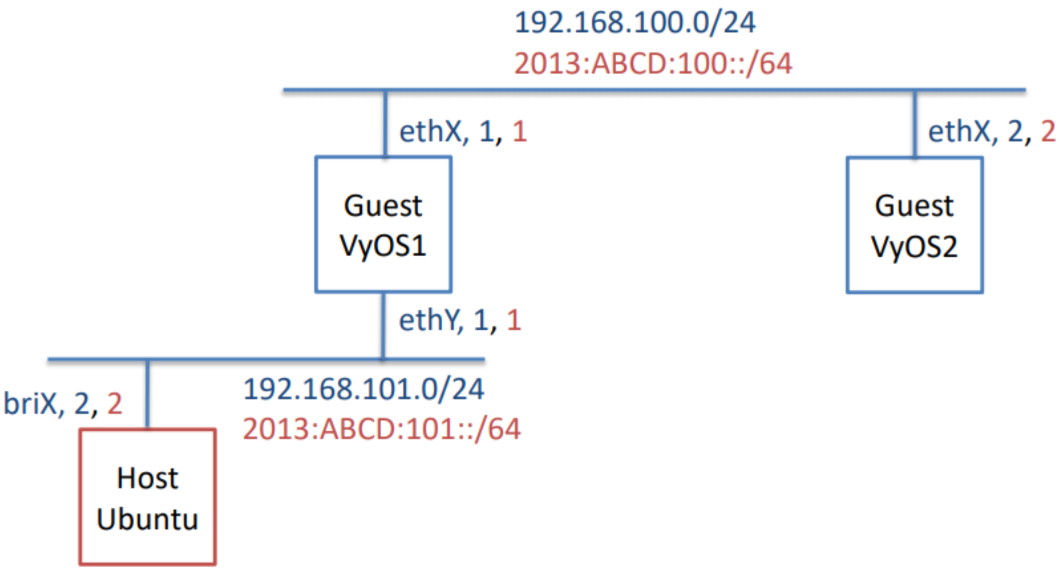
Small Network Setup Assignment

-> We are going to make following network in ubuntu host



-> We have 3 node

1. Host Ubuntu

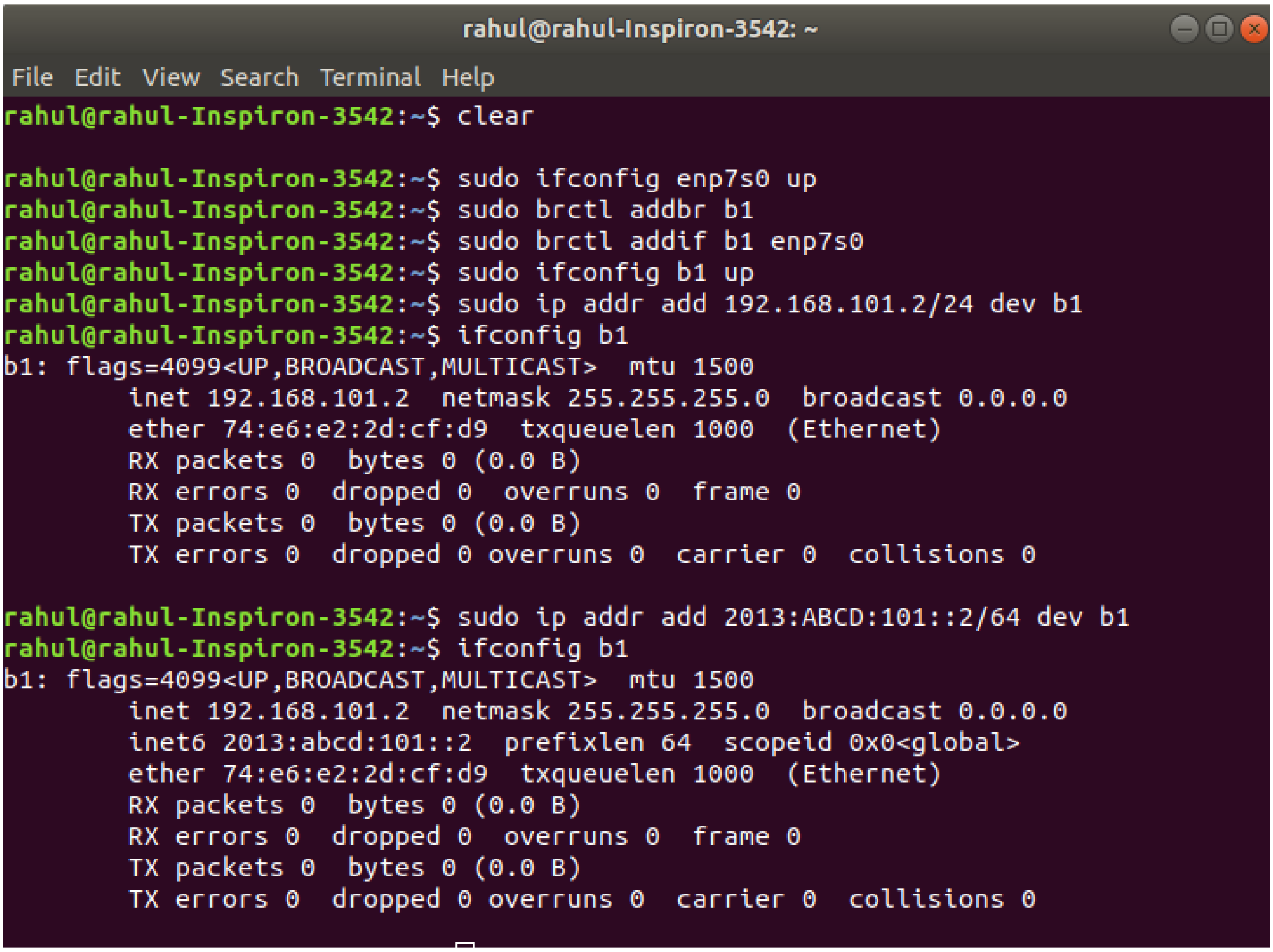
2. Guest VyOS1 (created under KVM)

