Computer Networks Lab

UE19CS255

Week 10

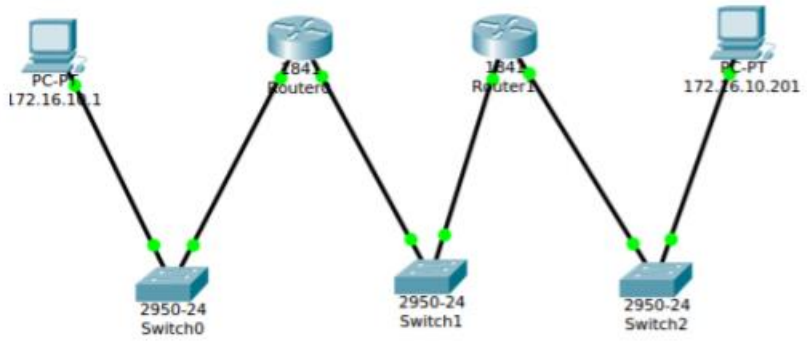
Name: Sreenath Saikumar
Semester: 4 Section: G
SRN: PES2UG19CS406
Date: 11/04/21

Objectives:

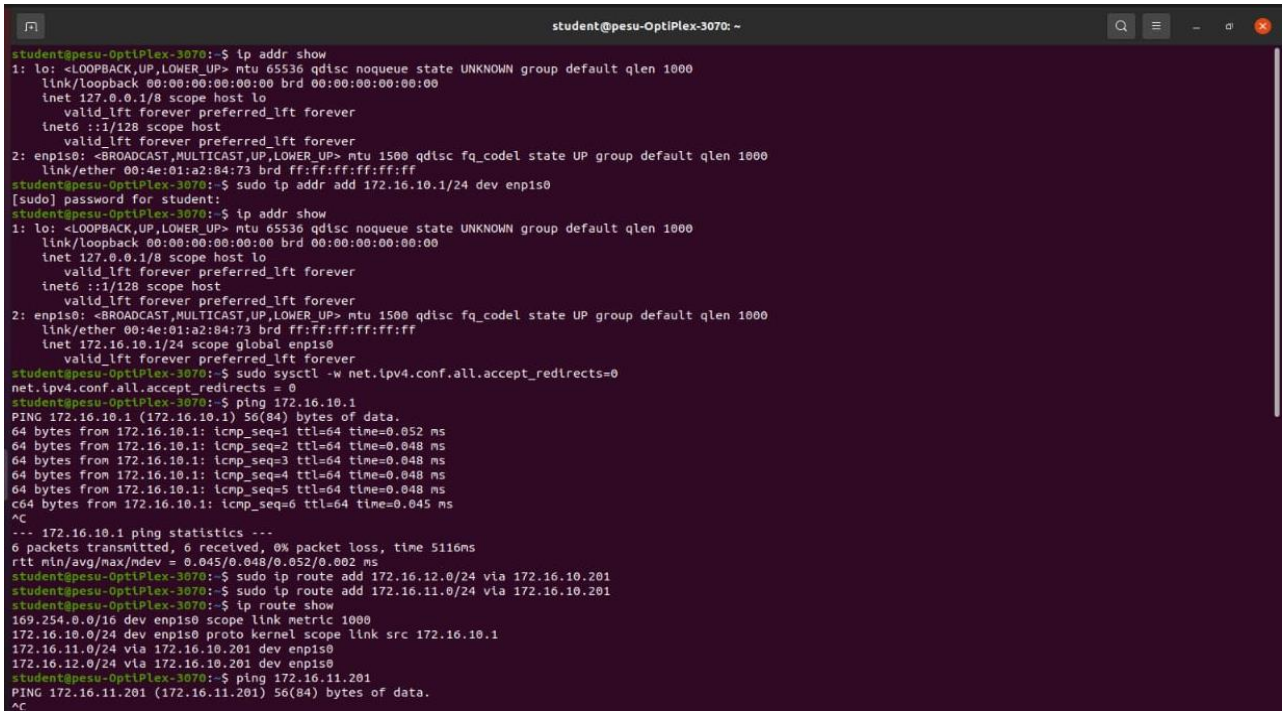
To setup a network with 2 routers and exchange packets across routers.

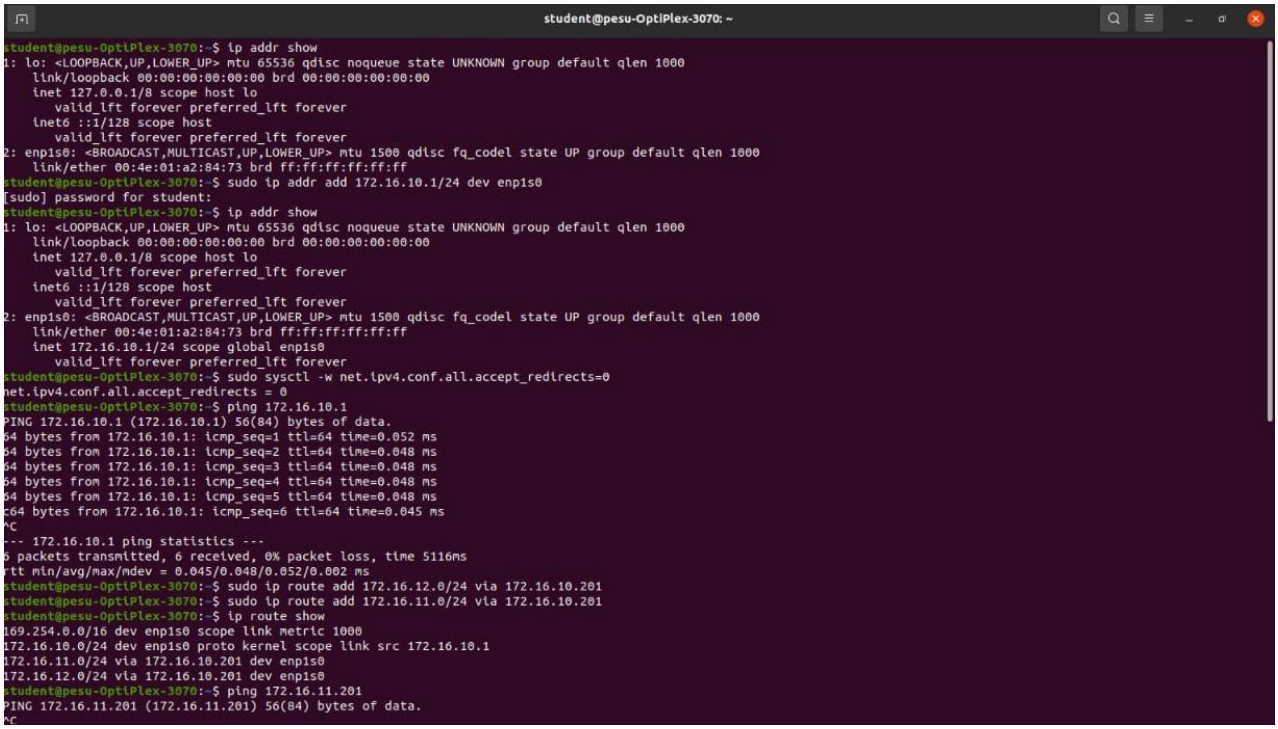
Topology Description:

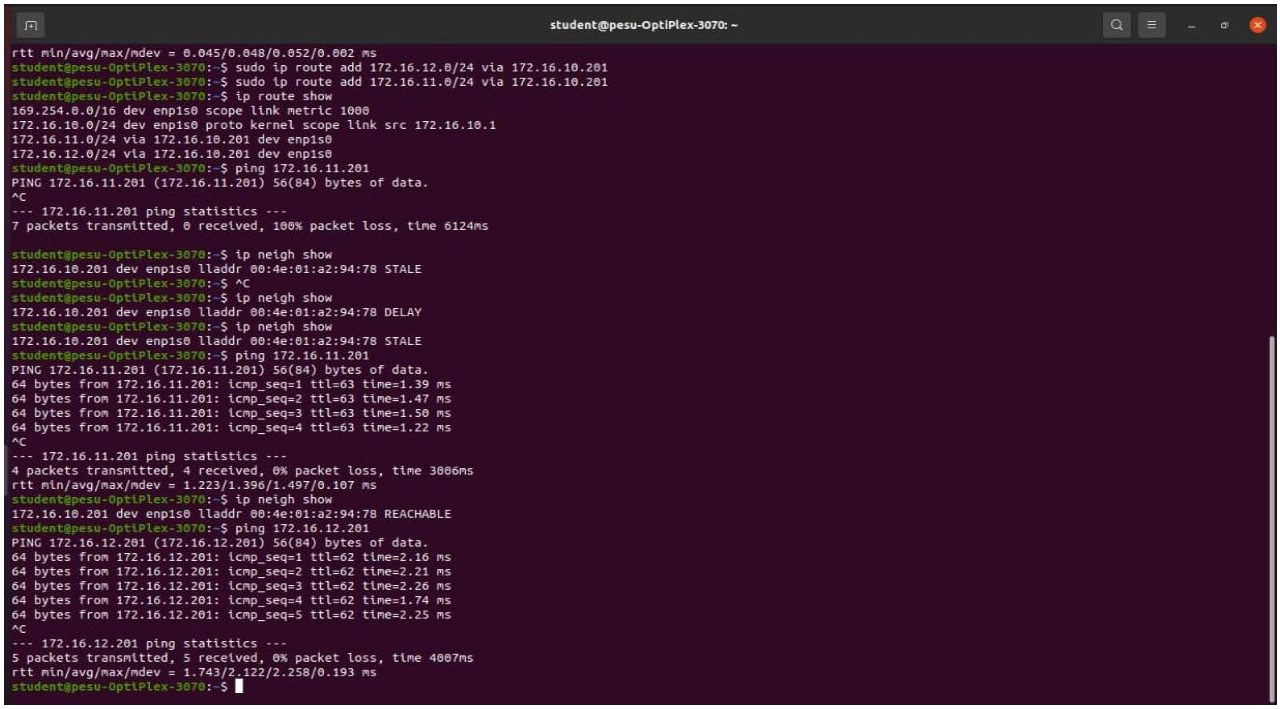
Design a network with atleast 2 router networks. Host **Ha** should be able to communicate with Host **Hd** using newly assigned addresses.

