

COMPUTER NETWORKS LAB

SRN – PES1UG19CS542

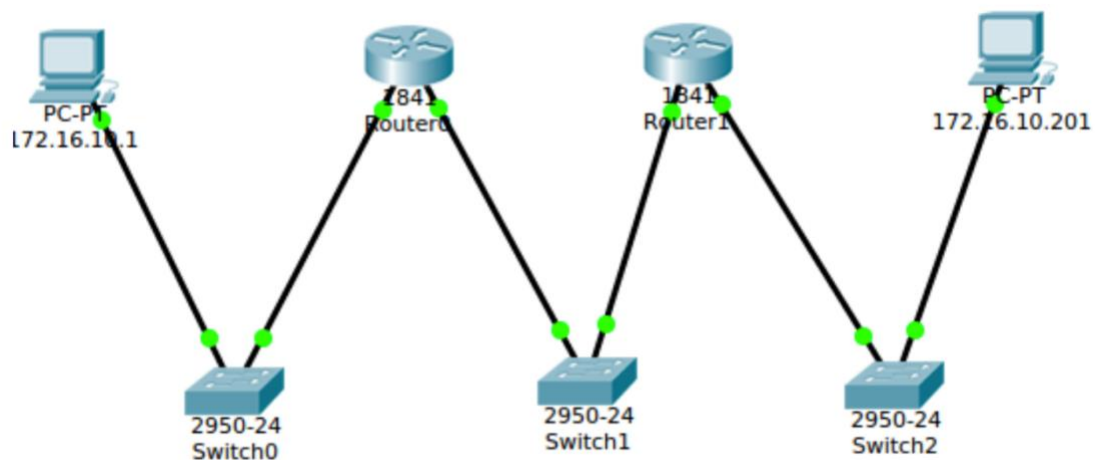
SECTION – I

NAME- TRISHA JAIN

IPv4 Addressing and Static Routing

Objective: To setup a network with two routers and exchange packets across routers.

Topology Description: Design a network with at least 2 router networks. Host Ha should be able to communicate with Host Hd using newly assigned addresses.



Task 1: Assign IP addresses to all computers A, B, C and D (Source Host Ha, Router R1, Router R2 & Destination Host Hd).

Step 1: Assign the IP address to the Ha.

```
$ sudo ip addr add 172.16.10.1/24 dev eth1
```

```
$ ip addr show
```

```

student@CSELAB:~$ sudo ip addr add 172.16.10.1/24 dev enp2s0
student@CSELAB:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    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: enp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether b8:ae:ed:a5:a6:b5 brd ff:ff:ff:ff:ff:ff
    inet 172.16.10.1/24 scope global enp2s0
        valid_lft forever preferred_lft forever
    inet6 fe80::baae:edff:fea5:a6b5/64 scope link
        valid_lft forever preferred_lft forever

```

Step 2: Assign the IP address to R1.

\$ sudo ip addr add 172.16.10.201/24 dev eth1

\$ sudo ip addr add 172.16.11.1/24 dev eth2

\$ ifconfig

```

student@CSELAB:~$ ifconfig
enp2s0    Link encap:Ethernet  HWaddr b8:ae:ed:a5:a6:0e
          inet addr:172.16.10.201  Bcast:0.0.0.0  Mask:255.255.255.0
          inet6 addr: fe80::baae:edff:fea5:a60e/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:26702 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1379 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3709643 (3.7 MB)  TX bytes:153505 (153.5 KB)

enxd03745b8f2f3 Link encap:Ethernet  HWaddr d0:37:45:b8:f2:f3
          inet addr:172.16.11.1  Bcast:0.0.0.0  Mask:255.255.255.0
          inet6 addr: fe80::d237:45ff:feb8:f2f3/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:298 errors:0 dropped:0 overruns:0 frame:0
          TX packets:208 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:43172 (43.1 KB)  TX bytes:33018 (33.0 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128  Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:367 errors:0 dropped:0 overruns:0 frame:0
          TX packets:367 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:27961 (27.9 KB)  TX bytes:27961 (27.9 KB)

```

Step 3: Assign the IP address to R2.

