

Don Bosco Institute of Technology, Kurla
Academic Year 2022-23

EXPERIMENT NO. 1

SEMESTER: V

DATE OF PERFORMANCE: 11/07/22

SUBJECT: CN Lab

DATE OF SUBMISSION: 06/08/22

NAME OF THE STUDENT: Shrikrishna umbare

ROLL NO.: 57

AIM	Study of Linux Networking Commands.
LEARNING OBJECTIVE	The student will understand the basic Linux networking commands.
LEARNING OUTCOME	<ul style="list-style-type: none">• The student will experiment and explain the basic Linux networking commands.• The student will be able to find out IP/MAC addresses, IP packet status, link status, network statistics, port scanning etc.
LAB OUTCOME	CSL502.2: The student will illustrate the use of basic networking commands.
PROGRAM OUTCOME	PO1: The student will be able to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. PO5: The student will be able to create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
BLOOM'S TAXONOMY LEVEL	Knowledge , Understand
THEORY	<p>1. ifconfig: ifconfig is used to configure the system's kernel-resident network interfaces. It is used at boot time to set up interfaces as necessary. After that, it is usually only needed when debugging or when system tuning is needed. If no arguments are given, ifconfig displays the status of the system's active interfaces. If a single interface argument is given, it displays the status of the given interface only.</p> <ul style="list-style-type: none">• In the command prompt, type ifconfig. Running ifconfig with no options will display the configuration of all active interfaces.• Find the difference between ifconfig/all and ifconfig command?• Attach output. <p>2. ping: Ping is a basic Internet program that lets you verify that a particular Internet address exists and can accept requests. The verb ping means the act of using the ping utility or command.</p>

Class: T.E Comps (Sem V)

Lecturer: Sejal M Chopra

Subject: CN Lab

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Ping is used diagnostically to ensure that a host computer you are trying to reach is actually operating. If, for example, a user cannot ping a host, then the user will be unable to use the File Transfer Protocol (FTP) to send files to that host. Ping can also be used with a host that is operating to see how long it takes to get a response back. Using ping, you can learn the number form of the IP address from the symbolic domain name. Loosely, ping means "to get the attention of" or "to check for the presence of" another party online". Ping operates by sending a packet to a designated address and waiting for a response.

- Ask your friend to give his/her IP address.
- Now try a simple ping to their machine using e.g. **ping** your friend's IP address.
- Attach output.
- Try the option ping -n 2 IP ADDRESS, then try ping -n 7 IP ADDRESS. What differences do you notice?
- Attach output.

3. traceroute:

traceroute prints the route that packets take to a network host. It is used to find network path from machine to server.

- In the command prompt type trace route www.dbit.in (Take website of your choice instead of www.dbit.com)
- Attach output of both website.

4. tracepath:

tracepath traces the complete path to a networking host discovering the MTU along the path. It uses UDP port or some random port. It is similar to traceroute, only it does not require super user privileges and has no fancy options.

- In the command prompt type tracepath www.dbit.in (Take website of your choice instead of www.dbit.com)
- Attach output of both website.
- What difference do you see between traceroute and tracepath command?

5. nslookup:

nslookup is a network administration command-line tool available for many computer operating systems for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or for any other specific DNS record.

- In the command prompt Type nslookup www.yahoo.com (Take website of your choice instead of www.yahoo.com)
- Note that this command gives you the actual name of the server, as per the hosting company's naming conventions; its IP address; and any aliases under which that server operates.
- Attach output.

6. Netstat:

Netstat allows you to display statistics about your Ethernet interface. If any errors are

indicated in the display, you might have problems with your network connection that are slowing the network down. If the error packets approach 1% of the total number of packets, something is probably wrong with your NIC or physical interface.

- In the command prompt, type in netstat to list all current network connections, not just inbound but outbound as well.
- Attach output.

7. ARP:

ARP command is used to view and then delete the ARP cache, and you use the ping command to generate ARP cache entries. Address Resolution Protocol (ARP) is a telecommunications protocol used for resolution of network layer addresses into link layer addresses, a critical function in multiple-access networks. ARP was defined by RFC 826 and is also the name of the program for manipulating these addresses in most operating systems.

In the command prompt, type arp -a. Remember, that previously the computer discovered the MAC address of your computer by using address resolution protocol (ARP). You have now resolved the globally unique MAC address of your device.

- In the command prompt, type in ARP.
- Attach output.

8.ip addr show:

ip addr show command is used to view ip addresses.

- In the command prompt, type ip addr show.
- Attach output.

9.dig:

Using dig command you can query DNS name server for your DNS lookup related tasks.

- In the command prompt type dig dbit.in (Take website of your choice instead of www.dbit.com)
- The dig command result will have header, question section, answer section, authority section and additional section.
- Attach output of both website.