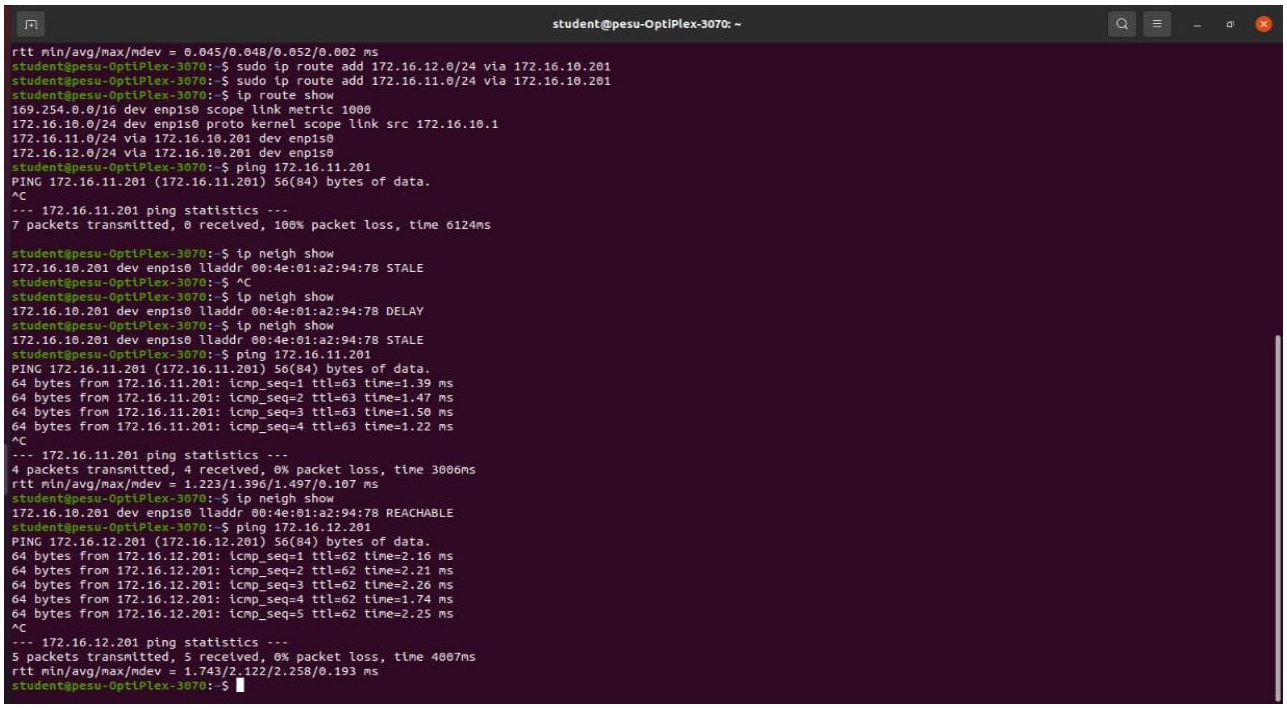


Host **Ha**:

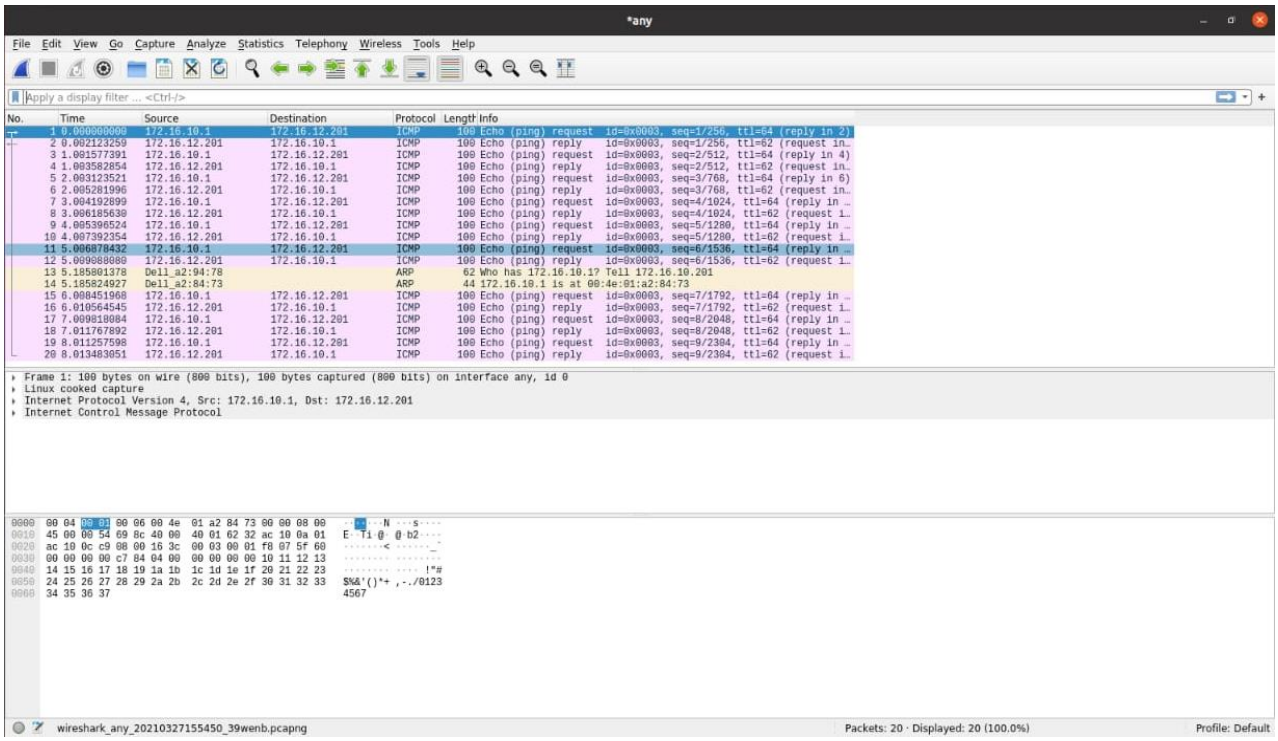

student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:84:73 brd ff:ff:ff:ff:ff:ff
student@pesu-OptiPlex-3070:~$ sudo ip addr add 172.16.10.1/24 dev enp1s0
[sudo] password for student:
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:84:73 brd ff:ff:ff:ff:ff:ff
inet 172.16.10.1/24 scope global enp1s0
valid_lft forever preferred_lft forever
student@pesu-OptiPlex-3070:~$ sudo sysctl -w net.ipv4.conf.all.accept_redirects=0
net.ipv4.conf.all.accept_redirects = 0
student@pesu-OptiPlex-3070:~$ ping 172.16.10.1
PING 172.16.10.1 (172.16.10.1) 56(84) bytes of data.
64 bytes from 172.16.10.1: icmp_seq=1 ttl=64 time=0.052 ms
64 bytes from 172.16.10.1: icmp_seq=2 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=4 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=5 ttl=64 time=0.048 ms
c64 bytes from 172.16.10.1: icmp_seq=6 ttl=64 time=0.045 ms
^C
--- 172.16.10.1 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5116ms
rtt min/avg/max/mdev = 0.045/0.048/0.052/0.002 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000
172.16.10.0/24 dev enp1s0 proto kernel scope link src 172.16.10.1
172.16.11.0/24 via 172.16.10.201 dev enp1s0
172.16.12.0/24 via 172.16.10.201 dev enp1s0
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
^C

