

# CSE1004 NAC LAB

## ASSIGNMENT NO. – 3

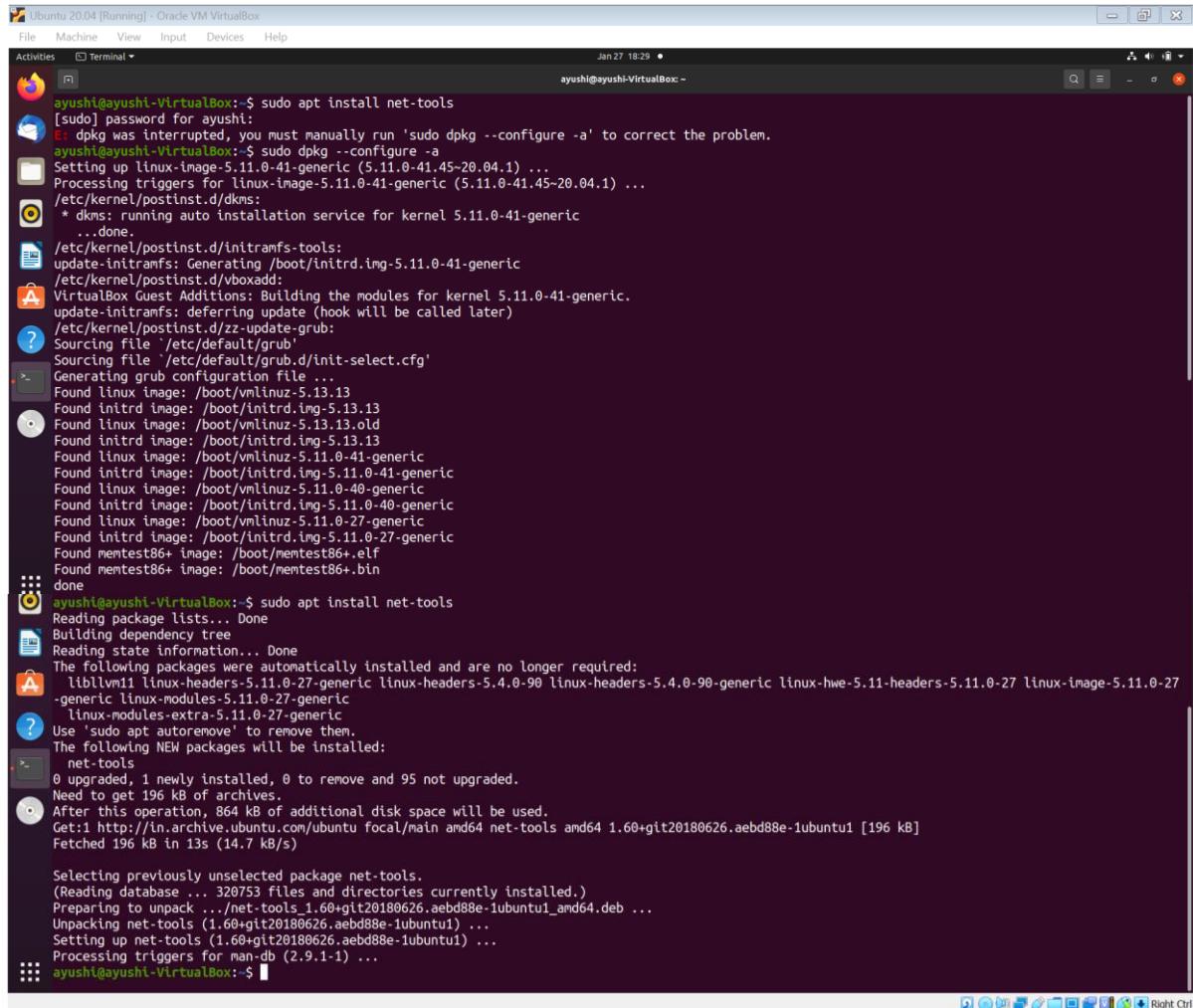
### NETWORK CONFIGURATION COMMANDS

**DATE – 20/01/22**

**NAME – AYUSHI TRIVEDI**

**REGISTRATION NUMBER – 20BPS1135**

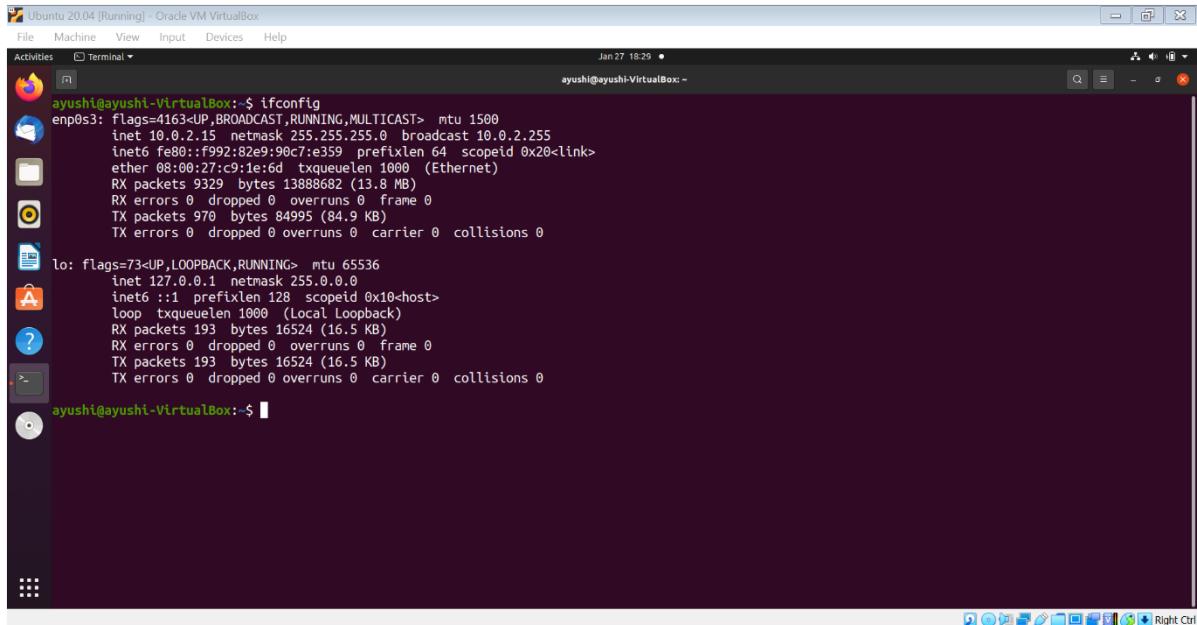
**AIM:** To explore the network configuration commands using Linux.



```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal Jan 27 18:29
ayushi@ayushi-VirtualBox:~$ sudo apt install net-tools
[sudo] password for ayushi:
E: dpkg was interrupted, you must manually run 'sudo dpkg --configure -a' to correct the problem.
ayushi@ayushi-VirtualBox:~$ sudo dpkg --configure -a
Setting up linux-image-5.11.0-41-generic (5.11.0-41.45~20.04.1) ...
Processing triggers for linux-image-5.11.0-41-generic (5.11.0-41.45~20.04.1) ...
/etc/kernel/postinst.d/dkms:
 * dkms: running auto installation service for kernel 5.11.0-41-generic
   ...done.
/etc/kernel/postinst.d/initramfs-tools:
update-initramfs: Generating /boot/initrd.img-5.11.0-41-generic
/etc/kernel/postinst.d/vboxadd:
VirtualBox Guest Additions: Building the modules for kernel 5.11.0-41-generic.
update-initramfs: deferring update (hook will be called later)
/etc/kernel/postinst.d/zz-update-grub:
  Sourcing file '/etc/default/grub'
  Sourcing file '/etc/default/grub.d/init-select.cfg'
  Generating grub configuration file ...
  Found linux image: /boot/vmlinuz-5.13.13
  Found initrd image: /boot/initrd.img-5.13.13
  Found linux image: /boot/vmlinuz-5.13.13.old
  Found initrd image: /boot/initrd.img-5.13.13
  Found linux image: /boot/vmlinuz-5.11.0-41-generic
  Found initrd image: /boot/initrd.img-5.11.0-41-generic
  Found linux image: /boot/vmlinuz-5.11.0-40-generic
  Found initrd image: /boot/initrd.img-5.11.0-40-generic
  Found linux image: /boot/vmlinuz-5.11.0-27-generic
  Found initrd image: /boot/initrd.img-5.11.0-27-generic
  Found memtest86+ image: /boot/memtest86+.elf
  Found memtest86+ image: /boot/memtest86+.bin
  done
ayushi@ayushi-VirtualBox:~$ sudo apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  liblvm11 linux-headers-5.11.0-27-generic linux-headers-5.4.0-90 linux-headers-5.4.0-90-generic linux-hwe-5.11-headers-5.11.0-27 linux-image-5.11.0-27-generic linux-modules-5.11.0-27-generic
  linux-modules-extra-5.11.0-27-generic
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  net-tools
  0 upgraded, 1 newly installed, 0 to remove and 95 not upgraded.
Need to get 196 kB of archives.
After this operation, 864 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Fetched 196 kB in 13s (14.7 kB/s)

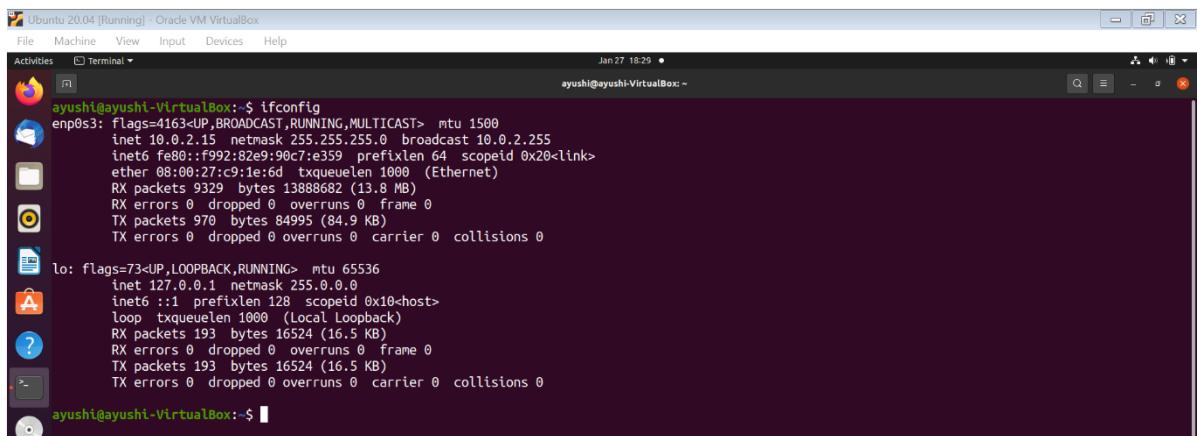
Selecting previously unselected package net-tools.
(Reading database ... 320753 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
ayushi@ayushi-VirtualBox:~$
```