3. Guest VyOsS (created under KVM)

->Lets configure Each Node.

1. Host Ubuntu :-

We are creating a bridge (b1) and allocate static ip (192.168.101.2 & 2013:ABCD:101::2) to it.

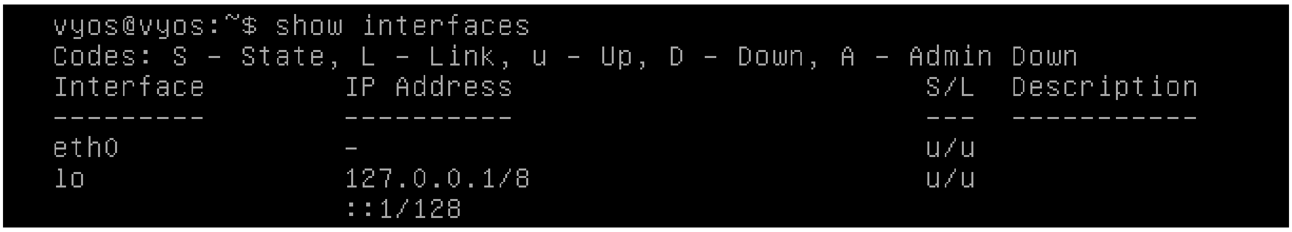

rahul@rahul-Inspiron-3542: ~
File Edit View Search Terminal Help

```
rahul@rahul-Inspiron-3542:~$ clear

rahul@rahul-Inspiron-3542:~$ sudo ifconfig enp7s0 up
rahul@rahul-Inspiron-3542:~$ sudo brctl addbr b1
rahul@rahul-Inspiron-3542:~$ sudo brctl addif b1 enp7s0
rahul@rahul-Inspiron-3542:~$ sudo ifconfig b1 up
rahul@rahul-Inspiron-3542:~$ sudo ip addr add 192.168.101.2/24 dev b1
rahul@rahul-Inspiron-3542:~$ ifconfig b1
b1: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.101.2  netmask 255.255.255.0  broadcast 0.0.0.0
        ether 74:e6:e2:2d:cf:d9  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

rahul@rahul-Inspiron-3542:~$ sudo ip addr add 2013:ABCD:101::2/64 dev b1
rahul@rahul-Inspiron-3542:~$ ifconfig b1
b1: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 192.168.101.2  netmask 255.255.255.0  broadcast 0.0.0.0
        inet6 2013:abcd:101::2  prefixlen 64  scopeid 0x0<global>
        ether 74:e6:e2:2d:cf:d9  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

2. Vyos Guest 1(v1) :-

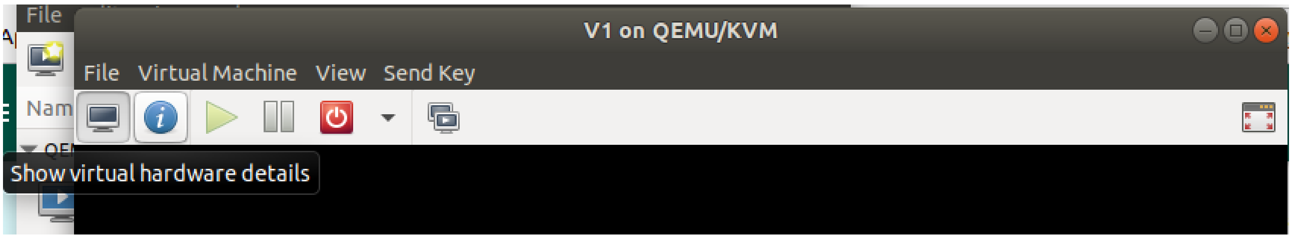
we need two Ethernet interface in VYOS1. We have only one(eht0) ,have to create virtually another one and we will assign static ip to each interfaces.

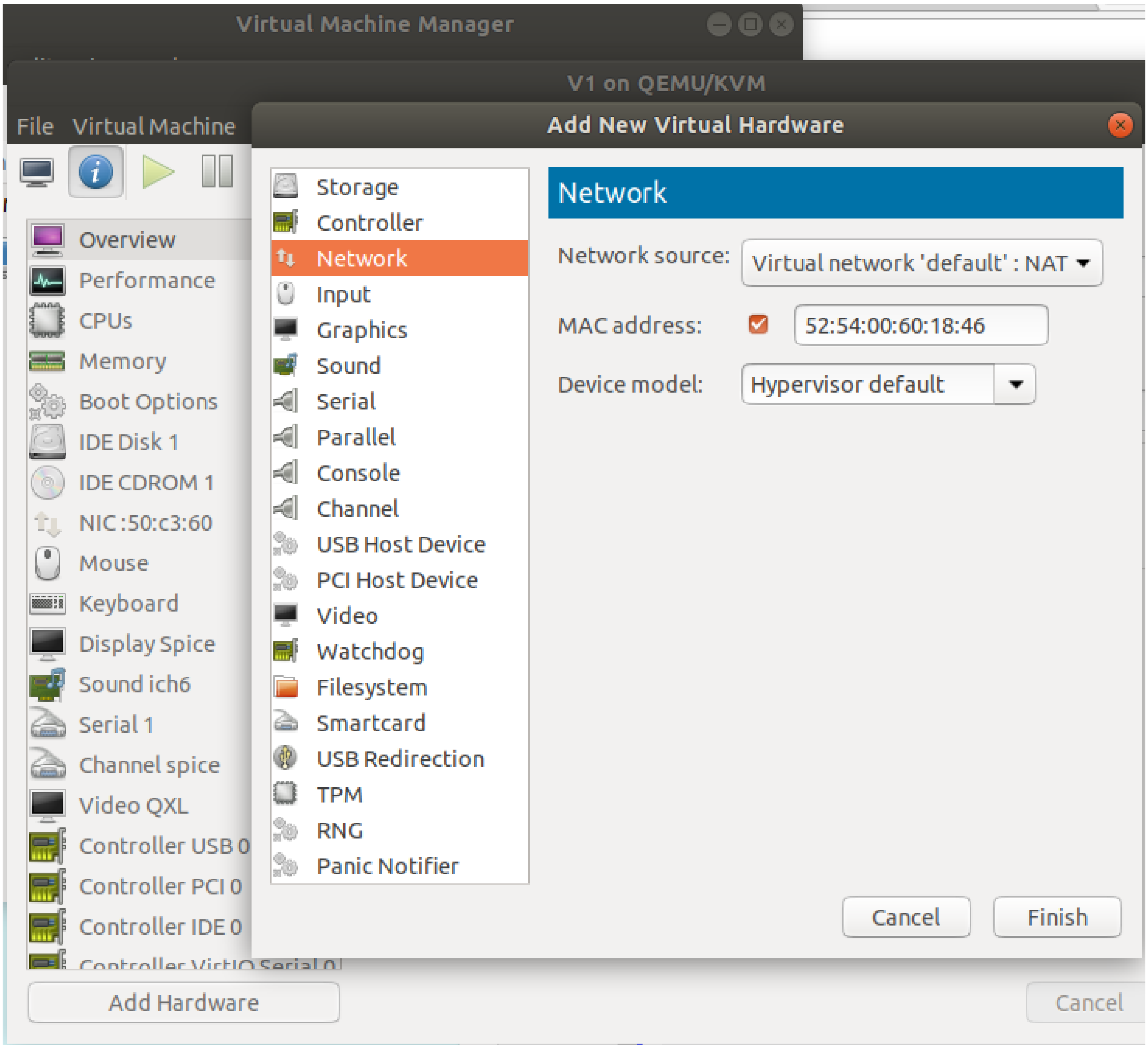
-> Lets create another



