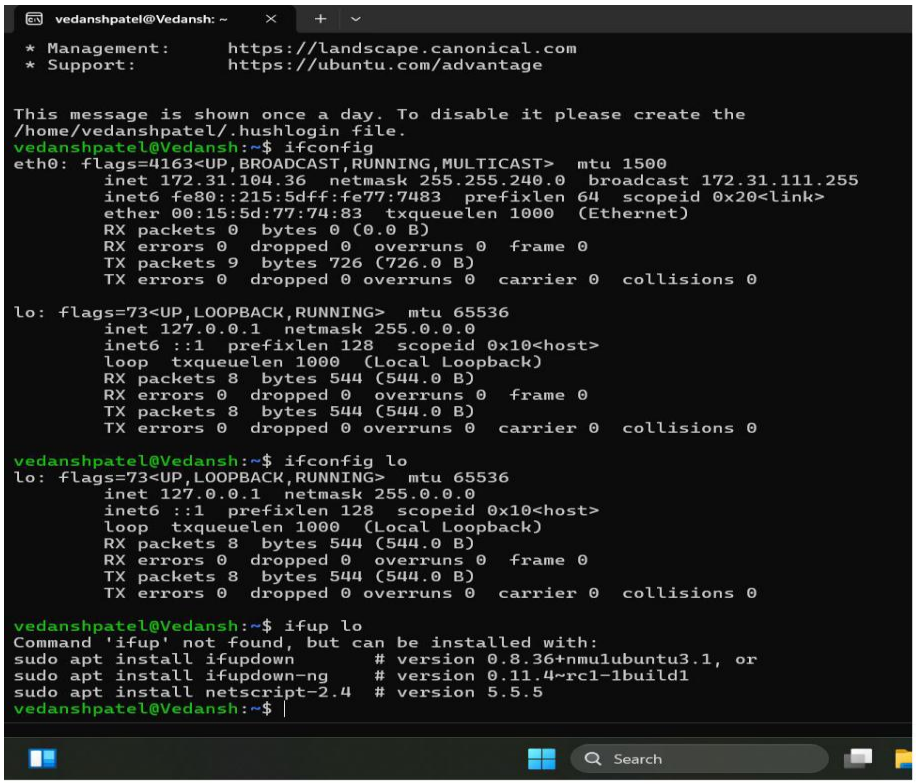
Q1)Prepare a report for the network commands (Windows/Linux) with two options.Execute the commands in prompt and include screenshot with explanation

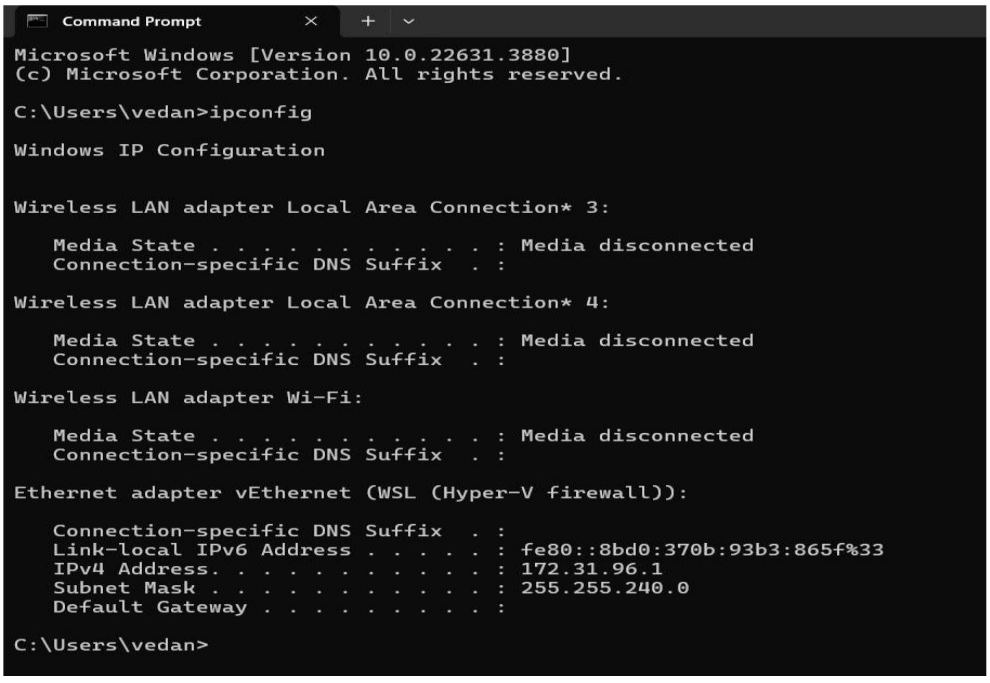
1. **ifconfig :**

Syntax : ifconfig [interface] [options]

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. After that, it is usually used when needed during debugging or when you need system tuning. Also, this command is used to assign the IP address and netmask to an interface or to enable or disable a given interface.

Network Configuration: ifconfig allows users to configure network interfaces, including setting IP addresses, netmasks, and broadcast addresses.
Network Troubleshooting: It provides detailed information about network interfaces, which is essential for diagnosing connectivity issues, monitoring network traffic, and checking interface statuses.
Interface Management: Users can enable or disable network interfaces, which is crucial for managing network connections and controlling which interfaces are active.
MAC Address Modification: ifconfig enables users to change the MAC address of a network interface, which can be useful for security purposes or bypassing network restrictions.
Temporary Network Changes: It allows for temporary network configuration changes without editing configuration files, useful for testing and


vedanshpatel@Vedansh: ~
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage
This message is shown once a day. To disable it please create the
/home/vedanshpatel/.hushlogin file.
vedanshpatel@Vedansh:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 172.31.104.36 netmask 255.255.240.0 broadcast 172.31.111.255
inet6 fe80::215:5dff:fe77:7483 prefixlen 64 scopeid 0x20<link>
ether 00:15:5d:77:74:83 txqueuelen 1000 (Ethernet)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 9 bytes 726 (726.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 8 bytes 544 (544.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 8 bytes 544 (544.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
vedanshpatel@Vedansh:~$ ifconfig lo
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 8 bytes 544 (544.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 8 bytes 544 (544.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
vedanshpatel@Vedansh:~$ ifup lo
Command 'ifup' not found, but can be installed with:
sudo apt install ifupdown # version 0.8.36+nmu1ubuntu3.1, or
sudo apt install ifupdown-ng # version 0.11.4~rc1-1build1
sudo apt install netscript-2.4 # version 5.5.5
vedanshpatel@Vedansh:~$
Search


Command Prompt
Microsoft Windows [Version 10.0.22631.3880]
(c) Microsoft Corporation. All rights reserved.
C:\Users\vedan>ipconfig
Windows IP Configuration
Wireless LAN adapter Local Area Connection* 3:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Wireless LAN adapter Local Area Connection* 4:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Wireless LAN adapter Wi-Fi:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Ethernet adapter vEthernet (WSL (Hyper-V firewall)):
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::8bd0:370b:93b3:865f%33
IPv4 Address. . . . . : 172.31.96.1
Subnet Mask . . . . . : 255.255.240.0
Default Gateway . . . . . :
C:\Users\vedan>

2. Ping :

Syntax : ping [options] host_or_IP_address

The PING (Packet Internet Groper) command is used to check the network connectivity between the host and server/host. This command takes as input the IP address or the URL and sends a data packet to the specified address with the message “PING” and gets a response from the server/host this time is recorded which is called latency. Fast ping with low latency means a faster connection. Ping uses **ICMP(Internet Control Message Protocol)** to send an **ICMP echo message** to the specified host if that host is available then it sends an **ICMP reply message**. Ping is generally measured in milliseconds every modern operating system has this ping pre-installed.

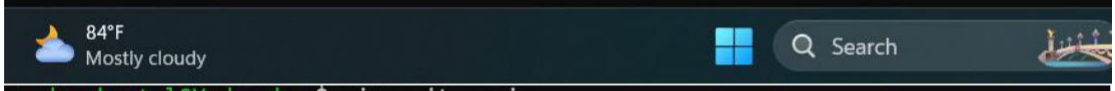
min: minimum time to get a response

avg: average time to get responses

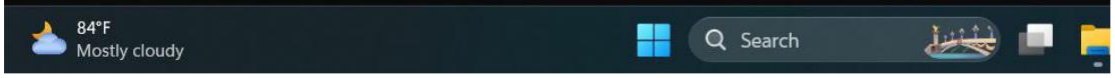
max: maximum time to get a response

The internet connection to www.google.com is working correctly with 0% packet loss, successful transmission and reception of 8 packets, and low round-trip time (RTT) values averaging 0.019 ms, indicating a responsive and stable connection.

```
C:\Users\vedan>ping vit.ac.in

Pinging vit.ac.in [122.184.65.22] with 32 bytes of data:
Reply from 122.184.65.22: bytes=32 time=4ms TTL=250
Reply from 122.184.65.22: bytes=32 time=8ms TTL=250
Reply from 122.184.65.22: bytes=32 time=5ms TTL=250
Reply from 122.184.65.22: bytes=32 time=4ms TTL=250

Ping statistics for 122.184.65.22:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 8ms, Average = 5ms

C:\Users\vedan>
```



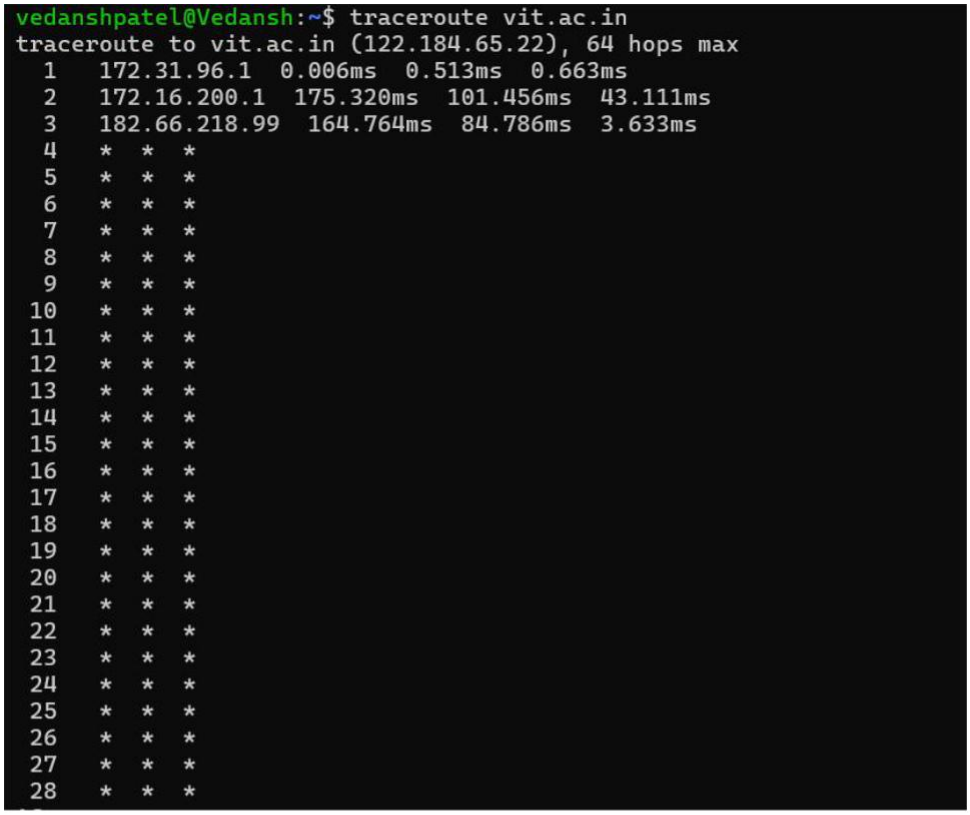

```
vedanshpatel@Vedansh:~$ ping vit.ac.in
PING vit.ac.in (122.184.65.22) 56(84) bytes of data.
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=1 ttl=249 time=6.20 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=2 ttl=249 time=8.82 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=3 ttl=249 time=7.41 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=4 ttl=249 time=4.57 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=5 ttl=249 time=6.60 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=6 ttl=249 time=6.54 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=7 ttl=249 time=5.96 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=8 ttl=249 time=6.86 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=9 ttl=249 time=3.85 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=10 ttl=249 time=8.79 ms
64 bytes from 122.184.65.22 (122.184.65.22): icmp_seq=11 ttl=249 time=6.83 ms
```

