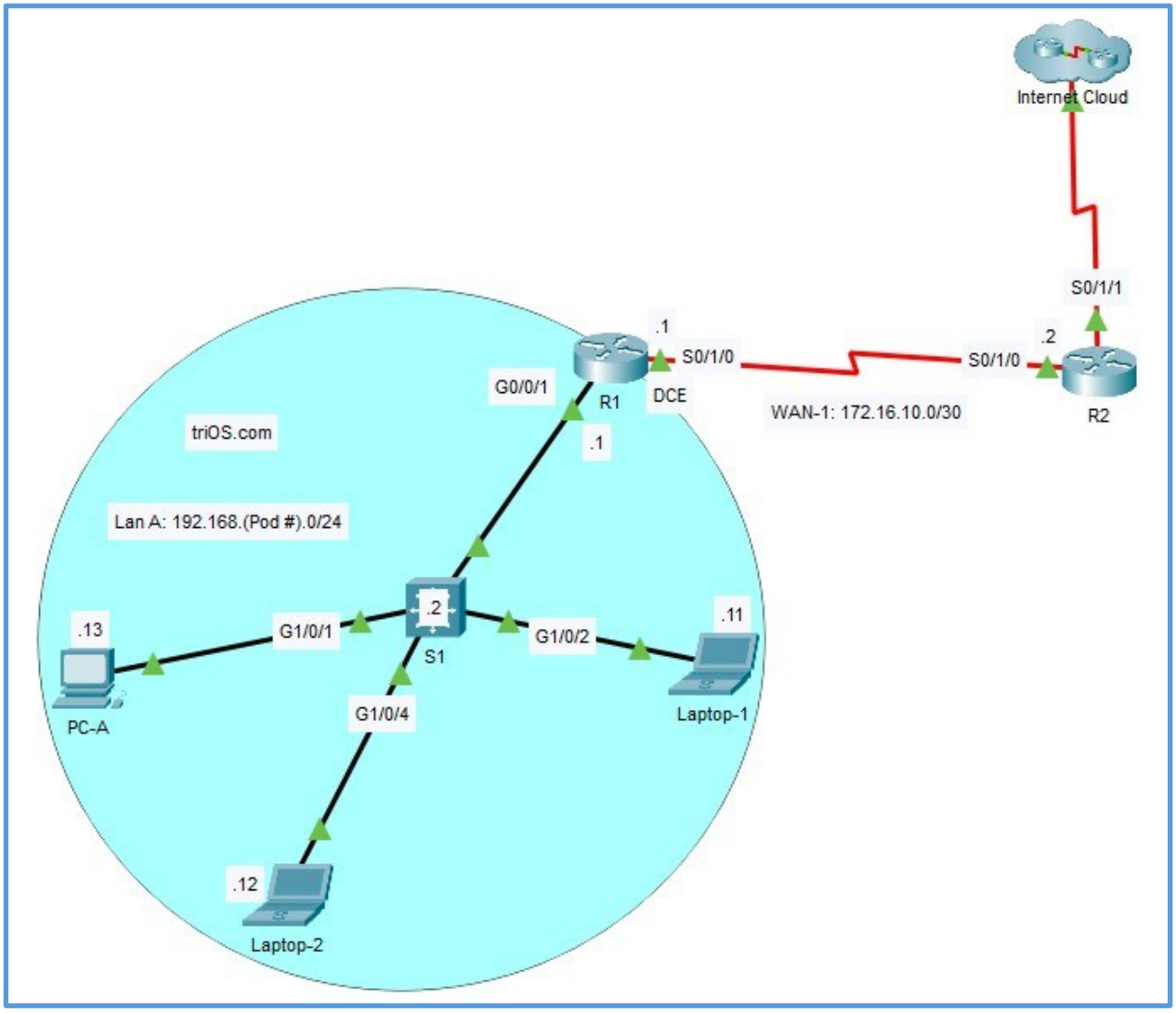
Lab Activity – Initial Configuration:

- There is a LAN and a WAN in the topology below. Please build the following topology on the physical pod/rack in the lab room.



Required Resources:

- One Layer-3/Multilayer Switch (Cisco Catalyst 1000 Series with Cisco IOS Release 15.1+ image)
- Two Routers (Cisco 4221 with Cisco IOS Release 17.6+ image)
- Two Laptops (Windows with Terminal Emulation Program)
- One Desktop PC (Windows with Terminal Emulation Program)

- Cables:

- Console cables to configure the Cisco IOS devices through the console port. ○ Ethernet cables as shown in the topology.

Addressing Table:

Device	Interface	IP Address	Subnet Mask / CIDR	Default Gateway
S1	VLAN1	192.168.Pod#.2	255.255.255.0	192.168.Pod#.1
R1	G0/0/1	192.168.Pod#.1	255.255.255.0 OR /24	N/A
	S0/1/0	172.16.10.1 172.16.10.2	/30	N/A
R2	S0/1/0		/30	N/A
Laptop-1	NIC	192.168.Pod#.11	255.255.255.0	192.168.Pod#.1
Laptop-2	NIC	192.168.Pod#.12	255.255.255.0	192.168.Pod#.1
PC-A	NIC	192.168.Pod#.13	255.255.255.0	192.168.Pod#.1

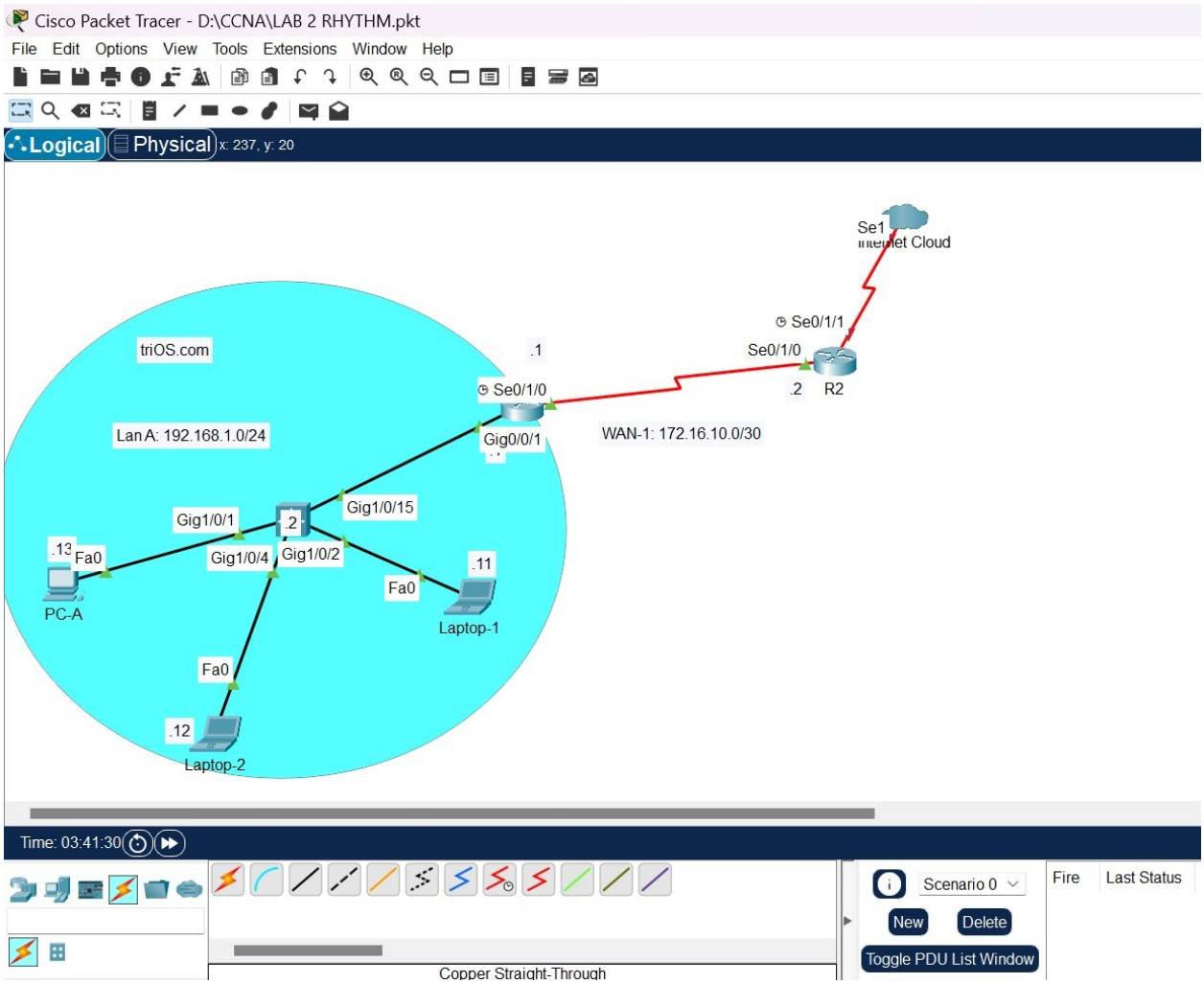
Lab Description:

- In this lab, please build a LAN and WAN-based simple network.
  - LAN A with one multi-layer/layer-3 switch and three hosts.
  - WAN-1 with two routers.

- You are also required to do the basic configuration on the following devices:
  - Switch:
    - Hostnames
    - SVI
    - Default gateway
    - Login banner
    - DNS lookup (disable) ○ Laptops and PC:
    - IP addressing
    - Default gateway ○ Routers:
    - Hostnames
    - IP addressing
    - Login banner
    - DNS lookup (disable)

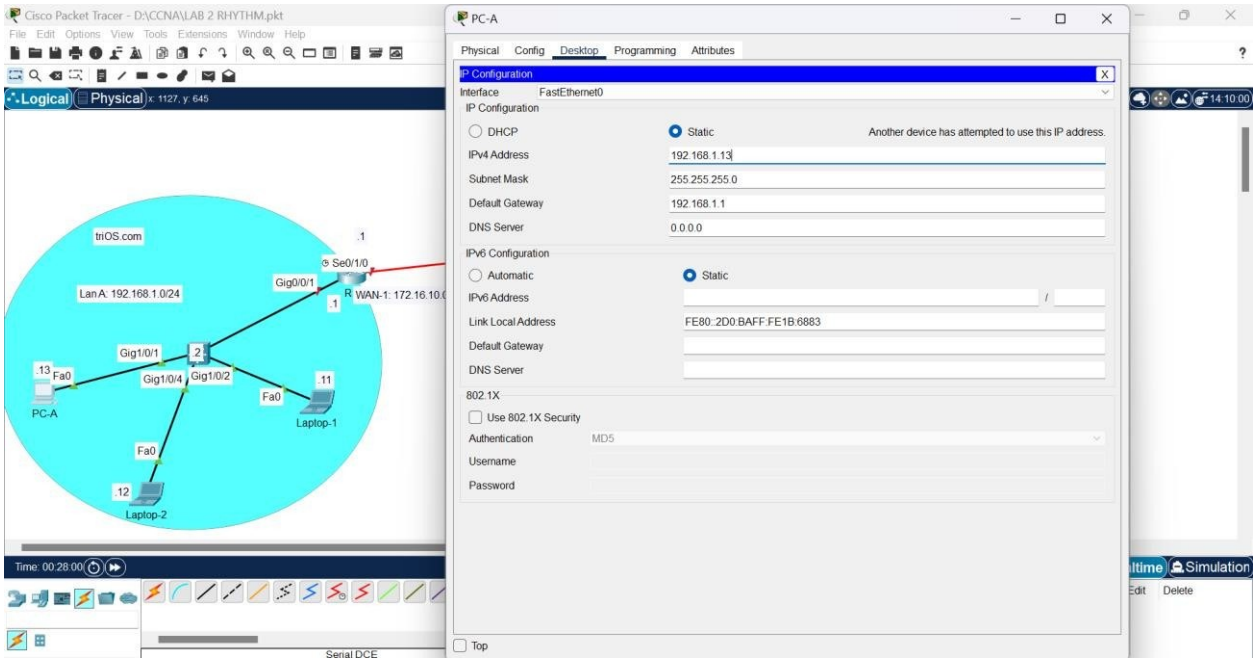
SOLUTION

Step 1: Set up the network topology.

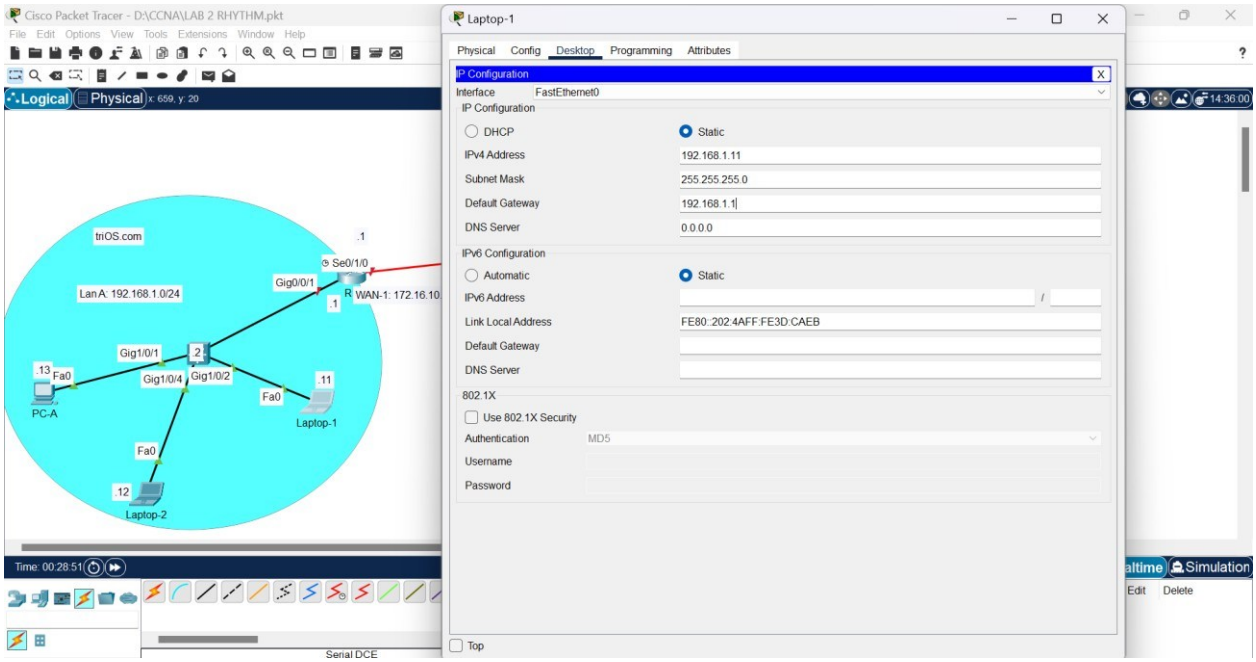


Step 2: Configure the PC and laptop hosts.

