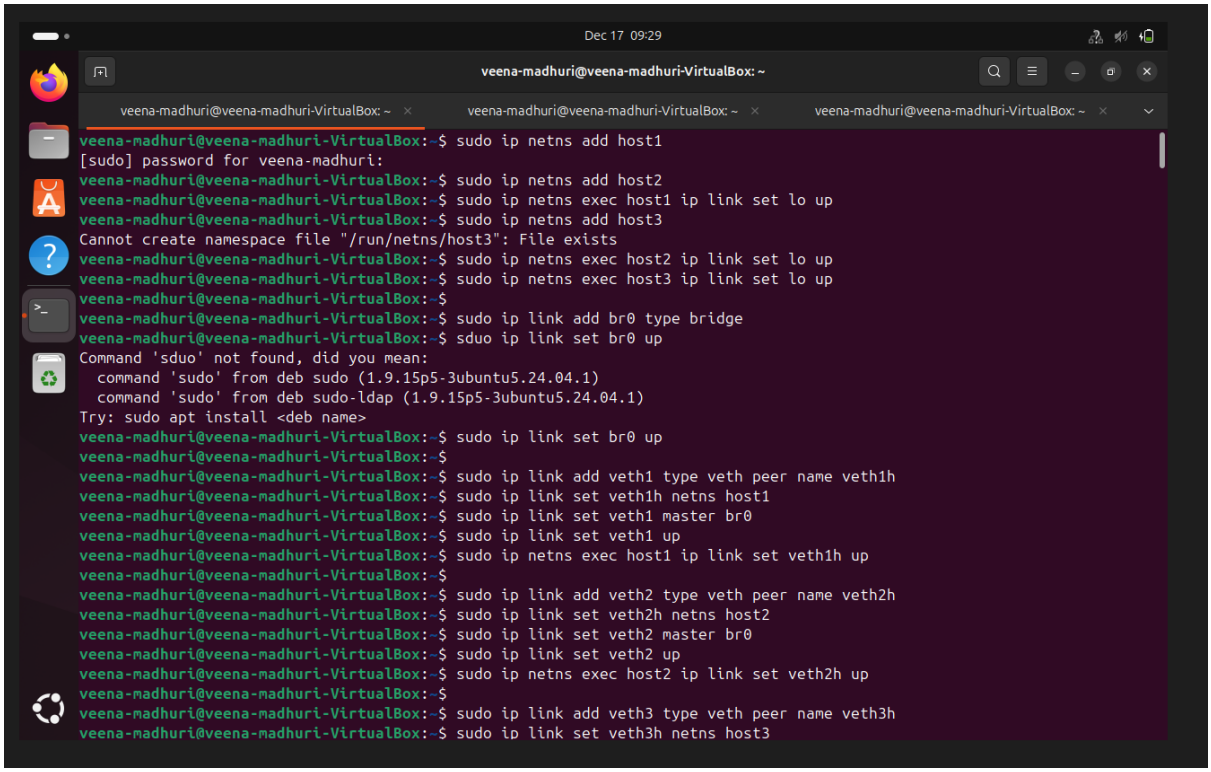
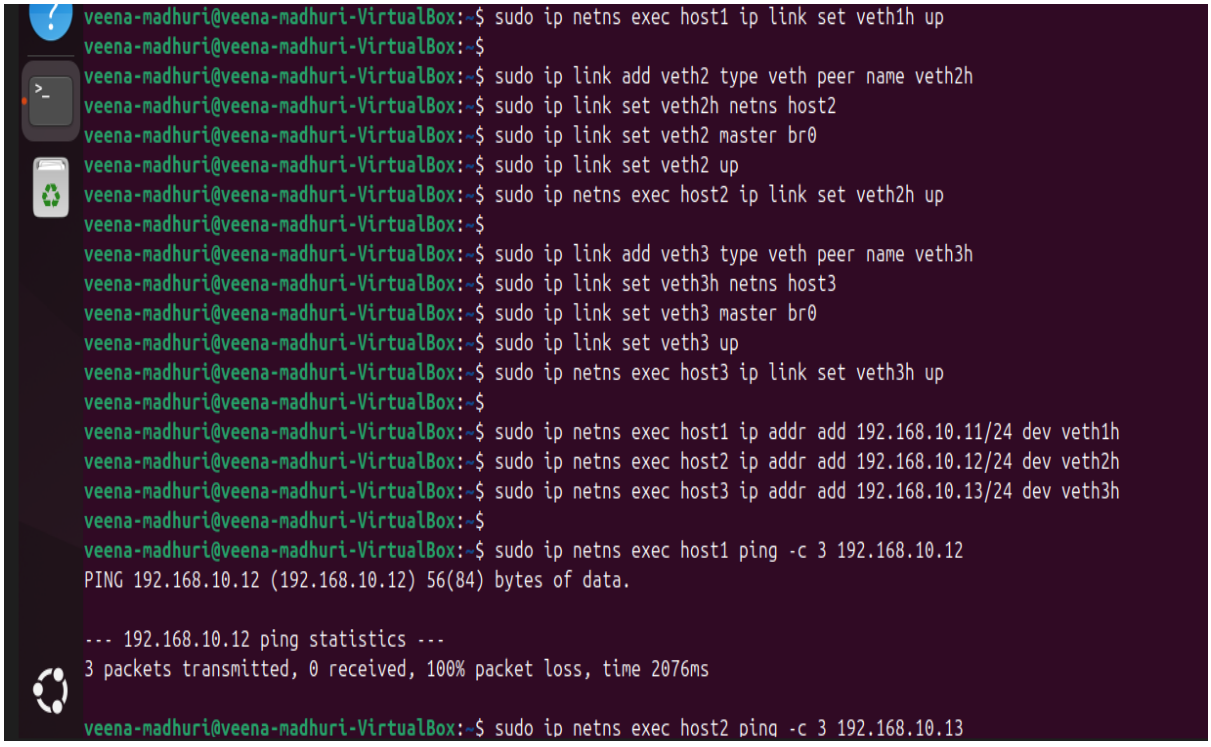
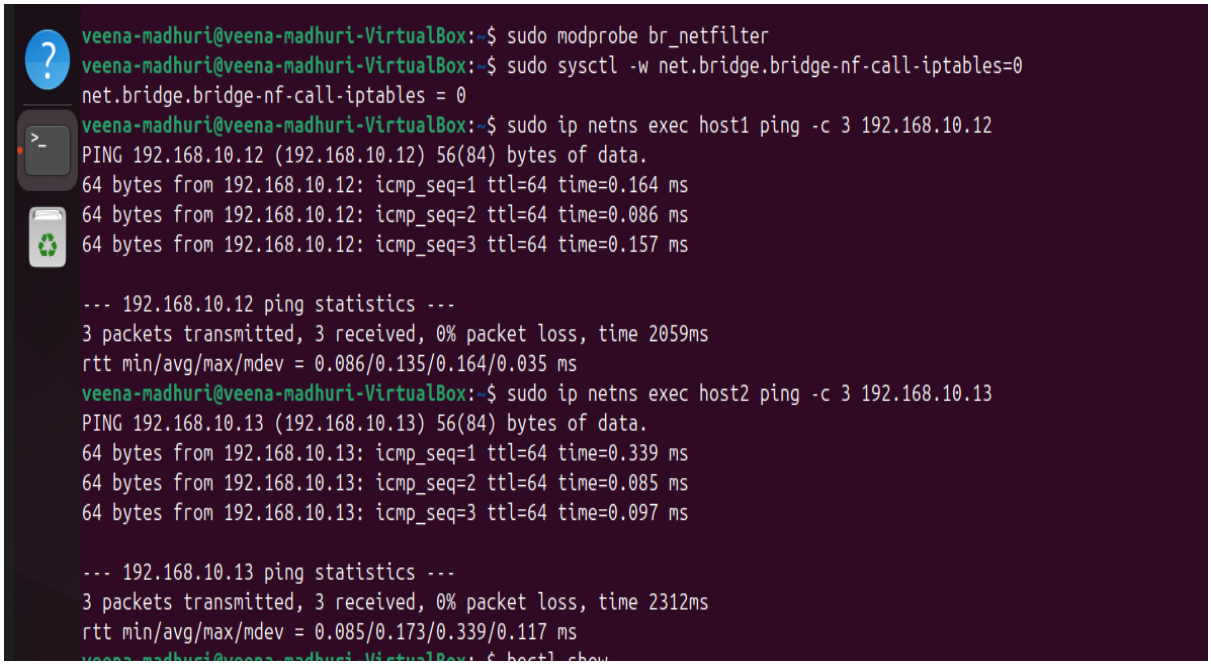
Advanced Linux Network Lab: Bridges, NAT, Policy Routing, VXLAN

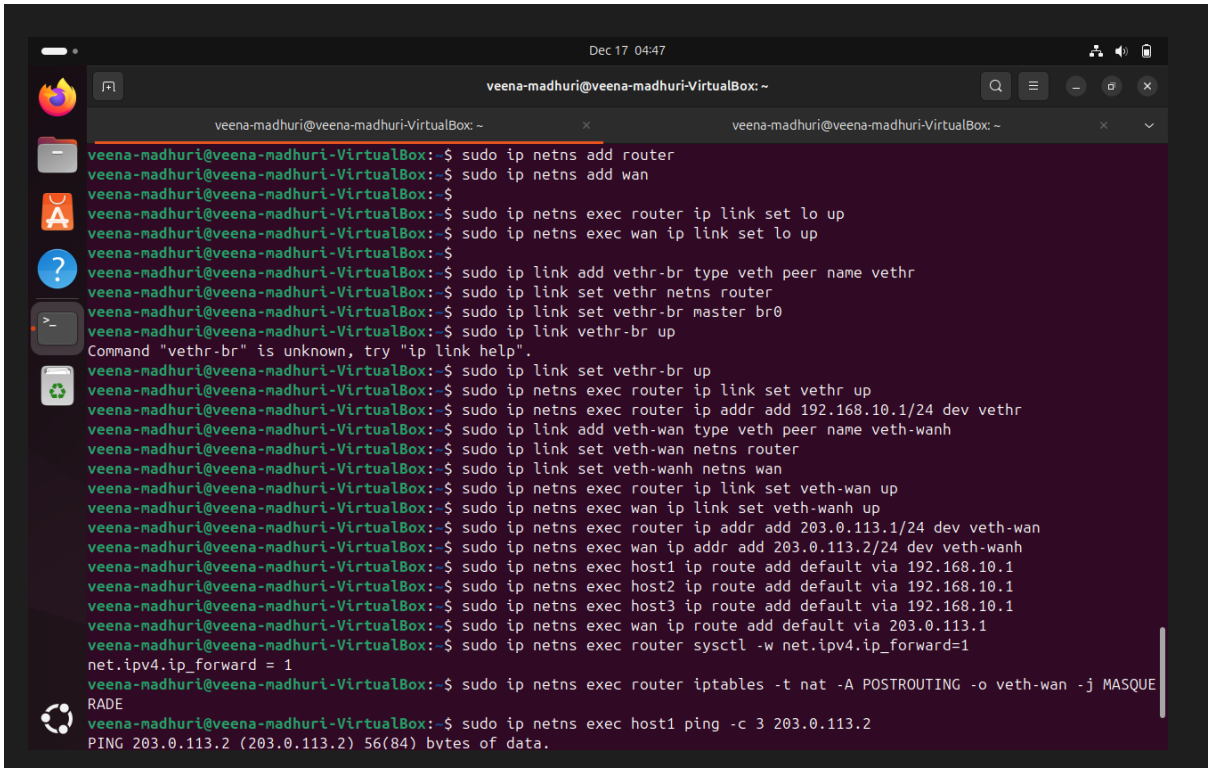
Part 1: L2 switch with bridge and multiple hosts

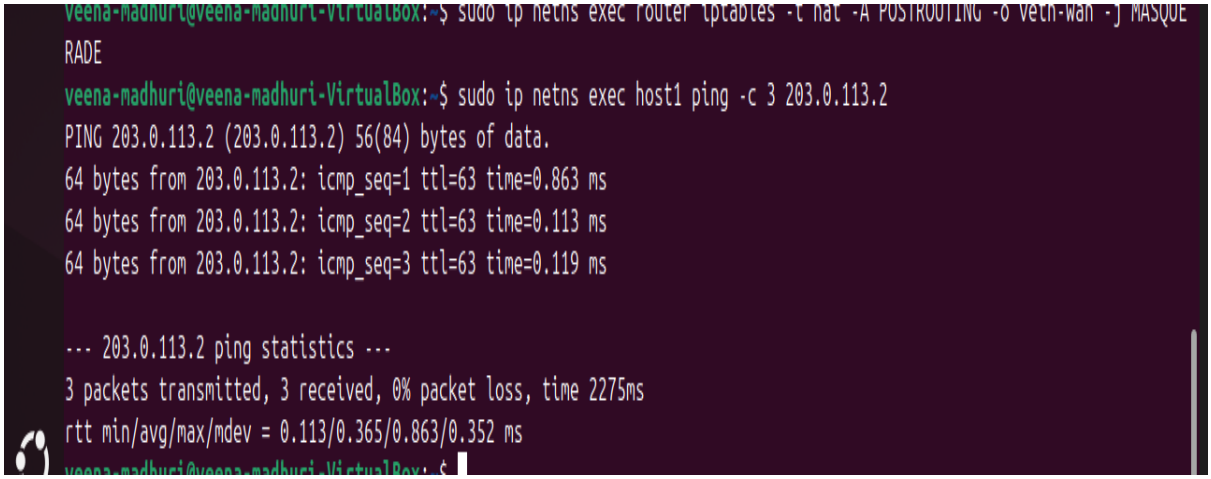


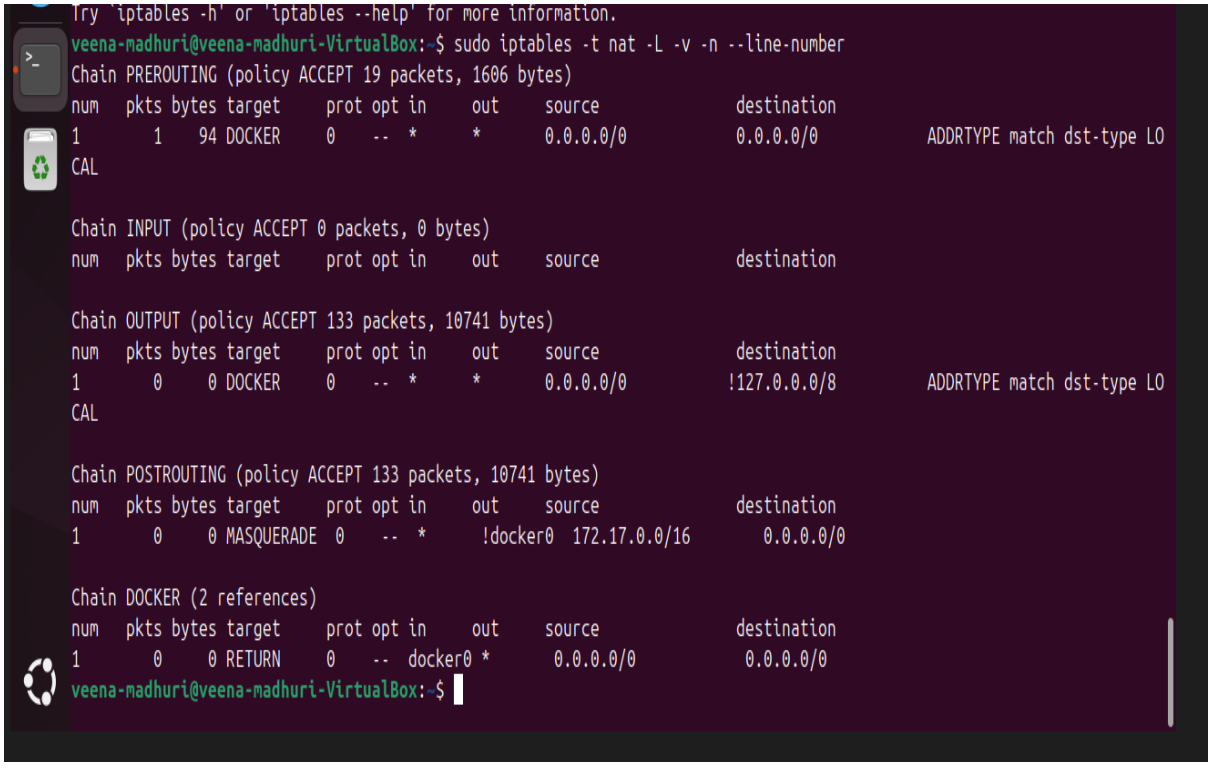




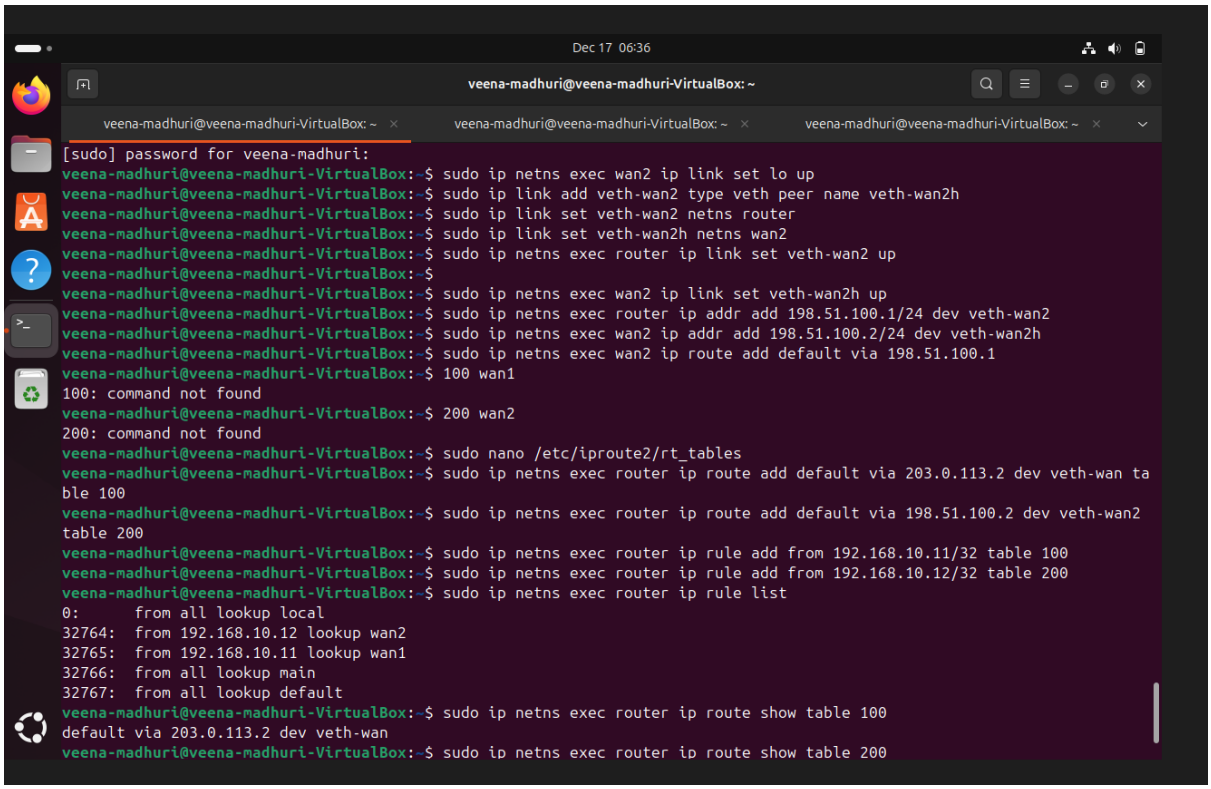
Part 2: Router + NAT firewall namespace

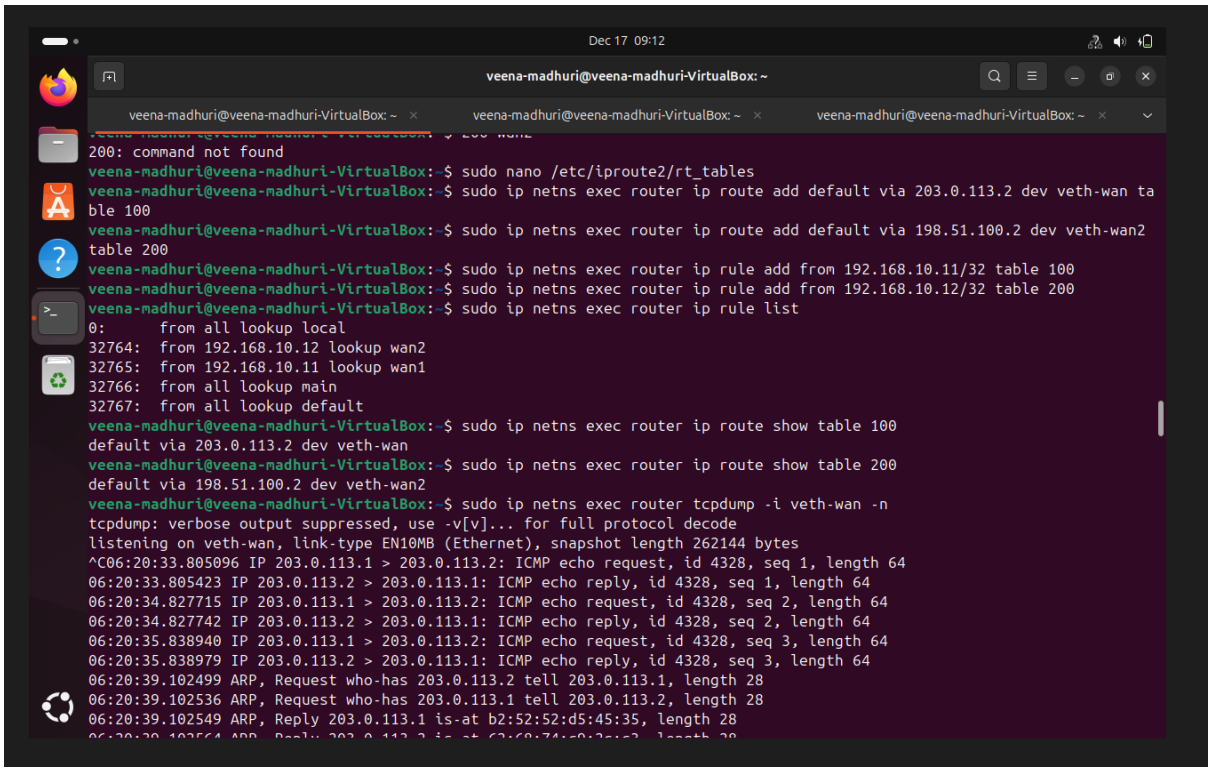


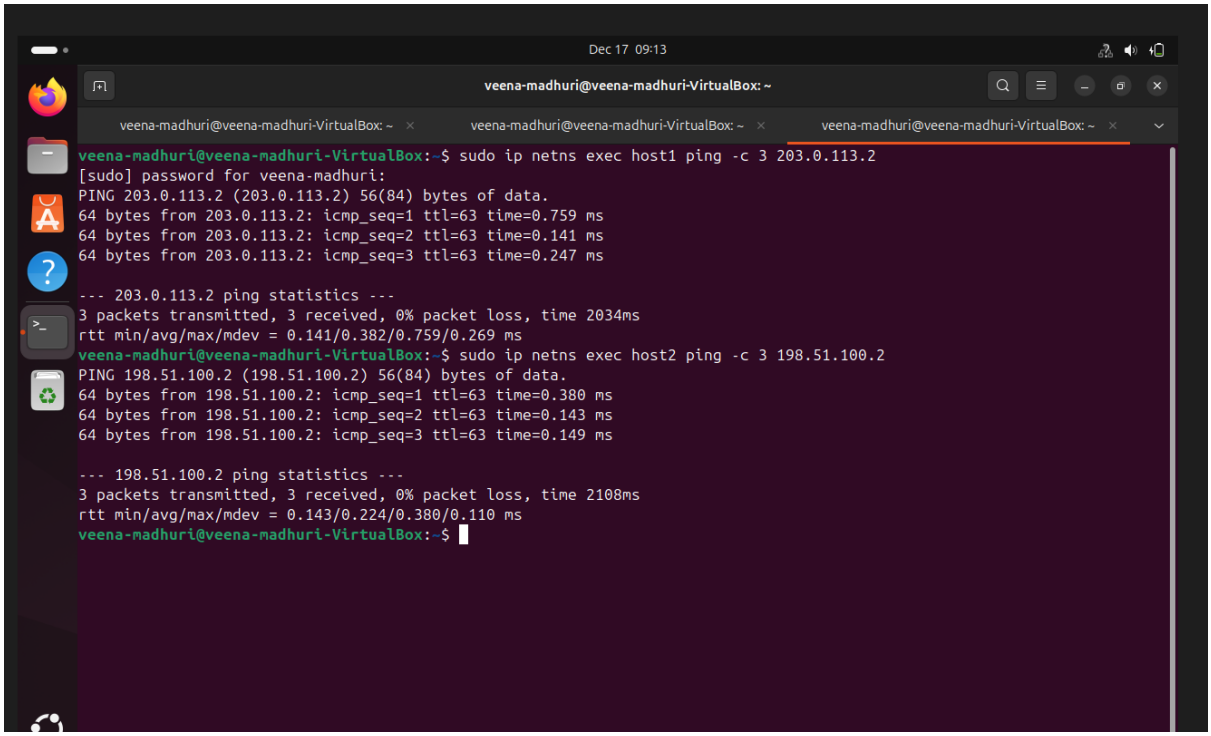

veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec router iptables -t nat -A POSTROUTING -o veth-wan -j MASQUE
RADE
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec host1 ping -c 3 203.0.113.2
PING 203.0.113.2 (203.0.113.2) 56(84) bytes of data.
64 bytes from 203.0.113.2: icmp_seq=1 ttl=63 time=0.863 ms
64 bytes from 203.0.113.2: icmp_seq=2 ttl=63 time=0.113 ms
64 bytes from 203.0.113.2: icmp_seq=3 ttl=63 time=0.119 ms
--- 203.0.113.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2275ms
rtt min/avg/max/mdev = 0.113/0.365/0.863/0.352 ms


Try 'iptables -h' or 'iptables --help' for more information.
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo iptables -t nat -L -v -n --line-number
Chain PREROUTING (policy ACCEPT 19 packets, 1606 bytes)
num pkts bytes target prot opt in out source destination
1 1 94 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 133 packets, 10741 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 133 packets, 10741 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
veena-madhuri@veena-madhuri-VirtualBox:~$

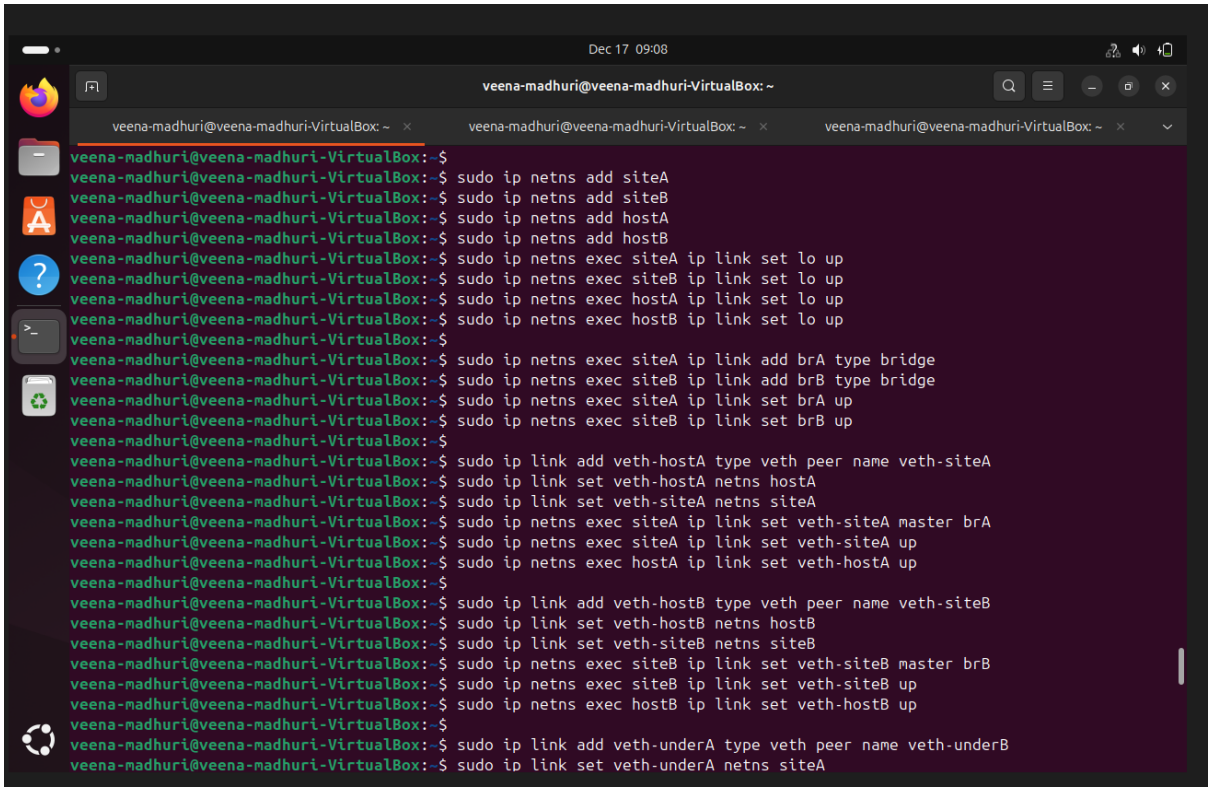
Part 3: Policy-based routing with multiple uplinks

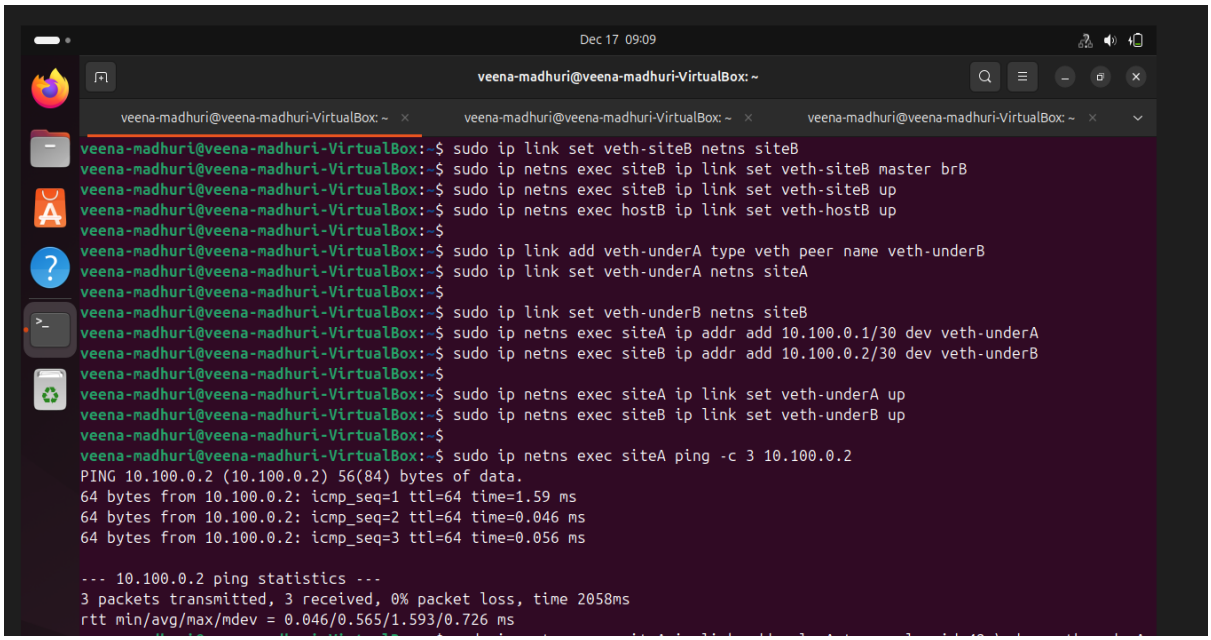


