

INSTITUTE OF COMPUTER TECHNOLOGY
B. TECH COMPUTER SCIENCE AND ENGINEERING

Subject: Computer Networks[CN]

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SEM : 5

Class : A

Batch : 52 (CS)

Practical 3

Aim: To Design and configure a network using Dynamic Host Configuration Protocol (DHCP).

Scenario:

Mr. Jason has hired a new network admin and asked him to create a network for his company. He has given him the liberty to erase all the previous network setup and create a new one as per his understanding and expertise. Below are the details provided by Mr. Jason to the network admin.

- 1) The company has 3 departments – Admin, HR, Sales.
- 2) Each department have 10 users (add at least 3 devices in each network)
- 3) The networking device available in the organization is 3 DNS servers, 2 DHCP servers, 3 routers and 3 switches.
- 4) All the users should get the IP address dynamically.
- 5) The organization has their own inbuilt Domain Name Server (DNS) which will have the details of the website that the user can access.
- 6) The users of the company are allowed to access only mentioned websites in the office premises. The list of the website is mentioned below:

Admin – google, yahoo, cisco

HR – google, cisco

Sales – google

Help the admin to create the network and establish the connection between the devices.

Procedure:

- 1) Create network as given below
- 2) Configure IP address (Routers, DNS servers, DHCP servers)
- 3) Configure dynamic routing table (RIP in routers)
- 4) Configure DNS service
- 5) Configure WEB service by hosting websites
- 6) Configure DHCP server
- 7) Configure IP-Helper command to appropriate interface of a router
- 8) Set PC to get IP address based on DHCP

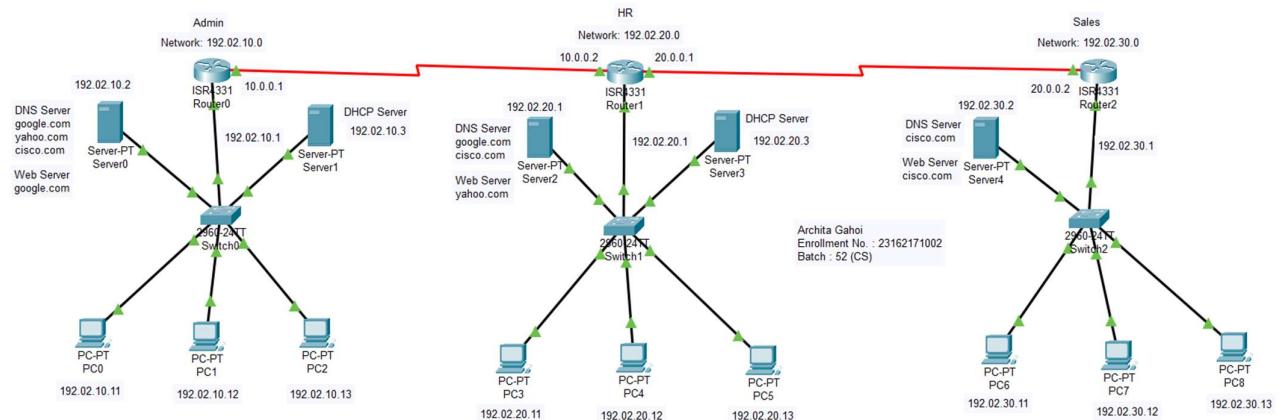
Note:

Make sure last two digits of your enrollment numbers appears in network

IP address that must be visible in snapshot of the cisco packet tracer. i.e.