\$ sudo ip addr add 172.16.11.201/24 dev eth2

\$ sudo ip addr add 172.16.12.1/24 dev eth1

\$ ifconfig

```

student@CSELAB:~$ ifconfig
enp2s0    Link encap:Ethernet  HWaddr b8:ae:ed:a5:a5:b9
          inet addr:172.16.12.1  Bcast:172.16.12.255  Mask:255.255.255.0
          inet6 addr: fe80::e06d:a6e0:e80e:2053/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:19590 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1394 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2646988 (2.6 MB)  TX bytes:159130 (159.1 KB)

enxd03745b8f18d Link encap:Ethernet  HWaddr d0:37:45:b8:f1:8d
          inet addr:172.16.11.201  Bcast:172.16.11.255  Mask:255.255.255.0
          inet6 addr: fe80::2f4b:152f:3a88:6d7d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:261 errors:0 dropped:0 overruns:0 frame:0
          TX packets:373 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:37811 (37.8 KB)  TX bytes:58286 (58.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:387 errors:0 dropped:0 overruns:0 frame:0
          TX packets:387 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:29427 (29.4 KB)  TX bytes:29427 (29.4 KB)

```

Step 4: Assign the IP address to the Hd.

\$ sudo ip addr add 172.16.12.201/24 dev eth1

\$ ifconfig

```

student@CSELAB:~$ ifconfig
enp2s0    Link encap:Ethernet  HWaddr b8:ae:ed:35:c1:dc
          inet addr:172.16.12.201  Bcast:172.16.12.255  Mask:255.255.255.0
          inet6 addr: fe80::6702:7146:7342:f35d/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:19069 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1496 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2740366 (2.7 MB)  TX bytes:174780 (174.7 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:432 errors:0 dropped:0 overruns:0 frame:0
          TX packets:432 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:34037 (34.0 KB)  TX bytes:34037 (34.0 KB)

```

Disabling accepting the ICMP redirect packets :-

```

student@CSELAB:~$ sudo sysctl -w net.ipv4.conf.all.accept_redirects=0
[sudo] password for student:
net.ipv4.conf.all.accept_redirects = 0

```


Disabling sending of the ICMP redirect packets by these routers with aliased interfaces :-

```
student@CSELAB:~$ sudo sysctl -w net.ipv4.conf.all.send_redirects=0
net.ipv4.conf.all.send_redirects = 0
```

Task 2: Convert the machines B and C into routers.

To check if IP forwarding is enabled or not.

\$ sysctl net.ipv4.ip_forward

```
student@CSELAB:~$ sysctl net.ipv4.ip_forward
net.ipv4.ip_forward = 0
```

Setting the value of net.ipv4.ip_forward.

\$ sudo sysctl -w net.ipv4.ip_forward=1

```
student@CSELAB:~$ sudo sysctl -w net.ipv4.ip_forward=1
net.ipv4.ip_forward = 1
```

Task 3: Verify the connection between Ha and Hd using ping command.

At Ha: \$ ping 172.16.10.1 (Local network)

```
student@CSELAB:~$ 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=0.630 ms
64 bytes from 172.16.10.1: icmp_seq=2 ttl=62 time=0.799 ms
^C
--- 172.16.10.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 999ms
rtt min/avg/max/mdev = 0.630/0.714/0.799/0.088 ms
```

At Hd: \$ ping 172.16.12.1 (Local network)

```
student@CSELAB:~$ 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=0.194 ms
64 bytes from 172.16.12.1: icmp_seq=2 ttl=64 time=0.226 ms
^C
--- 172.16.12.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 999ms
rtt min/avg/max/mdev = 0.194/0.210/0.226/0.016 ms
```

Task 4: Insert routing table entries on each system to direct ipv4 packets to ping across the networks.

