EXPERIMENT NO. 1

SEMESTER: V **DATE OF PERFORMANCE: 20-07-2022**

SUBJECT: CN Lab **DATE OF SUBMISSION: 23-07-2022**

NAME OF THE STUDENT: Ashish Jha **ROLL NO.: 27**

AIM	Study of Linux Networking Commands.
LEARNING OBJECTIVE	The student will understand the basic Linux networking commands.
LEARNING OUTCOME	• 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	**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. Ifno 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. • In the command prompt, type ifconfig. Running ifconfig with no options will display the configuration of all active interfaces. • Attach output. **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. Ping is used diagnostically to ensure that a host computer you arr 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 witha 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 apacket 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 -c 2 IP ADDRESS, then try ping -c 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.

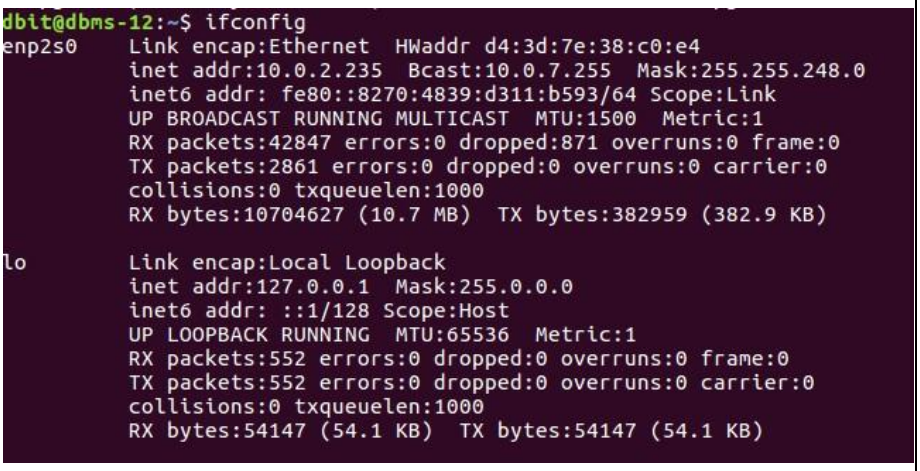
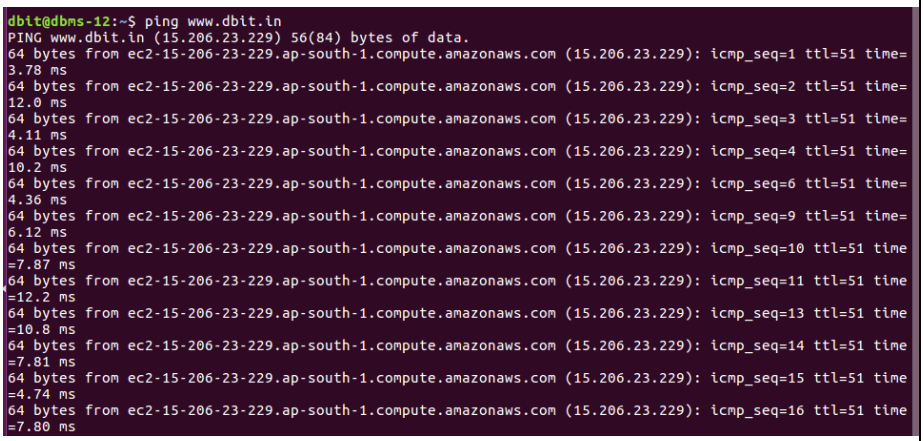
- In the command prompt type tracepath www.dbit.in (Take website of your choice instead of www.dbit.com)
- Attach output of both website.
- What difference do you see between traceroute and tracepath command?

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. • Try atleast 10 variations of netstat command doing specific operations. • 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 ofyour 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. • What does route –n command do? • Attach output for both the commands executed.
LAB EXERCISE	**1. ifconfig:**  2. ping www.dbit.in 

```
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=98 ttl=51 time
=4.81 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=99 ttl=51 time
=4.81 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=100 ttl=51 tim
e=3.91 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=101 ttl=51 tim
e=4.51 ms
64 bytes from ec2-15-206-23-229.ap-south-1.compute.amazonaws.com (15.206.23.229): icmp_seq=102 ttl=51 tim
e=3.97 ms
^C
--- www.dbit.in ping statistics ---
102 packets transmitted, 95 received, 6% packet loss, time 101270ms
rtt min/avg/max/mdev = 3.769/5.583/12.238/2.506 ms
```