```
vyos@vyos:~$ show interfaces
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface        IP Address                        S/L  Description
---------        ----------                        ---  -----------
eth0             -                                 u/u
lo               127.0.0.1/8                       u/u
                 ::1/128
```

-> Click on **i** icon(top left) which is show virtual hardware details goto Network & add interface.


V1 on QEMU/KVM
File Virtual Machine View Send Key
Show virtual hardware details

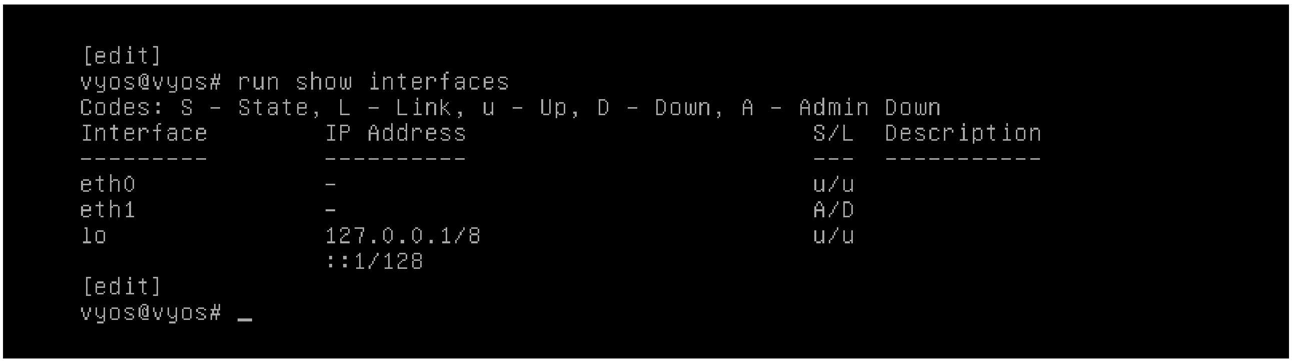


Network

Network source: Virtual network 'default' : NAT

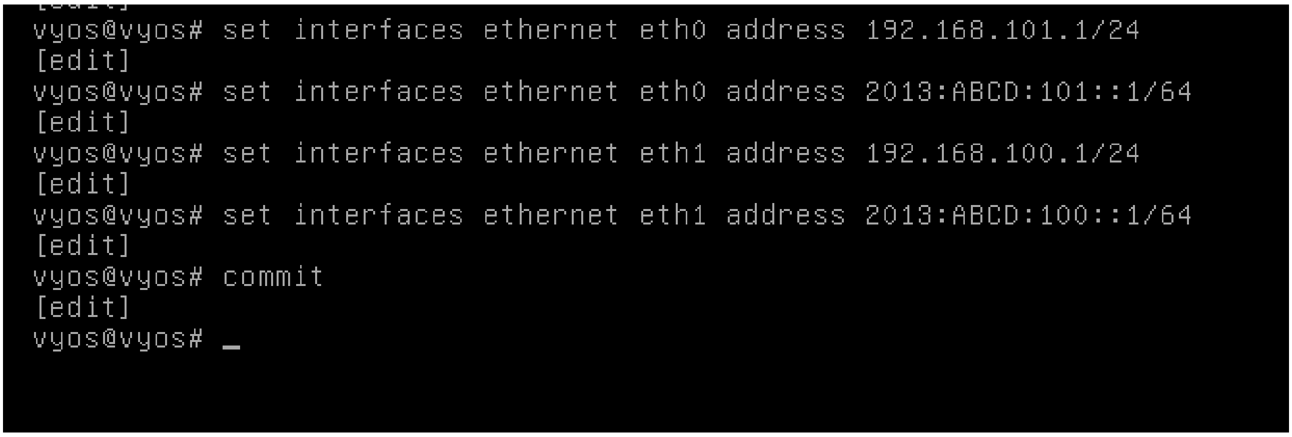
MAC address: ☑ 52:54:00:60:18:46

Device model: Hypervisor default

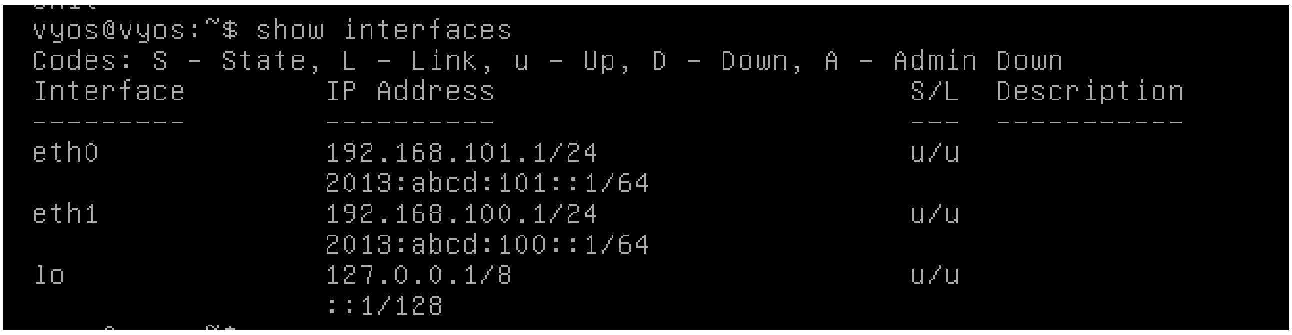


