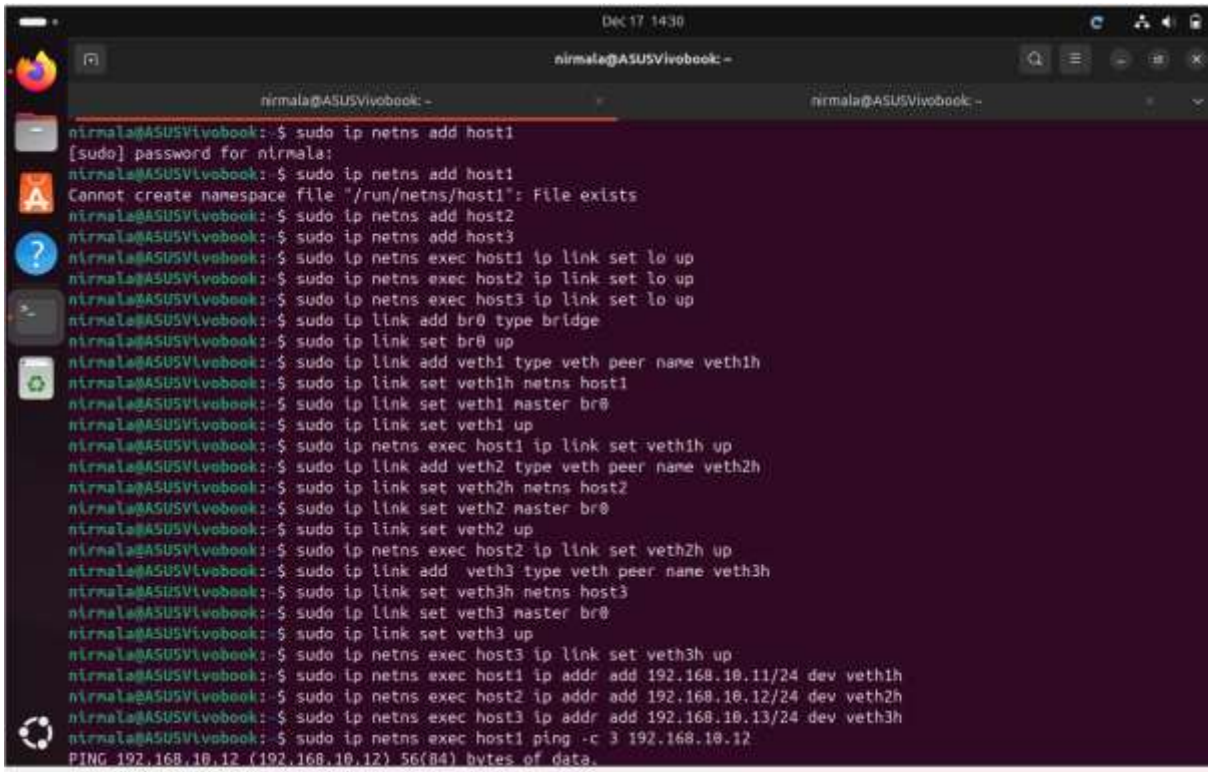
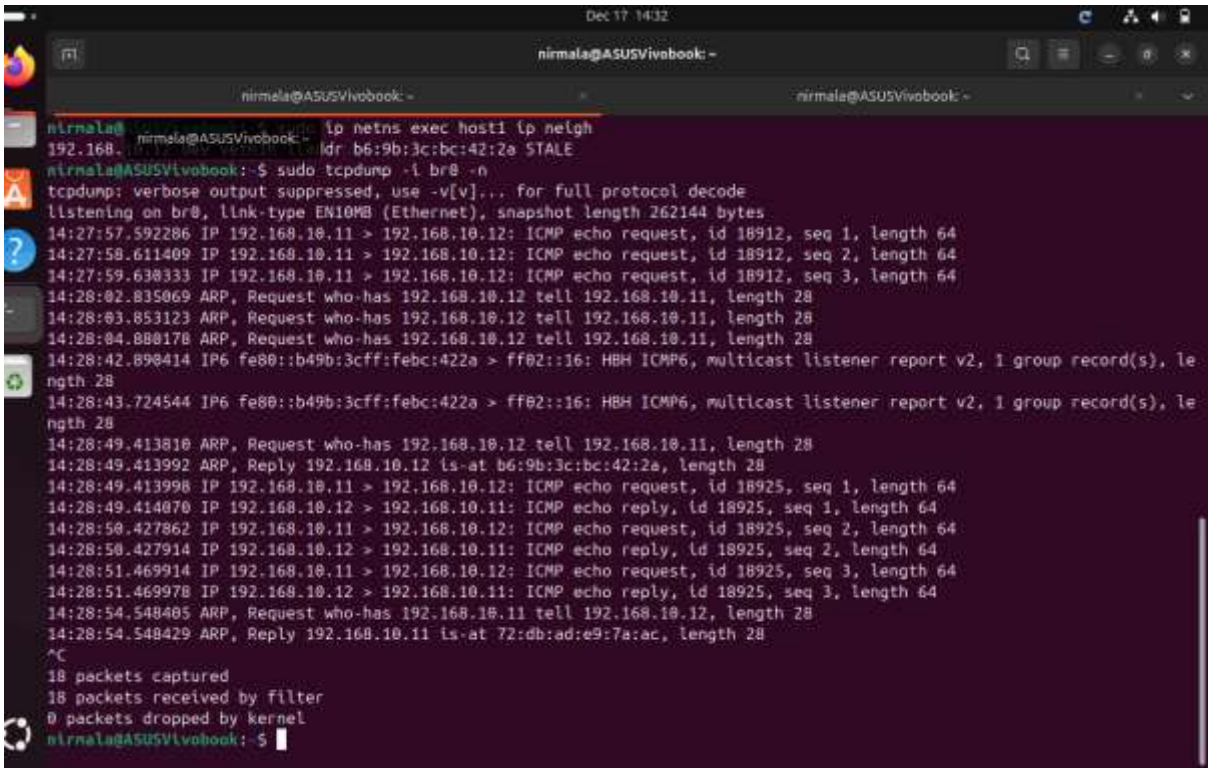
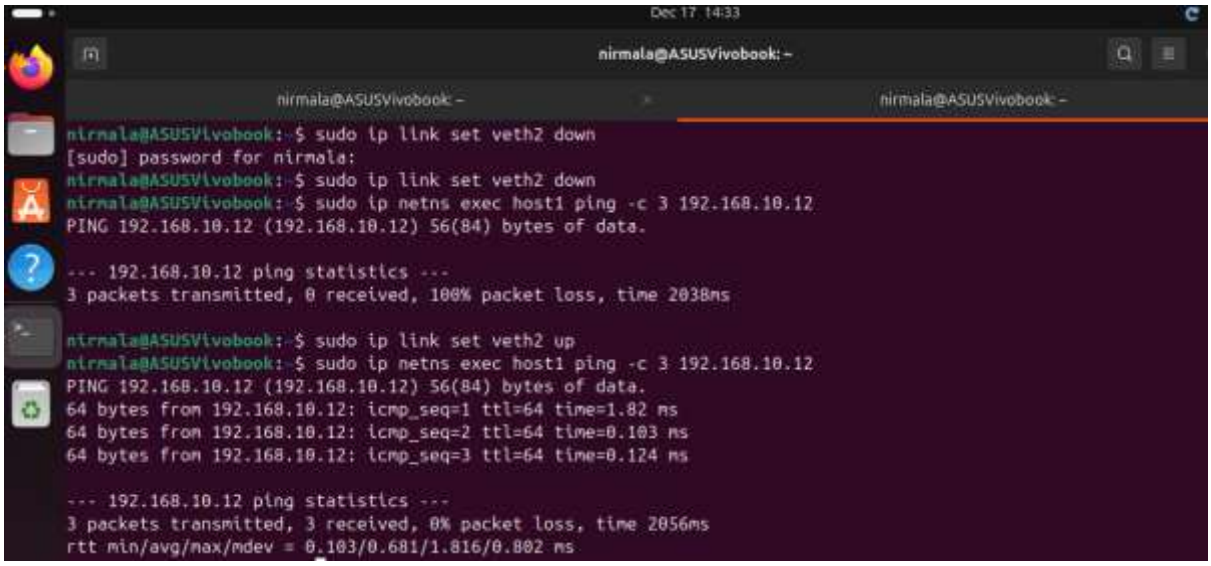
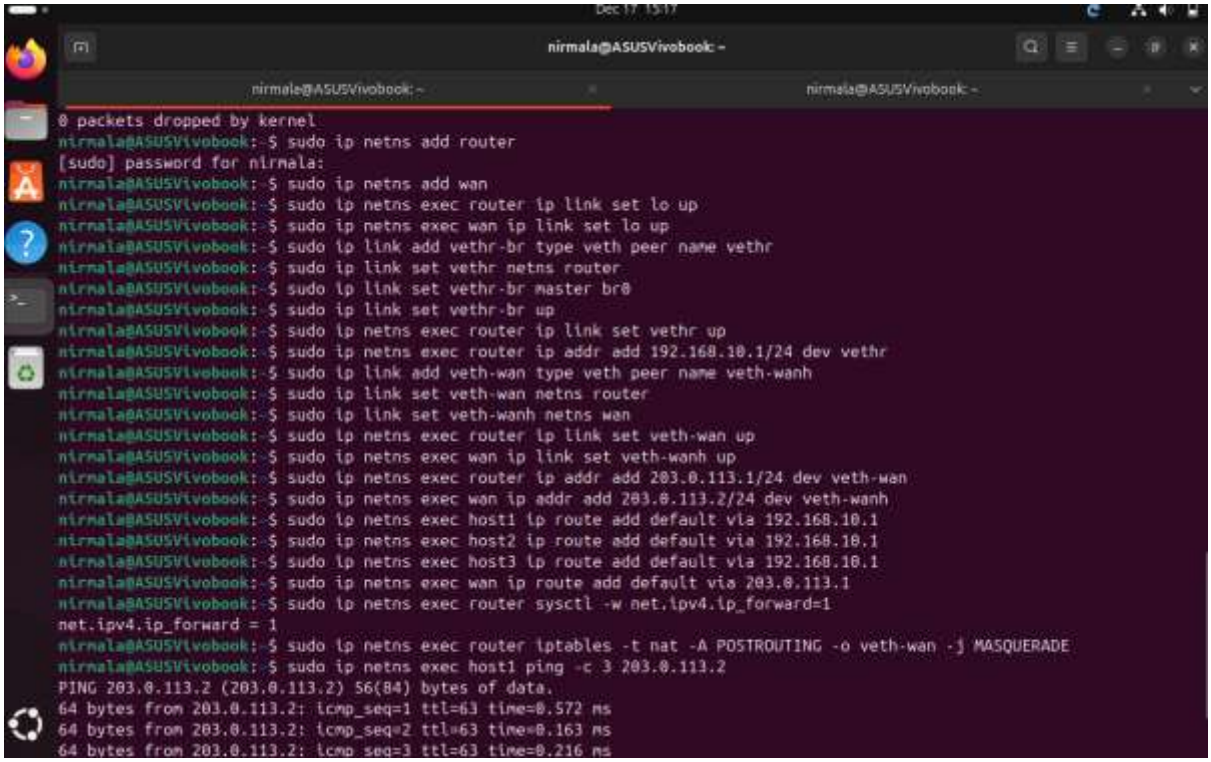
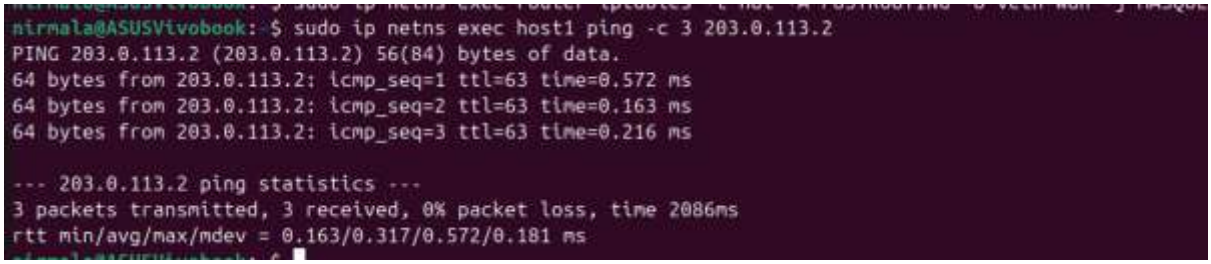


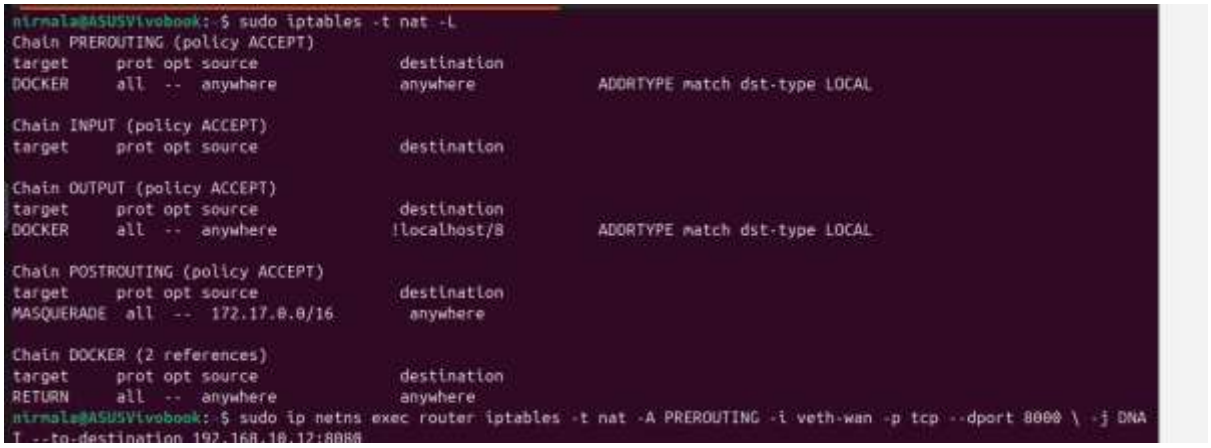

```
nirmala@ASUSVivobook:~$ sudo ip netns exec host1 ping -c 3 192.168.10.12
PING 192.168.10.12 (192.168.10.12) 56(84) bytes of data.
64 bytes from 192.168.10.12: icmp_seq=1 ttl=64 time=1.29 ms
64 bytes from 192.168.10.12: icmp_seq=2 ttl=64 time=0.085 ms
64 bytes from 192.168.10.12: icmp_seq=3 ttl=64 time=0.095 ms

--- 192.168.10.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2158ms
rtt min/avg/max/mdev = 0.085/0.488/1.286/0.563 ms
nirmala@ASUSVivobook:~$ sudo ip netns exec host2 ping -c 3 192.168.10.13
PING 192.168.10.13 (192.168.10.13) 56(84) bytes of data.