192. XX .10.1 (XX indicates last two digits of your enrollment no.)

⇒ Main Circuit

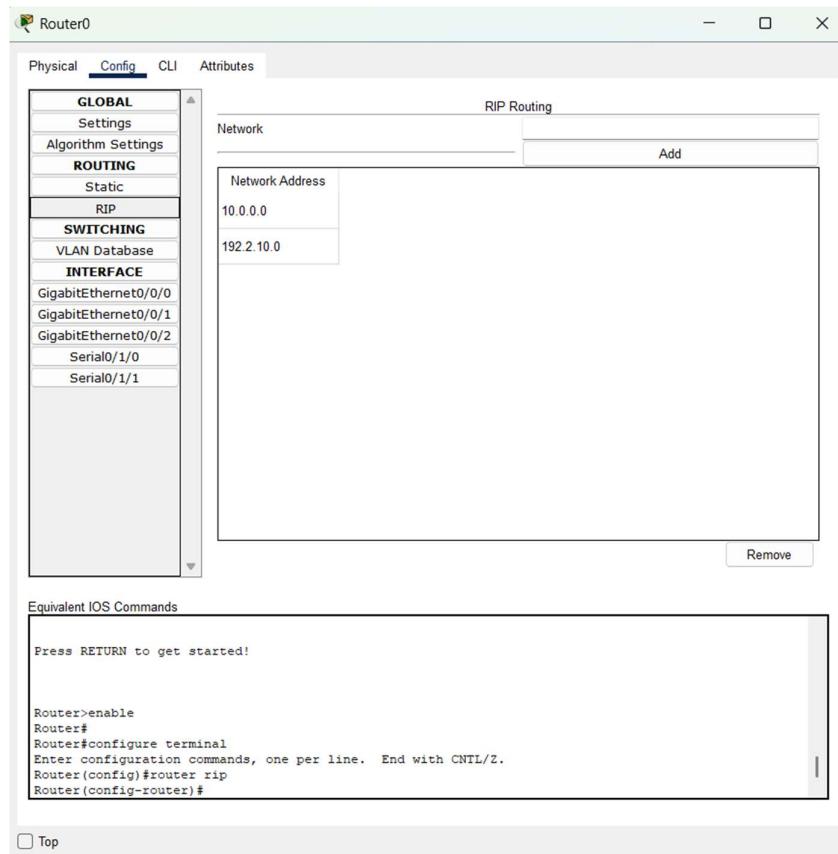


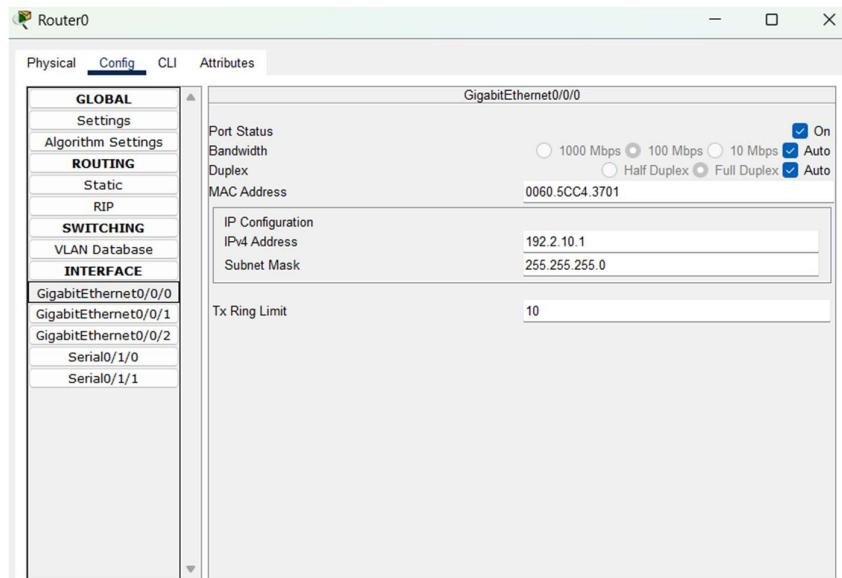
Configuration:

IP Address:

⇒ Routers

Router 0





Equivalent IOS Commands

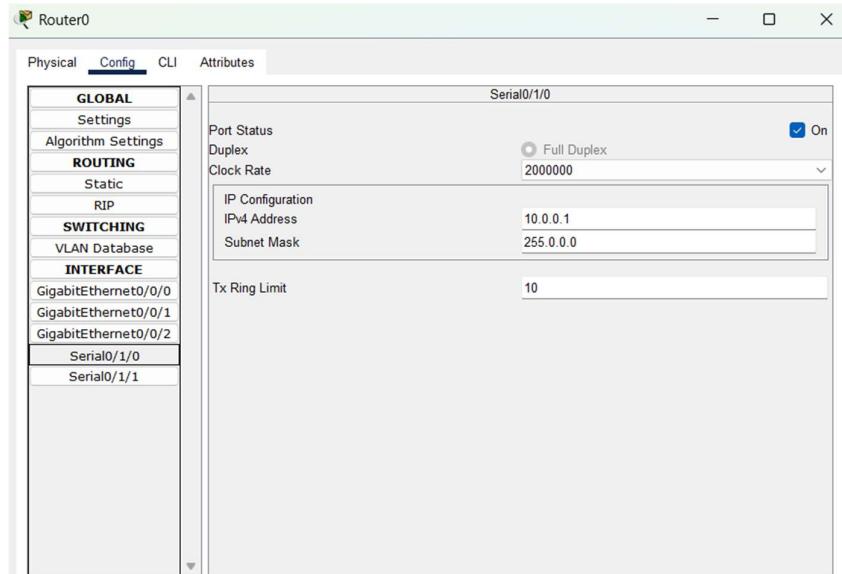
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Press RETURN to get started!