```
[edit]
vyos@vyos# run show interfaces
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface        IP Address                        S/L  Description
---------        ----------                        ---  -----------
eth0             -                                 u/u
eth1             -                                 A/D
lo               127.0.0.1/8                       u/u
                 ::1/128
[edit]
vyos@vyos# _
```

->Lets add IP to each ethernet interface



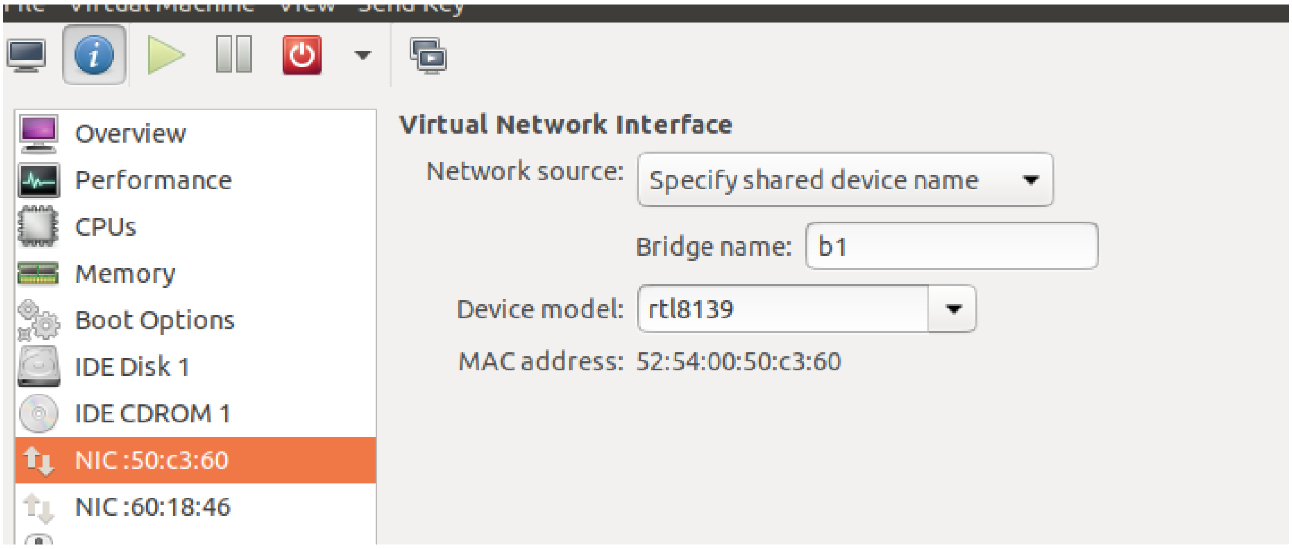
```
vyos@vyos# set interfaces ethernet eth0 address 192.168.101.1/24
[edit]
vyos@vyos# set interfaces ethernet eth0 address 2013:ABCD:101::1/64
[edit]
vyos@vyos# set interfaces ethernet eth1 address 192.168.100.1/24
[edit]
vyos@vyos# set interfaces ethernet eth1 address 2013:ABCD:100::1/64
[edit]
vyos@vyos# commit
[edit]
vyos@vyos# _
```



