



Qualification national code and title	AE780 Transition to Cyber Security Skillset
Unit/s national code/s and title/s	VU23214: Configure and secure networked end points

Assessment type (b):

- Questioning (Oral/Written)
- Practical Demonstration
- 3rd Party Report
- Other – Project/**Portfolio** (*Part of assessment task 2*)

Assessment Resources:

- PC
- Google
- Cisco Packet Tracer

Assessment Instructions:Instructions to the assessor:

This lab is a part of Assessment Task 2 portfolio, it is a practical lab based on the performance criteria requirements of the unit. Each student should be given a copy of this lab to complete either in class or out of class. As the student completes each section of this lab you should verify, check off and sign off the section (Use this document as the observation checklist). Use the assessor section at the bottom to provide feedback to the student if required.

See the instructions to the student section for the remainder of the instructions.

Instructions to the student:

This lab consists of activities that you perform on the hardware and software nominated concerning preventative maintenance and base level troubleshooting procedures.

There are several short answer questions where you will be asked to research and answer questions relating to these topics. You are encouraged to use the documentation in the resource section to help you work on the requirements.

Time:

Nominally 180 mins

Due date:

This lab is part of assessment 2 and inherits its due date.

Submission instructions:

When the lab is complete, submit the assessment via Blackboard.

Reasonable adjustment:

Should there be difficulty with reading technical manuals relating to disability of language and literacy levels you are encouraged to use online video tutorials similar to the following:

- https://www.youtube.com/watch?v=HBP8_LqBj44

Your Student ID: 20145454	Your Name: Rajib Hossain Khan
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Lab: Configuring and Troubleshooting Wired and Wireless Networks

Learning Objectives

By the end of this lab, students will be able to:

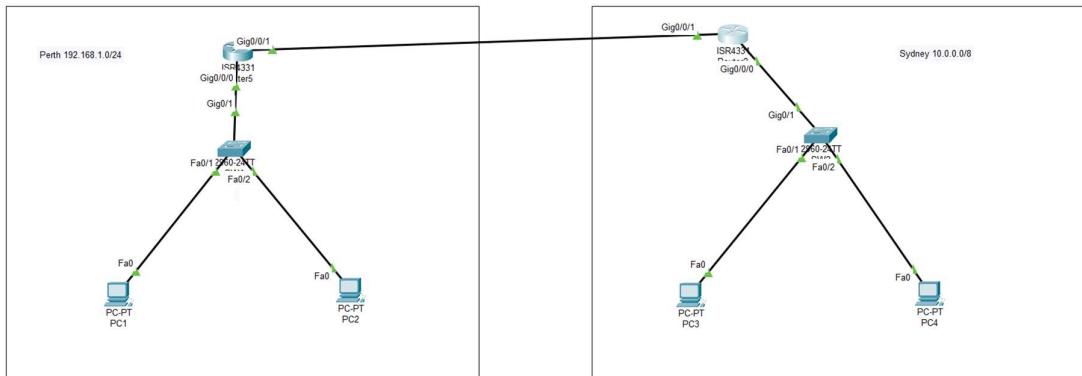
- Configure IP addresses on end devices.
- Configure and Test Wired LAN Connectivity

Network Setup

Step 1: Physical Connections

- PCs to Switches:**
 - PC1 & PC2 → SW1 (192.168.1.0/24)
 - PC3 & PC4 → SW2 (10.0.0.0/8)
- Switches to Routers:**
 - SW1 → Router1 (GigabitEthernet 0/0/0)
 - SW2 → Router2 (GigabitEthernet 0/0/0)
- Router-to-Router Connection:**
 - Router1 (GigabitEthernet 0/0/1) ↔ Router2 (GigabitEthernet 0/0/1)
 - Assign the network: 192.168.2.0/30

Screenshot of Network Topology:



RHK





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Step 2: Router Configurations

Router1 (R1) Configuration

```

Router> enable
Router# configure terminal

! Configure LAN Interface (Connects to SW1)
Router(config)# interface GigabitEthernet 0/0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit

! Configure Gigabit Ethernet Link to Router2
Router(config)# interface GigabitEthernet 0/0/1
Router(config-if)# ip address 192.168.2.1 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# exit
Router# write