## Ifconfig



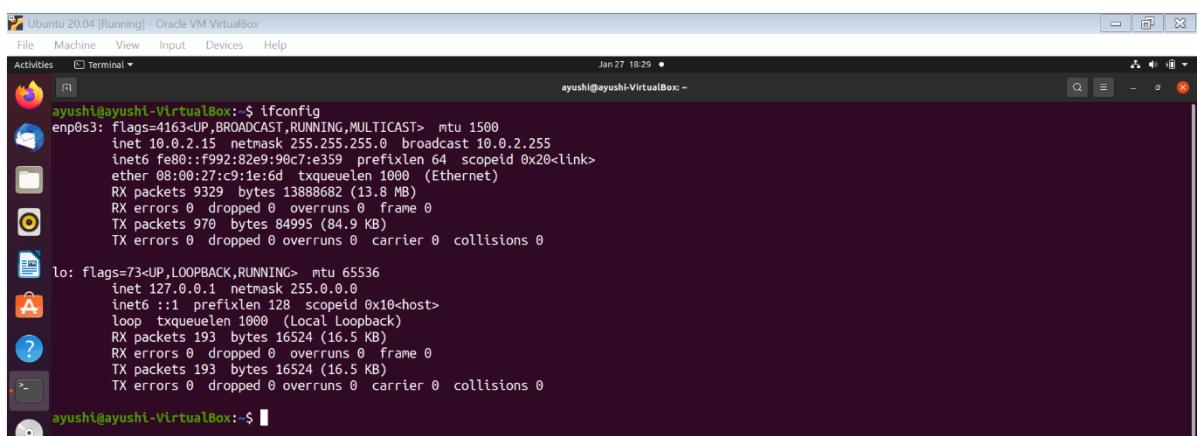
```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~
Jan 27 18:29 • ayushi@ayushi-VirtualBox: ~
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                    RX packets 9329 bytes 13888682 (13.8 MB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 970 bytes 84995 (84.9 KB)
                    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 193 bytes 16524 (16.5 KB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 193 bytes 16524 (16.5 KB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~$
```

**ifconfig [interface-name] down & ifconfig [interface name] up**



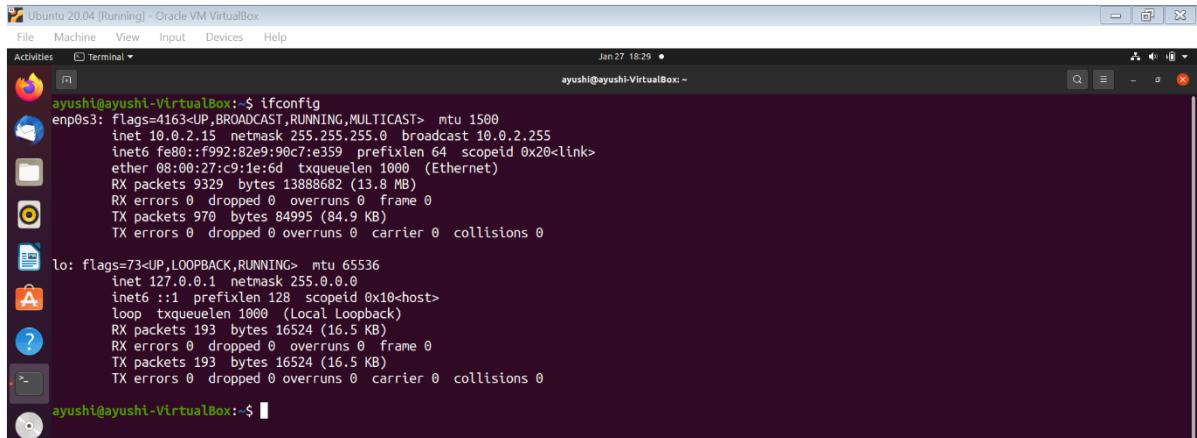
```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~
Jan 27 18:29 • ayushi@ayushi-VirtualBox: ~
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                    RX packets 9329 bytes 13888682 (13.8 MB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 970 bytes 84995 (84.9 KB)
                    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 193 bytes 16524 (16.5 KB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 193 bytes 16524 (16.5 KB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~$
```