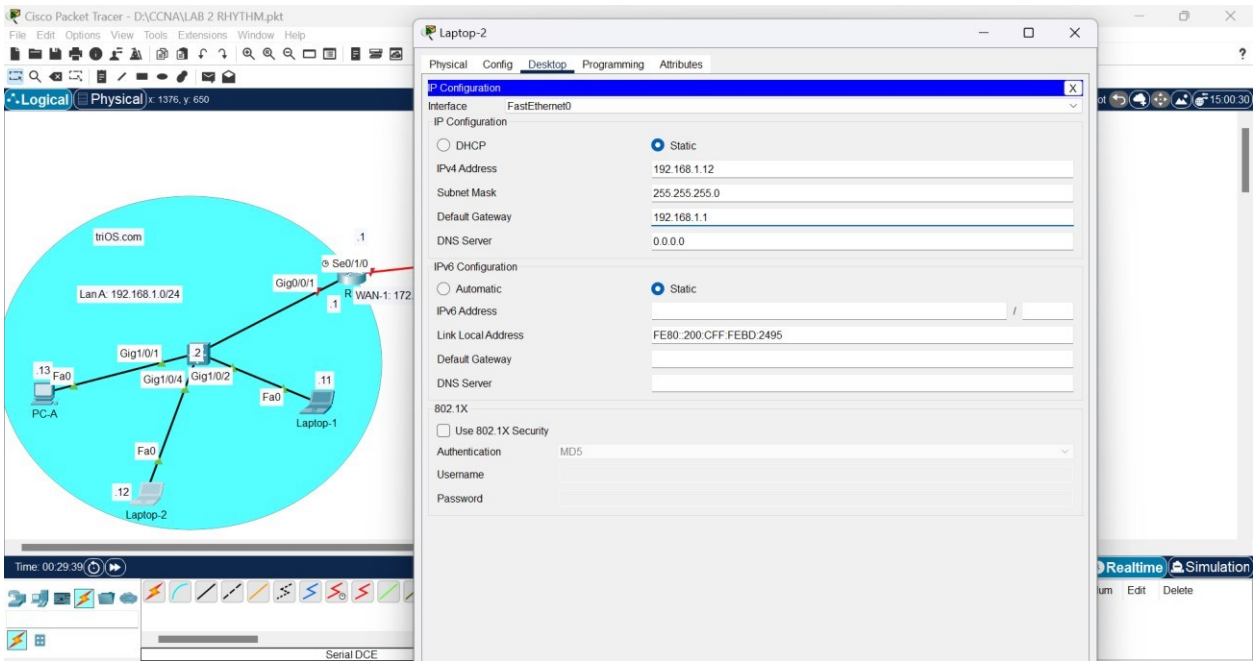
PC-A



LAPTOP-1

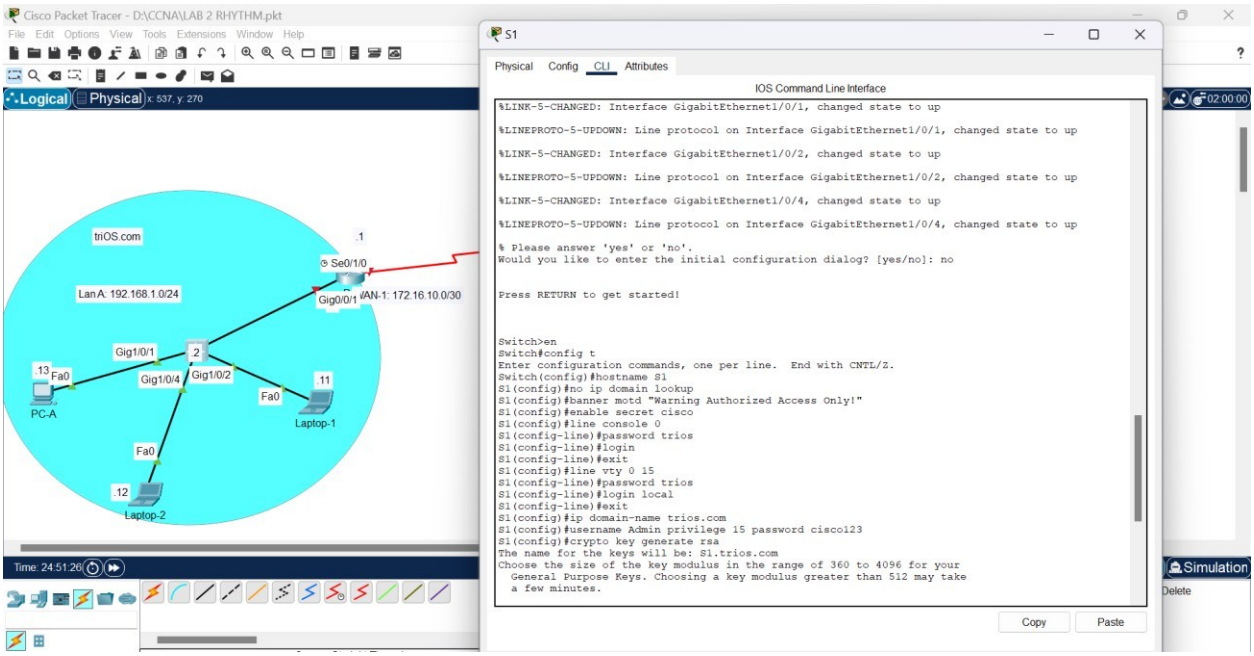


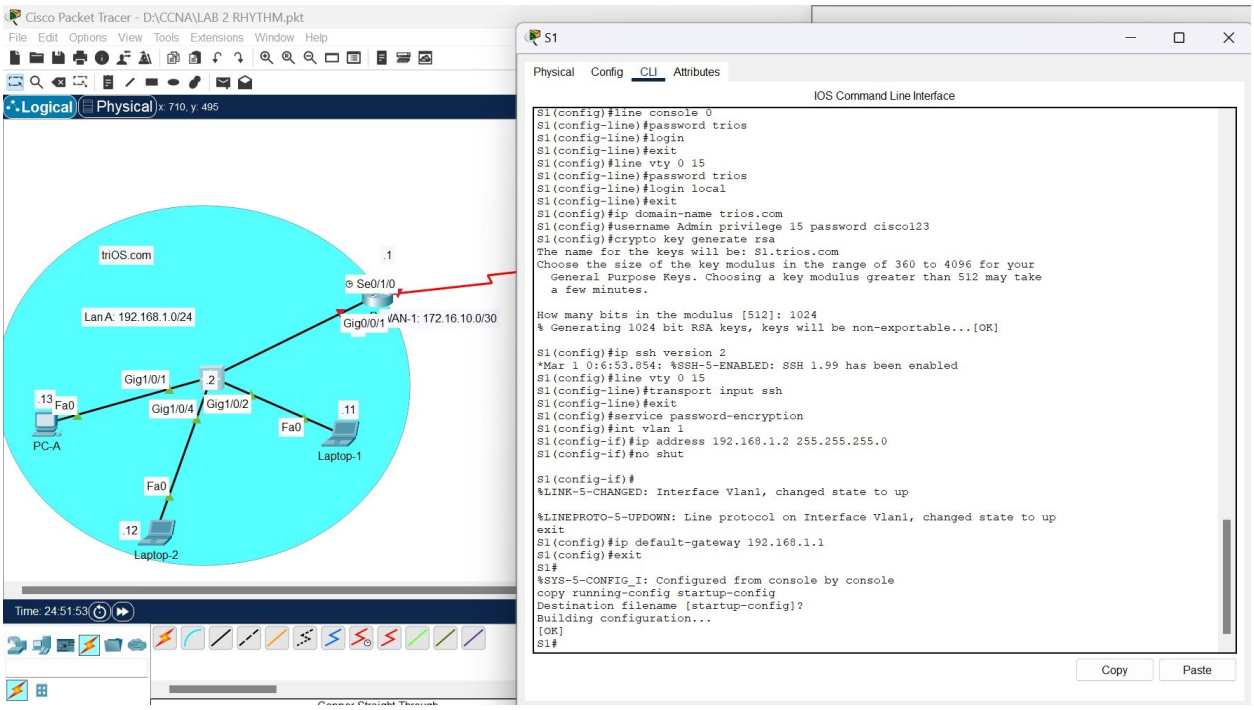
LAPTOP-2



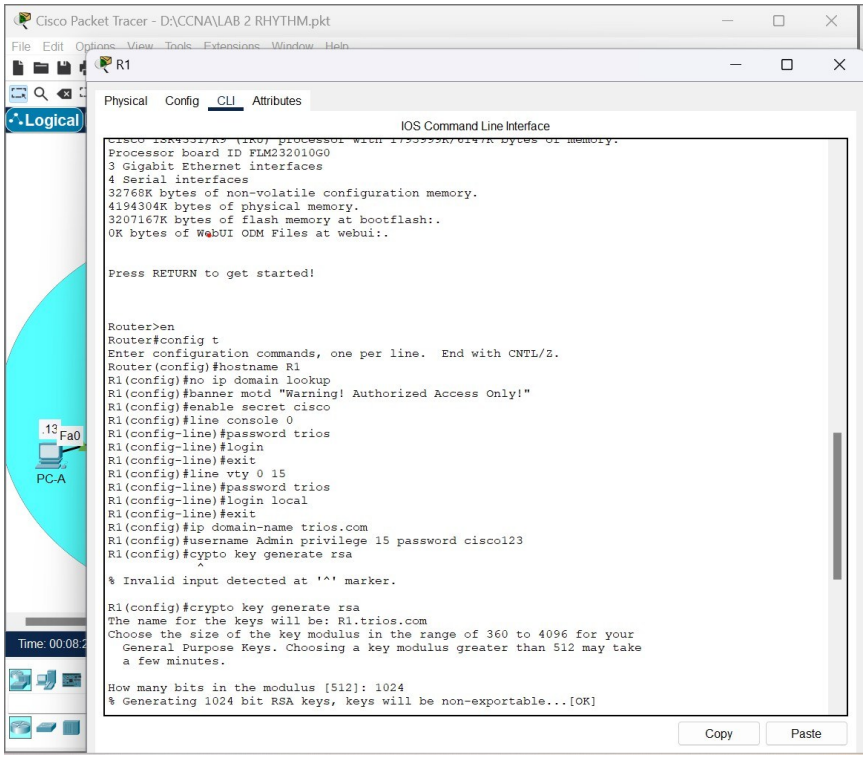
- Configure the following on the PC and laptops appropriately according to the addressing table: ○ IP address ○ Subnet mask ○ Default gateway