10.route:

route command will display the routing table entries.

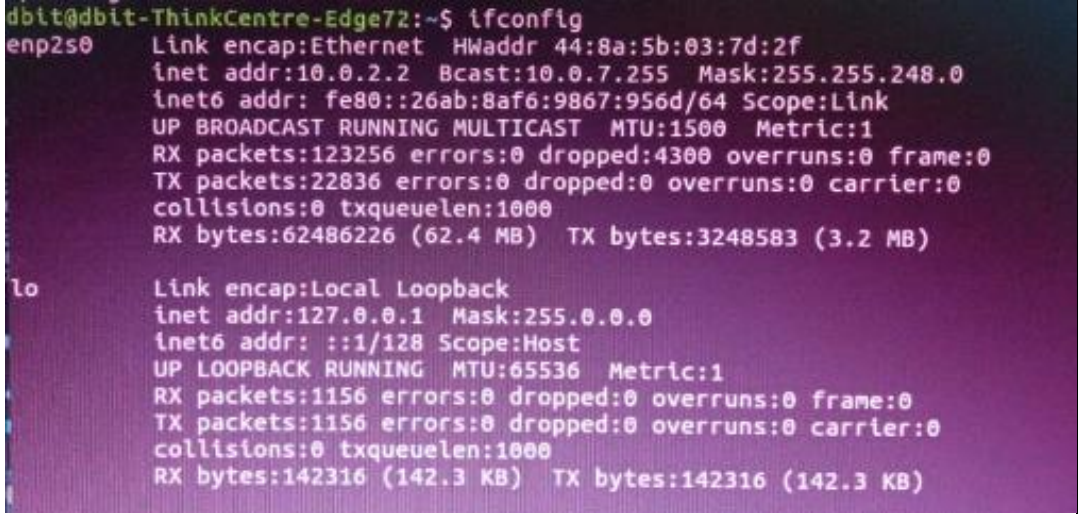
- In the command prompt type route. This will display the routing table entries.
- Find an alternative command for the same task.
- Attach output for both the commands executed.

11.curl:

curl is a tool for transferring data from or to a server. It supports various protocols. The command is designed to work without user interaction.

curl offers a busload of useful tricks like proxy support, user authentication, FTP upload,

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	<p>HTTP post, SSL connections, cookies, file transfer resume and more.</p> <p>12.wget:</p> <p>Wget is a free utility for non-interactive download of files from the Web. It supports HTTP, HTTPS, and FTP protocols, as well as retrieval through HTTP proxies. Wget is non-interactive, meaning that it can work in the background, while the user is not logged on. By contrast, most of the Web browsers require constant user's presence, which can be a great hindrance when transferring a lot of data.</p> <p>Wget can follow links in HTML, XHTML, and CSS pages, to create local versions of remote web sites, fully recreating the directory structure of the original site.</p> <p>Wget can be instructed to convert the links in downloaded files to point at the local files, for offline viewing.</p> <p>13.ssh:</p> <p>ssh (SSH client) is a program for logging into a remote machine and for executing commands on a remote machine. It is intended to provide secure encrypted communications between two untrusted hosts over an insecure network.</p> <p>ssh connects and logs into the specified destination, which may be specified as either [user@]hostname or a URI of the form ssh://[user@]hostname[:port].</p>
LAB EXERCISE	<ul style="list-style-type: none">• Ifconfig  <pre>dbit@dbit-ThinkCentre-Edge72:~\$ ifconfig enp2s0 Link encap:Ethernet HWaddr 44:8a:5b:03:7d:2f inet addr:10.0.2.2 Bcast:10.0.7.255 Mask:255.255.248.0 inet6 addr: fe80::26ab:8af6:9867:956d/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:123256 errors:0 dropped:4300 overruns:0 frame:0 TX packets:22836 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:62486226 (62.4 MB) TX bytes:3248583 (3.2 MB) lo Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:65536 Metric:1 RX packets:1156 errors:0 dropped:0 overruns:0 frame:0 TX packets:1156 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:142316 (142.3 KB) TX bytes:142316 (142.3 KB)</pre>

ifconfig -a:

```
dbit@dbit-ThinkCentre-Edge72:~$ ifconfig -a
enp2s0  Link encap:Ethernet  HWaddr 44:8a:5b:03:7d:2f
        inet addr:10.0.2.2  Bcast:10.0.7.255  Mask:255.255.240.0
        inet6 addr: fe80::26ab:8af6:9867:956d/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:154389 errors:0 dropped:5517 overruns:0 frame:0
        TX packets:23559 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:68957099 (68.9 MB)  TX bytes:3361920 (3.3 MB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:1223 errors:0 dropped:0 overruns:0 frame:0
        TX packets:1223 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:155145 (155.1 KB)  TX bytes:155145 (155.1 KB)
```