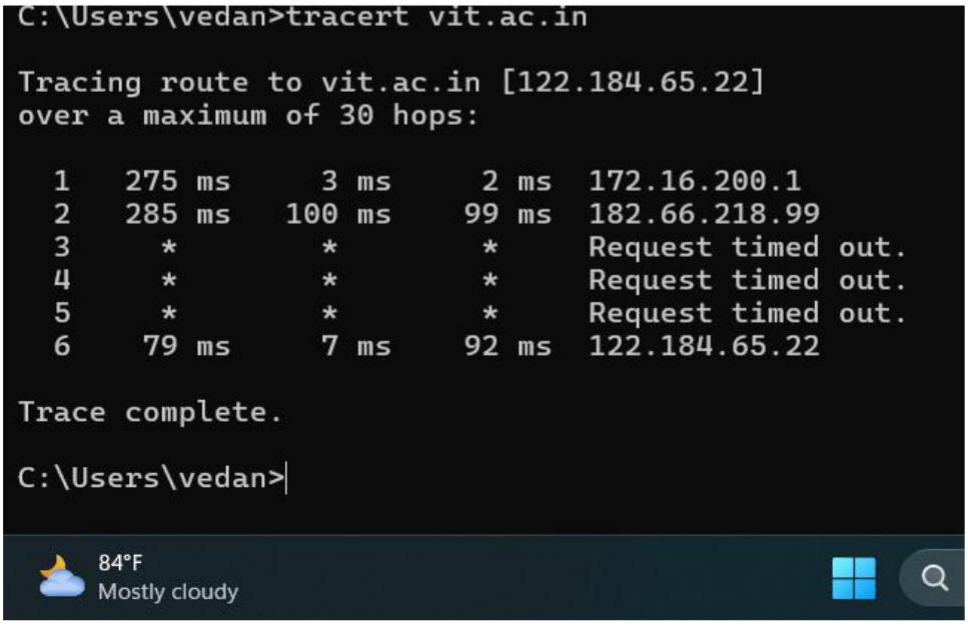


3. **Traceroute :**

Syntax : traceroute [options] destination

The `traceroute` command is a network diagnostic tool used to trace the route taken by packets from a source to a destination over an IP network. It provides valuable insights into the network path, including the number of hops (routers) between the source and destination, and the round-trip time (RTT) for each hop. A handy utility to view the number of hops and response time to get to a remote system or web site is traceroute.

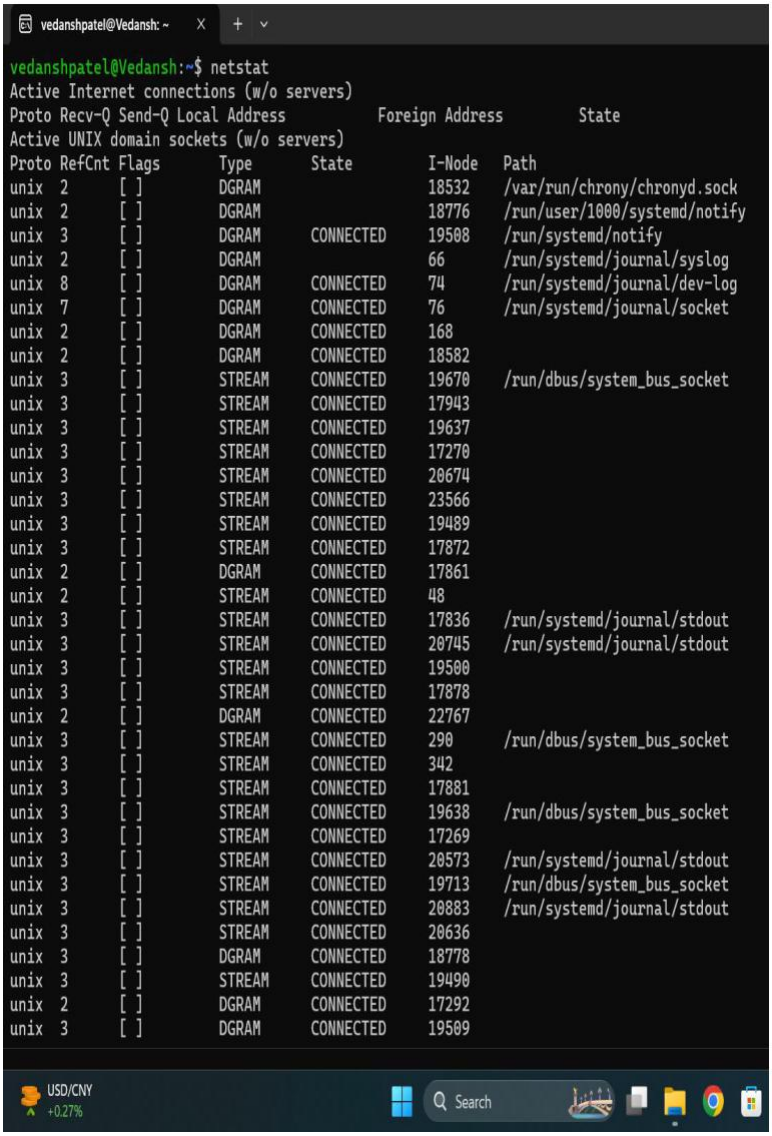


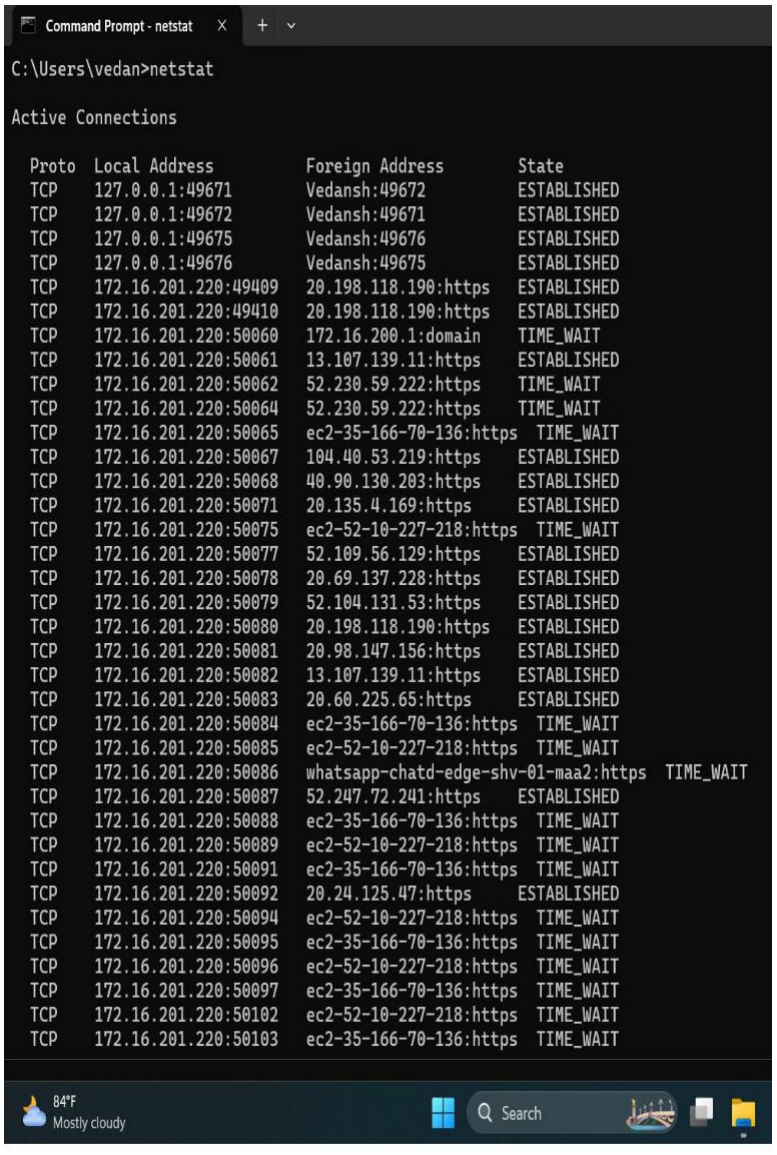


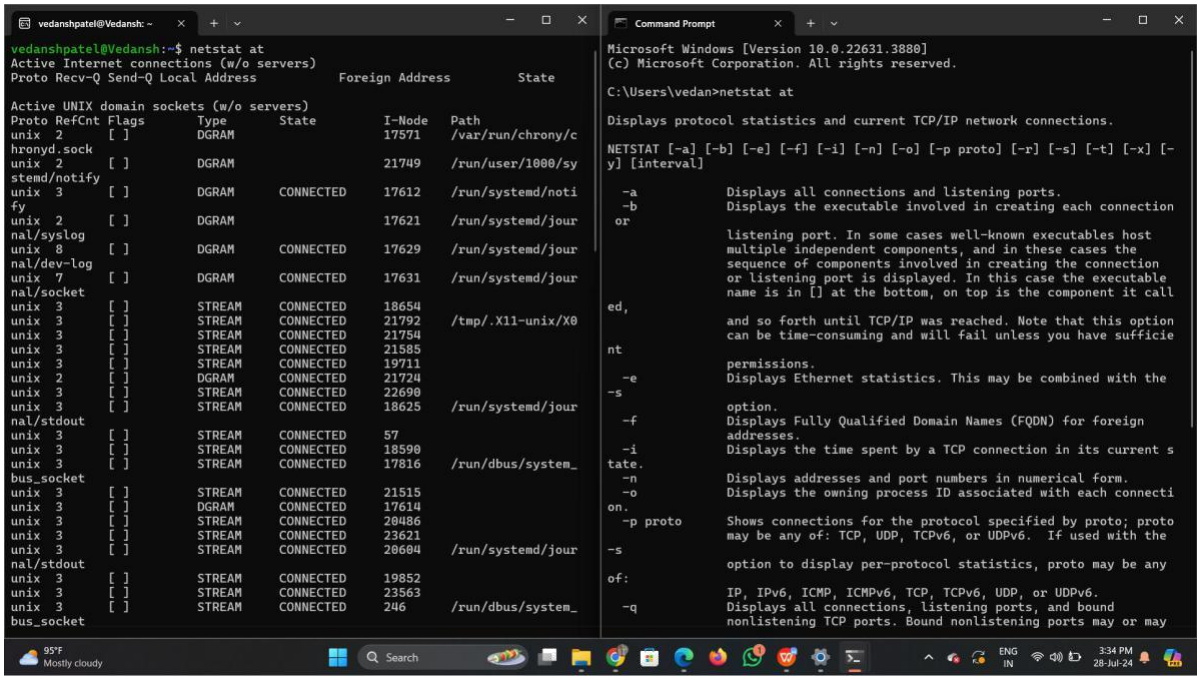
4. Netstat :