**Ifconfig [interface-name] & infconfig -a**



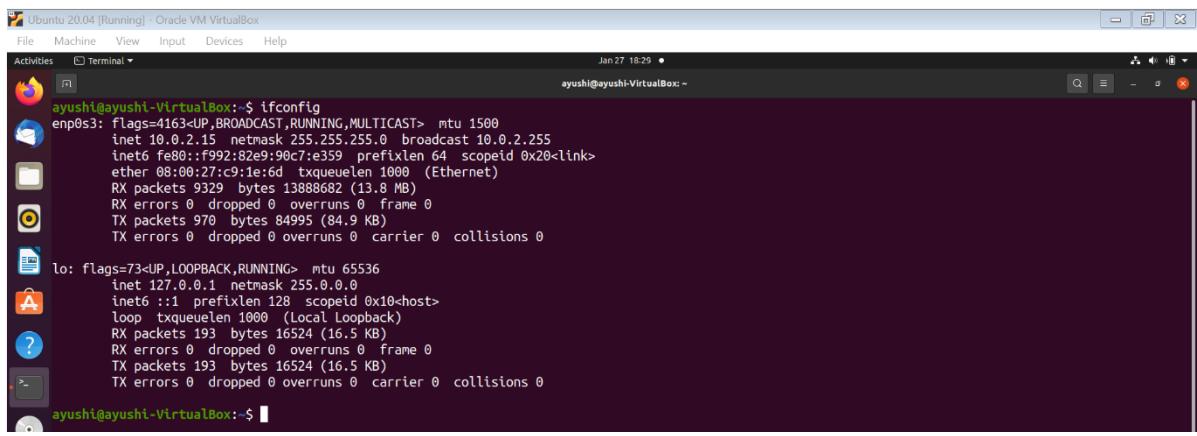
```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~
Jan 27 18:29 • ayushi@ayushi-VirtualBox: ~
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                    RX packets 9329 bytes 13888682 (13.8 MB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 970 bytes 84995 (84.9 KB)
                    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 193 bytes 16524 (16.5 KB)
                    RX errors 0 dropped 0 overruns 0 frame 0
                    TX packets 193 bytes 16524 (16.5 KB)
                    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~$
```

## Ifconfig -s & ifconfig –help



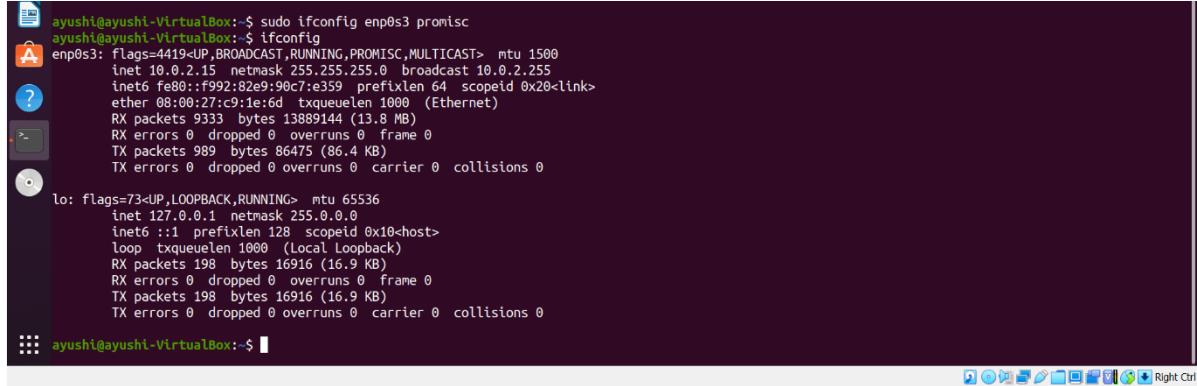
```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~ Jan 27 18:29
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                        RX packets 9329 bytes 13888682 (13.8 MB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 970 bytes 84995 (84.9 KB)
                        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 193 bytes 16524 (16.5 KB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 193 bytes 16524 (16.5 KB)
                        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~
```

## Ifconfig [interface-name] arp



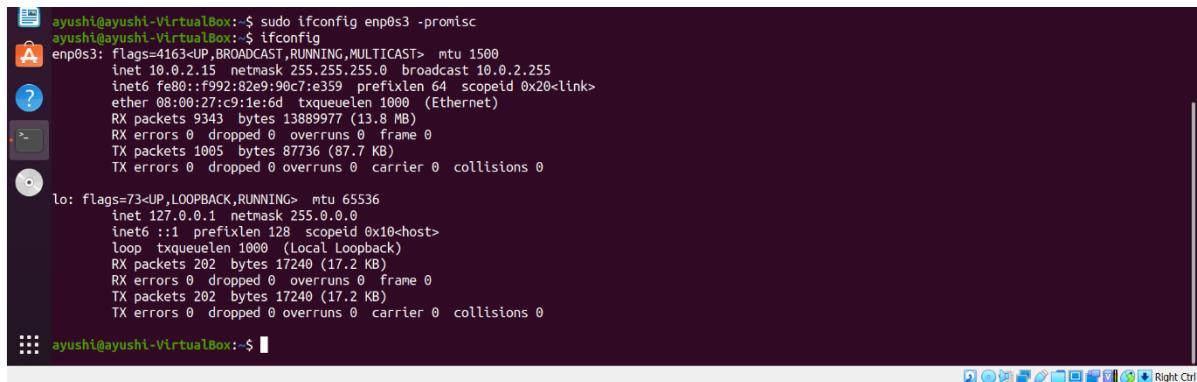
```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~ Jan 27 18:29
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                        RX packets 9329 bytes 13888682 (13.8 MB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 970 bytes 84995 (84.9 KB)
                        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 193 bytes 16524 (16.5 KB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 193 bytes 16524 (16.5 KB)
                        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~
```

## Ifconfig [interface-name] promisc (enable)



```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox: ~ Jan 27 18:29
ayushi@ayushi-VirtualBox: $ sudo ifconfig enp0s3 promisc
ayushi@ayushi-VirtualBox: $ ifconfig
enp0s3: flags=4419<UP,BROADCAST,RUNNING,PROMISC,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
                inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
                    ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
                        RX packets 9333 bytes 13889144 (13.8 MB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 989 bytes 86475 (86.4 KB)
                        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 198 bytes 16916 (16.9 KB)
                        RX errors 0 dropped 0 overruns 0 frame 0
                        TX packets 198 bytes 16916 (16.9 KB)
                        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
ayushi@ayushi-VirtualBox: ~
```

## Ifconfig [interface-name] -promisc (disable)

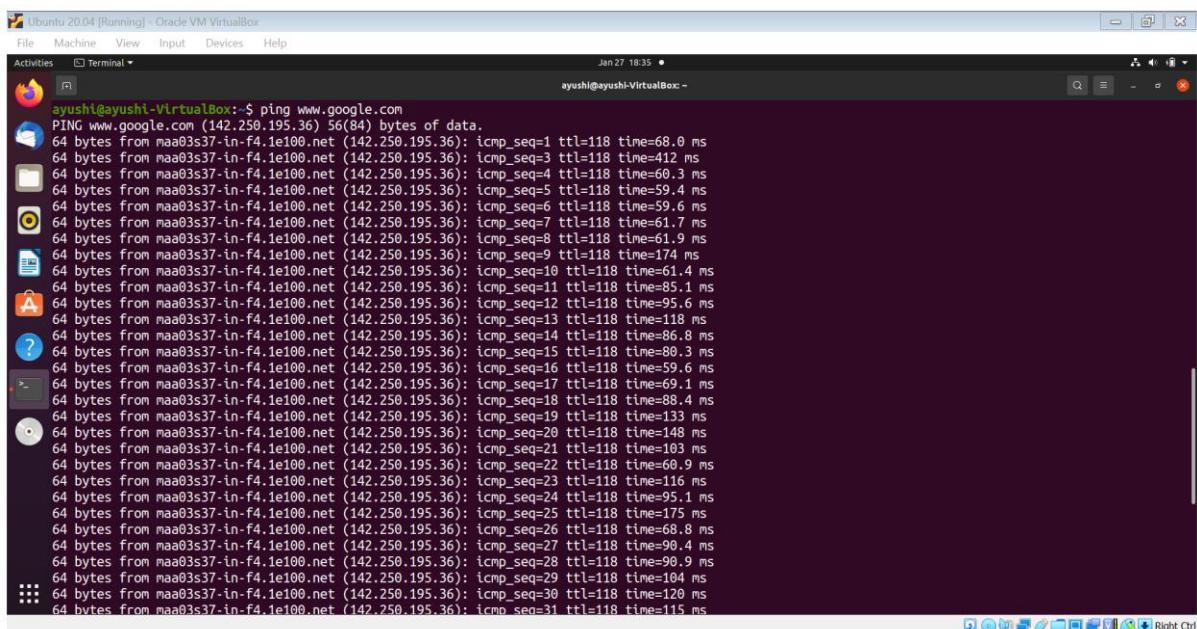


```
ayush@ayushi-VirtualBox:~$ sudo ifconfig enp0s3 -promisc
ayush@ayushi-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
        inet6 fe80::f992:82e9:90c7:e359 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:c9:1e:6d txqueuelen 1000 (Ethernet)
RX packets 9343 bytes 13889977 (13.8 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 1005 bytes 87736 (87.7 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

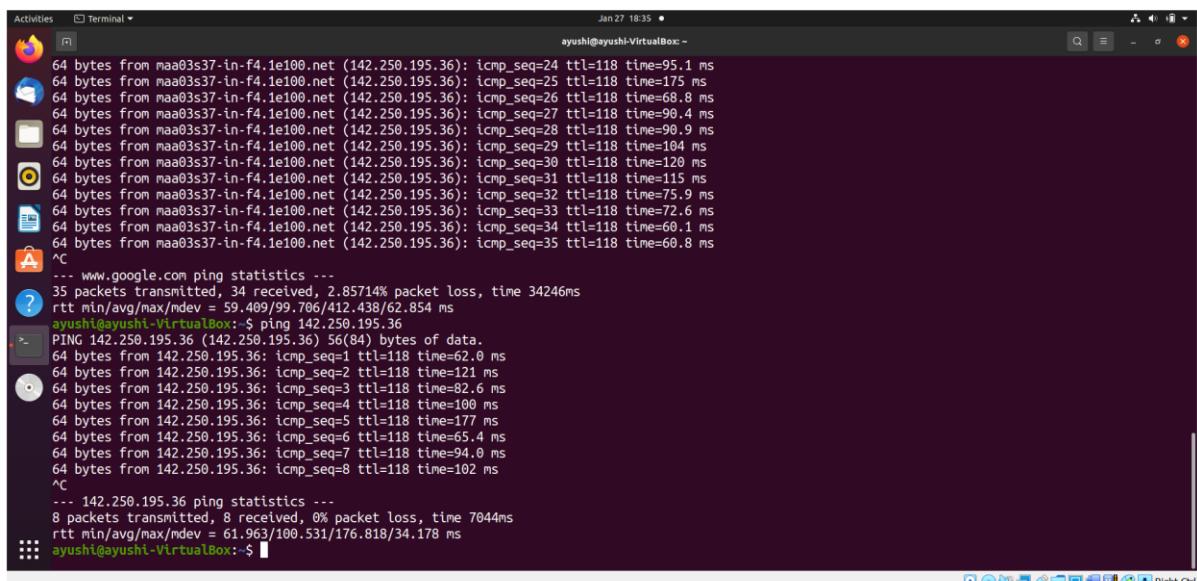
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 202 bytes 17240 (17.2 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 202 bytes 17240 (17.2 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

ayush@ayushi-VirtualBox:~$
```