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#

```

Top



Equivalent IOS Commands

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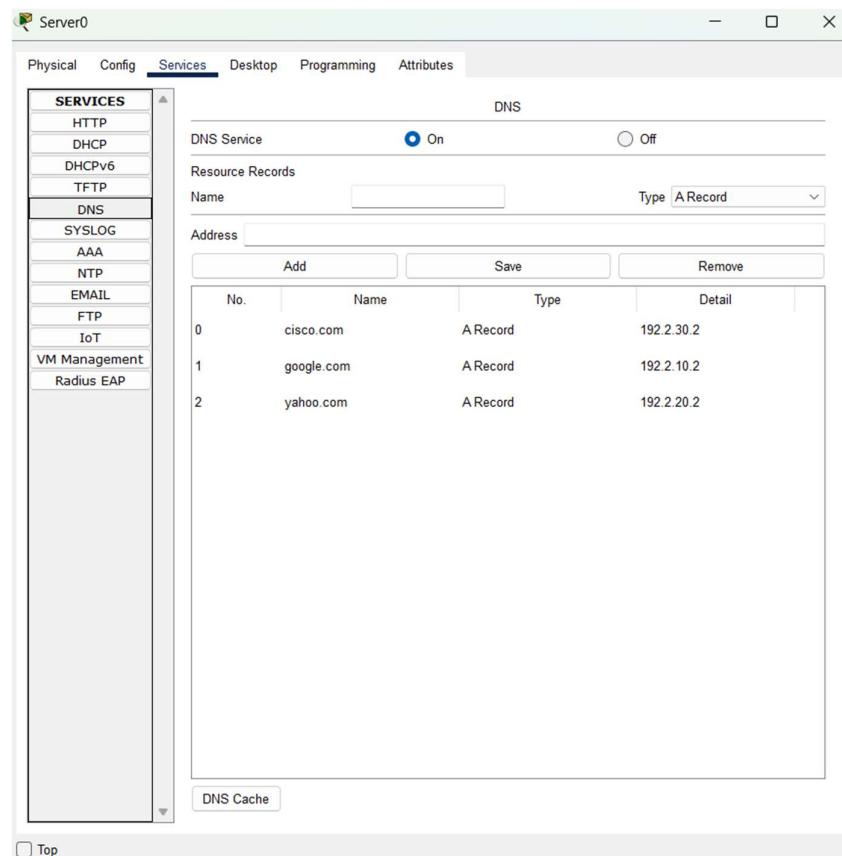
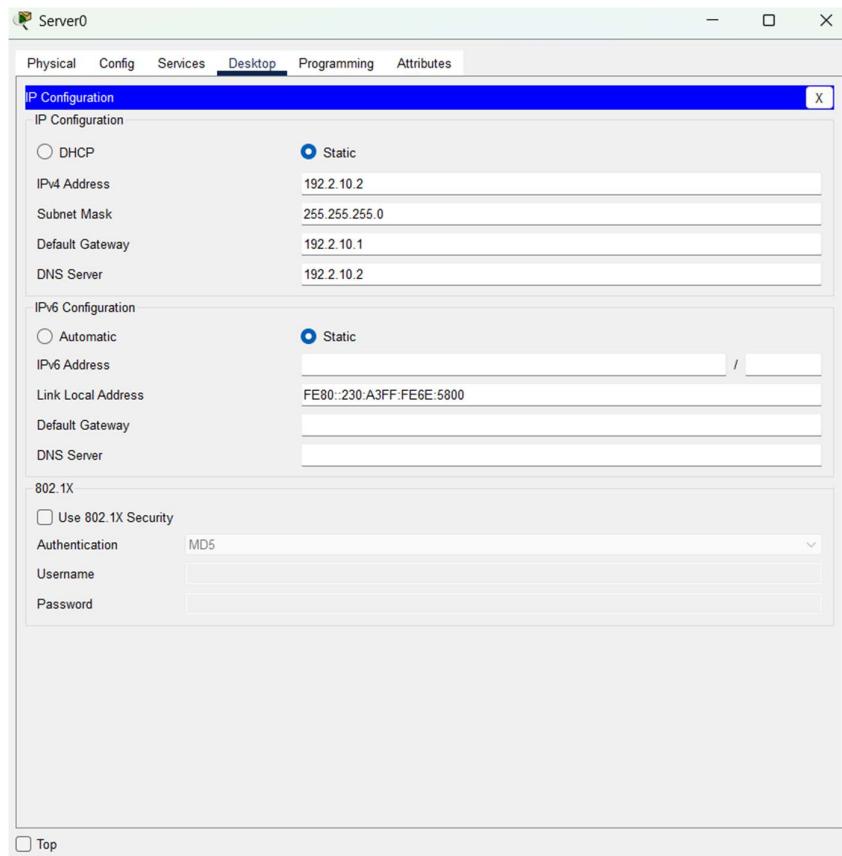
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/1/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console

Router(config-if)#

