

Week 2 Assignment 1

Course: [Cloud and Network Security - C1-2026](#)

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[Week two Assignment one:](#)

[Class exercise: Build a switch and Router Network](#)

Week 2 Assignment 1

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Introduction

Topology



Addressing Table

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0/0	192.168.0.1 /24	N/A
		2001:db8:acad::1/64	
		fe80::1	
	G0/0/1	192.168.1.1 /24	N/A
		200:db8:acad:1::1/64	
		fe80::1	
S1	VLAN 1	192.168.1.2 /24	192.168.1.1
PC-A	NIC	192.168.1.3 /24	192.168.1.1
		2001:db8:acad:1::3/64	fe80::1
PC-B	NIC	192.168.0.3 /24	192.168.0.1
		2001:db8:acad::3/64	fe80::1

Objectives

- **Part 1: Set Up the Topology and Initialize Devices**
- **Part 2: Configure Devices and Verify Connectivity**

Background / Scenario

This is a comprehensive lab to review previously covered IOS commands. In this lab, you will cable the equipment as shown in the topology diagram. You will then configure the devices to match the addressing table. After the configurations have been saved, you will verify your configurations by testing for network connectivity.

After the devices have been configured and network connectivity has been verified, you will use IOS commands to retrieve information from the devices to answer questions about your network equipment.

This lab provides minimal assistance with the actual commands necessary to configure the router. Test your knowledge by trying to configure the devices without referring to the content or previous activities.

S1# show sdm prefer

Use the following commands to assign the **dual-ipv4-and-ipv6** template as the default SDM template.

S1# configure terminal

S1(config)# sdm prefer dual-ipv4-and-ipv6 default

S1(config)# end

S1# reload

Required Resources

- 1 Router (Cisco 4221 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 1 Switch (Cisco 2960 with Cisco IOS Release 15.2(2) lanbasek9 image or comparable)
- 2 PCs (Windows with a terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

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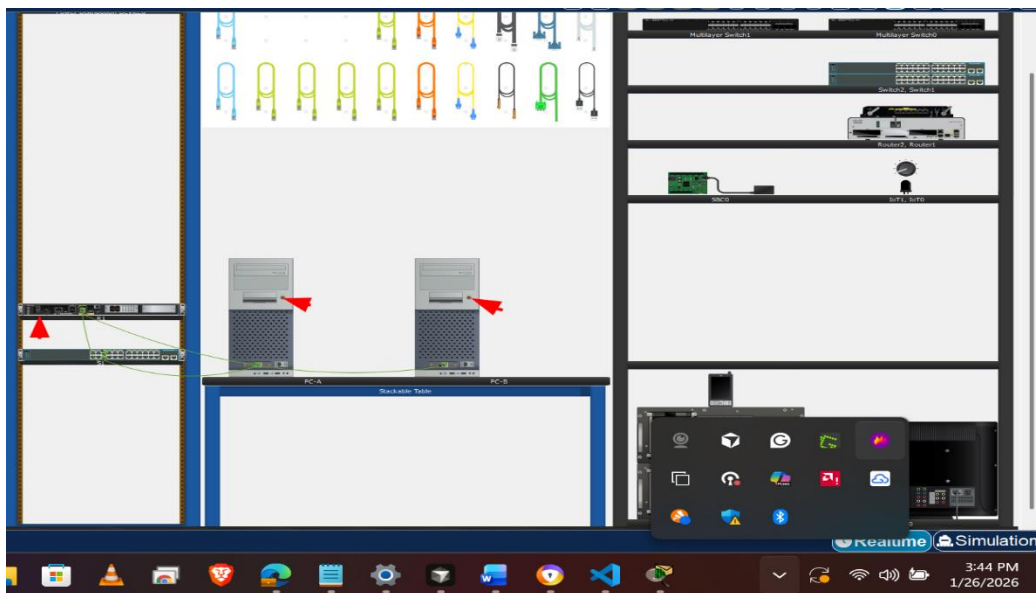
Note: The Gigabit Ethernet interfaces on Cisco 4221 routers are autosensing and an Ethernet straight-through cable may be used between the router and PC-B. If using another model Cisco router, it may be necessary to use an Ethernet crossover cable.

Instructions

Part 1: Set Up Topology and Initialize Devices

Step 1: Cable the network as shown in the topology.

- Attach the devices shown in the topology diagram and cable, as necessary.
- Power on all the devices in the topology.



Step 2: Initialize and reload the router and switch.

On Switch:

```
Switch# delete flash:vlan.dat
```

```
Switch# erase startup-config
```

```
Switch# reload
```

On Router:

```
Router# erase startup-config
```

```
Router# reload
```

Week 2 Assignment 1

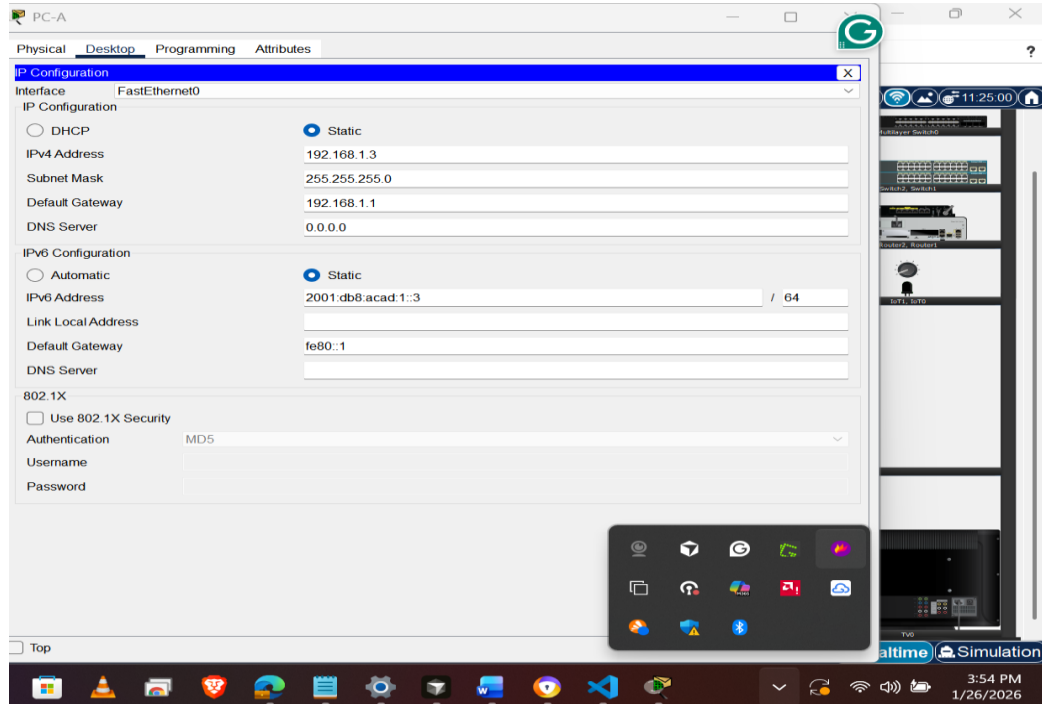
If configuration files were previously saved on the router and switch, initialize and reload these devices back to their default configurations.

Part 2: Configure Devices and Verify Connectivity

In Part 2, you will set up the network topology and configure basic settings, such as the interface IP addresses, device access, and passwords.

