8th july

-> aws vpc
-> openstack neutron

Physical connectivity(router,switch etc)
In aws eni card(or nat card) and in openstack it is known as vNIC(virtual network card)
Both sides should have unique ip address
We req a device (switch or router on the bases of networking)
Private ip can only connects with private and vice versa

C:\Users\user>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

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

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix . :
   Link-local IPv6 Address . . . . . : fe80::8c48:9d18:b9e9:10ab%10
   IPv4 Address. . . . . : 192.168.56.1
   Subnet Mask . . . . : 255.255.255.0
   Default Gateway . . . . :

Ethernet adapter VirtualBox Host-Only Network #2:

   Connection-specific DNS Suffix . :
   Link-local IPv6 Address . . . . . : fe80::cd99:5eb7:860:f0b1%21
   IPv4 Address. . . . . : 192.168.99.1
   Subnet Mask . . . . : 255.255.255.0
   Default Gateway . . . . :

Wireless LAN adapter Local Area Connection* 3:

   Media State . . . . : Media disconnected

Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 4:

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

Wireless LAN adapter Wi-Fi:

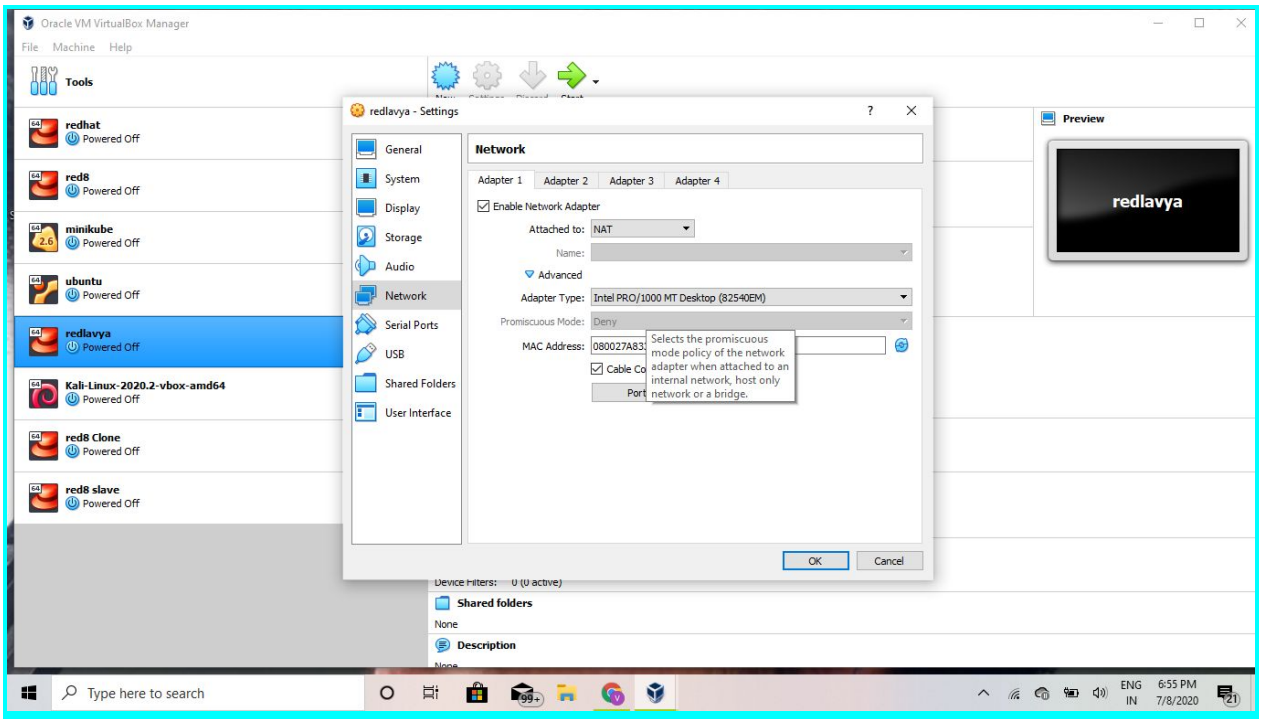
Connection-specific DNS Suffix . :
IPv6 Address. . . . . : 2401:4900:463f:a5bd:e98c:fb29:5c6c:dbed
Temporary IPv6 Address. . . . . : 2401:4900:463f:a5bd:d875:839f:6406:7fda
Link-local IPv6 Address . . . . . : fe80::e98c:fb29:5c6c:dbed%12
IPv4 Address. . . . . : 192.168.43.178
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : fe80::c8:7ff:fe29:76fe%12
192.168.43.1
C:\Users\user>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=70ms TTL=114
Reply from 8.8.8.8: bytes=32 time=81ms TTL=114
Reply from 8.8.8.8: bytes=32 time=69ms TTL=114
Reply from 8.8.8.8: bytes=32 time=67ms TTL=114