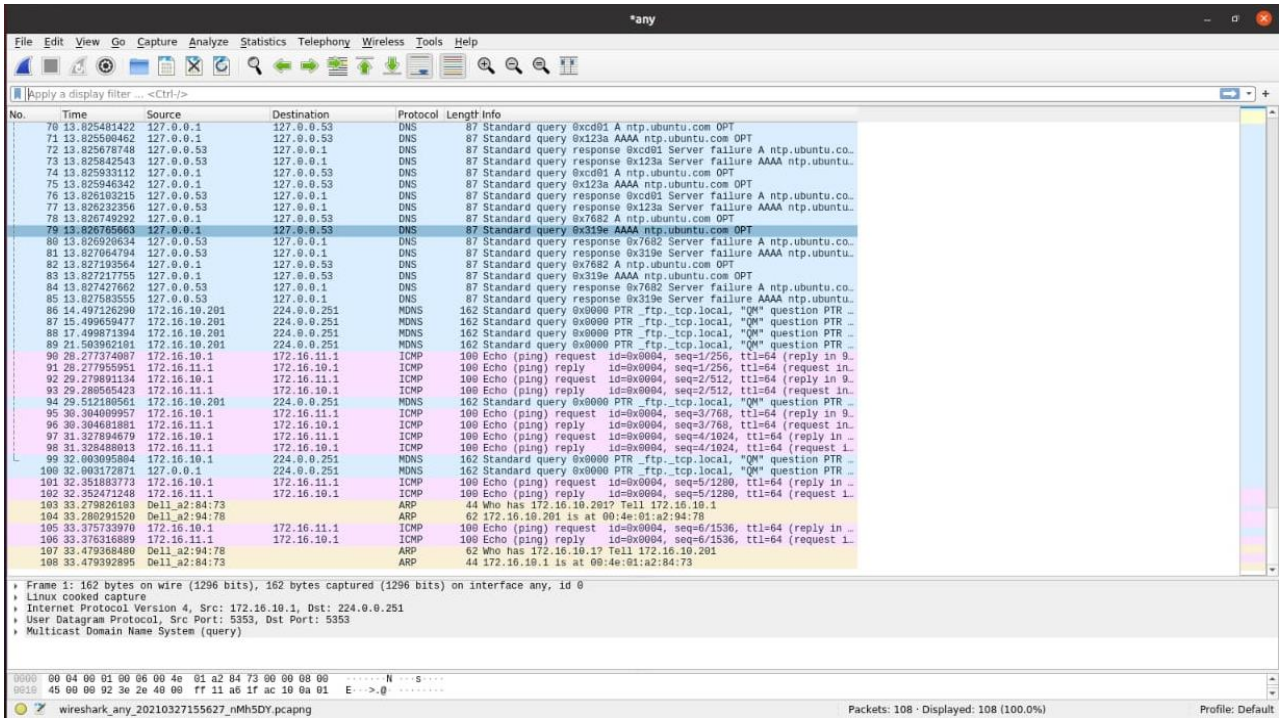

student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:84:73 brd ff:ff:ff:ff:ff:ff
student@pesu-OptiPlex-3070:~$ sudo ip addr add 172.16.10.1/24 dev enp1s0
[sudo] password for student:
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:84:73 brd ff:ff:ff:ff:ff:ff
inet 172.16.10.1/24 scope global enp1s0
valid_lft forever preferred_lft forever
student@pesu-OptiPlex-3070:~$ sudo sysctl -w net.ipv4.conf.all.accept_redirects=0
net.ipv4.conf.all.accept_redirects = 0
student@pesu-OptiPlex-3070:~$ ping 172.16.10.1
PING 172.16.10.1 (172.16.10.1) 56(84) bytes of data.
64 bytes from 172.16.10.1: icmp_seq=1 ttl=64 time=0.052 ms
64 bytes from 172.16.10.1: icmp_seq=2 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=4 ttl=64 time=0.048 ms
64 bytes from 172.16.10.1: icmp_seq=5 ttl=64 time=0.048 ms
c64 bytes from 172.16.10.1: icmp_seq=6 ttl=64 time=0.045 ms
^C
--- 172.16.10.1 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5116ms
rtt min/avg/max/mdev = 0.045/0.048/0.052/0.002 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000
172.16.10.0/24 dev enp1s0 proto kernel scope link src 172.16.10.1
172.16.11.0/24 via 172.16.10.201 dev enp1s0
172.16.12.0/24 via 172.16.10.201 dev enp1s0
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
^C


student@pesu-OptiPlex-3070: ~
rtt min/avg/max/mdev = 0.045/0.048/0.052/0.002 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000
172.16.10.0/24 dev enp1s0 proto kernel scope link src 172.16.10.1
172.16.11.0/24 via 172.16.10.201 dev enp1s0
172.16.12.0/24 via 172.16.10.201 dev enp1s0
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
^C
--- 172.16.11.201 ping statistics ---
7 packets transmitted, 0 received, 100% packet loss, time 6124ms
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 STALE
student@pesu-OptiPlex-3070:~$ ^C
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 DELAY
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 STALE
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
64 bytes from 172.16.11.201: icmp_seq=1 ttl=63 time=1.39 ms
64 bytes from 172.16.11.201: icmp_seq=2 ttl=63 time=1.47 ms
64 bytes from 172.16.11.201: icmp_seq=3 ttl=63 time=1.50 ms
64 bytes from 172.16.11.201: icmp_seq=4 ttl=63 time=1.22 ms
^C
--- 172.16.11.201 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 1.223/1.396/1.497/0.107 ms
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 REACHABLE
student@pesu-OptiPlex-3070:~$ ping 172.16.12.201
PING 172.16.12.201 (172.16.12.201) 56(84) bytes of data.
64 bytes from 172.16.12.201: icmp_seq=1 ttl=62 time=2.16 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=62 time=2.21 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=62 time=2.26 ms
64 bytes from 172.16.12.201: icmp_seq=4 ttl=62 time=1.74 ms
64 bytes from 172.16.12.201: icmp_seq=5 ttl=62 time=2.25 ms
^C
--- 172.16.12.201 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4007ms
rtt min/avg/max/mdev = 1.743/2.122/2.258/0.193 ms
student@pesu-OptiPlex-3070:~$

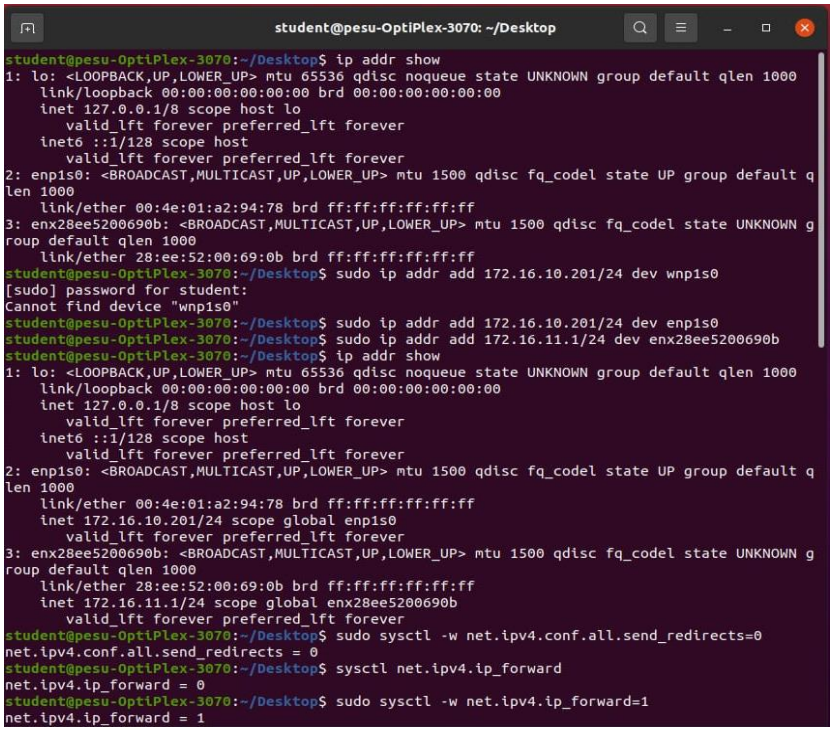

student@pesu-OptiPlex-3070: ~
rtt min/avg/max/mdev = 0.045/0.048/0.052/0.002 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000
172.16.10.0/24 dev enp1s0 proto kernel scope link src 172.16.10.1
172.16.11.0/24 via 172.16.10.201 dev enp1s0
172.16.12.0/24 via 172.16.10.201 dev enp1s0
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
^C
--- 172.16.11.201 ping statistics ---
7 packets transmitted, 0 received, 100% packet loss, time 6124ms
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 STALE
student@pesu-OptiPlex-3070:~$ ^C
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 DELAY
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 STALE
student@pesu-OptiPlex-3070:~$ ping 172.16.11.201
PING 172.16.11.201 (172.16.11.201) 56(84) bytes of data.
64 bytes from 172.16.11.201: icmp_seq=1 ttl=63 time=1.39 ms
64 bytes from 172.16.11.201: icmp_seq=2 ttl=63 time=1.47 ms
64 bytes from 172.16.11.201: icmp_seq=3 ttl=63 time=1.50 ms
64 bytes from 172.16.11.201: icmp_seq=4 ttl=63 time=1.22 ms
^C
--- 172.16.11.201 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 1.223/1.396/1.497/0.107 ms
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.10.201 dev enp1s0 lladdr 00:4e:01:a2:94:78 REACHABLE
student@pesu-OptiPlex-3070:~$ ping 172.16.12.201
PING 172.16.12.201 (172.16.12.201) 56(84) bytes of data.
64 bytes from 172.16.12.201: icmp_seq=1 ttl=62 time=2.16 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=62 time=2.21 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=62 time=2.26 ms
64 bytes from 172.16.12.201: icmp_seq=4 ttl=62 time=1.74 ms
64 bytes from 172.16.12.201: icmp_seq=5 ttl=62 time=2.25 ms
^C
--- 172.16.12.201 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4007ms
rtt min/avg/max/mdev = 1.743/2.122/2.258/0.193 ms
student@pesu-OptiPlex-3070:~$