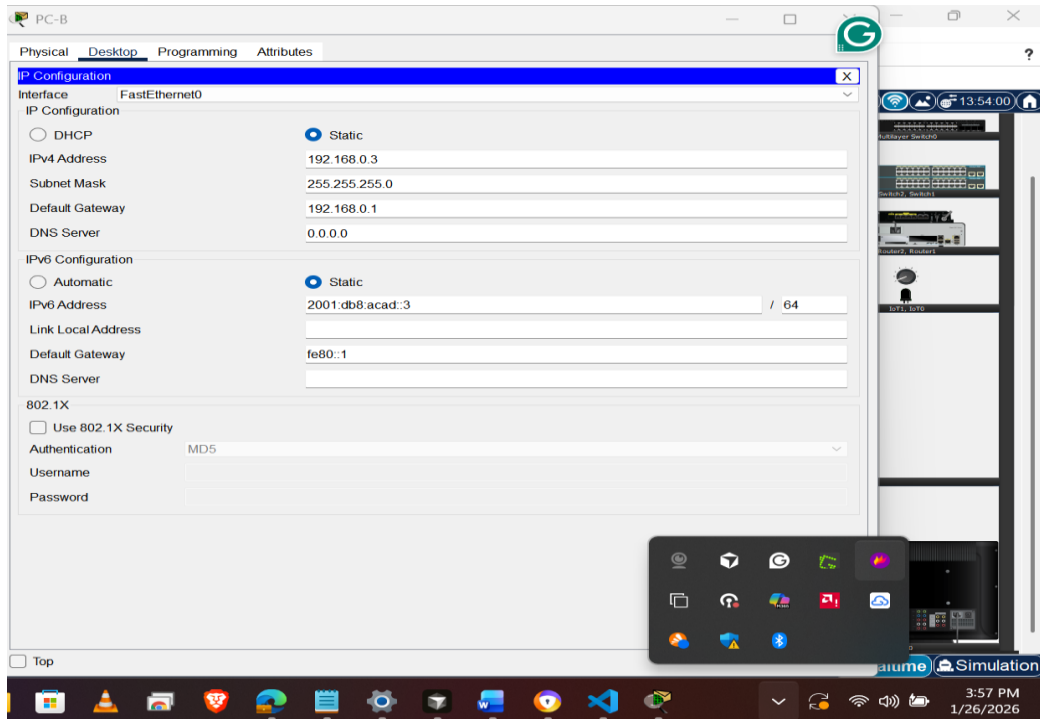
Step 1: Assign static IP information to the PC interfaces.

a. Configure the IP address, subnet mask, and default gateway settings on PC-A.

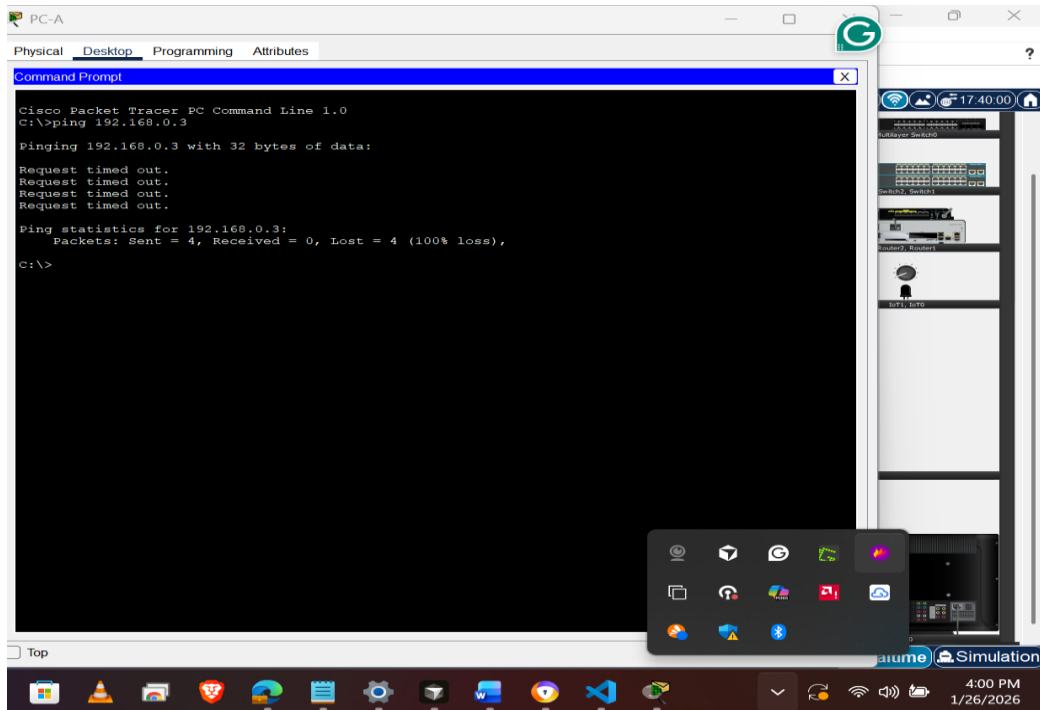


b. Configure the IP address, subnet mask, and default gateway settings on PC-B.

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



Note: If pings are not successful, the Windows Firewall may need to be turned off.

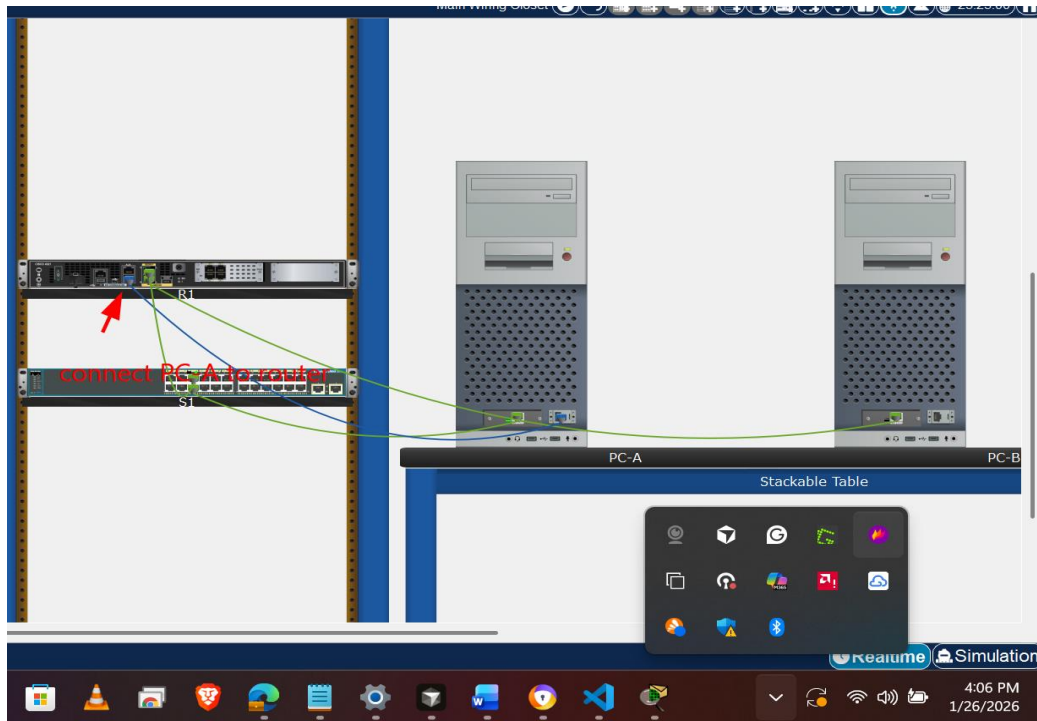
Why were the pings not successful?

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

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Step 2: Configure the router.

a. Console into the router and enable privileged EXEC mode.



Router> **enable**

b. Enter configuration mode.

Router# **config terminal**

c. Assign a device name to the router.

Router(config)# **hostname R1**

d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

R1(config)# **no ip domain-lookup**

e. Assign class as the privileged EXEC encrypted password.

