Course: SWE-Computer Network Practical			
Instructor	Dr. Asad Raza Malik	Practical/Lab No.	08
Date	25-09-2024	CLOs	03
Student's Roll no:		Point Scored:	
Date of Conduct:	25-09-2024	Teacher's Signature:	

LAB PERFORMANCE INDICATOR	Subject Knowledge	Data Analysis and Interpretation	Ability to Conduct Experiment	Presentation	Calculation and Coding	Observation/ Result	Score

Topic	To configure the default routers between two routers.
Objective	• Understand the concept of default routing. • Learn how to configure default routers between two routers. • Test and verify network connectivity using ping and traceroute commands. • Implement default routers to handle traffic for unknown destination.

Lab Discussion: Theoretical concepts and Procedural steps

Pre-Lab Theoretical Concepts:

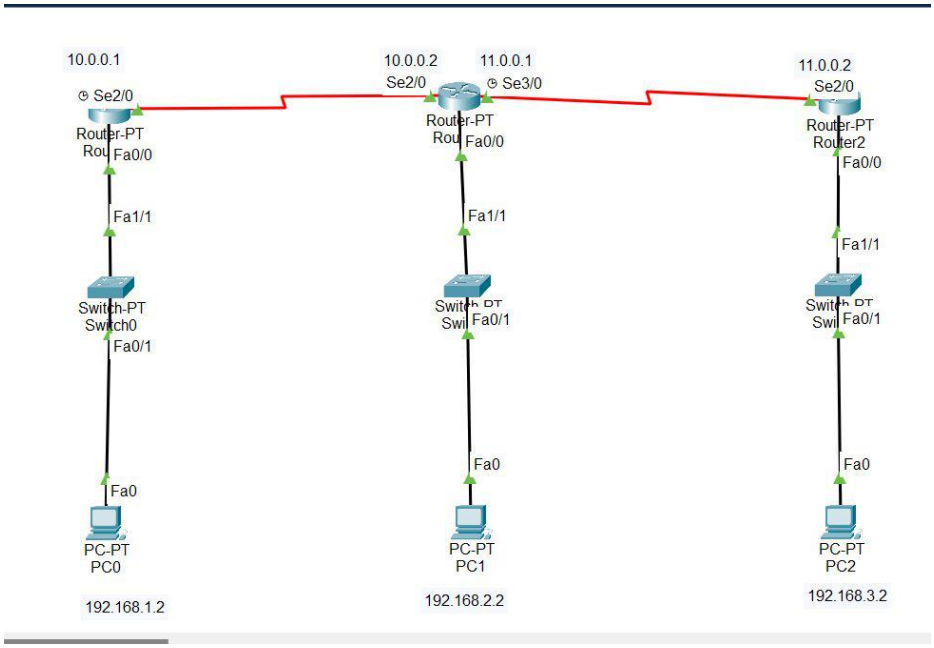
Default Routing: Default routing is a technique used to route traffic destined for unknown or unlisted networks through a specific next-hop router. A router configured with a default route will forward all packets, for which it has no specific route in its routing table, to the specified next-hop router. Default Routes are configured mostly in Stub Network.

Sut Network: It is a network containing only one exit interface or only one way to reach the destination. When we configure default routes, it requires these packets to another router that has the path to the destination

```
CLI command:
R-1(config)#ip route (any destination)
(any subnet mask) (next hop IP address)
R-1(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.2
```

Step 1: First, create a network topology of the these given devise listed below in the table:

S. No	Device	Model name	Quantity
1.	PC	PC	3
2.	Switch	PT-Switch	3
3.	Router	PT-router	3



Step 2: Configuring Hosts (PCs) with IP addresses and Default Gateway using IP Addressing table given below:

S. No	Device	IPv4	Subnet mask	Default gateway
1.	**Pc0**	**192.168.1.2**	**255.255.255.0**	**192.168.1.1**
2.	**Pc1**	**192.168.2.2**	**255.255.255.0**	**192.168.2.1**
3.	**Pc2**	**192.168.3.2**	**255.255.255.0**	**192.168.3.1**

Step 3: Configure PCs follow these steps:

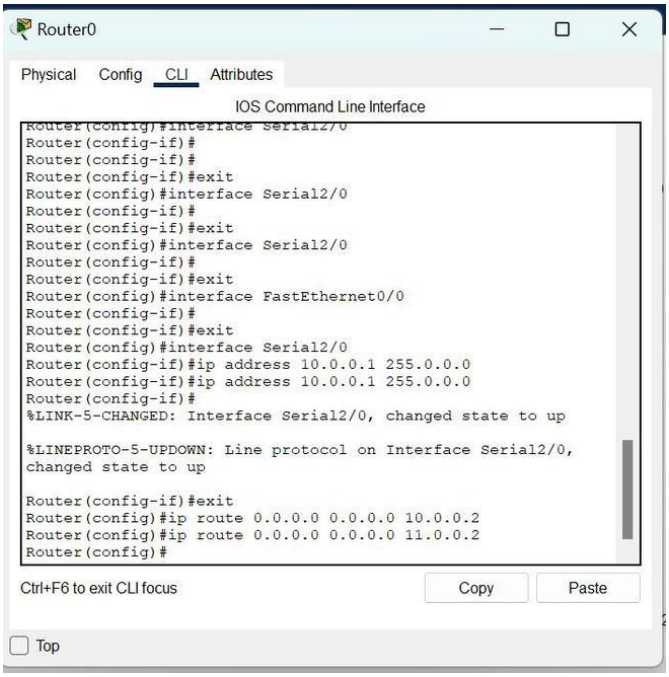
- Click on PC0 then go to desktop.
- Click on IP configuration.
- Then on the static route, fill up the IP configuration according to the IP addressing table given above.
- Repeat the same procedure with other PCs to configure them.

Step 4: Configuring the Interfaces (routers) with IP Addresses and Default gateways and assigning the default routes.

Router0 Configuration:

- Click on router0 then, Go to CLI commands and enter commands to configure them given below.
- Now we will add the IP address of the serial se2/0 and its subnet mask.
- In this step, we will add the IP address of the interface FastEthernet port fa0/0 and its subnet mask.
- Then we need to add Default Routes to configure the router:

```
R-1(config)#ip route (any destination~reserved)
(any subnet mask~reserved) (next hop IP address)
```

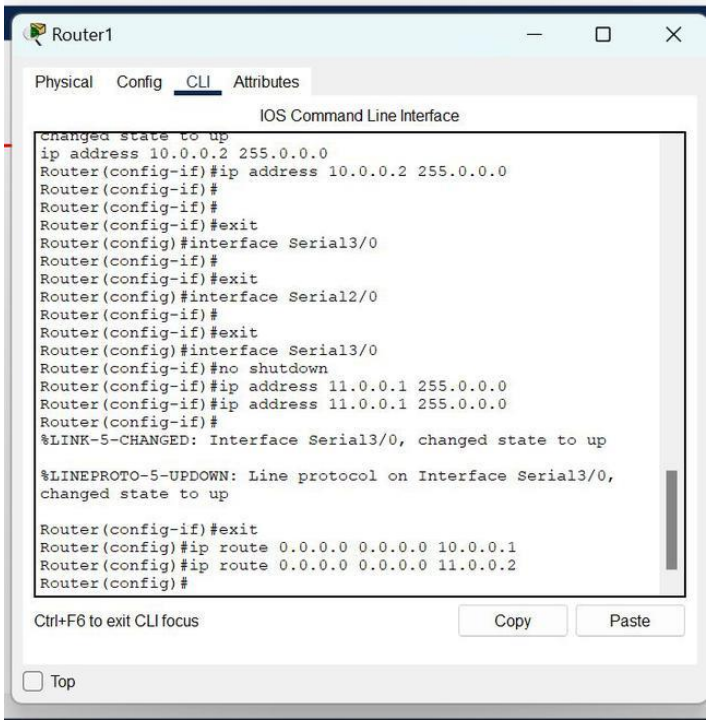


- Add the IP address of the next hope to connect with another LAN.