At Ha:

```
$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
```

```
$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
```

```
$ ip route show
```

```
student@CSELAB:~$ sudo ip route add 172.16.12.0/24 via 172.16.10.201
student@CSELAB:~$ sudo ip route add 172.16.11.0/24 via 172.16.10.201
student@CSELAB:~$ ip route show
169.254.0.0/16 dev enp2s0 scope link metric 1000
172.16.10.0/24 dev enp2s0 proto kernel scope link src 172.16.10.1
172.16.11.0/24 via 172.16.10.201 dev enp2s0
172.16.12.0/24 via 172.16.10.201 dev enp2s0
```

At R1:

```
$ sudo ip route add 172.16.12.0/24 via 172.16.11.201
```

```
$ ip route show
```

```
student@CSELAB:~$ sudo ip route add 172.16.12.0/24 via 172.16.11.201
student@CSELAB:~$ ip route show
169.254.0.0/16 dev enp2s0 scope link metric 1000
172.16.10.0/24 dev enp2s0 proto kernel scope link src 172.16.10.201
172.16.11.0/24 dev enxd03745b8f2f3 proto kernel scope link src 172.16.11.1 metric 100
172.16.12.0/24 via 172.16.11.201 dev enxd03745b8f2f3
```

At R2:

```
$ sudo ip route add 172.16.10.0/24 via 172.16.11.1
```

```
$ ip route show
```

```
student@CSELAB:~$ sudo ip route add 172.16.10.0 via 172.16.11.1
student@CSELAB:~$ ip route show
169.254.0.0/16 dev enp2s0 scope link metric 1000
172.16.10.0 via 172.16.11.1 dev enxd03745b8f18d
172.16.11.0/24 dev enxd03745b8f18d proto kernel scope link src 172.16.11.201 metric 100
172.16.12.0/24 dev enp2s0 proto kernel scope link src 172.16.12.1 metric 100
```

At Hd:

```
$ sudo ip route add 172.16.10.0/24 via 172.16.12.1
```

```
$ sudo ip route add 172.16.11.0/24 via 172.16.12.1
```

```
$ ip route show
```

```
student@CSELAB:~$ sudo ip route add 172.16.10.0/24 via 172.16.12.1
[sudo] password for student:
student@CSELAB:~$ sudo ip route add 172.16.11.0/24 via 172.16.12.1
student@CSELAB:~$ ip route show
169.254.0.0/16 dev enp2s0 scope link metric 1000
172.16.10.0/24 via 172.16.12.1 dev enp2s0
172.16.11.0/24 via 172.16.12.1 dev enp2s0
172.16.12.0/24 dev enp2s0 proto kernel scope link src 172.16.12.201 metric 100
student@CSELAB:~$
```

Task 5: After adding routing table entries again verify the connection from Ha and Hd using ping command.

Step 1: Testing path from Ha and Hd

\$ ping 172.16.12.1 and \$ ping 172.16.12.201

```
student@CSELAB:~$ 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=63 time=0.568 ms
64 bytes from 172.16.12.1: icmp_seq=2 ttl=63 time=0.591 ms
64 bytes from 172.16.12.1: icmp_seq=3 ttl=63 time=0.634 ms
64 bytes from 172.16.12.1: icmp_seq=4 ttl=63 time=0.571 ms
^C
--- 172.16.12.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2998ms
rtt min/avg/max/mdev = 0.568/0.591/0.634/0.026 ms
student@CSELAB:~$ 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=0.900 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=62 time=0.802 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=62 time=0.840 ms
64 bytes from 172.16.12.201: icmp_seq=4 ttl=62 time=0.833 ms
64 bytes from 172.16.12.201: icmp_seq=5 ttl=62 time=0.853 ms
^C
--- 172.16.12.201 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.802/0.845/0.900/0.045 ms
```