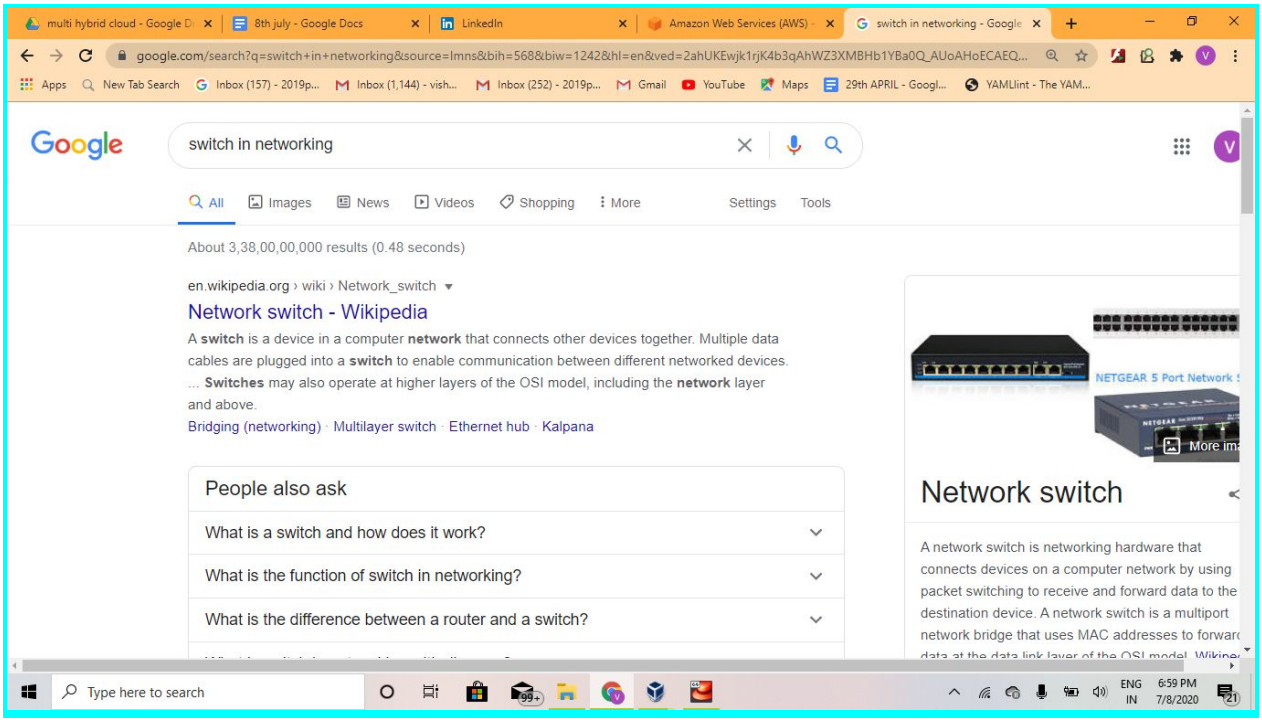
Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 67ms, Maximum = 81ms, Average = 71ms

naas(network as a service)

> in aws we use the concept of floating ip
And we can get the random ip from dhcp server
In aws we have eni card



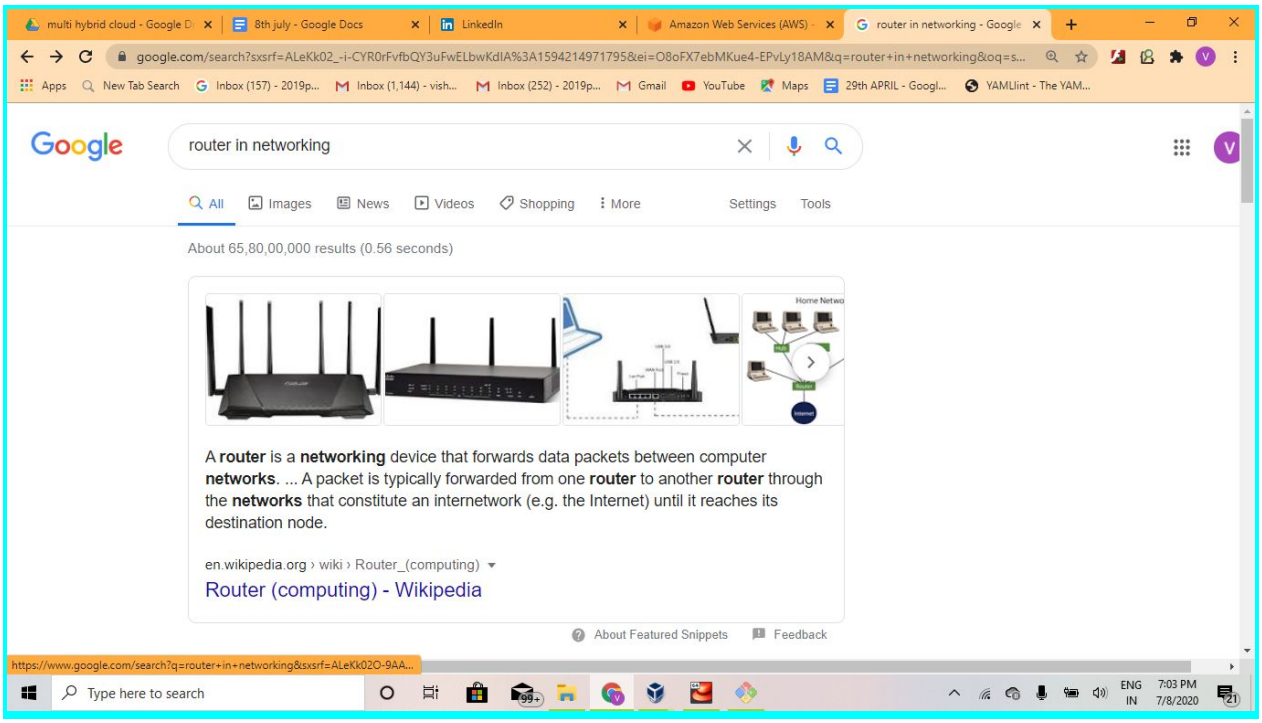
/16 or /24 it is known as cidr or prefix length