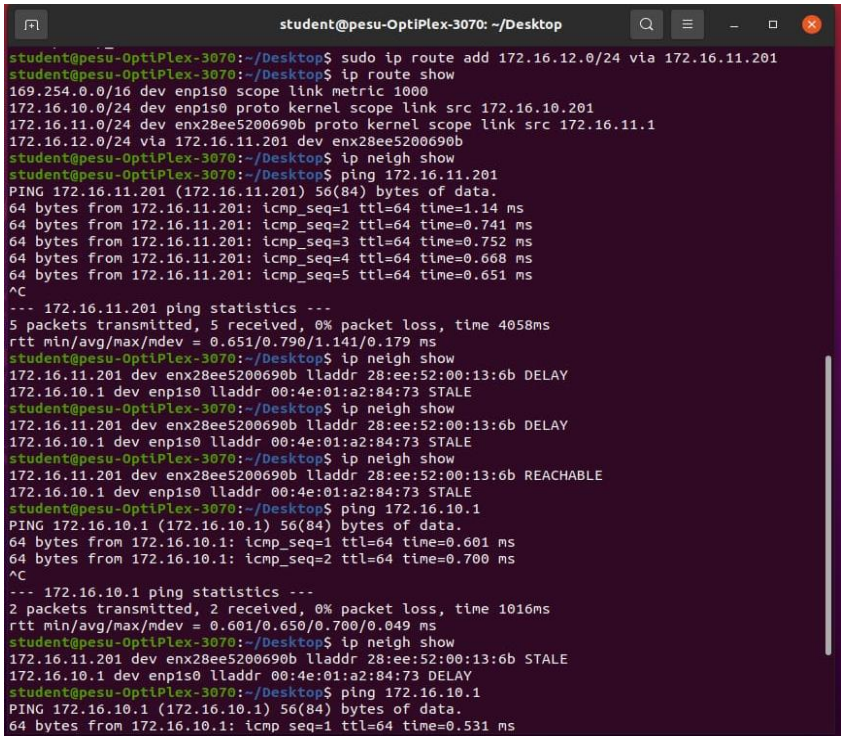
Wireshark Captures



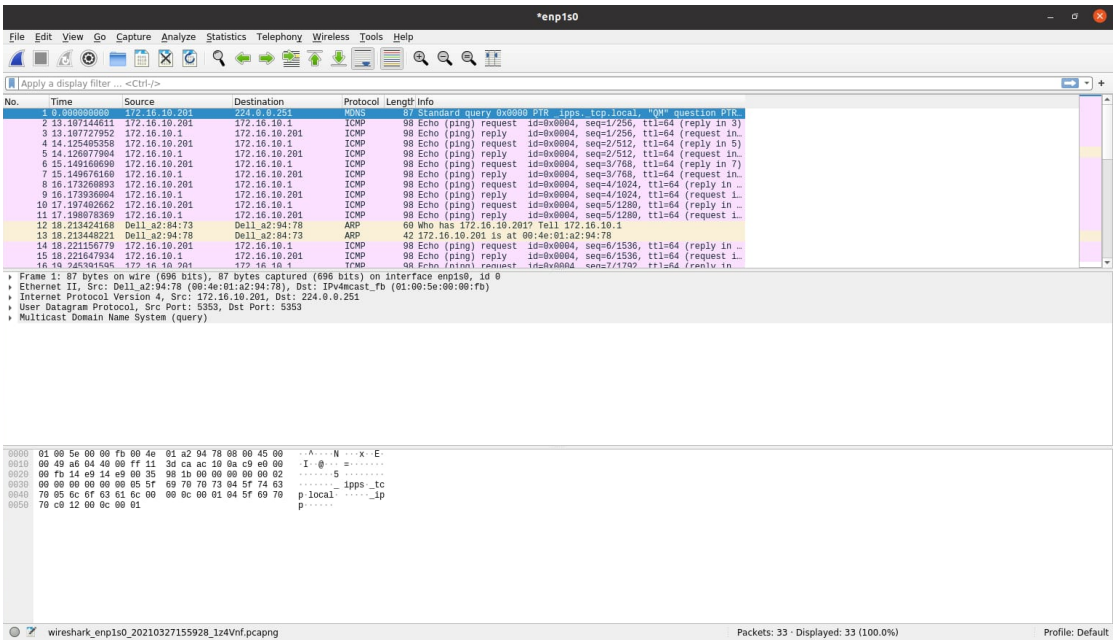

*any
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
70 13.825481422 127.0.0.1 127.0.0.53 DNS 87 Standard query 0xcd01 A ntp.ubuntu.com OPT
71 13.825500462 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x123a AAAA ntp.ubuntu.com OPT
72 13.825678748 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0xcd01 Server failure A ntp.ubuntu.co…
73 13.825842543 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x123a Server failure AAAA ntp.ubuntu…
74 13.825933112 127.0.0.1 127.0.0.53 DNS 87 Standard query 0xcd01 A ntp.ubuntu.com OPT
75 13.825946342 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x123a AAAA ntp.ubuntu.com OPT
76 13.826103215 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0xcd01 Server failure A ntp.ubuntu.co…
77 13.826232356 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x123a Server failure AAAA ntp.ubuntu…
78 13.826749292 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x7682 A ntp.ubuntu.com OPT
79 13.826765669 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x319e AAAA ntp.ubuntu.com OPT
80 13.826920634 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x7682 Server failure A ntp.ubuntu.co…
81 13.827064794 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x319e Server failure AAAA ntp.ubuntu…
82 13.827193564 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x7682 A ntp.ubuntu.com OPT
83 13.827217755 127.0.0.1 127.0.0.53 DNS 87 Standard query 0x319e AAAA ntp.ubuntu.com OPT
84 13.827427662 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x7682 Server failure A ntp.ubuntu.co…
85 13.827583555 127.0.0.53 127.0.0.1 DNS 87 Standard query response 0x319e Server failure AAAA ntp.ubuntu…
86 14.497126290 172.16.10.201 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
87 15.499659477 172.16.10.201 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
88 17.499871394 172.16.10.201 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
89 21.503962101 172.16.10.201 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
90 28.277374007 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=1/256, ttl=64 (reply in 9…
91 28.277955951 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=1/256, ttl=64 (request in…
92 29.279891134 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=2/512, ttl=64 (reply in 9…
93 29.280565423 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=2/512, ttl=64 (request in…
94 29.512180561 172.16.10.201 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
95 30.304009957 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=3/768, ttl=64 (reply in 9…
96 30.304681881 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=3/768, ttl=64 (request in…
97 31.327894679 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=4/1024, ttl=64 (reply in …
98 31.328488013 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=4/1024, ttl=64 (request i…
99 32.003095804 172.16.10.1 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
100 32.003172871 127.0.0.1 224.0.0.251 MDNS 162 Standard query 0x0000 PTR _ftp._tcp.local, "QM" question PTR …
101 32.351083773 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=5/1280, ttl=64 (reply in …
102 32.352471248 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=5/1280, ttl=64 (request i…
103 33.279826103 Dell_a2:84:73 ARP 44 Who has 172.16.10.201? Tell 172.16.10.1
104 33.280291520 Dell_a2:94:78 ARP 62 172.16.10.201 is at 00:4e:01:a2:94:78
105 33.375733970 172.16.10.1 172.16.11.1 ICMP 100 Echo (ping) request id=0x0004, seq=6/1536, ttl=64 (reply in …
106 33.376316880 172.16.11.1 172.16.10.1 ICMP 100 Echo (ping) reply id=0x0004, seq=6/1536, ttl=64 (request i…
107 33.479368480 Dell_a2:94:78 ARP 62 Who has 172.16.10.1? Tell 172.16.10.201
108 33.479392895 Dell_a2:84:73 ARP 44 172.16.10.1 is at 00:4e:01:a2:84:73
Frame 1: 162 bytes on wire (1296 bits), 162 bytes captured (1296 bits) on interface any, id 0
Linux cooked capture
Internet Protocol Version 4, Src: 172.16.10.1, Dst: 224.0.0.251
User Datagram Protocol, Src Port: 5353, Dst Port: 5353
Multicast Domain Name System (query)
0000 00 04 00 01 00 06 00 4e 01 a2 84 73 00 00 08 00 ....N ...s....
0010 45 00 00 92 3e 2e 40 00 ff 11 a6 1f ac 10 0a 01 E...>.@. ....
wireshark_any_20210327155627_nMh5DY.pcapng
Packets: 108 · Displayed: 108 (100.0%)
Profile: Default