```

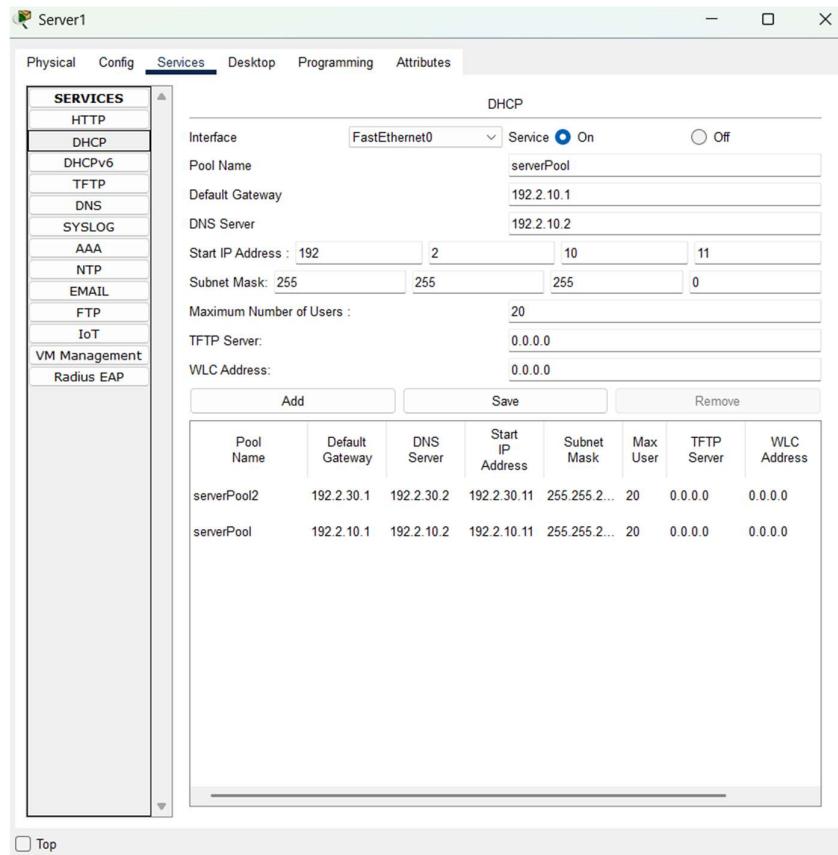
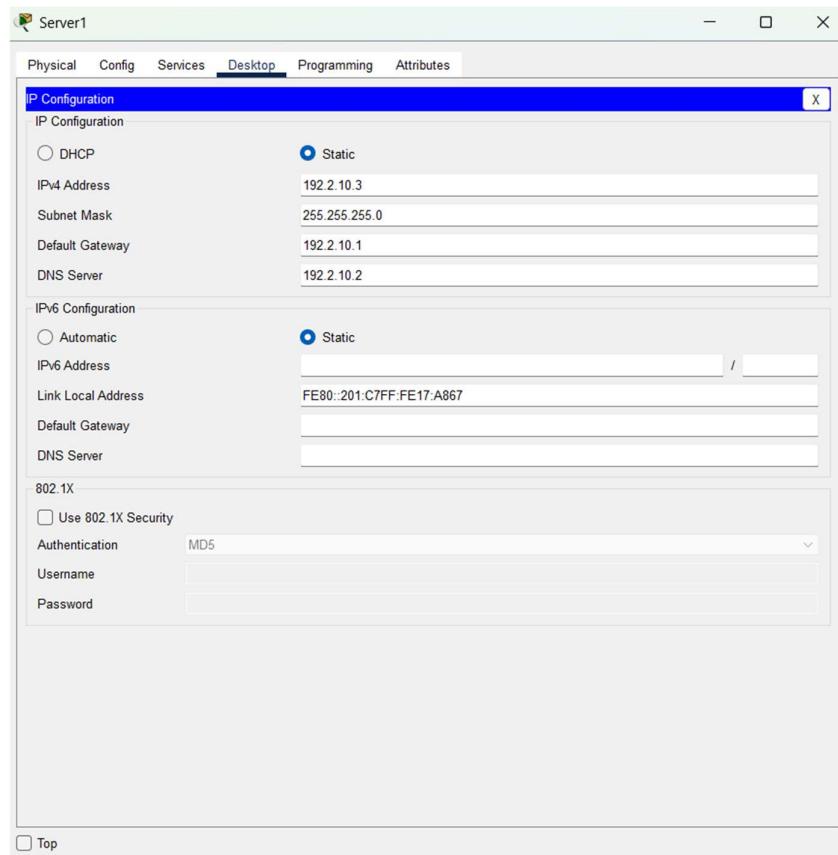
Top