switch depends on the number of ports

And they should belong to same network

When we create a switch using a software thn it is known as bridge

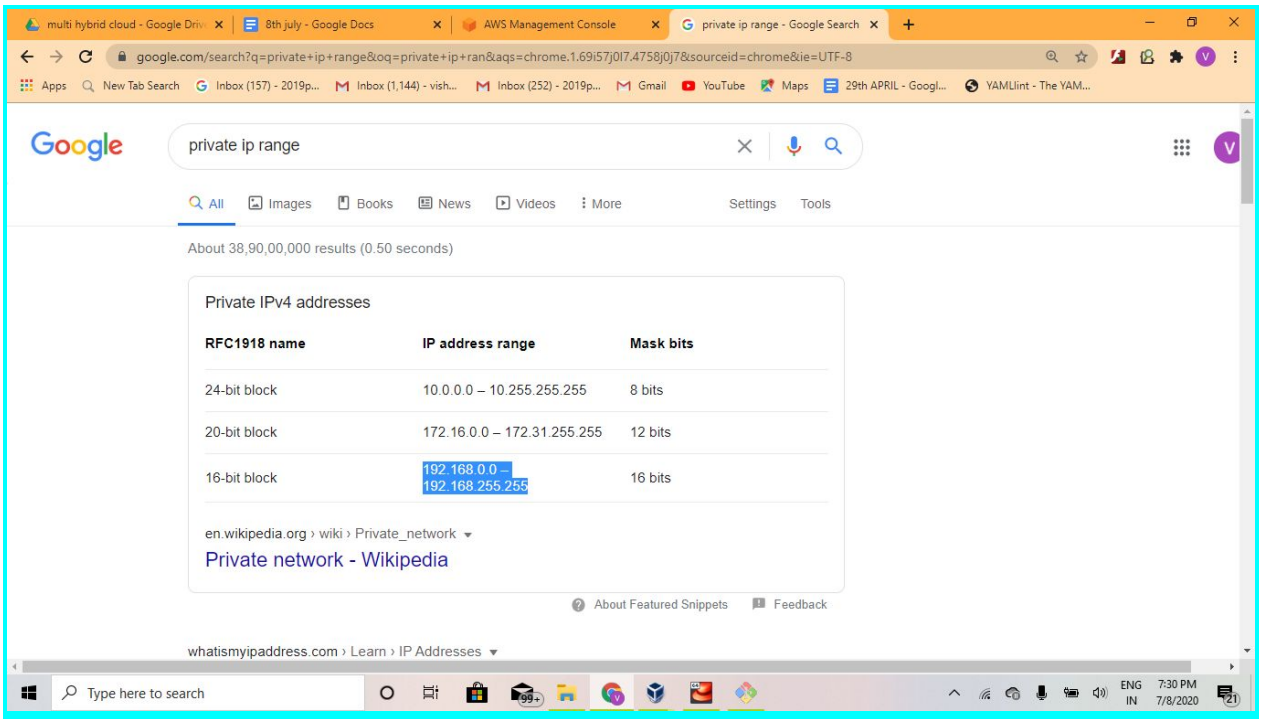


IN NETWORKING WORLD WE HAVE OSI WORLD

- **PHYSCIAL**
- **DATA LINK LAYER(switch)**
- **NETWORK LAYER(router)**
- **TRANSPORT LAYER**
- **SESSION LAYER**
- **PRESENTATION LAYER**
- **APPLICATION LAYER**

Switch works on layer2 and it is also known as l2switch
Router work on layer3 and it is also known as layer3switch

Mobile hotspot works like a switch and router
Hotspot is also knows as l3bridge
In linux we have a software linuxswitch we have pre conf
Or we have open-v-switch
Router connects with isp
IANA range
10.0.0.0-10.255.255.255 are consider as a private ip
172.16.0.0 – 172.31.255.255
192.168.0.0 – 192.168.255.255