3. traceroute www.levis.in

```
dbit@dbms-12:~$ traceroute www.levis.in
traceroute to www.levis.in (204.74.99.100), 30 hops max, 60 byte packets
 1  ipcopdirect.localdomain (10.0.1.148)  0.182 ms  0.175 ms  0.166 ms
 2  static-153.96.248.49-tataidc.co.in (49.248.96.153)  8.966 ms  8.985 ms  9.455 ms
 3  10.129.10.230 (10.129.10.230)  8.942 ms  8.945 ms  8.930 ms
 4  121.241.5.101.mumbai-static.vsnl.net.in (121.241.5.101)  20.811 ms  16.738 ms  16.747 ms
 5  172.31.167.54 (172.31.167.54)  42.418 ms  30.576 ms *
 6  * * *
 7  ix-ae-4-2020.tcore1.cxr-chennai.as6453.net (180.87.36.165)  41.768 ms  28.012 ms  47.799 ms
 8  * if-be-34-2.ecore2.esin4-singapore.as6453.net (180.87.36.41)  68.834 ms  63.511 ms
 9  if-be-10-2.ecore2.svq-singapore.as6453.net (180.87.107.0)  63.463 ms  63.472 ms  63.450 ms
10  if-ae-46-2.thar1.svq-singapore.as6453.net (120.29.214.10)  69.443 ms  67.036 ms  67.033 ms
11  180.87.96.93 (180.87.96.93)  68.703 ms  68.372 ms  72.663 ms
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
```

4. tracepath www.dbit.in

```
dbit@dbms-12:~$ tracepath www.dbit.in
 1?: [LOCALHOST]                                         pmtu 1500
 1:  ipcopdirect.localdomain                               0.502ms
 1:  ipcopdirect.localdomain                               0.615ms
 2:  static-153.96.248.49-tataidc.co.in                    4.406ms
 3:  no reply
 4:  99.83.94.154                                          4.033ms asymm  5
 5:  52.95.65.171                                          5.383ms asymm 10
 6:  52.95.64.186                                          4.347ms asymm  9
 7:  52.95.64.175                                          5.936ms asymm 10
 8:  99.83.76.81                                           5.047ms asymm 10
 9:  52.95.65.141                                          5.123ms asymm  7
10:  no reply
11:  no reply
12:  no reply
13:  no reply
14:  no reply
15:  no reply
16:  ec2-15-206-23-229.ap-south-1.compute.amazonaws.com    4.919ms reached
```

5. nslookup www.yahoo.com

```
dbit@dbms-12:~$ 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.y
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
```

6. netsat www.dbit.in

```
dbit@dbms-12:~$ netstat www.dbit.in
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 10.0.2.235:39266        ec2-54-244-16-100:https ESTABLISHED
tcp        0      0 10.0.2.235:48152        201.181.244.35.bc:https ESTABLISHED
tcp        0      0 10.0.2.235:55308        server-52-222-144:https ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    23101    /run/user/1000/systemd/notify
unix  3      [ ]         DGRAM                    15504    /run/systemd/notify
unix  2      [ ]         DGRAM                    15505    /run/systemd/cgroups-agent
unix  13     [ ]         DGRAM                    15522    /run/systemd/journal/dev-log
unix  2      [ ]         DGRAM                    15523    /run/systemd/journal/syslog
unix  7      [ ]         DGRAM                    15525    /run/systemd/journal/socket
unix  3      [ ]         STREAM     CONNECTED     25082    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     26665
unix  3      [ ]         STREAM     CONNECTED     24026
unix  3      [ ]         STREAM     CONNECTED     26841
unix  3      [ ]         STREAM     CONNECTED     25996
unix  3      [ ]         STREAM     CONNECTED     37864
unix  3      [ ]         STREAM     CONNECTED     26704
unix  3      [ ]         STREAM     CONNECTED     23342
unix  3      [ ]         STREAM     CONNECTED     24743    @/tmp/.X11-unix/X0
unix  2      [ ]         DGRAM                    26344
unix  3      [ ]         STREAM     CONNECTED     19236
unix  3      [ ]         STREAM     CONNECTED     24024
unix  3      [ ]         STREAM     CONNECTED     24821    @/tmp/dbus-b03XoDMEB2
unix  3      [ ]         STREAM     CONNECTED     35632
unix  3      [ ]         STREAM     CONNECTED     26379    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     25958    @/tmp/ibus/dbus-aWNtwjCd
unix  3      [ ]         STREAM     CONNECTED     25138    @/tmp/dbus-RO8KRVE3S4
unix  3      [ ]         STREAM     CONNECTED     24893
unix  3      [ ]         STREAM     CONNECTED     23857
unix  2      [ ]         DGRAM                    15544
unix  3      [ ]         STREAM     CONNECTED     26368    @/tmp/dbus-RO8KRVE3S4
unix  3      [ ]         STREAM     CONNECTED     23256
unix  3      [ ]         STREAM     CONNECTED     24674
unix  3      [ ]         STREAM     CONNECTED     24521    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     25956
unix  3      [ ]         STREAM     CONNECTED     36482
unix  3      [ ]         STREAM     CONNECTED     26686
```