## ping [domainname] & ping [ipaddress]

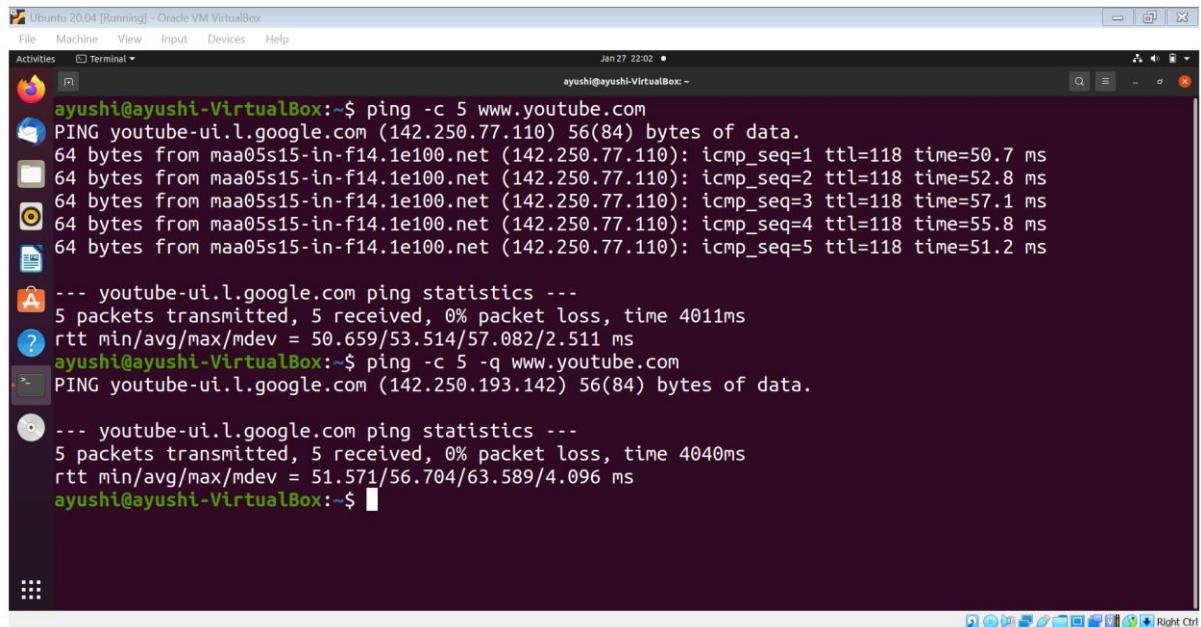


```
ayush@ayushi-VirtualBox:~$ ping www.google.com
PING www.google.com (142.250.195.36) 56(84) bytes of data.
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=1 ttl=118 time=68.0 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=3 ttl=118 time=412 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=4 ttl=118 time=60.3 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=5 ttl=118 time=59.4 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=6 ttl=118 time=59.6 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=7 ttl=118 time=61.7 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=8 ttl=118 time=61.9 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=9 ttl=118 time=174 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=10 ttl=118 time=61.4 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=11 ttl=118 time=85.1 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=12 ttl=118 time=95.6 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=13 ttl=118 time=118 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=14 ttl=118 time=86.8 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=15 ttl=118 time=80.3 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=16 ttl=118 time=59.6 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=17 ttl=118 time=69.1 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=18 ttl=118 time=88.4 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=19 ttl=118 time=133 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=20 ttl=118 time=148 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=21 ttl=118 time=103 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=22 ttl=118 time=60.9 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=23 ttl=118 time=116 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=24 ttl=118 time=95.1 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=25 ttl=118 time=175 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=26 ttl=118 time=60.8 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=27 ttl=118 time=90.4 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=28 ttl=118 time=90.9 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=29 ttl=118 time=104 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=30 ttl=118 time=120 ms
64 bytes from maa03s37-in-f4.1e100.net (142.250.195.36): icmp_seq=31 ttl=118 time=115 ms
```



```
ayush@ayushi-VirtualBox:~$ ping 142.250.195.36
PING 142.250.195.36 (142.250.195.36) 56(84) bytes of data.
64 bytes from 142.250.195.36: icmp_seq=1 ttl=118 time=62.0 ms
64 bytes from 142.250.195.36: icmp_seq=2 ttl=118 time=121 ms
64 bytes from 142.250.195.36: icmp_seq=3 ttl=118 time=82.6 ms
64 bytes from 142.250.195.36: icmp_seq=4 ttl=118 time=100 ms
64 bytes from 142.250.195.36: icmp_seq=5 ttl=118 time=177 ms
64 bytes from 142.250.195.36: icmp_seq=6 ttl=118 time=65.4 ms
64 bytes from 142.250.195.36: icmp_seq=7 ttl=118 time=94.0 ms
64 bytes from 142.250.195.36: icmp_seq=8 ttl=118 time=102 ms
^C
--- 142.250.195.36 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7044ms
rtt min/avg/max/mdev = 61.963/100.531/176.818/34.178 ms
ayush@ayushi-VirtualBox:~$
```