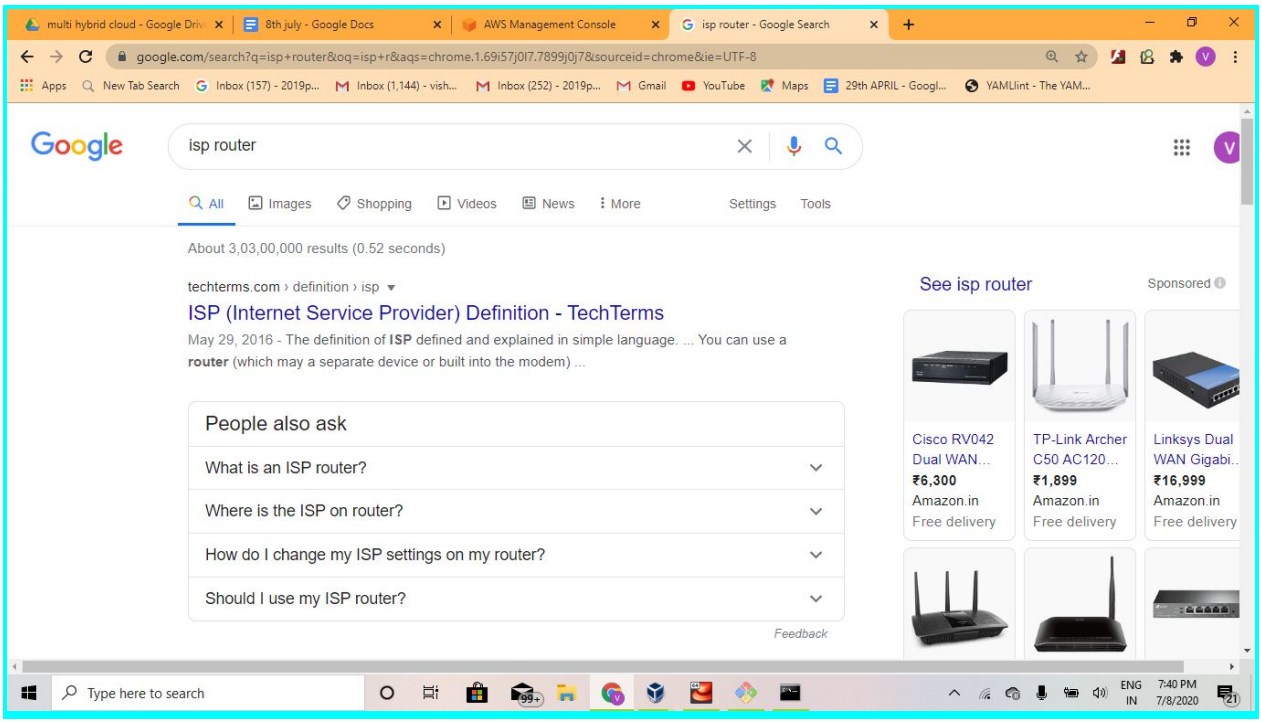
[root@localhost ~]# ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=113 time=55.2 ms

With the help of nating we can able to ping the public world from private ip

Why we pay for the internet?
> they give us the wire/wireless connection

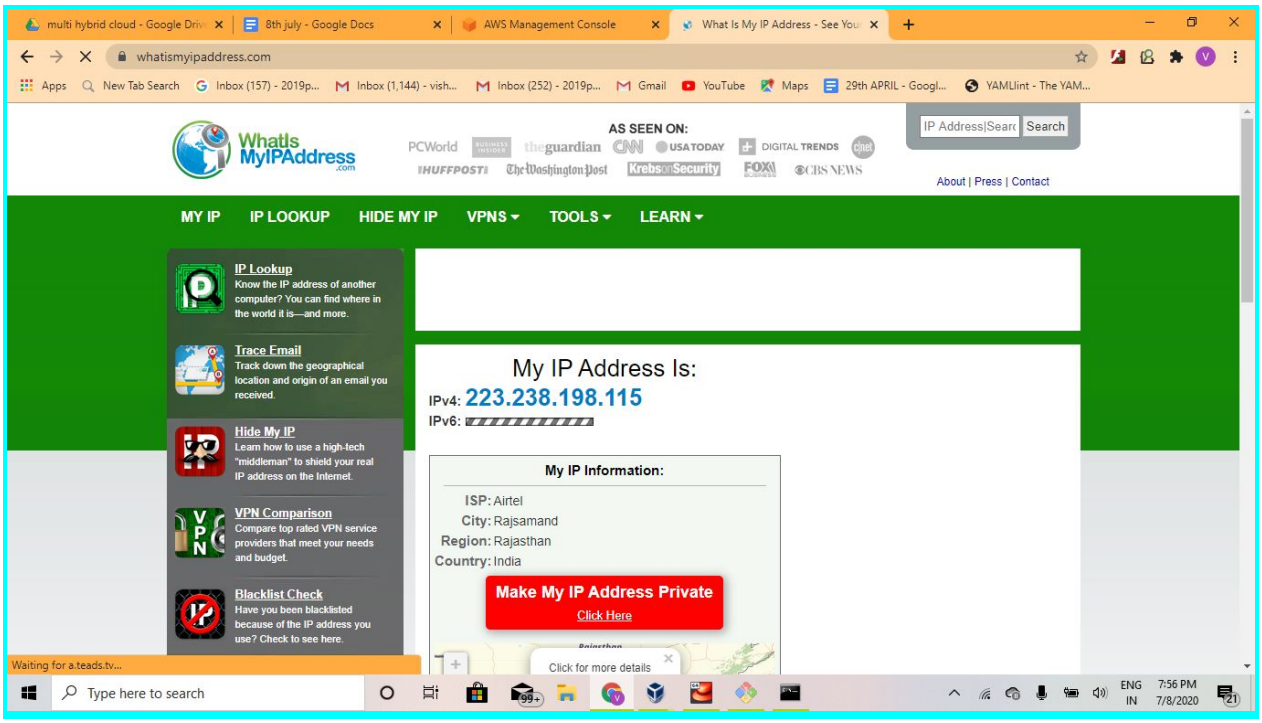
In modem we have a wanport
In modem they give public ip