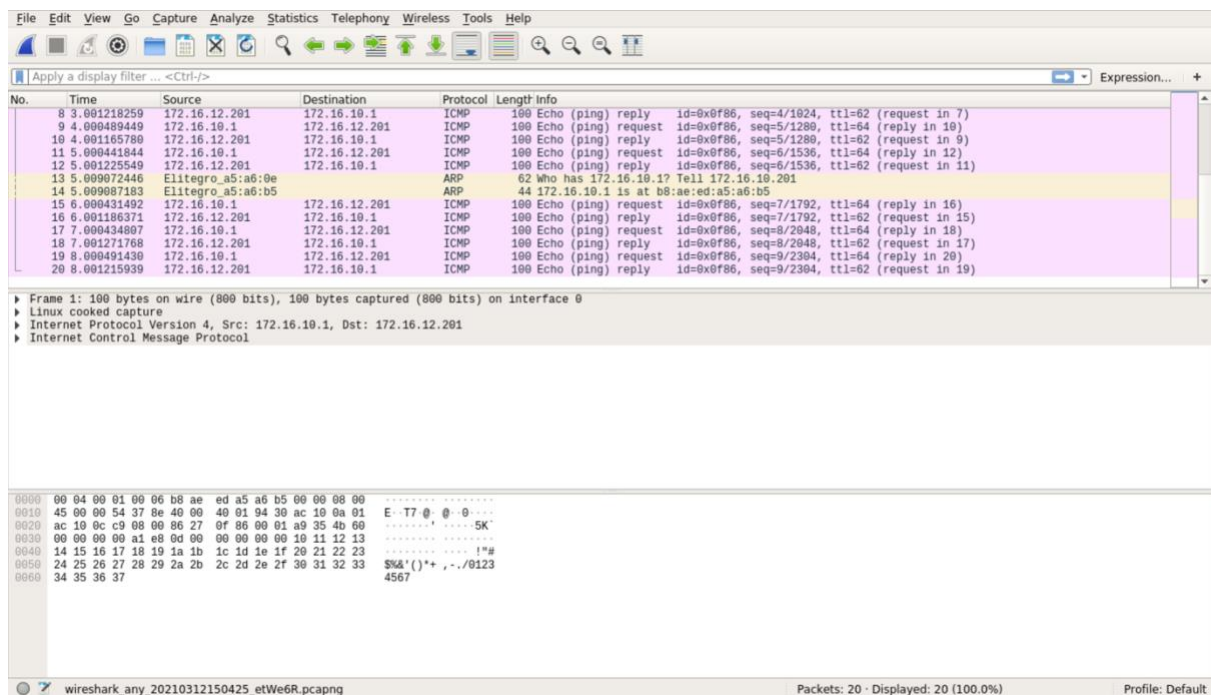
Step 2: Testing path from Hd and Ha

\$ ping 172.16.12.1 and \$ ping 172.16.12.201

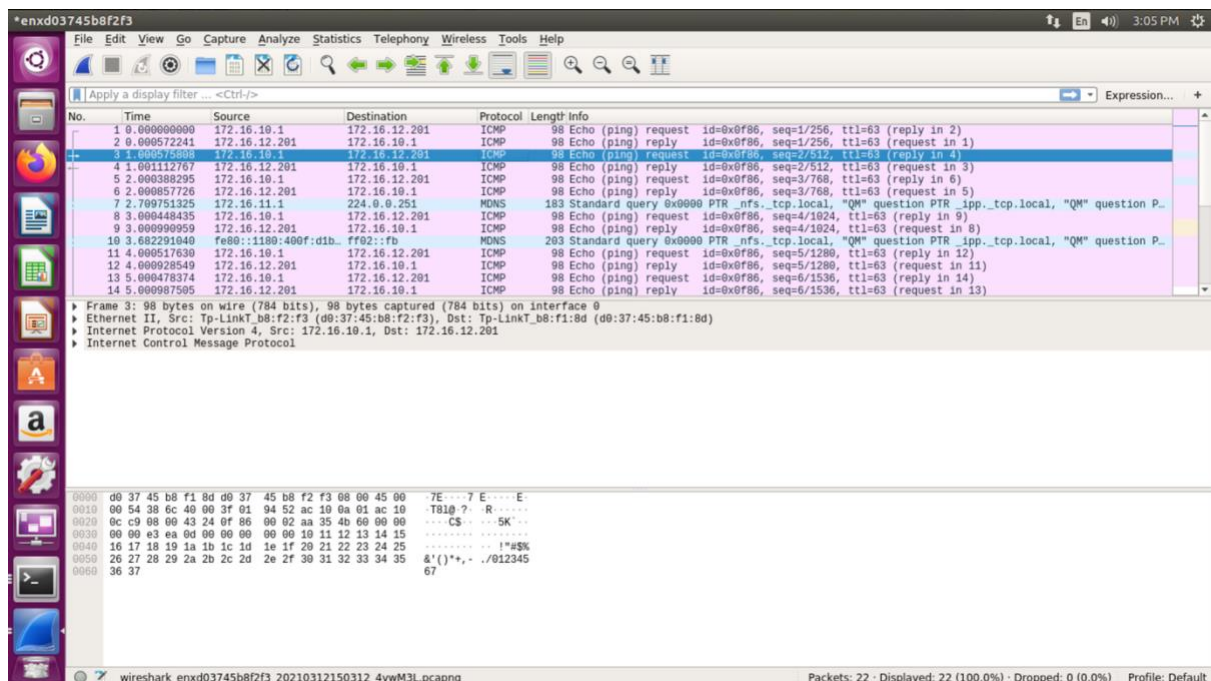
```
student@CSELAB:~$ ping 172.16.12.1
PING 172.16.12.1 (172.16.12.1) 56(84) bytes of data.
64 bytes from 172.16.12.1: icmp_seq=1 ttl=64 time=0.194 ms
64 bytes from 172.16.12.1: icmp_seq=2 ttl=64 time=0.226 ms
^C
--- 172.16.12.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 999ms
rtt min/avg/max/mdev = 0.194/0.210/0.226/0.016 ms
student@CSELAB:~$ 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=0.900 ms
64 bytes from 172.16.12.201: icmp_seq=2 ttl=62 time=0.802 ms
64 bytes from 172.16.12.201: icmp_seq=3 ttl=62 time=0.840 ms
64 bytes from 172.16.12.201: icmp_seq=4 ttl=62 time=0.833 ms
64 bytes from 172.16.12.201: icmp_seq=5 ttl=62 time=0.853 ms
^C
--- 172.16.12.201 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3999ms
rtt min/avg/max/mdev = 0.802/0.845/0.900/0.045 ms
```

