

Network Programming and Advanced Communication Network

Collaborators

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Overview

This network scenario consists of 13 hosts, 5 routers, 4 switches, and 2 servers. The network is configured using RIP and DNS protocols and utilizes Class A, B, and C IP addresses (both classful and classless).

Objectives

- Configure the network using Class A, B, and C IP addresses (both classful and classless).
- Implement RIP and DNS protocols for efficient routing and domain resolution.
- Check the connectivity between PC 0 and Server 0 by displaying the “All the Best” message at PC 0 using a web browser.
- Display the routing table of all routers in the network.
- Configure Ethernet frames in the network and display their configurations.

Tasks

Task 1: Network Topology Design and Configuration

- Design and implement a single topology using Cisco Packet Tracer.
- Configure RIP on the routers for dynamic routing.
- Set up DNS for domain name resolution.
- Assign Class A, B, and C IP addresses to different network segments.

Task 2: Checking Connectivity

- Verify the connection between PC 0 and Server 0.
- Ensure the “All the Best” message is displayed in a web browser on PC 0 when accessing the server.

Task 3: Displaying Routing Tables

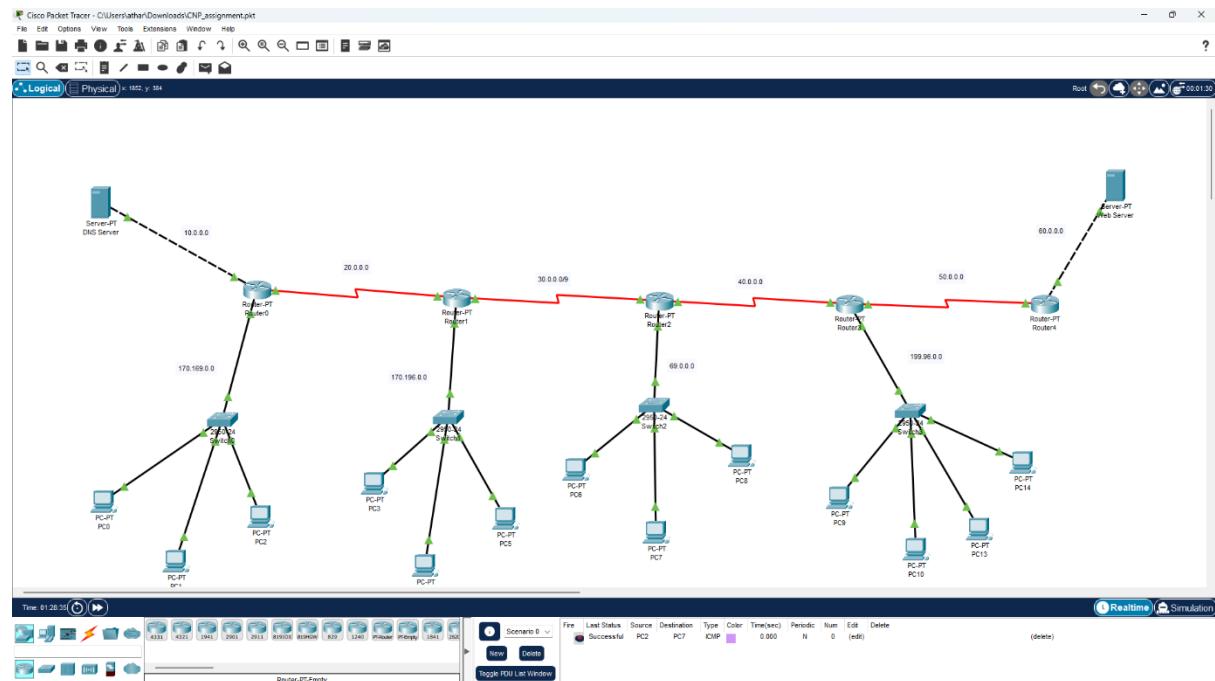
- Display the routing table of all routers.
- Verify the proper propagation of RIP routes.

Task 4: Display the configuration of frame in network

- Display the Ethernet frame configuration in the network.

Results

Network Topology :



Router Configurations

R0

Router 0 configuration	Yashraj Sakund 230953172
Router #	
Router# configuration terminal	
Enter configuration commands , one per line . End with CNTLZ	
Router (config)# interface FastEthernet 0/0	
Router (config-if) # ip address 170.169.0.1 255.255.0.0	
Router (config-if) #	
Router (config-if)# exit	
Router (config-if)# interface FastEthernet 1/0	
Router (config-if) # ip address 10.0.0.2 255.0.0.0	
Router (config-if) #	
Router (config-if) # exit	
Router (config)# interface serial 2/0	
Router (config-if) # ip address 20.0.0.1 255.0.0.0	
Router (config-if) #	
Router (config-if) # exit	
Router (config-if) # router rip	
Router (config-router) # network 10.0.0.0	
Router (config-router) # network 20.0.0.0	
Router (config-router) # network 170.169.0.0	
Router (config-router) # exit	

R1

Yashraj Satunde
230953172

Router 1

Router #

Router # configure terminal

Enter configuration commands, one per line. END with
CTRL/Z

Router(config)# interface fastEthernet 0/0

Router(config-if)# ip address 170.169.0.0 255.255.0.0

Router(config-if)#

Router(config-if)# exit

Router(config)# interface serial 2/0

Router(config-if)# ip address 20.0.0.2 255.0.0.0

Router(config-if)#

Router(config-if)# exit

Router(config-if)# interface serial 3/0

Router(config-if)# ip address 30.0.0.1 255.128.0.0

Router(config-if)#

Router(config-if)# exit

Router(config)# router rip

Router(config-router)# network 20.0.0.0

Router(config-router)# network 30.0.0.0

Router(config-router)# network 170.196.0.0

Router(config-router)# exit.

R2

ROUTER-2

Mayurika S

230953140

Router#configure terminal
Enter configuration commands , one per line.
End with CNTL/Z

Router (config)#interface FastEthernet0/0
Router (config-if)#ip address 69.0.0.1 255.0.0.0
Router (config-if)#
Router (config-if)#exit
Router (config)#interface Serial2/0
Router (config-if)#ip address 30.0.0.2
 255.128.0.0

Router (config-if)#
Router (config-if)#exit
Router (config)#interface Serial3/0
Router (config-if)#ip address 40.0.0.1
 255.0.0.0

Router (config-if)#
Router (config-if)#exit
Router (config)#router rip
Router (config-router)#network 30.0.0.0
Router (config-router)#network 40.0.0.0
Router (config-router)#network 69.0.0.0
Router (config-router)##

R3

Sauthi DV

230953142

Router 3

Router# configure terminal

Enter configuration commands, one per line.