7. arp

```
dbit@dbms-12:~$ arp
Address                  HWtype  HWaddress           Flags Mask
ipcopdirect.localdomain  ether   00:13:3b:0f:a3:63   C
10.0.7.37                ether   e0:d5:5e:32:59:6c   C
10.0.1.254               ether   10:78:d2:e9:1a:52   C
10.0.1.150                       (incomplete)
```

8. ip add show

```
dbit@dbms-12:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 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> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether d4:3d:7e:38:c0:e4 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.235/21 brd 10.0.7.255 scope global enp2s0
       valid_lft forever preferred_lft forever
    inet6 fe80::8270:4839:d311:b593/64 scope link
       valid_lft forever preferred_lft forever
```

9. ding www.lavis.in

```
dbit@dbms-12:~$ dig www.levis.in

; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.levis.in
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2010
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1280
;; QUESTION SECTION:
;www.levis.in.                  IN      A

;; ANSWER SECTION:
www.levis.in.           44      IN      A       204.74.99.100

;; Query time: 24 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Jul 20 11:34:29 IST 2022
;; MSG SIZE  rcvd: 69
```

10. route

```
dbit@dbms-12:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         ipcopdirect.loc 0.0.0.0         UG    100    0        0 enp2s0
10.0.0.0        *               255.255.248.0   U     100    0        0 enp2s0
link-local      *               255.255.0.0     U     1000   0        0 enp2s0
dbit@dbms-12:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default q
    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> mtu 1500 qdisc pfifo_fast state UP gro
    link/ether d4:3d:7e:38:c0:e4 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.235/21 brd 10.0.7.255 scope global enp2s0
       valid_lft forever preferred_lft forever
    inet6 fe80::8270:4839:d311:b593/64 scope link
       valid_lft forever preferred_lft forever
```