- ping

```
dbit@dbit-ThinkCentre-Edge72:~$ ping 10.0.3.107
PING 10.0.3.107 (10.0.3.107) 56(84) bytes of data.
64 bytes from 10.0.3.107: icmp_seq=1 ttl=64 time=0.107 ms
64 bytes from 10.0.3.107: icmp_seq=2 ttl=64 time=0.152 ms
64 bytes from 10.0.3.107: icmp_seq=3 ttl=64 time=0.152 ms
64 bytes from 10.0.3.107: icmp_seq=4 ttl=64 time=0.140 ms
64 bytes from 10.0.3.107: icmp_seq=5 ttl=64 time=0.150 ms
64 bytes from 10.0.3.107: icmp_seq=6 ttl=64 time=0.151 ms
64 bytes from 10.0.3.107: icmp_seq=7 ttl=64 time=0.144 ms
64 bytes from 10.0.3.107: icmp_seq=8 ttl=64 time=0.161 ms
64 bytes from 10.0.3.107: icmp_seq=9 ttl=64 time=0.177 ms
64 bytes from 10.0.3.107: icmp_seq=10 ttl=64 time=0.173 ms
64 bytes from 10.0.3.107: icmp_seq=11 ttl=64 time=0.186 ms
```

```
64 bytes from 10.0.3.107: icmp_seq=228 ttl=64 time=0.158 ms
64 bytes from 10.0.3.107: icmp_seq=229 ttl=64 time=0.156 ms
64 bytes from 10.0.3.107: icmp_seq=230 ttl=64 time=0.192 ms
^C
--- 10.0.3.107 ping statistics ---
230 packets transmitted, 230 received, 0% packet loss, time 2:
rtt min/avg/max/mdev = 0.107/0.175/0.223/0.025 ms
dbit@dbit-ThinkCentre-Edge72:~$
```


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ping www.dbit.in

```
dbit@dbit-ThinkCentre-Edge72:~$ ping www.dbit.in
PING www.dbit.in (15.206.23.229) 36(84) bytes of data:
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=1 ttl=51 time=3.85 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=2 ttl=51 time=3.59 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=3 ttl=51 time=16.3 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=4 ttl=51 time=3.48 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=5 ttl=51 time=3.84 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=6 ttl=51 time=3.54 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=7 ttl=51 time=3.56 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=8 ttl=51 time=3.51 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=9 ttl=51 time=8.68 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=10 ttl=51 time=3.63 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=11 ttl=51 time=6.83 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=12 ttl=51 time=6.32 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=13 ttl=51 time=9.06 ms
^C
--- www.dbit.in ping statistics ---
14 packets transmitted, 13 received, 7% packet loss, time 13623ms
rtt min/avg/max/mdev = 3.480/5.869/16.359/3.611 ms
```

ping invalid address

```
dbit@dbit-ThinkCentre-Edge72:~$ ping www.dbet.in
ping: unknown host www.dbet.in
```

- traceroute

traceroute www.dbit.in

```
dbit@dbit-ThinkCentre-Edge72:~$ traceroute www.dbit.in
traceroute to www.dbit.in (15.206.23.229), 30 hops max, 60 byte packets
 1 ipcopdirect.localdonain (10.0.1.148) 0.173 ms 0.165 ms 0.158 ms
 2 static-153.96.248.49-tataidc.co.in (49.248.96.153) 3.849 ms 3.855 ms 3.850 ms
 3 10.129.10.230 (10.129.10.230) 0.585 ms 0.586 ms 7.319 ms
 4 99.83.94.154 (99.83.94.154) 0.507 ms 0.556 ms 0.544 ms
 5 52.95.65.167 (52.95.65.167) 6.666 ms 7.278 ms 52.95.65.163 (52.95.65.163) 0.519 ms
 6 52.95.64.190 (52.95.64.190) 6.508 ms 52.95.64.100 (52.95.64.100) 8.009 ms 52.95.64.136 (52.95.64.136) 5.998 ms
 7 52.95.64.167 (52.95.64.167) 7.420 ms 52.95.64.181 (52.95.64.181) 4.991 ms 52.95.64.179 (52.95.64.179) 7.410 ms
 8 52.95.66.217 (52.95.66.217) 5.368 ms 52.95.66.151 (52.95.66.151) 12.094 ms 99.83.76.73 (99.83.76.73) 12.153 ms
 9 52.95.67.196 (52.95.67.196) 12.037 ms 99.83.76.92 (99.83.76.92) 11.182 ms 11.097 ms
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229) 4.168 ms 4.188 ms 4.158 ms
dbit@dbit-ThinkCentre-Edge72:~$
```