End with CNTL/Z

Router(config)# interface FastEthernet 0/0

Router(config-if)# ip address 199.96.0.1 255.255.255.0

Router(config-if) #

Router(config-if) # exit

Router(config)# interface serial2/0

Router(config-if) # ip address 40.0.0.2 255.0.0.0

Router(config-if) #

Router(config-if) # exit

Router(config)# interface Serial 3/0

Router(config-if) # ip address 50.0.0.2 255.0.0.0

Router(config-if) #

Router(config-if) # exit

Router(config) # router rip

Router(config-router) # network 40.0.0.0

Router(config-router) # network 50.0.0.0

Router(config-router) # network 199.96.0.0

Router(config-router) #

R4

Athaw Pawar 230953170.

Date : _____

Router 4

Router#configure terminal

Enter configuration Commands , one per line. End with
CNTL/Z .

5 Router(config)# interface FastEthernet 0/0

Router(config-if)# ip address 60.0.0.2 255.0.0.0

Router(config-if)#

Router(config-if)# exit

Router(config)# interface Serial 2/0

10 Router(config-if)# ip address 50.0.0.1 255.0.0.0

Router(config-if)#

Router(config-if)# exit

Router(config)# router rip

Router(config-router)# network 50.0.0.0

15 Router(config-router)# network 60.0.0.0

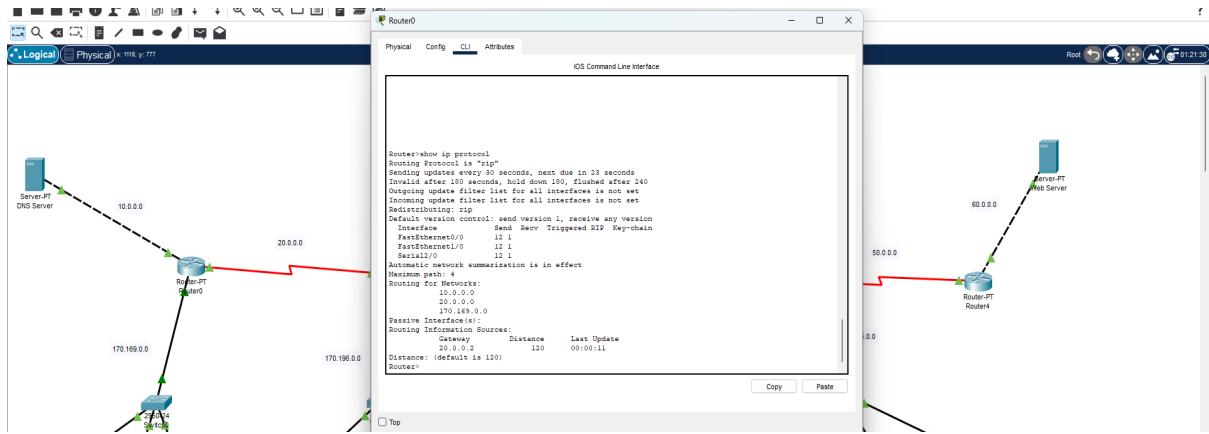
Router(config-router)# exit .

RIP Implementation

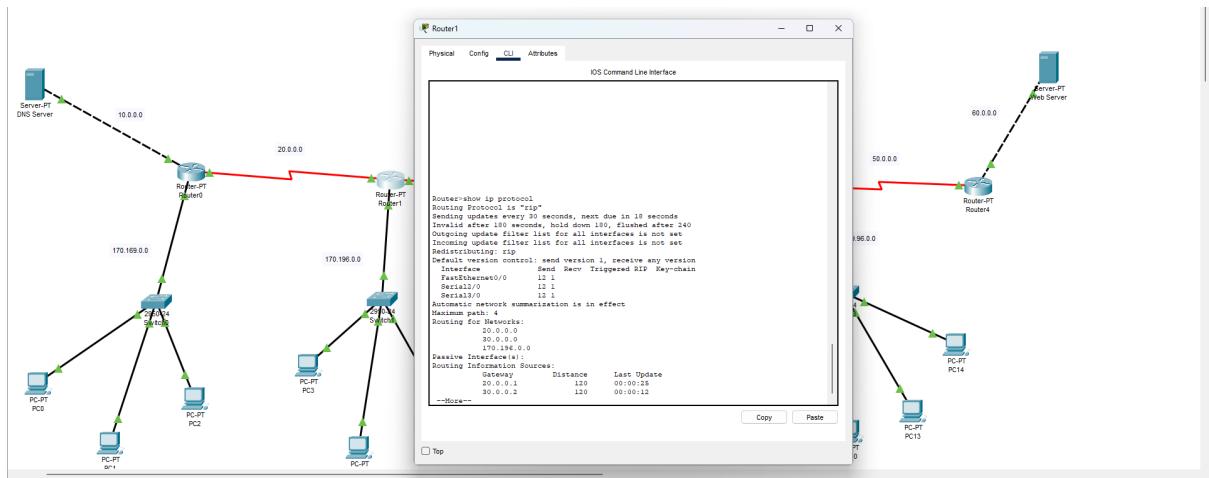
In our network topology, RIP has been used. RIP helps all routers learn about networks that are not directly connected to them.

The successful implementation and functioning of RIP can be proven by inspecting the routing table using the command 'show ip protocol' .

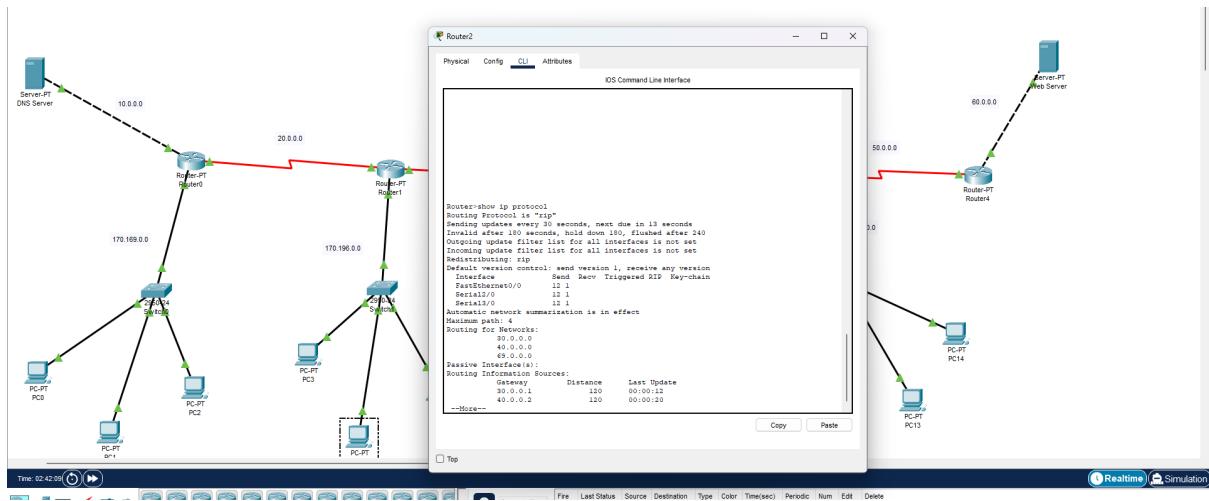
Router0:



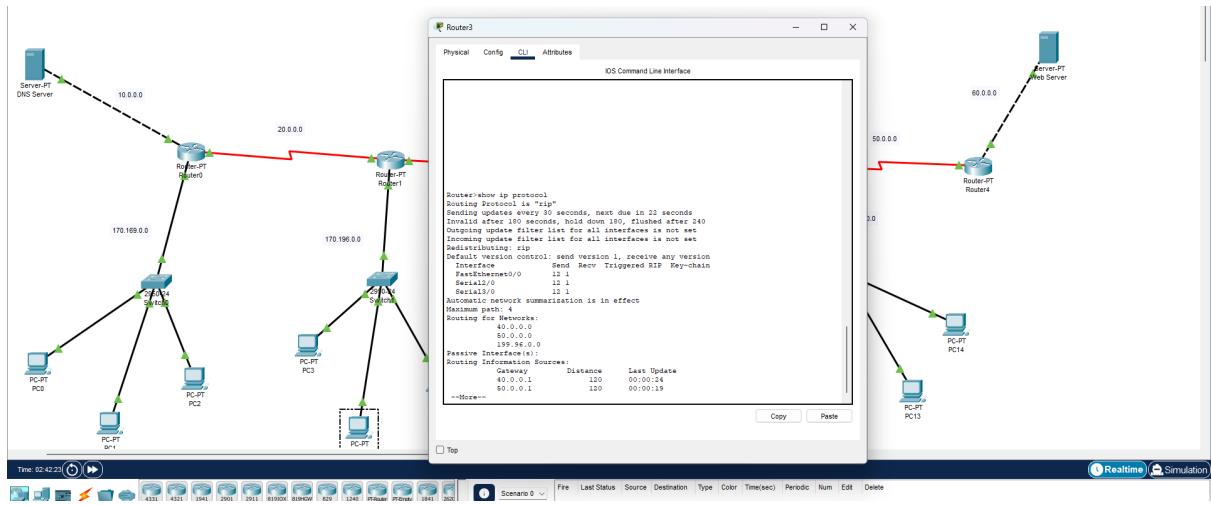
Router1:



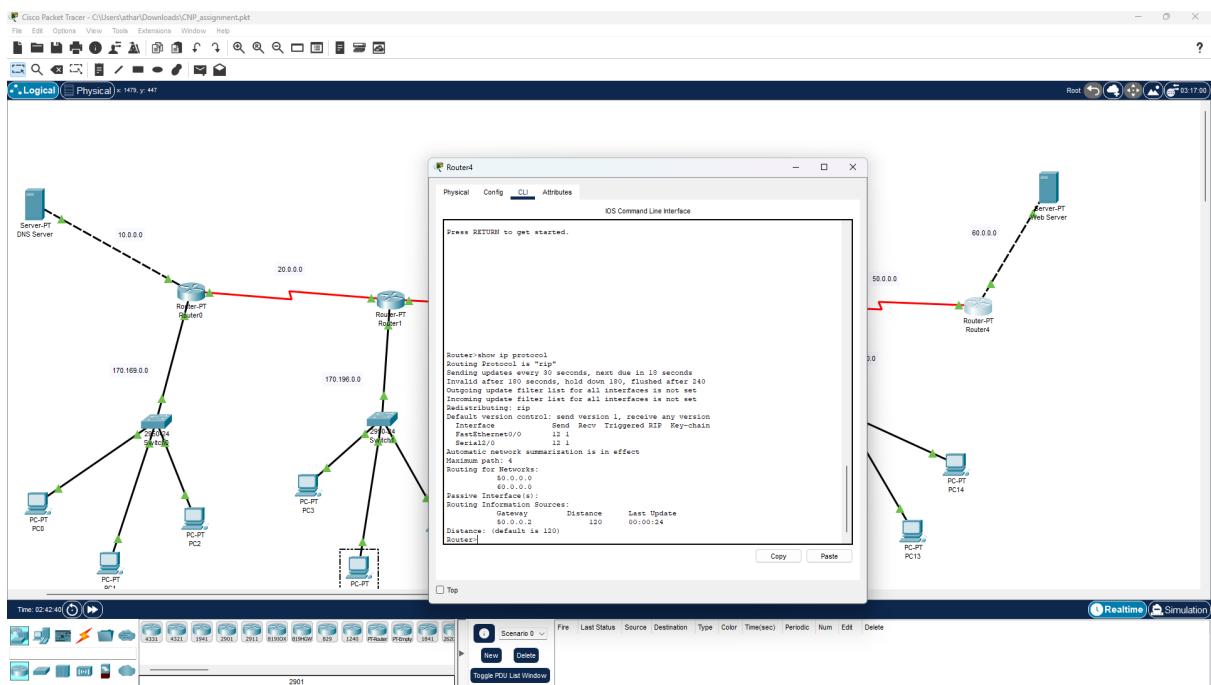
Router2:



Router3:

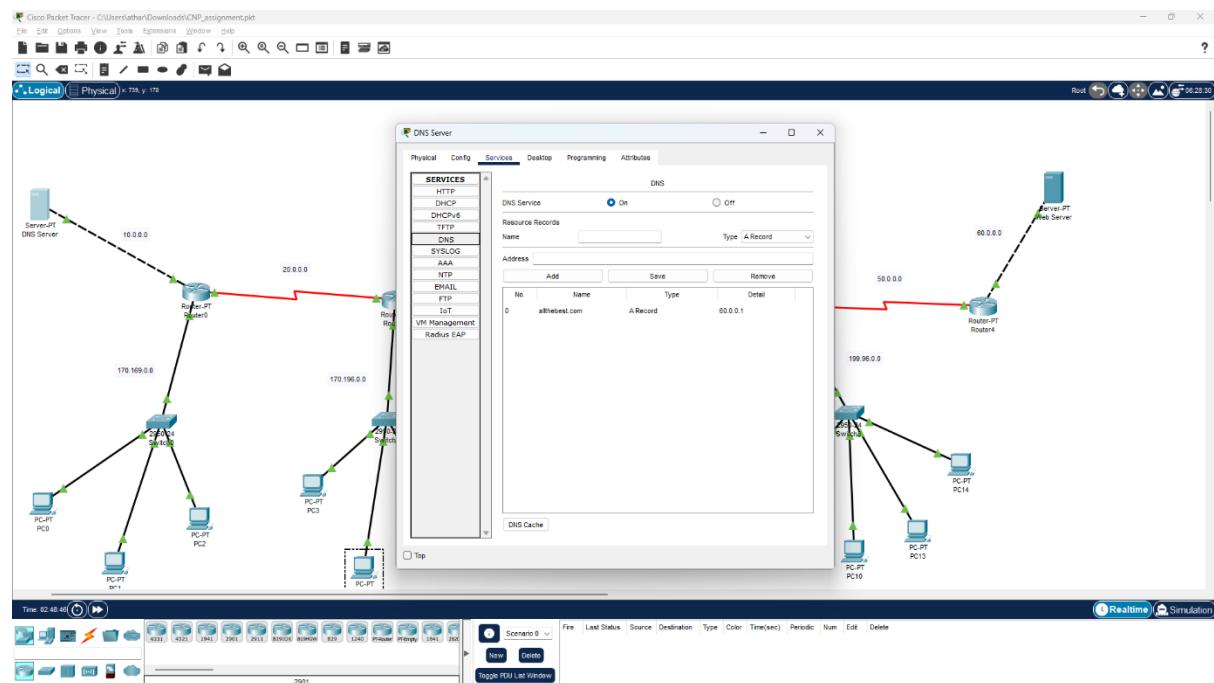


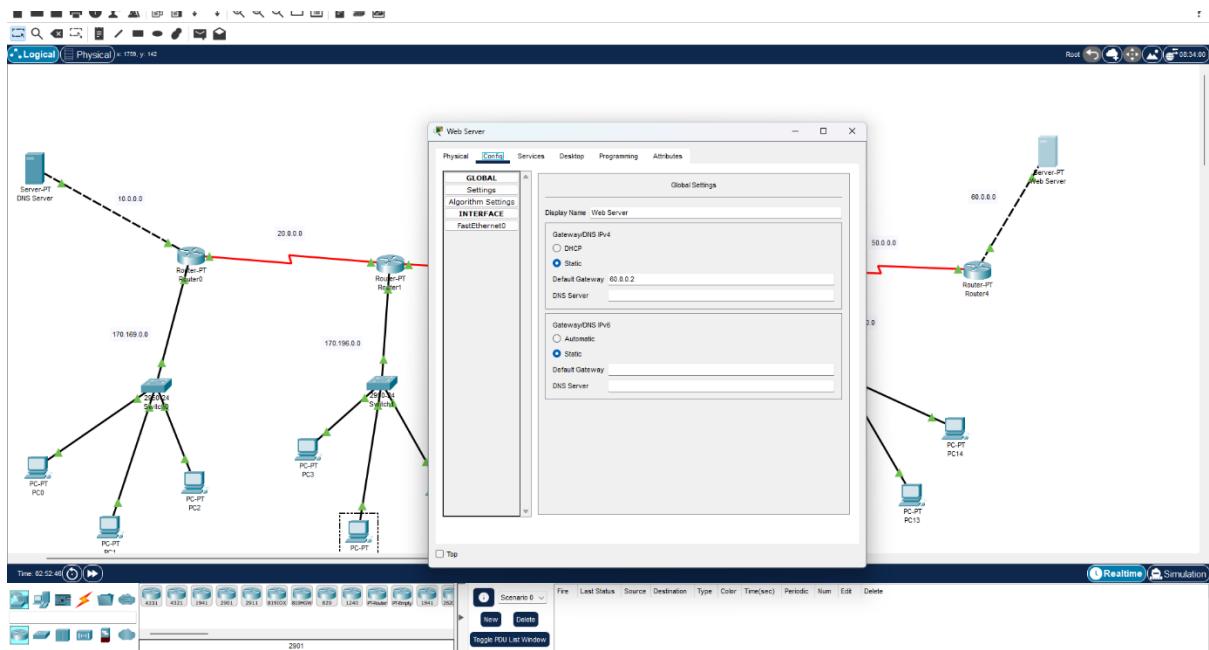
Router4:



DNS Implementation :

A Domain Name Service(DNS) server resolves host names into IP addresses. Although we can access a network host using its IP address, DNS makes it easier by allowing us use domain names which are easier to remember. For example, it's much easier to access google website by typing <http://www.google.com> as compared to typing <http://208.117.229.214>. In either case, you'll access google website, but using domain name is obviously easier.

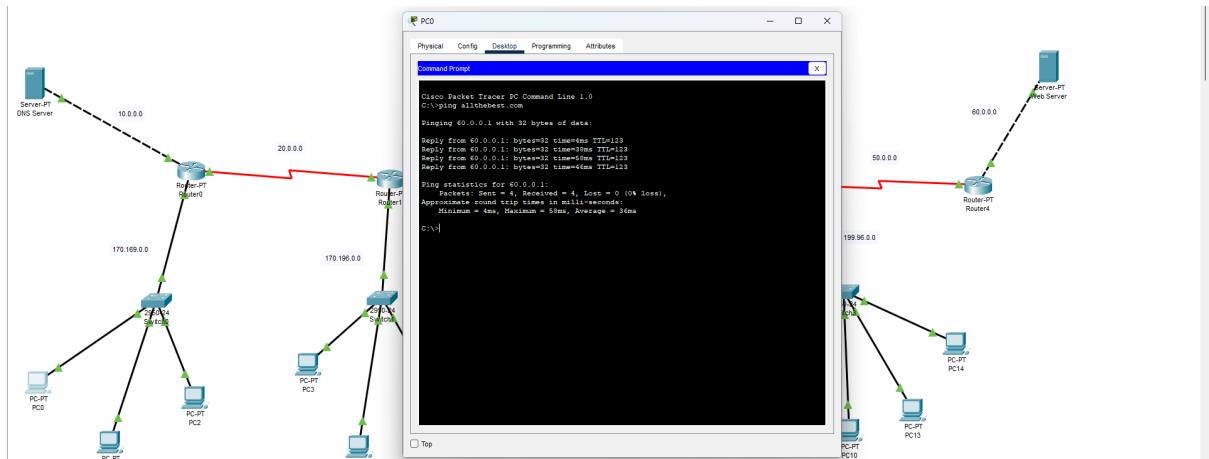




b] Check connectivity between PC 0 and Server 0 by displaying the “All the Best” message in the web browser.