```

Router2 (R2) Configuration

```

Router> enable
Router# configure terminal

! Configure LAN Interface (Connects to SW2)
Router(config)# interface GigabitEthernet 0/0/0
Router(config-if)# ip address 10.0.0.1 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# exit

! Configure Gigabit Ethernet Link to Router1
Router(config)# interface GigabitEthernet 0/0/1
Router(config-if)# ip address 192.168.2.2 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# exit
Router# write

```

2 Screenshots of Routers (R1 & R2) Configuration



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Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

Initializing Hardware ...

Checking for PCIe device presence...done
System integrity status: 0x610
Rom image verified correctly

R H K

System Bootstrap, Version 16.7(3r), RELEASE SOFTWARE
Copyright (c) 1994-2018 by cisco Systems, Inc.

Current image running: Boot ROM0

Last reset cause: LocalSoft
Cisco ISR4331/K9 platform with 4194304 Kbytes of main memory

no valid BOOT image found
Final autoboot attempt from default boot device...
Located isr4300-universalk9.16.06.04.SPA.bin
#####

Package header rev 1 structure detected
IsoSize = 550114467
Calculating SHA-1 hash...Validate package: SHA-1 hash:
 calculated 444F4D02:44C58887:D9C8942B:C557D3CF:2A14247E
 expected 444F4D02:44C58887:D9C8942B:C557D3CF:2A14247E

RSA Signed RELEASE Image Signature Verification Successful.
Image validated

Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

cisco Systems, Inc.



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The screenshot shows a terminal window titled "Router5" running the "IOS Command Line Interface". The window has tabs for "Physical", "Config", "CLI" (which is selected), and "Attributes". The main area displays the following text:

```

OK bytes of WebUI ODM Files at webui:.

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: RHK

Press RETURN to get started!

Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet 0/0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(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
exit
Router(config)#interface GigabitEthernet 0/0/1
Router(config-if)#ip address 192.168.2.1 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
exit
Router(config)#exit
Router#wri
%SYS-5-CONFIG_I: Configured from console by console
exit
Translating "wriexit"...domain server (255.255.255.255)
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

```

At the bottom of the terminal window, there are "Copy" and "Paste" buttons. Below the terminal window, there is a checkbox labeled "Top".

Step 3: Enable Routing (RIP v2)

On Router1 (R1)

```

Router> enable
Router# configure terminal
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network 192.168.1.0
Router(config-router)# network 192.168.2.0
Router(config-router)# exit

```



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Router# write

On Router2 (R2)

```
Router> enable
Router# configure terminal
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network 10.0.0.0
Router(config-router)# network 192.168.2.0
Router(config-router)# exit
Router# write
```

2 Screenshots of RIP V2 Configuration on Routers (R1 & R2)

Router con0 is now available

Press RETURN to get started.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network 192.168.1.0
Router(config-router)# network 192.168.2.0
Router(config-router)# exit
Router(config)# write
^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#wri
%SYS-5-CONFIG_I: Configured from console by console
write
Translating "wriwrite"...domain server (255.255.255.255)|
```

Top

Copy Paste



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Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

RHK

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet 0/0/1
Router(config-if)#ip address 192.168.2.2 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#ex
%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
exit
^
* Invalid input detected at '^' marker.

Router(config-if)#exit
Router(config)#exit
Router#wr
%SYS-5-CONFIG_I: Configured from console by console
write
Translating "wrwrite"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#exit
Router(config)#exit
Router#w
%SYS-5-CONFIG_I: Configured from console by console

```

Top



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Step 4: Test Connectivity

Test 1: Verify Router-to-Router Connectivity

On **Router1 (R1)**, test if it can reach **Router2 (R2)**:

```
Router1# ping 192.168.2.2
```

On **Router2 (R2)**, test if it can reach **Router1 (R1)**:

```
Router2# ping 192.168.2.1
```

If the pings are **successful**, the routers are correctly connected.