R1(config)# **enable secret class**

f. Assign cisco as the console password and enable login.

R1(config)# **line console 0**

R1(config-line)# **password cisco**

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R1(config-line)# **login**

g. Assign cisco as the VTY password and enable login.

R1(config)# **line vty 0 4**

R1(config-line)# **password cisco**

R1(config-line)# **login**

h. Encrypt the plaintext passwords.

R1(config)# **service password-encryption**

i. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.

R1(config)# **banner motd \$ Authorized Users Only! \$**

j. Configure and activate both interfaces on the router.

R1(config)# **interface g0/0/0**

R1(config-if)# **ip address 192.168.0.1 255.255.255.0**

R1(config-if)# **ipv6 address 2001:db8:acad::1/64**

R1(config-if)# **ipv6 address FE80::1 link-local**

R1(config-if)# **no shutdown**

R1(config-if)# **exit**

R1(config)# **interface g0/0/1**

R1(config-if)# **ip address 192.168.1.1 255.255.255.0**

R1(config-if)# **ipv6 address 2001:db8:acad:1::1/64**

R1(config-if)# **ipv6 address fe80::1 link-local**

R1(config-if)# **no shutdown**

R1(config-if)# **exit**

k. Configure an interface description for each interface indicating which device is connected to it.

R1(config)# **interface g0/0/1**

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R1(config-if)# **description** Connected to F0/5 on S1

R1(config-if)# **exit**

R1(config)# **interface** g0/0/0

R1(config-if)# **description** Connected to Host PC-B

R1(config-if)# **exit**

l. To enable IPv6 routing, enter the command ipv6 unicast-routing.

R1(config)# **ipv6 unicast-routing**

m. Save the running configuration to the startup configuration file.

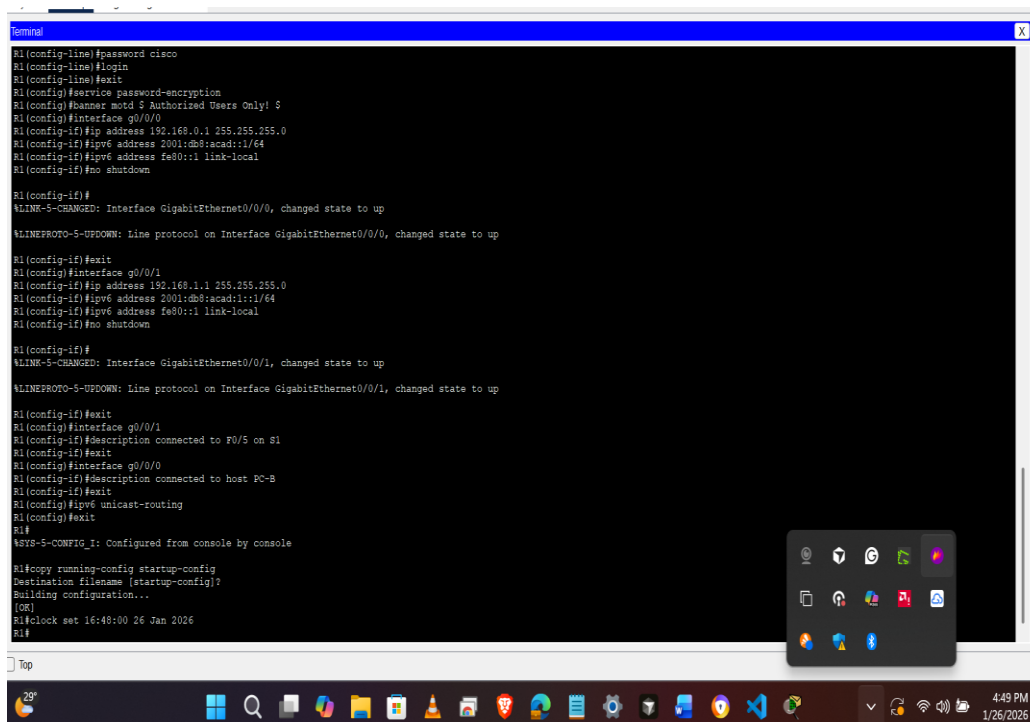
R1(config)# **exit**

R1# **copy running-config startup-config**

n. Set the clock on the router.

R1# **clock set 15:30:00 27 Aug 2019**

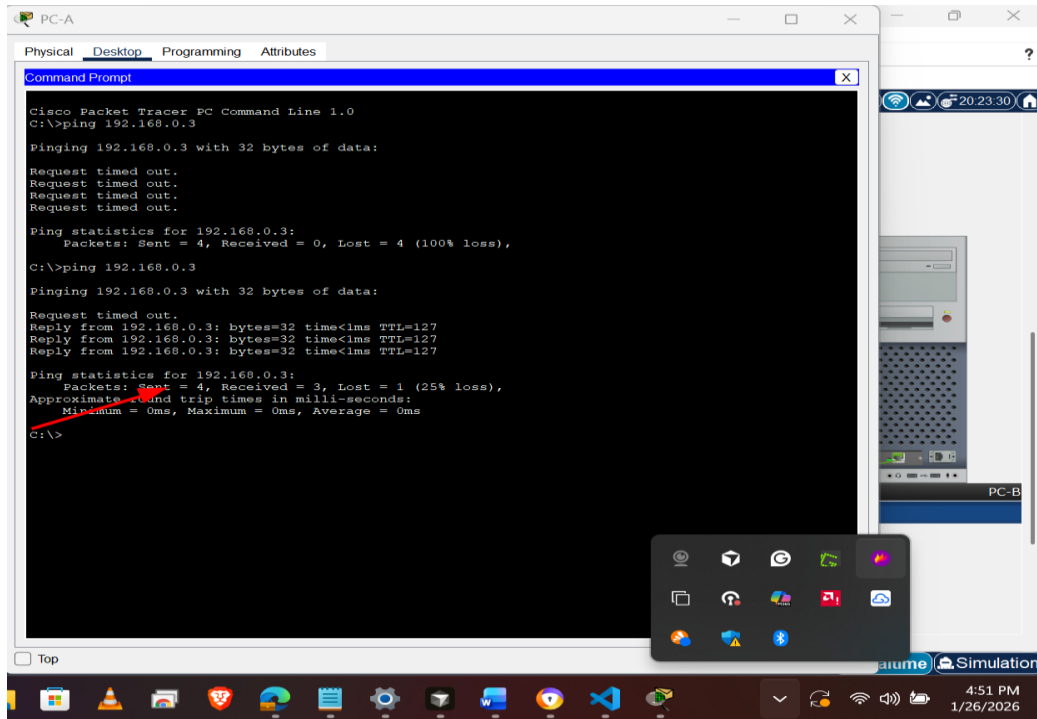
Note: Use the question mark (?) to help with the correct sequence of parameters needed to execute this command.



```
Terminal
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd $ Authorized Users Only! $
R1(config)#interface g0/0/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
R1(config-if)#exit
R1(config)#interface g0/0/1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
R1(config-if)#exit
R1(config)#interface g0/0/1
R1(config-if)#description connected to F0/5 on S1
R1(config-if)#exit
R1(config)#interface g0/0/0
R1(config-if)#description connected to host PC-B
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#clock set 16:48:00 26 Jan 2026
R1#
```

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



Note: If pings are not successful, the Windows Firewall may need to be turned off.

Were the pings successful? Explain.

Yes. The router is routing the ping traffic across the two subnets. The default settings for the 2960 switch will automatically turn up the interfaces that are connected to devices.

Step 3: Configure the switch.