11. Extra commands with some variations

```
dbit@dbms-12:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 dbms-12:domain          *:*                     LISTEN
tcp        0      0 localhost:ipp           *:*                     LISTEN
tcp        0      0 10.0.2.235:53074        172.67.14.186:https     ESTABLISHED
tcp        0      0 10.0.2.235:47788        ec2-52-34-133-113:https ESTABLISHED
tcp        0      0 10.0.2.235:59298        bom07s29-in-f3.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:33518        static-51.239.156.:http ESTABLISHED
tcp        0      0 10.0.2.235:60638        bom12s08-in-f14.1:https ESTABLISHED
tcp        0      0 10.0.2.235:45626        bom07s15-in-f2.1e:https TIME_WAIT
tcp        0      0 10.0.2.235:39266        ec2-54-244-16-100:https ESTABLISHED
tcp        0      0 10.0.2.235:39186        bom07s45-in-f14.1:https TIME_WAIT
tcp        0      0 10.0.2.235:47128        bom12s21-in-f4.1e:https TIME_WAIT
tcp        0      0 10.0.2.235:49654        bom07s28-in-f2.1e:https ESTABLISHED
tcp       40      0 10.0.2.235:35024        10.0.7.99:netbios-ssn   ESTABLISHED
tcp        0      0 10.0.2.235:37598        bom07s35-in-f4.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:40990        server-18-66-30-9:https ESTABLISHED
tcp        0      0 10.0.2.235:56370        172.67.169.247:https    ESTABLISHED
tcp        0      0 10.0.2.235:60152        172-105-63-17.ip.:https ESTABLISHED
tcp        0      0 10.0.2.235:45998        172.64.155.188:http     ESTABLISHED
tcp        0      0 10.0.2.235:43712        bom12s03-in-f2.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:35852        server-108-158-46:https ESTABLISHED
tcp        0      0 10.0.2.235:38504        123.208.120.34.bc:https ESTABLISHED
tcp        0      0 10.0.2.235:60622        bom12s08-in-f14.1:https ESTABLISHED
tcp        0      0 10.0.2.235:53662        bom07s32-in-f10.1:https ESTABLISHED
tcp        0      0 10.0.2.235:37486        edge-637.bunnyinf:https ESTABLISHED
tcp        0      0 10.0.2.235:58730        bom07s45-in-f3.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:37484        edge-637.bunnyinf:https ESTABLISHED
tcp        0      0 10.0.2.235:42000        se-in-f155.1e100.:https ESTABLISHED
tcp        0      0 10.0.2.235:37594        bom07s35-in-f4.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:47790        ec2-52-34-133-113:https TIME_WAIT
tcp        0      0 10.0.2.235:40998        edge-613.bunnyinf:https ESTABLISHED
tcp        0      0 10.0.2.235:40100        bom12s19-in-f10.1:https ESTABLISHED
tcp        0      0 10.0.2.235:35206        bom12s11-in-f2.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:50338        bom12s08-in-f8.1e:https ESTABLISHED
tcp        0      0 10.0.2.235:58680        bom07s45-in-f3.1e:https ESTABLISHED
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 dbms-12:domain          *:*
udp        0      0 *:mdns                  *:*
udp        0      0 *:ipp                   *:*
udp        0      0 *:39667                 *:*
dbit@dbms-12:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 dbms-12:domain          *:*
udp        0      0 *:mdns                  *:*
udp        0      0 *:ipp                   *:*
udp        0      0 *:39667                 *:*
udp        0      0 *:51977                 *:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:54052              [::]:*
```

```
dbit@dbms-12:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 dbms-12:domain          *:*                     LISTEN
tcp        0      0 localhost:ipp           *:*                     LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 dbms-12:domain          *:*
udp        0      0 *:mdns                  *:*
udp        0      0 *:ipp                   *:*
udp        0      0 *:39667                 *:*
udp        0      0 *:51977                 *:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:54052              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ACC ]     STREAM     LISTENING     23967    @/tmp/.ICE-unix/1484
unix  2      [ ACC ]     STREAM     LISTENING     23102    /run/user/1000/systemd/p
unix  2      [ ACC ]     SEQPACKET  LISTENING     15521    /run/udev/control
unix  2      [ ACC ]     STREAM     LISTENING     25702    @/tmp/dbus-b03XoDMEB2
unix  2      [ ACC ]     STREAM     LISTENING     23106    /run/user/1000/snapd-ses
unix  2      [ ACC ]     STREAM     LISTENING     20469    /run/user/1000/keyring/c
unix  2      [ ACC ]     STREAM     LISTENING     21938    /tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM     LISTENING     23187    /run/user/1000/keyring/p
unix  2      [ ACC ]     STREAM     LISTENING     23968    /tmp/.ICE-unix/1484
unix  2      [ ACC ]     STREAM     LISTENING     23189    /run/user/1000/keyring/s
unix  2      [ ACC ]     STREAM     LISTENING     23491    /run/user/1000/pulse/nat
unix  2      [ ACC ]     STREAM     LISTENING     40956    /tmp/OSL_PIPE_1000_Singl
f1443baeaae6668f3667
unix  2      [ ACC ]     STREAM     LISTENING     21937    @/tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM     LISTENING     49519    /run/user/1000/speech-di