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- **tracert**

tracert www.google.com

```
dbit@dbit-ThinkCentre-Edge72:~$ tracert www.google.com
 1: [LOCALHOST] pmtu 1500
 1: ipcopdirect.localdomain 0.520ms
 1: ipcopdirect.localdomain 0.450ms
 2: 49.248.96.153 135.795ms
 3: no reply
 4: 121.241.5.101.numbat-static.vsnl.net.in 18.724ms
 5: 172.31.167.54 38.517ms asynn 8
 6: 14.140.100.6.static.vsnl.net.in 28.884ms asynn 8
 7: 115.112.71.65.STDILL-Chennai.vsnl.net.in 33.528ms asynn 9
 8: 121.240.1.50 37.802ms
 9: no reply
10: no reply
11: no reply
12: no reply
13: no reply
14: no reply
15: no reply
16: no reply
17: no reply
18: no reply
19: no reply
20: no reply
21: no reply
22: no reply
23: no reply
24: no reply
25: no reply
26: no reply
27: no reply
28: no reply
29: no reply
30: no reply
Too many hops: pmtu 1500
Resume: pmtu 1500
dbit@dbit-ThinkCentre-Edge72:~$
```

Tracert www.dbit.in

```
dbit@dbit-ThinkCentre-Edge72:~$ tracert www.dbit.in
 1: [LOCALHOST] pmtu 1500
 1: ipcopdirect.localdomain 0.443ms
 1: ipcopdirect.localdomain 0.421ms
 2: static-153.96.248.49-tataidc.co.in 57.711ms
 3: 10.129.10.230 4.662ms
 4: 99.83.94.154 3.769ms asynn 5
 5: 52.95.65.167 4.574ms asynn 10
 6: 52.95.64.156 3.750ms asynn 9
 7: 52.95.64.183 5.532ms asynn 10
 8: 99.83.76.55 5.518ms asynn 9
 9: 99.83.76.66 4.637ms asynn 8
10: no reply
11: no reply
12: no reply
13: no reply
14: no reply
15: no reply
16: ec2-15-286-23-229.ap-south-1.compute.amazonaws.com 4.886ms reached
Resume: pmtu 1500 hops 16 back 14
dbit@dbit-ThinkCentre-Edge72:~$
```

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- **nslookup**

nslookup www.yahoo.com

nslookup www.dbit.in

```
dbit@dbit-ThinkCentre-Edge72:~$ nslookup www.yahoo.com
Server:           127.0.1.1
Address:          127.0.1.1#53

www.yahoo.com    canonical name = new-fp-shed.wg1.b.yahoo.com.
Name:   new-fp-shed.wg1.b.yahoo.com
Address: 202.165.107.50
Name:   new-fp-shed.wg1.b.yahoo.com
Address: 202.165.107.49

dbit@dbit-ThinkCentre-Edge72:~$ nslookup www.dbit.in
Server:           127.0.1.1
Address:          127.0.1.1#53

Name:   www.dbit.in
Address: 15.206.23.229
```

- **netstat**

```
dbit@dbit-ThinkCentre-Edge72:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 10.0.2.2:46990         ec2-34-215-91-121:https ESTABLISHED
tcp        0      0 10.0.2.2:47210         host2617-in-f14:https  ESTABLISHED
tcp        0      0 10.0.2.2:52828         10.0.7.99:netbios-ssn ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags   Type       State           I-Node   Path
unix    2      0 00000000 DGRAM     -
unix    3      0 00000000 DGRAM     -
unix    2      0 00000000 DGRAM     -
unix   13      0 00000000 DGRAM     -
unix    2      0 00000000 DGRAM     -
unix    7      0 00000000 DGRAM     -
unix    2      0 00000000 DGRAM     -
unix    3      0 00000000 STREAM    CONNECTED      45820    /run/user/1000/systemd/notify
unix    3      0 00000000 STREAM    CONNECTED      65429    /run/systemd/notify
unix    3      0 00000000 STREAM    CONNECTED      49373    /run/systemd/cgroups-agent
unix    3      0 00000000 STREAM    CONNECTED      48907    /run/systemd/journal/dev-log
unix    3      0 00000000 STREAM    CONNECTED      57316    /run/systemd/journal/syslog
unix    3      0 00000000 STREAM    CONNECTED      45937    /run/systemd/journal/socket
unix    3      0 00000000 STREAM    CONNECTED      46799    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      26299    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      88717    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      58397    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      49087    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      46816    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 SEQPACKET CONNECTED      57325    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      46873    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      47097    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      18721    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      17723    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      68799    @/tmp/dbus-AayPIFIVRG
unix    2      0 00000000 STREAM    CONNECTED      68767    @/tmp/dbus-AayPIFIVRG
unix    3      0 00000000 STREAM    CONNECTED      49118    @/tmp/dbus-C95081r22g
unix    3      0 00000000 STREAM    CONNECTED      45428    @/tmp/dbus-C95081r22g
unix    3      0 00000000 SEQPACKET CONNECTED      41813    @/tmp/dbus-C95081r22g
unix    3      0 00000000 STREAM    CONNECTED      17327    @/tmp/dbus-C95081r22g
unix    3      0 00000000 STREAM    CONNECTED      48906    @/tmp/dbus-C95081r22g
```