⇒ DNS Servers/Web Servers
Server 0



⇒ DHCP Servers

Server 1



To transfer packet from PC2 to PC8 need to configure in router 2 as in network 3 it doesn't have DHCP but it uses one in network 1



Router#
Router#
Router#exit

Router con0 is now available

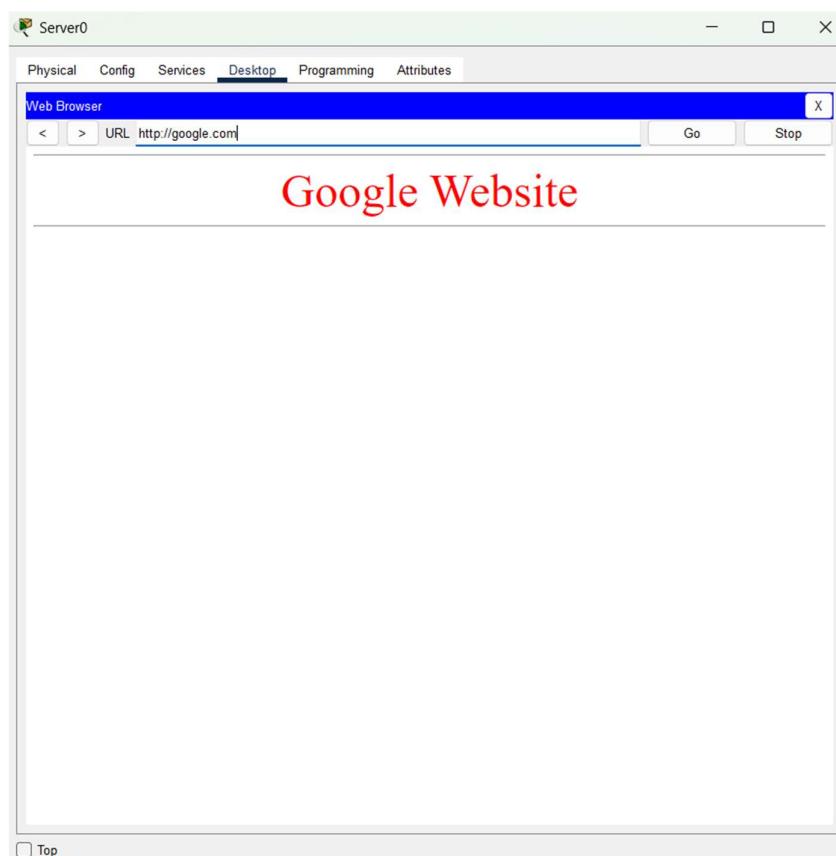
Press RETURN to get started.

