ASSIGNEMENT 1: BUILD A SWITCH AND ROUTER NETWORK WRITEUP

Introduction

In this lab we learned how to build a switch and router network. Th e assignment was divided into three major parts where the first part was on setting up a topology on packet tracer and initializing devices, the second part comprised of configuring basic settings on the devices and verifying their connectivity using ping commands and the final part was using different commands to display device information.

Part 1: Set Up Topology and Initialize Devices

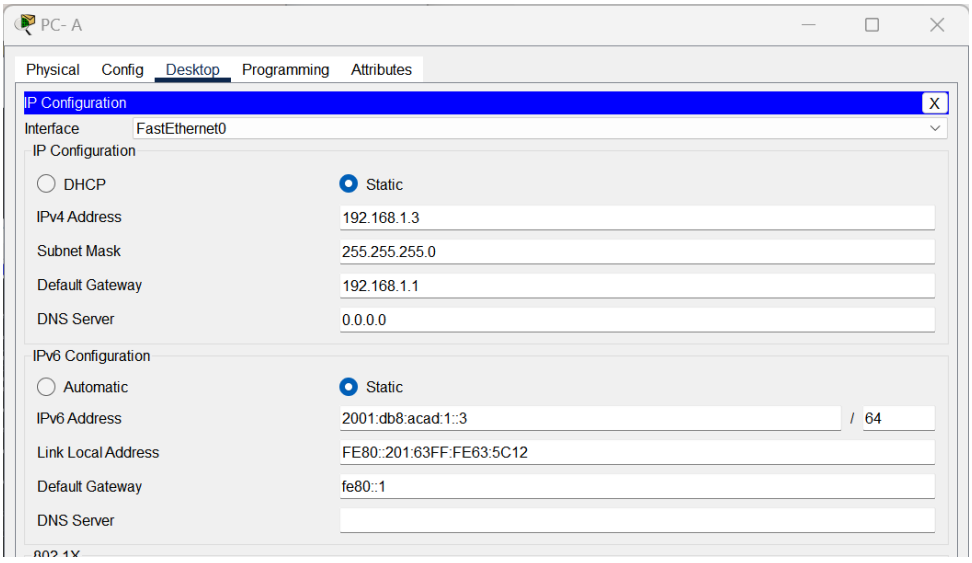
In this part, setting up of the topology was done as well as initializing and reloading the router and switch. Attachment of the devices shown in the topology diagram, and cable.

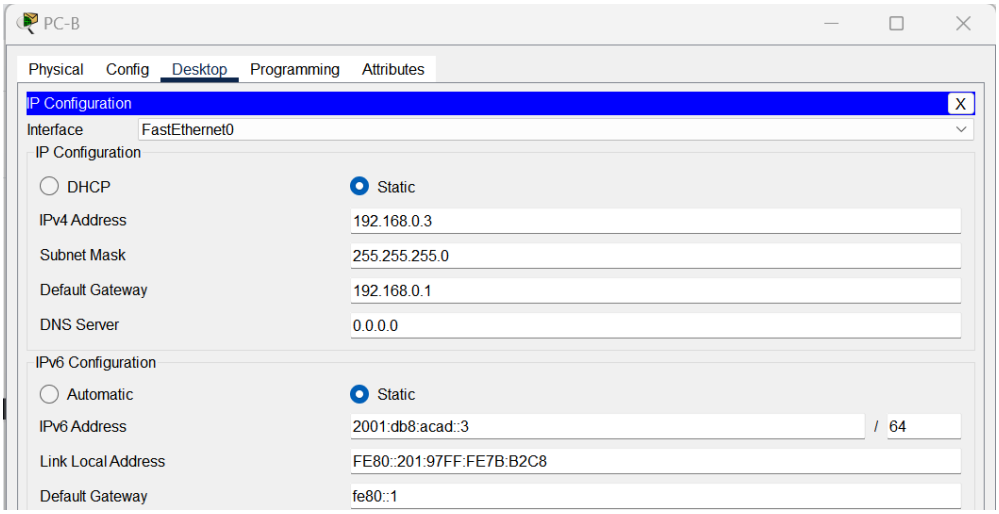
Part 2: Configure Devices and Verify Connectivity

In Part 2, configuration of the basic settings, such as the interface IP addresses, device access, and passwords were done.