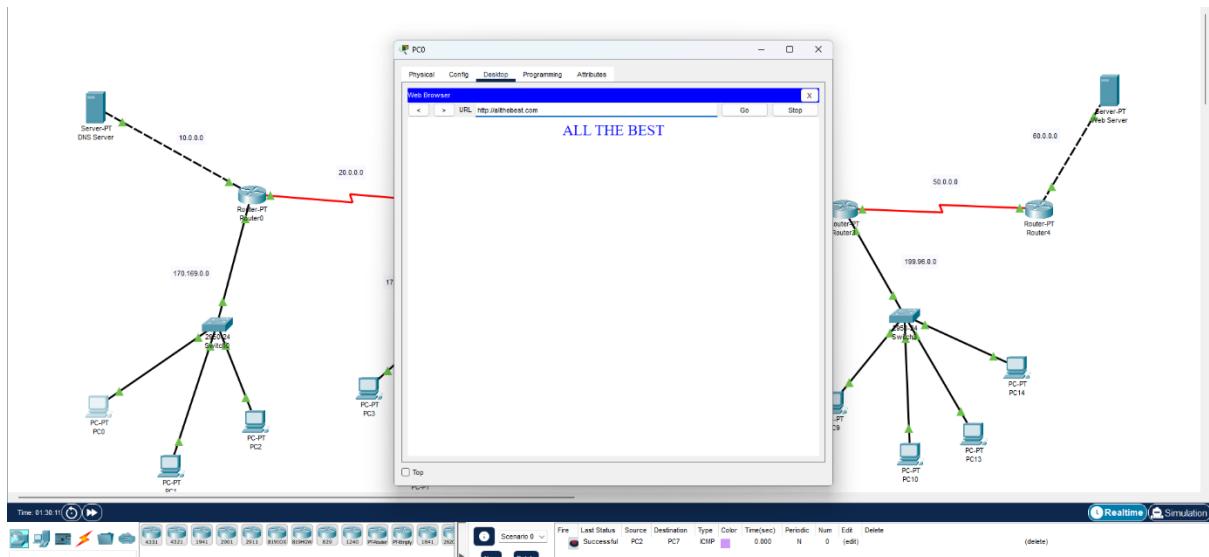
- The web browser on PC 0 accessed the test site "allthebest.com", confirming successful communication with Server 0 as can be seen below.

To verify the network connectivity, a ping test was conducted from PC0 to Web Server (IP address 60.0.0.1). The results of the ping test, visible in the Command Prompt window of PC0, confirm that the server is reachable. This successful communication proves that the Ethernet frames are being transmitted and received as expected across the network.



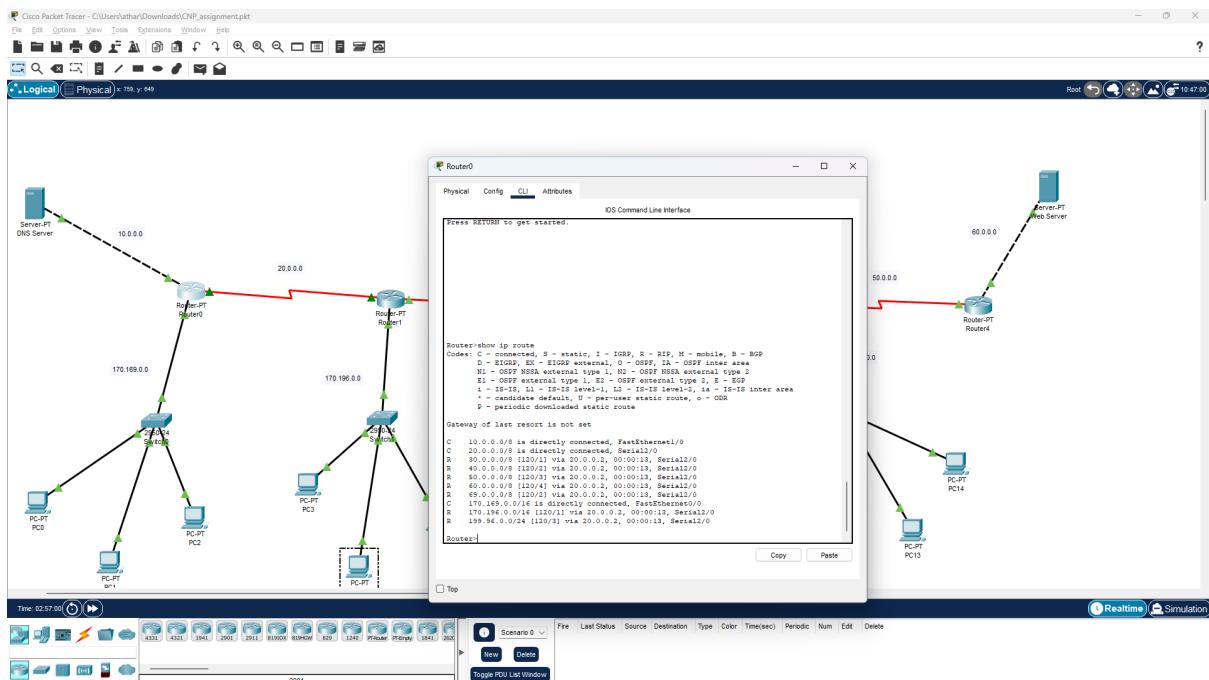
On Web Server, the HTTP service was enabled, and a simple HTML message saying "All the Best" was configured as the homepage. To view this, the web browser on PC0 was opened, and allthebest.com, was entered into the URL bar.

Thus, the displayed message "All the Best" is the output of a correctly functioning end-to-end Ethernet communication, where the client (PC0) successfully accesses the web page hosted on Web Server via DNS Server, demonstrating a complete and working Ethernet frame transmission across the network infrastructure.