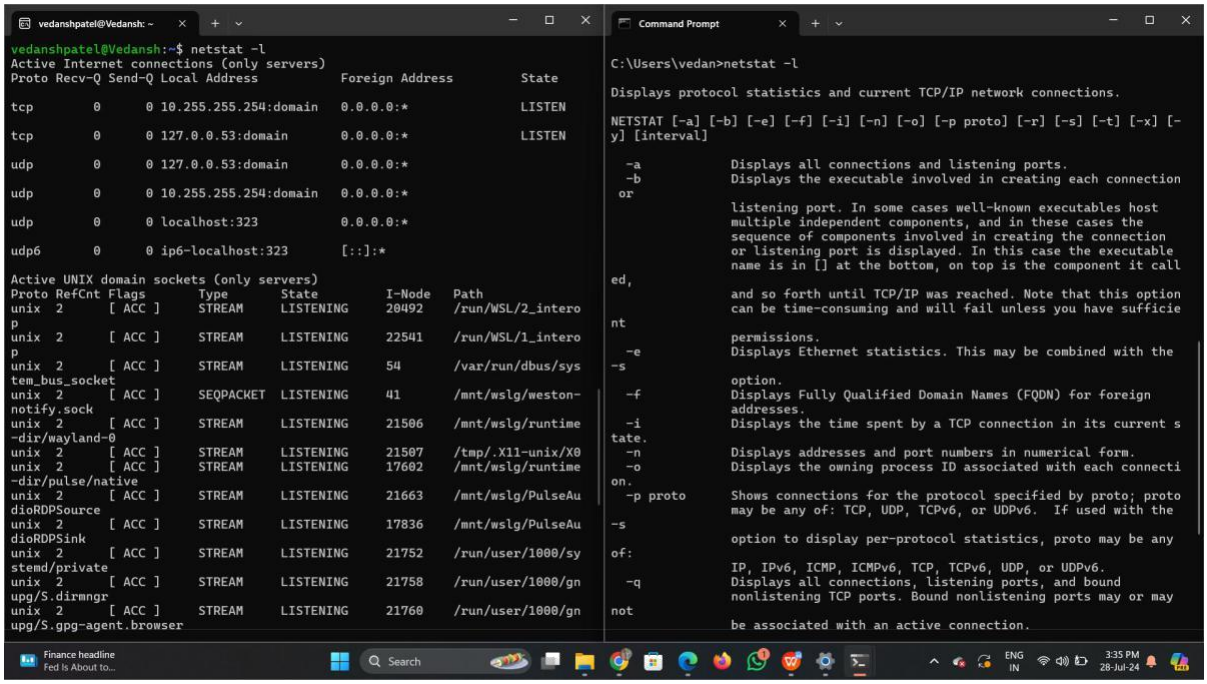
Syntax : netstat [options]

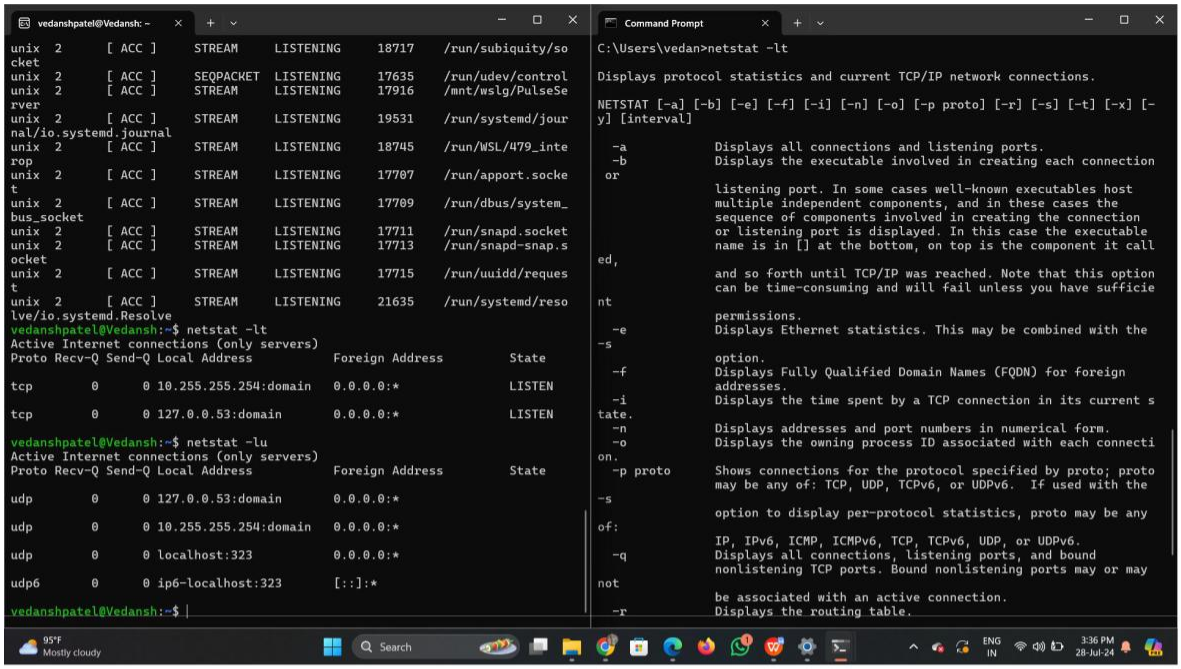
The netstat command is like a special tool in Linux that helps you understand and check things about how your computer connects to the internet. It can tell you about the connections your computer is making, the paths it uses to send information, and even some technical details like how many packets of data are being sent or received. In simple terms, it's like a window that shows you what's happening with your computer and the internet. `netstat` stands for network statistics. It allows users to display network-related information and diagnose various networking issues. The command has several options that can be combined to retrieve specific details.