2 Screenshots of Successful ping between Routers (R1 -> R2 & R2 -> R1)

The screenshot shows the IOS Command Line Interface (CLI) window for Router5. The window title is "Router5". The tabs at the top are "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs, it says "IOS Command Line Interface" and "Press RETURN to get started.". The main area contains handwritten text "R H K" above a command-line session. The session starts with "Router>enable", followed by configuration commands like "router rip", "version 2", and "network 192.168.1.0". It then shows a "write" command and a warning about invalid input. The session continues with "Router#ping 192.168.2.2", which sends 5 ICMP Echoes to 192.168.2.2 with a timeout of 2 seconds. The output shows a success rate of 100% (5/5) with round-trip times ranging from 0 to 1 ms. At the bottom right of the window are "Copy" and "Paste" buttons. At the bottom left is a "Top" button.

```

Router>enable
Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network 192.168.1.0
Router(config-router)# network 192.168.2.0
Router(config-router)# exit
Router(config)# write
^
% Invalid input detected at '^' marker.

Router(config)#exit
Router#wri
%SYS-5-CONFIG_I: Configured from console by console
Write
Translating "wriwrite"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#ping 192.168.2.2

Type escape sequence to abort.
Sending 5 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
Router#

```



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Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Router(config-if)#ip address 192.168.2.2 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#ex
%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
exit
^
% Invalid input detected at '^' marker.

Router(config-if)#exit
Router(config)#exit
Router#wr
%SYS-5-CONFIG_I: Configured from console by console
write
Translating "wrrwrite"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#exit
Router(config)#exit
Router#w
%SYS-5-CONFIG_I: Configured from console by console
write
Translating "wwrite"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#ping 192.168.2.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#

```

R H K

Top

Copy **Paste**



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Test 2: Check Routing Tables on Both Routers

On Router1, display the routing table to ensure **all networks are reachable**:

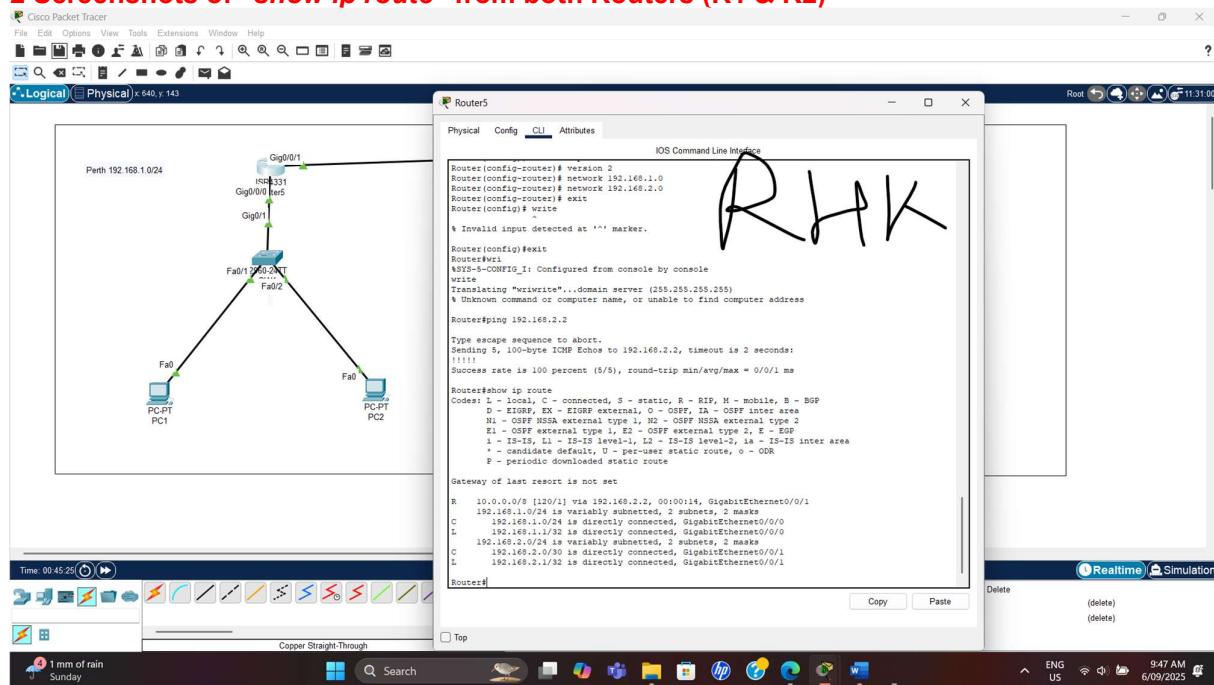
```
Router1# show ip route
```

On Router2, display its routing table:

```
Router2# show ip route
```

You should see entries for **192.168.1.0/24, 10.0.0.0/8, and 192.168.2.0/30** via RIP.

2 Screenshots of “show ip route” from both Routers (R1 & R2)





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Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#exit
Router(config)#exit
Router#w
%SYS-5-CONFIG_I: Configured from console by console
write
Translating "wwwrite"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#ping 192.168.2.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#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

  10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/8 is directly connected, GigabitEthernet0/0/0
L    10.0.0.1/32 is directly connected, GigabitEthernet0/0/0
R    192.168.1.0/24 [120/1] via 192.168.2.1, 00:00:12, GigabitEthernet0/0/1
      192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/30 is directly connected, GigabitEthernet0/0/1
L    192.168.2.2/32 is directly connected, GigabitEthernet0/0/1

Router#

```

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Test 3: Test End-to-End PC Communication

From **PC1**, test if it can communicate with **PC3**:

PC1> ping 10.0.0.2

From **PC2**, test if it can communicate with **PC4**:

PC2> ping 10.0.0.3

From **PC3**, test if it can communicate with **PC1**:

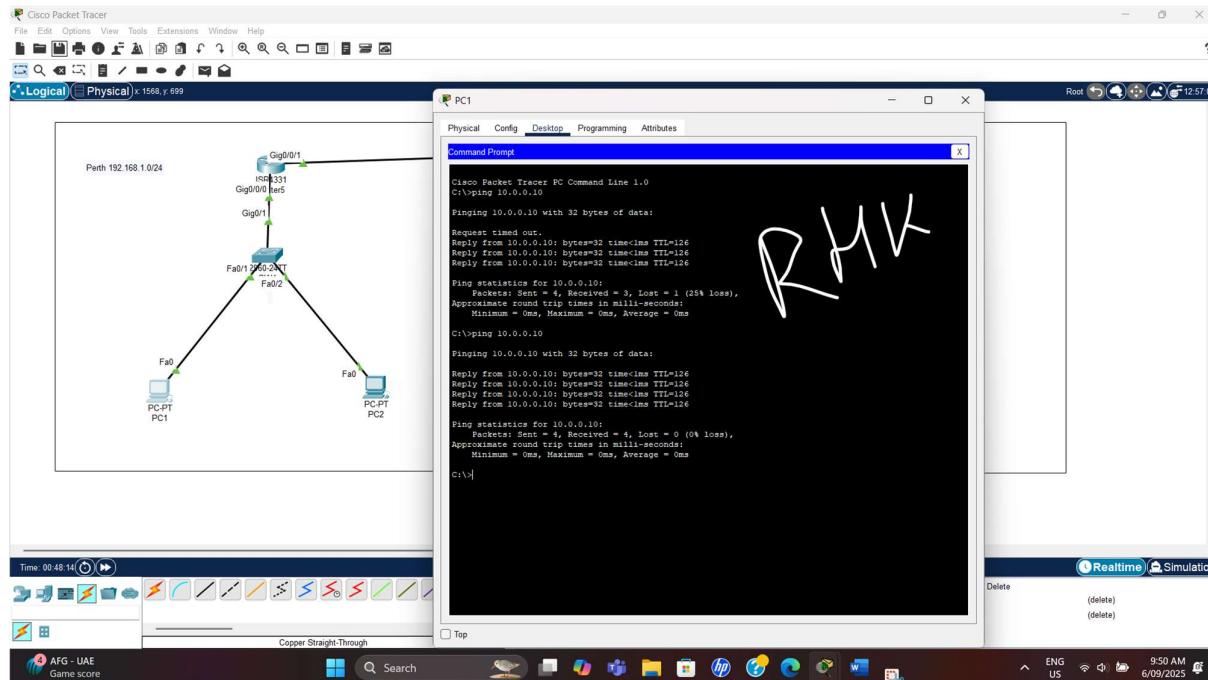
PC3> ping 192.168.1.2

From **PC4**, test if it can communicate with **PC2**:

PC4> ping 192.168.1.3

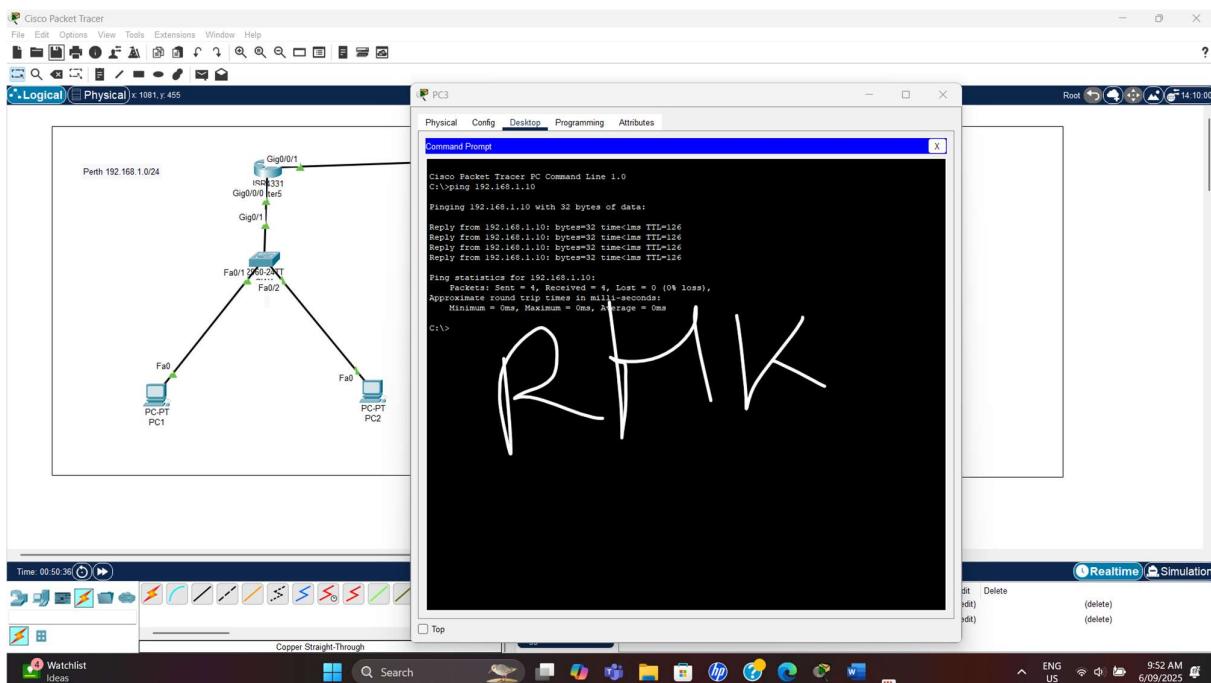
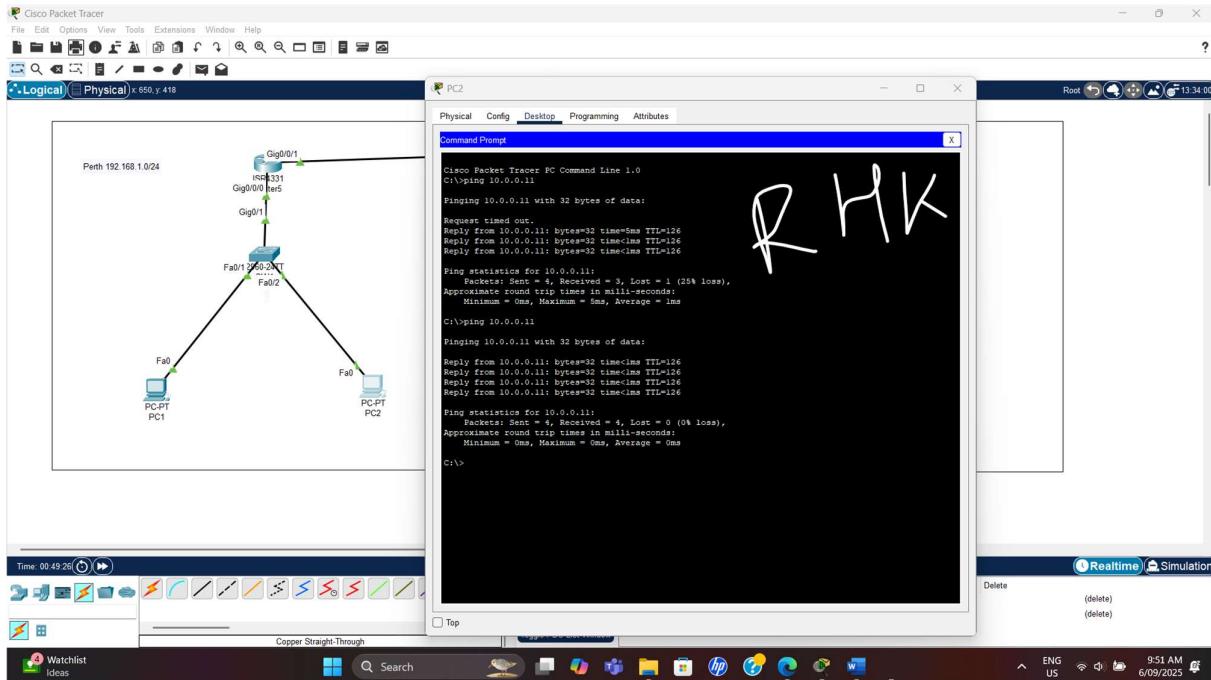
If all pings are **successful**, then the **entire network is properly configured**.