Isp only allow public ip



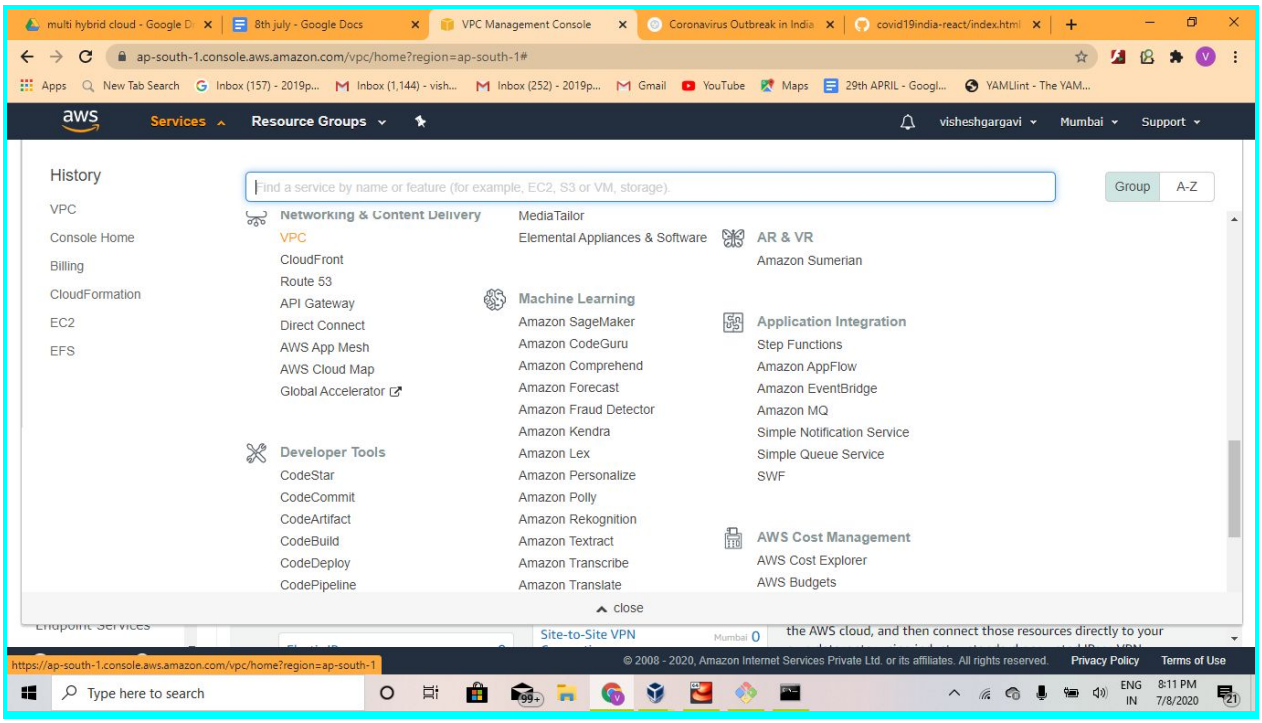
They block the private ip
Yum install iproute