```
vyos@vyos:~$ show interfaces
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface        IP Address                        S/L  Description
---------        ----------                        ---  -----------
eth0             192.168.101.1/24                  u/u
                 2013:abcd:101::1/64
eth1             192.168.100.1/24                  u/u
                 2013:abcd:100::1/64
lo               127.0.0.1/8                       u/u
                 ::1/128
```

->Lets connect eth0 of VYOS1 to Bridge (b1)

go to network -> go to eth0 mac address ->specify b1.



Virtual Network Interface

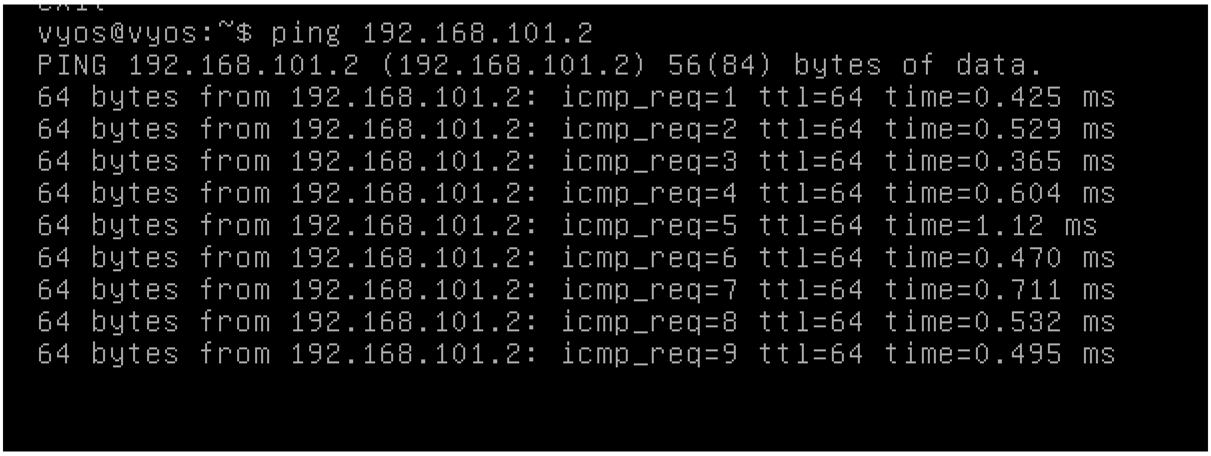
Network source: Specify shared device name

Bridge name: b1

Device model: rtl8139

MAC address: 52:54:00:50:c3:60

->Lets check bridge connceted properly or not by ping from vyos1 to ubuntu via b1

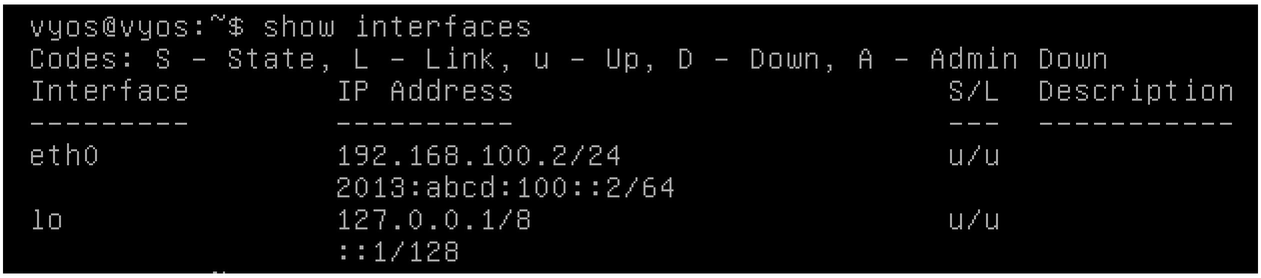