4 Screenshots of Successful ping between PCs (PC1 -> PC3 , PC2 -> PC4 , PC3 -> PC1 and PC4 -> PC2)



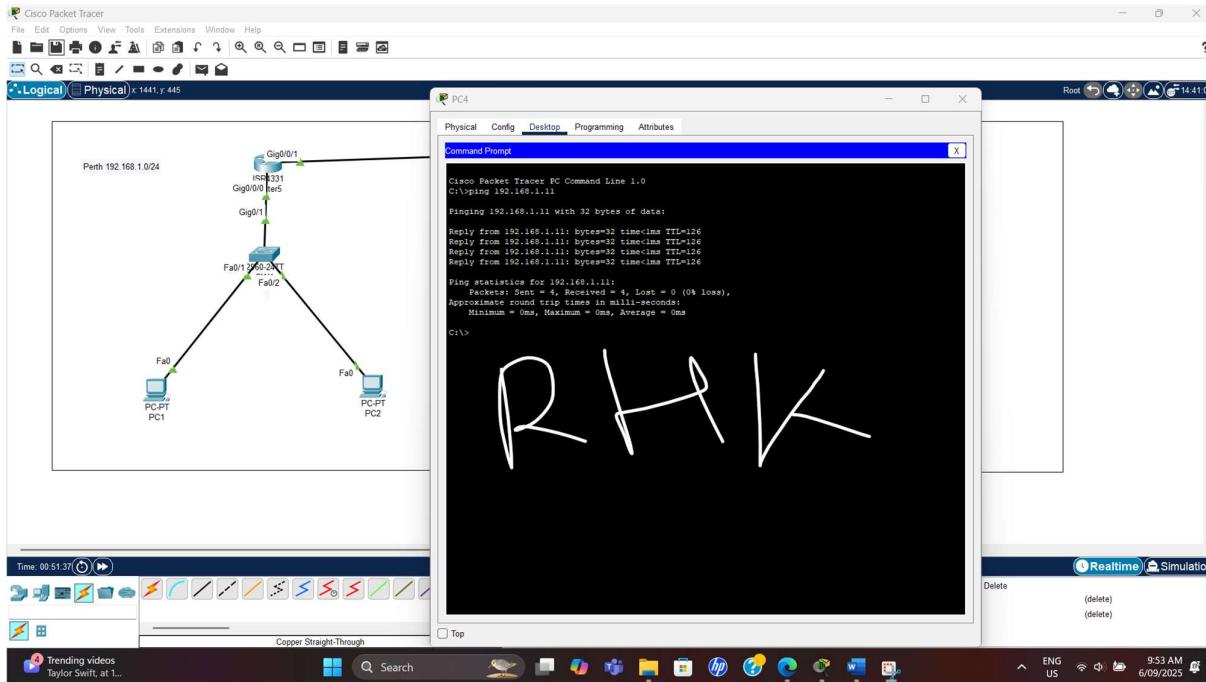


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Test 