64 bytes from 192.168.10.13: icmp_seq=1 ttl=64 time=0.140 ms
64 bytes from 192.168.10.13: icmp_seq=2 ttl=64 time=0.072 ms
64 bytes from 192.168.10.13: icmp_seq=3 ttl=64 time=0.077 ms

--- 192.168.10.13 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2055ms
rtt min/avg/max/mdev = 0.072/0.096/0.140/0.030 ms
```


Dec 17 14:32
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: ~
nirmala@ lp netns exec host1 ip neigh
192.168. ldr b6:9b:3c:bc:42:2a STALE
nirmala@ASUSVivobook:~$ sudo tcpdump -i br0 -n
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on br0, link-type EN10MB (Ethernet), snapshot length 262144 bytes
14:27:57.592286 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18912, seq 1, length 64
14:27:58.611409 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18912, seq 2, length 64
14:27:59.630333 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18912, seq 3, length 64
14:28:02.835069 ARP, Request who-has 192.168.10.12 tell 192.168.10.11, length 28
14:28:03.853123 ARP, Request who-has 192.168.10.12 tell 192.168.10.11, length 28
14:28:04.880178 ARP, Request who-has 192.168.10.12 tell 192.168.10.11, length 28
14:28:42.890414 IP6 fe80::b49b:3cff:febc:422a > ff02::16: HBH ICMP6, multicast listener report v2, 1 group record(s), length 28
14:28:43.724544 IP6 fe80::b49b:3cff:febc:422a > ff02::16: HBH ICMP6, multicast listener report v2, 1 group record(s), length 28
14:28:49.413810 ARP, Request who-has 192.168.10.12 tell 192.168.10.11, length 28
14:28:49.413992 ARP, Reply 192.168.10.12 is-at b6:9b:3c:bc:42:2a, length 28
14:28:49.413998 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18925, seq 1, length 64
14:28:49.414070 IP 192.168.10.12 > 192.168.10.11: ICMP echo reply, id 18925, seq 1, length 64
14:28:50.427862 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18925, seq 2, length 64
14:28:50.427914 IP 192.168.10.12 > 192.168.10.11: ICMP echo reply, id 18925, seq 2, length 64
14:28:51.469914 IP 192.168.10.11 > 192.168.10.12: ICMP echo request, id 18925, seq 3, length 64
14:28:51.469978 IP 192.168.10.12 > 192.168.10.11: ICMP echo reply, id 18925, seq 3, length 64
14:28:54.548405 ARP, Request who-has 192.168.10.11 tell 192.168.10.12, length 28
14:28:54.548429 ARP, Reply 192.168.10.11 is-at 72:db:ad:e9:7a:ac, length 28
^C
18 packets captured
18 packets received by filter
0 packets dropped by kernel
nirmala@ASUSVivobook: $

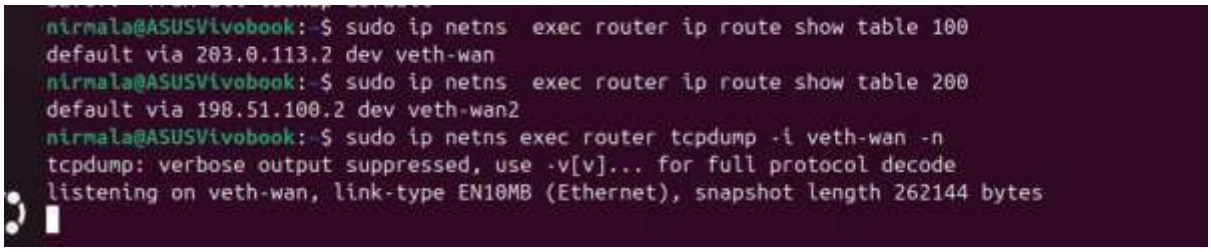

Dec 17 14:33
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook:~$ sudo ip link set veth2 down
[sudo] password for nirmala:
nirmala@ASUSVivobook:~$ sudo ip link set veth2 down
nirmala@ASUSVivobook:~$ sudo ip netns exec host1 ping -c 3 192.168.10.12
PING 192.168.10.12 (192.168.10.12) 56(84) bytes of data.
--- 192.168.10.12 ping statistics ---
3 packets transmitted, 0 received, 100% packet loss, time 2038ms
nirmala@ASUSVivobook:~$ sudo ip link set veth2 up
nirmala@ASUSVivobook:~$ sudo ip netns exec host1 ping -c 3 192.168.10.12
PING 192.168.10.12 (192.168.10.12) 56(84) bytes of data.
64 bytes from 192.168.10.12: icmp_seq=1 ttl=64 time=1.82 ms
64 bytes from 192.168.10.12: icmp_seq=2 ttl=64 time=0.103 ms
64 bytes from 192.168.10.12: icmp_seq=3 ttl=64 time=0.124 ms
--- 192.168.10.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2056ms
rtt min/avg/max/mdev = 0.103/0.681/1.816/0.802 ms


nirmala@ASUSVivobook: ~
0 packets dropped by kernel
nirmala@ASUSVivobook: $ sudo ip netns add router
[sudo] password for nirmala:
nirmala@ASUSVivobook: $ sudo ip netns add wan
nirmala@ASUSVivobook: $ sudo ip netns exec router ip link set lo up
nirmala@ASUSVivobook: $ sudo ip netns exec wan ip link set lo up
nirmala@ASUSVivobook: $ sudo ip link add vethr-br type veth peer name vethr
nirmala@ASUSVivobook: $ sudo ip link set vethr netns router
nirmala@ASUSVivobook: $ sudo ip link set vethr-br master br0
nirmala@ASUSVivobook: $ sudo ip link set vethr-br up
nirmala@ASUSVivobook: $ sudo ip netns exec router ip link set vethr up
nirmala@ASUSVivobook: $ sudo ip netns exec router ip addr add 192.168.10.1/24 dev vethr
nirmala@ASUSVivobook: $ sudo ip link add veth-wan type veth peer name veth-wanh
nirmala@ASUSVivobook: $ sudo ip link set veth-wan netns router
nirmala@ASUSVivobook: $ sudo ip link set veth-wanh netns wan
nirmala@ASUSVivobook: $ sudo ip netns exec router ip link set veth-wan up
nirmala@ASUSVivobook: $ sudo ip netns exec wan ip link set veth-wanh up
nirmala@ASUSVivobook: $ sudo ip netns exec router ip addr add 203.0.113.1/24 dev veth-wan
nirmala@ASUSVivobook: $ sudo ip netns exec wan ip addr add 203.0.113.2/24 dev veth-wanh
nirmala@ASUSVivobook: $ sudo ip netns exec host1 ip route add default via 192.168.10.1
nirmala@ASUSVivobook: $ sudo ip netns exec host2 ip route add default via 192.168.10.1
nirmala@ASUSVivobook: $ sudo ip netns exec host3 ip route add default via 192.168.10.1
nirmala@ASUSVivobook: $ sudo ip netns exec wan ip route add default via 203.0.113.1
nirmala@ASUSVivobook: $ sudo ip netns exec router sysctl -w net.ipv4.ip_forward=1
net.ipv4.ip_forward = 1
nirmala@ASUSVivobook: $ sudo ip netns exec router iptables -t nat -A POSTROUTING -o veth-wan -j MASQUERADE
nirmala@ASUSVivobook: $ sudo ip netns exec host1 ping -c 3 203.0.113.2
PING 203.0.113.2 (203.0.113.2) 56(84) bytes of data.