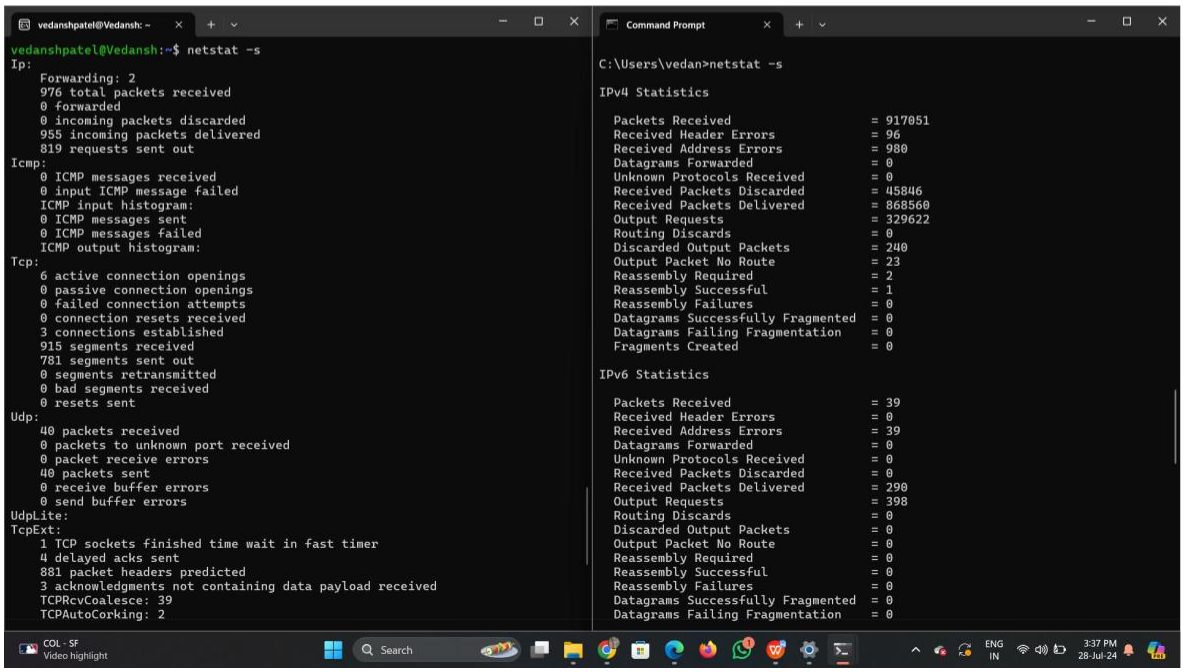


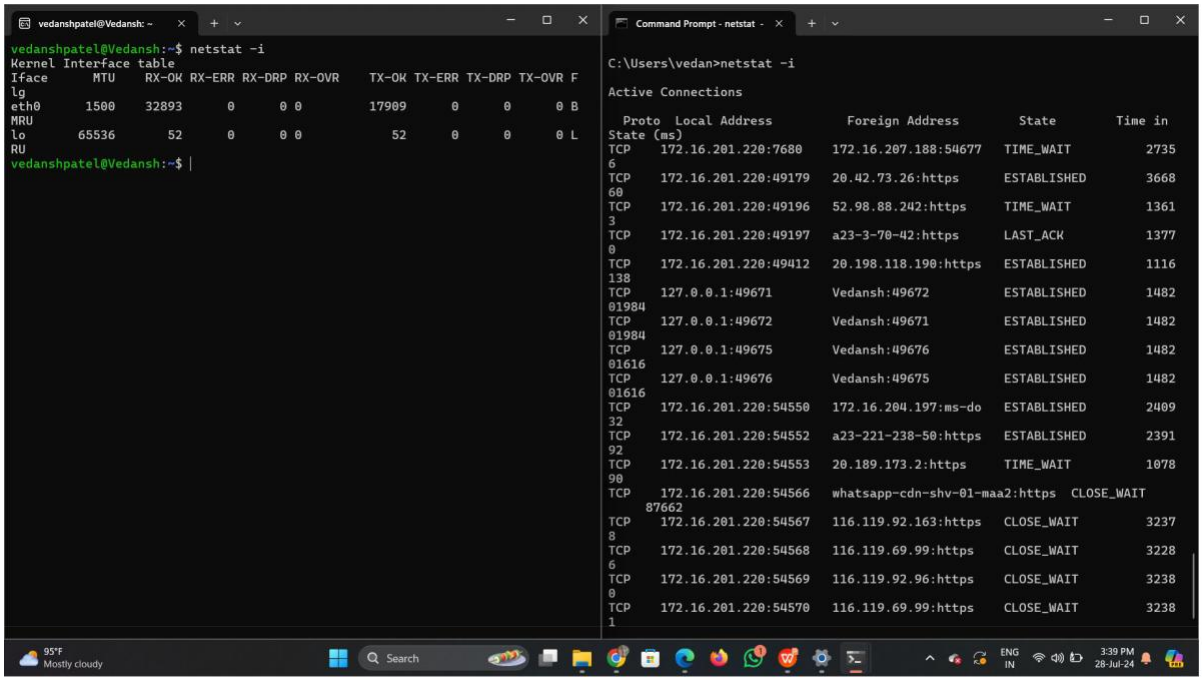


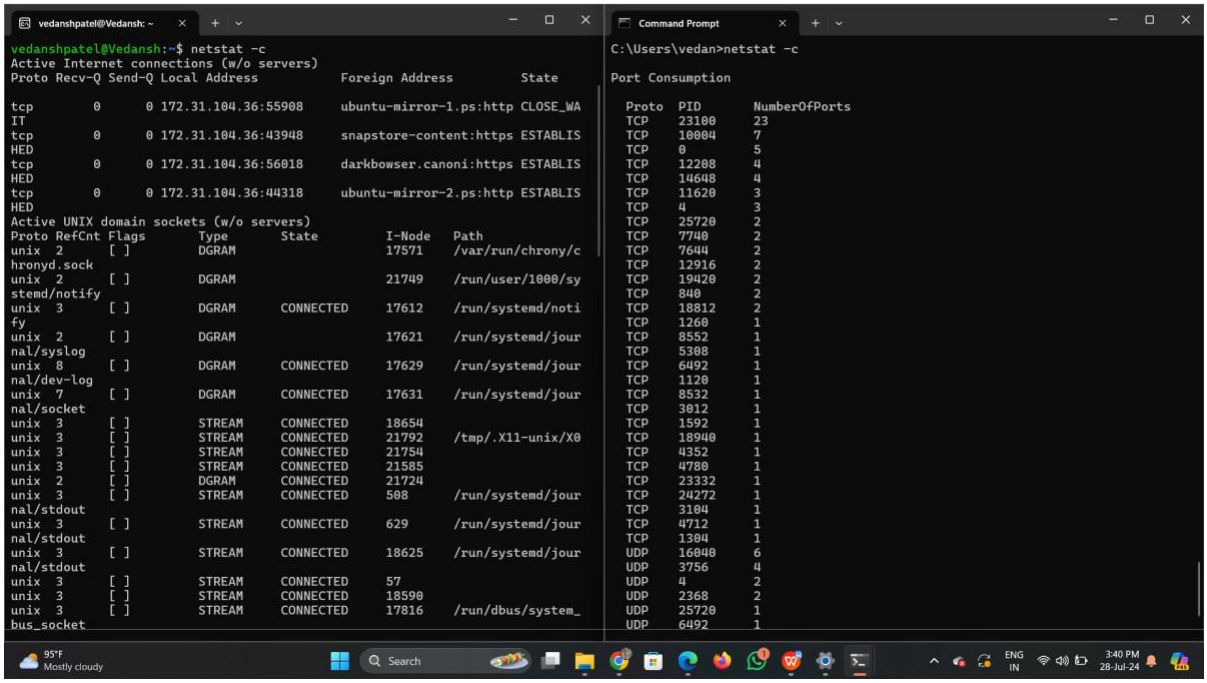

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ netstat at
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags Type State I-Node Path
unix 2 [ ] DGRAM 17571 /var/run/chrony/chronyd.sock
unix 2 [ ] DGRAM 21749 /run/user/1000/systemd/notify
unix 3 [ ] DGRAM CONNECTED 17612 /run/systemd/notify
unix 2 [ ] DGRAM 17621 /run/systemd/journal/syslog
unix 8 [ ] DGRAM CONNECTED 17629 /run/systemd/journal/dev-log
unix 7 [ ] DGRAM CONNECTED 17631 /run/systemd/journal/socket
unix 3 [ ] STREAM CONNECTED 18654
unix 3 [ ] STREAM CONNECTED 21792 /tmp/.X11-unix/X0
unix 3 [ ] STREAM CONNECTED 21754
unix 3 [ ] STREAM CONNECTED 21585
unix 3 [ ] STREAM CONNECTED 19711
unix 2 [ ] DGRAM CONNECTED 21724
unix 3 [ ] STREAM CONNECTED 22690
unix 3 [ ] STREAM CONNECTED 18625 /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 57
unix 3 [ ] STREAM CONNECTED 18590
unix 3 [ ] STREAM CONNECTED 17816 /run/dbus/system_bus_socket
unix 3 [ ] STREAM CONNECTED 21515
unix 3 [ ] DGRAM CONNECTED 17614
unix 3 [ ] STREAM CONNECTED 20486
unix 3 [ ] STREAM CONNECTED 23621
unix 3 [ ] STREAM CONNECTED 20604 /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 19852
unix 3 [ ] STREAM CONNECTED 23563
unix 3 [ ] STREAM CONNECTED 246 /run/dbus/system_bus_socket
Command Prompt
Microsoft Windows [Version 10.0.22631.3880]
(c) Microsoft Corporation. All rights reserved.
C:\Users\vedan>netstat at
Displays protocol statistics and current TCP/IP network connections.
NETSTAT [-a] [-b] [-e] [-f] [-i] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [interval]
-a Displays all connections and listening ports.
-b Displays the executable involved in creating each connection or
listening port. In some cases well-known executables host multiple independent components, and in these cases the sequence of components involved in creating the connection or listening port is displayed. In this case the executable name is in [] at the bottom, on top is the component it called,
and so forth until TCP/IP was reached. Note that this option can be time-consuming and will fail unless you have sufficient
permissions.
-e Displays Ethernet statistics. This may be combined with the -s
option.
-f Displays Fully Qualified Domain Names (FQDN) for foreign addresses.
-i Displays the time spent by a TCP connection in its current state.
-n Displays addresses and port numbers in numerical form.
-o Displays the owning process ID associated with each connection.
-p proto Shows connections for the protocol specified by proto; proto may be any of: TCP, UDP, TCPv6, or UDPv6. If used with the -s
option to display per-protocol statistics, proto may be any of:
IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, or UDPv6.
-q Displays all connections, listening ports, and bound nonlistening TCP ports. Bound nonlistening ports may or may
95°F
Mostly cloudy
Search
ENG
IN
3:34 PM
28-Jul-24


vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 10.255.255.254:domain 0.0.0.0:* LISTEN
tcp 0 0 127.0.0.53:domain 0.0.0.0:* LISTEN
udp 0 0 127.0.0.53:domain 0.0.0.0:*
udp 0 0 10.255.255.254:domain 0.0.0.0:*
udp 0 0 localhost:323 0.0.0.0:*
udp6 0 0 ip6-localhost:323 [::]:*
Active UNIX domain sockets (only servers)
Proto RefCnt Flags Type State I-Node Path
unix 2 [ACC] STREAM LISTENING 20492 /run/WSL/2_interop
unix 2 [ACC] STREAM LISTENING 22541 /run/WSL/1_interop
unix 2 [ACC] STREAM LISTENING 54 /var/run/dbus/system_bus_socket
unix 2 [ACC] SEQPACKET LISTENING 41 /mnt/wslg/weston-notify.sock
unix 2 [ACC] STREAM LISTENING 21506 /mnt/wslg/runtime-dir/wayland-0
unix 2 [ACC] STREAM LISTENING 21507 /tmp/.X11-unix/X0
unix 2 [ACC] STREAM LISTENING 17602 /mnt/wslg/runtime-dir/pulse/native
unix 2 [ACC] STREAM LISTENING 21663 /mnt/wslg/PulseAudioRDPSource
unix 2 [ACC] STREAM LISTENING 17836 /mnt/wslg/PulseAudioRDPSink
unix 2 [ACC] STREAM LISTENING 21752 /run/user/1000/systemd/private
unix 2 [ACC] STREAM LISTENING 21758 /run/user/1000/gnupg/S.dirmngr
unix 2 [ACC] STREAM LISTENING 21760 /run/user/1000/gnupg/S.gpg-agent.browser
Command Prompt
C:\Users\vedan>netstat -l
Displays protocol statistics and current TCP/IP network connections.
NETSTAT [-a] [-b] [-e] [-f] [-i] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [interval]
-a Displays all connections and listening ports.
-b Displays the executable involved in creating each connection or
listening port. In some cases well-known executables host multiple independent components, and in these cases the sequence of components involved in creating the connection or listening port is displayed. In this case the executable name is in [] at the bottom, on top is the component it called,
and so forth until TCP/IP was reached. Note that this option can be time-consuming and will fail unless you have sufficient
permissions.
-e Displays Ethernet statistics. This may be combined with the -s
option.
-f Displays Fully Qualified Domain Names (FQDN) for foreign addresses.
-i Displays the time spent by a TCP connection in its current state.
-n Displays addresses and port numbers in numerical form.
-o Displays the owning process ID associated with each connection.
-p proto Shows connections for the protocol specified by proto; proto may be any of: TCP, UDP, TCPv6, or UDPv6. If used with the -s
option to display per-protocol statistics, proto may be any of:
IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, or UDPv6.
-q Displays all connections, listening ports, and bound nonlistening TCP ports. Bound nonlistening ports may or may not
be associated with an active connection.
Finance headline
Fed Is About to...
Search
ENG
IN
3:35 PM
28-Jul-24


vedanshpatel@Vedansh: ~
unix 2 [ACC] STREAM LISTENING 18717 /run/subiquity/socket
unix 2 [ACC] SEQPACKET LISTENING 17635 /run/udev/control
unix 2 [ACC] STREAM LISTENING 17916 /mnt/wslg/PulseServer
unix 2 [ACC] STREAM LISTENING 19531 /run/systemd/journal/io.systemd.journal
unix 2 [ACC] STREAM LISTENING 18745 /run/WSL/479_interop
unix 2 [ACC] STREAM LISTENING 17707 /run/apport.socket
unix 2 [ACC] STREAM LISTENING 17709 /run/dbus/system_bus_socket
unix 2 [ACC] STREAM LISTENING 17711 /run/snapd.socket
unix 2 [ACC] STREAM LISTENING 17713 /run/snapd-snap.socket
unix 2 [ACC] STREAM LISTENING 17715 /run/uuidd/request
unix 2 [ACC] STREAM LISTENING 21635 /run/systemd/resolve/io.systemd.Resolve
vedanshpatel@Vedansh:~$ netstat -lt
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 10.255.255.254:domain 0.0.0.0:* LISTEN
tcp 0 0 127.0.0.53:domain 0.0.0.0:* LISTEN
vedanshpatel@Vedansh:~$ netstat -lu
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
udp 0 0 127.0.0.53:domain 0.0.0.0:*
udp 0 0 10.255.255.254:domain 0.0.0.0:*
udp 0 0 localhost:323 0.0.0.0:*
udp6 0 0 ip6-localhost:323 [::]:*
vedanshpatel@Vedansh:~$
Command Prompt
C:\Users\vedan>netstat -lt
Displays protocol statistics and current TCP/IP network connections.
NETSTAT [-a] [-b] [-e] [-f] [-i] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [interval]
-a Displays all connections and listening ports.
-b Displays the executable involved in creating each connection or
listening port. In some cases well-known executables host
multiple independent components, and in these cases the
sequence of components involved in creating the connection
or listening port is displayed. In this case the executable
name is in [] at the bottom, on top is the component it called,
and so forth until TCP/IP was reached. Note that this option
can be time-consuming and will fail unless you have sufficient
permissions.
-e Displays Ethernet statistics. This may be combined with the -s
option.
-f Displays Fully Qualified Domain Names (FQDN) for foreign
addresses.
-i Displays the time spent by a TCP connection in its current state.
-n Displays addresses and port numbers in numerical form.
-o Displays the owning process ID associated with each connection.
-p proto Shows connections for the protocol specified by proto; proto
may be any of: TCP, UDP, TCPv6, or UDPv6. If used with the -s
option to display per-protocol statistics, proto may be any of:
IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, or UDPv6.
-q Displays all connections, listening ports, and bound
nonlistening TCP ports. Bound nonlistening ports may or may not
be associated with an active connection.
-r Displays the routing table.
95°F
Mostly cloudy
Search
ENG
IN
3:36 PM
28-Jul-24