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unix 3	STREAM	CONNECTED	48878	
unix 3	STREAM	CONNECTED	48058	
unix 3	STREAM	CONNECTED	49921	
unix 3	STREAM	CONNECTED	49445	
unix 3	STREAM	CONNECTED	49249	
unix 3	STREAM	CONNECTED	25441	
unix 3	STREAM	CONNECTED	61890	
unix 3	STREAM	CONNECTED	57794	
unix 3	STREAM	CONNECTED	46938	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	48588	
unix 3	STREAM	CONNECTED	46984	/var/run/dbus/system_bus_socket
unix 3	STREAM	CONNECTED	48080	@/tmp/.X11-unix/X0
unix 3	STREAM	CONNECTED	46693	@/tmp/ibus/dbus-TL6POvee
unix 3	STREAM	CONNECTED	48688	
unix 3	STREAM	CONNECTED	49466	
unix 3	STREAM	CONNECTED	27089	/var/run/cups/cups.sock
unix 3	STREAM	CONNECTED	61883	
unix 3	STREAM	CONNECTED	57121	
unix 3	STREAM	CONNECTED	21250	
unix 3	STREAM	CONNECTED	19421	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	57182	@/tmp/ibus/dbus-TL6POvee
unix 3	DGRAM		46620	
unix 3	STREAM	CONNECTED	57317	
unix 3	STREAM	CONNECTED	49182	
unix 3	STREAM	CONNECTED	48119	@/tmp/.ICE-unix/22298
unix 3	STREAM	CONNECTED	46620	
unix 3	STREAM	CONNECTED	21875	
unix 3	STREAM	CONNECTED	57131	
unix 3	STREAM	CONNECTED	49370	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	58138	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	51232	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	47843	
unix 3	STREAM	CONNECTED	23129	
unix 3	SEQPACKET	CONNECTED	58148	
unix 3	STREAM	CONNECTED	58134	@/tmp/.X11-unix/X0
unix 3	STREAM	CONNECTED	43041	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	27079	
unix 3	STREAM	CONNECTED	60879	
unix 3	STREAM	CONNECTED	47819	@/tmp/.X11-unix/X0
unix 3	STREAM	CONNECTED	48084	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	22757	/var/run/dbus/system_bus_socket
unix 3	STREAM	CONNECTED	18791	
unix 3	STREAM	CONNECTED	49141	/run/systemd/journal/stdout

unix 3	STREAM	CONNECTED	12077	@/tmp/.X11-unix/X0
unix 3	STREAM	CONNECTED	48094	
unix 3	DGRAM	CONNECTED	48075	@/tmp/.X11-unix/X0
unix 3	STREAM	CONNECTED	17183	
unix 3	STREAM	CONNECTED	57795	@/tmp/.ICE-unix/22298
unix 3	STREAM	CONNECTED	48836	
unix 3	STREAM	CONNECTED	52223	
unix 3	STREAM	CONNECTED	48610	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	50321	
unix 3	STREAM	CONNECTED	48891	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	24638	/var/run/dbus/system_bus_socket
unix 3	STREAM	CONNECTED	61887	
unix 3	STREAM	CONNECTED	58223	/var/run/dbus/system_bus_socket
unix 3	STREAM	CONNECTED	58222	
unix 3	STREAM	CONNECTED	48963	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	43979	@/tmp/.ICE-unix/22298
unix 3	STREAM	CONNECTED	65486	@/tmp/dbus-AayPIfIVRG
unix 3	SEQPACKET	CONNECTED	59757	
unix 3	STREAM	CONNECTED	57139	
unix 3	STREAM	CONNECTED	46983	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	34999	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	49539	
unix 3	STREAM	CONNECTED	45827	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	28589	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	30320	
unix 3	STREAM	CONNECTED	46669	
unix 3	STREAM	CONNECTED	52076	
unix 3	STREAM	CONNECTED	58289	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	48115	@/tmp/dbus-G95081r2Zg
unix 3	STREAM	CONNECTED	48874	
unix 3	STREAM	CONNECTED	48640	
unix 3	STREAM	CONNECTED	48611	
unix 3	STREAM	CONNECTED	57134	
unix 3	STREAM	CONNECTED	49418	
unix 3	STREAM	CONNECTED	58444	@/tmp/dbus-AayPIfIVRG
unix 3	STREAM	CONNECTED	47593	
unix 3	STREAM	CONNECTED	23234	
unix 3	STREAM	CONNECTED	25534	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	61890	
unix 3	STREAM	CONNECTED	58218	
unix 3	STREAM	CONNECTED	49441	/run/systemd/journal/stdout
unix 3	STREAM	CONNECTED	48834	
unix 3	STREAM	CONNECTED	48721	