Router>
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0/0
Router(config-if)#ip helper-address 192.02.10.3
Router(config-if)#exit
Router(config)#interface gigabitEthernet 0/0/0
Router(config-if)#ip helper-address 192.02.10.3
Router(config-if)#do write
Building configuration...
[OK]
Router(config-if)#exit
Router(config)#exit
Router#
\$SYS-5-CONFIG_I: Configured from console by console

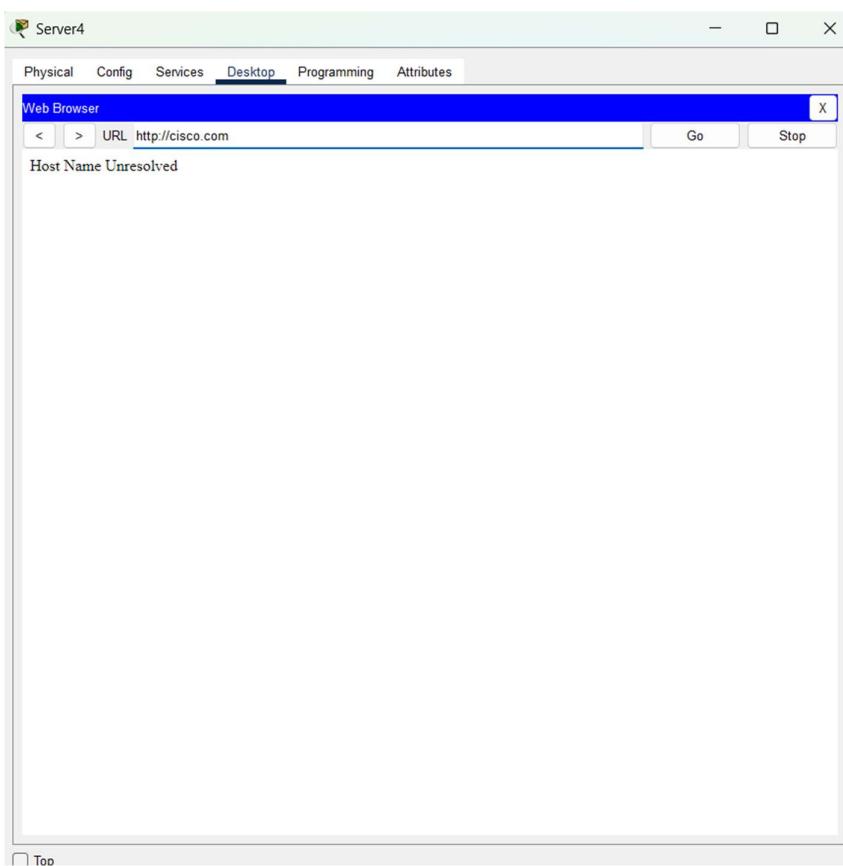
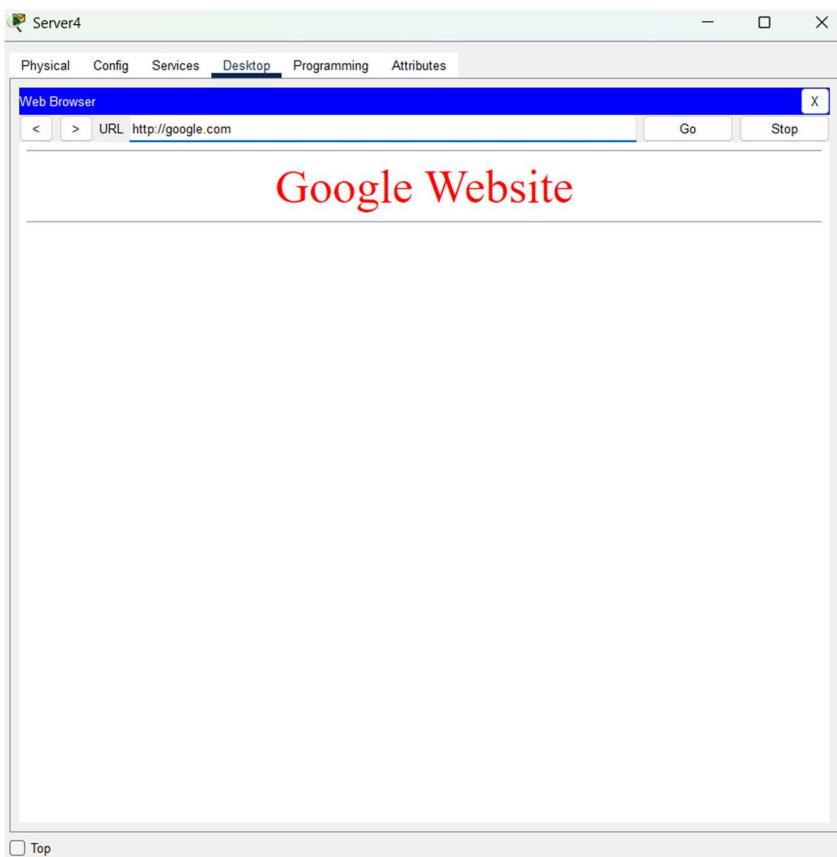
Output:

WEB service by hosting websites

Network 1:

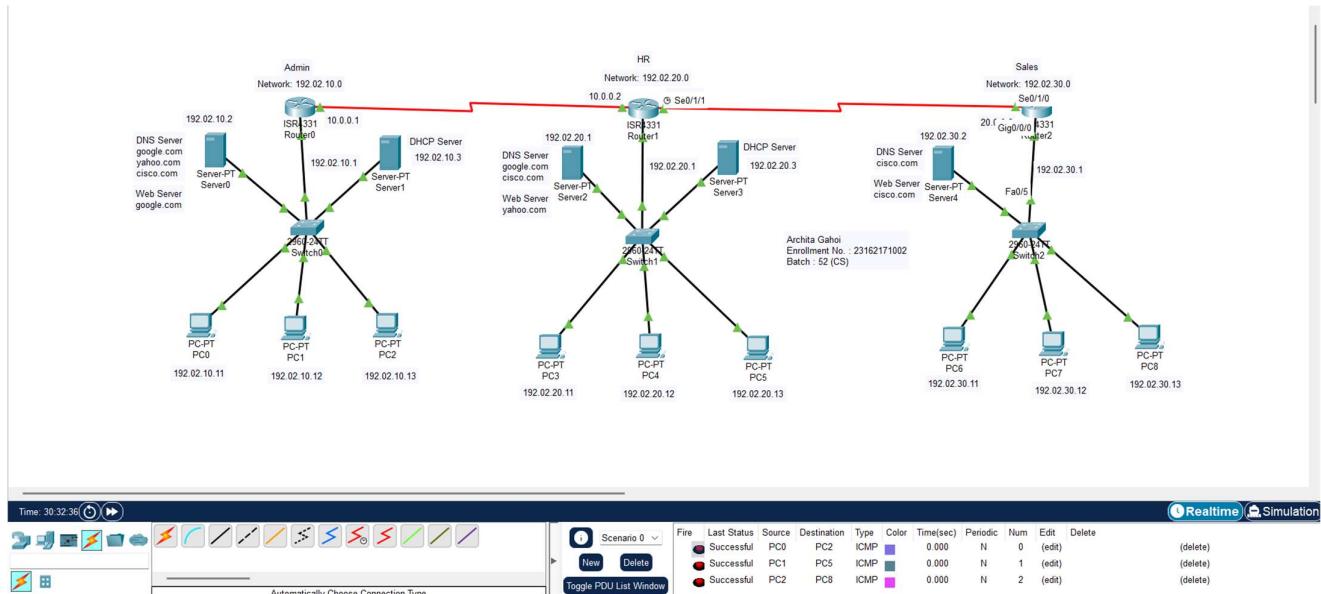


Network 3:



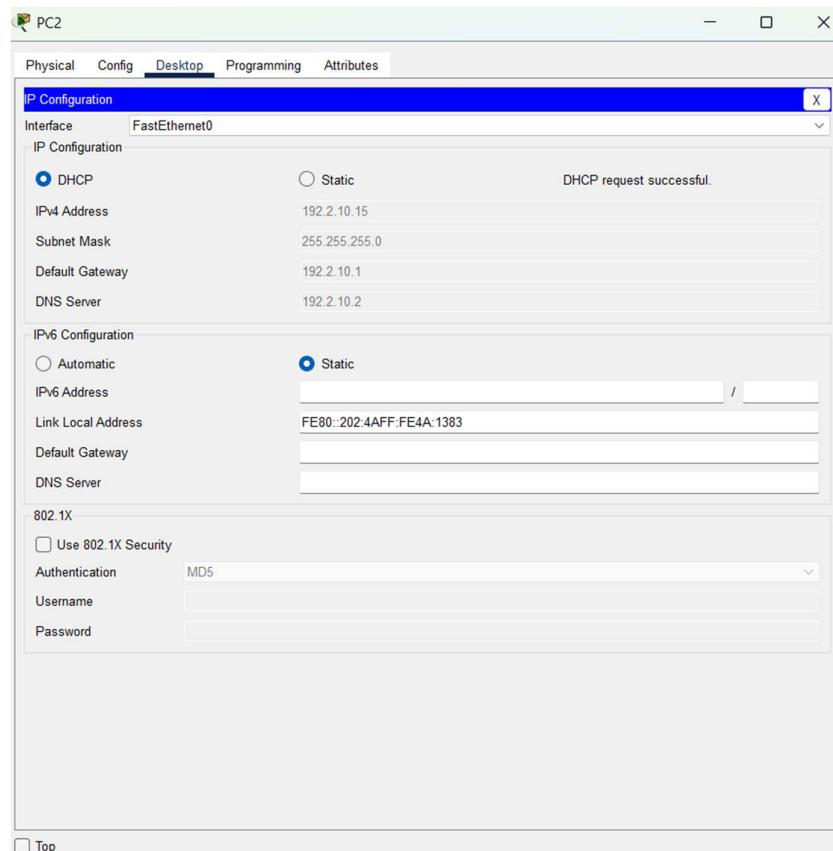
PCs packet transfer

- : within network
- : from network1 to network2
- : from network1 to network3

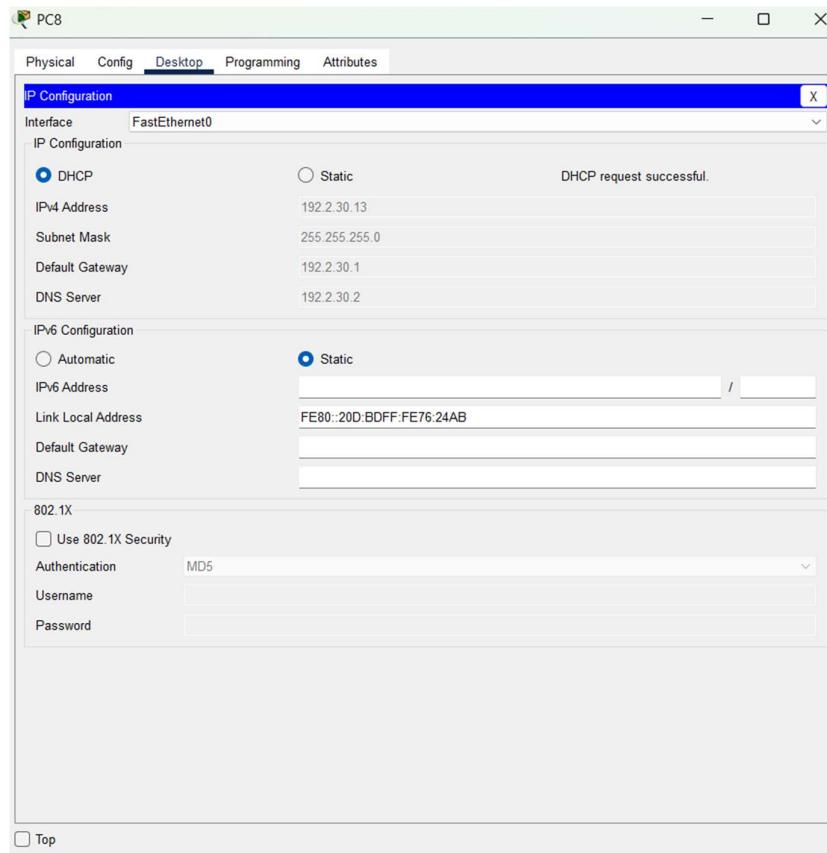


PCs gets successful IP address based on DHCP

PC2:



PC8:



Conclusion:

A three-department enterprise was built with dynamic addressing via two DHCP servers and RIP v2 routing. Departmental access control to sites was enforced using per-department DNS servers: Admin (google, yahoo, cisco), HR (google, cisco), Sales (google). DHCP relay (ip helper) enabled HR clients to obtain leases from the Admin DHCP server. Tests confirmed correct addressing, inter-LAN reachability, and policy-compliant web access.