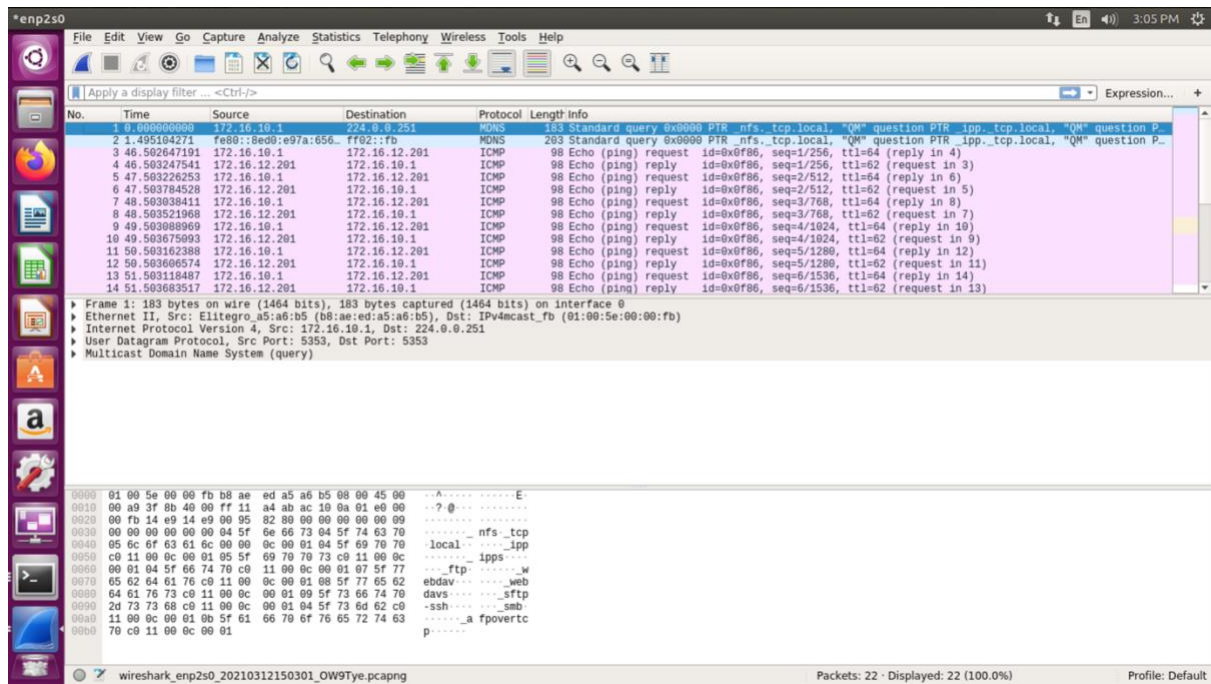
Task 7: Capture packets from Ha and Hb using Wireshark tool.

Step 1: Capture packets from Ha and Hd.