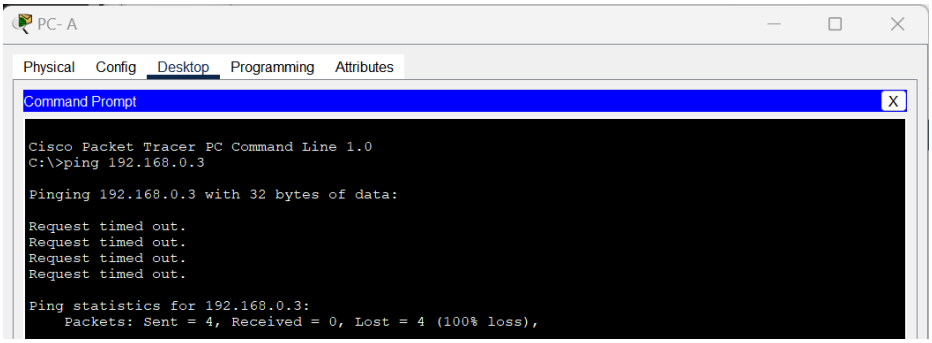
Step 1: Assign static IP information to the PC interfaces.

In this step configuration of the IP address, subnet mask, and default gateway settings ere done on PC-A and PC-B as shown below:





To confirm Ping PC-B from a command prompt window on PC-A.



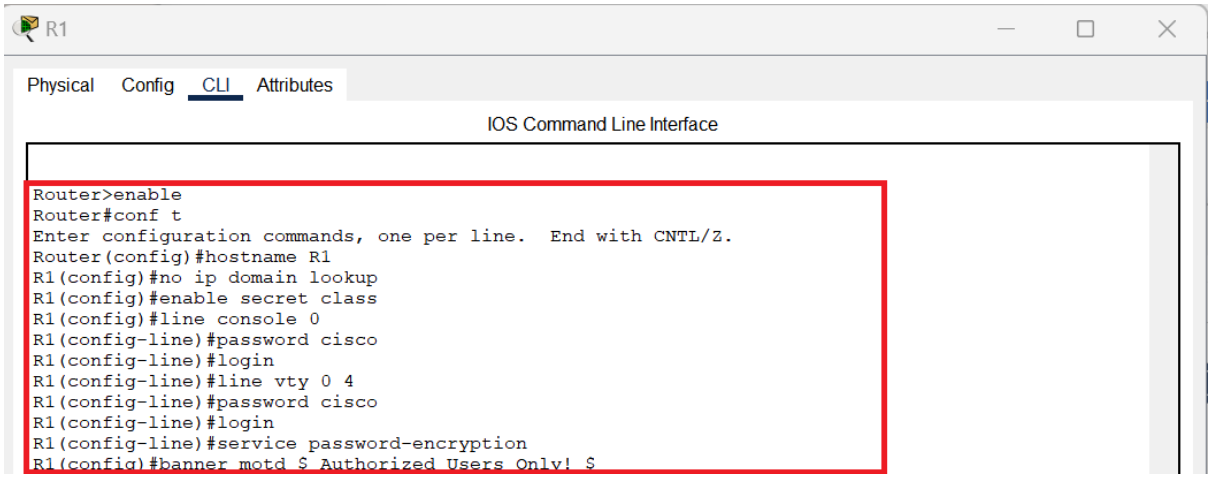
Question:

Why were the pings not successful?