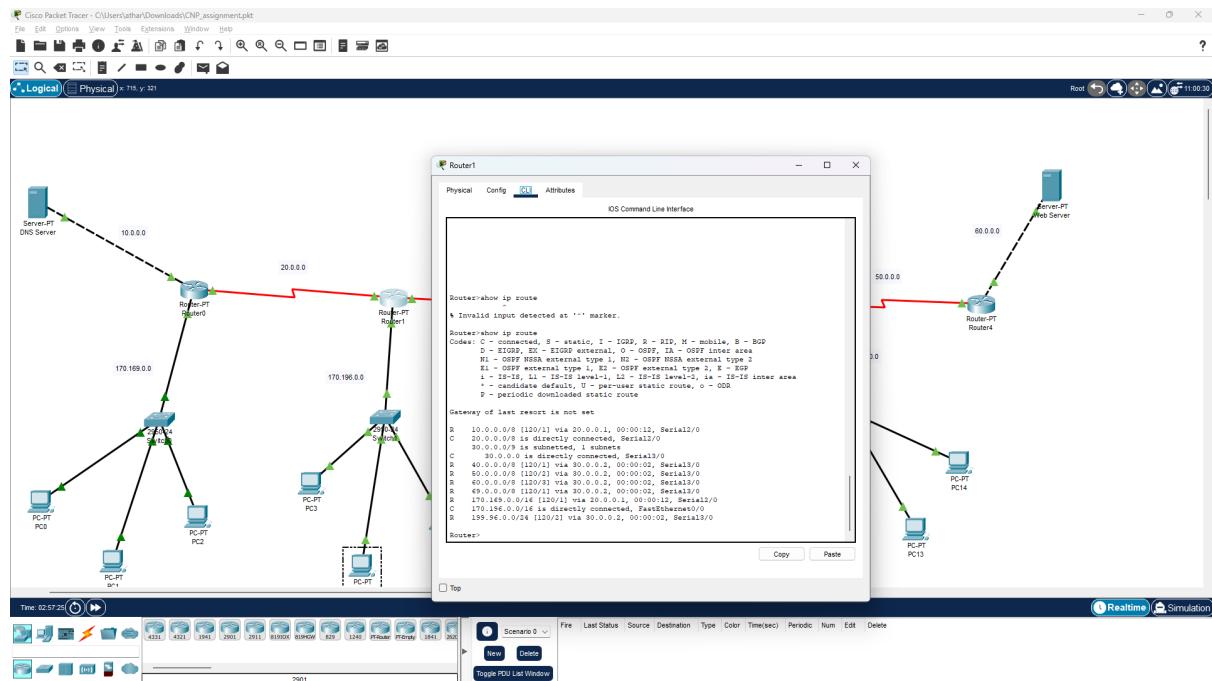


d] Displayed routing tables of all routers

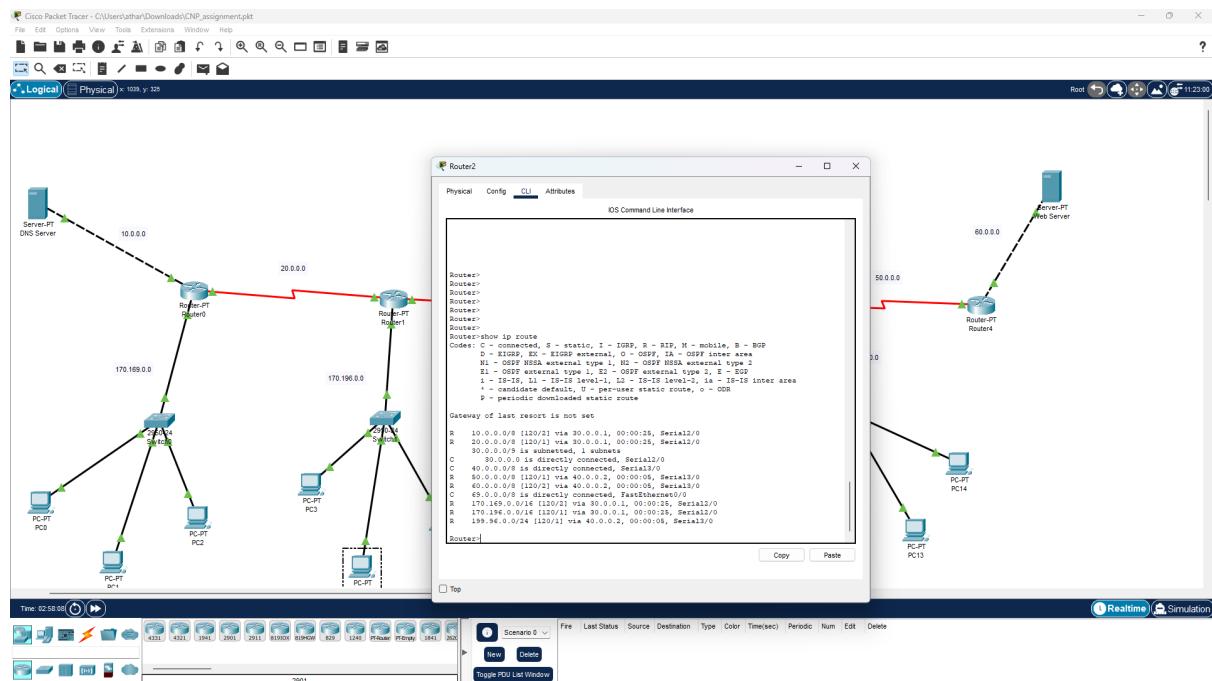
R0



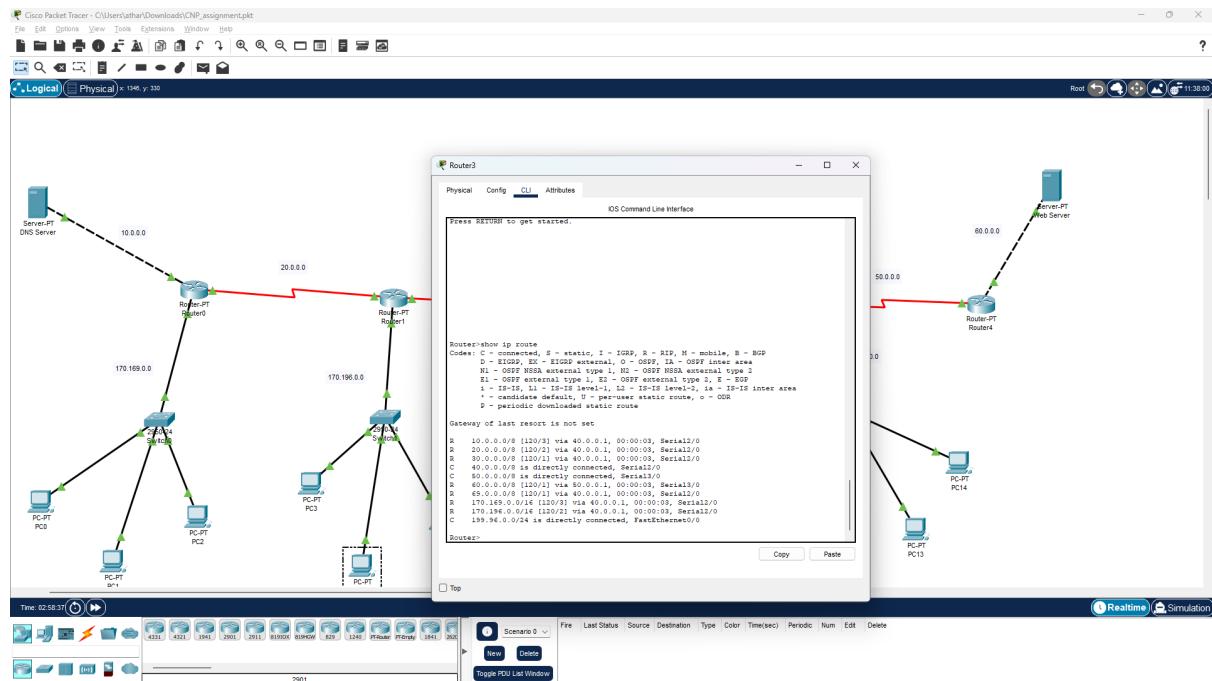
R1



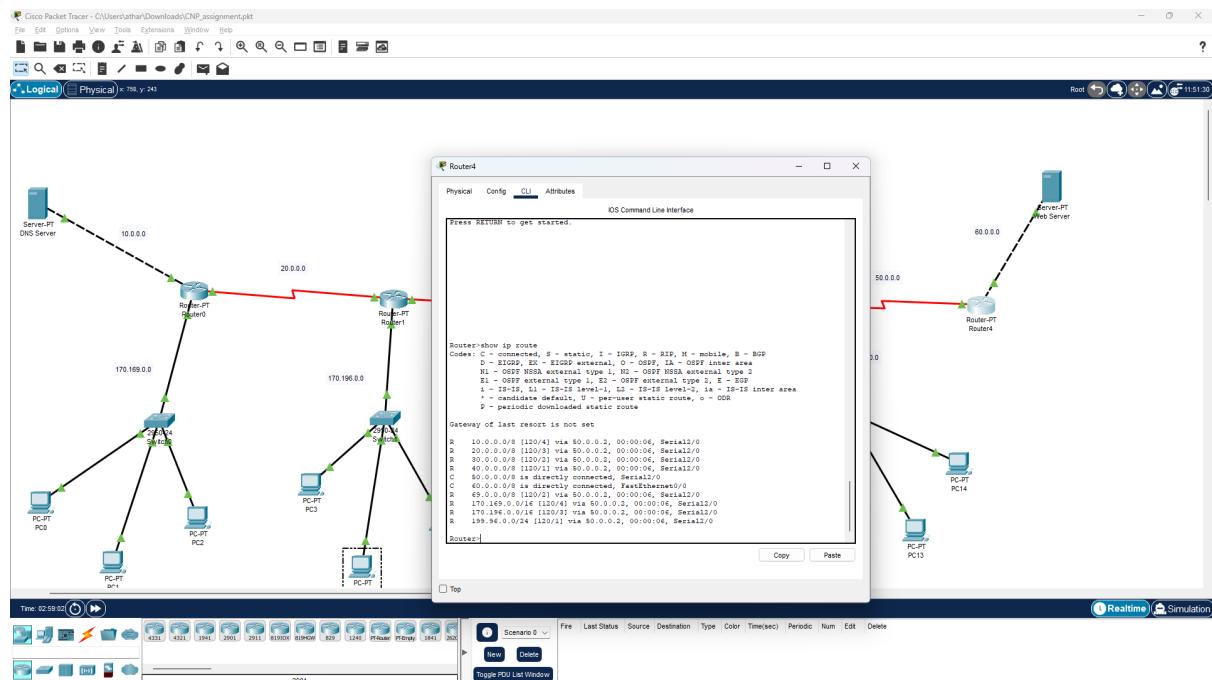
R2



R3

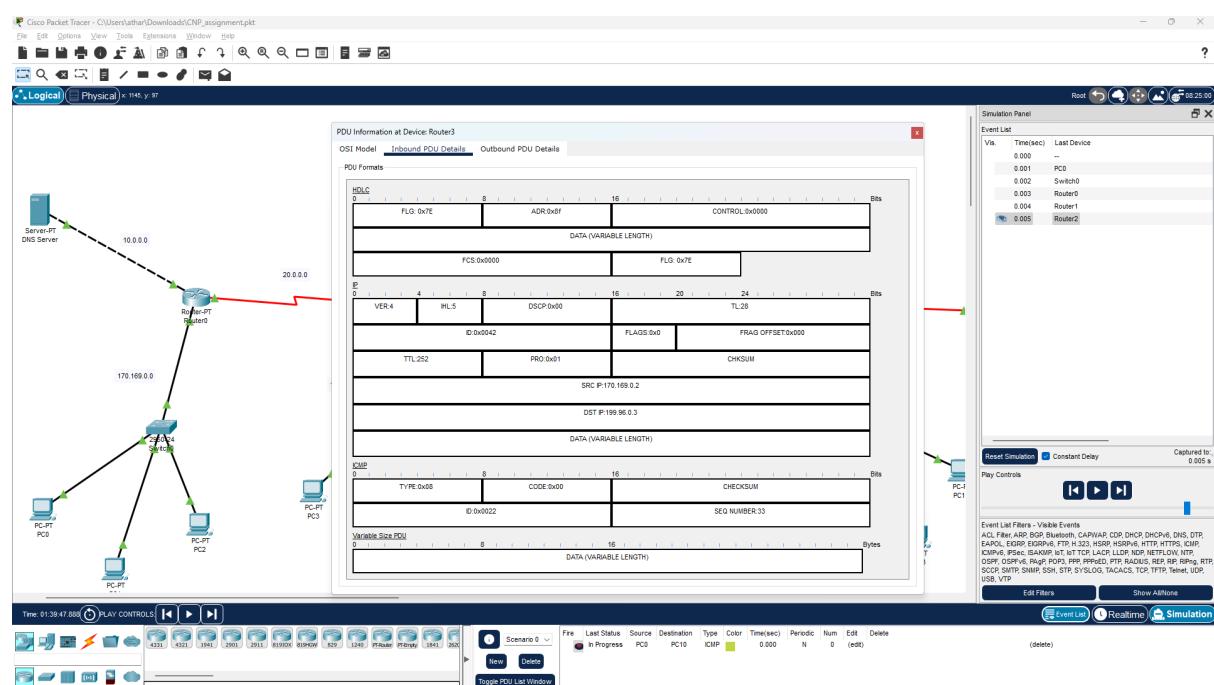