64 bytes from 203.0.113.2: icmp_seq=1 ttl=63 time=0.572 ms
64 bytes from 203.0.113.2: icmp_seq=2 ttl=63 time=0.163 ms
64 bytes from 203.0.113.2: icmp_seq=3 ttl=63 time=0.216 ms

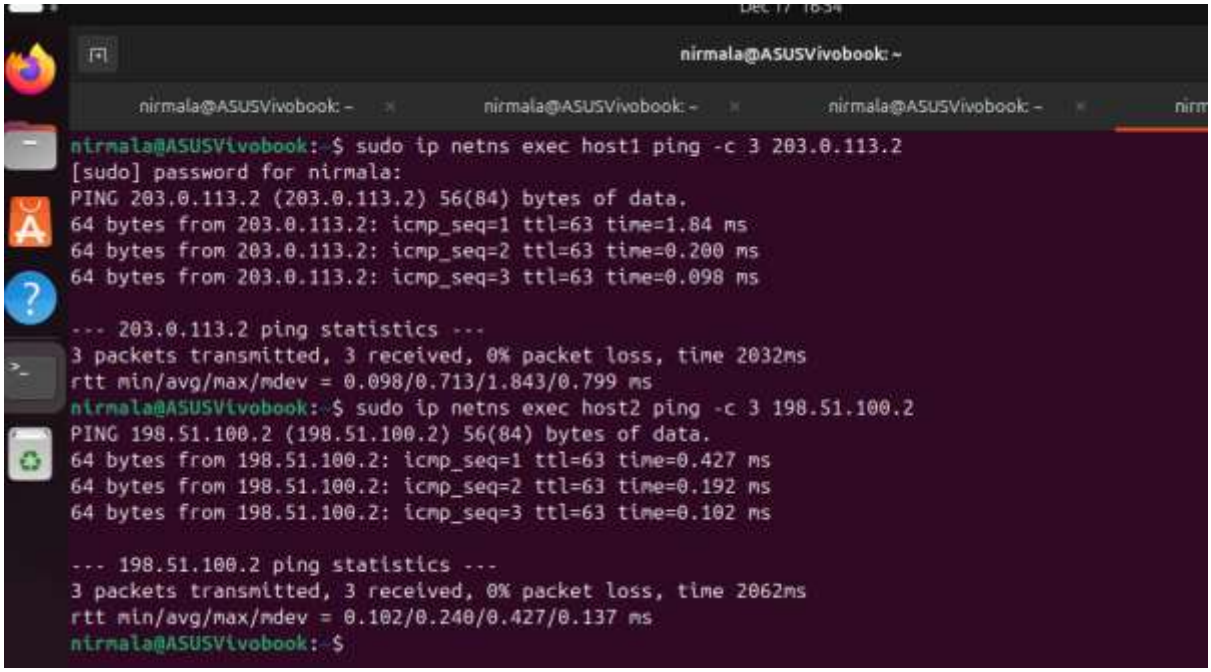

nirmala@ASUSVivobook: $ sudo ip netns exec host1 ping -c 3 203.0.113.2
PING 203.0.113.2 (203.0.113.2) 56(84) bytes of data.
64 bytes from 203.0.113.2: icmp_seq=1 ttl=63 time=0.572 ms
64 bytes from 203.0.113.2: icmp_seq=2 ttl=63 time=0.163 ms
64 bytes from 203.0.113.2: icmp_seq=3 ttl=63 time=0.216 ms
--- 203.0.113.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2086ms
rtt min/avg/max/mdev = 0.163/0.317/0.572/0.181 ms


nirmala@ASUSVivobook: $ sudo iptables -t nat -L
Chain PREROUTING (policy ACCEPT)
target prot opt source destination
DOCKER all -- anywhere anywhere ADDRTYPE match dst-type LOCAL
Chain INPUT (policy ACCEPT)
target prot opt source destination
Chain OUTPUT (policy ACCEPT)
target prot opt source destination
DOCKER all -- anywhere !localhost/8 ADDRTYPE match dst-type LOCAL
Chain POSTROUTING (policy ACCEPT)
target prot opt source destination
MASQUERADE all -- 172.17.0.0/16 anywhere
Chain DOCKER (2 references)
target prot opt source destination
RETURN all -- anywhere anywhere