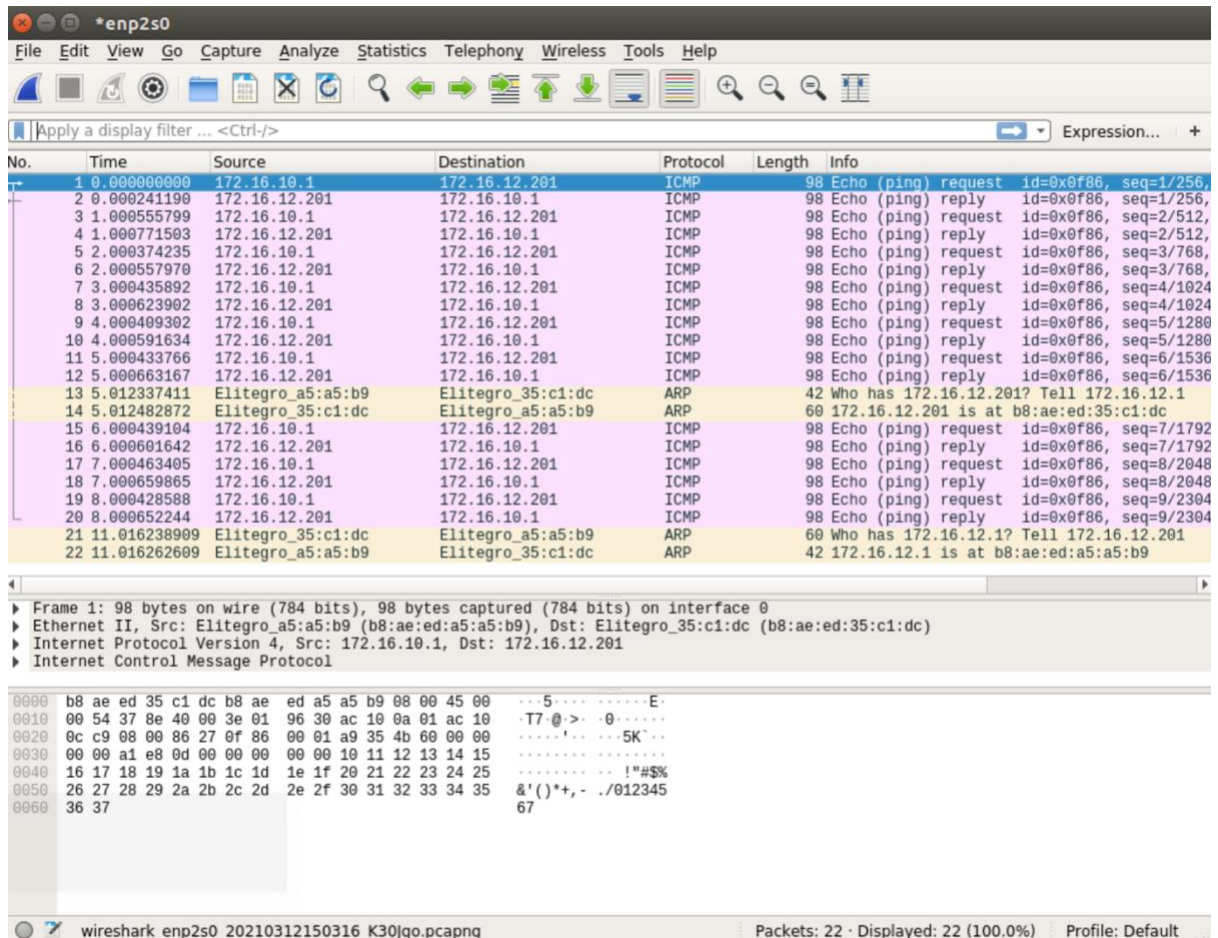


Step 2: Capture packets from R1 using both interfaces.





Step 3: Capture packets from R2 using both interfaces.



Wireshark interface showing a packet capture file named *enxd03745b8f18d. The interface includes a menu bar (File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, Help) and a toolbar with various icons for file operations, capture, analysis, and display.

The main display area shows a list of captured packets with columns: No., Time, Source, Destination, Protocol, Length, and Info. The packets are filtered by the expression "Apply a display filter ... <Ctrl-/>".

No.	Time	Source	Destination	Protocol	Length	Info
5	2.000376023	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
6	2.000609282	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
7	2.709732113	172.16.11.1	224.0.0.251	MDNS	183	Standard query 0x0000 PTR _nfs._tcp.
8	3.000437706	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
9	3.000674077	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
10	3.682253278	fe80::1180:400f:d1bb:3...	ff02::fb	MDNS	203	Standard query 0x0000 PTR _nfs._tcp.
11	4.000420737	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
12	4.000622754	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
13	5.000445296	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
14	5.000704762	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
15	5.008862653	Tp-LinkT_b8:f2:f3	Tp-LinkT_b8:f1:8d	ARP	60	Who has 172.16.11.201? Tell 172.16.1
16	5.008884501	Tp-LinkT_b8:f1:8d	Tp-LinkT_b8:f2:f3	ARP	42	172.16.11.201 is at d0:37:45:b8:f1:8
17	6.000450058	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
18	6.000648300	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
19	7.000467820	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
20	7.000709291	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
21	8.000442539	172.16.10.1	172.16.12.201	ICMP	98	Echo (ping) request id=0x0f86, seq=
22	8.000691519	172.16.12.201	172.16.10.1	ICMP	98	Echo (ping) reply id=0x0f86, seq=
23	11.012374124	Tp-LinkT_b8:f1:8d	Tp-LinkT_b8:f2:f3	ARP	42	Who has 172.16.11.1? Tell 172.16.11.
24	11.012605754	Tp-LinkT_b8:f2:f3	Tp-LinkT_b8:f1:8d	ARP	60	172.16.11.1 is at d0:37:45:b8:f2:f3

The packet details pane shows the selected packet (No. 15) with the following structure:

- Frame 1: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface 0
- Ethernet II, Src: Tp-LinkT_b8:f2:f3 (d0:37:45:b8:f2:f3), Dst: Tp-LinkT_b8:f1:8d (d0:37:45:b8:f1:8d)
- Internet Protocol Version 4, Src: 172.16.10.1, Dst: 172.16.12.201
- Internet Control Message Protocol

