Faculty of Engineering & Technology

Electrical & Computer Engineering Department

ENCS3320

Project 2 Report

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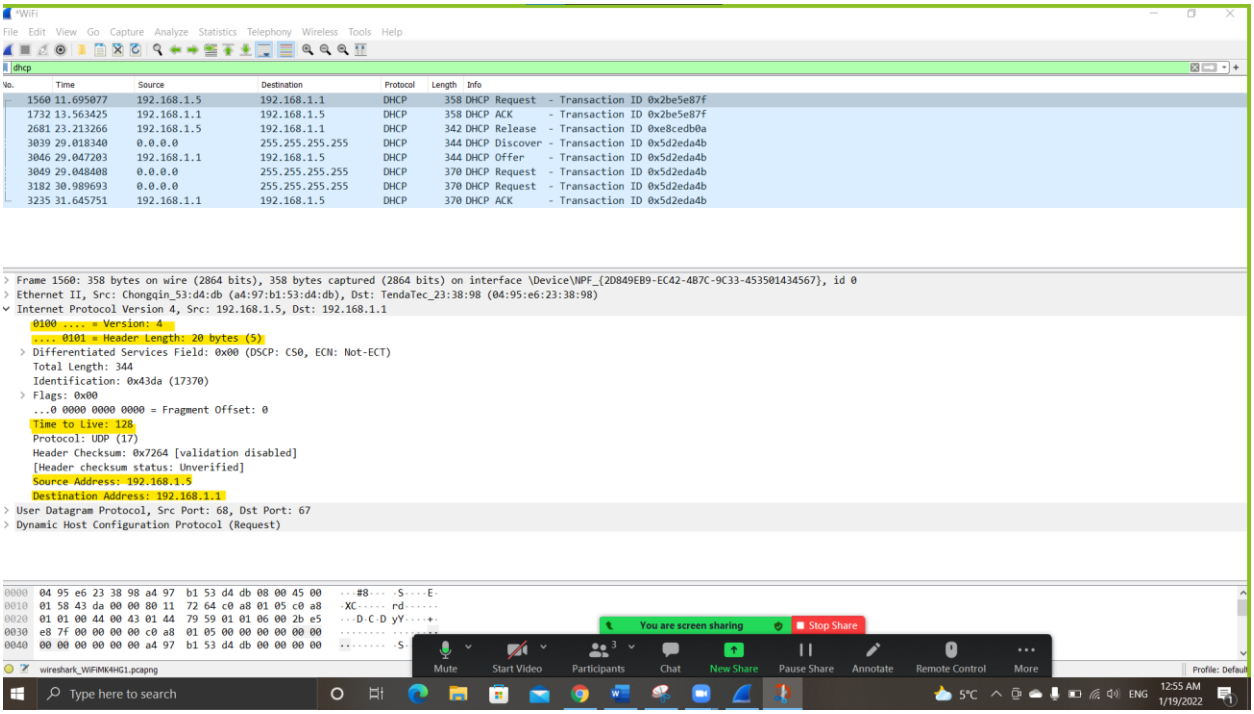
Section#:3

Part 1:

Using Wireshark, capture few DHCP and ICMP packets. Show the packets, write some comments about each picture and explain at least 3 fields of each packet.
Capture a TCP session for transferring a large file, show the sequence number of three packets and the ACK numbers, and conclude the data size on two packets.

Answer:

DHCP:



1. Version: the internet protocol addressing version is IPV4.

2. Header Length: the total length of the header is 20 bytes.

3. Total length of the packets is 344 Bits.

4. TTL: The packet can travel through 128 routers.

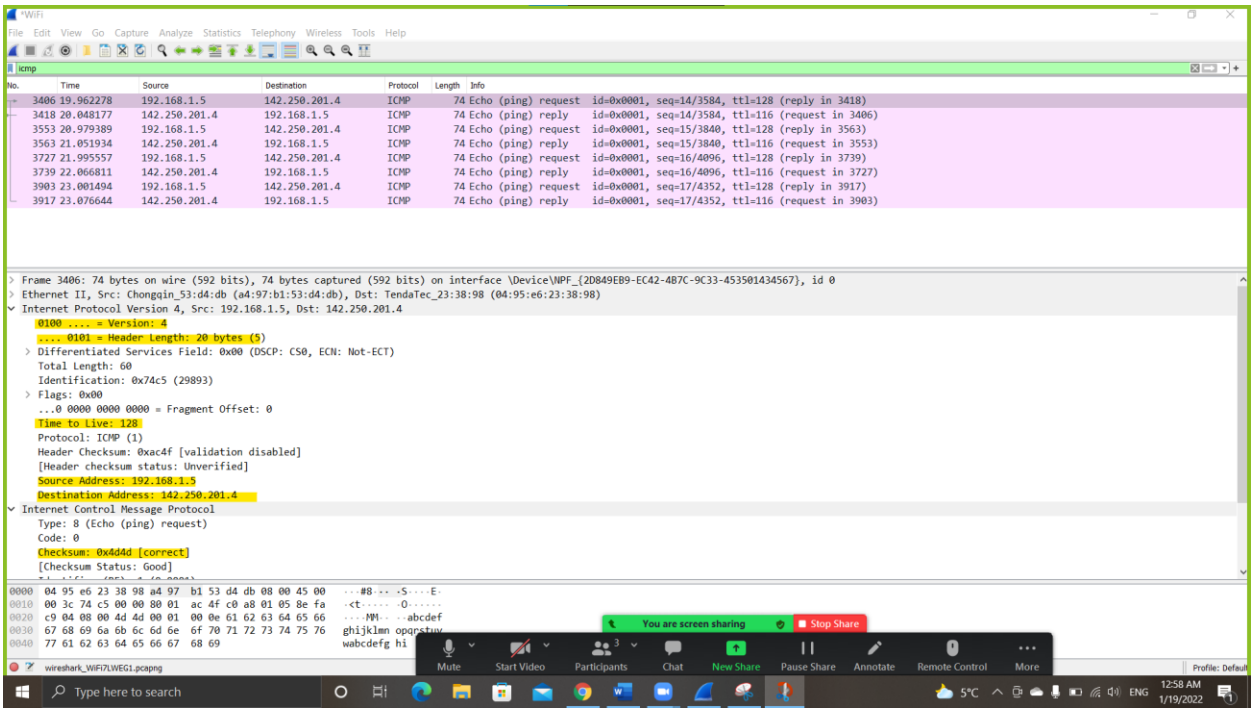
5. Source Address: the local IP address = 0.0.0.0.

6. Destination Address: the IP address of the destination = 255. 255. 255. 255.

7. Source Port: the source port of the packets = 68.

8. Destination Port: the destination port of the packets = 67.

ICMP:



We wrote in CMD the following command: ping www.google.com, to obtain the previous packets.