nirmala@ASUSVivobook: $ sudo ip netns exec router iptables -t nat -A PREROUTING -i veth-wan -p tcp --dport 8000 \ -j DNA
T --to-destination 192.168.10.12:8080

```
nirmala@ASUSVivobook: $ sudo iptables -t nat -L -v -n --line-number
Chain PREROUTING (policy ACCEPT 5 packets, 5140 bytes)
num   pkts bytes target     prot opt in     out     source               destination
1        5  5140 DOCKER     0    --  *      *       0.0.0.0/0            0.0.0.0/0           ADDRTYPE match dst-type LO
CAL

Chain INPUT (policy ACCEPT 0 packets, 0 bytes)
num   pkts bytes target     prot opt in     out     source               destination

Chain OUTPUT (policy ACCEPT 4572 packets, 367K bytes)
num   pkts bytes target     prot opt in     out     source               destination
1        0     0 DOCKER     0    --  *      *       0.0.0.0/0           !127.0.0.0/8         ADDRTYPE match dst-type LO
CAL

Chain POSTROUTING (policy ACCEPT 4572 packets, 367K bytes)
num   pkts bytes target     prot opt in     out     source               destination
1        0     0 MASQUERADE  0    --  *      !docker0  172.17.0.0/16        0.0.0.0/0

Chain DOCKER (2 references)
num   pkts bytes target     prot opt in     out     source               destination