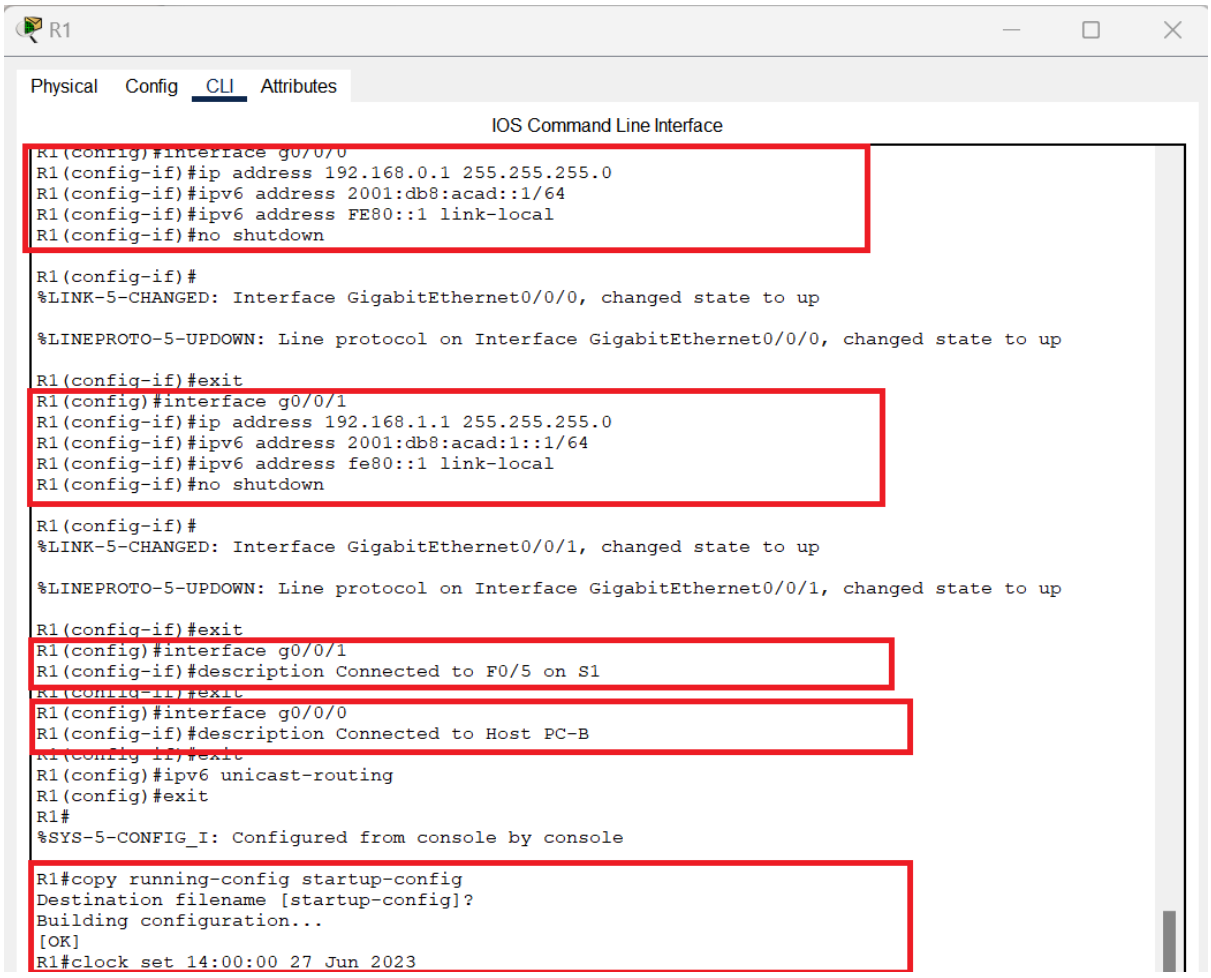
The pings were not successful because the router interfaces (default gateways) have not been configured yet so Layer 3 traffic is not being routed between subnets.

Step 2: Configure the router.

In this step configuration of the hostname, DNS lookup,and activation of bot interfaces on the router was done. The following displays the configuration:



Configure and activate both interfaces on the router, Configure an interface description for each interface indicating which device is connected to it and set the clock on the router.