Router **R1**

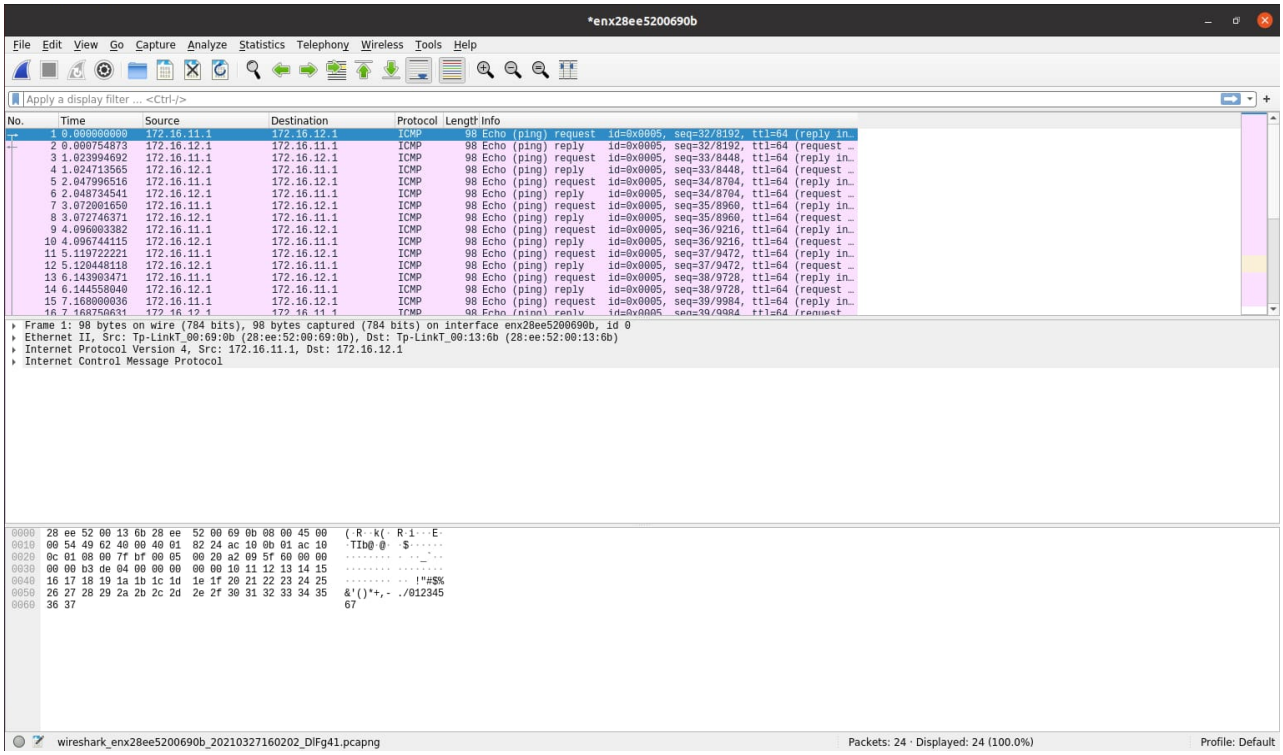

student@pesu-OptiPlex-3070: ~/Desktop
student@pesu-OptiPlex-3070:~/Desktop$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default q
len 1000
link/ether 00:4e:01:a2:94:78 brd ff:ff:ff:ff:ff:ff
3: enx28ee5200690b: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN g
roup default qlen 1000
link/ether 28:ee:52:00:69:0b brd ff:ff:ff:ff:ff:ff
student@pesu-OptiPlex-3070:~/Desktop$ sudo ip addr add 172.16.10.201/24 dev wnp1s0
[sudo] password for student:
Cannot find device "wnp1s0"
student@pesu-OptiPlex-3070:~/Desktop$ sudo ip addr add 172.16.10.201/24 dev enp1s0
student@pesu-OptiPlex-3070:~/Desktop$ sudo ip addr add 172.16.11.1/24 dev enx28ee5200690b
student@pesu-OptiPlex-3070:~/Desktop$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default q
len 1000
link/ether 00:4e:01:a2:94:78 brd ff:ff:ff:ff:ff:ff
inet 172.16.10.201/24 scope global enp1s0
valid_lft forever preferred_lft forever
3: enx28ee5200690b: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN g
roup default qlen 1000
link/ether 28:ee:52:00:69:0b brd ff:ff:ff:ff:ff:ff
inet 172.16.11.1/24 scope global enx28ee5200690b
valid_lft forever preferred_lft forever
student@pesu-OptiPlex-3070:~/Desktop$ sudo sysctl -w net.ipv4.conf.all.send_redirects=0
net.ipv4.conf.all.send_redirects = 0
student@pesu-OptiPlex-3070:~/Desktop$ sysctl net.ipv4.ip_forward
net.ipv4.ip_forward = 0
student@pesu-OptiPlex-3070:~/Desktop$ sudo sysctl -w net.ipv4.ip_forward=1
net.ipv4.ip_forward = 1