1. Version: the internet protocol addressing version is IPV4.

2. Header Length: the total length of the header is 20 bytes.

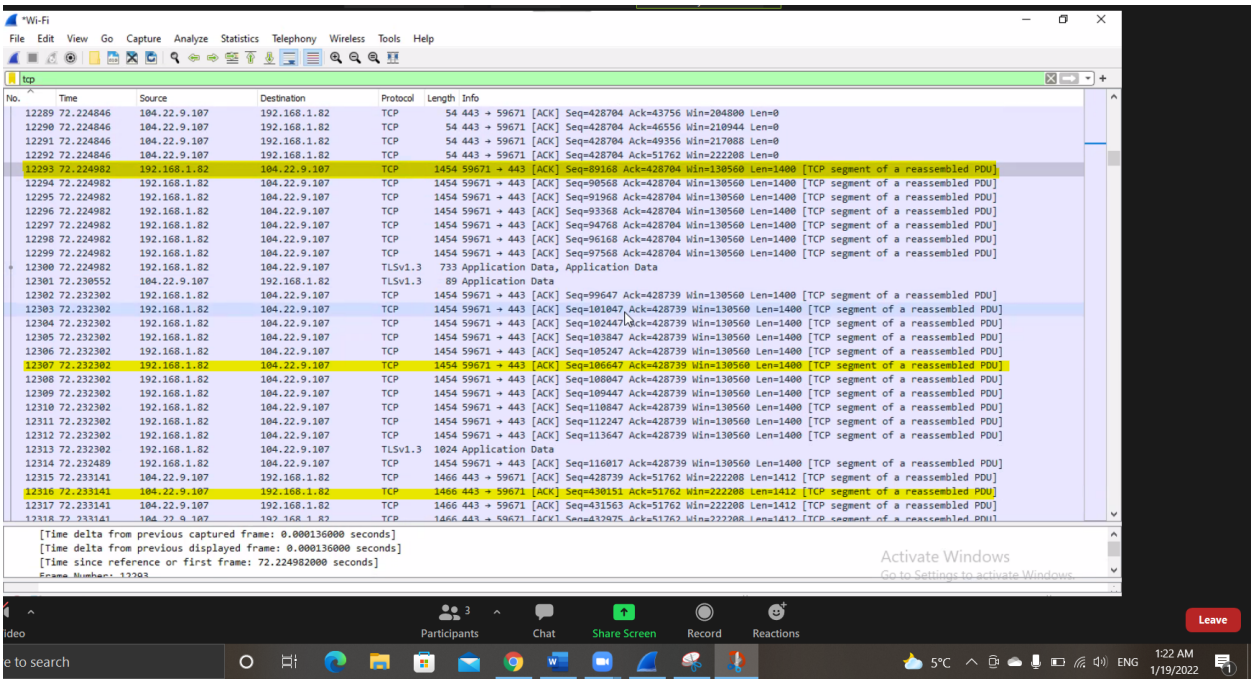
3. TTL: The packet can travel through 128 routers.

4. Source Address: the local IP address of my PC = 192.168.1.5.

5. Destination Address: the IP address of the destination = 142.250.201.4 which is google address.

6. Checksum: 0x4d4d[correct] means that there is no error in the received packets.

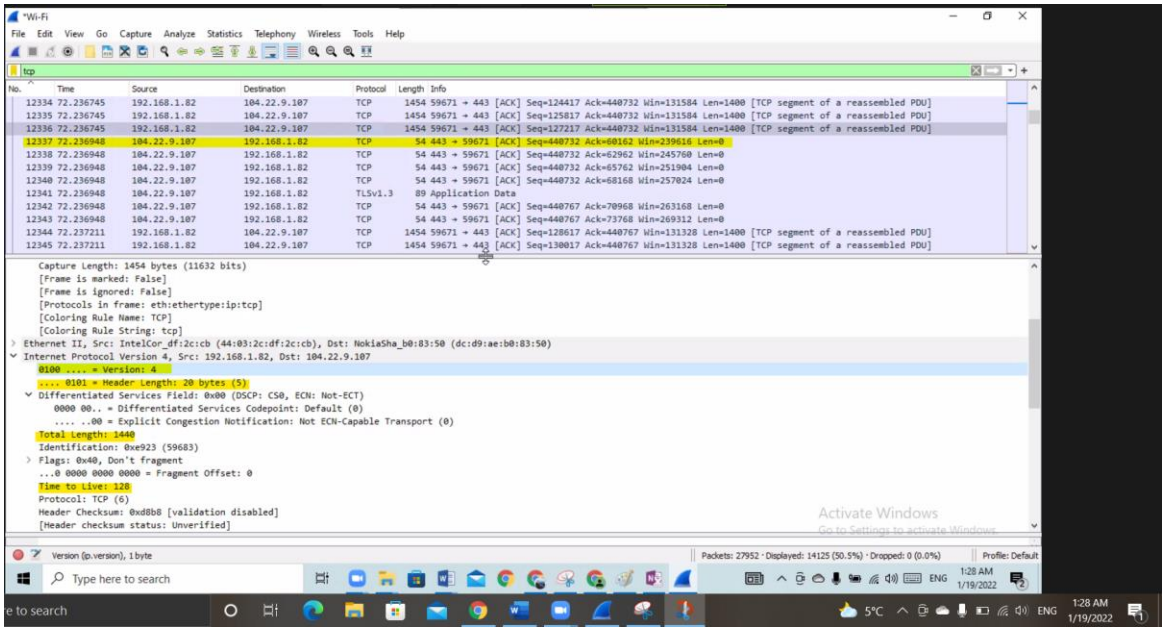
TCP:



Packet 1: No. 12293, Sequence Number: 89168, Ack Number: 428704

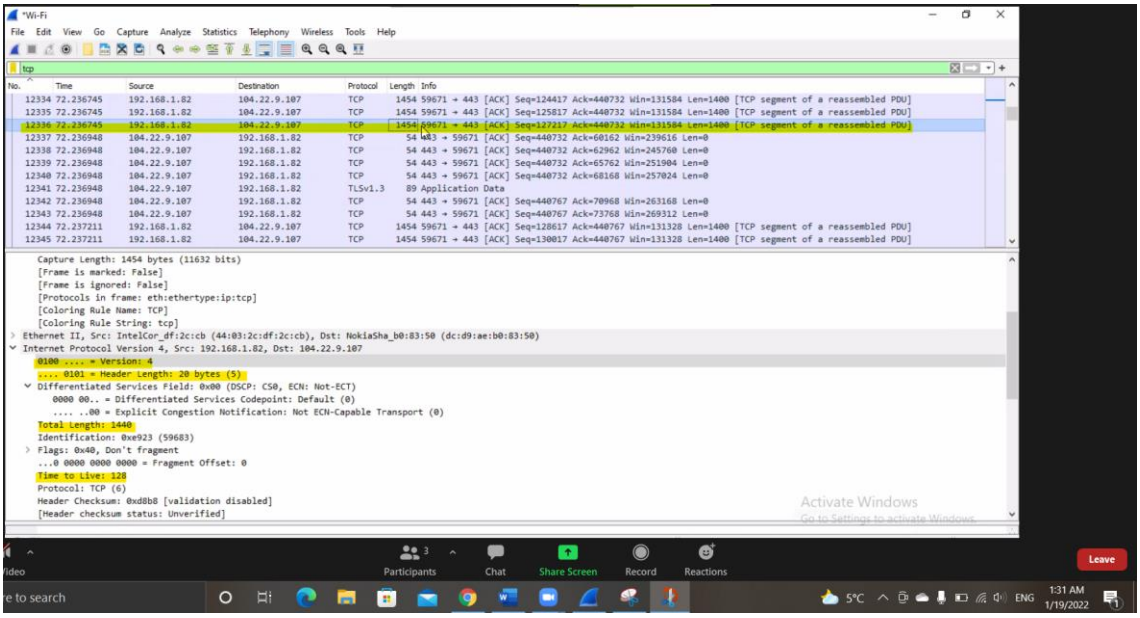
Packet 2: No. 12307, Sequence Number: 106647, Ack Number: 428739

Packet 3: No.12316, Sequence Number: 430151, Ack Number: 51762



The Data Size of first packet:

Data size = Total Length – Header Length = 1440-20 = 1420 bytes



The Data Size of second packet:

Data size = Total Length – Header Length = 40-20 = 20 bytes

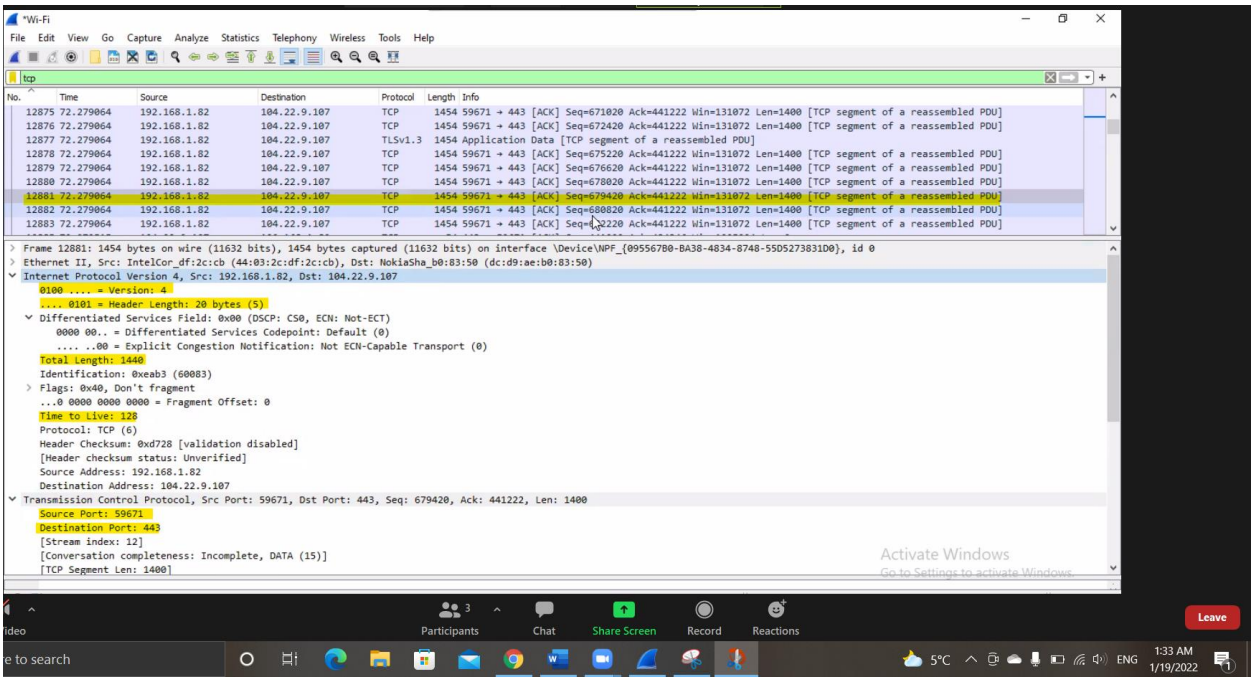
The Information about the file I send to get the packets information:

IP Source: 192.168.1.82

IP Destination: 104.22.9.107 (I check if this IP is correct using nslookup, by the way this IP for www.ritaj.birzeit.edu)

Source Port: 59671

Destination Port: 443



1. Version: the internet protocol addressing version is IPV4.

2. Header Length: the total length of the header is 20 bytes.

3. TTL: The packet can travel through 128 routers.

4. Source Address: the local IP address of my PC = 192.168.1.82.

5. Destination Address: the IP address of the destination = 104.22.9.107

6. Source Port: the source port of the packets = 59671

7. Destination Port: the destination port of the packets = 443.

Part 2:

a. All PCs, Routers and switches in packet tracer:

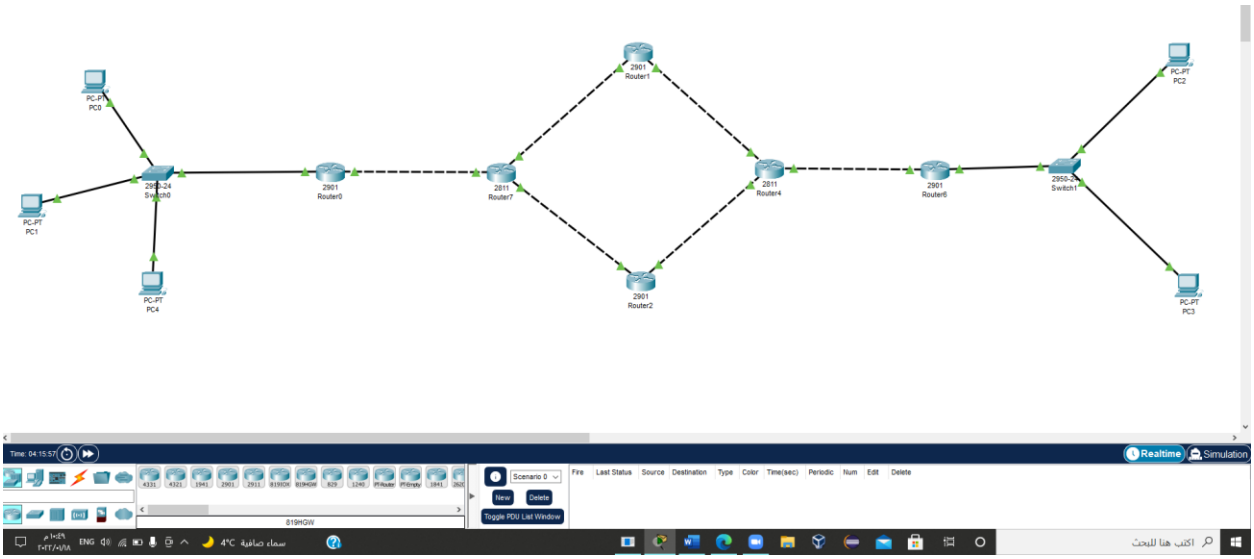


Figure (1): All system in packet tracer

b. IPv6 assigned to PC0 :

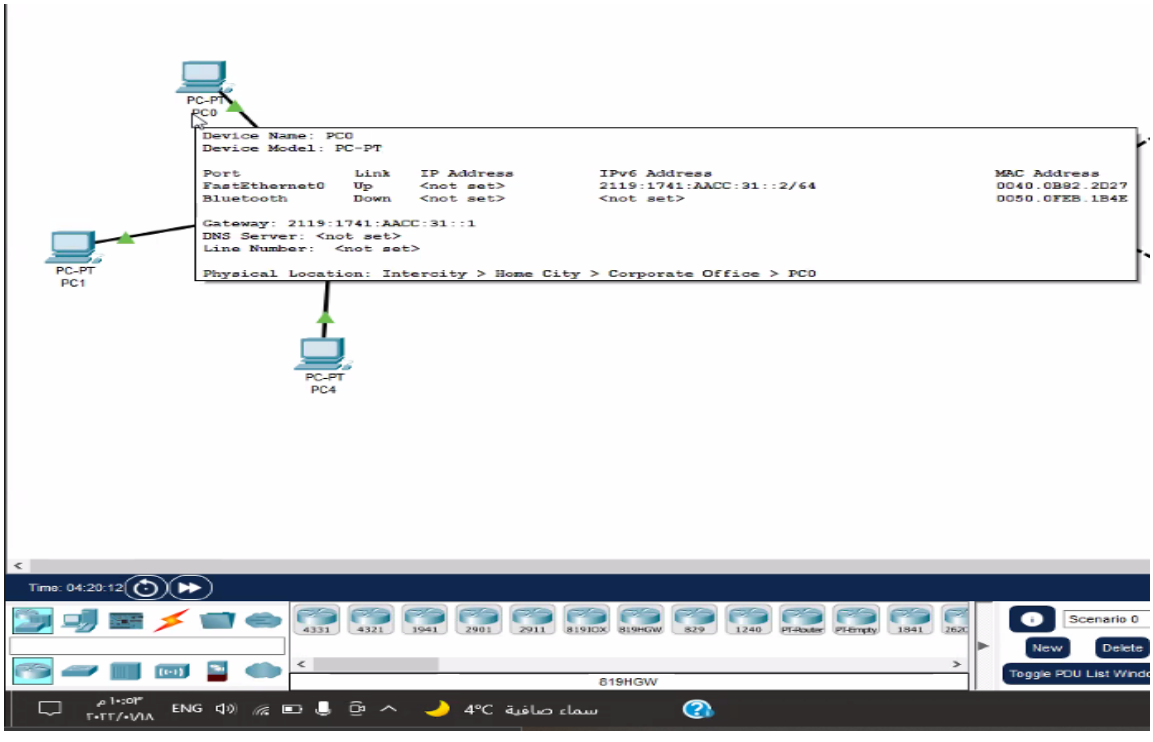


Figure (2): Information's with IPs for PC0

c. IPv6 and IPv4 assigned to Router 0:

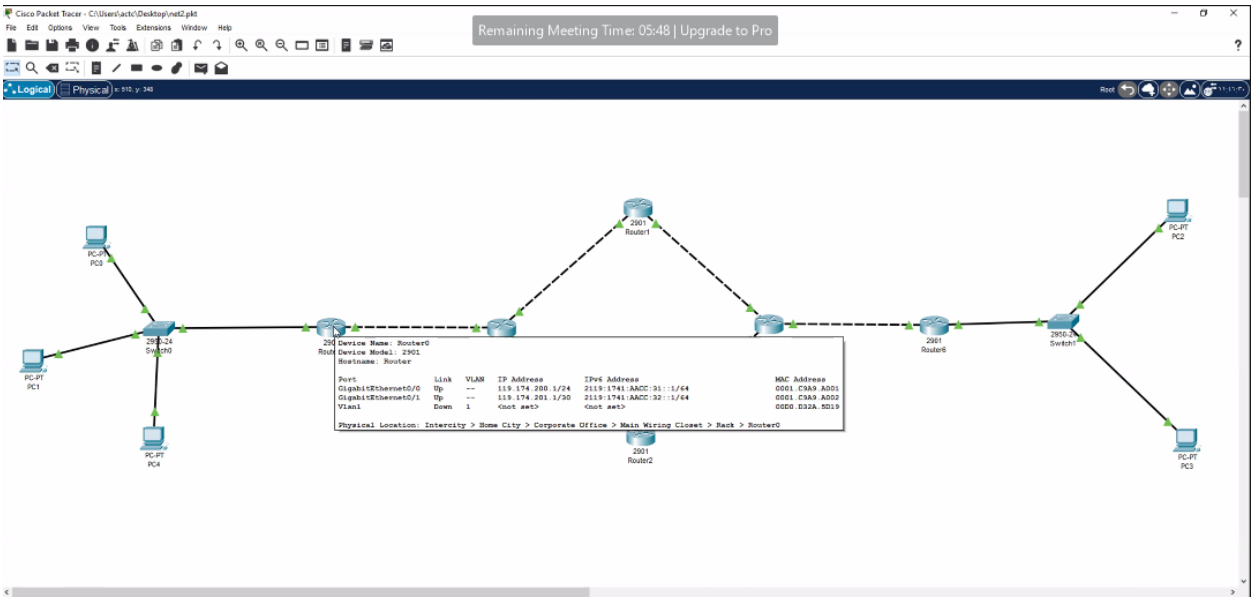


Figure (3): Information's with IPs for R0

d. IPv6 and IPv4 assigned to Router 7:

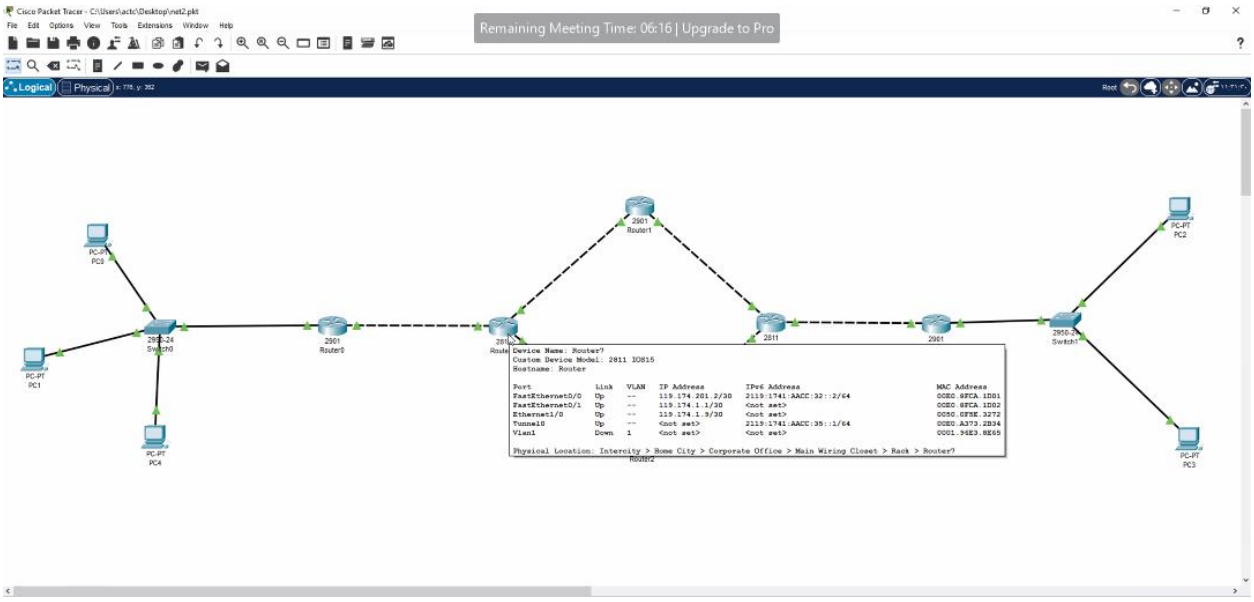


Figure (4): Information's with IPs for R7

e. IPv4 assigned to Router 1:

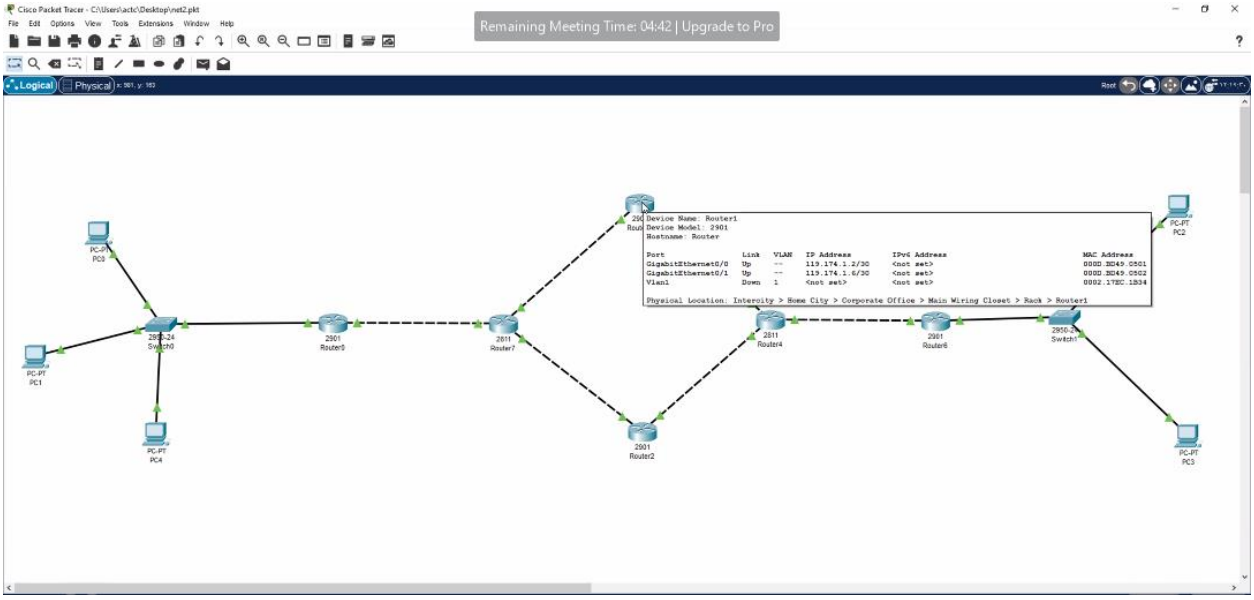


Figure (5): Information's with IPs for R1

f. IPv4 assigned to Router 2:

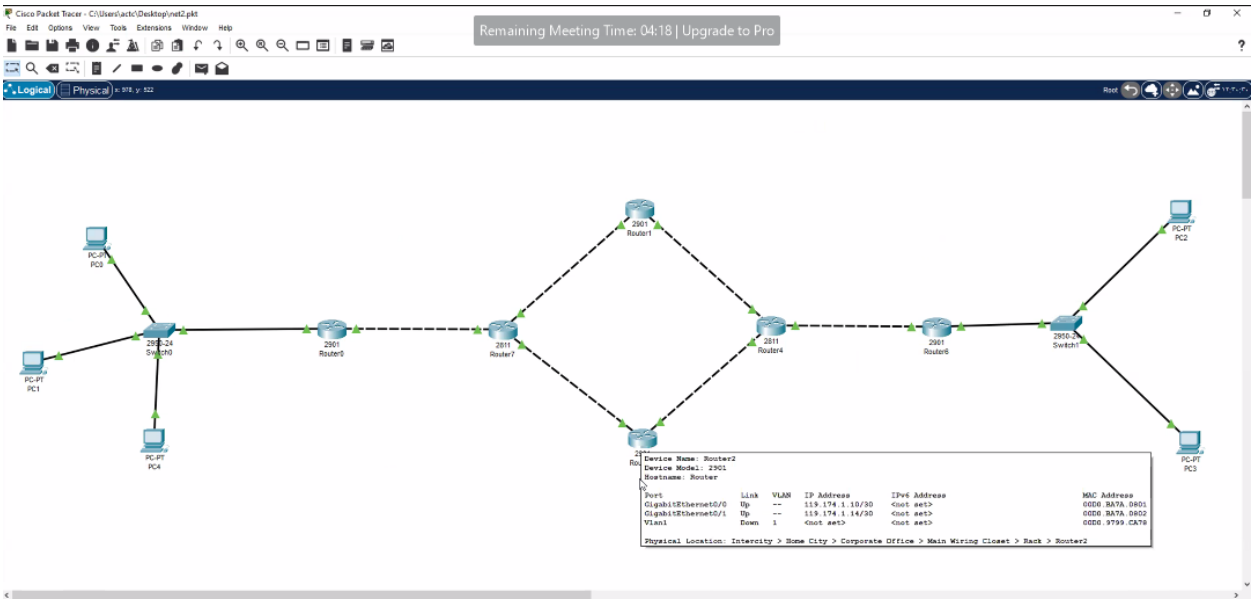


Figure (6): Information's with IPs for R2

g. IPv6 and IPv4 assigned to Router 4:

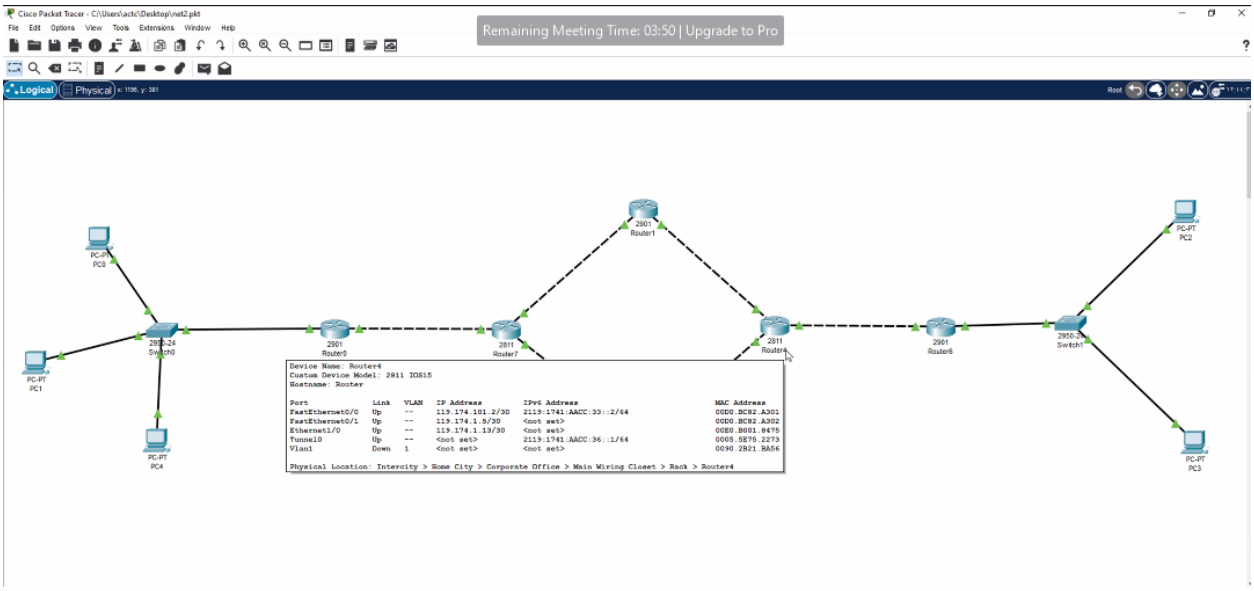


Figure (6): Information's with IPs for R4

h. IPv4 and IPv6 assigned to Router 6:

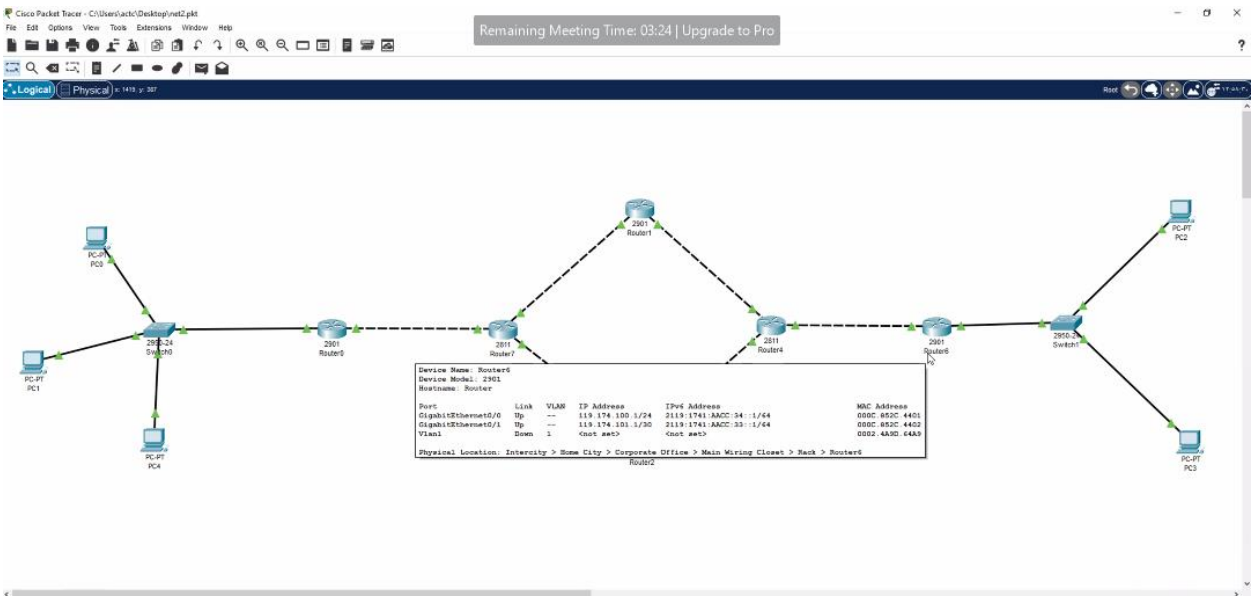


Figure (7): Information's with IPs for R6

i. IPv6 assigned to PC2:

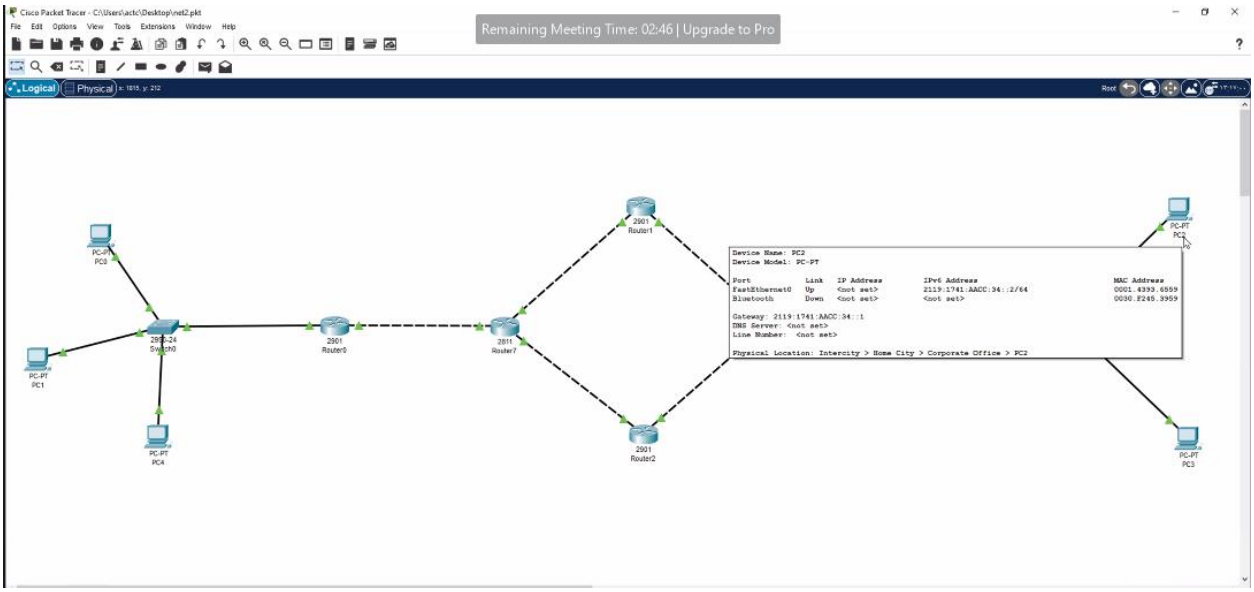


Figure (8): Information's with IPs for PC2

j. IPv4 assigned to PC3

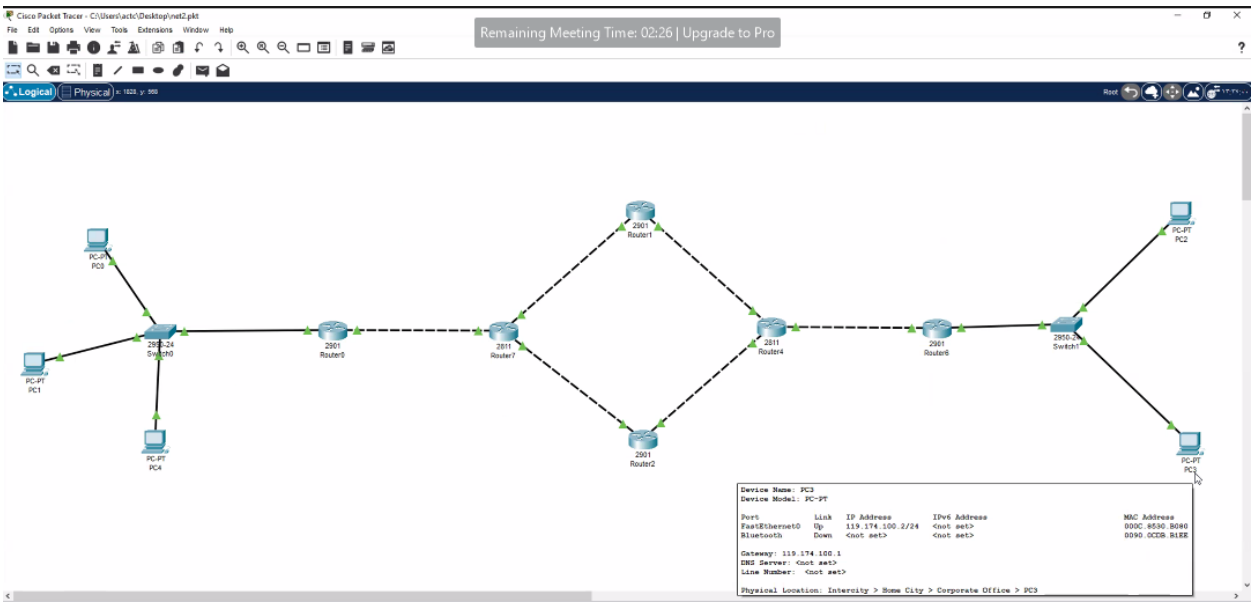


Figure (9): Information's with IPs for PC3

Testing and Ping our whole system:

a. Ping from PC1 to PC4:

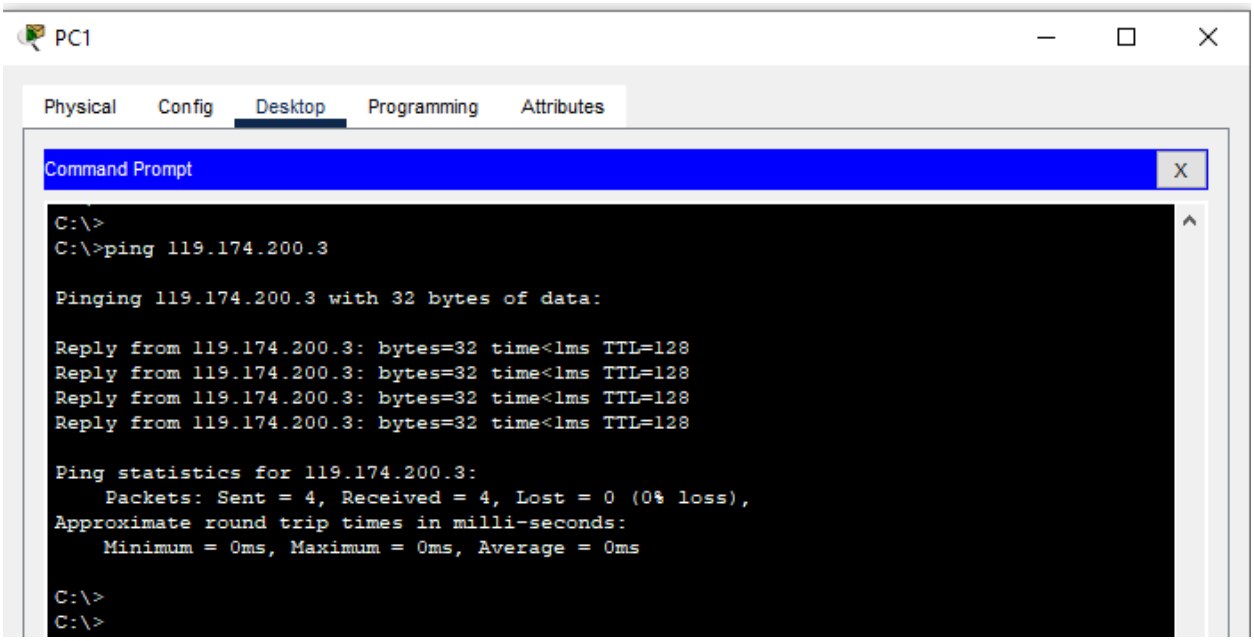


Figure (10): Result of Ping Hosts in the Same Network

b. Ping from PC3 to Router 1 (Interface GigabitEthernet0/0):