## **ping -c [count] [domainname] & ping -c [count] -q [domainname]**

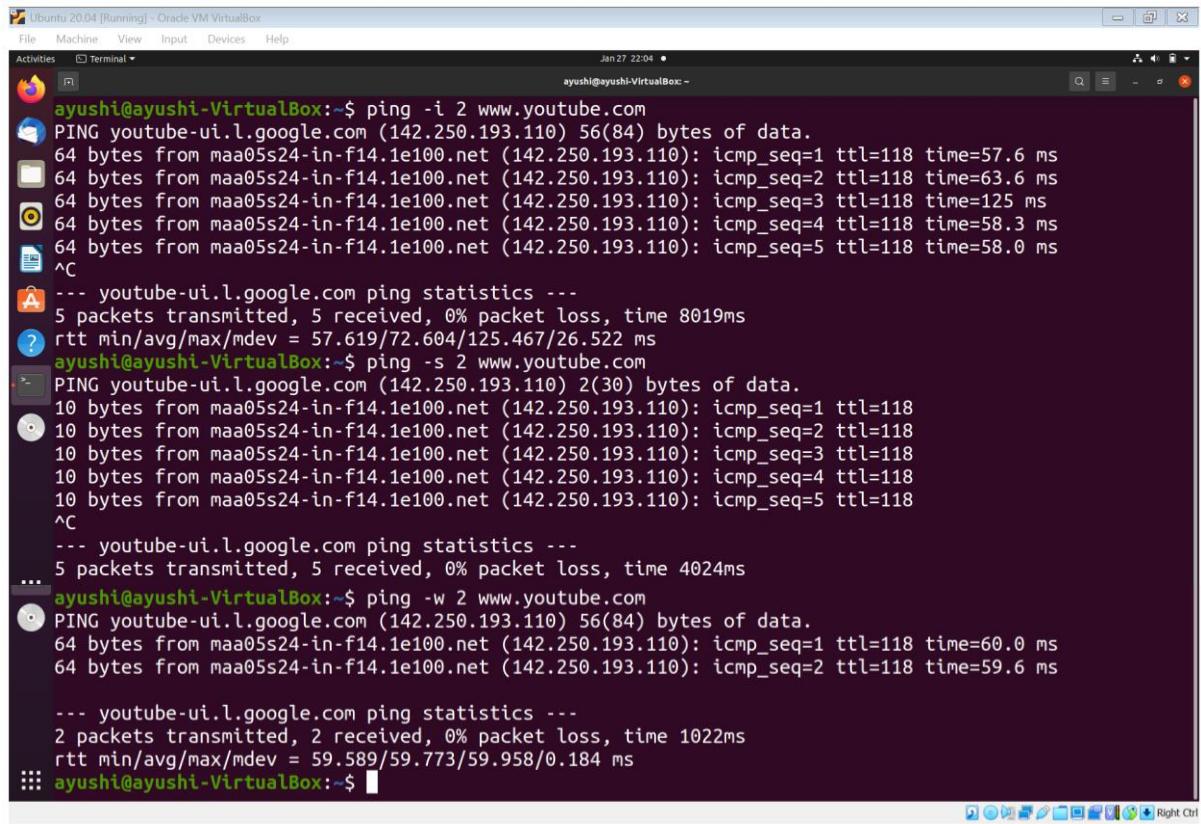


```
ayushi@ayushi-VirtualBox:~$ ping -c 5 www.youtube.com
PING youtube-ui.l.google.com (142.250.77.110) 56(84) bytes of data.
64 bytes from maa05s15-in-f14.1e100.net (142.250.77.110): icmp_seq=1 ttl=118 time=50.7 ms
64 bytes from maa05s15-in-f14.1e100.net (142.250.77.110): icmp_seq=2 ttl=118 time=52.8 ms
64 bytes from maa05s15-in-f14.1e100.net (142.250.77.110): icmp_seq=3 ttl=118 time=57.1 ms
64 bytes from maa05s15-in-f14.1e100.net (142.250.77.110): icmp_seq=4 ttl=118 time=55.8 ms
64 bytes from maa05s15-in-f14.1e100.net (142.250.77.110): icmp_seq=5 ttl=118 time=51.2 ms

--- youtube-ui.l.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4011ms
rtt min/avg/max/mdev = 50.659/53.514/57.082/2.511 ms
ayushi@ayushi-VirtualBox:~$ ping -c 5 -q www.youtube.com
PING youtube-ui.l.google.com (142.250.193.142) 56(84) bytes of data.

--- youtube-ui.l.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4040ms
rtt min/avg/max/mdev = 51.571/56.704/63.589/4.096 ms
ayushi@ayushi-VirtualBox:~$
```

## **ping -i [interval] [domainname], ping -s [packet\_size] [domainname], ping -w [deadline] [domainname] & ping**



```
ayushi@ayushi-VirtualBox:~$ ping -i 2 www.youtube.com
PING youtube-ui.l.google.com (142.250.193.110) 56(84) bytes of data.
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=1 ttl=118 time=57.6 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=2 ttl=118 time=63.6 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=3 ttl=118 time=125 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=4 ttl=118 time=58.3 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=5 ttl=118 time=58.0 ms
^C
--- youtube-ui.l.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 8019ms
rtt min/avg/max/mdev = 57.619/72.604/125.467/26.522 ms
ayushi@ayushi-VirtualBox:~$ ping -s 2 www.youtube.com
PING youtube-ui.l.google.com (142.250.193.110) 2(30) bytes of data.
10 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=1 ttl=118
10 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=2 ttl=118
10 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=3 ttl=118
10 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=4 ttl=118
10 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=5 ttl=118
^C
--- youtube-ui.l.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4024ms
...
ayushi@ayushi-VirtualBox:~$ ping -w 2 www.youtube.com
PING youtube-ui.l.google.com (142.250.193.110) 56(84) bytes of data.
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=1 ttl=118 time=60.0 ms
64 bytes from maa05s24-in-f14.1e100.net (142.250.193.110): icmp_seq=2 ttl=118 time=59.6 ms

--- youtube-ui.l.google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1022ms
rtt min/avg/max/mdev = 59.589/59.773/59.958/0.184 ms
ayushi@ayushi-VirtualBox:~$
```

## traceroute -I [domainname], hostname & hostname -i

```
ayushi@ayushi-VirtualBox:~$ traceroute -I www.google.com
traceroute to www.google.com (142.250.182.68), 64 hops max
 1  10.0.2.2  0.364ms  0.182ms  0.102ms
 2  192.168.1.1  8.119ms  4.934ms  15.517ms
 3  172.21.181.129  29.656ms  23.907ms  19.362ms
 4  * * *
 5  192.168.199.170  58.103ms  57.690ms  65.150ms
 6  202.78.239.62  58.465ms  299.455ms  57.641ms
 7  74.125.242.129  55.143ms  55.179ms  56.466ms
 8  142.251.55.247  53.393ms  54.088ms  53.644ms
 9  142.250.182.68  55.058ms  53.215ms  55.408ms
ayushi@ayushi-VirtualBox:~$ hostname
ayushi-VirtualBox
ayushi@ayushi-VirtualBox:~$ hostname -i
127.0.1.1
ayushi@ayushi-VirtualBox:~$
```

## host [domainname]

```
ayushi@ayushi-VirtualBox:~$ hostname
ayushi-VirtualBox
ayushi@ayushi-VirtualBox:~$ hostname -i
127.0.1.1
ayushi@ayushi-VirtualBox:~$ host www.facebook.com
www.facebook.com is an alias for star-mini.c10r.facebook.com.
star-mini.c10r.facebook.com has address 157.240.1.35
star-mini.c10r.facebook.com has IPv6 address 2a03:2880:f16b:81:face:b00c:0:25de
ayushi@ayushi-VirtualBox:~$ host www.twitter.com
www.twitter.com is an alias for twitter.com.
twitter.com has address 104.244.42.65
twitter.com mail is handled by 10 aspmx.l.google.com.
twitter.com mail is handled by 30 aspmx3.googlemail.com.
twitter.com mail is handled by 20 alt2.aspmx.l.google.com.
twitter.com mail is handled by 20 alt1.aspmx.l.google.com.
twitter.com mail is handled by 30 aspmx2.googlemail.com.
ayushi@ayushi-VirtualBox:~$
```