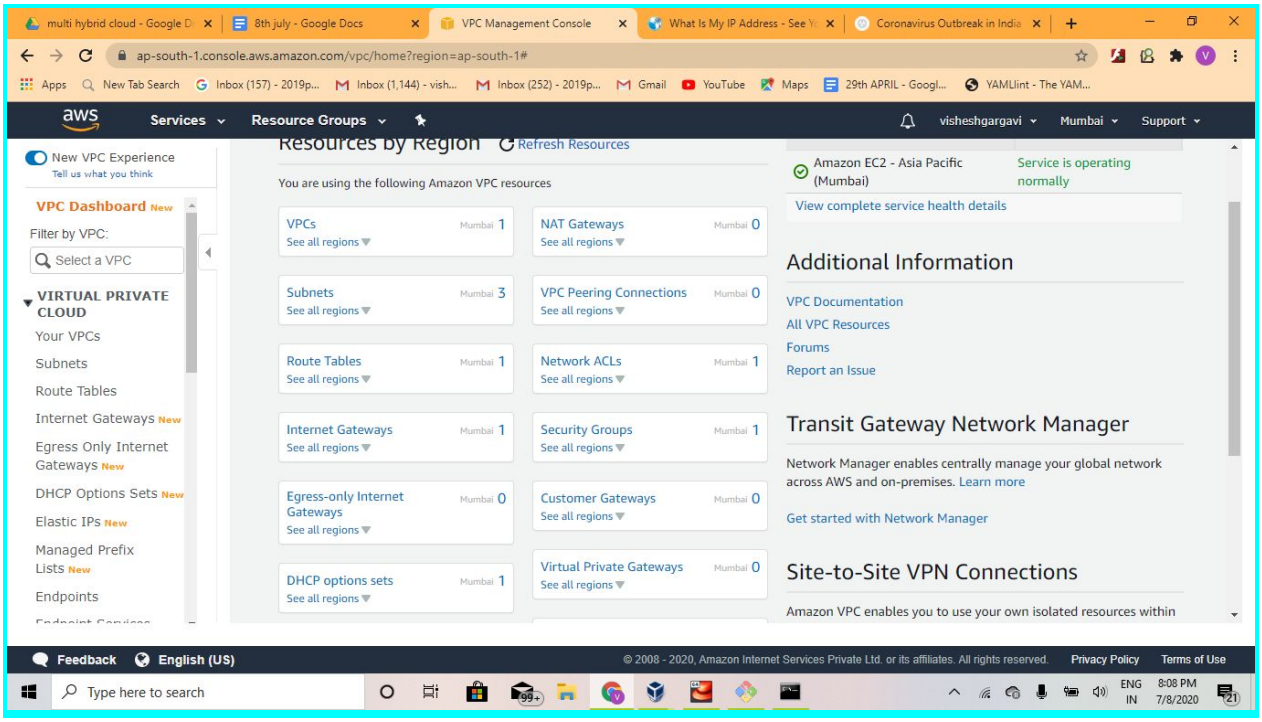
We snd packets
System creates packets and from where the packet is snd it is known as source ip(we have header) and destination ip for destination
Data is also known as ylowd
Router remove the private ip to public ip NAT(network address transmission)
Soure nating is performed by the router
Every system has internally nating enabled



If we dont have the route table set then also we can’t able to ping

Dnat is not allowed bydefault (pating or pod address translation)





router is also known as gateway

C:\Users\user>route PRINT

21...0a 00 27 00 00 15 .....VirtualBox Host-Only Ethernet Adapter

10...0a 00 27 00 00 0a .....VirtualBox Host-Only Ethernet Adapter #2

20...0a 00 27 00 00 14 .....VirtualBox Host-Only Ethernet Adapter #3

68...02 00 4c 4f 4f 50 .....Npcap Loopback Adapter

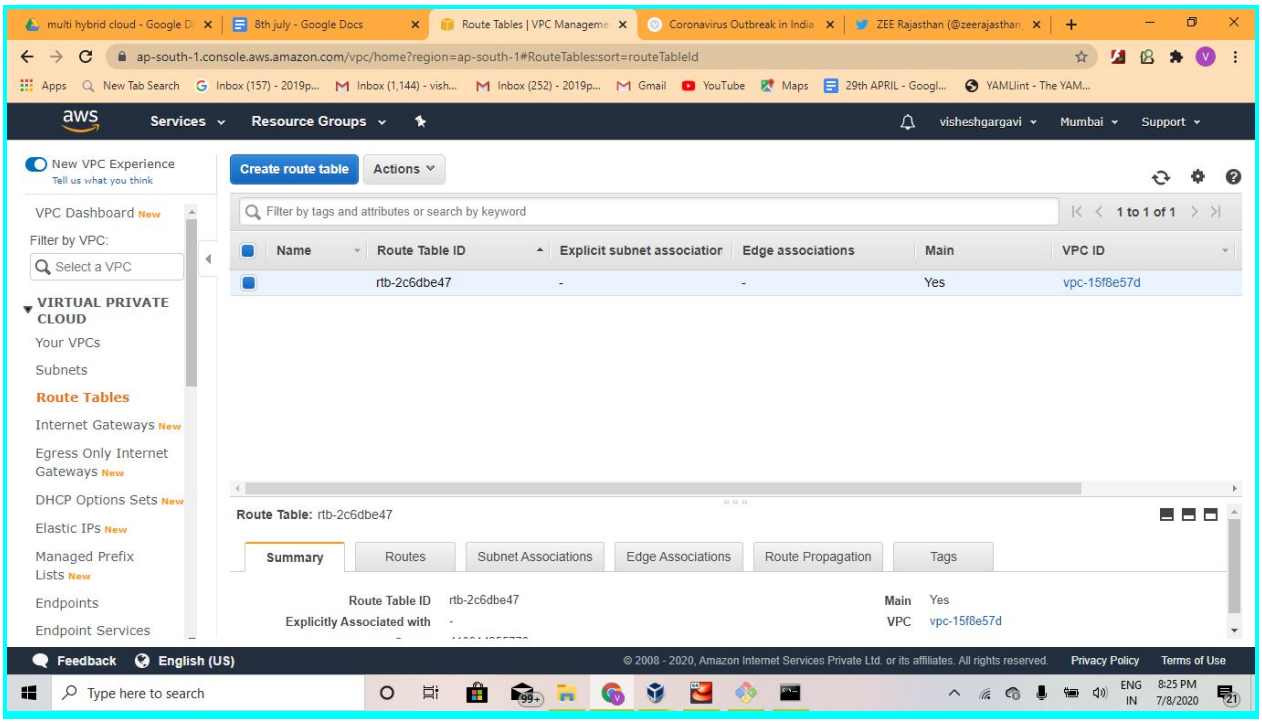
```
 14...1e bb 58 42 45 3f ......Microsoft Wi-Fi Direct Virtual Adapter
 13...2e bb 58 42 45 3f ......Microsoft Wi-Fi Direct Virtual Adapter #2
 15...4c bb 58 42 45 3f ......Dell Wireless 1705 802.11b|g|n (2.4GHZ)
  2...4c bb 58 42 45 40 ......Bluetooth Device (Personal Area Network)
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0      192.168.43.1    192.168.43.55     55
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    331
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:

[root@localhost ~]# route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.0.2.2        0.0.0.0         UG    100    0        0 enp0s3
0.0.0.0         192.168.43.1    0.0.0.0         UG    101    0        0 enp0s8
0.0.0.0         192.168.43.1    0.0.0.0         UG    102    0        0 enp0s9
[root@localhost ~]# route del -net 0.0.0.0
[root@localhost ~]# route del -net 0.0.0.0
[root@localhost ~]# ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=114 time=56.8 ms
[root@localhost ~]# route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         192.168.43.1    0.0.0.0         UG    101    0        0 enp0s8
0.0.0.0         192.168.43.1    0.0.0.0         UG    102    0        0 enp0s9
```