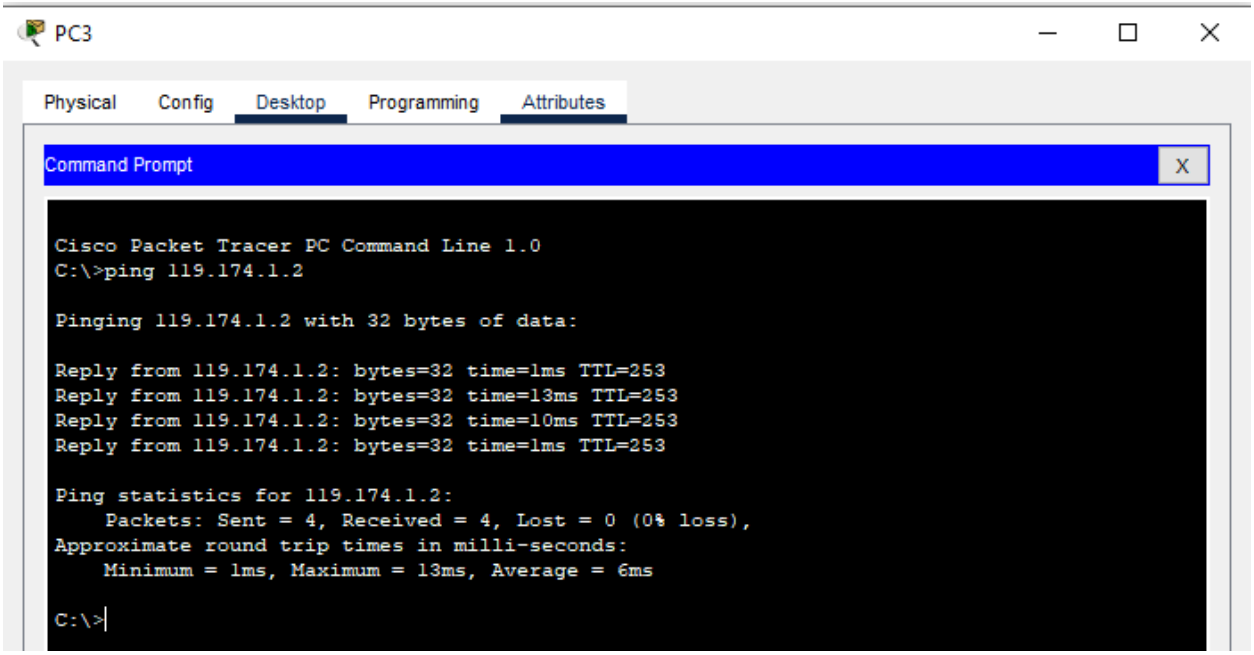


Figure (11): Test1. Result of Ping Router Using IPv4 in the Whole Network

c. Ping from PC4 to Router 4 (FastEthernet0/0):

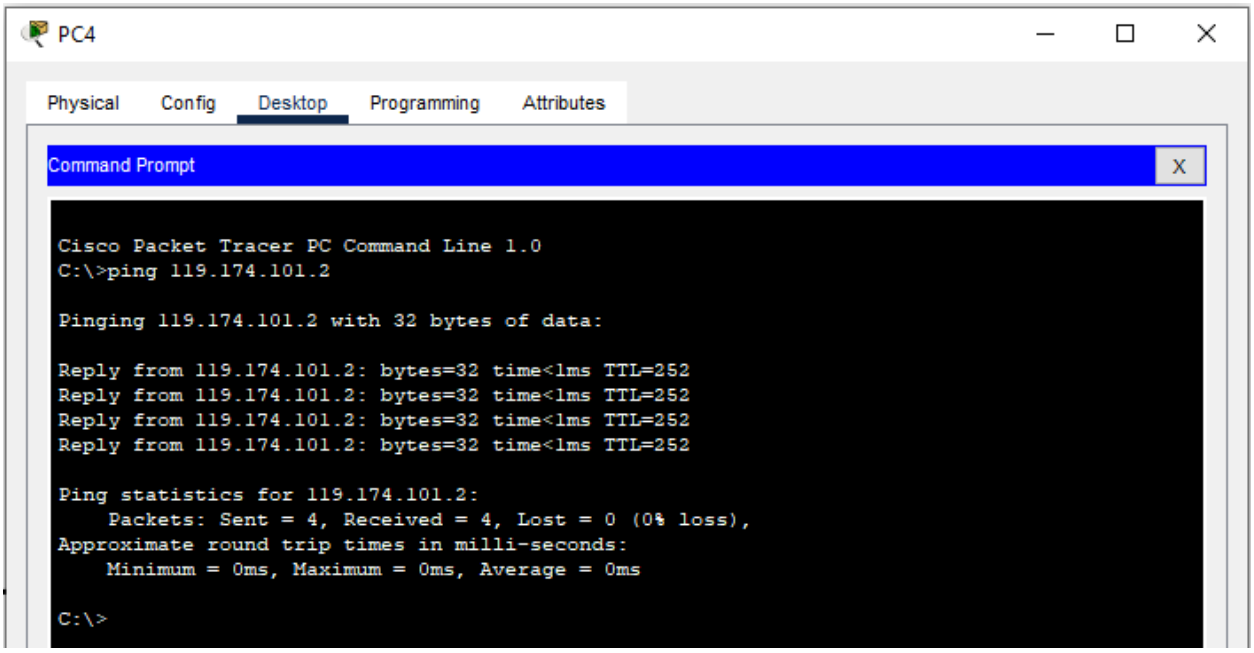


Figure (12): Test2. Result of Ping Router Using IPv4 in the Whole Network

d. Ping From Router 0 to Router 6 (Interface GigabitEthernet0/1) and Ping From Router 0 to Router 6 (Interface GigabitEthernet0/0)

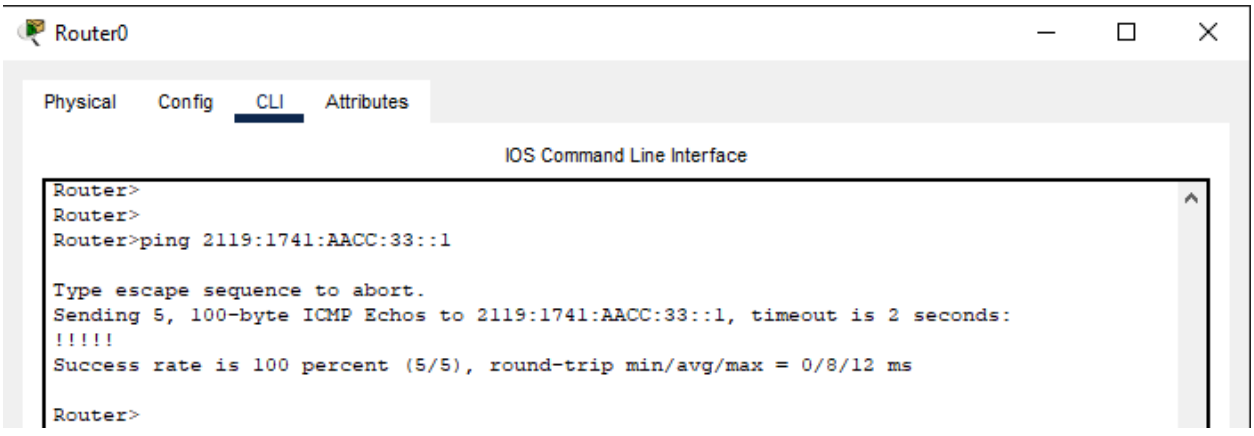


Figure (13): Test1. Ping IPv6 from R0 to interface in R6 (Testing Tunnels)

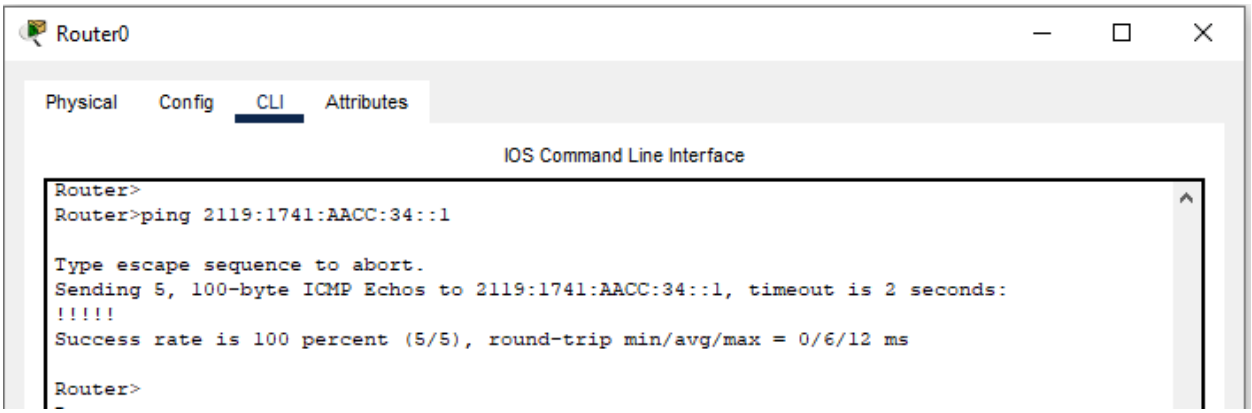


Figure (14): Test2. Ping IPv6 from R0 to interface in R6 (Testing Tunnels)

Explanation about tunnels:

Router 7 and Router 6 both have virgin ipv4 and ipv6 but in the way between them there are only routers that have virgin ipv4, so IPv4 traffic will only pass between them, two tunnel were implemented (IPv6 over IPv4) to allow IPv6 traffic to pass through those routers, the first tunnel from Router 7 to Router 6 and the other from Router 6 to Router 7.

e. Ping From PC0 to PC2:

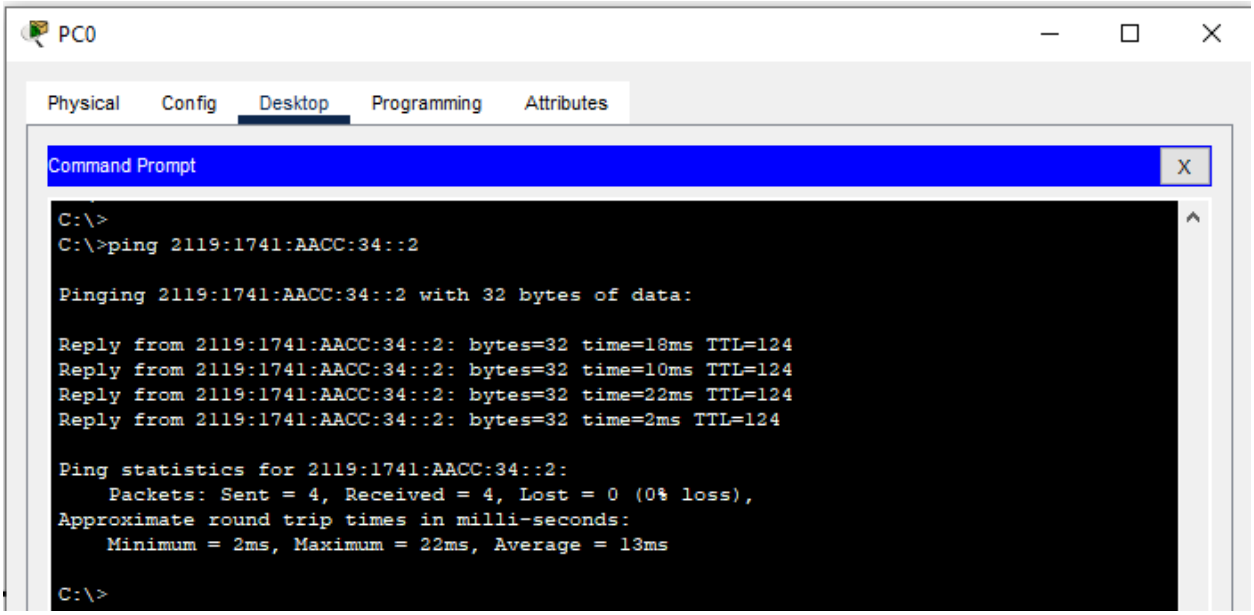


Figure (15): Ping from PC0 (IPv6) to PC2 (IPv6) (Testing Tunnels)

f. Ping From PC1 to PC3:

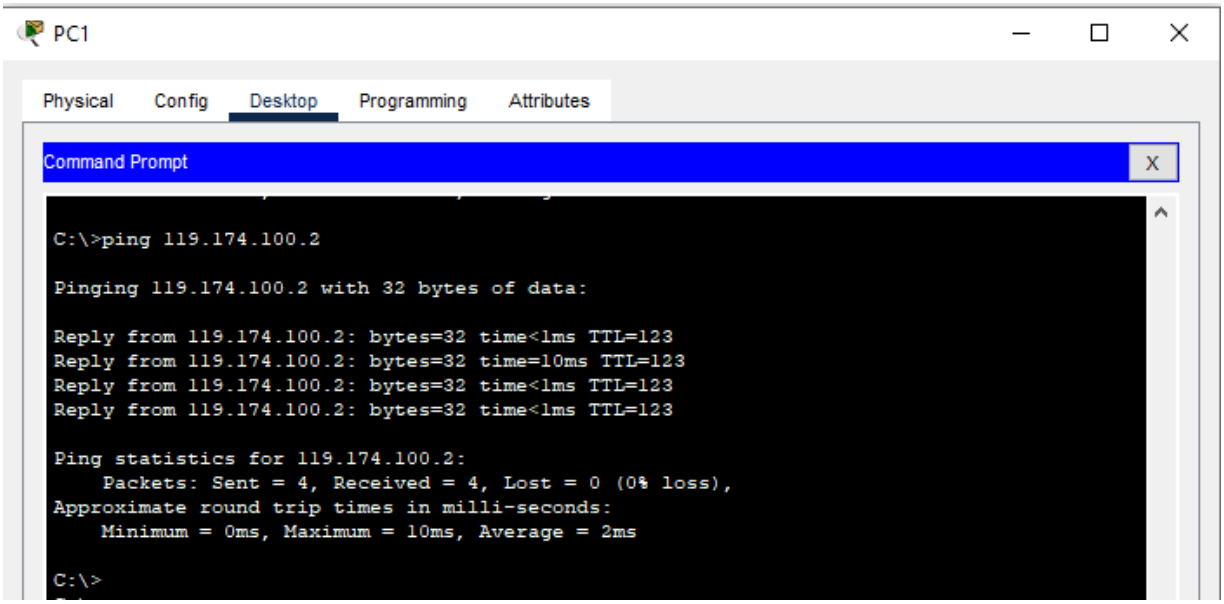


Figure (16): Ping from PC1 (IPv4) to PC3 (IPv4)

g. Ping From PC0 to PC3:

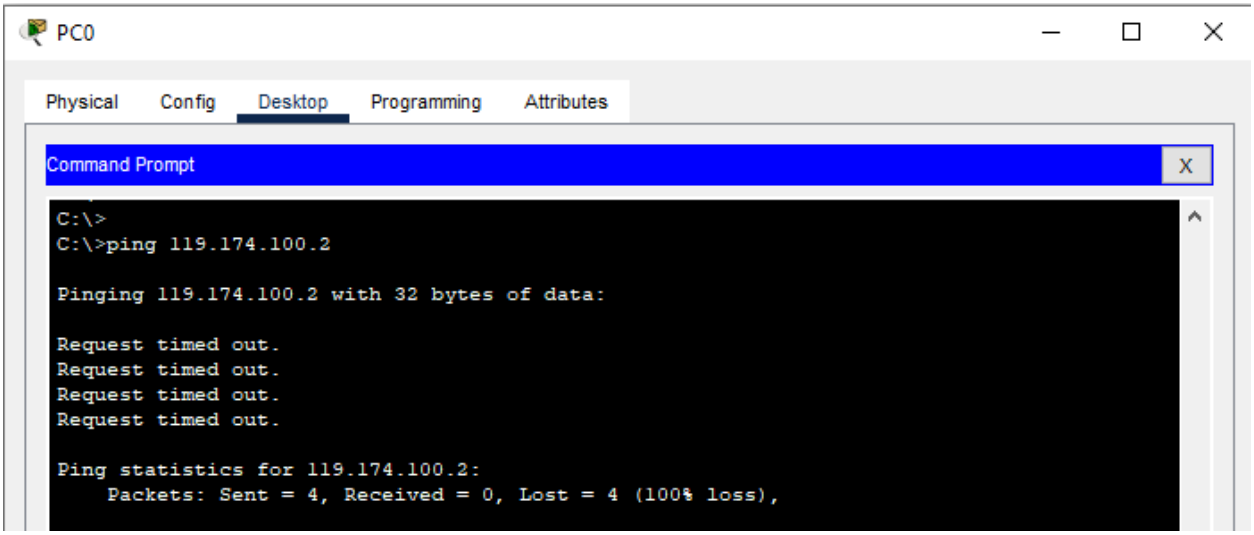


Figure (16): Ping from PC0 (IPv6) to PC3 (IPv4)

The Result was Requested timed out because the versions of the PCs was different and when the version of the internet protocols and there's no packets can send from IPv6 to IPv4 and vice versa.

If we want to send a packet from IPv6 to IPv4 we must use a special tunnel to be connected and hopeful to arrive the packets.