## nslookup [domainname]

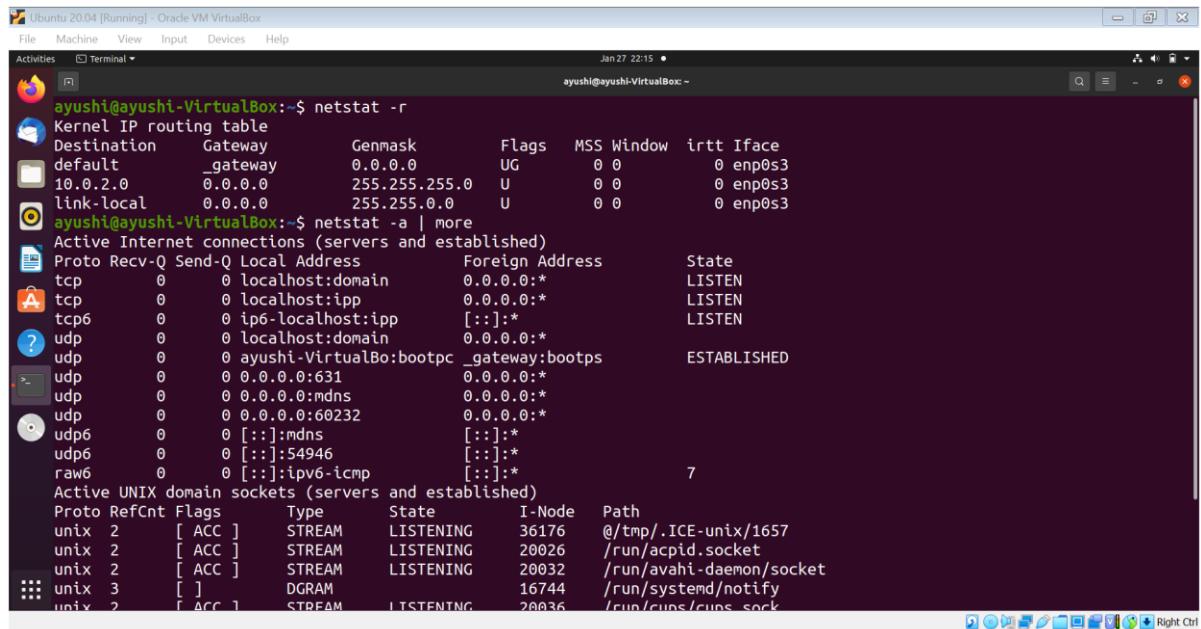
```
ayushi@ayushi-VirtualBox:~$ nslookup www.bing.com
Server:  127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
www.bing.com canonical name = a-0001.a-afdentry.net.trafficmanager.net.
a-0001.a-afdentry.net.trafficmanager.net canonical name = www-bing-com.dual-a-0001.a-msedge.net.
www-bing-com.dual-a-0001.a-msedge.net canonical name = dual-a-0001.a-msedge.net.

Name:  dual-a-0001.a-msedge.net
Address: 204.79.197.200
Name:  dual-a-0001.a-msedge.net
Address: 13.107.21.200
Name:  dual-a-0001.a-msedge.net
Address: 2620:1ec:c11::200

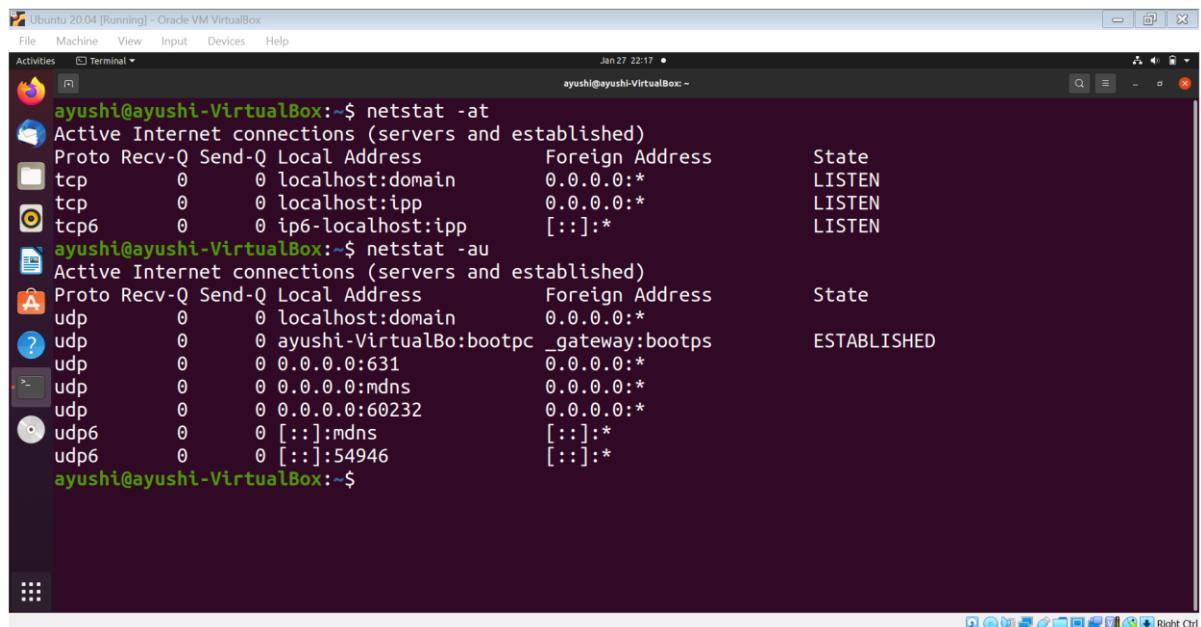
ayushi@ayushi-VirtualBox:~$ host www.bing.com
www.bing.com is an alias for a-0001.a-afdentry.net.trafficmanager.net.
a-0001.a-afdentry.net.trafficmanager.net is an alias for www-bing-com.dual-a-0001.a-msedge.net.
www-bing-com.dual-a-0001.a-msedge.net is an alias for dual-a-0001.a-msedge.net.
dual-a-0001.a-msedge.net has address 13.107.21.200
dual-a-0001.a-msedge.net has address 204.79.197.200
dual-a-0001.a-msedge.net has IPv6 address 2620:1ec:c11::200
ayushi@ayushi-VirtualBox:~$
```

## netstat -r & netstat -a | more



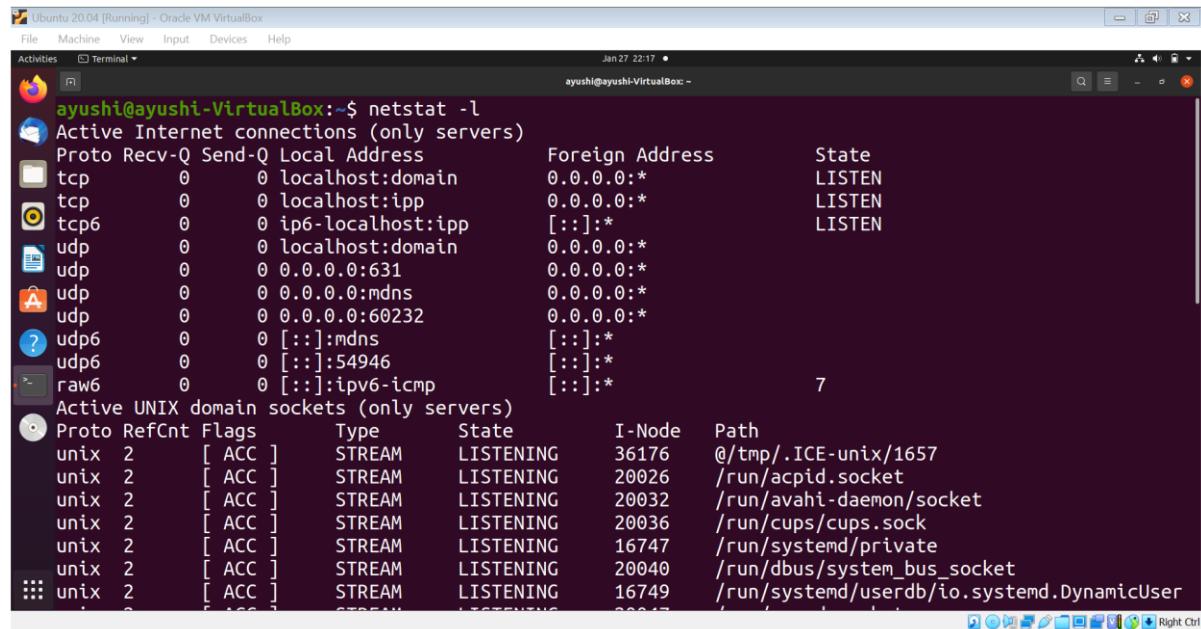
```
ayushi@ayushi-VirtualBox:~$ netstat -r
Kernel IP routing table
Destination     Gateway         Genmask        Flags   MSS Window irtt Iface
default         _gateway       0.0.0.0        UG        0 0          0 enp0s3
10.0.2.0        0.0.0.0       255.255.255.0  U         0 0          0 enp0s3
link-local      0.0.0.0       255.255.0.0    U         0 0          0 enp0s3
ayushi@ayushi-VirtualBox:~$ netstat -a | more
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
tcp      0      0 localhost:domain          0.0.0.0:*
tcp      0      0 localhost:ipp            0.0.0.0:*
tcp6     0      0 ip6-localhost:ipp        [::]:*
udp      0      0 localhost:domain          0.0.0.0:*
udp      0      0 ayushi-VirtualBo:bootpc  _gateway:bootps      ESTABLISHED
udp      0      0 0.0.0.0:631             0.0.0.0:*
udp      0      0 0.0.0.0:mdns            0.0.0.0:*
udp6     0      0 [::]:mdns              [::]:*
udp6     0      0 [::]:54946             [::]:*
raw6     0      0 [::]:ipv6-icmp        [::]:*                7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type      State      I-Node Path
unix  2      [ ACC ]     STREAM   LISTENING  36176  @/tmp/.ICE-unix/1657
unix  2      [ ACC ]     STREAM   LISTENING  20026  /run/acpid.socket
unix  2      [ ACC ]     STREAM   LISTENING  20032  /run/avahi-daemon/socket
:::: unix  3      [ ]        DGRAM    LISTENING  16744  /run/systemd/notify
unix  2      [ ACC ]     STREAM   LISTENING  20036  /run/cups/cups.sock
ayushi@ayushi-VirtualBox:~$
```