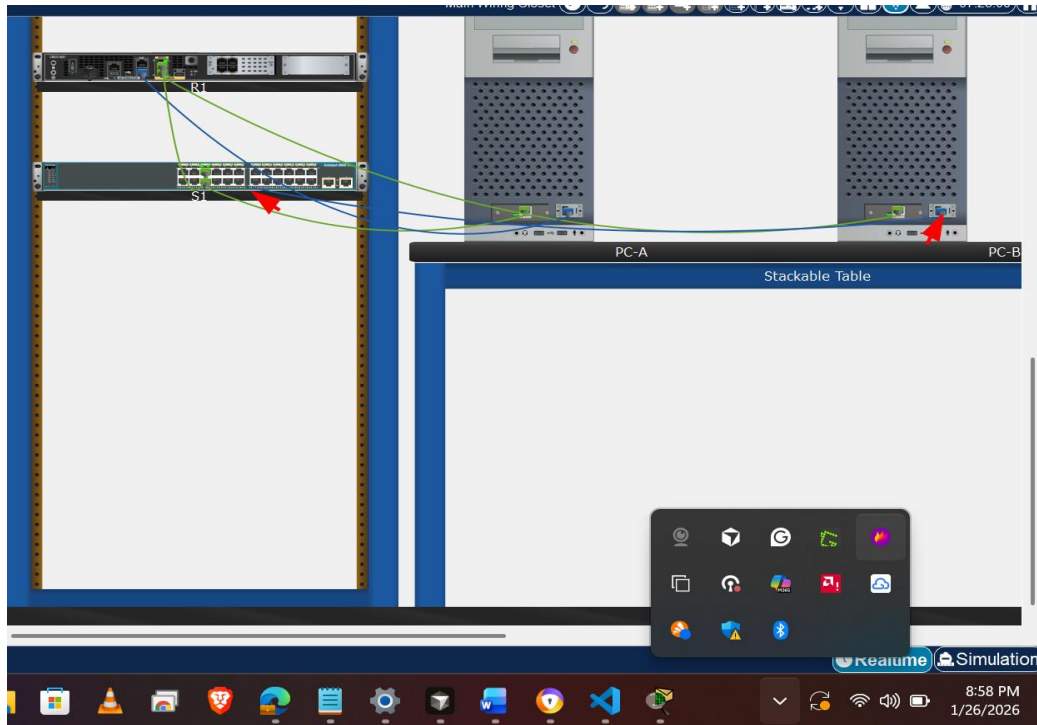
In this step, you will configure the hostname, the VLAN 1 interface and its default gateway.

a. Console into the switch and enable privileged EXEC mode.

Right-click on switch **S1**, select “**Inspect Rear**” to display S1 **console port**.

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Use the console cable to connect PC-B to the switch through the console port.



Switch> **enable**

b. Enter configuration mode.

Switch# **config terminal**

c. Assign a device name to the switch.

Switch(config)# **hostname S1**

d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

S1(config)# **no ip domain-lookup**

e. Configure and activate the VLAN interface on the switch S1.

S1(config)# **interface vlan 1**

S1(config-if)# **ip address 192.168.1.2 255.255.255.0**

S1(config-if)# **no shutdown**

S1(config-if)# **exit**

f. Configure the default gateway for the switch S1.

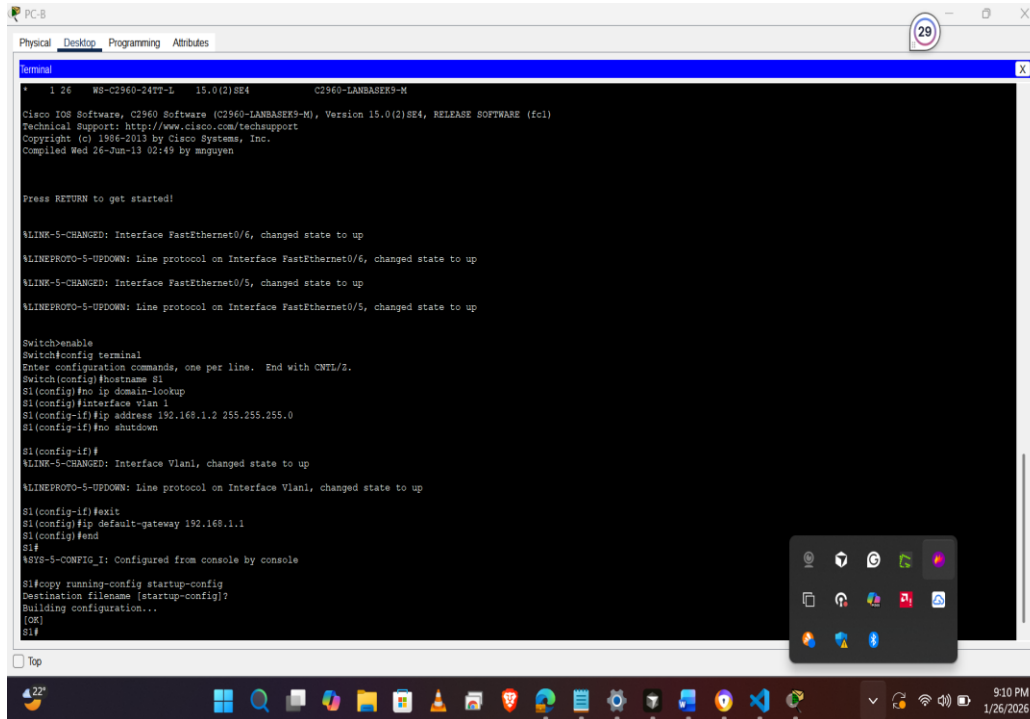
Week 2 Assignment 1

S1(config)# ip default-gateway 192.168.1.1

S1(config-if)# end

g. Save the running configuration to the startup configuration file.

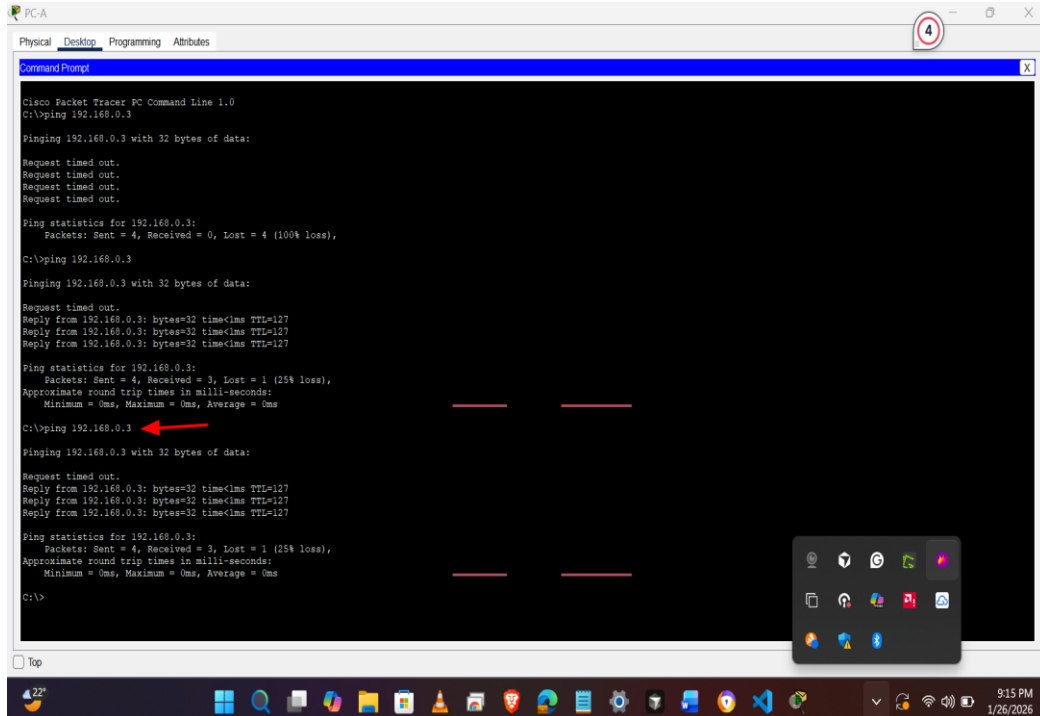
S1# copy running-config startup-config



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

a. From PC-A, ping PC-B.