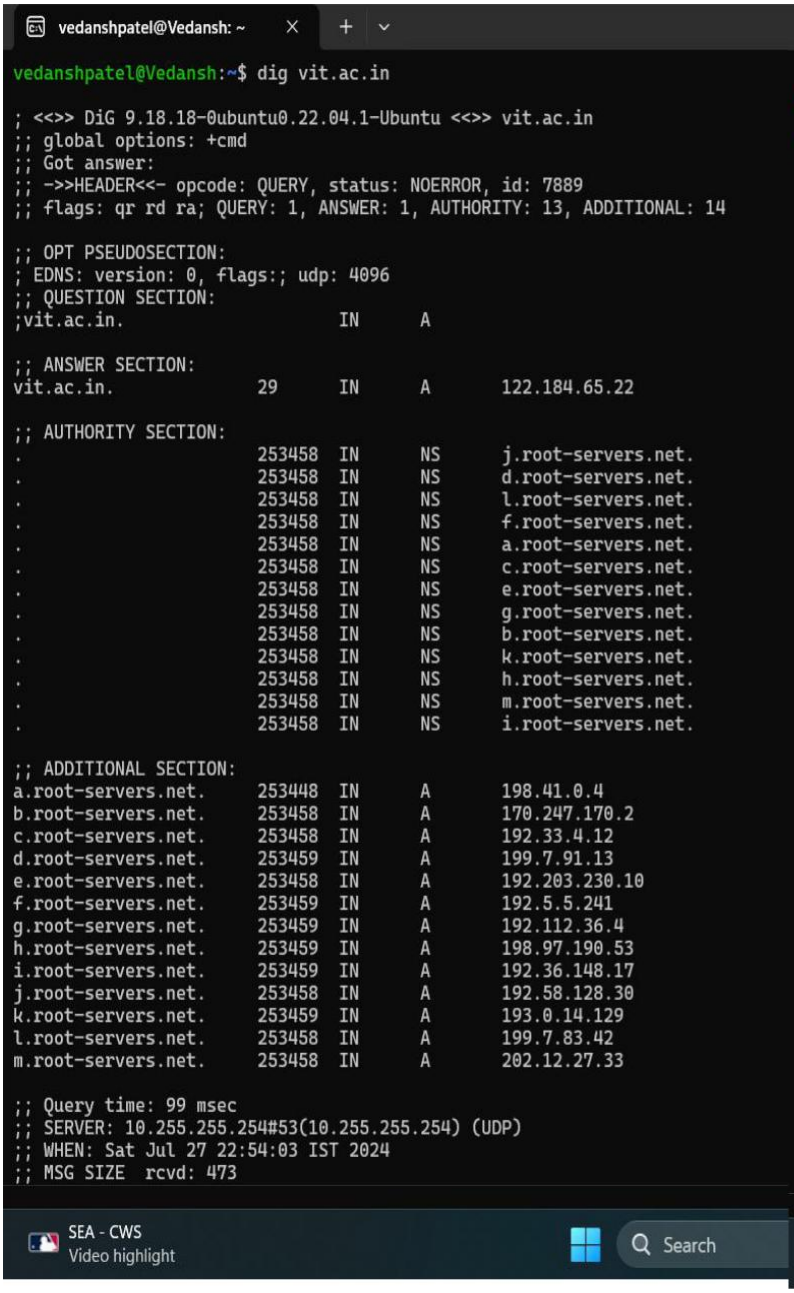

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ netstat -s
Ip:
Forwarding: 2
976 total packets received
0 forwarded
0 incoming packets discarded
955 incoming packets delivered
819 requests sent out
Icmp:
0 ICMP messages received
0 input ICMP message failed
ICMP input histogram:
0 ICMP messages sent
0 ICMP messages failed
ICMP output histogram:
Tcp:
6 active connection openings
0 passive connection openings
0 failed connection attempts
0 connection resets received
3 connections established
915 segments received
781 segments sent out
0 segments retransmitted
0 bad segments received
0 resets sent
Udp:
40 packets received
0 packets to unknown port received
0 packet receive errors
40 packets sent
0 receive buffer errors
0 send buffer errors
UdpLite:
TcpExt:
1 TCP sockets finished time wait in fast timer
4 delayed acks sent
881 packet headers predicted
3 acknowledgments not containing data payload received
TCPRcvCoalesce: 39
TCPAutoCorking: 2
Command Prompt
C:\Users\vedan>netstat -s
IPv4 Statistics
Packets Received = 917051
Received Header Errors = 96
Received Address Errors = 980
Datagrams Forwarded = 0
Unknown Protocols Received = 0
Received Packets Discarded = 45846
Received Packets Delivered = 868560
Output Requests = 329622
Routing Discards = 0
Discarded Output Packets = 240
Output Packet No Route = 23
Reassembly Required = 2
Reassembly Successful = 1
Reassembly Failures = 0
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
Fragments Created = 0
IPv6 Statistics
Packets Received = 39
Received Header Errors = 0
Received Address Errors = 39
Datagrams Forwarded = 0
Unknown Protocols Received = 0
Received Packets Discarded = 0
Received Packets Delivered = 290
Output Requests = 398
Routing Discards = 0
Discarded Output Packets = 0
Output Packet No Route = 0
Reassembly Required = 0
Reassembly Successful = 0
Reassembly Failures = 0
Datagrams Successfully Fragmented = 0
Datagrams Failing Fragmentation = 0
COL - SF
Video highlight
Search
ENG
IN
3:37 PM
28-Jul-24

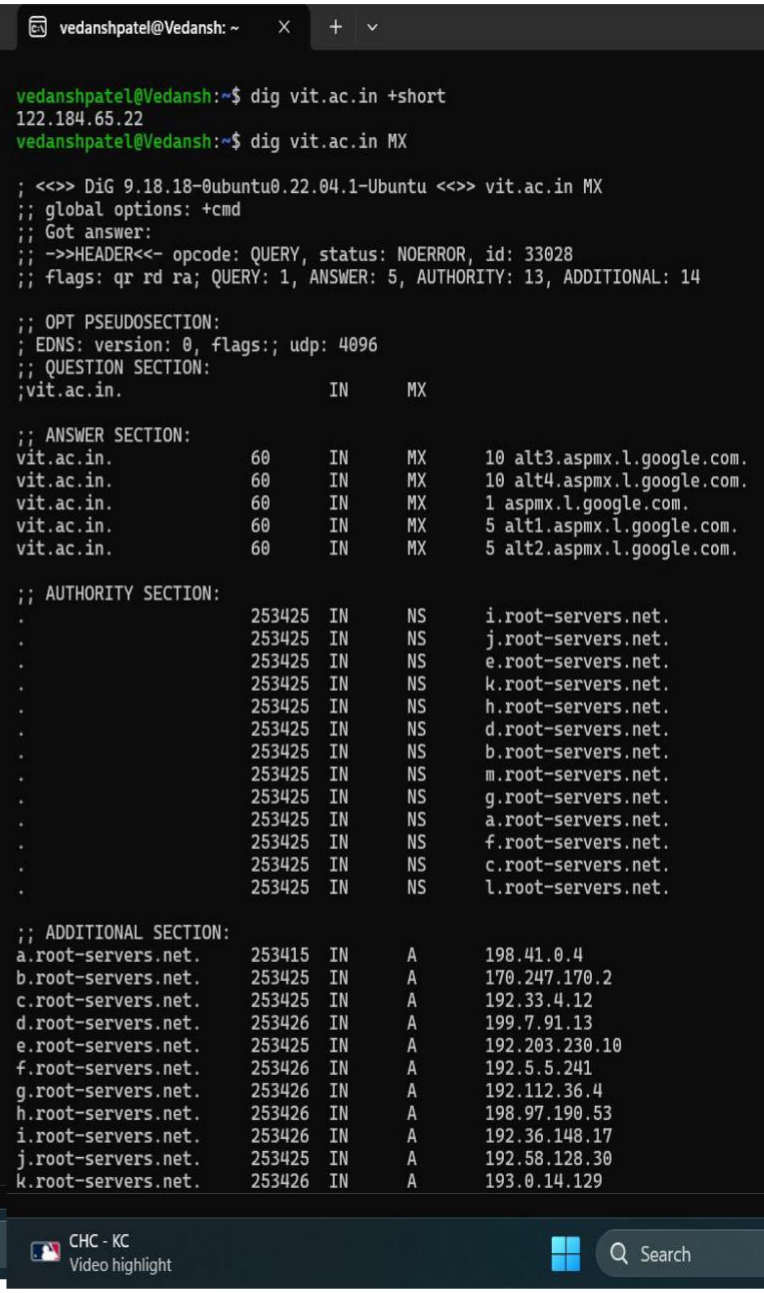

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ netstat -i
Kernel Interface table
Iface MTU RX-OK RX-ERR RX-DRP RX-OVR TX-OK TX-ERR TX-DRP TX-OVR Flg
eth0 1500 32893 0 0 0 17909 0 0 0 BMRU
lo 65536 52 0 0 0 52 0 0 0 LRU
vedanshpatel@Vedansh:~$
Command Prompt - netstat -
C:\Users\vedan>netstat -i
Active Connections
Proto Local Address Foreign Address State Time in State (ms)
TCP 172.16.201.220:7680 172.16.207.188:54677 TIME_WAIT 27356
TCP 172.16.201.220:49179 20.42.73.26:https ESTABLISHED 36686
TCP 172.16.201.220:49196 52.98.88.242:https TIME_WAIT 13613
TCP 172.16.201.220:49197 a23-3-70-42:https LAST_ACK 13770
TCP 172.16.201.220:49412 20.198.118.190:https ESTABLISHED 11161138
TCP 127.0.0.1:49671 Vedansh:49672 ESTABLISHED 1482019840
TCP 127.0.0.1:49672 Vedansh:49671 ESTABLISHED 1482019840
TCP 127.0.0.1:49675 Vedansh:49676 ESTABLISHED 1482016160
TCP 127.0.0.1:49676 Vedansh:49675 ESTABLISHED 1482016160
TCP 172.16.201.220:54550 172.16.204.197:ms-do ESTABLISHED 24093232
TCP 172.16.201.220:54552 a23-221-238-50:https ESTABLISHED 23919292
TCP 172.16.201.220:54553 20.189.173.2:https TIME_WAIT 10789090
TCP 172.16.201.220:54566 whatsapp-cdn-shv-01-maa2:https CLOSE_WAIT 87662
TCP 172.16.201.220:54567 116.119.92.163:https CLOSE_WAIT 32378
TCP 172.16.201.220:54568 116.119.69.99:https CLOSE_WAIT 32286
TCP 172.16.201.220:54569 116.119.92.96:https CLOSE_WAIT 32380
TCP 172.16.201.220:54570 116.119.69.99:https CLOSE_WAIT 32381
95°F Mostly cloudy
Search
ENG IN
3:39 PM 28-Jul-24

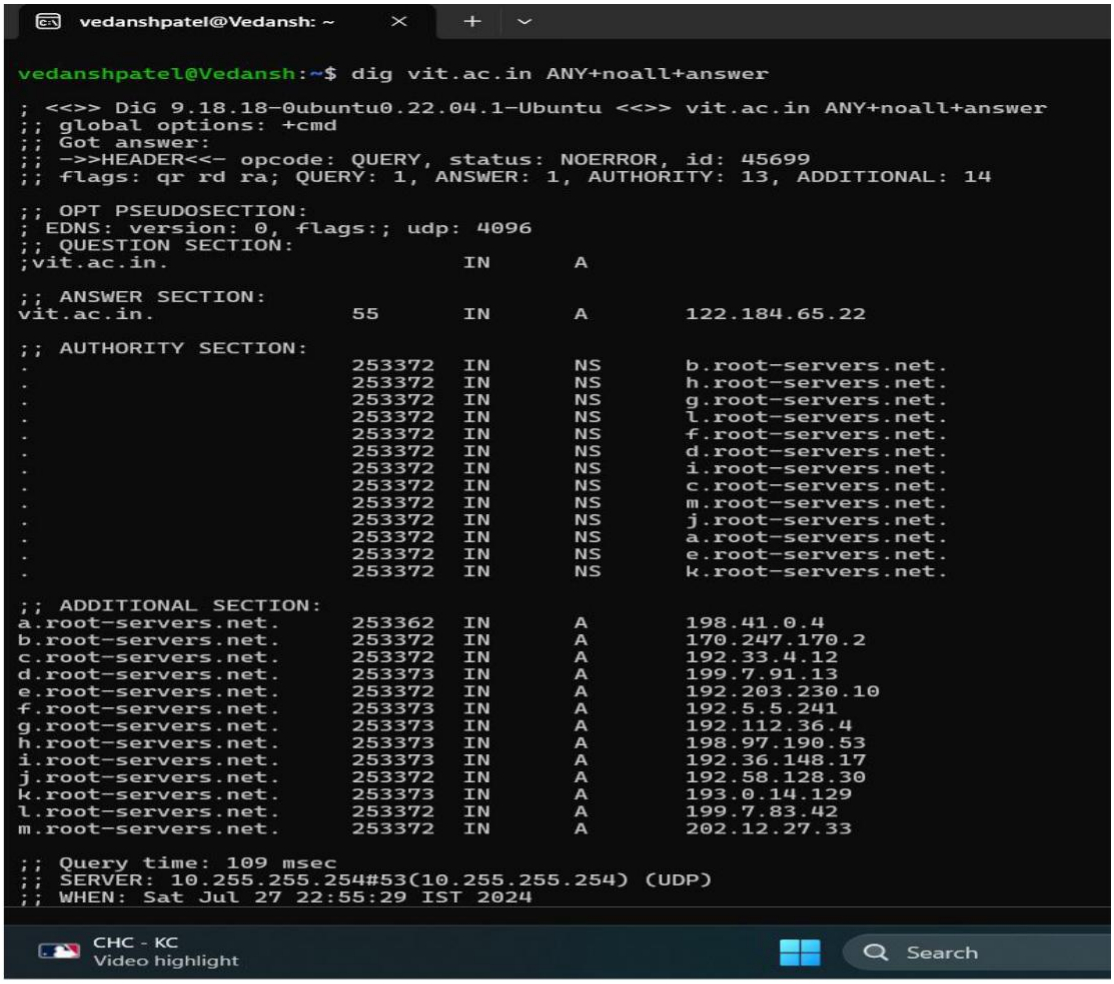

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ netstat -c
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 172.31.104.36:55908 ubuntu-mirror-1.ps:http CLOSE_WAIT
tcp 0 0 172.31.104.36:43948 snapstore-content:https ESTABLISHED
tcp 0 0 172.31.104.36:56018 darkbowser.canoni:https ESTABLISHED
tcp 0 0 172.31.104.36:44318 ubuntu-mirror-2.ps:http ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags Type State I-Node Path
unix 2 [ ] DGRAM 17571 /var/run/chrony/chronyd.sock
unix 2 [ ] DGRAM 21749 /run/user/1000/systemd/notify
unix 3 [ ] DGRAM CONNECTED 17612 /run/systemd/notify
unix 2 [ ] DGRAM 17621 /run/systemd/journal/syslog
unix 8 [ ] DGRAM CONNECTED 17629 /run/systemd/journal/dev-log
unix 7 [ ] DGRAM CONNECTED 17631 /run/systemd/journal/socket
unix 3 [ ] STREAM CONNECTED 18654
unix 3 [ ] STREAM CONNECTED 21792 /tmp/.X11-unix/X0
unix 3 [ ] STREAM CONNECTED 21754
unix 3 [ ] STREAM CONNECTED 21585
unix 2 [ ] DGRAM CONNECTED 21724
unix 3 [ ] STREAM CONNECTED 508 /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 629 /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 18625 /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 57
unix 3 [ ] STREAM CONNECTED 18590
unix 3 [ ] STREAM CONNECTED 17816 /run/dbus/system_bus_socket
Command Prompt
C:\Users\vedan>netstat -c
Port Consumption
Proto PID NumberOfPorts
TCP 23100 23
TCP 10004 7
TCP 0 5
TCP 12208 4
TCP 14648 4
TCP 11620 3
TCP 4 3
TCP 25720 2
TCP 7740 2
TCP 7644 2
TCP 12916 2
TCP 19420 2
TCP 840 2
TCP 18812 2
TCP 1260 1
TCP 8552 1
TCP 5308 1
TCP 6492 1
TCP 1120 1
TCP 8532 1
TCP 3012 1
TCP 1592 1
TCP 18940 1
TCP 4352 1
TCP 4780 1
TCP 23332 1
TCP 24272 1
TCP 3104 1
TCP 4712 1
TCP 1304 1
UDP 16040 6
UDP 3756 4
UDP 4 2
UDP 2368 2
UDP 25720 1
UDP 6492 1
95°F Mostly cloudy
Search
ENG IN
3:40 PM 28-Jul-24