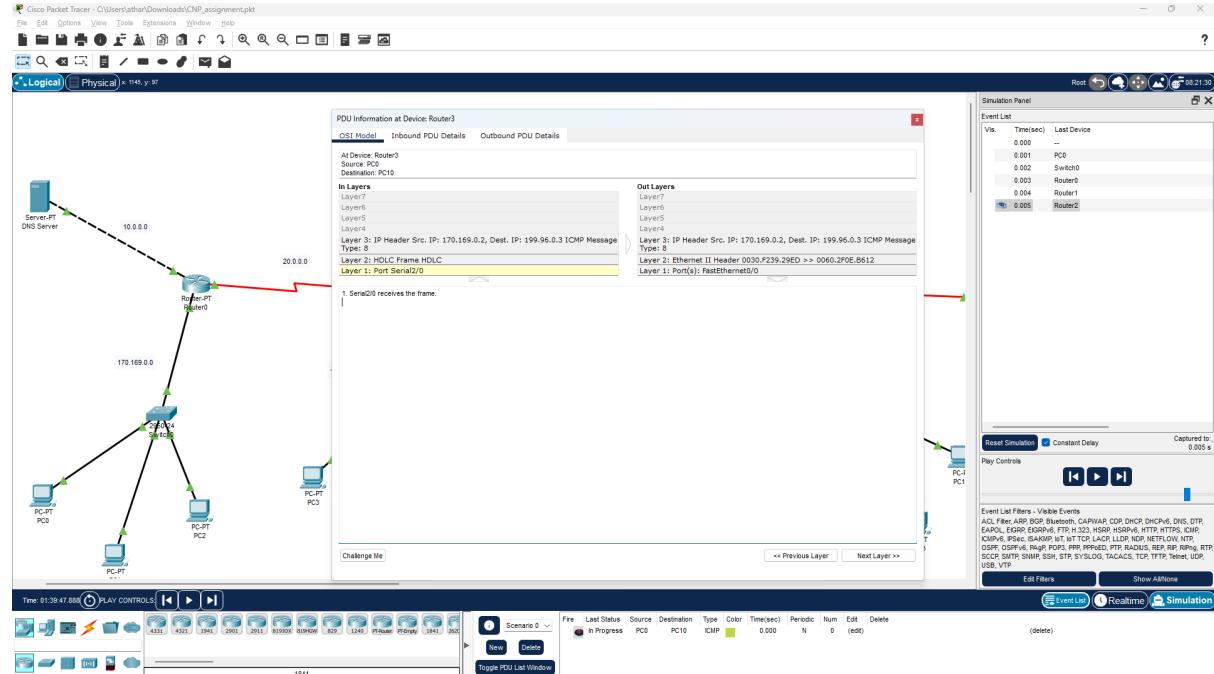


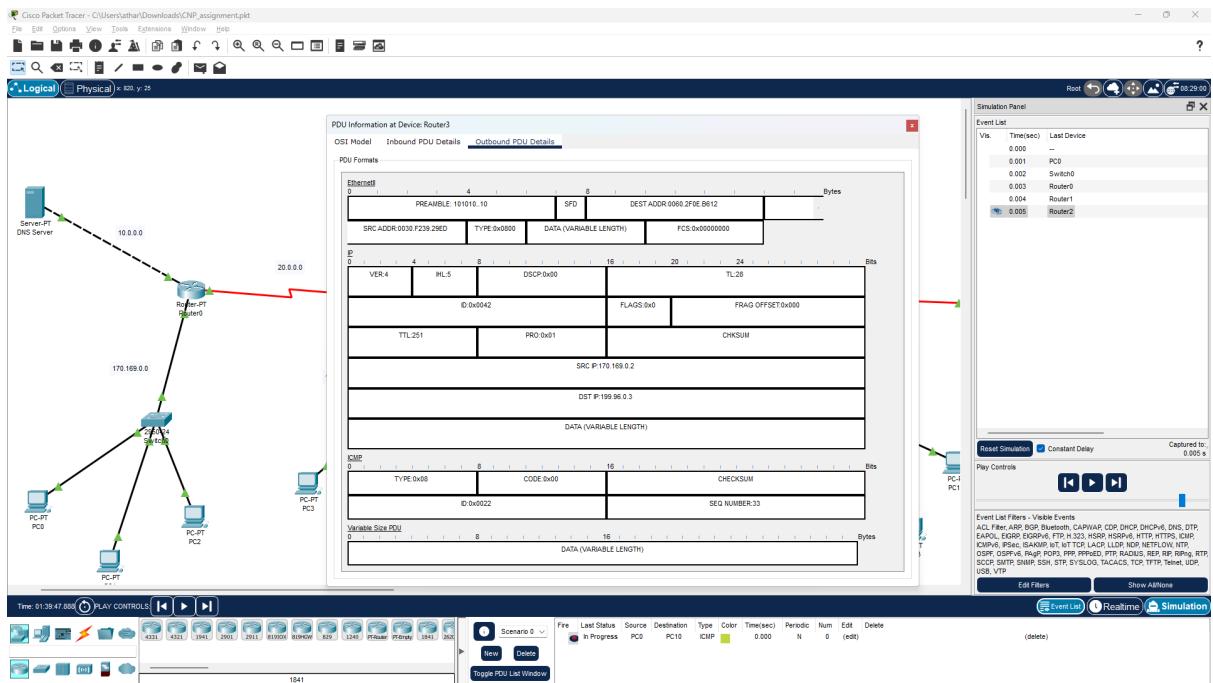
R4



e] Use the same Topology and configure the Ethernet frame in the network. Display the configuration of Frame in network

Frame sent from PC0 to PC10





Conclusion

By completing this assignment, we will successfully configure a network with RIP and DNS protocols, verify connectivity, and analyse routing tables and Ethernet frames. This experiment will help us understand dynamic routing, domain resolution, and Ethernet communication in a structured network.