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The screenshot shows a Windows-style desktop environment with a taskbar at the bottom. A window titled 'PC-A' is open, displaying a 'Command Prompt' window. The command prompt shows the output of several ping commands to the IP address 192.168.0.3. The first three attempts result in 'Request timed out.' The fourth attempt shows successful replies from 192.168.0.3 with a TTL of 127. The statistics for the fourth attempt are: Packets: Sent = 4, Received = 3, Lost = 1 (25% loss), Minimum = 0ms, Maximum = 0ms, Average = 0ms. A red arrow points to the command 'C:\>ping 192.168.0.3'.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Request timed out.
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 = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

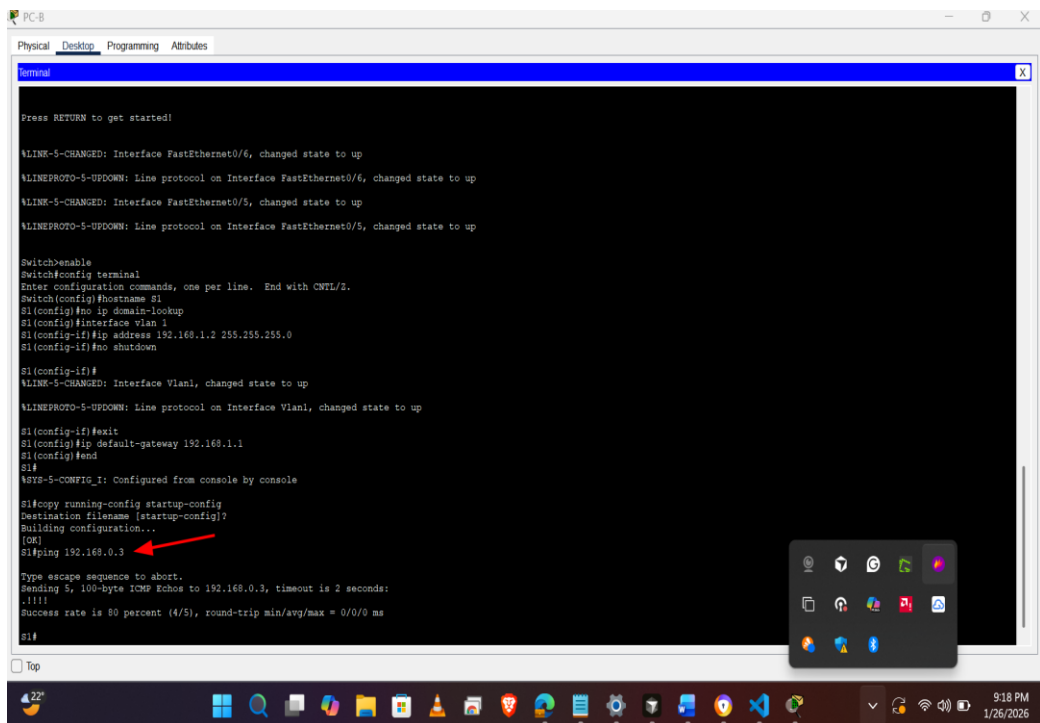
C:\>ping 192.168.0.3
Pinging 192.168.0.3 with 32 bytes of data:

Request timed out.
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 = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

b. From S1, ping PC-B.



The screenshot shows a Windows-style desktop environment with a taskbar at the bottom. A window titled 'PC-B' is open, displaying a 'Terminal' window. The terminal shows the configuration of a switch (S1) and the execution of a ping command to 192.168.0.3. The configuration includes setting the hostname to S1, enabling the console, and configuring the interface Vlan1 with IP address 192.168.1.2. The ping command is executed successfully, showing a success rate of 80 percent (4/5) and a round-trip time of 0/0/0 ms. A red arrow points to the command 'S1#ping 192.168.0.3'.

```
Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

Switch>enable
Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#interface vlan 1
S1(config-if)#ip address 192.168.1.2 255.255.255.0
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S1(config-if)#exit
S1(config)#ip default-gateway 192.168.1.1
S1(config)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S1#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes 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#
```

All the pings should be successful.

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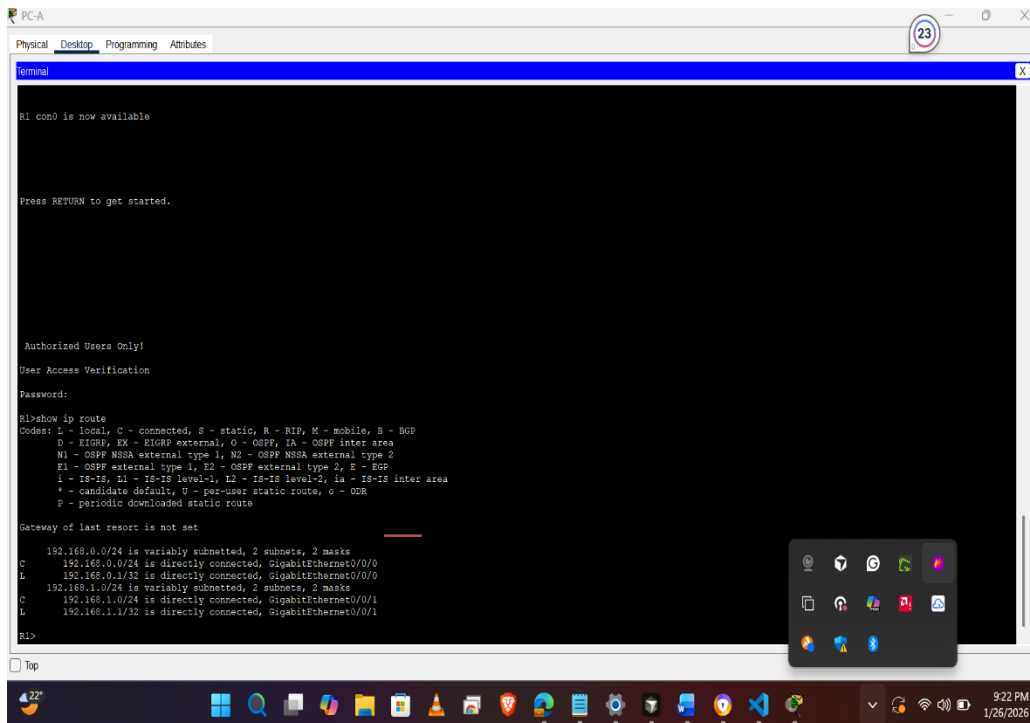
Part 3: Display Device Information

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

Step 1: Display the routing table on the router.

a. Use the **show ip route** command on the router R1 to answer the following questions.

R1# show ip route



```
PC-A
Physical Desktop Programming Attributes
Terminal
R1 con0 is now available

Press RETURN to get started.

Authorized Users Only!
User Access Verification
Password:

R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/24 is directly connected, GigabitEthernet0/0/0
L 192.168.0.1/32 is directly connected, GigabitEthernet0/0/0
C 192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/1
L 192.168.1.1/32 is directly connected, GigabitEthernet0/0/1
R1#
```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, * - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP

+ - replicated route, % - next hop override

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Gateway of last resort is not set

192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.0.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.0.1/32 is directly connected, GigabitEthernet0/0/0

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.1.1/32 is directly connected, GigabitEthernet0/0/1

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. Both answers are correct.