1        0     0 RETURN     0    --  docker0 *       0.0.0.0/0            0.0.0.0/0
nirmala@ASUSVivobook: $
```

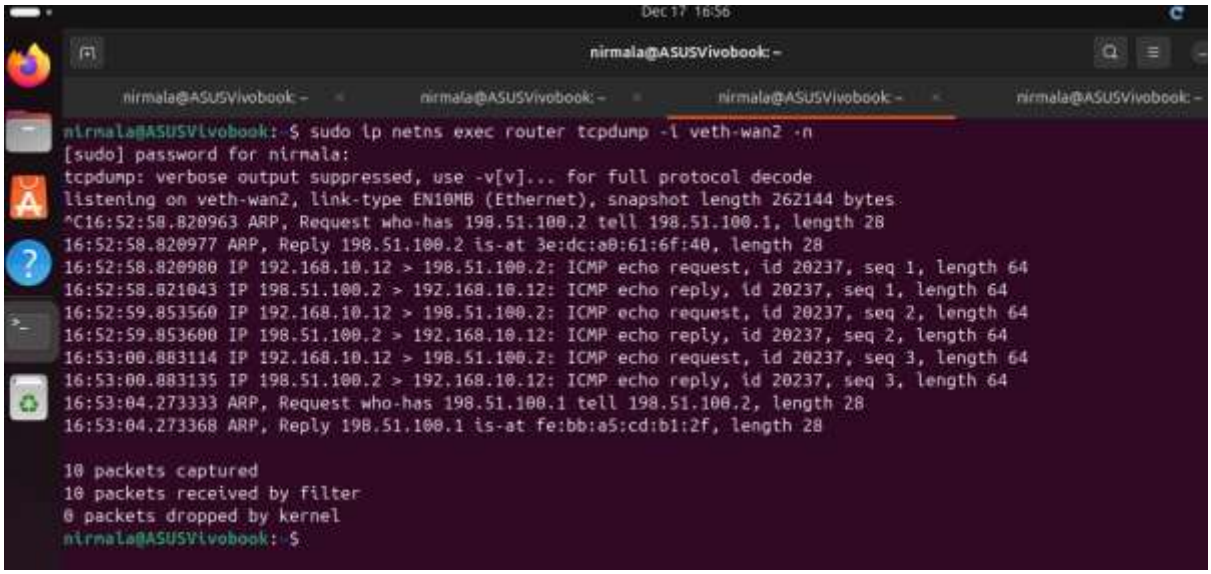


```
nirmala@ASUSVivobook: $ sudo ip netns  exec router ip route show table 100
default via 203.0.113.2 dev veth-wan
nirmala@ASUSVivobook: $ sudo ip netns  exec router ip route show table 200
default via 198.51.100.2 dev veth-wan2
nirmala@ASUSVivobook: $ sudo ip netns exec router tcpdump -i veth-wan -n
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on veth-wan, link-type EN10MB (Ethernet), snapshot length 262144 bytes
```

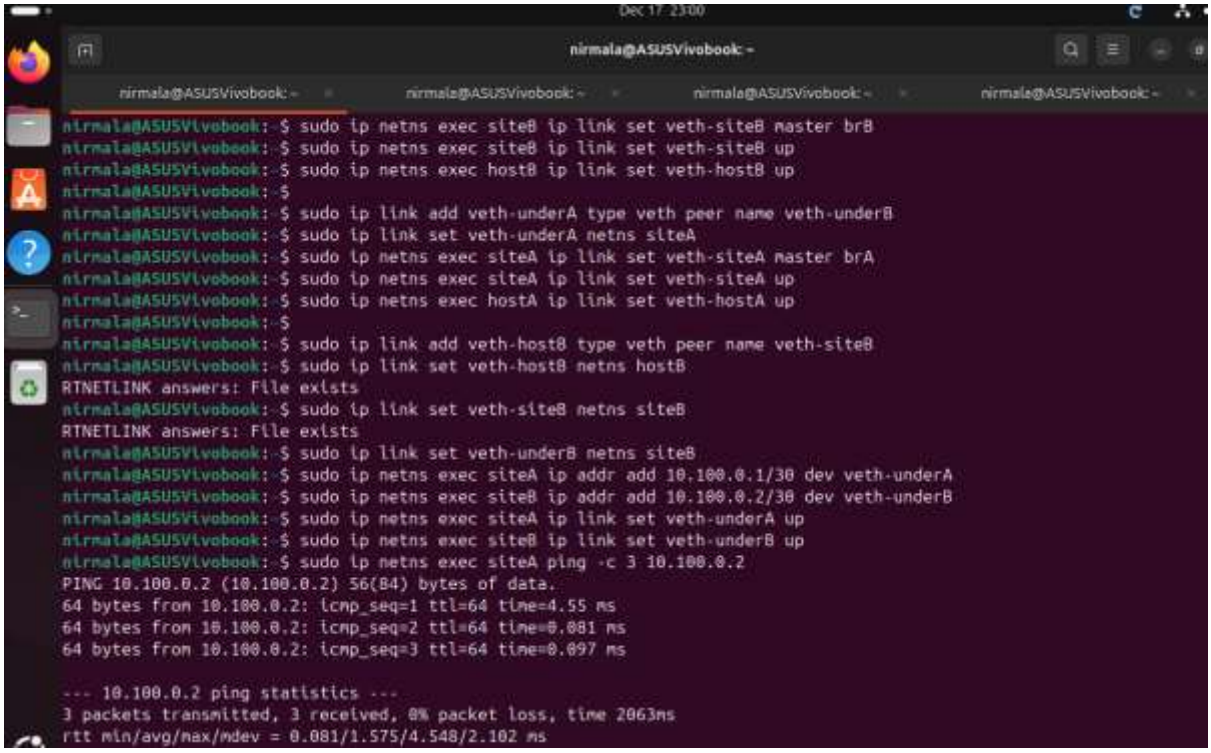


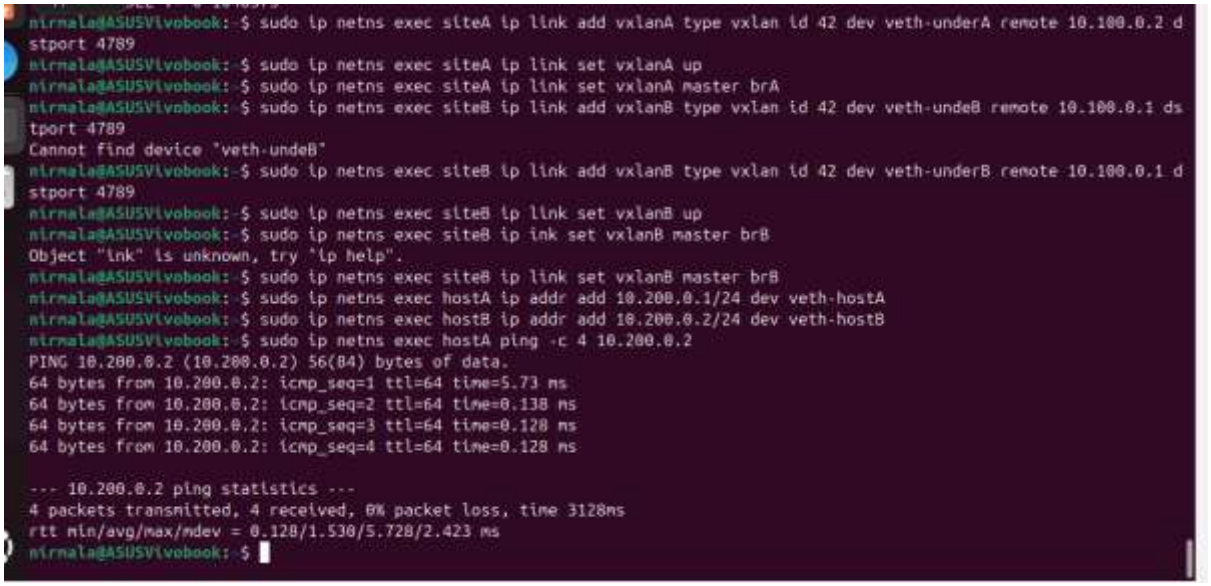
```
nirmala@ASUSVivobook: ~
nirmala@ASUSVivobook: $ sudo ip netns exec host1 ping -c 3 203.0.113.2
[sudo] password for nirmala:
PING 203.0.113.2 (203.0.113.2) 56(84) bytes of data.
64 bytes from 203.0.113.2: icmp_seq=1 ttl=63 time=1.84 ms
64 bytes from 203.0.113.2: icmp_seq=2 ttl=63 time=0.200 ms
64 bytes from 203.0.113.2: icmp_seq=3 ttl=63 time=0.098 ms

--- 203.0.113.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2032ms
rtt min/avg/max/mdev = 0.098/0.713/1.843/0.799 ms
nirmala@ASUSVivobook: $ sudo ip netns exec host2 ping -c 3 198.51.100.2
PING 198.51.100.2 (198.51.100.2) 56(84) bytes of data.