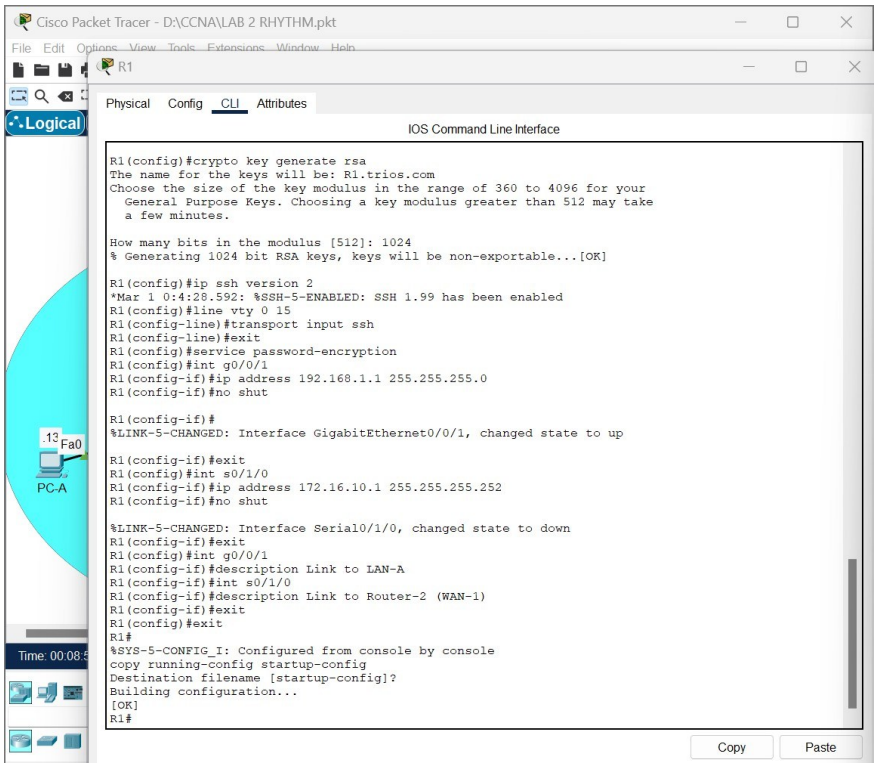
Step 3: Configure and verify basic switch settings.



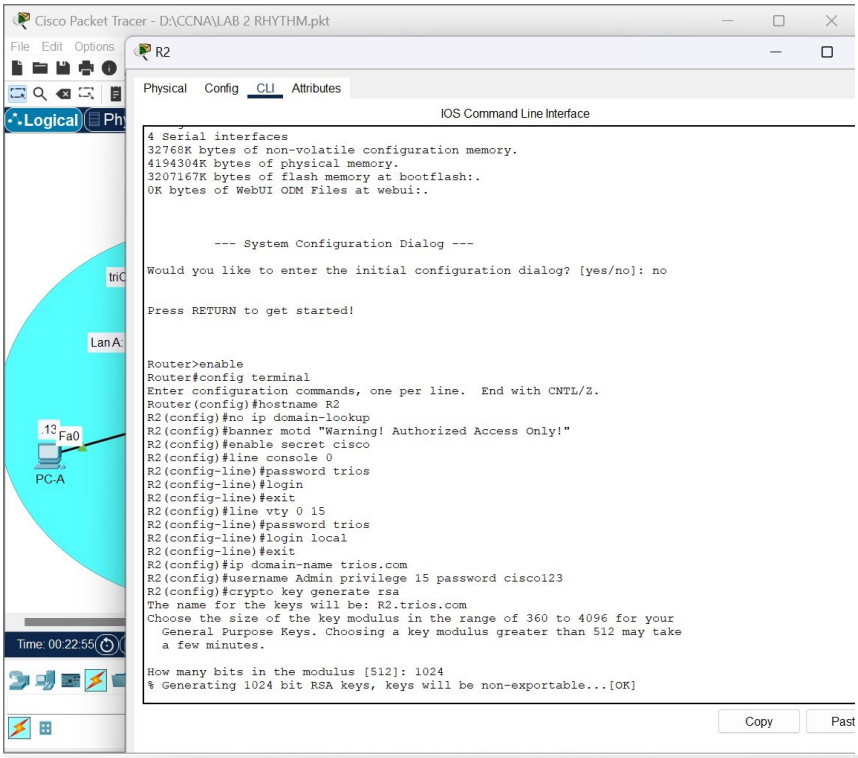


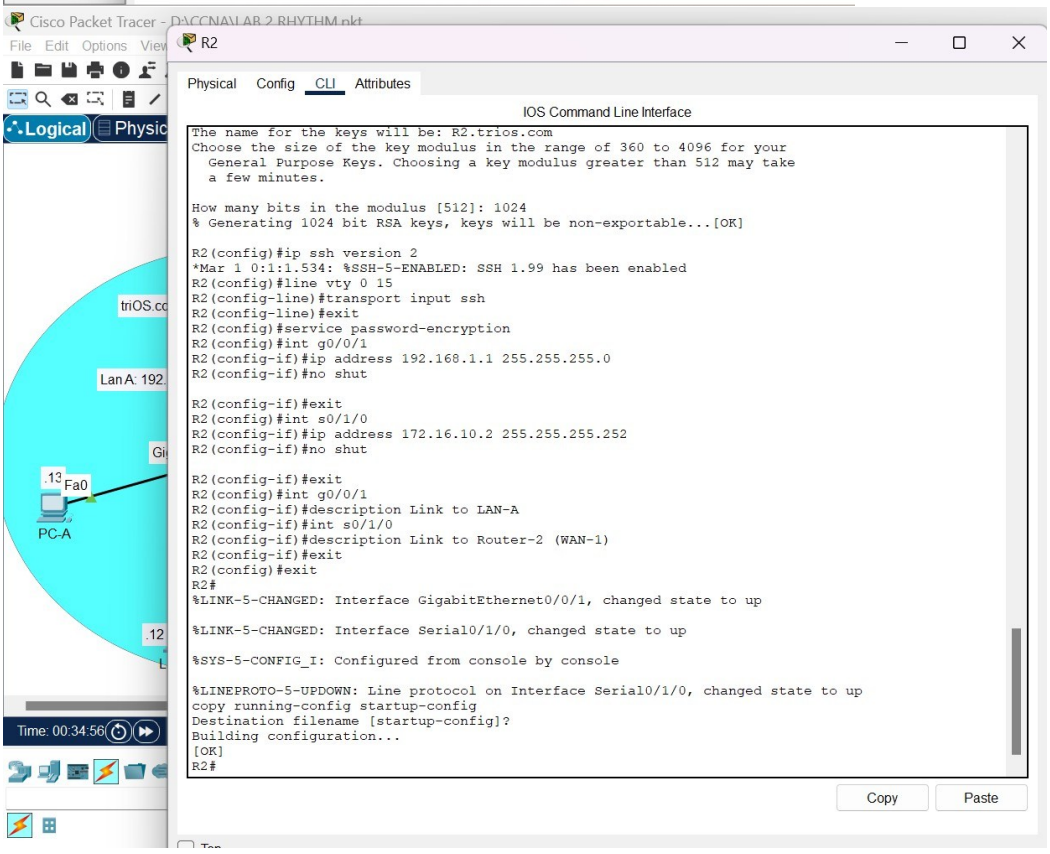
Step 4: Configure and verify basic router settings on both routers. R1


Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options View Tools Extensions Window Help
Logical
R1
Physical Config CLI Attributes
IOS Command Line Interface
Processor board ID FLM232010G0
3 Gigabit Ethernet interfaces
4 Serial interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3207167K bytes of flash memory at bootflash:.
0K bytes of WebUI ODM Files at webui:.
Press RETURN to get started!
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain lookup
R1(config)#banner motd "Warning! Authorized Access Only!"
R1(config)#enable secret cisco
R1(config)#line console 0
R1(config-line)#password trios
R1(config-line)#login
R1(config-line)#exit
R1(config)#line vty 0 15
R1(config-line)#password trios
R1(config-line)#login local
R1(config-line)#exit
R1(config)#ip domain-name trios.com
R1(config)#username Admin privilege 15 password cisco123
R1(config)#cypto key generate rsa
% Invalid input detected at '^' marker.
R1(config)#crypto key generate rsa
The name for the keys will be: R1.trios.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
Copy
Paste
PC-A
Fa0
Time: 00:08:2


Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options View Tools Extensions Window Help
Logical
R1
Physical Config CLI Attributes
IOS Command Line Interface
R1(config)#crypto key generate rsa
The name for the keys will be: R1.trios.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
R1(config)#ip ssh version 2
*Mar 1 0:4:28.592: %SSH-5-ENABLED: SSH 1.99 has been enabled
R1(config)#line vty 0 15
R1(config-line)#transport input ssh
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#int g0/0/1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
R1(config-if)#exit
R1(config)#int s0/1/0
R1(config-if)#ip address 172.16.10.1 255.255.255.252
R1(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R1(config-if)#exit
R1(config)#int g0/0/1
R1(config-if)#description Link to LAN-A
R1(config-if)#int s0/1/0
R1(config-if)#description Link to Router-2 (WAN-1)
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#
Copy
Paste
PC-A
Fa0
Time: 00:08:5

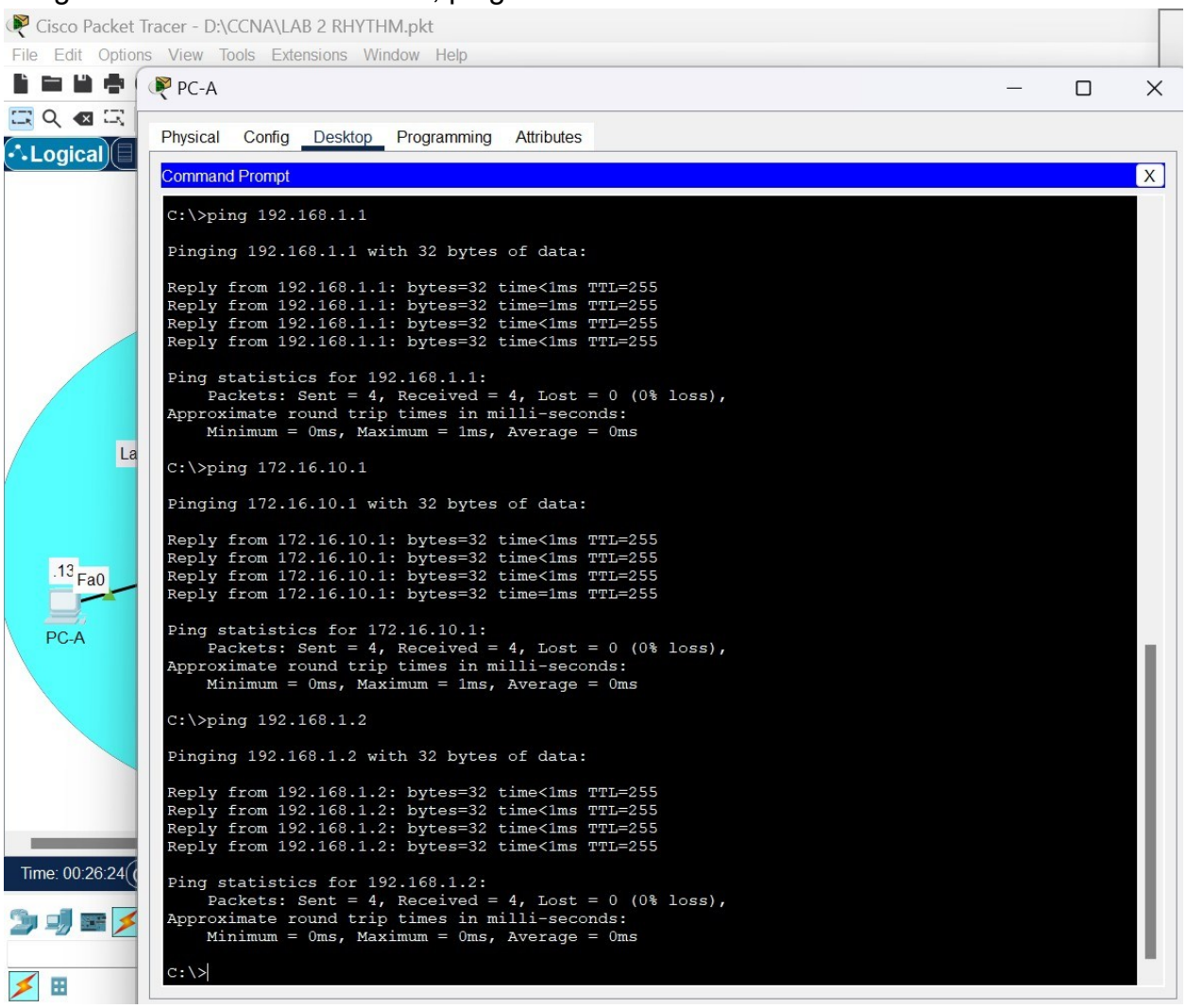
R2


Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options
R2
Physical Config CLI Attributes
IOS Command Line Interface
4 Serial interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3207167K bytes of flash memory at bootflash:.
0K bytes of WebUI ODM Files at webui:.
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#banner motd "Warning! Authorized Access Only!"
R2(config)#enable secret cisco
R2(config)#line console 0
R2(config-line)#password trios
R2(config-line)#login
R2(config-line)#exit
R2(config)#line vty 0 15
R2(config-line)#password trios
R2(config-line)#login local
R2(config-line)#exit
R2(config)#ip domain-name trios.com
R2(config)#username Admin privilege 15 password cisco123
R2(config)#crypto key generate rsa
The name for the keys will be: R2.trios.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
Copy
Past
Logical
Lan A:
.13
Fa0
PC-A
Time: 00:22:55