Ping PC-B from a command prompt window on PC-A.

```
C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

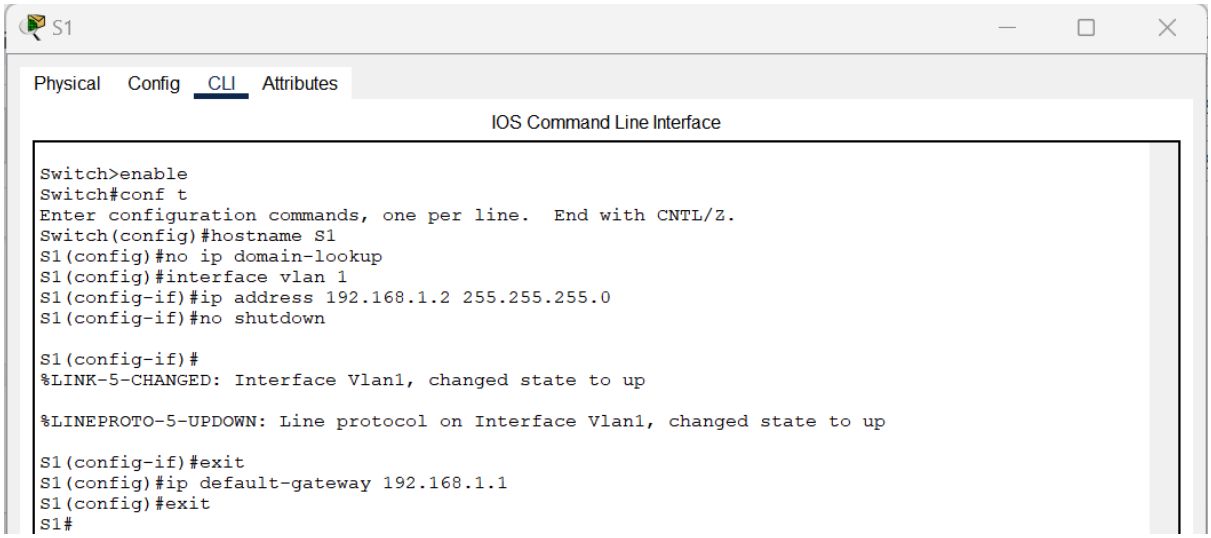
Question:

Were the pings successful? Explain.

Yes the ping was successful because the router was configured and is routing the ping traffic across the two subnets.

Step 3: Configure the switch.