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

2

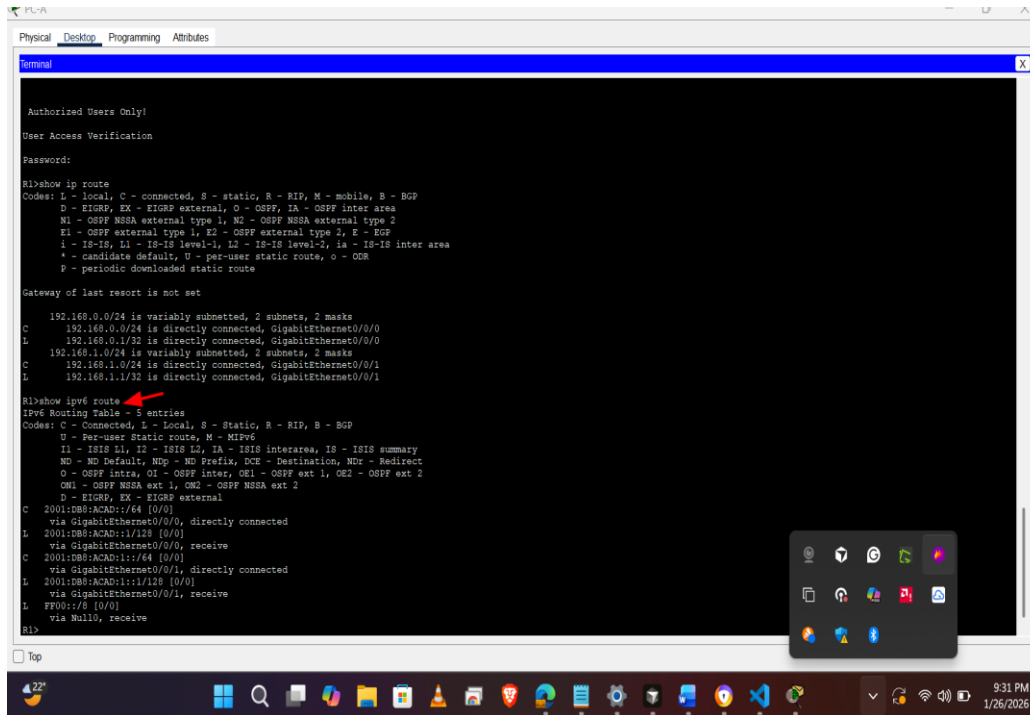
What interface types are associated to the C coded routes?

Answers may vary depending of router type, but on the 4221 the correct answer is G0/0/0 and G0/0/1.

b. Use the **show ipv6 route** command on router R1 to display the IPv6 routes.

R1# **show ipv6 route**

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```
Physical Desktop Programming Attributes
Terminal

Authorized Users Only!
User Access Verification
Password:

R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, IS - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

    192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.0.0/24 is directly connected, GigabitEthernet0/0/0
L       192.168.0.1/32 is directly connected, GigabitEthernet0/0/0
C       192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, GigabitEthernet0/0/1
L       192.168.1.1/32 is directly connected, GigabitEthernet0/0/1

R1#show ipv6 route
IPv6 Routing Table - 5 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
C       2001:DB8:ACAD::/64 [0/0]
       via GigabitEthernet0/0/0, directly connected
L       2001:DB8:ACAD::1/128 [0/0]
       via GigabitEthernet0/0/0, receive
C       2001:DB8:ACAD::1::/64 [0/0]
       via GigabitEthernet0/0/1, directly connected
L       2001:DB8:ACAD::1:1/128 [0/0]
       via GigabitEthernet0/0/1, receive
L       FF00::/8 [0/0]
       via Null0, receive
R1#
```

IPv6 Routing Table - default - 5 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, R - RIP, H - NHRP, I1 - ISIS L1

I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary, D - EIGRP

EX - EIGRP external, ND - ND Default, NDp - ND Prefix, DCE - Destination

NDr - Redirect, RL - RPL, O - OSPF Intra, OI - OSPF Inter

OE1 - OSPF ext 1, OE2 - OSPF ext 2, ON1 - OSPF NSSA ext 1

ON2 - OSPF NSSA ext 2, la - LISP alt, lr - LISP site-registrations

ld - LISP dyn-eid, IA - LISP away, le - LISP extranet-policy

a - Application

C 2001:DB8:ACAD::/64 [0/0]

via GigabitEthernet0/0/0, directly connected

L 2001:DB8:ACAD::1/128 [0/0]

via GigabitEthernet0/0/0, receive

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C 2001:DB8:ACAD:1::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:1::1/128 [0/0]

via GigabitEthernet0/0/1, receive

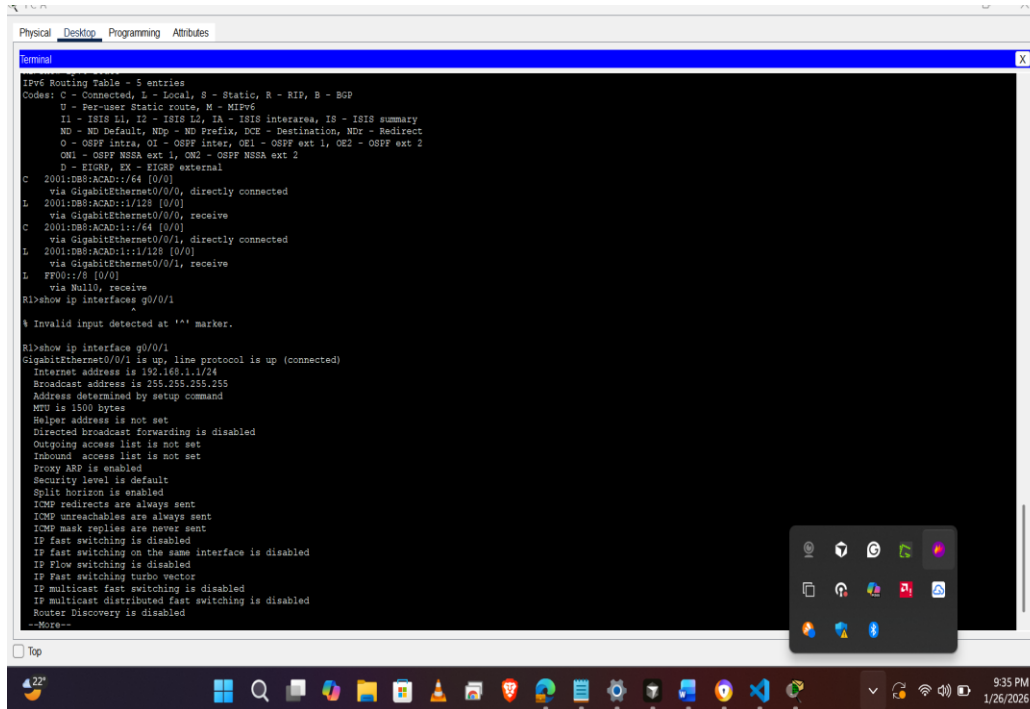
L FF00::/8 [0/0]

via Null0, receive

Step 2: Display interface information on the router R1.

a. Use the **show ip interface g0/0/1** to answer the following questions.

R1# show ip interfaces g0/0/1



```
Physical Desktop Programming Attributes
Terminal
IPv6 Routing Table - 5 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
U - Per-user static route, M - MIPv6
Tl - ISIS tl, T2 - ISIS l2, T3 - ISIS interarea, IS - ISIS summary
ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ONI - OSPF NSR ext 1, ON2 - OSPF NSR ext 2
D - EIGRP, EX - EIGRP external
C 2001:DB8:ACAD::/64 [0/0]
  via GigabitEthernet0/0/0, directly connected
L 2001:DB8:ACAD:1/128 [0/0]
  via GigabitEthernet0/0/0, receive
C 2001:DB8:ACAD:1::/64 [0/0]
  via GigabitEthernet0/0/1, directly connected
L 2001:DB8:ACAD:1::1/128 [0/0]
  via GigabitEthernet0/0/1, receive
L FF00::/8 [0/0]
  via Null0, receive
R1#show ip interfaces g0/0/1
% Invalid input detected at '^' marker.