```
vyos@vyos:~$ ping 192.168.101.2
PING 192.168.101.2 (192.168.101.2) 56(84) bytes of data.
64 bytes from 192.168.101.2: icmp_req=1 ttl=64 time=0.425 ms
64 bytes from 192.168.101.2: icmp_req=2 ttl=64 time=0.529 ms
64 bytes from 192.168.101.2: icmp_req=3 ttl=64 time=0.365 ms
64 bytes from 192.168.101.2: icmp_req=4 ttl=64 time=0.604 ms
64 bytes from 192.168.101.2: icmp_req=5 ttl=64 time=1.12 ms
64 bytes from 192.168.101.2: icmp_req=6 ttl=64 time=0.470 ms
64 bytes from 192.168.101.2: icmp_req=7 ttl=64 time=0.711 ms
64 bytes from 192.168.101.2: icmp_req=8 ttl=64 time=0.532 ms
64 bytes from 192.168.101.2: icmp_req=9 ttl=64 time=0.495 ms
```

->It’s working..........

3. VYOS2 :-

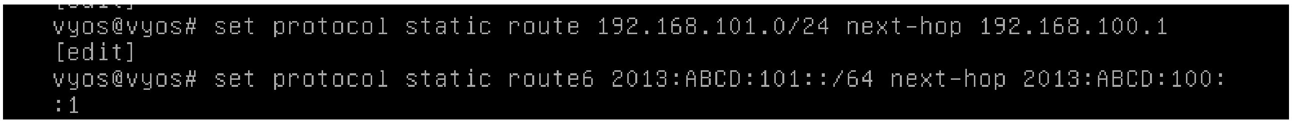
lets create another VYOS2 and configure the same way we did in VYOS1.I have given ip as (192.168.100.2/64 & 2013:abc:100::2/64)



```
vyos@vyos:~$ show interfaces
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface        IP Address                        S/L  Description
---------        ----------                        ---  -----------
eth0             192.168.100.2/24                  u/u
                 2013:abcd:100::2/64
lo               127.0.0.1/8                       u/u
                 ::1/128
```

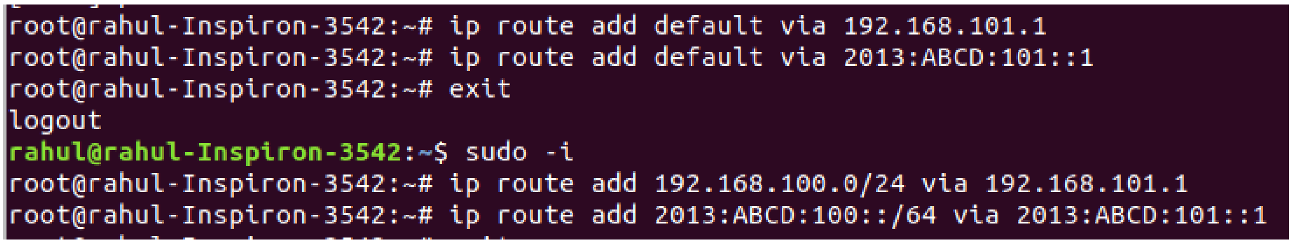
->Very Important step , adding static routing rule in VYOS 2.

Rule is about if i want to from VYOS2 to Ubuntu ,I will go via VYOS1



```
vyos@vyos# set protocol static route 192.168.101.0/24 next-hop 192.168.100.1
[edit]
vyos@vyos# set protocol static route6 2013:ABCD:101::/64 next-hop 2013:ABCD:100:
:1
```

->By this we can ping from VYOS2 to Ubuntu via VYOS1. But, we will also ping from Ubutu to VYOS2 .we have to write rule in host Ubuntu

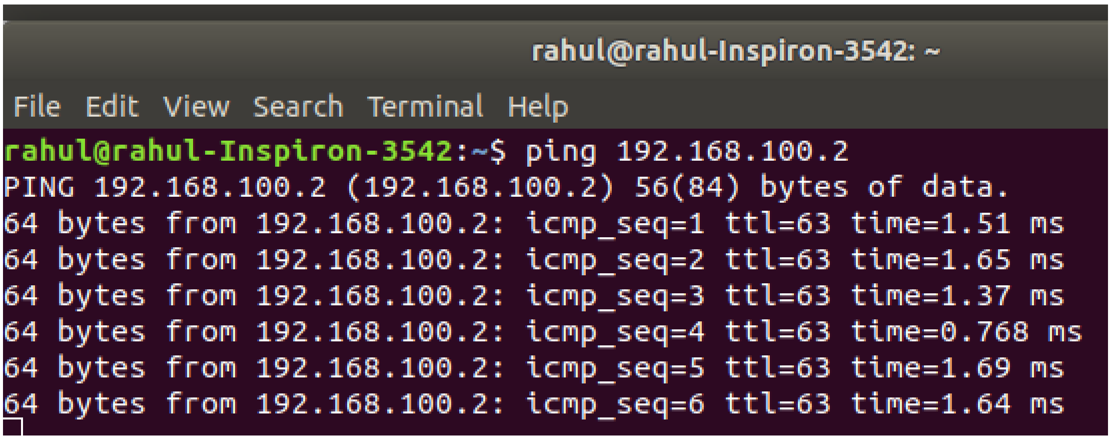