In this step, configuration of the hostname, the VLAN 1 interface and its default gateway were done as shown below:



Step 4: Verify connectivity end-to-end connectivity.

To verify the connectivity from S1, ping PC-B in which was successful hence the configuration was correct.

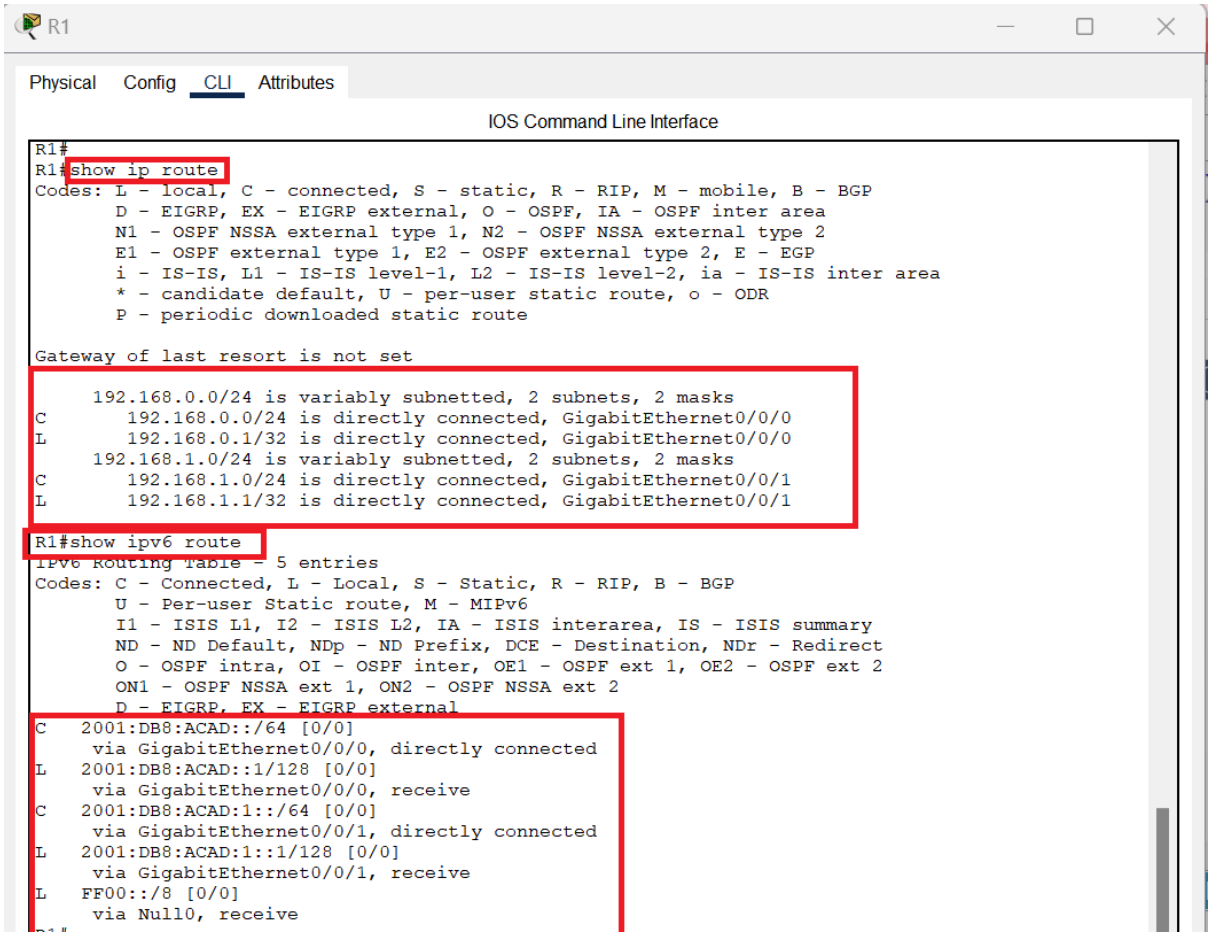
```
S1#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