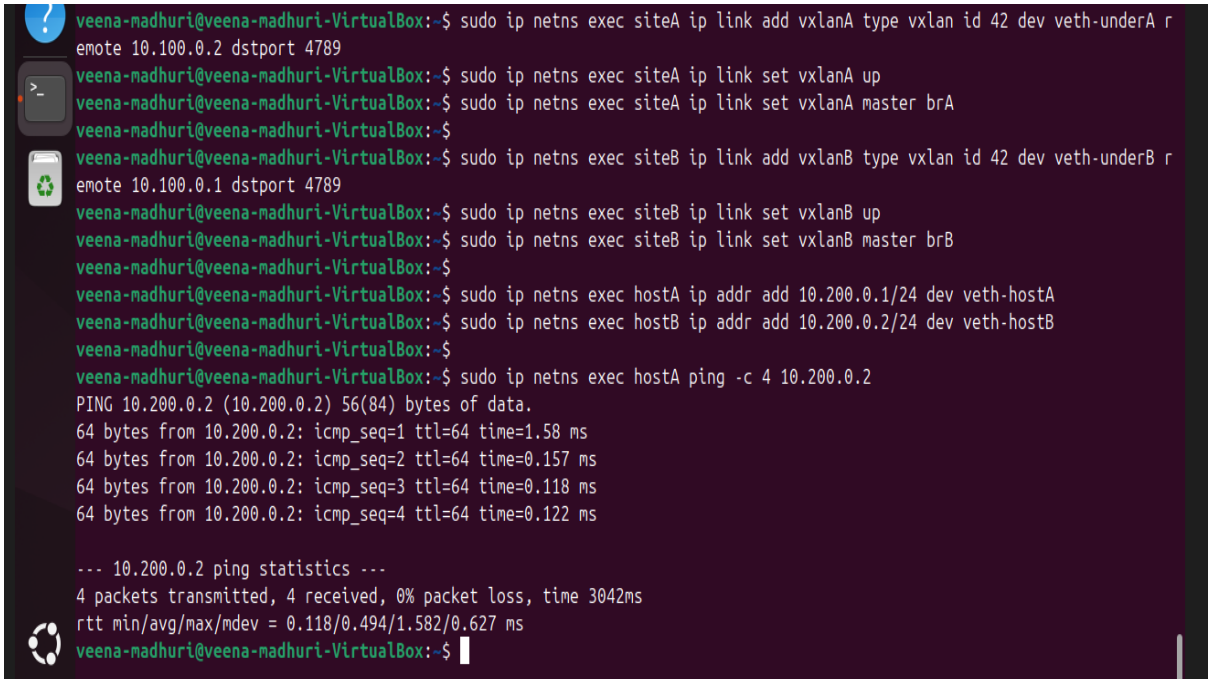




Part 4: Overlay experiment with VXLAN




Dec 17 09:09
veena-madhuri@veena-madhuri-VirtualBox: ~
veena-madhuri@veena-madhuri-VirtualBox: ~
veena-madhuri@veena-madhuri-VirtualBox: ~
veena-madhuri@veena-madhuri-VirtualBox: ~
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip link set veth-siteB netns siteB
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link set veth-siteB master brB
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link set veth-siteB up
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec hostB ip link set veth-hostB up