64 bytes from 198.51.100.2: icmp_seq=1 ttl=63 time=0.427 ms
64 bytes from 198.51.100.2: icmp_seq=2 ttl=63 time=0.192 ms
64 bytes from 198.51.100.2: icmp_seq=3 ttl=63 time=0.102 ms

--- 198.51.100.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2062ms
rtt min/avg/max/mdev = 0.102/0.240/0.427/0.137 ms
nirmala@ASUSVivobook: $
```

```
nirmala@ASUSVivobook:~$ sudo ip netns  exec router ip route show table 100
default via 203.0.113.2 dev veth-wan
nirmala@ASUSVivobook:~$ sudo ip netns  exec router ip route show table 200
default via 198.51.100.2 dev veth-wan2
nirmala@ASUSVivobook:~$ sudo ip netns exec router tcpdump -i veth-wan -n
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on veth-wan, link-type EN10MB (Ethernet), snapshot length 262144 bytes
^C16:52:10.284158 IP 203.0.113.1 > 203.0.113.2: ICMP echo request, id 20230, seq 1, length 64
16:52:10.284613 IP 203.0.113.2 > 203.0.113.1: ICMP echo reply, id 20230, seq 1, length 64
16:52:11.287114 IP 203.0.113.1 > 203.0.113.2: ICMP echo request, id 20230, seq 2, length 64
16:52:11.287154 IP 203.0.113.2 > 203.0.113.1: ICMP echo reply, id 20230, seq 2, length 64
16:52:12.316200 IP 203.0.113.1 > 203.0.113.2: ICMP echo request, id 20230, seq 3, length 64
16:52:12.316220 IP 203.0.113.2 > 203.0.113.1: ICMP echo reply, id 20230, seq 3, length 64
16:52:15.631435 ARP, Request who-has 203.0.113.2 tell 203.0.113.1, length 28
16:52:15.631590 ARP, Request who-has 203.0.113.1 tell 203.0.113.2, length 28
16:52:15.631616 ARP, Reply 203.0.113.1 is-at 32:fc:fb:a9:e7:be, length 28
16:52:15.631639 ARP, Reply 203.0.113.2 is-at 1a:c4:cc:49:12:aa, length 28

10 packets captured
10 packets received by filter
0 packets dropped by kernel
nirmala@ASUSVivobook:~$
```



```
nirmala@ASUSVivobook:~$ sudo ip netns add hostA
nirmala@ASUSVivobook:~$ sudo ip netns add hostB
nirmala@ASUSVivobook:~$ sudo ip netns exec siteB ip link set lo up
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link set lo up
nirmala@ASUSVivobook:~$ sudo ip netns exec hostA ip link set lo up
nirmala@ASUSVivobook:~$ sudo ip netns exec hostB ip link set lo up
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link add brA type bridge
nirmala@ASUSVivobook:~$ sudo ip netns exec siteB ip link add brB type bridge
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link set brA up
nirmala@ASUSVivobook:~$ sudo ip netns exec siteB ip link set brB up
nirmala@ASUSVivobook:~$ sudo ip link add veth-hostA type veth peer name veth-siteA
nirmala@ASUSVivobook:~$ sudo ip link set veth-hostA netns hostA
nirmala@ASUSVivobook:~$ sudo ip link set veth-siteA netns siteA
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link set veth-siteA master brA
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link set veth-siteA up
nirmala@ASUSVivobook:~$ sudo ip netns exec hostA ip link set veth-hostA up
nirmala@ASUSVivobook:~$
nirmala@ASUSVivobook:~$ sudo ip link add veth-hostB type veth peer name veth-siteB
nirmala@ASUSVivobook:~$ sudo ip link set veth-hostB netns hostB
nirmala@ASUSVivobook:~$ sudo ip link set veth-siteB nents siteB
Error: either "dev" is duplicate, or "nents" is a garbage.
nirmala@ASUSVivobook:~$ sudo ip link set veth-siteB netns siteB
nirmala@ASUSVivobook:~$ sudo ip netns exec siteB ip link set veth-siteB master brB
nirmala@ASUSVivobook:~$ sudo ip netns exec siteB ip link set veth-siteB up
nirmala@ASUSVivobook:~$ sudo ip netns exec hostB ip link set veth-hostB up
nirmala@ASUSVivobook:~$
nirmala@ASUSVivobook:~$ sudo ip link add veth-underA type veth peer name veth-underB
nirmala@ASUSVivobook:~$ sudo ip link set veth-underA netns siteA
nirmala@ASUSVivobook:~$ sudo ip netns exec siteA ip link set veth-siteA master brA
```




nirmala@ASUSVivobook: $ sudo ip netns exec siteA ip link add vxlanA type vxlan id 42 dev veth-underA remote 10.100.0.2 d
stport 4789
nirmala@ASUSVivobook: $ sudo ip netns exec siteA ip link set vxlanA up
nirmala@ASUSVivobook: $ sudo ip netns exec siteA ip link set vxlanA master brA
nirmala@ASUSVivobook: $ sudo ip netns exec siteB ip link add vxlanB type vxlan id 42 dev veth-undeB remote 10.100.0.1 ds
tport 4789
Cannot find device "veth-undeB"
nirmala@ASUSVivobook: $ sudo ip netns exec siteB ip link add vxlanB type vxlan id 42 dev veth-underB remote 10.100.0.1 d
stport 4789
nirmala@ASUSVivobook: $ sudo ip netns exec siteB ip link set vxlanB up
nirmala@ASUSVivobook: $ sudo ip netns exec siteB ip ink set vxlanB master brB
Object "ink" is unknown, try "ip help".
nirmala@ASUSVivobook: $ sudo ip netns exec siteB ip link set vxlanB master brB
nirmala@ASUSVivobook: $ sudo ip netns exec hostA ip addr add 10.200.0.1/24 dev veth-hostA
nirmala@ASUSVivobook: $ sudo ip netns exec hostB ip addr add 10.200.0.2/24 dev veth-hostB
nirmala@ASUSVivobook: $ sudo ip netns exec hostA ping -c 4 10.200.0.2
PING 10.200.0.2 (10.200.0.2) 56(84) bytes of data.
64 bytes from 10.200.0.2: icmp_seq=1 ttl=64 time=5.73 ms
64 bytes from 10.200.0.2: icmp_seq=2 ttl=64 time=0.138 ms
64 bytes from 10.200.0.2: icmp_seq=3 ttl=64 time=0.128 ms
64 bytes from 10.200.0.2: icmp_seq=4 ttl=64 time=0.128 ms
--- 10.200.0.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3128ms
rtt min/avg/max/mdev = 0.128/1.530/5.728/2.423 ms
nirmala@ASUSVivobook: $