R1#show ip interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up (connected)
  Internet address is 192.168.1.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is disabled
  IP fast switching on the same interface is disabled
  IP flow switching is disabled
  IP fast switching turbo vector
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
  --More--
```

GigabitEthernet0/0/1 is up, line protocol is up

Hardware is ISR4321-2x1GE, address is a0e0.af0d.e141 (bia a0e0.af0d.e141)

Description: Connectd to F0/5 on S1

Internet address is 192.168.1.1/24

MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,

reliability 255/255, txload 1/255, rxload 1/255

Week 2 Assignment 1

Encapsulation ARPA, loopback not set

Keepalive not supported

Full Duplex, 100Mbps, link type is auto, media type is RJ45

output flow-control is off, input flow-control is off

ARP type: ARPA, ARP Timeout 04:00:00

Last input 00:00:00, output 00:00:19, output hang never

Last clearing of "show interface" counters never

Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: fifo

Output queue: 0/40 (size/max)

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

4579 packets input, 637737 bytes, 0 no buffer

Received 1092 broadcasts (0 IP multicasts)

0 runts, 0 giants, 0 throttles

0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored

0 watchdog, 2863 multicast, 0 pause input

700 packets output, 115187 bytes, 0 underruns

0 output errors, 0 collisions, 1 interface resets

0 unknown protocol drops

0 babbles, 0 late collision, 0 deferred

0 lost carrier, 0 no carrier, 0 pause output

0 output buffer failures, 0 output buffers swapped out

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

GigabitEthernet0/0/1 is up, line protocol is up

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

Week 2 Assignment 1

Answers will vary but will appear in the form of: xxxx.xxxx.xxxx, where each x will be replaced with a hexadecimal number.

How is the Internet address displayed in this command?

Internet address is 192.168.1.1/24.

b. For the IPv6 information, enter the **show ipv6 interface *interface*** command.

R1# show ipv6 interface g0/0/1

Physical Desktop Networking Attributes

```

Terminal
IP fast switching is disabled
IP fast switching on the same interface is disabled
IP flow switching is disabled
IP Fast switching turbo vector
IP multicast fast switching is disabled
IP multicast distributed fast switching is disabled
Router discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTT/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: WCCP Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

R1>
R1>
R1>
R1>show ipv6 interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::1
No Virtual link-local address(es):
Global unicast address(es):
  2001:DB8:ACAD::1, subnet is 2001:DB8:ACAD::1::/64
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FE80::1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachable are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.

R1>
  
```

Top

9:43 PM 1/26/2026

GigabitEthernet0/0/1 is up, line protocol is up

IPv6 is enabled, link-local address is FE80::1

No Virtual link-local address(es):

Description: Connectd to F0/5 on S1

Global unicast address(es):

2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64

Joined group address(es):

FF02::1

FF02::2

Week 2 Assignment 1

FF02::1:FF00:1

MTU is 1500 bytes

ICMP error messages limited to one every 100 milliseconds

ICMP redirects are enabled

ICMP unreachable are sent

ND DAD is enabled, number of DAD attempts: 1

ND reachable time is 30000 milliseconds (using 30000)

ND advertised reachable time is 0 (unspecified)

ND advertised retransmit interval is 0 (unspecified)

ND router advertisements are sent every 200 seconds

ND router advertisements live for 1800 seconds

ND advertised default router preference is Medium

Hosts use stateless autoconfig for addresses.

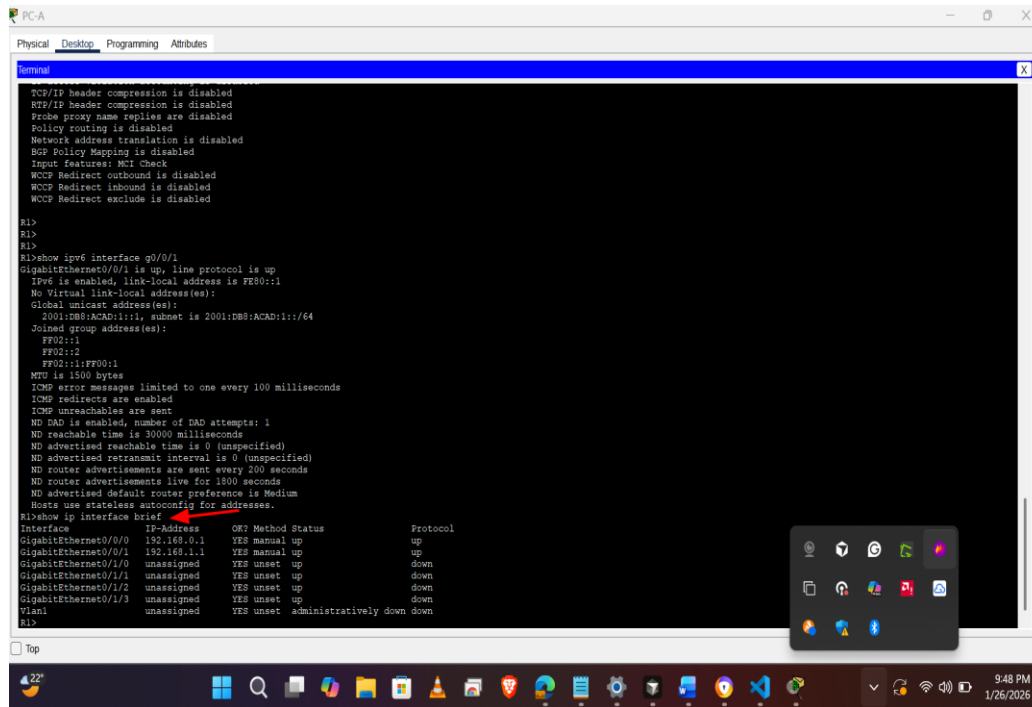
Step 3: Display a summary list of the interfaces on the router and switch.

There are several commands that can be used to verify an interface configuration. One of the most useful of these is the **show ip interface brief** command. The command output displays a summary list of the interfaces on the device and provides immediate feedback to the status of each interface.

a. Enter the **show ip interface brief** command on the router R1.

R1# **show ip interface brief**

Week 2 Assignment 1



```
PC-A
Physical Desktop Programming Attributes
Terminal
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
BGP Policy Mapping is disabled
Input features: NCI Check
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

R1>
R1>
R1>
R1>
R1>show ipv6 interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::1
No Virtual link-local address(es):
Global unicast address(es):
2001:DB8:ACAD::1, subnet is 2001:DB8:ACAD::1::/64
Joined group address(es):
FF02::1
FF02::2
FF02::1:FF00:1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachable are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.

R1>show ip interface brief
Interface      IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0  192.168.0.1    YES manual up          up
GigabitEthernet0/0/1  192.168.1.1    YES manual up          up
GigabitEthernet0/1/0   unassigned     YES unset  up          down
GigabitEthernet0/1/1   unassigned     YES unset  up          down
GigabitEthernet0/1/2   unassigned     YES unset  up          down
GigabitEthernet0/1/3   unassigned     YES unset  up          down
Vlan1            unassigned     YES unset  administratively down down
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/0	192.168.0.1	YES	manual	up	up
GigabitEthernet0/0/1	192.168.1.1	YES	manual	up	up
Serial0/1/0	unassigned	YES	unset	up	up
Serial0/1/1	unassigned	YES	unset	up	up

b. To see the IPv6 interface information, enter the **show ipv6 interface brief** command on R1.