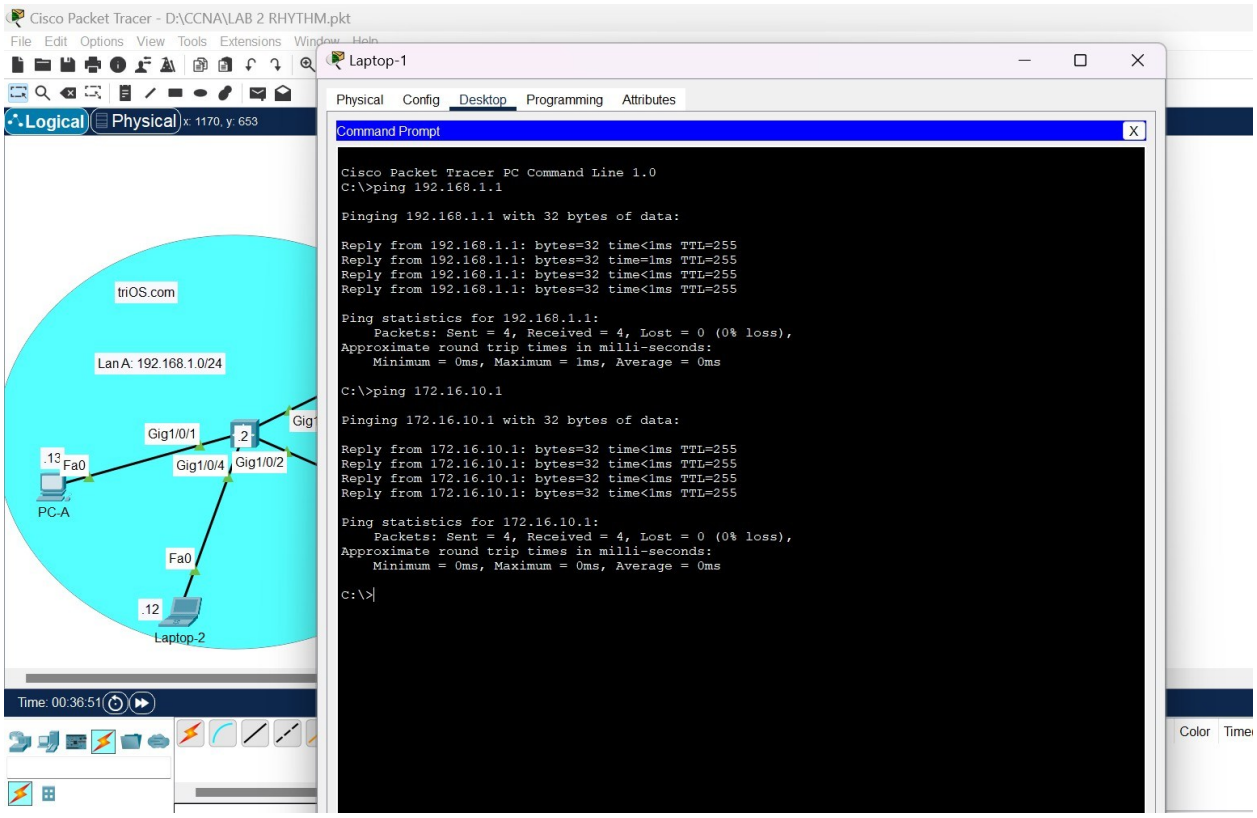

Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options View
R2
Physical Config CLI Attributes
IOS Command Line Interface
The name for the keys will be: R2.trios.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]
R2(config)#ip ssh version 2
*Mar 1 0:1:1.534: %SSH-5-ENABLED: SSH 1.99 has been enabled
R2(config)#line vty 0 15
R2(config-line)#transport input ssh
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#int g0/0/1
R2(config-if)#ip address 192.168.1.1 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#int s0/1/0
R2(config-if)#ip address 172.16.10.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#int g0/0/1
R2(config-if)#description Link to LAN-A
R2(config-if)#int s0/1/0
R2(config-if)#description Link to Router-2 (WAN-1)
R2(config-if)#exit
R2(config)#exit
R2#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%SYS-5-CONFIG_I: Configured from console by console
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
Copy
Paste
Logical
Lan A: 192.
.13
Fa0
PC-A
Time: 00:34:56

Step 5: Verify the connectivity.

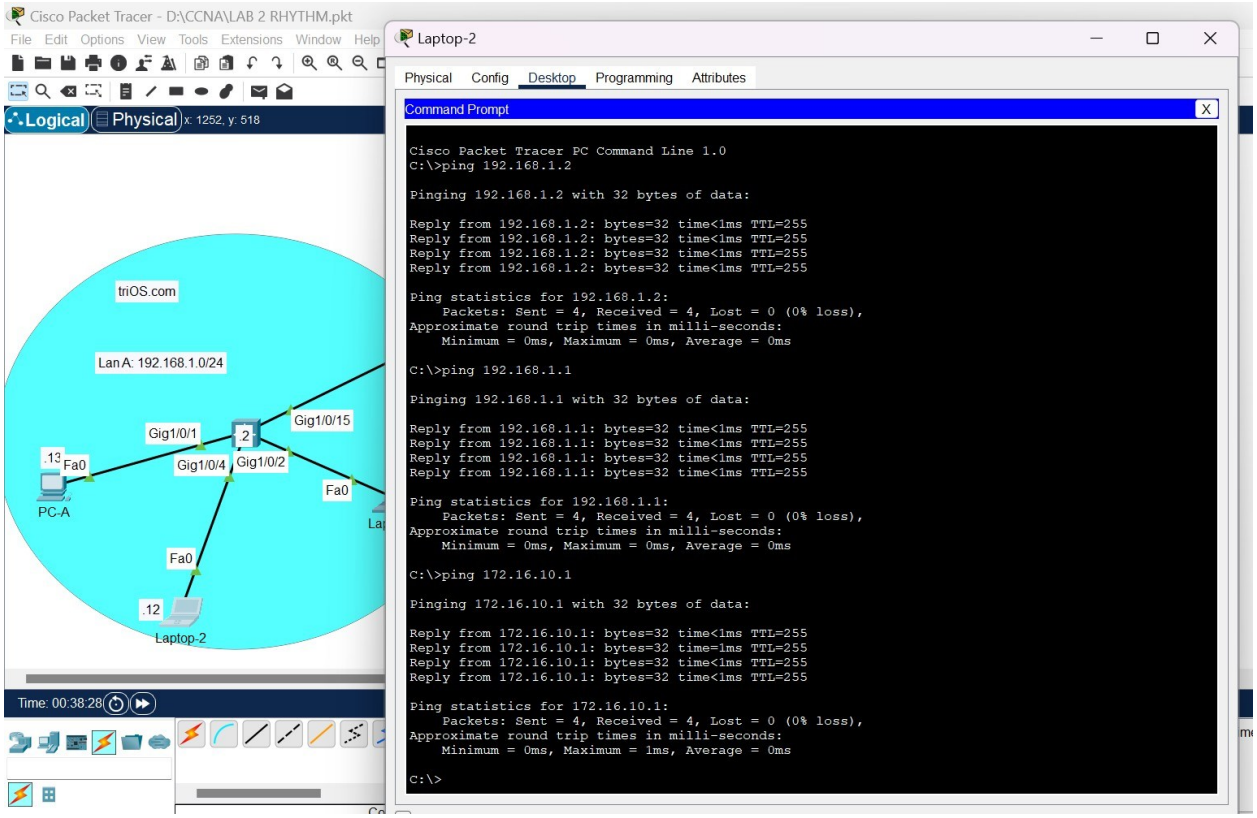
- Using the command line at PC-A, ping the IP address of int. g0/0/1 at R1.
- Using the command line at PC-A, ping the IP address of int. S0/1/0 at R1.
- Using the command line at PC-A, ping the IP address of SVI of S1.