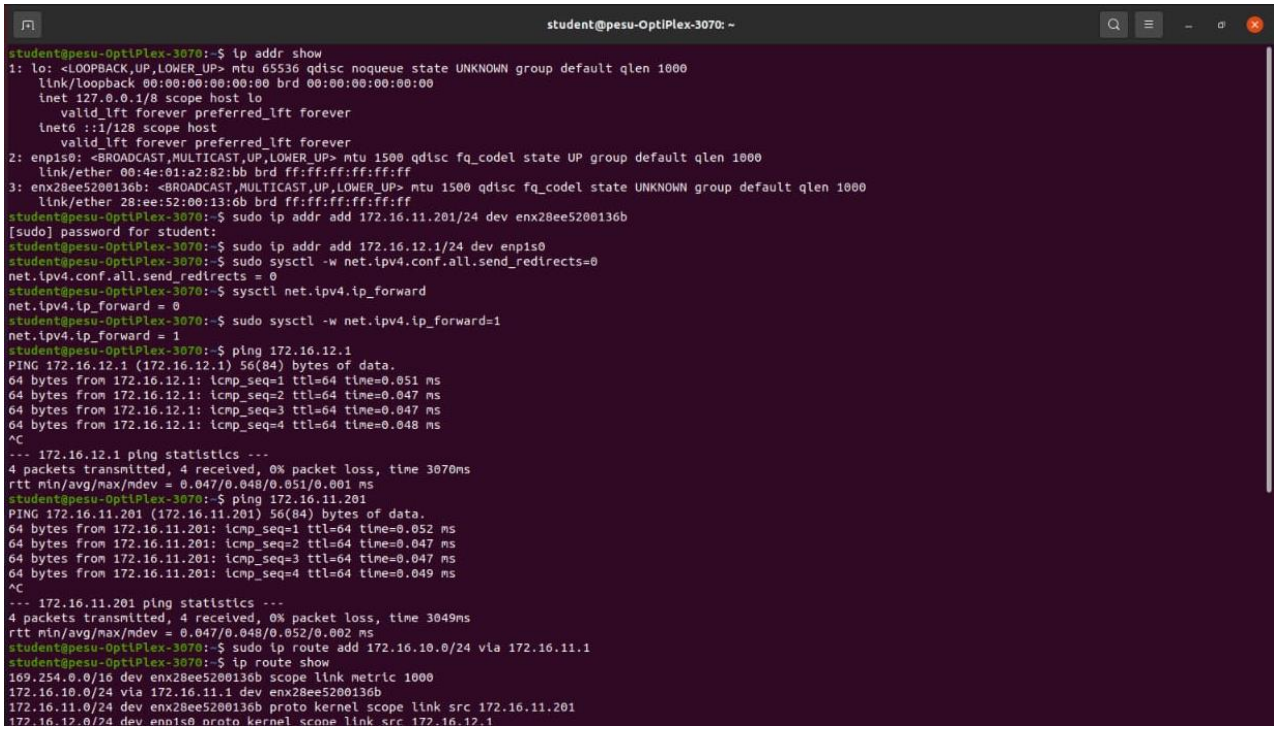
Interface enp1s0 Wireshark Capture

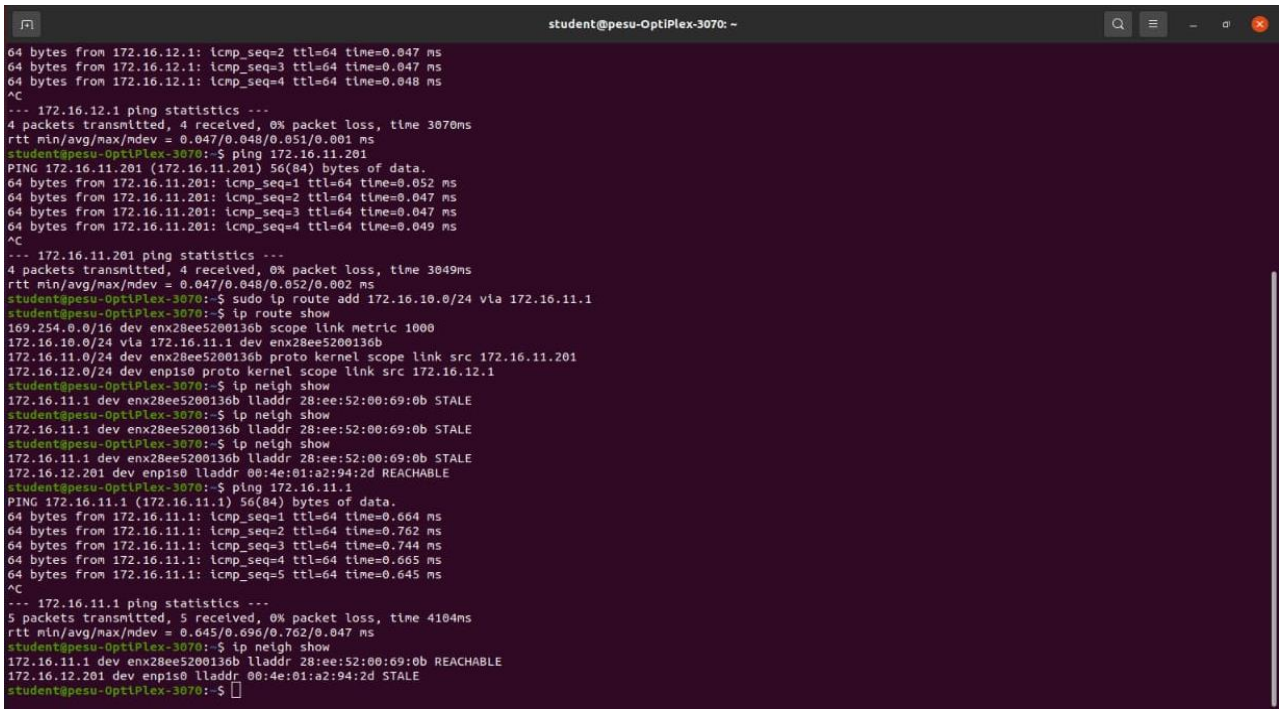


Interface enx28ee5200690b Wireshark Capture

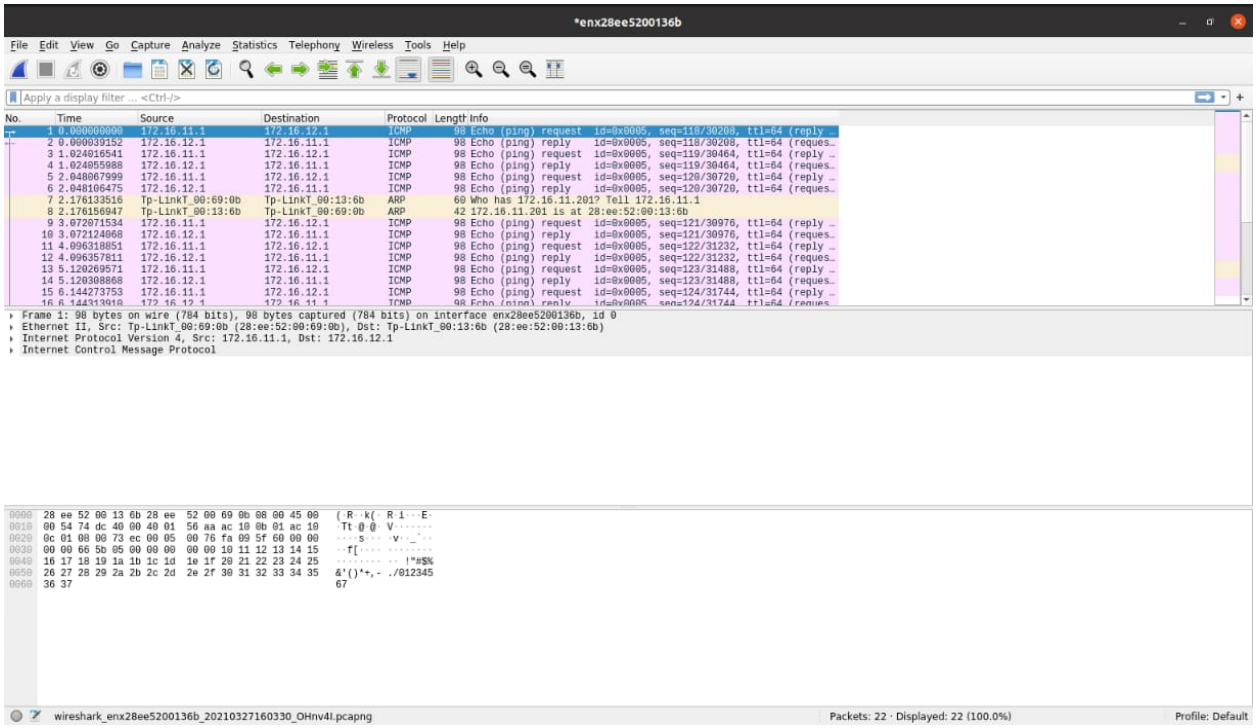


Router **R2**

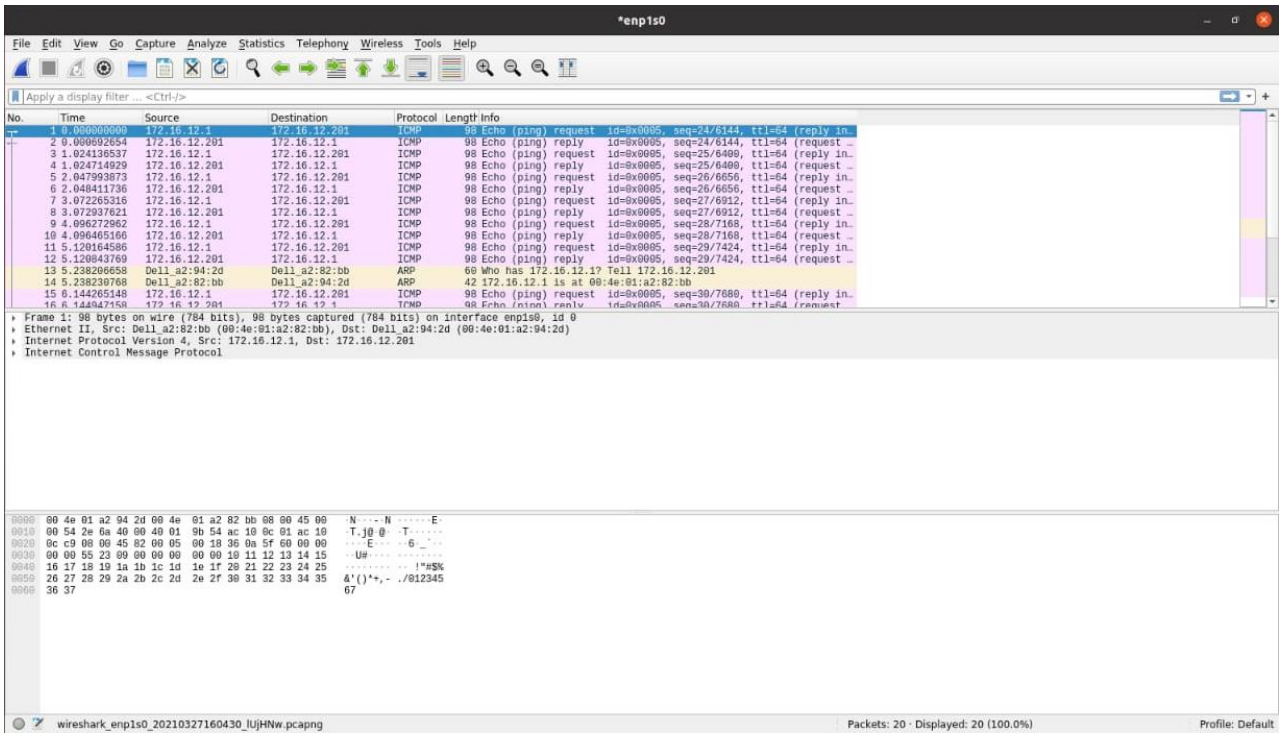




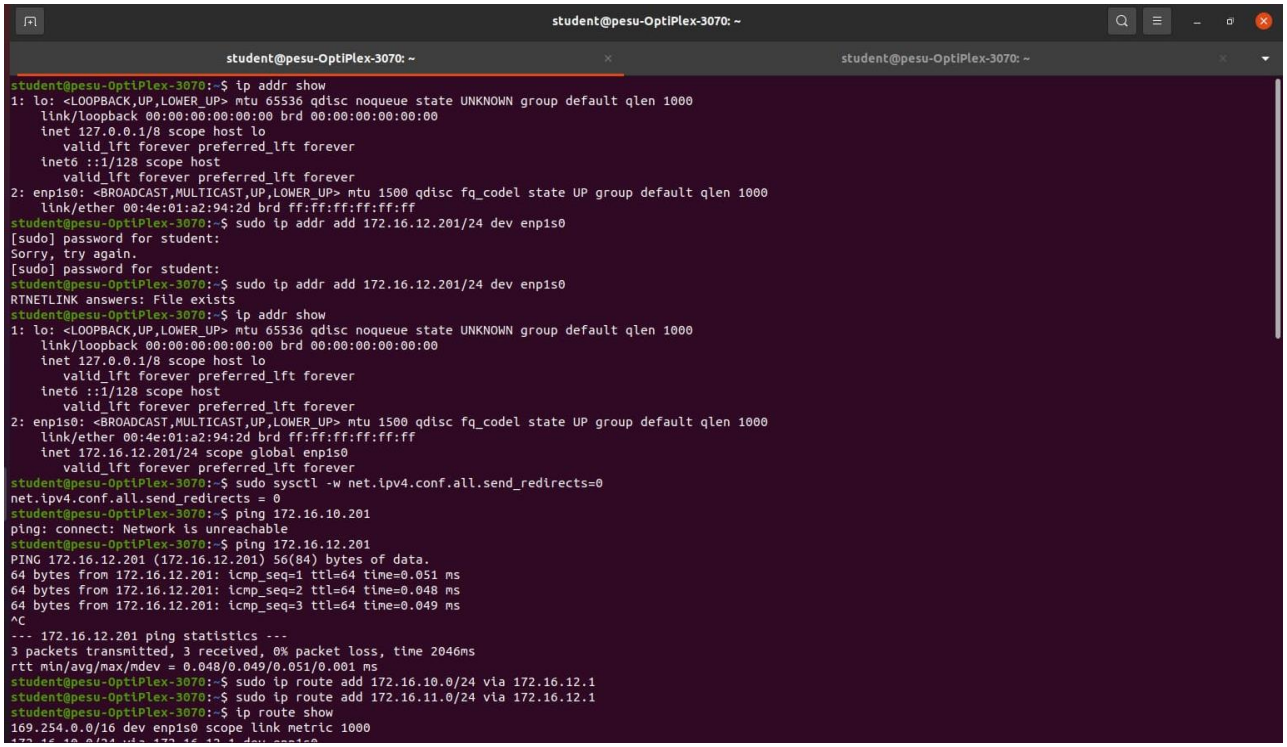
Interface enx28ee5200136b Wireshark Capture