Router1 Configuration:

- Click on the router1 then, Go to CLI commands, and enter commands to configure them given below.
- Now, we will add the IP address of the serial se2/0 and its subnet mask.
- Second, we will add the IP address of the interface FastEthernet port fa0/0 and its subnet mask.
- Then we need to add Default Routes to configure the router:

```
R-1(config)#ip route (any destination~reserved)
(any subnet mask~reserved) (next-hop IP address)
```

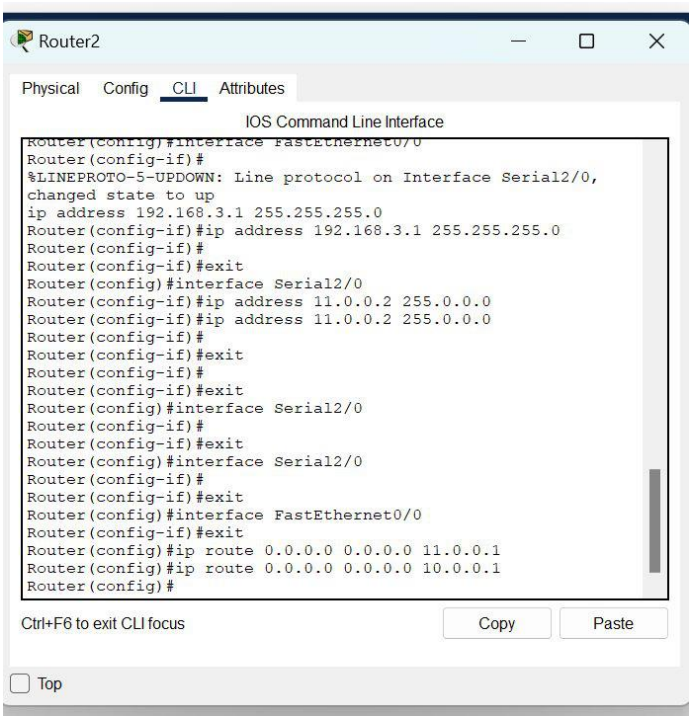


- Add the IP address of the next hope to connect with another LAN.

Router2 Configuration:

- Click on the router2 then, Go to CLI commands, and enter commands to configure them given below.
- Now, we will add the IP address of the serial se2/0 and its subnet mask.
- Second, we will add the IP address of the interface FastEthernet port fa0/0 and its subnet mask.
- Then we need to add Default Routes to configure the router:

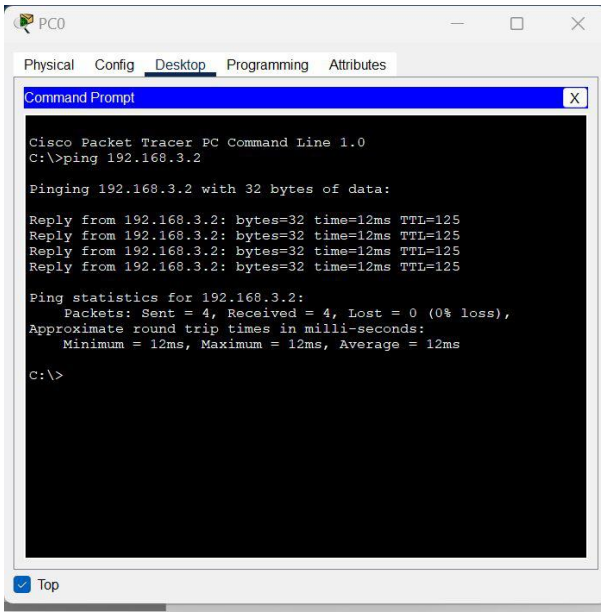
```
R-1(config)#ip route (any destination~reserved)
(any subnet mask~reserved) (next-hop IP address)
```



Step 4: After configuring all the devices red indicator turns into green and the network is live so we can send and receive packets.

To verify the network we'll verify the network by pinging the IP address of the target node in any Host.

- Click on PC0 then, Go to the desktop.
- Click on Command Prompt, and type this command "ping 192.168.2.3".
- In the below image we can see that we getting replies from a targeted node which means the connection is established successfully.



The below representation shows exactly how the packets are moving from the source node to the destination node.

- The PDU packet started moving from PC0 to PC3 and then came backward green tick shows that we are getting replies successfully.

Student Assignment:

1. **Group Assignment**: Each group will configure the network topology and set up default routes between the routers using different IP addressing schemes (similar to the table provided in the previous lab).
2. **Submission**:
    - Submit a brief report explaining the process of configuring default routing.
    - Include screenshots of successful ping and traceroute results.
    - Each group should explain how default routing can be useful in real-world scenarios.

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