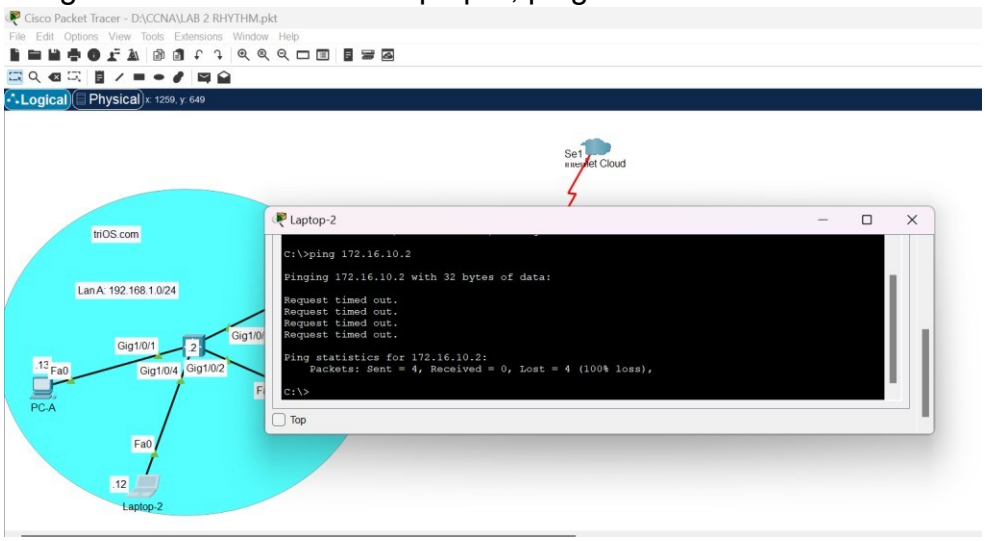
- Using the command line at Laptop-1, ping the IP address of int. g0/0/1 at R1.
- Using the command line at Laptop1, ping the IP address of int. S0/1/0 at R1.



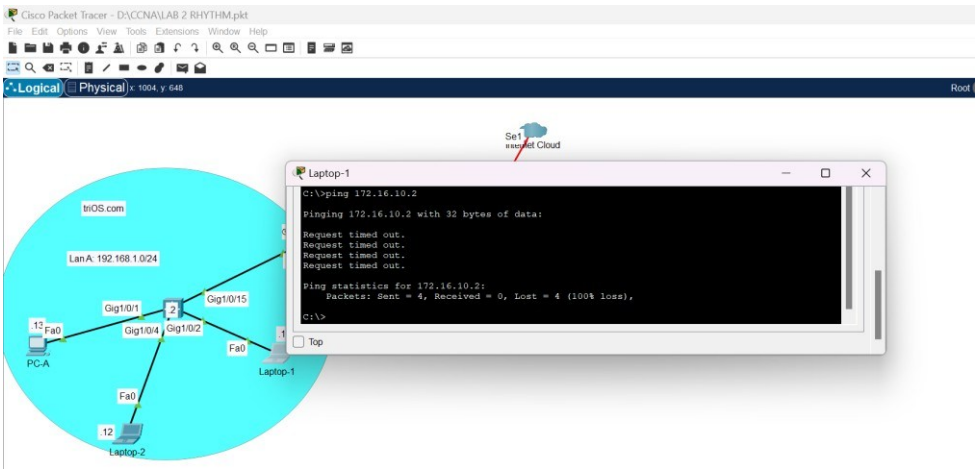
- Using the command line at Laptop-2, ping the IP address of SVI of S1.
- Using the command line at Laptop-2, ping the IP address of int. g0/0/1 at R1.
- Using the command line at Laptop-2, ping the IP address of int. S0/1/0 at R1.



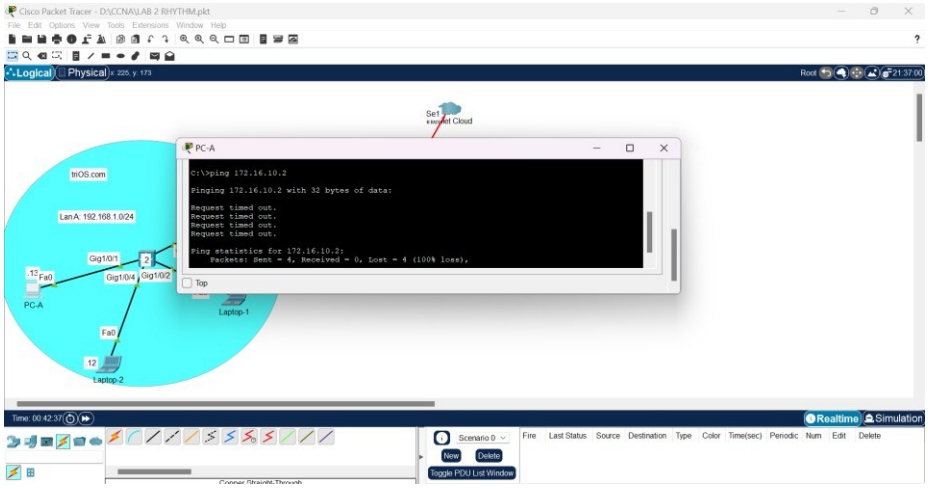
Using the command line at Laptop-2, ping the IP address of int. S0/1/0 at R2.



- Using the command line at Laptop-1, ping the IP address of int. S0/1/0 at R2.



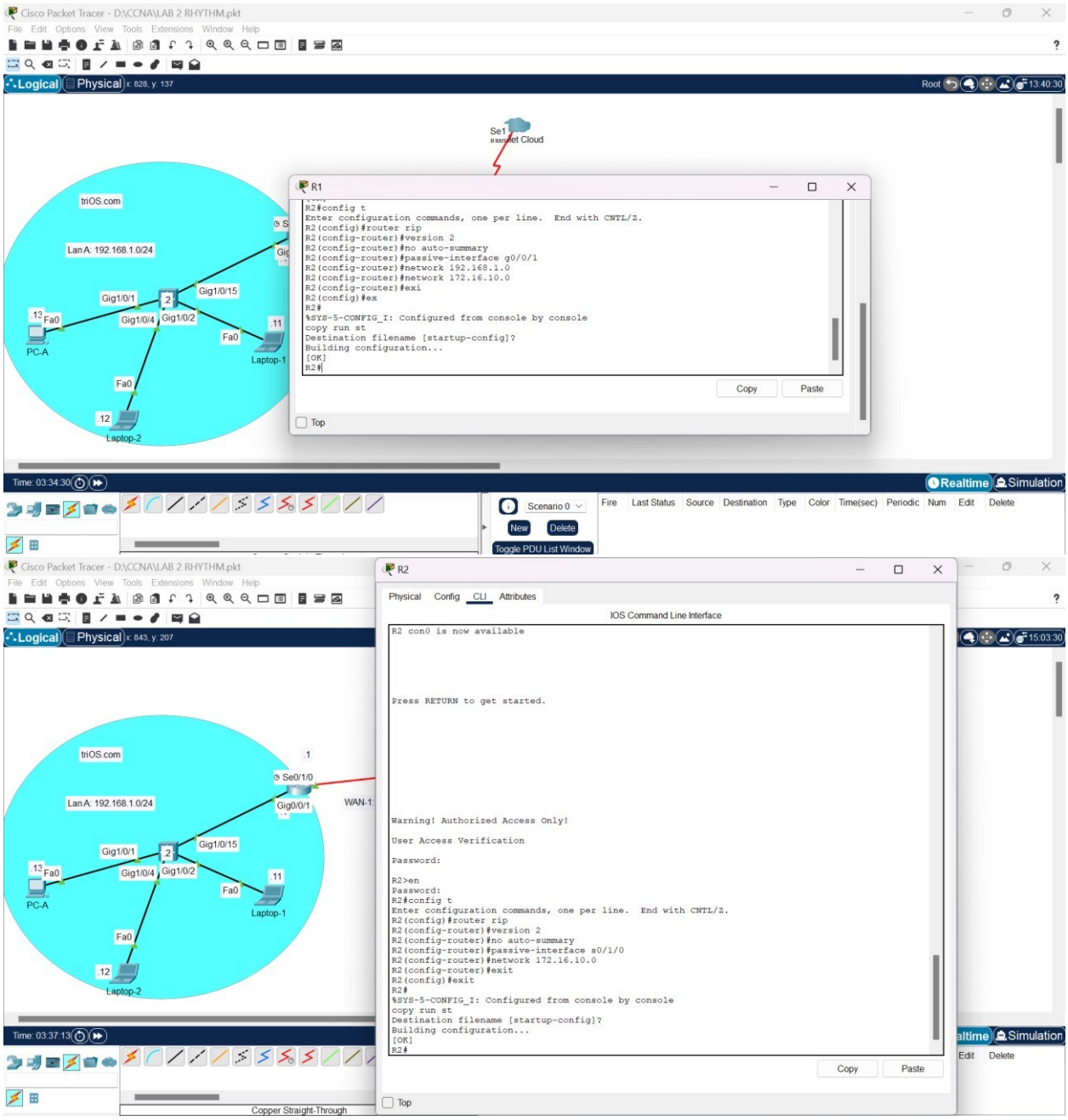
- Using the command line at PC-A, ping the IP address of int. S0/1/0 at R2.