R1# show ipv6 interface brief

Week 2 Assignment 1

```
Physical Desktop Programming Attributes
Terminal
R1>
R1>show ipv6 interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::1
No Virtual link-local address(es):
Global unicast address(es):
  2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FF00:1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachable are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.
R1>show ip interface brief
Interface      IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0  192.168.0.1    YES manual up          up
GigabitEthernet0/0/1  192.168.1.1    YES manual up          up
GigabitEthernet0/1/0   unassigned     YES unset  up          down
GigabitEthernet0/1/1   unassigned     YES unset  up          down
GigabitEthernet0/1/2   unassigned     YES unset  up          down
GigabitEthernet0/1/3   unassigned     YES unset  up          down
Vlan1            unassigned     YES unset  administratively down down
R1>show ipv6 interface brief
GigabitEthernet0/0/0    [up/up]
FE80::1
2001:DB8:ACAD:1::1
GigabitEthernet0/0/1    [up/up]
FE80::1
2001:DB8:ACAD:1::1
GigabitEthernet0/1/0    [up/down]
GigabitEthernet0/1/1    [up/down]
GigabitEthernet0/1/2    [up/down]
GigabitEthernet0/1/3    [up/down]
Vlan1                    [administratively down/down]
unassigned
R1>
```

GigabitEthernet0/0/0 [up/up]

FE80::1

2001:DB8:ACAD::1

GigabitEthernet0/0/1 [up/up]

FE80::1

2001:DB8:ACAD:1::1

Serial0/1/0 [up/up]

unassigned

Serial0/1/1 [up/up]

unassigned

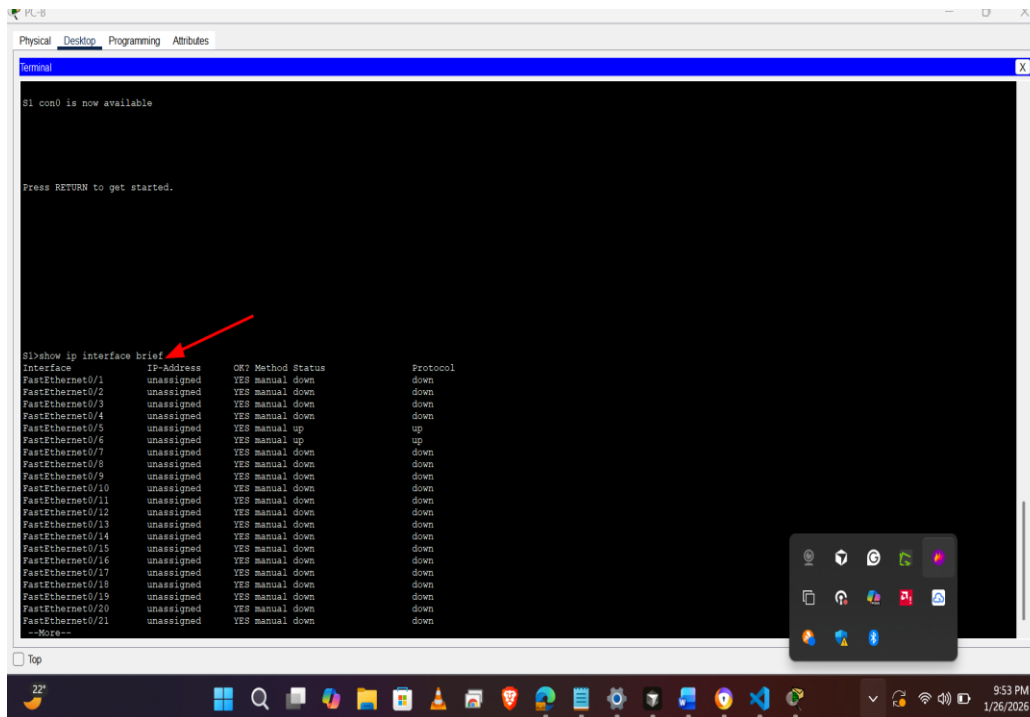
GigabitEthernet0 [down/down]

Unassigned

c. Enter the **show ip interface brief** command on the switch S1.

S1# show ip interface brief

Week 2 Assignment 1



```
PC-B
Physical Desktop Programming Attributes
Terminal
S1 con0 is now available

Press RETURN to get started.

S1#show ip interface brief
Interface      IP-Address      OK? Method Status  Protocol
FastEthernet0/1 unassigned      YES manual down    down
FastEthernet0/2 unassigned      YES manual down    down
FastEthernet0/3 unassigned      YES manual down    down
FastEthernet0/4 unassigned      YES manual down    down
FastEthernet0/5 unassigned      YES manual up      up
FastEthernet0/6 unassigned      YES manual up      up
FastEthernet0/7 unassigned      YES manual down    down
FastEthernet0/8 unassigned      YES manual down    down
FastEthernet0/9 unassigned      YES manual down    down
FastEthernet0/10 unassigned      YES manual down    down
FastEthernet0/11 unassigned      YES manual down    down
FastEthernet0/12 unassigned      YES manual down    down
FastEthernet0/13 unassigned      YES manual down    down
FastEthernet0/14 unassigned      YES manual down    down
FastEthernet0/15 unassigned      YES manual down    down
FastEthernet0/16 unassigned      YES manual down    down
FastEthernet0/17 unassigned      YES manual down    down
FastEthernet0/18 unassigned      YES manual down    down
FastEthernet0/19 unassigned      YES manual down    down
FastEthernet0/20 unassigned      YES manual down    down
FastEthernet0/21 unassigned      YES manual down    down
--More--
```

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan1	192.168.1.2	YES	NVRAM	up	up
FastEthernet0/1	unassigned	YES	unset	down	down
FastEthernet0/2	unassigned	YES	unset	down	down
FastEthernet0/3	unassigned	YES	unset	down	down
FastEthernet0/4	unassigned	YES	unset	down	down
FastEthernet0/5	unassigned	YES	unset	up	up
FastEthernet0/6	unassigned	YES	unset	up	up
FastEthernet0/7	unassigned	YES	unset	down	down
FastEthernet0/8	unassigned	YES	unset	down	down
FastEthernet0/9	unassigned	YES	unset	down	down
FastEthernet0/10	unassigned	YES	unset	down	down
FastEthernet0/11	unassigned	YES	unset	down	down
FastEthernet0/12	unassigned	YES	unset	down	down

Week 2 Assignment 1

FastEthernet0/13	unassigned	YES	unset	down	down
FastEthernet0/14	unassigned	YES	unset	down	down
FastEthernet0/15	unassigned	YES	unset	down	down
FastEthernet0/16	unassigned	YES	unset	down	down
FastEthernet0/17	unassigned	YES	unset	down	down
FastEthernet0/18	unassigned	YES	unset	down	down
FastEthernet0/19	unassigned	YES	unset	down	down
FastEthernet0/20	unassigned	YES	unset	down	down
FastEthernet0/21	unassigned	YES	unset	down	down
FastEthernet0/22	unassigned	YES	unset	down	down
FastEthernet0/23	unassigned	YES	unset	down	down
FastEthernet0/24	unassigned	YES	unset	down	down
GigabitEthernet0/1	unassigned	YES	unset	down	down
GigabitEthernet0/2	unassigned	YES	unset	down	down

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-if)# 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 this exercise, the objectives of setting up a network topology, configuring devices, and verifying connectivity were successfully met. By configuring a Cisco router and a switch, the lab demonstrated the critical role of routers in interconnecting distinct subnets