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```

ubuntu 2 DGRAM 26680
ubuntu 2 STREAM CONNECTED 45785
ubuntu 2 STREAM CONNECTED 45785 8/Tcp/ibus/dbus-TLSPvxx
ubuntu 2 STREAM CONNECTED 45781
ubuntu 2 STREAM CONNECTED 45780 /var/run/ibus/system_bus_socket
ubuntu 2 STREAM CONNECTED 45889 /run/systemd/journal/stdout
ubuntu 1 DGRAM 15946
ubuntu 1 STREAM CONNECTED 73086 /var/run/ibus/system_bus_socket
ubuntu 3 STREAM CONNECTED 26786
ubuntu 3 STREAM CONNECTED 46759 /run/systemd/journal/stdout
ubuntu 3 STREAM CONNECTED 20324 /var/run/ibus/system_bus_socket
ubuntu 3 STREAM CONNECTED 48592 @/com/ubuntu/upstart-session/1000/220/4
ubuntu 3 STREAM CONNECTED 53236
ubuntu 3 STREAM CONNECTED 45890
ubuntu 3 STREAM CONNECTED 20648
ubuntu 3 STREAM CONNECTED 17166
ubuntu 3 STREAM CONNECTED 50124 @bit-com.canonical.Unity.Scope-Files-T553727956584j
ubuntu 3 STREAM CONNECTED 49946
ubuntu 3 STREAM CONNECTED 47997
ubuntu 3 STREAM CONNECTED 51246
ubuntu 3 STREAM CONNECTED 45773
ubuntu 3 DGRAM 15945
ubuntu 3 STREAM CONNECTED 51237
ubuntu 3 STREAM CONNECTED 27683
ubuntu 3 STREAM CONNECTED 48059
ubuntu 2 DGRAM 15878
ubuntu 3 STREAM CONNECTED 51225
ubuntu 3 STREAM CONNECTED 46698 8/Tcp/ibus-4ayPfZVRc
ubuntu 3 STREAM CONNECTED 45891 /run/user/1000/pulse/native
ubuntu 3 STREAM CONNECTED 17388 /var/run/ibus/system_bus_socket
ubuntu 3 STREAM CONNECTED 51245
ubuntu 3 STREAM CONNECTED 69540
ubuntu 3 STREAM CONNECTED 50346
ubuntu 3 STREAM CONNECTED 48776 @bit-com.canonical.Unity.Master.Scope-Files-T5536703450772
ubuntu 3 STREAM CONNECTED 24172 8/Tcp/331-unity/x0
ubuntu 2 DGRAM 15936
ubuntu 3 STREAM CONNECTED 45942 /run/systemd/journal/stdout
ubuntu 3 STREAM CONNECTED 47042
ubuntu 3 STREAM CONNECTED 52231 @bit-com.canonical.Unity.Scope-applications-T5540687735026
ubuntu 3 STREAM CONNECTED 38484 /run/systemd/journal/stdout
ubuntu 3 STREAM CONNECTED 48182 @/com/ubuntu/upstart-session/1000/220/4
ubuntu 3 STREAM CONNECTED 47180

```

```
netstat -t:
netstat -au:
```

```

root@kali:~# ss -tlns -o sstate=TCP,SYN_RECV netstat -t -n
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address         State
tcp        0      0 10.0.2.12:40900        ec2-34-215-91-121:https ESTABLISHED
tcp        0      0 10.0.2.12:81900        bom05s23-ln-f7.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:87430        bom07s32-ln-f14.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:59230        bom12s14-ln-f22.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:81962        bom05s23-ln-f7.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:41672        bom07s32-ln-f10.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:38240        bom12s13-ln-f1.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:37810        bom12e07-ln-f14.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:38834        neap03s40-ln-f10.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:52832        bom07s25-ln-f22.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:54130        123.200.120.34.bc:https ESTABLISHED
tcp        0      0 10.0.2.12:54800        bom07s40-ln-f6.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:38414        bom07s30-ln-f14.1e:https ESTABLISHED
tcp        0      0 10.0.2.12:52820        10.0.7.99:netbios-ssn   ESTABLISHED