```
root@rahul-Inspiron-3542:~# ip route add default via 192.168.101.1
root@rahul-Inspiron-3542:~# ip route add default via 2013:ABCD:101::1
root@rahul-Inspiron-3542:~# exit
logout
rahul@rahul-Inspiron-3542:~$ sudo -i
root@rahul-Inspiron-3542:~# ip route add 192.168.100.0/24 via 192.168.101.1
root@rahul-Inspiron-3542:~# ip route add 2013:ABCD:100::/64 via 2013:ABCD:101::1
```

->Now we can say network is Done.................

Ping

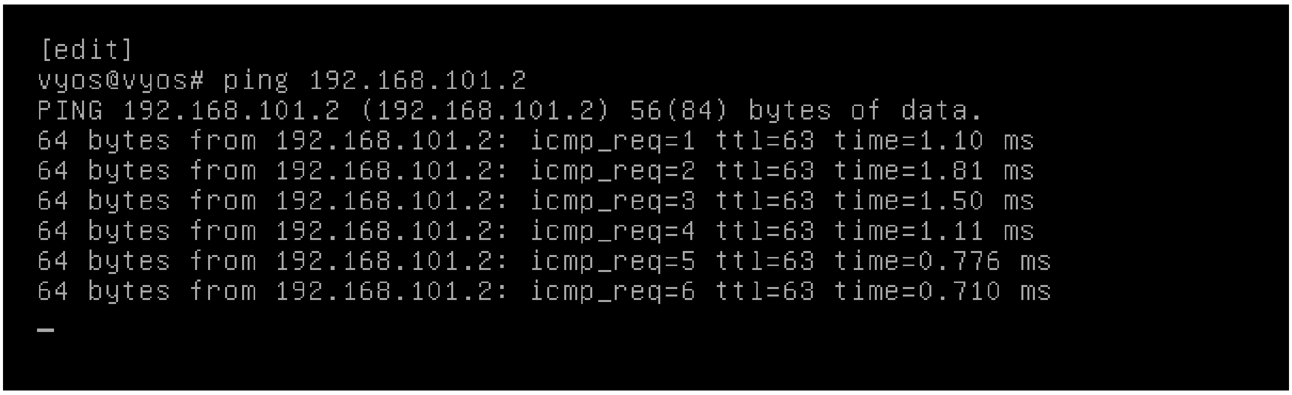
1. Ubuntu to VYOS2



rahul@rahul-Inspiron-3542: ~
File Edit View Search Terminal Help

```
rahul@rahul-Inspiron-3542:~$ ping 192.168.100.2
PING 192.168.100.2 (192.168.100.2) 56(84) bytes of data.
64 bytes from 192.168.100.2: icmp_seq=1 ttl=63 time=1.51 ms
64 bytes from 192.168.100.2: icmp_seq=2 ttl=63 time=1.65 ms
64 bytes from 192.168.100.2: icmp_seq=3 ttl=63 time=1.37 ms
64 bytes from 192.168.100.2: icmp_seq=4 ttl=63 time=0.768 ms
64 bytes from 192.168.100.2: icmp_seq=5 ttl=63 time=1.69 ms
64 bytes from 192.168.100.2: icmp_seq=6 ttl=63 time=1.64 ms
```

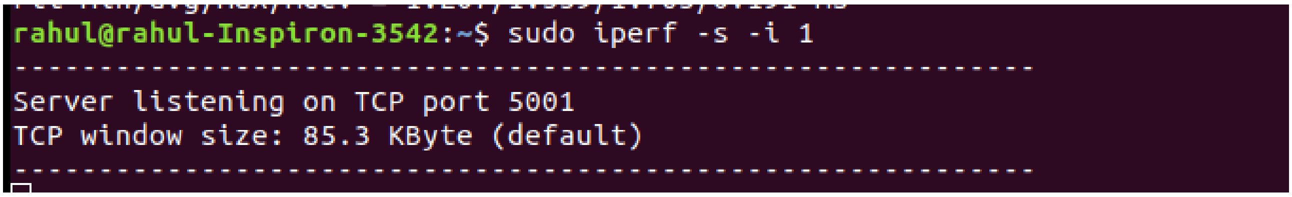
2. VYOS2 to Ubuntu



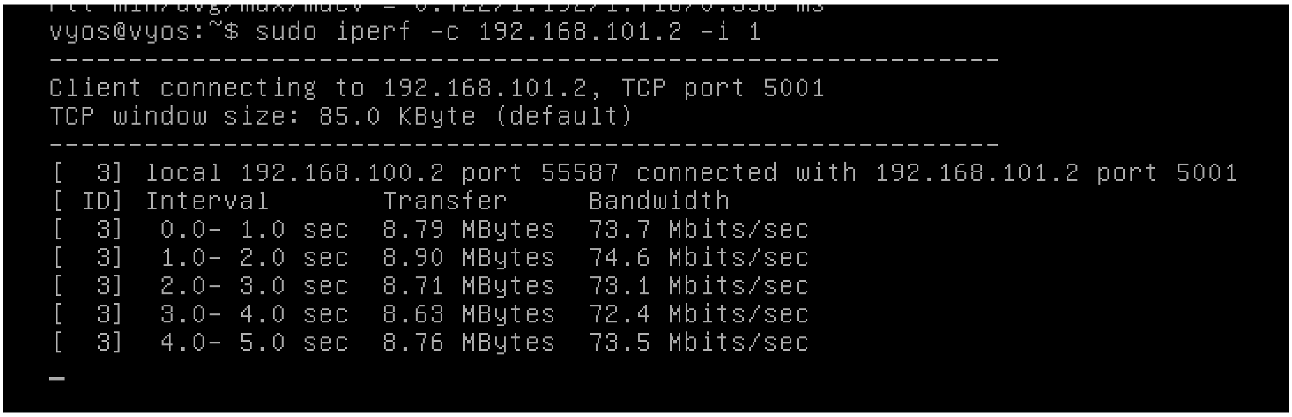
```
[edit]
vyos@vyos# ping 192.168.101.2
PING 192.168.101.2 (192.168.101.2) 56(84) bytes of data.
64 bytes from 192.168.101.2: icmp_req=1 ttl=63 time=1.10 ms
64 bytes from 192.168.101.2: icmp_req=2 ttl=63 time=1.81 ms
64 bytes from 192.168.101.2: icmp_req=3 ttl=63 time=1.50 ms
64 bytes from 192.168.101.2: icmp_req=4 ttl=63 time=1.11 ms
64 bytes from 192.168.101.2: icmp_req=5 ttl=63 time=0.776 ms
64 bytes from 192.168.101.2: icmp_req=6 ttl=63 time=0.710 ms
_
```

Ipef

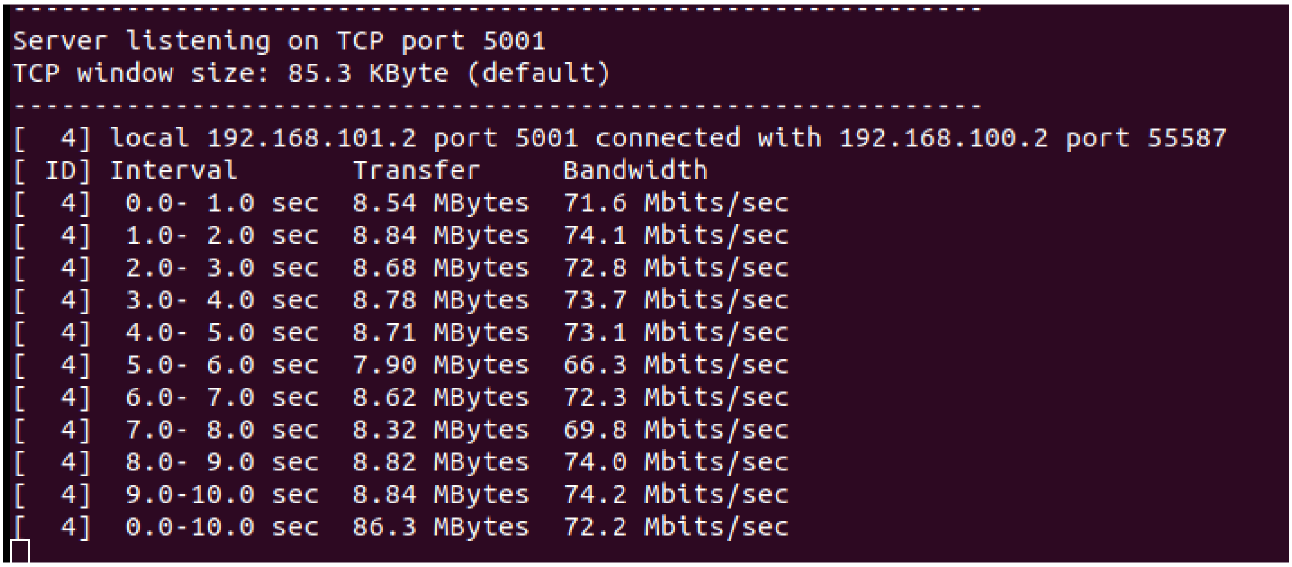
->I created **Ubuntu as Server** and **VYOS2 as Client**