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip link add veth-underA type veth peer name veth-underB
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip link set veth-underA netns siteA
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip link set veth-underB netns siteB
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ip addr add 10.100.0.1/30 dev veth-underA
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip addr add 10.100.0.2/30 dev veth-underB
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ip link set veth-underA up
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link set veth-underB up
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ping -c 3 10.100.0.2
PING 10.100.0.2 (10.100.0.2) 56(84) bytes of data.
64 bytes from 10.100.0.2: icmp_seq=1 ttl=64 time=1.59 ms
64 bytes from 10.100.0.2: icmp_seq=2 ttl=64 time=0.046 ms
64 bytes from 10.100.0.2: icmp_seq=3 ttl=64 time=0.056 ms
--- 10.100.0.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2058ms
rtt min/avg/max/mdev = 0.046/0.565/1.593/0.726 ms


veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ip link add vxlanA type vxlan id 42 dev veth-underA r
emote 10.100.0.2 dstport 4789
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ip link set vxlanA up
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteA ip link set vxlanA master brA
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link add vxlanB type vxlan id 42 dev veth-underB r
emote 10.100.0.1 dstport 4789
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link set vxlanB up
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec siteB ip link set vxlanB master brB
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec hostA ip addr add 10.200.0.1/24 dev veth-hostA
veena-madhuri@veena-madhuri-VirtualBox:~$ sudo ip netns exec hostB ip addr add 10.200.0.2/24 dev veth-hostB
veena-madhuri@veena-madhuri-VirtualBox:~$
veena-madhuri@veena-madhuri-VirtualBox:~$ 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=1.58 ms
64 bytes from 10.200.0.2: icmp_seq=2 ttl=64 time=0.157 ms
64 bytes from 10.200.0.2: icmp_seq=3 ttl=64 time=0.118 ms
64 bytes from 10.200.0.2: icmp_seq=4 ttl=64 time=0.122 ms
--- 10.200.0.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3042ms
rtt min/avg/max/mdev = 0.118/0.494/1.582/0.627 ms
veena-madhuri@veena-madhuri-VirtualBox:~$