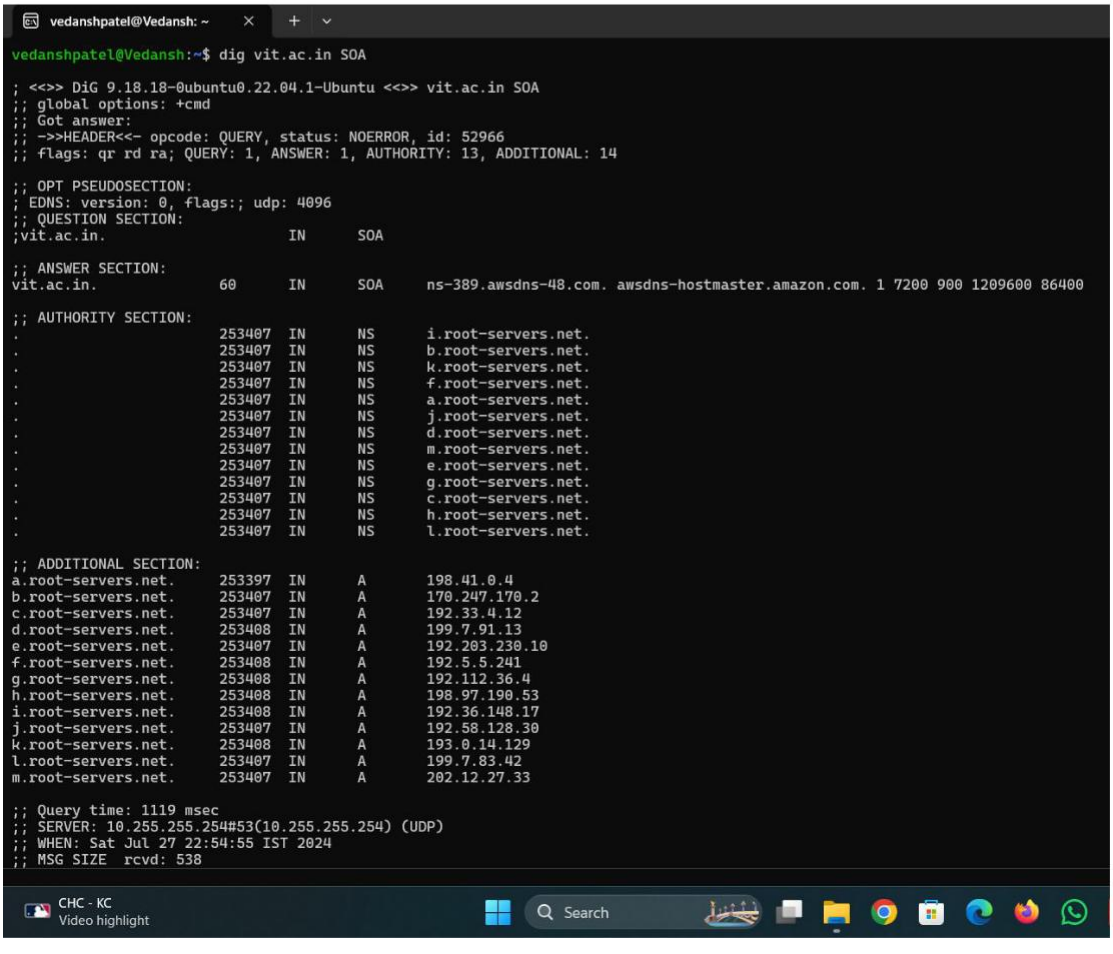
5. DIG Command:

• Dig stands for (Domain Information Groper) is a network administration command-line tool for querying Domain Name System (DNS) name servers.
• It is useful for verifying and troubleshooting DNS problems and also to perform DNS lookups and displays the answers that are returned from the name server that were queried.
• dig is part of the BIND domain name server software suite.
• dig command replaces older tool such as nslookup and the host.
• dig tool is available in major Linux distributions.





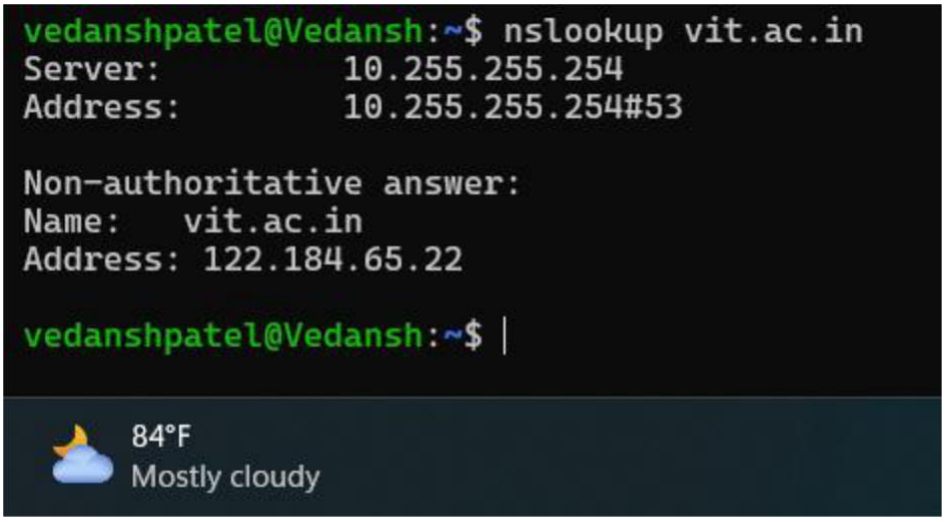

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ dig vit.ac.in ANY+noall+answer
; <<>> DiG 9.18.18-0ubuntu0.22.04.1-Ubuntu <<>> vit.ac.in ANY+noall+answer
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45699
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 13, ADDITIONAL: 14
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;vit.ac.in. IN A
;; ANSWER SECTION:
vit.ac.in. 55 IN A 122.184.65.22
;; AUTHORITY SECTION:
. 253372 IN NS b.root-servers.net.
. 253372 IN NS h.root-servers.net.
. 253372 IN NS g.root-servers.net.
. 253372 IN NS l.root-servers.net.
. 253372 IN NS f.root-servers.net.
. 253372 IN NS d.root-servers.net.
. 253372 IN NS i.root-servers.net.
. 253372 IN NS c.root-servers.net.
. 253372 IN NS m.root-servers.net.
. 253372 IN NS j.root-servers.net.
. 253372 IN NS a.root-servers.net.
. 253372 IN NS e.root-servers.net.
. 253372 IN NS k.root-servers.net.
;; ADDITIONAL SECTION:
a.root-servers.net. 253362 IN A 198.41.0.4
b.root-servers.net. 253372 IN A 170.247.170.2
c.root-servers.net. 253372 IN A 192.33.4.12
d.root-servers.net. 253373 IN A 199.7.91.13
e.root-servers.net. 253372 IN A 192.203.230.10
f.root-servers.net. 253373 IN A 192.5.5.241
g.root-servers.net. 253373 IN A 192.112.36.4
h.root-servers.net. 253373 IN A 198.97.190.53
i.root-servers.net. 253373 IN A 192.36.148.17
j.root-servers.net. 253372 IN A 192.58.128.30
k.root-servers.net. 253373 IN A 193.0.14.129
l.root-servers.net. 253372 IN A 199.7.83.42
m.root-servers.net. 253372 IN A 202.12.27.33
;; Query time: 109 msec
;; SERVER: 10.255.255.254#53(10.255.255.254) (UDP)
;; WHEN: Sat Jul 27 22:55:29 IST 2024
CHC - KC
Video highlight
Search

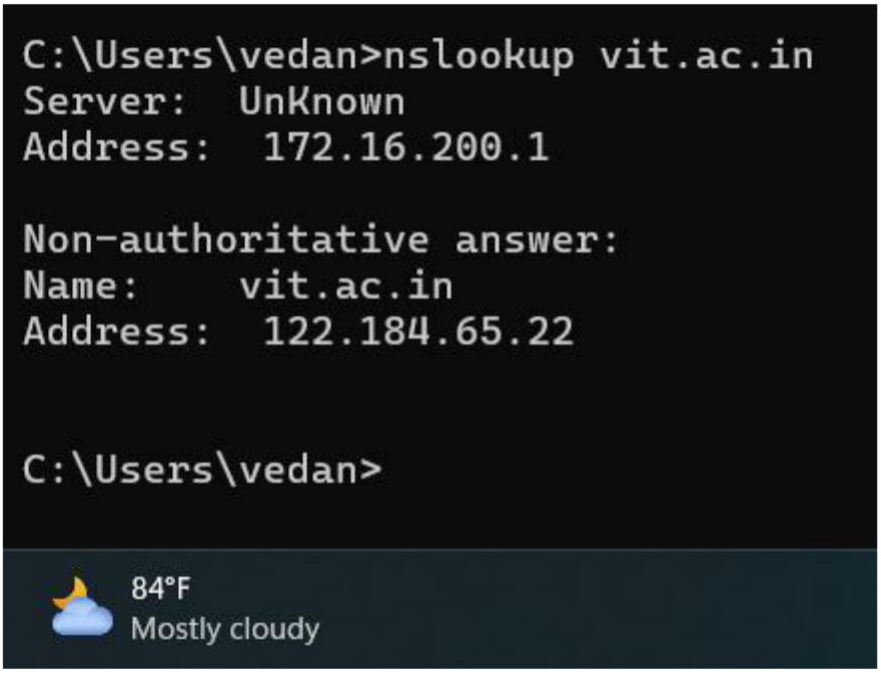

vedanshpatel@Vedansh: ~
vedanshpatel@Vedansh:~$ dig vit.ac.in SOA
; <<>> DiG 9.18.18-0ubuntu0.22.04.1-Ubuntu <<>> vit.ac.in SOA
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52966
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 13, ADDITIONAL: 14
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;vit.ac.in. IN SOA
;; ANSWER SECTION:
vit.ac.in. 60 IN SOA ns-389.awsdns-48.com. awsdns-hostmaster.amazon.com. 1 7200 900 1209600 86400
;; AUTHORITY SECTION:
. 253407 IN NS i.root-servers.net.
. 253407 IN NS b.root-servers.net.
. 253407 IN NS k.root-servers.net.
. 253407 IN NS f.root-servers.net.
. 253407 IN NS a.root-servers.net.
. 253407 IN NS j.root-servers.net.
. 253407 IN NS d.root-servers.net.
. 253407 IN NS m.root-servers.net.
. 253407 IN NS e.root-servers.net.
. 253407 IN NS g.root-servers.net.
. 253407 IN NS c.root-servers.net.
. 253407 IN NS h.root-servers.net.
. 253407 IN NS l.root-servers.net.
;; ADDITIONAL SECTION:
a.root-servers.net. 253397 IN A 198.41.0.4
b.root-servers.net. 253407 IN A 170.247.170.2
c.root-servers.net. 253407 IN A 192.33.4.12
d.root-servers.net. 253408 IN A 199.7.91.13
e.root-servers.net. 253407 IN A 192.203.230.10
f.root-servers.net. 253408 IN A 192.5.5.241
g.root-servers.net. 253408 IN A 192.112.36.4
h.root-servers.net. 253408 IN A 198.97.190.53
i.root-servers.net. 253408 IN A 192.36.148.17
j.root-servers.net. 253407 IN A 192.58.128.30
k.root-servers.net. 253408 IN A 193.0.14.129
l.root-servers.net. 253407 IN A 199.7.83.42
m.root-servers.net. 253407 IN A 202.12.27.33
;; Query time: 1119 msec
;; SERVER: 10.255.255.254#53(10.255.255.254) (UDP)
;; WHEN: Sat Jul 27 22:54:55 IST 2024
;; MSG SIZE rcvd: 538
CHC - KC
Video highlight
Search

6. **nslookup :**

Syntax : nslookup [option] [domain]

nslookup (stands for “Name Server Lookup”) is a useful command for getting information from the DNS server. It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record. It is also used to troubleshoot DNS-related problems.





