



Department of Computer Science and Engineering
Islamic University of Technology (IUT)
A subsidiary organ of OIC

Lab Report 01

CSE 4412 : Computer Networks Lab

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Section: SWE

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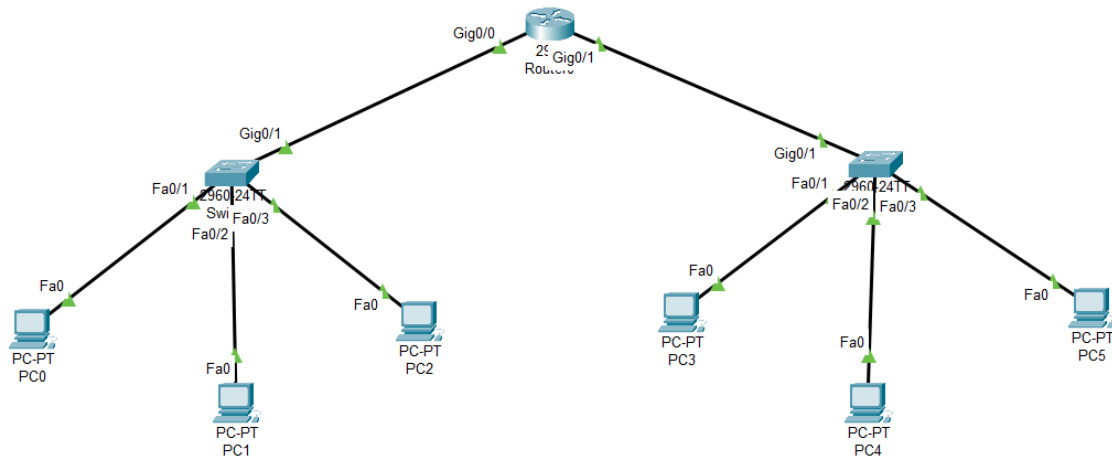
Date of Submission: 23/01/2024

Title: Configure router using static routing to connect multiple networks in Cisco Packet Tracer

Objectives:

1. Understand how to operate Cisco Packet Tracer
2. Learn to create and connect multiple networks using static routing
3. Understand wiring of different network components like router, switch, PC etc.
4. Configure router and switch interfaces
5. Verify connectivity of the network
6. Understand the basics of IP Subnetting
7. Learn to subnet a network following given specifications

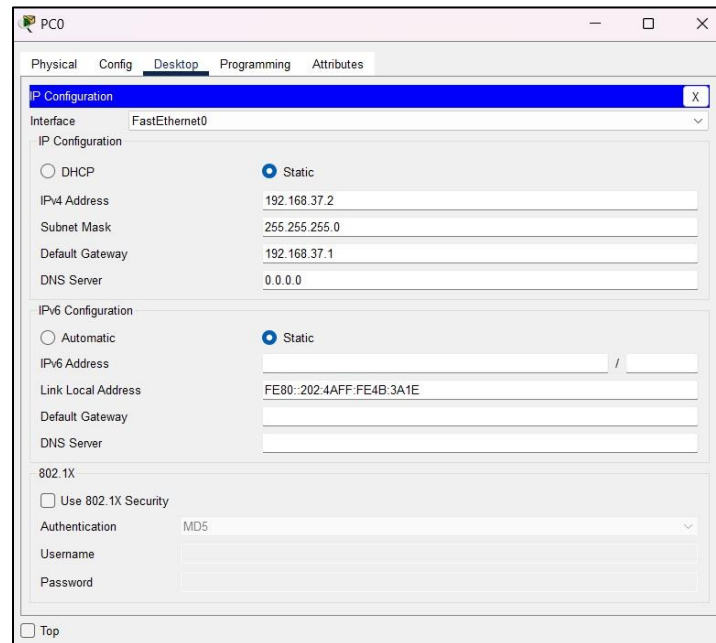
Diagram of the experiment:



Working Procedure:

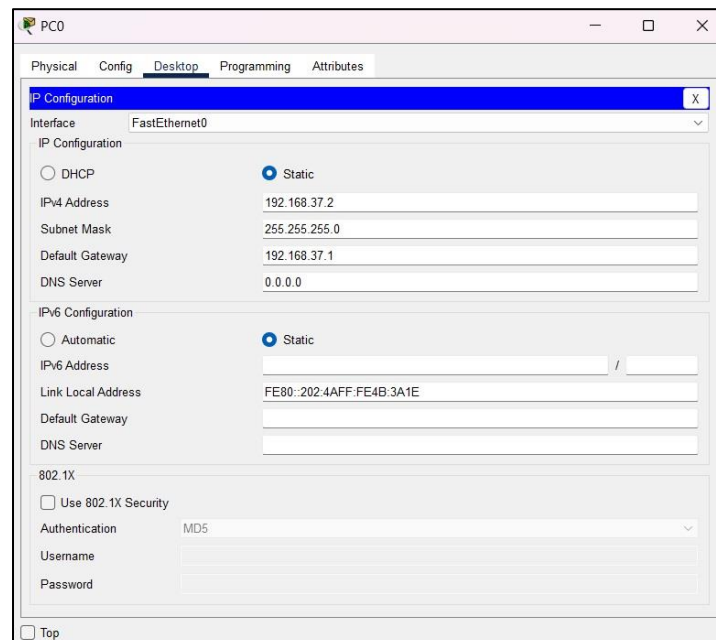
Step 1: Setting IP Address

I set the IP address of the PCs. For PC0-PC2 IP address was set to 192.168.37.2 - .4. The Default gateway for these 3 PCs is 192.168.37.1.



The screenshot shows the 'PC0' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below the radio buttons, the 'IPv4 Address' is set to '192.168.37.2', the 'Subnet Mask' is '255.255.255.0', the 'Default Gateway' is '192.168.37.1', and the 'DNS Server' is '0.0.0.0'. The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below the radio buttons, the 'IPv6 Address' is empty, the 'Link Local Address' is 'FE80::202:4AFF:FE4B:3A1E', the 'Default Gateway' is empty, and the 'DNS Server' is empty. The '802.1X' section has a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' set to 'MD5', and fields for 'Username' and 'Password' which are empty. A 'Top' button is at the bottom left.

For PC3-PC5 IP address was set to 192.168.47.2 - .4. The Default gateway for these 3 PCs is 192.168.47.1.