```
rahul@rahul-Inspiron-3542:~$ sudo iperf -s -i 1
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
```



```
vyos@vyos:~$ sudo iperf -c 192.168.101.2 -i 1
------------------------------------------------------------
Client connecting to 192.168.101.2, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.100.2 port 55587 connected with 192.168.101.2 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0- 1.0 sec  8.79 MBytes  73.7 Mbits/sec
[  3]  1.0- 2.0 sec  8.90 MBytes  74.6 Mbits/sec
[  3]  2.0- 3.0 sec  8.71 MBytes  73.1 Mbits/sec
[  3]  3.0- 4.0 sec  8.63 MBytes  72.4 Mbits/sec
[  3]  4.0- 5.0 sec  8.76 MBytes  73.5 Mbits/sec
_
```



```
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
------------------------------------------------------------
[  4] local 192.168.101.2 port 5001 connected with 192.168.100.2 port 55587
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 1.0 sec  8.54 MBytes  71.6 Mbits/sec
[  4]  1.0- 2.0 sec  8.84 MBytes  74.1 Mbits/sec
[  4]  2.0- 3.0 sec  8.68 MBytes  72.8 Mbits/sec
[  4]  3.0- 4.0 sec  8.78 MBytes  73.7 Mbits/sec
[  4]  4.0- 5.0 sec  8.71 MBytes  73.1 Mbits/sec
[  4]  5.0- 6.0 sec  7.90 MBytes  66.3 Mbits/sec
[  4]  6.0- 7.0 sec  8.62 MBytes  72.3 Mbits/sec
[  4]  7.0- 8.0 sec  8.32 MBytes  69.8 Mbits/sec
[  4]  8.0- 9.0 sec  8.82 MBytes  74.0 Mbits/sec
[  4]  9.0-10.0 sec  8.84 MBytes  74.2 Mbits/sec
[  4]  0.0-10.0 sec  86.3 MBytes  72.2 Mbits/sec
```