7. Route :

Syntax : route

The route command displays and manipulate IP routing table for your system.

```
vedanshpatel@Vedansh:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         Vedansh.mshome. 0.0.0.0         UG    0      0        0 eth0
172.31.96.0     0.0.0.0         255.255.240.0   U     0      0        0 eth0
vedanshpatel@Vedansh:~$
```

LAD - HOU
Video highlight

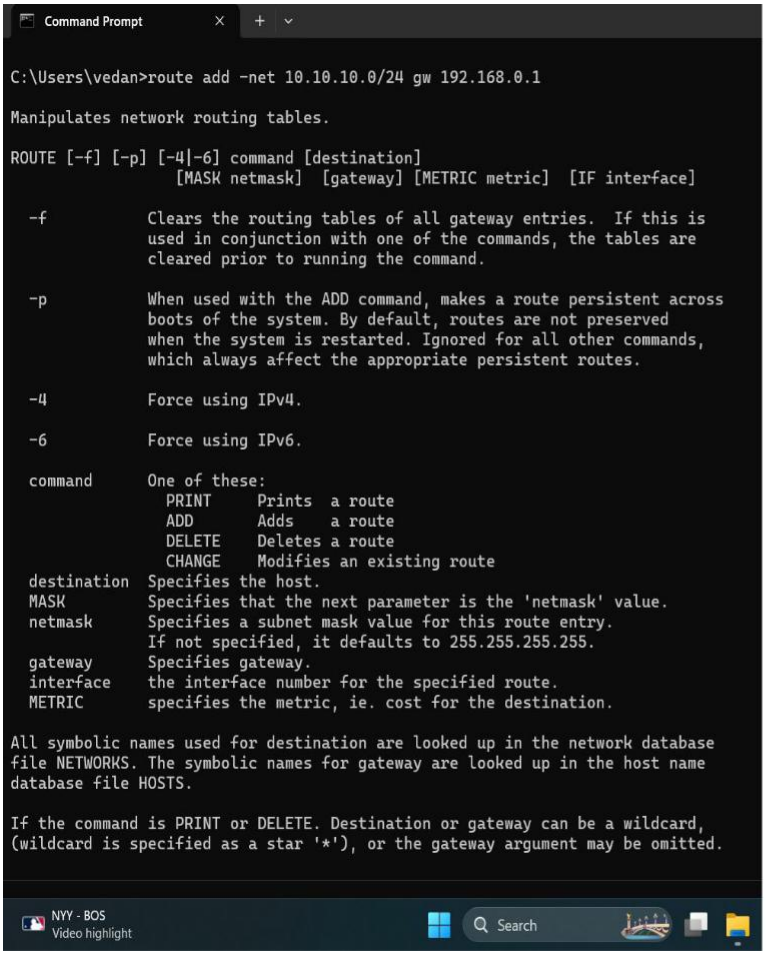
Search

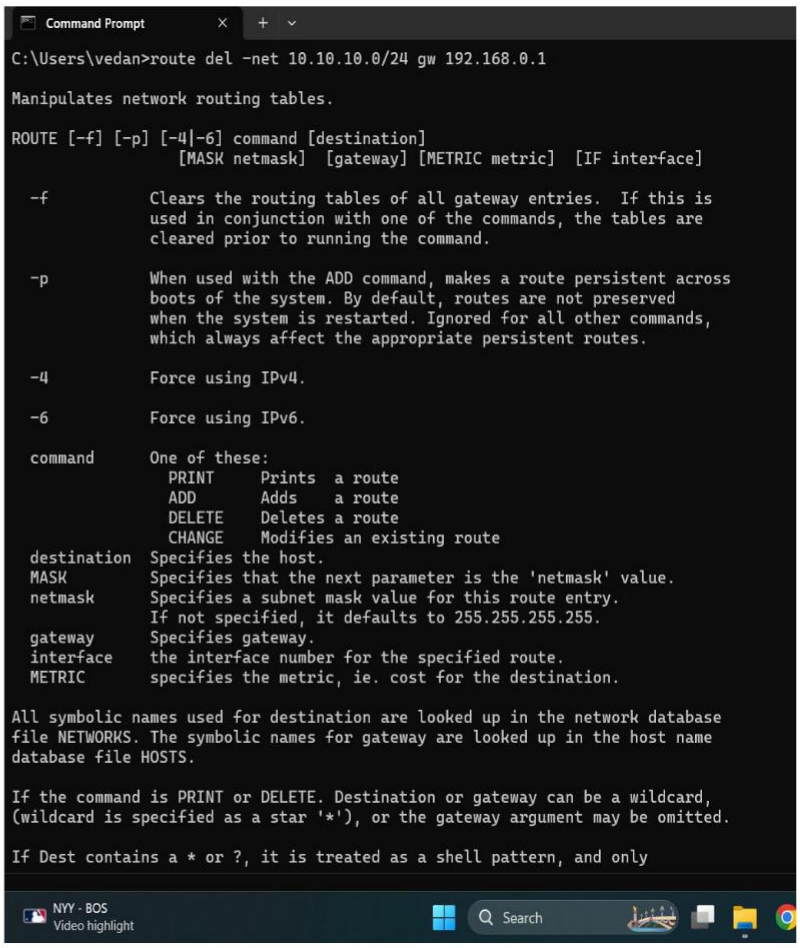
Command Prompt

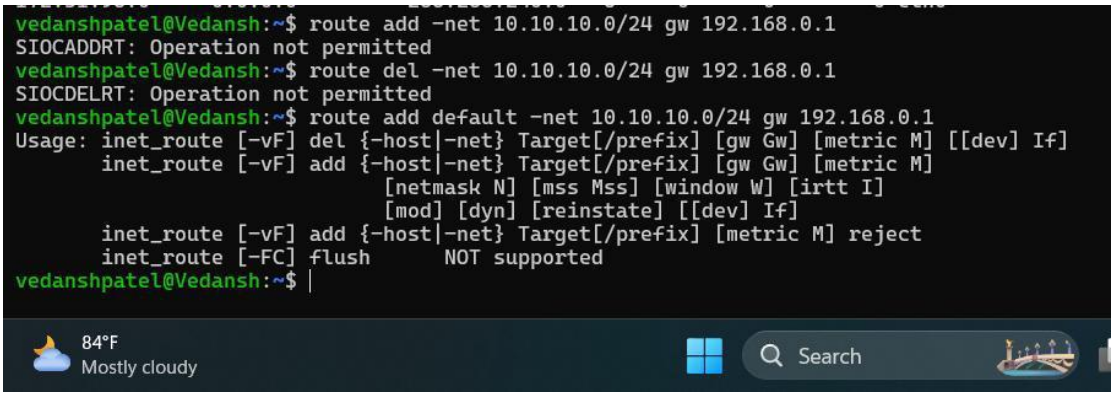
```
C:\Users\vedan>route

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
                  [MASK netmask]  [gateway] [METRIC metric]  [IF interface]

  -f           Clears the routing tables of all gateway entries.  If this is
               used in conjunction with one of the commands, the tables are
               cleared prior to running the command.

  -p           When used with the ADD command, makes a route persistent across
               boots of the system. By default, routes are not preserved
               when the system is restarted. Ignored for all other commands,
               which always affect the appropriate persistent routes.

  -4           Force using IPv4.

  -6           Force using IPv6.

  command      One of these:
                 PRINT     Prints  a route
                 ADD       Adds    a route
                 DELETE    Deletes a route
                 CHANGE    Modifies an existing route
  destination  Specifies the host.
  MASK         Specifies that the next parameter is the 'netmask' value.
  netmask      Specifies a subnet mask value for this route entry.
               If not specified, it defaults to 255.255.255.255.
  gateway      Specifies gateway.
  interface    the interface number for the specified route.
  METRIC       specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.
```

LAD - HOU
Video highlight

Search

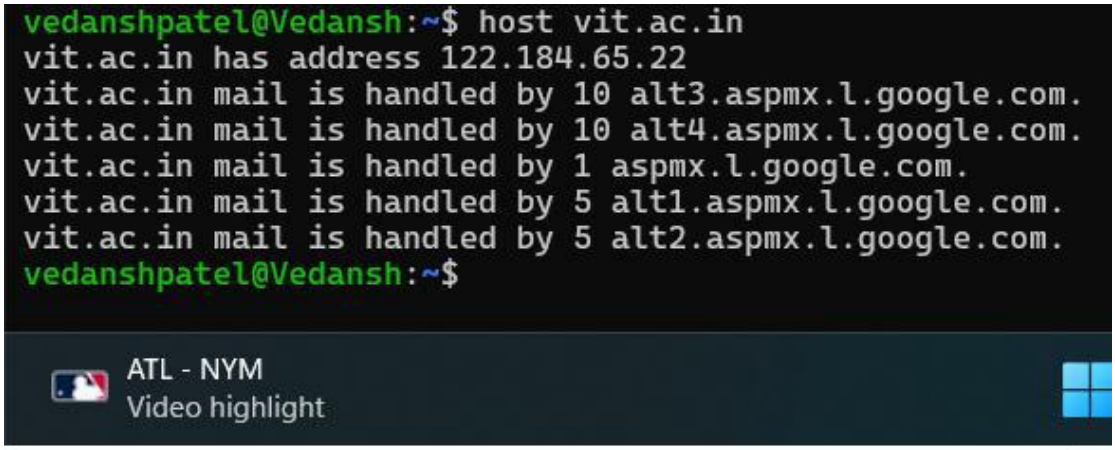

Command Prompt
C:\Users\vedan>route add -net 10.10.10.0/24 gw 192.168.0.1
Manipulates network routing tables.
ROUTE [-f] [-p] [-4|-6] command [destination]
[MASK netmask] [gateway] [METRIC metric] [IF interface]
-f Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.
-p When used with the ADD command, makes a route persistent across boots of the system. By default, routes are not preserved when the system is restarted. Ignored for all other commands, which always affect the appropriate persistent routes.
-4 Force using IPv4.
-6 Force using IPv6.
command One of these:
PRINT Prints a route
ADD Adds a route
DELETE Deletes a route
CHANGE Modifies an existing route
destination Specifies the host.
MASK Specifies that the next parameter is the 'netmask' value.
netmask Specifies a subnet mask value for this route entry.
If not specified, it defaults to 255.255.255.255.
gateway Specifies gateway.
interface the interface number for the specified route.
METRIC specifies the metric, ie. cost for the destination.
All symbolic names used for destination are looked up in the network database file NETWORKS. The symbolic names for gateway are looked up in the host name database file HOSTS.
If the command is PRINT or DELETE. Destination or gateway can be a wildcard, (wildcard is specified as a star '*'), or the gateway argument may be omitted.
NYY - BOS
Video highlight
Search