root@kali:~# ss -tlns -o sstate=TCP,SYN_RECV netstat -av
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address          State
udp        0      0 dbit-ThinkCentre:domain *:*
udp        0      0 *:indns                 *:*
udp        0      0 *:34036                  *:*
udp        0      0 *:42362                  *:*
udp        0      0 *:48818                   *:*
udp        0      0 *:46607                   *:*
udp        0      0 *:lisp                    *:*
udp6       0      0 [::]:3308                [::]:*
udp6       0      0 [::]:indns                [::]:*
```


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```
unlX 0          STREAM      CONNECTED    71248  
unlX 3          STREAM      CONNECTED    46980  
unlX 3          STREAM      CONNECTED    45891  
unlX 3          STREAM      CONNECTED    17388  
unlX 3          STREAM      CONNECTED    51245  
unlX 3          STREAM      CONNECTED    69940  
unlX 3          STREAM      CONNECTED    50306  
unlX 3          STREAM      CONNECTED    48776  
unlX 3          STREAM      CONNECTED    24172  
unlX 2          DGRAM       15939  
unlX 3          STREAM      CONNECTED    45942  
unlX 3          STREAM      CONNECTED    71383  
unlX 3          STREAM      CONNECTED    47042  
unlX 3          STREAM      CONNECTED    52231  
unlX 3          STREAM      CONNECTED    24644  
unlX 3          STREAM      CONNECTED    48591  
unlX 3          STREAM      CONNECTED    47900
```

@tnp/dbus-AayPlfIVRG
/run/user/1000/pulse/native
/var/run/dbus/system_bus_socket

gdblt-con.canonical.Unity.Master.Scope.files.T5S3670345877Z
@tnp/.x11-unix/X0

/run/systemd/journal/stdout

@gblt-con.canonical.Unity.Scope.applications.T5S40587375926
/run/systemd/journal/stdout
@con/ubuntu/upstart-session/1000/22074

```
dolt@gblt-ThLakCentre-Edge72i~$ netstat -ln
```

Kernel Interface table											
iface	RPU	Mot	RX-OK	RX-ERR	RX-DROP	RX-OVR	TX-OK	TX-ERR	TX-DROP	TX-OVR	Flg
enp2so	1500	o	316563	o	10733	o	28555	o	o	o	BMRU
lo	85534	o	1795	o	o	o	1795	o	o	o	LNU

```
dolt@gblt-ThLakCentre-Edge72i~$
```

netstat -g: Display multicast group membership information for IPv4 and IPv6.

```

# ip netstat -g
IPv4v4 Group Memberships
Interface RefCnt Group
-----
lo 1 all-systems.mcast.net
exp2a 1 224.0.0.251
exp2a 1 all-systems.mcast.net
lo 1 ip6-allnodes
lo 1 ff01::1
exp2a 1 ff02::fb
exp2a 1 ff02::1:ff07:95ed
exp2a 1 ip6-allnodes
exp2a 1 ff01::1

```

- **ARP**

arp -a:

[illegible]

- ip addr show

```
@bitgdbit-ThinkCentre-Edge72:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> Ntu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> Ntu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 44:8a:5b:83:7d:2f brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.2/24 brd 10.0.2.255 scope global enp2s0
        valid_lft forever preferred_lft forever
    inet6 fe80::2a8b:8af6:9867:95a2/64 scope link
        valid_lft forever preferred_lft forever
@bitgdbit-ThinkCentre-Edge72:~$
```

- dig

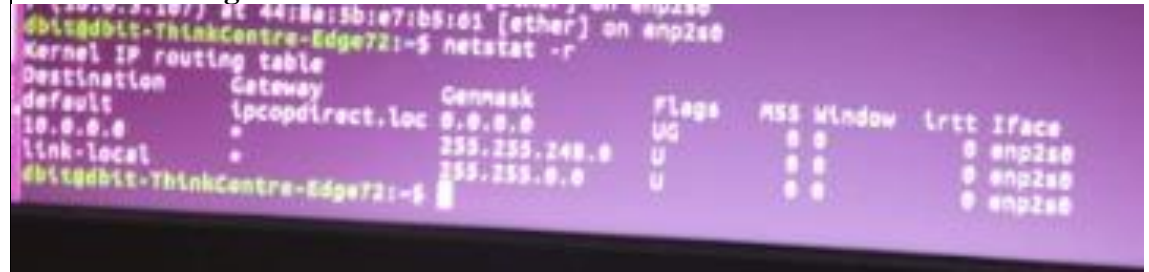
```
@bitgdbit-ThinkCentre-Edge72:~$ dig www.google.com
; <--> DIG 9.10.3-P4-Ubuntu <--> www.google.com
;; global options: +cmd
;; Got answer:
;; --HEADER-- opcode: QUERY, status: NOERROR, id: 64674
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.google.com.
;; ANSWER SECTION:
www.google.com. 142 IN A 142.250.182.228
;; Query time: 0 msec
;; SERVER: 127.0.0.1:53(127.0.0.1)
;; WHEN: Mon Jul 11 10:29:38 IST 2023
;; MSG SIZE rcvd: 96
@bitgdbit-ThinkCentre-Edge72:~$
```