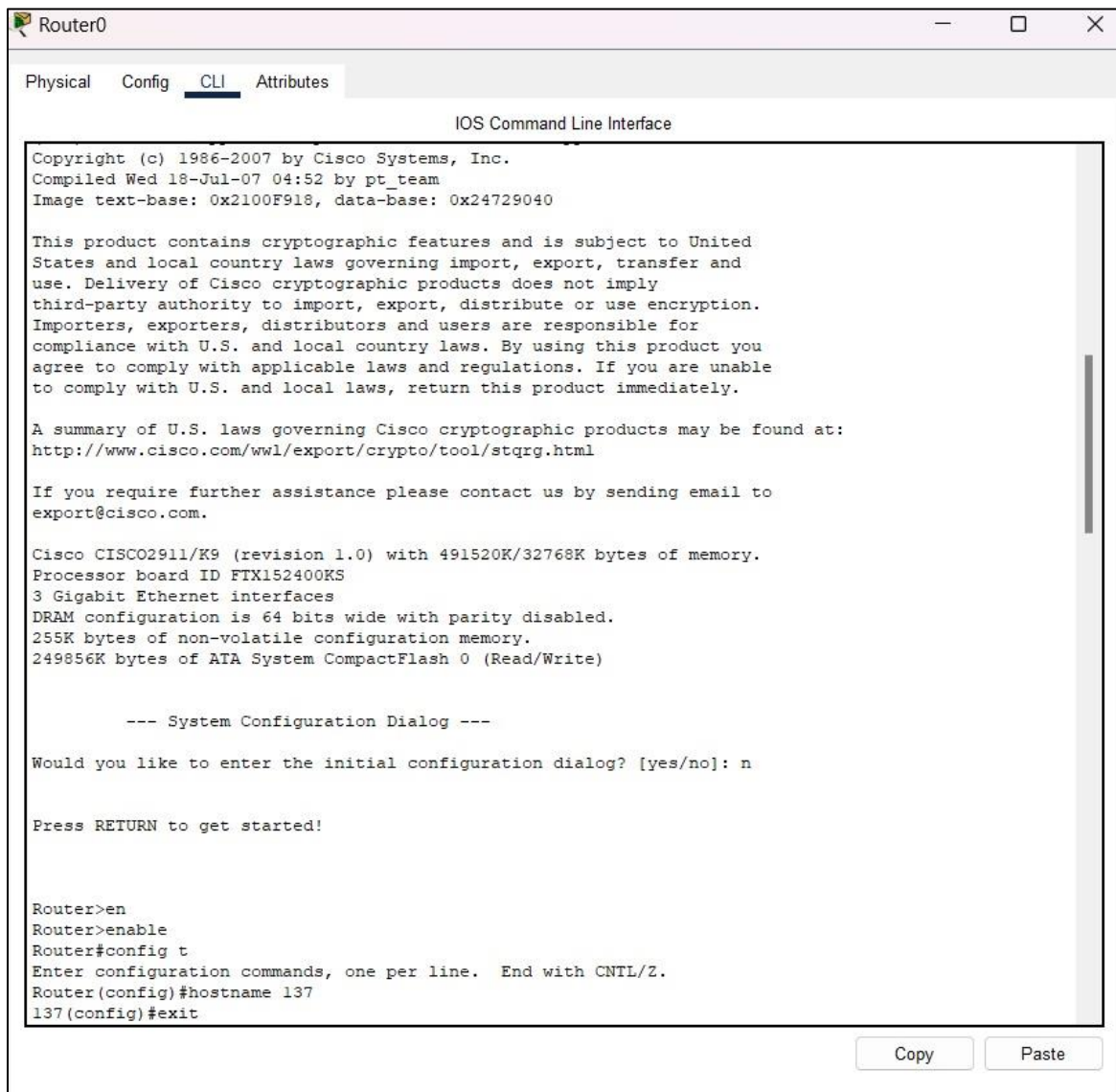
This screenshot is identical to the one above, showing the 'PC0' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below the radio buttons, the 'IPv4 Address' is set to '192.168.37.2', the 'Subnet Mask' is '255.255.255.0', the 'Default Gateway' is '192.168.37.1', and the 'DNS Server' is '0.0.0.0'. The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below the radio buttons, the 'IPv6 Address' is empty, the 'Link Local Address' is 'FE80::202:4AFF:FE4B:3A1E', the 'Default Gateway' is empty, and the 'DNS Server' is empty. The '802.1X' section has a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' set to 'MD5', and fields for 'Username' and 'Password' which are empty. A 'Top' button is at the bottom left.

Step 2: Renaming Host

To rename host of router, I clicked on the router, went to CLI and wrote the following code:

```
n
Router>enable
Router# config t
Router(config)# hostname 137
137(config)# exit
```

Here is the screenshot of the code:

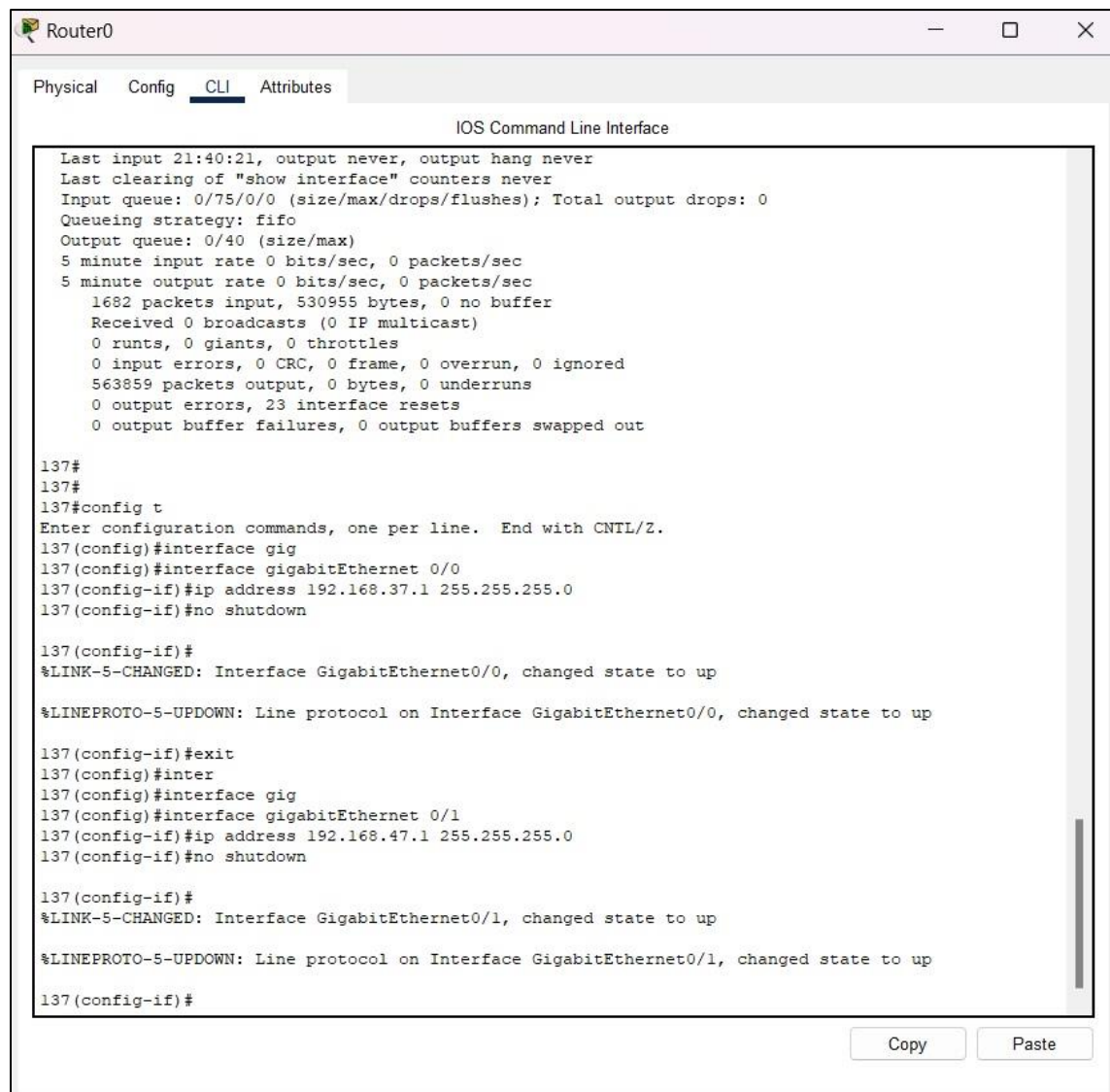


Step 3: Configuring Router

To rename host of router, I clicked on the router, went to CLI and wrote the following code:

```
137# config t
137(config)# interface gigabitEthernet 0/0
137(config-if)# ip address 196.168.37.1 255.255.255.0
137(config-if)# no shutdown
137(config-if)# exit
137(config)# interface gigabitEthernet 0/1
137(config-if)# ip address 196.168.47.1 255.255.255.0
137(config-if)# no shutdown
137(config-if)# exit
```

Here is the screenshot of the command:

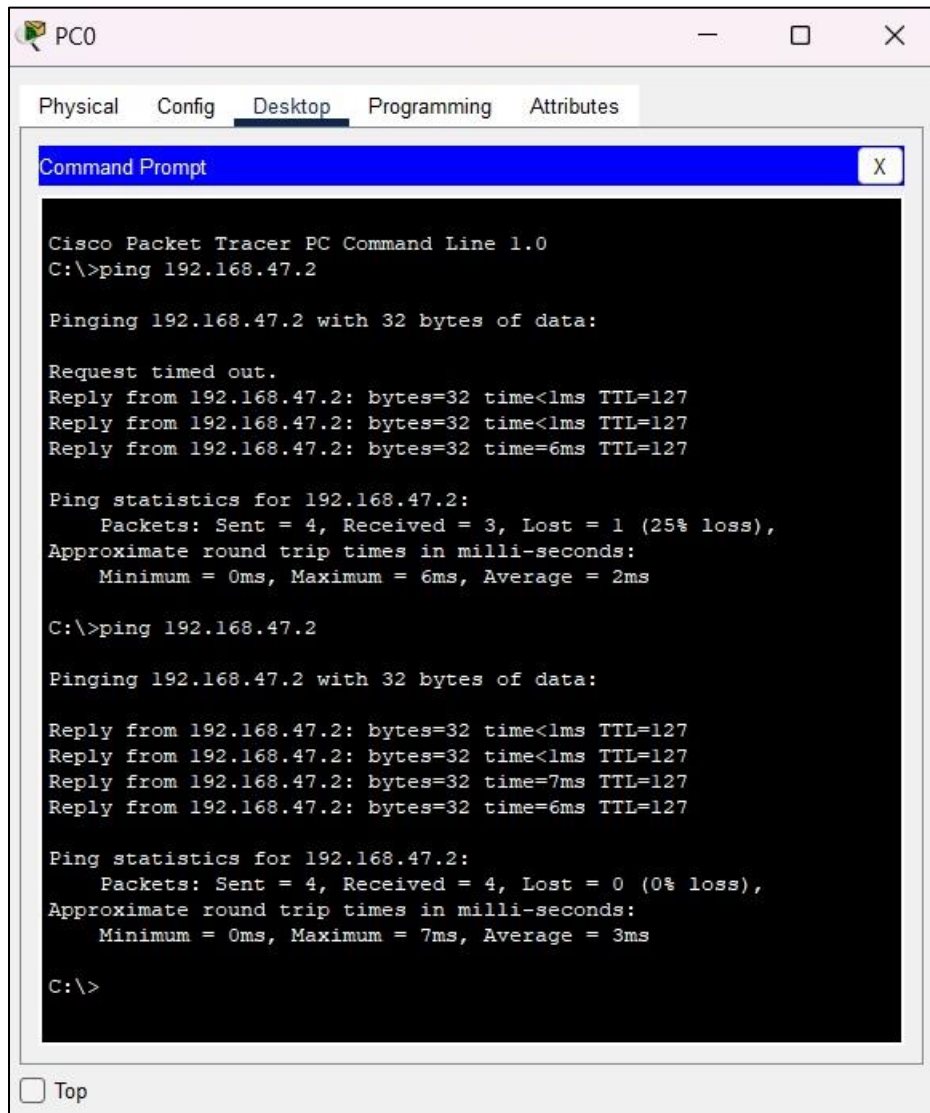


Step 4: Using the ping command from the terminal

To ping, I clicked on PC0, went to Desktop, then Command Prompt. In the command prompt I wrote:

```
Ping 192.168.47.2
```

Here is the screenshot of this step:



Questions (Answer to the point):

Q1. Write the command to check the status of all interfaces in a router.

Ans: `show interface`.

Q2. Why do we use switches and not hubs?

Ans: We prefer switches over hubs because they direct data only to intended devices, reducing network congestion and increasing security and performance.

Q3. How do you make all the configuration changes in a Cisco device persistent? What would happen if you didn't do this?

Ans: To make all the configuration changes in a Cisco device persistent, the following command needs to be used:

```
copy running-config startup-config
```

If I don't save the running configuration to the startup configuration, any changes I've made will be lost when the device is rebooted.

Q4. What are the interfaces of the router? Why are they necessary?

Ans: Routers typically have several types of interfaces. The key types of interfaces found on routers include:

1. fastEthernet
2. gigabitEthernet
3. serial
4. VLAN

Interfaces are necessary for routers because they serve as the connection points to different networks. Routers operate at the network layer (Layer 3) of the OSI model and use routing tables to make decisions about how to forward data between networks. Interfaces are how routers send and receive data on these networks. The diversity of interface types allows routers to be versatile and adaptable to various networking scenarios, supporting different technologies and connectivity options.

Q5. Why is default gateway necessary?

Ans: A default gateway is necessary because it serves as the router's exit point for traffic destined for remote networks. It allows devices within a local network to communicate with devices in other networks, enabling access to resources outside their own subnet.

Challenges (if any):

When I was pinging from PC0 to PC3 for the first time, it was unsuccessful. But when I again used the ping command for PC0 to PC3, it was successful. All the 4 data packets were received.