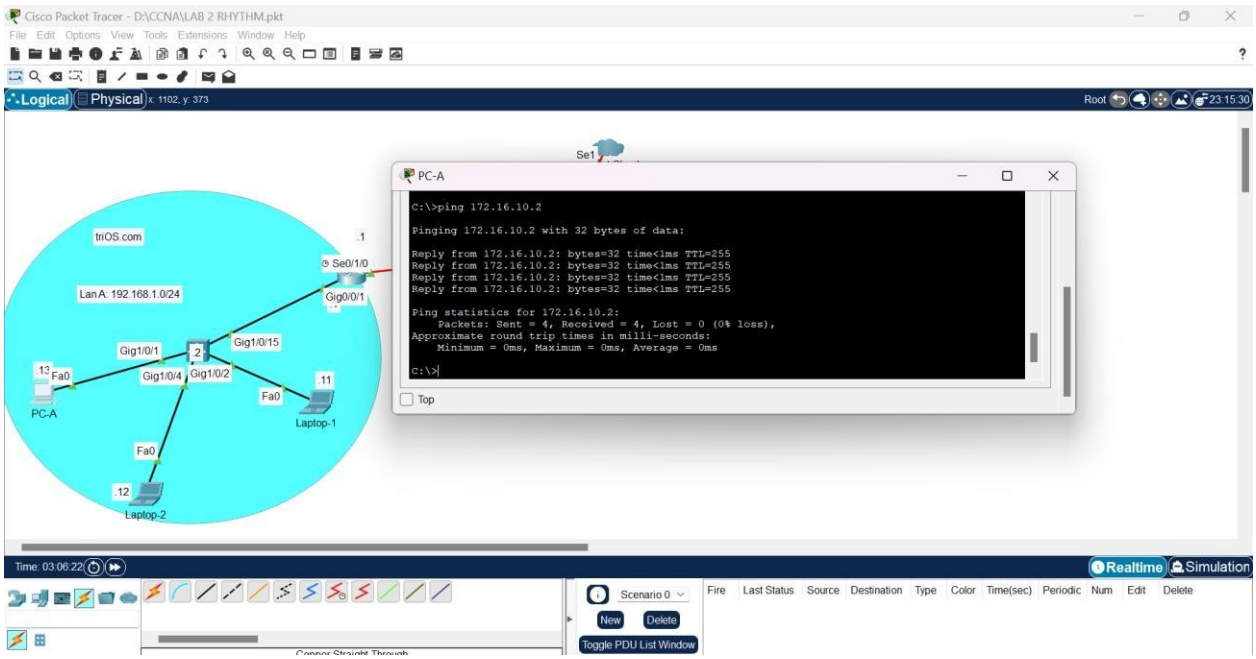
CHALLENGE:

The last three pings to R2 may not be successful. You must troubleshoot to make sure there is full connectivity from Laptop-1, Laptop-2, and PC-A to S0/1/0 interface of Router R2.

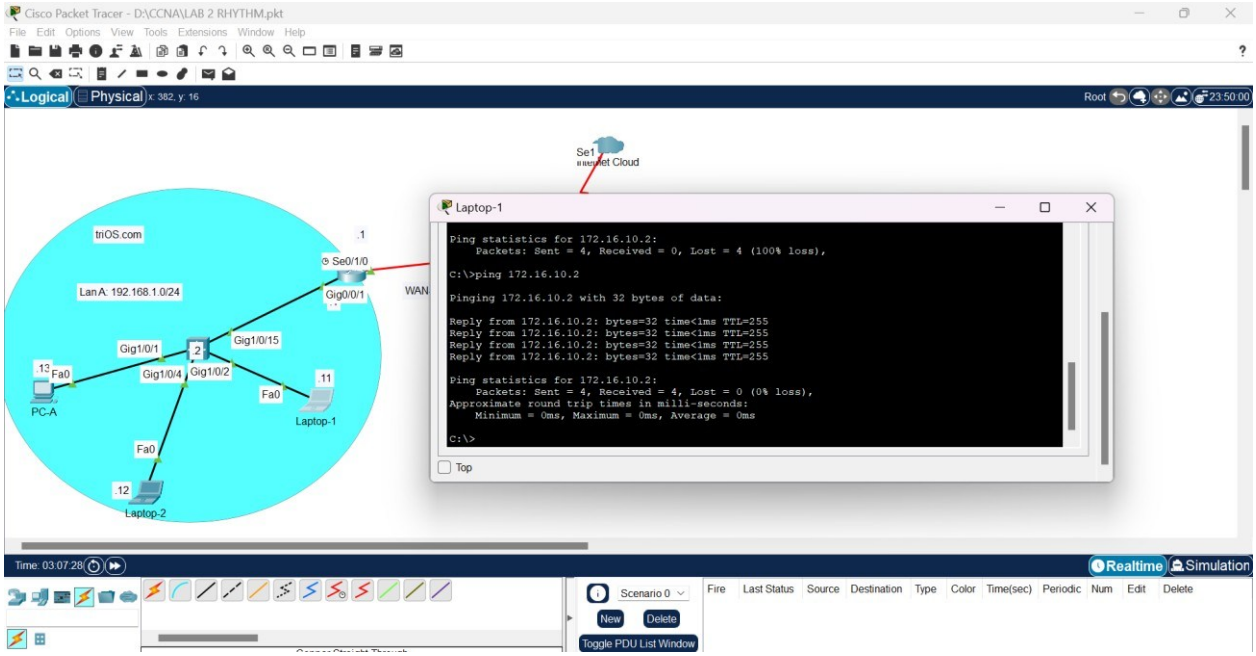
R1 and R2


Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical
Root
triOS.com
Lan A: 192.168.1.0/24
Gig1/0/1
Gig1/0/15
Gig1/0/4
Gig1/0/2
Fa0
PC-A
Laptop-1
Laptop-2
R1
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#no auto-summary
R2(config-router)#passive-interface g0/0/1
R2(config-router)#network 192.168.1.0
R2(config-router)#network 172.16.10.0
R2(config-router)#exi
R2(config)#ex
R2#
%SYS-5-CONFIG_I: Configured from console by console
copy run st
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
Copy
Paste
Top
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R2 con0 is now available
Press RETURN to get started.
Warning! Authorized Access Only!
User Access Verification
Password:
R2>en
Password:
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#no auto-summary
R2(config-router)#passive-interface s0/1/0
R2(config-router)#network 172.16.10.0
R2(config-router)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console
copy run st
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
Copy
Paste
Top
Se0/1/0
Gig0/0/1
WAN-1
Copper Straight-Through

PC-A


Cisco Packet Tracer - D:\CCNA\LAB 2 RHYTHM.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1102, y: 373
Root 23:15:30
triOS.com
Lan A: 192.168.1.0/24
.1
Se0/1/0
Gig0/0/1
Gig1/0/15
Gig1/0/1
.2
Gig1/0/4
Gig1/0/2
.13
Fa0
PC-A
Fa0
.11
Laptop-1
Fa0
.12
Laptop-2
PC-A
C:\>ping 172.16.10.2
Pinging 172.16.10.2 with 32 bytes of data:
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Ping statistics for 172.16.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top
Time: 03:06:22
Realtime Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete

LAPTOP-1



LAPTOP-2