## netstat -at & netstat -au



```
ayushi@ayushi-VirtualBox:~$ netstat -at
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
tcp      0      0 localhost:domain          0.0.0.0:*
tcp      0      0 localhost:ipp            0.0.0.0:*
tcp6     0      0 ip6-localhost:ipp        [::]:*
ayushi@ayushi-VirtualBox:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
tcp      0      0 localhost:domain          0.0.0.0:*
tcp      0      0 ayushi-VirtualBo:bootpc  _gateway:bootps      ESTABLISHED
udp      0      0 0.0.0.0:631             0.0.0.0:*
udp      0      0 0.0.0.0:mdns            0.0.0.0:*
udp      0      0 0.0.0.0:60232          0.0.0.0:*
udp6     0      0 [::]:mdns              [::]:*
udp6     0      0 [::]:54946             [::]:*
ayushi@ayushi-VirtualBox:~$
```

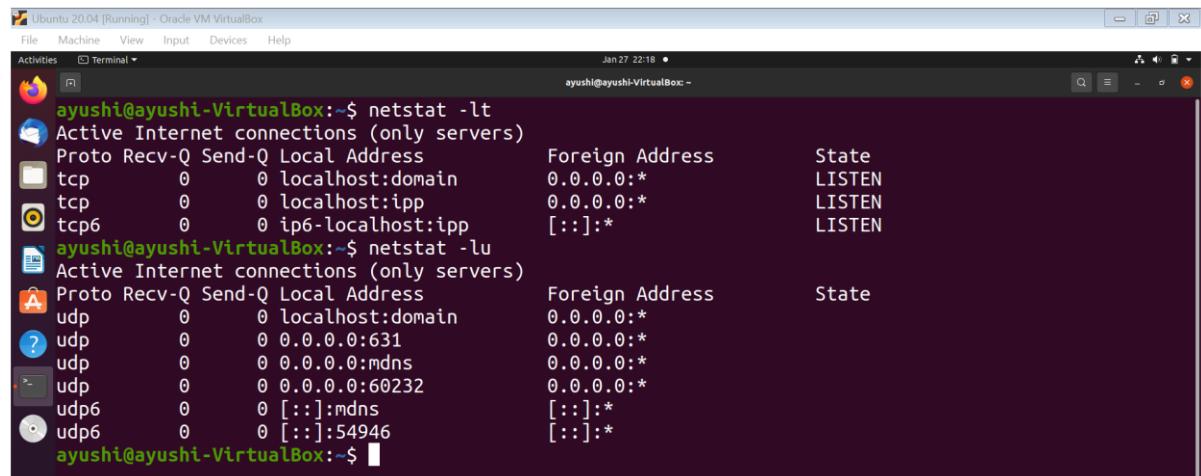
## netstat -l



```
ayushi@ayushi-VirtualBox:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
tcp      0      0 localhost:domain          0.0.0.0:*             LISTEN
tcp      0      0 localhost:ipp             0.0.0.0:*             LISTEN
tcp6     0      0 ip6-localhost:ipp        [::]:*                LISTEN
udp      0      0 localhost:domain          0.0.0.0:*             LISTEN
udp      0      0 0.0.0.0:631              0.0.0.0:*             LISTEN
udp      0      0 0.0.0.0:mdns             0.0.0.0:*             LISTEN
udp      0      0 0.0.0.0:60232            0.0.0.0:*             LISTEN
udp6     0      0 [::]:mdns               [::]:*                LISTEN
udp6     0      0 [::]:54946              [::]:*                LISTEN
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  36176   @/tmp/.ICE-unix/1657
unix    2      [ ACC ]     STREAM   LISTENING  20026   /run/acpid.socket
unix    2      [ ACC ]     STREAM   LISTENING  20032   /run/avahi-daemon/socket
unix    2      [ ACC ]     STREAM   LISTENING  20036   /run/cups/cups.sock
unix    2      [ ACC ]     STREAM   LISTENING  16747   /run/systemd/private
unix    2      [ ACC ]     STREAM   LISTENING  20040   /run/dbus/system_bus_socket
::: unix  2      [ ACC ]     STREAM   LISTENING  16749   /run/systemd/userdb/io.systemd.DynamicUser
```

## netstat -lt & netstat -lu



```
ayushi@ayushi-VirtualBox:~$ netstat -lt
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
tcp      0      0 localhost:domain          0.0.0.0:*             LISTEN
tcp      0      0 localhost:ipp             0.0.0.0:*             LISTEN
tcp6     0      0 ip6-localhost:ipp        [::]:*                LISTEN

ayushi@ayushi-VirtualBox:~$ netstat -lu
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address       State
udp      0      0 localhost:domain          0.0.0.0:*             LISTEN
? udp      0      0 0.0.0.0:631              0.0.0.0:*             LISTEN
? udp      0      0 0.0.0.0:mdns             0.0.0.0:*             LISTEN
> udp      0      0 0.0.0.0:60232            0.0.0.0:*             LISTEN
? udp6     0      0 [::]:mdns               [::]:*                LISTEN
? udp6     0      0 [::]:54946              [::]:*                LISTEN
```

## netstat -s

```
Ubuntu 20.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal ayushi@ayushi-VirtualBox:~$ netstat -s
Jan 27 22:19 •
ayushi@ayushi-VirtualBox:~$

Ip:
Forwarding: 2
602 total packets received
1 with invalid addresses
0 forwarded
0 incoming packets discarded
599 incoming packets delivered
614 requests sent out
20 outgoing packets dropped

Icmp:
152 ICMP messages received
0 input ICMP message failed
ICMP input histogram:
destination unreachable: 40
timeout in transit: 65
echo replies: 47
213 ICMP messages sent
0 ICMP messages failed
ICMP output histogram:
destination unreachable: 56
echo requests: 157

IcmpMsg:
InType0: 47
InType3: 40
InType11: 65
OutType3: 56

Tcp:
13 active connection openings
0 passive connection openings
4 failed connection attempts
0 connection resets received
0 connections established
76 segments received
78 segments sent out
6 segments retransmitted
0 bad segments received
5 resets sent

Udp:
311 packets received
56 packets to unknown port received
0 packet receive errors
355 packets sent
0 receive buffer errors
0 send buffer errors
IgnoredMulti: 4

UdpLite:
TCPExt:
1 TCP sockets finished time wait in fast timer
19 packet headers predicted
11 acknowledgments not containing data payload received
13 predicted acknowledgments
TCPLostRetransit: 2
TCPTimeouts: 6
TCPRecvCoalesce: 1
TCPSynRetrans: 6
TCPOrigDataSent: 24
TCPDelivered: 33
TcpTimeoutRehash: 6

IpExt:
InMcastPkts: 74
OutMcastPkts: 76
InBcastPkts: 4
OutBcastPkts: 4
InOctets: 108650
OutOctets: 51576
InMcastOctets: 7084
OutMcastOctets: 7164
InBcastOctets: 310
OutBcastOctets: 310
InNoECTPkts: 624

MPTcpExt:
ayushi@ayushi-VirtualBox:~$
```