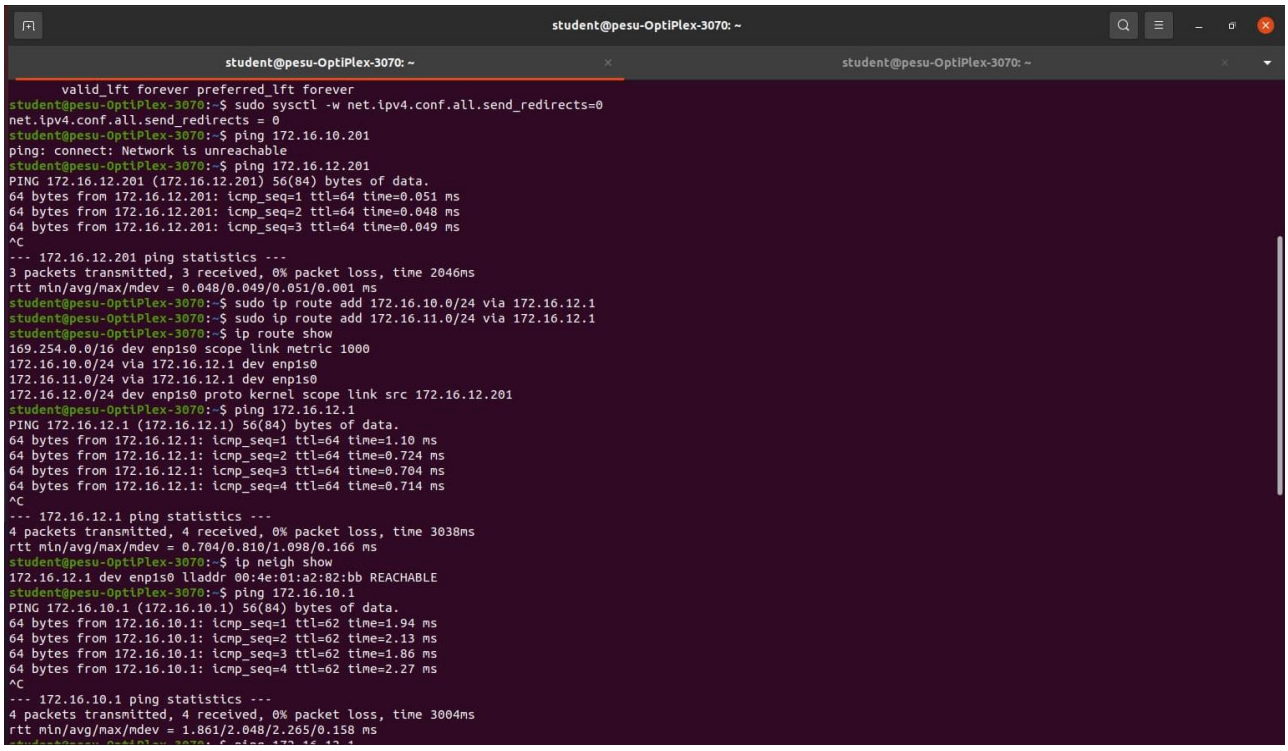


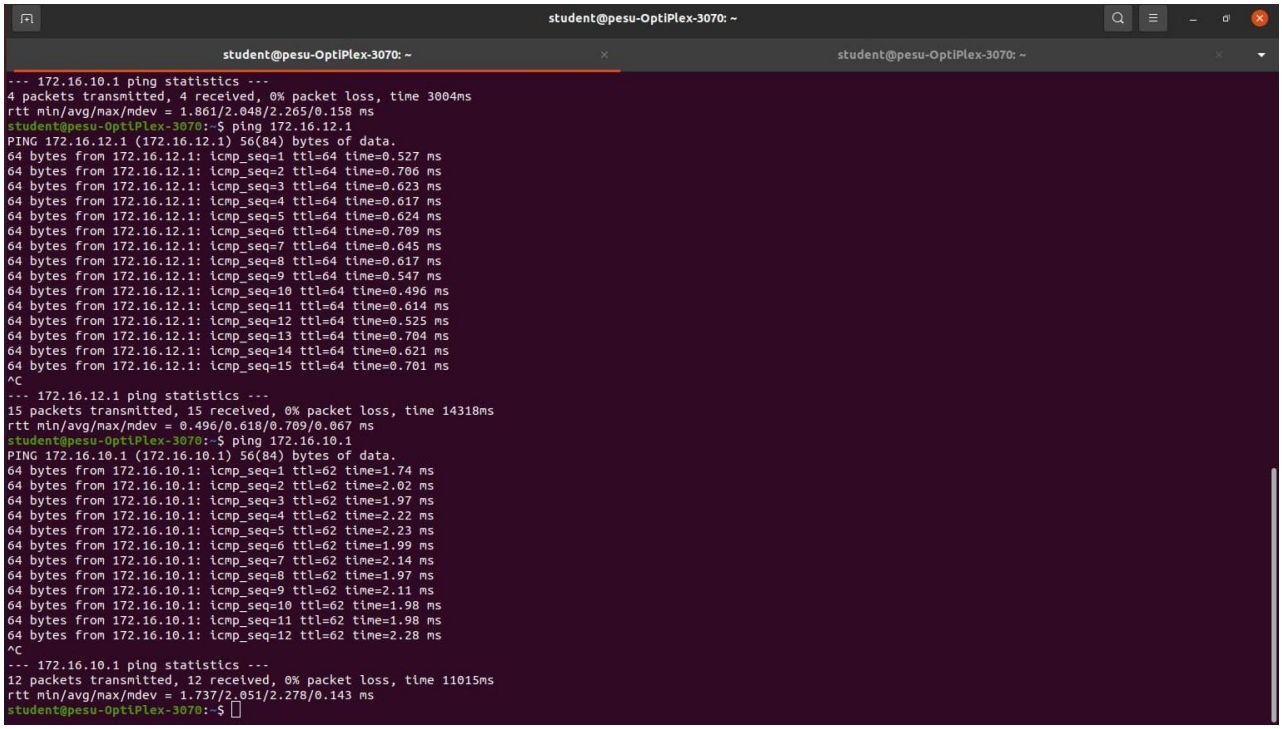
Interface enp1s0 Wireshark Capture

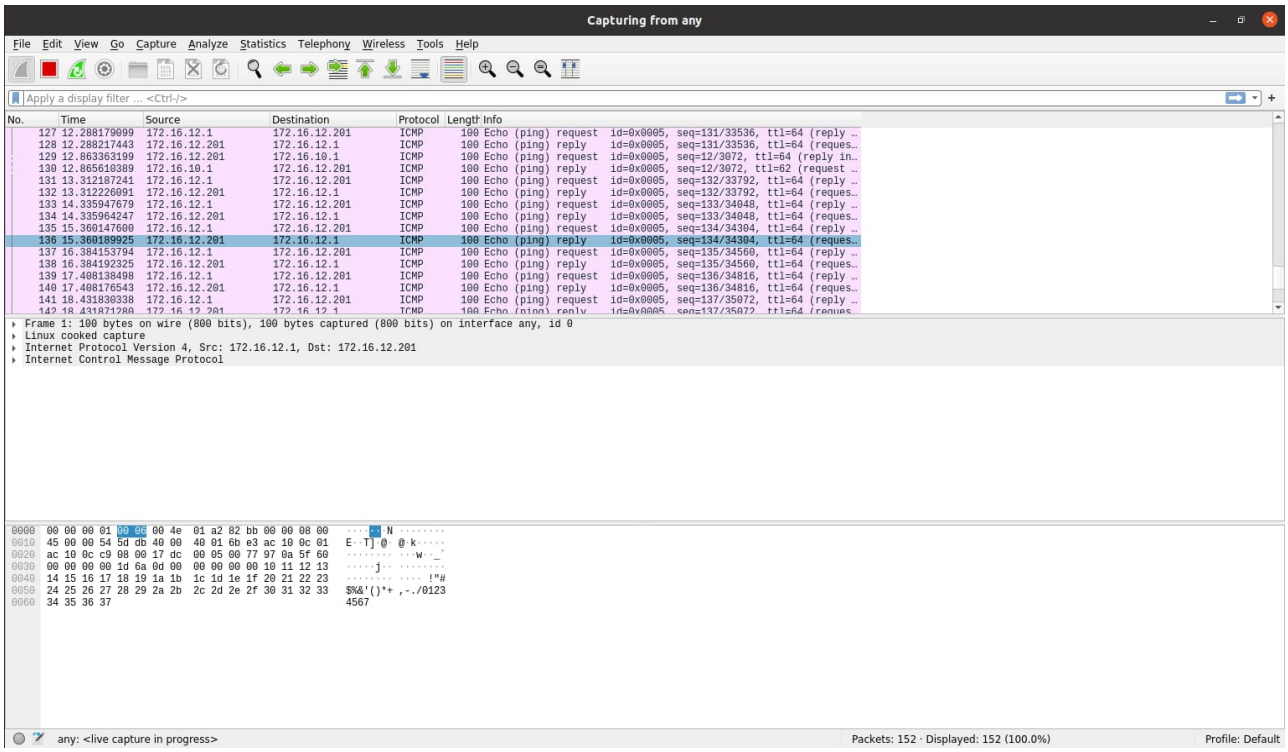


Host **Hd**


student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:94:2d brd ff:ff:ff:ff:ff:ff
student@pesu-OptiPlex-3070:~$ sudo ip addr add 172.16.12.201/24 dev enp1s0
[sudo] password for student:
Sorry, try again.
[sudo] password for student:
student@pesu-OptiPlex-3070:~$ sudo ip addr add 172.16.12.201/24 dev enp1s0
RTNETLINK answers: File exists
student@pesu-OptiPlex-3070:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 00:4e:01:a2:94:2d brd ff:ff:ff:ff:ff:ff
inet 172.16.12.201/24 scope global enp1s0
valid_lft forever preferred_lft forever
student@pesu-OptiPlex-3070:~$ sudo sysctl -w net.ipv4.conf.all.send_redirects=0
net.ipv4.conf.all.send_redirects = 0
student@pesu-OptiPlex-3070:~$ ping 172.16.10.201
ping: connect: Network is unreachable
student@pesu-OptiPlex-3070:~$ ping 172.16.12.201
PING 172.16.12.201 (172.16.12.201) 56(84) bytes of data.
64 bytes from 172.16.12.201: icmp_seq=1 ttl=64 time=0.051 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=64 time=0.048 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=64 time=0.049 ms
^C
--- 172.16.12.201 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2046ms
rtt min/avg/max/mdev = 0.048/0.049/0.051/0.001 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.10.0/24 via 172.16.12.1
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.12.1
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000