S1#
```

Part 3: Display Device Information

In Part 3, we will use **show** commands to retrieve interface and routing information from the router and switch.

Step 1: Display the routing table on the router.

Using the show ip/ ipv6 route command on router to display the routing table.



Questions:

What code is used in the routing table to indicate a directly connected network?

The C designates a directly connected subnet. An L designates a local interface.

How many route entries are coded with a C code in the routing table?

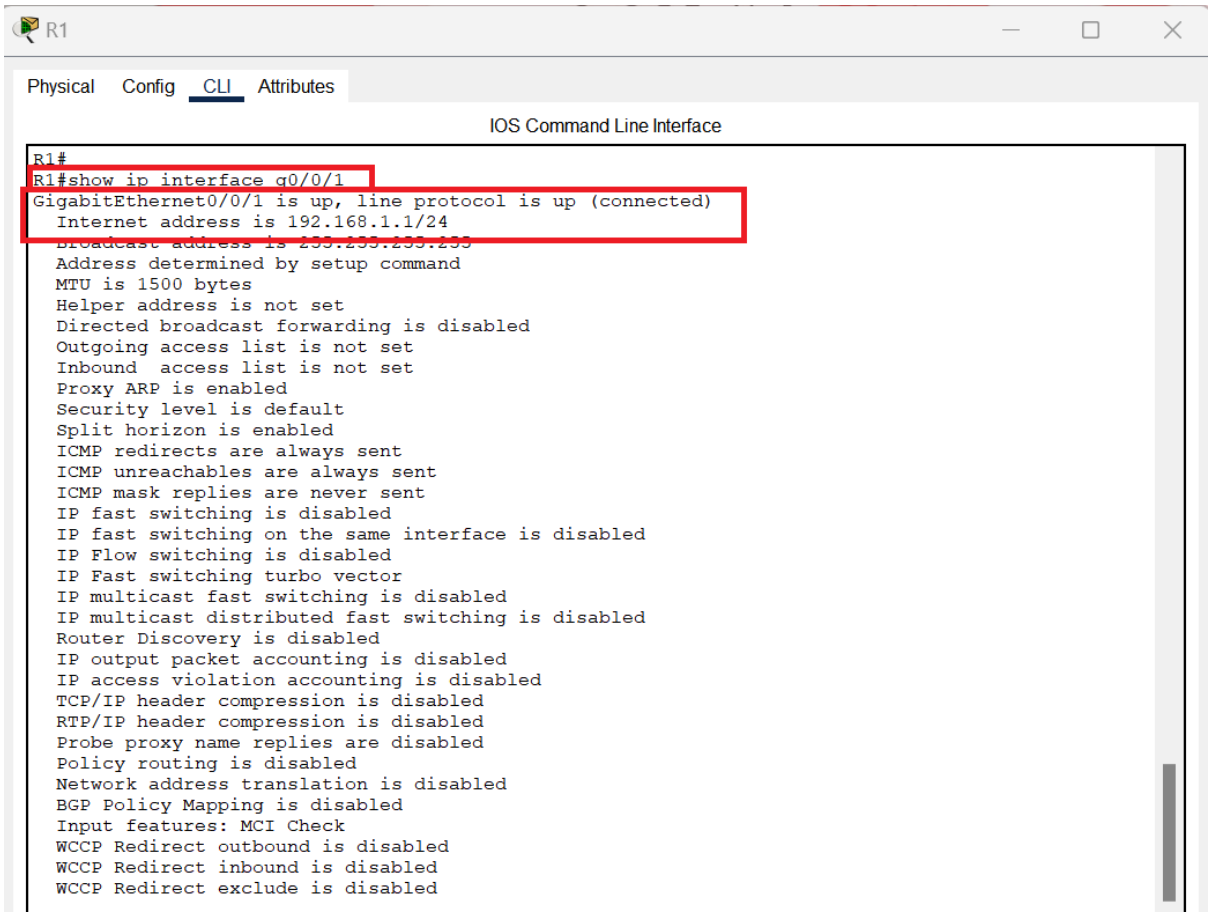
Two.

What interface types are associated to the C coded routes?

G0/0/0 and G0/0/1 as shown in the above diagram.

Step 2: Display interface information on the router R1.

Using the **show ip interface g0/0/1** to display the interface information as shown below:



Questions:

What is the operational status of the G0/0/1 interface?

GigabitEthernet0/0/1 is up, line protocol is up(connected) as show in the diagram above.

What is the Media Access Control (MAC) address of the G0/1 interface?

Using the show interface g0/0/1 the mac address would be

How is the Internet address displayed in this command?

Internet address is 192.168.1.1/24 as shown in the diagram above.

Reflection Questions

1. If the G0/0/1 interface showed that it was administratively down, what interface configuration command would you use to turn the interface up?

R1(config)#no shutdown

2. What would happen if you had incorrectly configured interface G0/0/1 on the router with an IP address of 192.168.1.2?

PC-A would not be able to ping PC-B. This is because PC-B is on a different network than PC-A which requires the default-gateway router to route these packets. PC-A is configured to use the IP address of 192.168.1.1 for the default-gateway router, but this address is not assigned to any device on the LAN. Any packets that need to be sent to the default-gateway for routing will never reach their destination.

Conclusion

In conclusion, this lab has provided us with invaluable practical experience in constructing and managing switch and router networks. By successfully completing each part of the assignment, we have developed a strong foundation in network building, configuration, and troubleshooting.