Command Prompt
C:\Users\vedan>route del -net 10.10.10.0/24 gw 192.168.0.1
Manipulates network routing tables.
ROUTE [-f] [-p] [-4|-6] command [destination]
[MASK netmask] [gateway] [METRIC metric] [IF interface]
-f Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.
-p When used with the ADD command, makes a route persistent across boots of the system. By default, routes are not preserved when the system is restarted. Ignored for all other commands, which always affect the appropriate persistent routes.
-4 Force using IPv4.
-6 Force using IPv6.
command One of these:
PRINT Prints a route
ADD Adds a route
DELETE Deletes a route
CHANGE Modifies an existing route
destination Specifies the host.
MASK Specifies that the next parameter is the 'netmask' value.
netmask Specifies a subnet mask value for this route entry.
If not specified, it defaults to 255.255.255.255.
gateway Specifies gateway.
interface the interface number for the specified route.
METRIC specifies the metric, ie. cost for the destination.
All symbolic names used for destination are looked up in the network database file NETWORKS. The symbolic names for gateway are looked up in the host name database file HOSTS.
If the command is PRINT or DELETE. Destination or gateway can be a wildcard, (wildcard is specified as a star '*'), or the gateway argument may be omitted.
If Dest contains a * or ?, it is treated as a shell pattern, and only
NYY - BOS
Video highlight
Search


vedanshpatel@Vedansh:~$ route add -net 10.10.10.0/24 gw 192.168.0.1
SIOCADDRT: Operation not permitted
vedanshpatel@Vedansh:~$ route del -net 10.10.10.0/24 gw 192.168.0.1
SIOCDELRT: Operation not permitted
vedanshpatel@Vedansh:~$ route add default -net 10.10.10.0/24 gw 192.168.0.1
Usage: inet_route [-vF] del {-host|-net} Target[/prefix] [gw Gw] [metric M] [[dev] If]
inet_route [-vF] add {-host|-net} Target[/prefix] [gw Gw] [metric M]
[netmask N] [mss Mss] [window W] [irtt I]
[mod] [dyn] [reinstate] [[dev] If]
inet_route [-vF] add {-host|-net} Target[/prefix] [metric M] reject
inet_route [-FC] flush NOT supported
vedanshpatel@Vedansh:~$
84°F
Mostly cloudy
Search

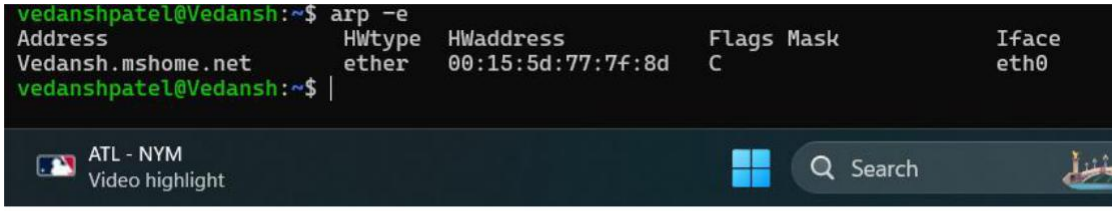
8. HOST:

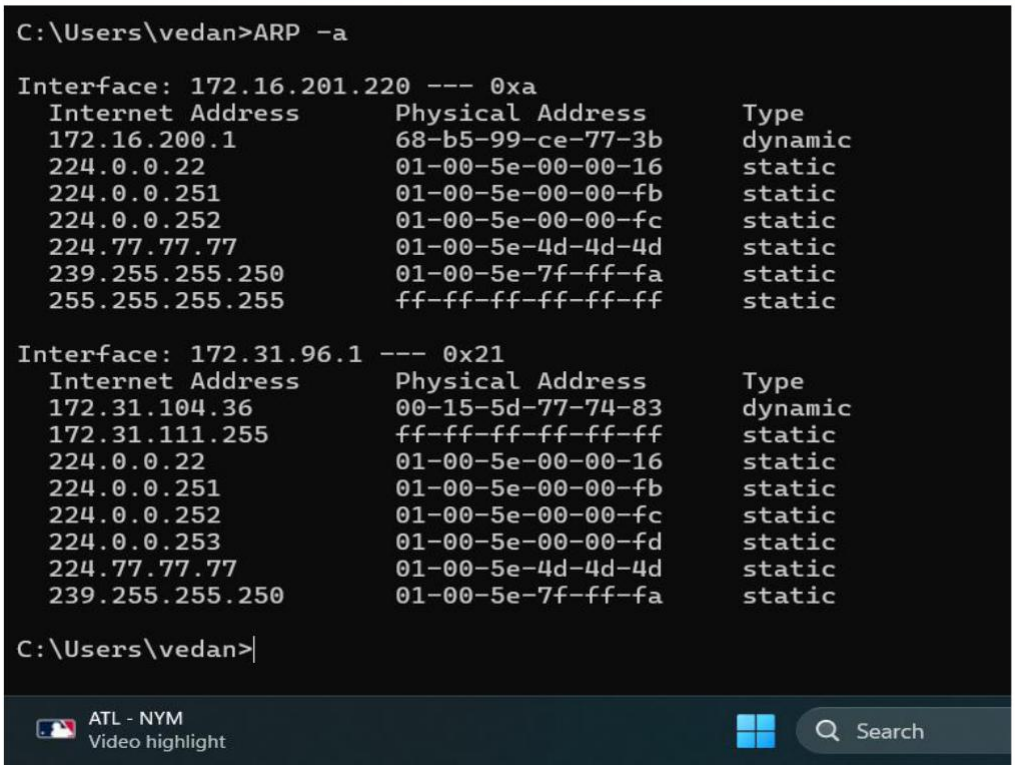
• host command to find name to IP (or) IP to name in IPv4 or IPv6 and also query DNS records.



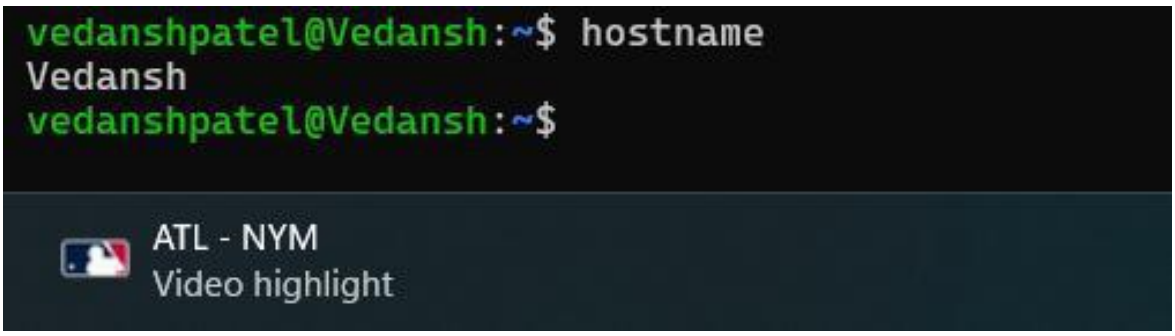
9. ARP:

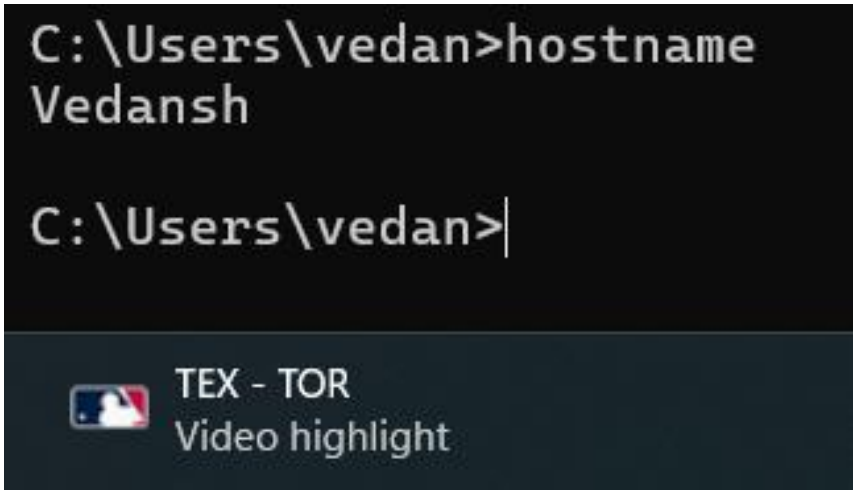
• ARP (Address Resolution Protocol) is useful to view / add the contents of the kernel's ARP tables. To see default table use the command as.





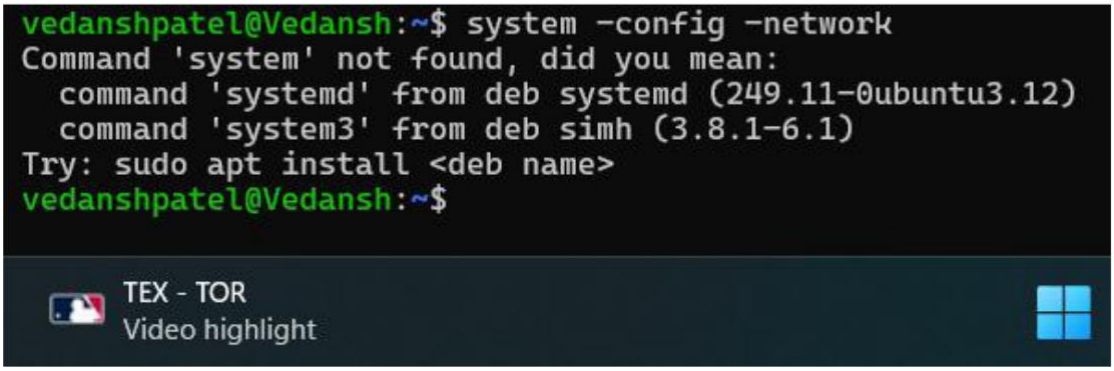
10. **HOSTNAME Command:**
    - hostname is to identify in a network.
    - Execute hostname command to see the hostname of your box.
    - You can set hostname permanently in /etc/sysconfig/network.
    - Need to reboot box once set a proper hostname.





11. <u>GUI tool system-confignetwork :</u>

- Type system-config-network in command prompt to configure network setting and you will get nice Graphical User Interface (GUI) which may also use to configure IP Address, Gateway, DNS etc. as shown below image.



Q2)

Overview

It’s a common networking device that helps direct traffic between different networks, such as your home network and the internet.

Characteristics of a Router:

1. **Network Interface**: Connects multiple devices, such as computers, smartphones, and printers, either through wired Ethernet cables or wirelessly via Wi-Fi.
2. **IP Address Assignment**: Assigns IP addresses to devices on the network using DHCP (Dynamic Host Configuration Protocol).
3. **Routing Tables**: Maintains routing tables to determine the best path for data to travel between devices and external networks.
4. **NAT (Network Address Translation)**: Allows multiple devices on a local network to share a single public IP address.
5. **Firewall**: Often includes a basic firewall to protect against unauthorized access and threats from the internet.

Advantages of a Router:

1. **Network Connectivity**: Connects multiple devices to the internet or to each other, enabling communication and data sharing.
2. **IP Address Management**: Automatically assigns IP addresses, simplifying network setup and management.
3. **NAT Support**: Provides security by hiding internal IP addresses from the public internet, reducing the risk of direct attacks.
4. **Wi-Fi Access**: Allows wireless devices to connect to the network, providing flexibility and convenience.
5. **Firewall Protection**: Offers basic security features to help protect your network from potential threats.

Disadvantages of a Router:

1. **Limited Range**: The signal strength of a Wi-Fi router may decrease with distance or obstacles, leading to weaker connections in certain areas.
2. **Security Risks**: If not properly configured, routers can be vulnerable to cyber attacks and unauthorized access.
3. **Performance Issues**: High traffic or multiple connected devices can impact performance and speed.
4. **Complex Configuration**: Advanced features and settings might be difficult to configure for non-technical users.
5. **Firmware Updates**: Routers need regular updates to maintain security and functionality, which can be an extra task for users.

Overall, routers are essential for connecting and managing networks, but they require some attention to ensure they operate efficiently and securely.