student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
valid_lft forever preferred_lft forever
student@pesu-OptiPlex-3070:~$ sudo sysctl -w net.ipv4.conf.all.send_redirects=0
net.ipv4.conf.all.send_redirects = 0
student@pesu-OptiPlex-3070:~$ ping 172.16.10.201
ping: connect: Network is unreachable
student@pesu-OptiPlex-3070:~$ ping 172.16.12.201
PING 172.16.12.201 (172.16.12.201) 56(84) bytes of data.
64 bytes from 172.16.12.201: icmp_seq=1 ttl=64 time=0.051 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=64 time=0.048 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=64 time=0.049 ms
^C
--- 172.16.12.201 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2046ms
rtt min/avg/max/mdev = 0.048/0.049/0.051/0.001 ms
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.10.0/24 via 172.16.12.1
student@pesu-OptiPlex-3070:~$ sudo ip route add 172.16.11.0/24 via 172.16.12.1
student@pesu-OptiPlex-3070:~$ ip route show
169.254.0.0/16 dev enp1s0 scope link metric 1000
172.16.10.0/24 via 172.16.12.1 dev enp1s0
172.16.11.0/24 via 172.16.12.1 dev enp1s0
172.16.12.0/24 dev enp1s0 proto kernel scope link src 172.16.12.201
student@pesu-OptiPlex-3070:~$ ping 172.16.12.1
PING 172.16.12.1 (172.16.12.1) 56(84) bytes of data.
64 bytes from 172.16.12.1: icmp_seq=1 ttl=64 time=1.10 ms
64 bytes from 172.16.12.1: icmp_seq=2 ttl=64 time=0.724 ms
64 bytes from 172.16.12.1: icmp_seq=3 ttl=64 time=0.704 ms
64 bytes from 172.16.12.1: icmp_seq=4 ttl=64 time=0.714 ms
^C
--- 172.16.12.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3038ms
rtt min/avg/max/mdev = 0.704/0.810/1.098/0.166 ms
student@pesu-OptiPlex-3070:~$ ip neigh show
172.16.12.1 dev enp1s0 lladdr 00:4e:01:a2:82:bb REACHABLE
student@pesu-OptiPlex-3070:~$ ping 172.16.10.1
PING 172.16.10.1 (172.16.10.1) 56(84) bytes of data.
64 bytes from 172.16.10.1: icmp_seq=1 ttl=62 time=1.94 ms
64 bytes from 172.16.10.1: icmp_seq=2 ttl=62 time=2.13 ms
64 bytes from 172.16.10.1: icmp_seq=3 ttl=62 time=1.86 ms
64 bytes from 172.16.10.1: icmp_seq=4 ttl=62 time=2.27 ms
^C
--- 172.16.10.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 1.861/2.048/2.265/0.158 ms


student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
student@pesu-OptiPlex-3070: ~
--- 172.16.10.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 1.861/2.048/2.265/0.158 ms
student@pesu-OptiPlex-3070:~$ ping 172.16.12.1
PING 172.16.12.1 (172.16.12.1) 56(84) bytes of data.
64 bytes from 172.16.12.1: icmp_seq=1 ttl=64 time=0.527 ms
64 bytes from 172.16.12.1: icmp_seq=2 ttl=64 time=0.706 ms
64 bytes from 172.16.12.1: icmp_seq=3 ttl=64 time=0.623 ms
64 bytes from 172.16.12.1: icmp_seq=4 ttl=64 time=0.617 ms
64 bytes from 172.16.12.1: icmp_seq=5 ttl=64 time=0.624 ms
64 bytes from 172.16.12.1: icmp_seq=6 ttl=64 time=0.709 ms
64 bytes from 172.16.12.1: icmp_seq=7 ttl=64 time=0.645 ms
64 bytes from 172.16.12.1: icmp_seq=8 ttl=64 time=0.617 ms
64 bytes from 172.16.12.1: icmp_seq=9 ttl=64 time=0.547 ms
64 bytes from 172.16.12.1: icmp_seq=10 ttl=64 time=0.496 ms
64 bytes from 172.16.12.1: icmp_seq=11 ttl=64 time=0.614 ms
64 bytes from 172.16.12.1: icmp_seq=12 ttl=64 time=0.525 ms
64 bytes from 172.16.12.1: icmp_seq=13 ttl=64 time=0.704 ms
64 bytes from 172.16.12.1: icmp_seq=14 ttl=64 time=0.621 ms
64 bytes from 172.16.12.1: icmp_seq=15 ttl=64 time=0.701 ms
^C
--- 172.16.12.1 ping statistics ---
15 packets transmitted, 15 received, 0% packet loss, time 14318ms
rtt min/avg/max/mdev = 0.496/0.618/0.709/0.067 ms
student@pesu-OptiPlex-3070:~$ ping 172.16.10.1
PING 172.16.10.1 (172.16.10.1) 56(84) bytes of data.
64 bytes from 172.16.10.1: icmp_seq=1 ttl=62 time=1.74 ms
64 bytes from 172.16.10.1: icmp_seq=2 ttl=62 time=2.02 ms
64 bytes from 172.16.10.1: icmp_seq=3 ttl=62 time=1.97 ms
64 bytes from 172.16.10.1: icmp_seq=4 ttl=62 time=2.22 ms
64 bytes from 172.16.10.1: icmp_seq=5 ttl=62 time=2.23 ms
64 bytes from 172.16.10.1: icmp_seq=6 ttl=62 time=1.99 ms
64 bytes from 172.16.10.1: icmp_seq=7 ttl=62 time=2.14 ms
64 bytes from 172.16.10.1: icmp_seq=8 ttl=62 time=1.97 ms
64 bytes from 172.16.10.1: icmp_seq=9 ttl=62 time=2.11 ms
64 bytes from 172.16.10.1: icmp_seq=10 ttl=62 time=1.98 ms
64 bytes from 172.16.10.1: icmp_seq=11 ttl=62 time=1.98 ms
64 bytes from 172.16.10.1: icmp_seq=12 ttl=62 time=2.28 ms
^C
--- 172.16.10.1 ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11015ms
rtt min/avg/max/mdev = 1.737/2.051/2.278/0.143 ms
student@pesu-OptiPlex-3070:~$


Capturing from any
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
127 12.288179099 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=131/33536, ttl=64 (reply …
128 12.288217443 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=131/33536, ttl=64 (reques…
129 12.863363199 172.16.12.201 172.16.10.1 ICMP 100 Echo (ping) request id=0x0005, seq=12/3072, ttl=64 (reply in…
130 12.865610389 172.16.10.1 172.16.12.201 ICMP 100 Echo (ping) reply id=0x0005, seq=12/3072, ttl=62 (request …
131 13.312187241 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=132/33792, ttl=64 (reply …
132 13.312226091 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=132/33792, ttl=64 (reques…
133 14.335947679 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=133/34048, ttl=64 (reply …
134 14.335964247 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=133/34048, ttl=64 (reques…
135 15.360147600 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=134/34304, ttl=64 (reply …
136 15.360189925 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=134/34304, ttl=64 (reques…
137 16.384153794 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=135/34560, ttl=64 (reply …
138 16.384192325 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=135/34560, ttl=64 (reques…
139 17.408138498 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=136/34816, ttl=64 (reply …
140 17.408176543 172.16.12.201 172.16.12.1 ICMP 100 Echo (ping) reply id=0x0005, seq=136/34816, ttl=64 (reques…
141 18.431830338 172.16.12.1 172.16.12.201 ICMP 100 Echo (ping) request id=0x0005, seq=137/35072, ttl=64 (reply …
Frame 1: 100 bytes on wire (800 bits), 100 bytes captured (800 bits) on interface any, id 0
Linux cooked capture
Internet Protocol Version 4, Src: 172.16.12.1, Dst: 172.16.12.201
Internet Control Message Protocol
0000 00 00 00 01 00 06 00 4e 01 a2 82 bb 00 00 08 00
0010 45 00 00 54 5d db 40 00 40 01 6b e3 ac 10 0c 01
0020 ac 10 0c c9 08 00 17 dc 00 05 00 77 97 0a 5f 60
0030 00 00 00 00 1d 6a 0d 00 00 00 00 00 10 11 12 13
0040 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23
0050 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33
0060 34 35 36 37
any: <live capture in progress>
Packets: 152 · Displayed: 152 (100.0%)
Profile: Default