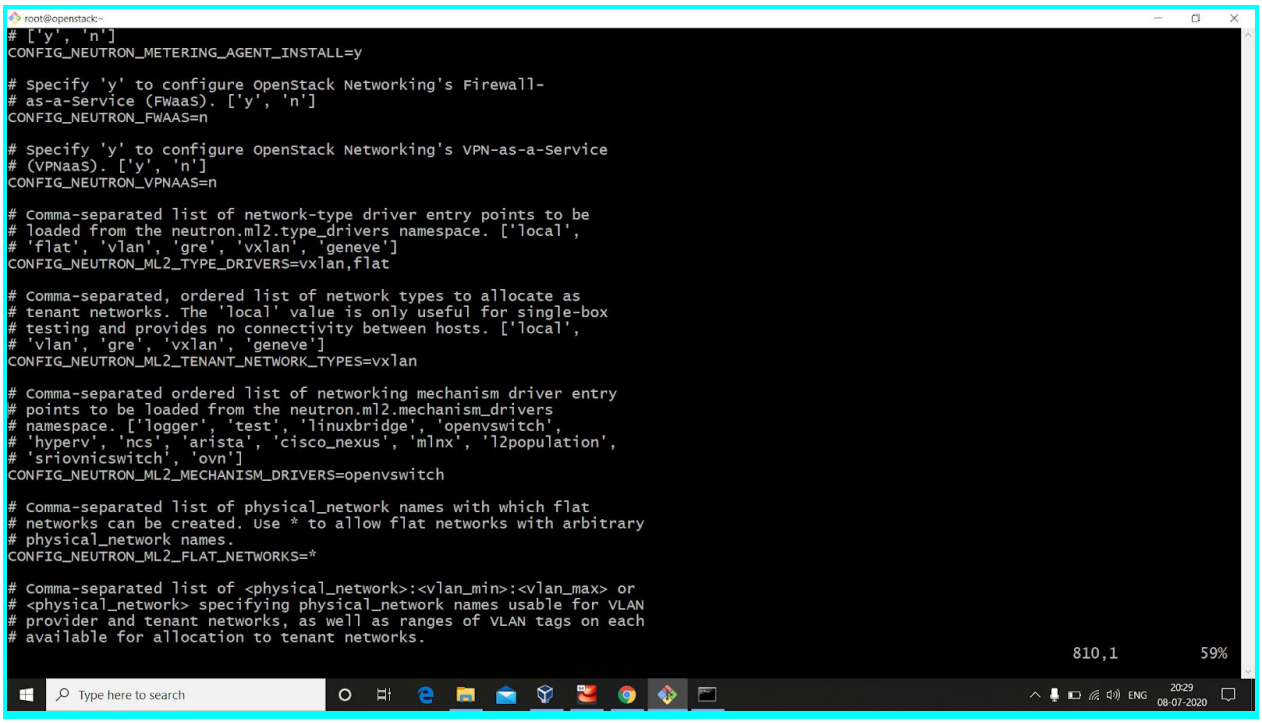
```
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
172.17.0.0      0.0.0.0         255.255.0.0     U     0      0        0 docker0
172.18.0.0      0.0.0.0         255.255.0.0     U     0      0        0 br-86e4dd51aaf8
192.168.43.0    0.0.0.0         255.255.255.0   U     101    0        0 enp0s8
192.168.43.0    0.0.0.0         255.255.255.0   U     102    0        0 enp0s9
192.168.122.0   0.0.0.0         255.255.255.0   U     0      0        0 virbr0
[root@localhost ~]# route add -net 0.0.0.0
SIOCADDRT: No such device
[root@localhost ~]# route add -net 0.0.0.0 gw 10.0.2.2
M) ipx (Novell IPX) ddp (Appletalk DDP)
    x25 (CCITT X.25)
[root@localhost ~]# route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.0.2.2        0.0.0.0         UG    0      0        0 enp0s3
0.0.0.0         192.168.43.1    0.0.0.0         UG    101    0        0 enp0s8
0.0.0.0         192.168.43.1    0.0.0.0         UG    102    0        0 enp0s9
```