The packet bytes pane shows the raw data in hexadecimal and ASCII format:

```

0000 d0 37 45 b8 f1 8d d0 37 45 b8 f2 f3 08 00 45 00 7E...7 E....E
0010 00 54 37 8e 40 00 3f 01 95 30 ac 10 0a 01 ac 10 T7 @ ? 0.....
0020 0c c9 08 00 86 27 0f 86 00 01 a9 35 4b 60 00 00 .....!...5K'..
0030 00 00 a1 e8 0d 00 00 00 00 00 10 11 12 13 14 15 .....
0040 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25 ..... !"#%$
0050 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 35 &'()*+,-./012345
0060 36 37 67

```

The status bar at the bottom indicates: Packets: 24 · Displayed: 24 (100.0%) · Profile: Default

Step 4: Capture packets from Hd and Ha.

The screenshot shows the Wireshark network protocol analyzer interface. The main pane displays a list of captured packets. The first 22 packets are ICMP Echo (ping) requests and replies between 172.16.10.1 and 172.16.12.201. The packet list pane shows the following details:

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=1/256, ttl=62 (r...
2	0.000041947	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=1/256, ttl=64 (r...
3	1.0000543730	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=2/512, ttl=62 (r...
4	1.0000573242	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=2/512, ttl=64 (r...
5	2.000335697	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=3/768, ttl=62 (r...
6	2.000352581	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=3/768, ttl=64 (r...
7	3.000387607	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=4/1024, ttl=62 (r...
8	3.000405858	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=4/1024, ttl=64 (r...
9	4.000349389	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=5/1280, ttl=62 (r...
10	4.000365420	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=5/1280, ttl=62 (r...
11	5.000377154	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=6/1536, ttl=62 (r...
12	5.000415187	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=6/1536, ttl=64 (r...
13	5.012247046	Elitegro_a5:a5:b9		ARP	62	Who has 172.16.12.201? Tell 172.16.12.1
14	5.012280138	Elitegro_35:c1:dc		ARP	44	172.16.12.201 is at b8:ae:ed:35:c1:dc
15	6.000356397	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=7/1792, ttl=62 (r...
16	6.000374121	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=7/1792, ttl=64 (r...
17	7.000381833	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=8/2048, ttl=62 (r...
18	7.000404531	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=8/2048, ttl=64 (r...
19	8.000341777	172.16.10.1	172.16.12.201	ICMP	100	Echo (ping) request id=0x0f86, seq=9/2304, ttl=62 (r...
20	8.000379434	172.16.12.201	172.16.10.1	ICMP	100	Echo (ping) reply id=0x0f86, seq=9/2304, ttl=64 (r...
21	11.015895141	Elitegro_35:c1:dc		ARP	44	Who has 172.16.12.1? Tell 172.16.12.201
22	11.016080133	Elitegro_a5:a5:b9		ARP	62	172.16.12.1 is at b8:ae:ed:a5:a5:b9

The packet details pane shows the following information for the selected packet (No. 1):

- Frame 1: 100 bytes on wire (800 bits), 100 bytes captured (800 bits) on interface 0
- Linux cooked capture
- Internet Protocol Version 4, Src: 172.16.10.1, Dst: 172.16.12.201
- Internet Control Message Protocol

The packet bytes pane shows the raw data in hexadecimal and ASCII:

```
0000 00 00 00 01 00 06 b8 ae ed a5 a5 b9 00 00 08 00 .....
0010 45 00 00 54 37 8e 40 00 3e 01 96 30 ac 10 0a 01 E..T7.0. >...0...
0020 ac 10 0c c9 08 00 86 27 0f 86 00 01 a9 35 4b 60 .....5K'
0030 00 00 00 00 a1 e8 0d 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 $%&'()*+,-./0123
0060 34 35 36 37 4567
```