## netstat -st

```
ayushi@ayushi-VirtualBox:~$ netstat -st
IcmpMsg:
  InType0: 47
  InType3: 40
  InType11: 65
  OutType3: 56
  OutType8: 157
Tcp:
  16 active connection openings
  0 passive connection openings
  4 failed connection attempts
  0 connection resets received
  0 connections established
  86 segments received
  89 segments sent out
  8 segments retransmitted
  0 bad segments received
  6 resets sent
UdpLite:
  TcpExt:
    1 TCP sockets finished time wait in fast timer
    20 packet headers predicted
    13 acknowledgments not containing data payload received
    15 predicted acknowledgments
    TCPLostRetransmit: 2
    TCPTimeouts: 8
    TCPRecvCoalesce: 1
    TCPSynRetrans: 8
    TCPOrigDataSent: 28
    TCPDelivered: 39
    TcpTimeoutRehash: 8
  IpExt:
    InMcastPkts: 74
    OutMcastPkts: 76
    InBcastPkts: 4
    OutBcastPkts: 4
    InOctets: 110515
    OutOctets: 53409
    InMcastOctets: 7084
    OutMcastOctets: 7164
    InBcastOctets: 310
    OutBcastOctets: 310
    InNoECTPkts: 647
  MPTcpExt:
ayushi@ayushi-VirtualBox:~$
```

## netstat -su

```
ayushi@ayushi-VirtualBox:~$ netstat -su
IcmpMsg:
  InType0: 47
  InType3: 40
  InType11: 65
  OutType3: 56
  OutType8: 157
  Udp:
    324 packets received
    56 packets to unknown port received
    0 packet receive errors
    368 packets sent
    0 receive buffer errors
    0 send buffer errors
    IgnoredMulti: 4
  UdpLite:
  IpExt:
    InMcastPkts: 74
    OutMcastPkts: 76
    InBcastPkts: 4
    OutBcastPkts: 4
    InOctets: 110515
    OutOctets: 53409
    InMcastOctets: 7084
    OutMcastOctets: 7164
    InBcastOctets: 310
    OutBcastOctets: 310
    InNoECTPkts: 647
  MPTcpExt:
ayushi@ayushi-VirtualBox:~$
```

## netstat -i & netstat -p

```
ayushi@ayushi-VirtualBox:~$ netstat -i
Kernel Interface table
Iface      MTU   RX-OK RX-ERR RX-DRP RX-OVR     TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3    1500     349     0     0 0       423     0     0     0 BMRU
lo       65536    292     0     0 0       292     0     0     0 LRU

ayushi@ayushi-VirtualBox:~$ netstat -p
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State      PID/Program name
A  udp      0      0 ayushi-VirtualBo:bootpc _gateway:bootps      ESTABLISHED -
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags      Type      State          I-Node PID/Program name      Path
?  unix    3      [ ]      DGRAM    CONNECTED      16744      -
?  unix    2      [ ]      DGRAM    CONNECTED      32984 1365/systemd      /run/user/1000/systemd/notify
?  unix    2      [ ]      DGRAM    CONNECTED      16758      -
?  unix   16      [ ]      DGRAM    CONNECTED      16768      -
?  unix    8      [ ]      DGRAM    CONNECTED      16772      -
?  unix    3      [ ]      STREAM   CONNECTED      36331 1752/dconf-service
?  unix    3      [ ]      STREAM   CONNECTED      25778      -
?  unix    3      [ ]      STREAM   CONNECTED      21206      -
?  unix    3      [ ]      STREAM   CONNECTED      24227      -
?  unix    3      [ ]      STREAM   CONNECTED      33466 1671/gnome-shell
?  unix    3      [ ]      STREAM   CONNECTED      37031      -
?  unix    3      [ ]      STREAM   CONNECTED      20758      -
?  unix    3      [ ]      STREAM   CONNECTED      34587      -
?  unix    3      [ ]      STREAM   CONNECTED      31476 1422/nvfs-mtp-volum
```

```
ayushi@ayushi-VirtualBox:~$ netstat -p
unix 3 [ ] STREAM CONNECTED 34585 -
unix 3 [ ] STREAM CONNECTED 34117 1377/dbus-daemon /run/user/1000/bus
unix 3 [ ] STREAM CONNECTED 34798 1817/gsd-rfkill
unix 3 [ ] STREAM CONNECTED 35353 1377/dbus-daemon /run/user/1000/bus
unix 3 [ ] STREAM CONNECTED 33144 1426/gvfs-goa-volum
unix 3 [ ] DGRAM -
unix 3 [ ] STREAM CONNECTED 32811 -
unix 3 [ ] STREAM CONNECTED 23299 -
unix 3 [ ] DGRAM 16745 -
unix 3 [ ] STREAM CONNECTED 36671 -
unix 3 [ ] STREAM CONNECTED 34077 1377/dbus-daemon /run/user/1000/bus
A  unix 3 [ ] STREAM CONNECTED 36550 1445/Xorg @/tmp/.X11-unix/X0
unix 3 [ ] STREAM CONNECTED 34582 1824/seahorse /run/dbus/system_bus_socket
?  unix 3 [ ] STREAM CONNECTED 39270 2041/gnome-calendar
?  unix 3 [ ] STREAM CONNECTED 36638 1839/gsd-usb-protec
unix 3 [ ] STREAM CONNECTED 21252 -
unix 3 [ ] STREAM CONNECTED 39245 2042/seahorse /run/dbus/system_bus_socket
?  unix 3 [ ] STREAM CONNECTED 30541 -
unix 3 [ ] STREAM CONNECTED 29106 -
unix 3 [ ] STREAM CONNECTED 34795 1817/gsd-rfkill
unix 3 [ ] STREAM CONNECTED 34046 -
unix 3 [ ] STREAM CONNECTED 36892 1827/gsd-smartcard
unix 3 [ ] STREAM CONNECTED 38768 2136/update-notifie
unix 3 [ ] STREAM CONNECTED 36668 1839/gsd-usb-protec
unix 3 [ ] STREAM CONNECTED 32700 -
unix 3 [ ] STREAM CONNECTED 28303 -
@/tmp/dbus-irbIdAHc /run/systemd/journal/stdout
unix 3 [ ] STREAM CONNECTED 28303 -
@/tmp/dbus-irbIdAHc /run/systemd/journal/stdout
```

## netstat -r

```
ayushi@ayushi-VirtualBox:~$ netstat -r
Kernel IP routing table
Destination     Gateway         Genmask        Flags  MSS Window irtt Iface
default         _gateway       0.0.0.0        UG            0 0        0 enp0s3
10.0.2.0        0.0.0.0        255.255.255.0  U        0 0        0 enp0s3
link-local      0.0.0.0        255.255.0.0   U        0 0        0 enp0s3
```

## arp -e, arp

```
ayushi@ayushi-VirtualBox:~$ arp -e
Address           Hwtype  HWaddress          Flags Mask      Iface
_gateway          ether    52:54:00:12:35:02  C          enp0s3
ayushi@ayushi-VirtualBox:~$ arp
Address           Hwtype  HWaddress          Flags Mask      Iface
_gateway          ether    52:54:00:12:35:02  C          enp0s3
```