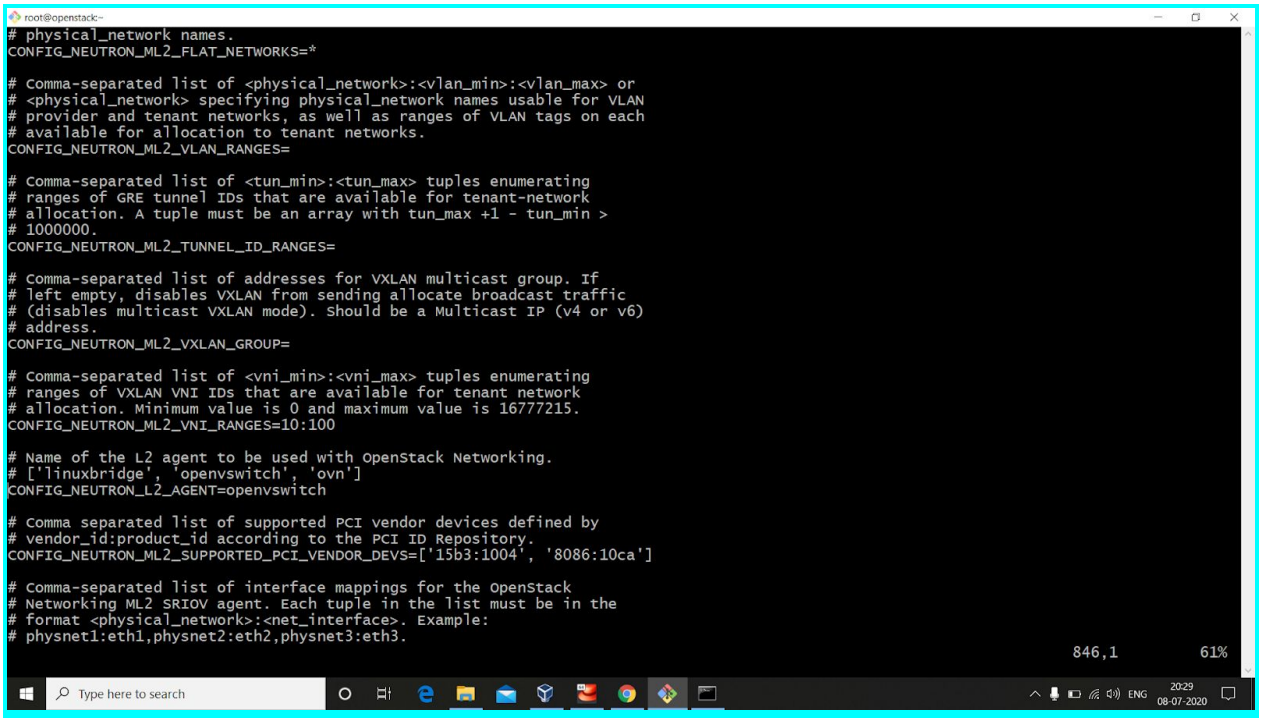



```
[root@openstack ~]# ifconfig enp0s3
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.43.186  netmask 255.255.255.0  broadcast 192.168.43.255
        inet6 2401:4900:463f:a5bd:a00:27ff:fe04:dd49  prefixlen 64  scopeid
0x0<global>
```

```
        inet6 fe80::a00:27ff:fe04:dd49  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:04:dd:49  txqueuelen 1000  (Ethernet)
        RX packets 2747  bytes 188267 (183.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2570  bytes 1292543 (1.2 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

You have mail in /var/spool/mail/root
[root@openstack ~]# rpm -qa | grep openv
openstack-neutron-openvswitch-12.0.2-0.20180421011362.0ec54fd.el7ost.noarch
openvswitch-selinux-extra-policy-1.0-3.el7fdp.noarch
python-openvswitch-2.9.0-47.el7fdp.2.noarch
openvswitch-2.9.0-47.el7fdp.2.x86_64
```






```
[root@openstack ~(keystone_demo)]# ovs-vsctl show
0c0552b8-e81b-4ef4-bc3a-0b2eaac6e011
    Manager "ptcp:6640:127.0.0.1"
        is_connected: true
    Bridge br-tun
        Controller "tcp:127.0.0.1:6633"
```

```
            is_connected: true
        fail_mode: secure
        Port patch-int
            Interface patch-int
                type: patch
                options: {peer=patch-tun}
        Port br-tun
            Interface br-tun
                type: internal
    Bridge br-int
```

>> important bridge for us is bridge int(bridge integration or internal)
In networking we have subnet and they internally create the bridge-int
And they attach it to the nat and to the vm
And we can scale the ports