- route

```
@bitgdbit-ThinkCentre-Edge72:~$ route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
default * 0.0.0.0 UG 100 0 0 enp2s0
10.0.0.0 * 255.255.240.0 U 100 0 0 enp2s0
link-local * 255.255.0.0 U 1000 0 0 enp2s0
@bitgdbit-ThinkCentre-Edge72:~$
```


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alternative using netstat -r



- **curl**

```
honeybadger@DESKTOP-E3POLBI:~$ curl mpt.hayden.co.in
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <meta name="description" content="">
  <title>MPT Sign-In</title>
  <!-- Bootstrap CDN -->
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-1BME4408Q781vHf1dvkuhftAU6au8T94wRhftj0brCEXSU10Boq/L2QV26jIW3" crossorigin="anonymous">
  <!-- Local Stylesheet -->
  <link href="/static/vendor/bootstrap/bootstrap.min.css" rel="stylesheet" integrity="sha384-1BME4408Q781vHf1dvkuhftAU6au8T94wRhftj0brCEXSU10Boq/L2QV26jIW3" crossorigin="anonymous">
  <link href="/static/css/login.css" rel="stylesheet">
</head>
<body class="">
  <div class="logo">
    <a class="" href="#">
      
    </a>
  </div>
  <main class="form-signin">
    <form action="" method="POST">
      <h1 class="h3 mb-3">Welcome to MPT</h1>
      <p style="opacity: 0.7;">Login by entering information below</p>
      <input type="hidden" name="csrfmiddlewaretoken" value="CQscgkCNAP4F6M42wNK0LxghLKS21xa1MSX8Y7N6CfQyYdQ2JN246Pg2">
      <div class="form-floating">
        <input type="email" name="email" class="form-control top" placeholder="Email" required>
        <label for="inputEmail">Email</label>
      </div>
      <div class="form-floating">
        <input type="password" name="password" class="form-control bottom" placeholder="Password" required>
        <label for="inputPassword">Password</label>
      </div>
      <p><a href=""><strong>Forgot password?</strong></a></p>
      <label class="checkbox-container" style="opacity: 0.85;font-size: 0.9rem;">
        <input type="checkbox">
        <span class="checkbox-mark"></span>
        Remember Me
      </label>
      <button class="w-100 btn btn-lg btn-primary" style="text-align: center;" type="submit">Login</button>
      <p style="opacity: 0.8;">Don't have an account? <a href="/sign-up"><strong>Register</strong></a></p>
    </form>
  </div>
</main>
<!-- Bootstrap CDN -->
```

- **wget**

```
honeybadger@DESKTOP-E3POLBI:~$ wget mpt.hayden.co.in
--2022-07-17 20:06:34-- http://mpt.hayden.co.in/
Resolving mpt.hayden.co.in (mpt.hayden.co.in)... 104.208.84.186, 108.162.194.113, 162.159.38.113, ...
Connecting to mpt.hayden.co.in (mpt.hayden.co.in)[104.208.84.186]:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2894 (2.8K) [text/html]
Saving to: 'index.html'

index.html          100%[=====] 2.83K --.-KB/s in 0s
2022-07-17 20:06:34 (70.6 MB/s) - 'index.html' saved [2894/2894]
```

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	<ul style="list-style-type: none">• ssh <pre>honeybadger@DESKTOP-E3POLBL:~\$ ssh mpt.hayden.co.in The authenticity of host 'mpt.hayden.co.in (104.208.84.186)' can't be established. ECDSA key fingerprint is SHA256:B2Ap32hmbDjqxY7pQ+KLbcDTEFihRVLWHvrlnGrYNNU. Are you sure you want to continue connecting (yes/no/[fingerprint])? yes Warning: Permanently added 'mpt.hayden.co.in,104.208.84.186' (ECDSA) to the list of known hosts. honeybadger@mpt.hayden.co.in: Permission denied (publickey).</pre>
REFERENCES	<ul style="list-style-type: none">• B.A. Forouzan, “Data Communications and Networking”, TMH, Fourth Edition.• https://www.networkworld.com/article/2697039/unix-topnetworking-commands-and-what-they-tell-you.html• https://www.youtube.com/watch?v=rurs7cdT5cc• https://www.youtube.com/watch?v=V_3t2wBBB1U• https://www.youtube.com/watch?v=75lCgcXP4dc