unix  2      [ ACC ]     STREAM     LISTENING     15506    /run/systemd/private
unix  2      [ ACC ]     STREAM     LISTENING     15511    /run/systemd/fsck.progre
unix  2      [ ACC ]     STREAM     LISTENING     15524    /run/systemd/journal/std
unix  2      [ ACC ]     STREAM     LISTENING     16268    /var/run/avahi-daemon/so
unix  2      [ ACC ]     STREAM     LISTENING     16269    /run/snapd.socket
unix  2      [ ACC ]     STREAM     LISTENING     16270    /run/snapd-snap.socket
unix  2      [ ACC ]     STREAM     LISTENING     16271    /var/run/dbus/system_bus
unix  2      [ ACC ]     STREAM     LISTENING     23161    @/tmp/dbus-RO8KRVE3S4
unix  2      [ ACC ]     STREAM     LISTENING     16272    /var/run/cups/cups.sock
```

```
dbit@dbms-12:~$ netstat -lu
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address
udp        0      0 dbms-12:domain          *:*
udp        0      0 *:mdns                  *:*
udp        0      0 *:ipp                   *:*
udp        0      0 *:39667                 *:*
udp        0      0 *:51977                 *:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:54052              [::]:*
```

```
dbit@dbms-12:~$ netstat -lx
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ACC ]     STREAM     LISTENING     23967    @/tmp/.ICE-unix/1484
unix  2      [ ACC ]     STREAM     LISTENING     23102    /run/user/1000/systemd/pr
unix  2      [ ACC ]     SEQPACKET  LISTENING     15521    /run/udev/control
unix  2      [ ACC ]     STREAM     LISTENING     25702    @/tmp/dbus-b03XoDMEB2
unix  2      [ ACC ]     STREAM     LISTENING     23106    /run/user/1000/snapd-sess
unix  2      [ ACC ]     STREAM     LISTENING     20469    /run/user/1000/keyring/co
unix  2      [ ACC ]     STREAM     LISTENING     21938    /tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM     LISTENING     23187    /run/user/1000/keyring/pk
unix  2      [ ACC ]     STREAM     LISTENING     23968    /tmp/.ICE-unix/1484
unix  2      [ ACC ]     STREAM     LISTENING     23189    /run/user/1000/keyring/ss
unix  2      [ ACC ]     STREAM     LISTENING     23491    /run/user/1000/pulse/nati
unix  2      [ ACC ]     STREAM     LISTENING     40956    /tmp/OSL_PIPE_1000_Single
f1443baeaae6668f3667
unix  2      [ ACC ]     STREAM     LISTENING     21937    @/tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM     LISTENING     49519    /run/user/1000/speech-dis
unix  2      [ ACC ]     STREAM     LISTENING     15506    /run/systemd/private
unix  2      [ ACC ]     STREAM     LISTENING     15511    /run/systemd/fsck.progres
unix  2      [ ACC ]     STREAM     LISTENING     15524    /run/systemd/journal/stdo
unix  2      [ ACC ]     STREAM     LISTENING     16268    /var/run/avahi-daemon/soc
unix  2      [ ACC ]     STREAM     LISTENING     16269    /run/snapd.socket
unix  2      [ ACC ]     STREAM     LISTENING     16270    /run/snapd-snap.socket
unix  2      [ ACC ]     STREAM     LISTENING     16271    /var/run/dbus/system_bus_
unix  2      [ ACC ]     STREAM     LISTENING     23161    @/tmp/dbus-RO8KRVE3S4
unix  2      [ ACC ]     STREAM     LISTENING     16272    /var/run/cups/cups.sock
unix  2      [ ACC ]     STREAM     LISTENING     16273    /run/uuidd/request
unix  2      [ ACC ]     STREAM     LISTENING     41426    @dbit-com.canonical.Unity
10505072422232
unix  2      [ ACC ]     STREAM     LISTENING     24690    @/tmp/ibus/dbus-aWNtwjCd
unix  2      [ ACC ]     STREAM     LISTENING     23259    /home/dbit/.gnupg/S.gpg-a
unix  2      [ ACC ]     STREAM     LISTENING     41452    @dbit-com.canonical.Unity
98737686
unix  2      [ ACC ]     STREAM     LISTENING     41425    @dbit-com.canonical.Unity
tions.T10505065778398
unix  2      [ ACC ]     STREAM     LISTENING     31920    /var/lib/fwupd/gnupg/S.gp
unix  2      [ ACC ]     STREAM     LISTENING     23828    @/com/ubuntu/upstart-sess
unix  2      [ ACC ]     STREAM     LISTENING     19065    /run/acpid.socket
```

```
dbit@dbms-12:~$ netstat -st
IcmpMsg:
    InType0: 186
    InType3: 249
    InType9: 26
    InType11: 157
    OutType3: 230
    OutType8: 205
Tcp:
    1730 active connections openings
    17 passive connection openings
    95 failed connection attempts
    14 connection resets received
    3 connections established
    209819 segments received
    141221 segments send out
    508 segments retransmited
    14 bad segments received.
    981 resets sent
UdpLite:
TcpExt:
    627 TCP sockets finished time wait in fast timer
    3 packets rejects in established connections because of timesta
    1468 delayed acks sent
    Quick ack mode was activated 93 times
    162604 packet headers predicted
    7185 acknowledgments not containing data payload received
    10454 predicted acknowledgments
    1 times recovered from packet loss by selective acknowledgement
    Detected reordering 18 times using SACK
    2 congestion windows recovered without slow start by DSACK
    67 congestion windows recovered without slow start after partia
    2 timeouts in loss state
    1 fast retransmits
    315 other TCP timeouts
    TCPLossProbes: 256
```

REFERENCES

- 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