4: Troubleshooting (If Pings Fail)

If a **ping** fails, use the following commands on the routers:

Check RIP Routing Configuration

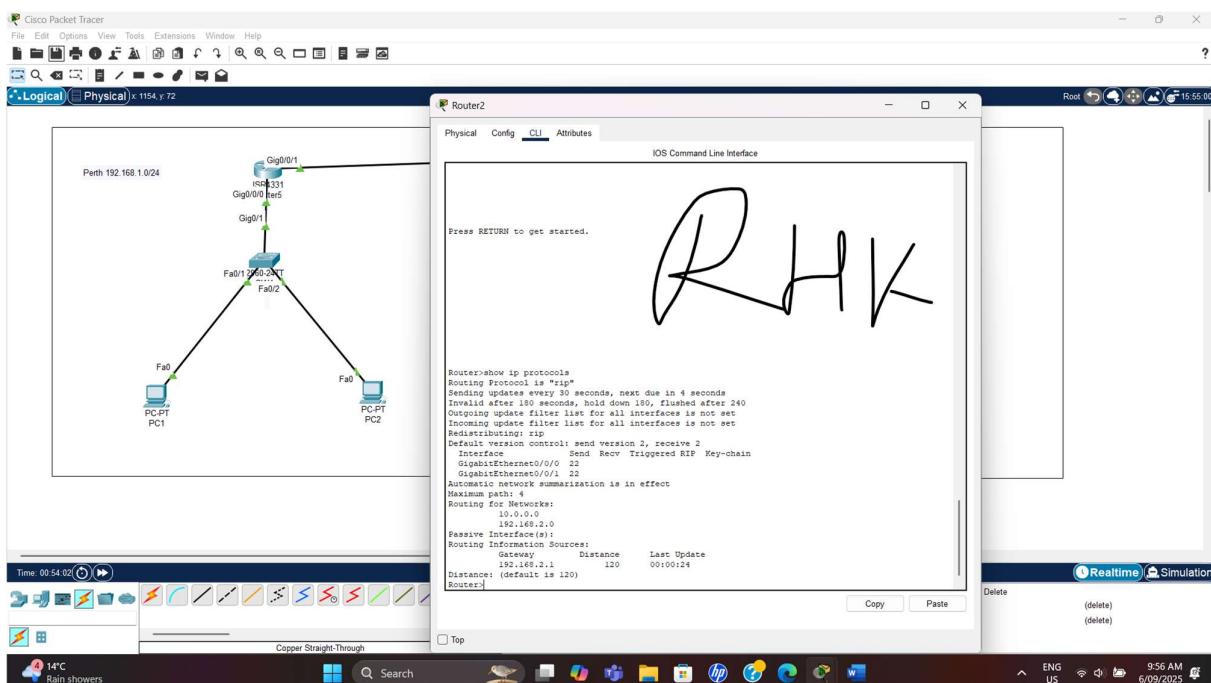
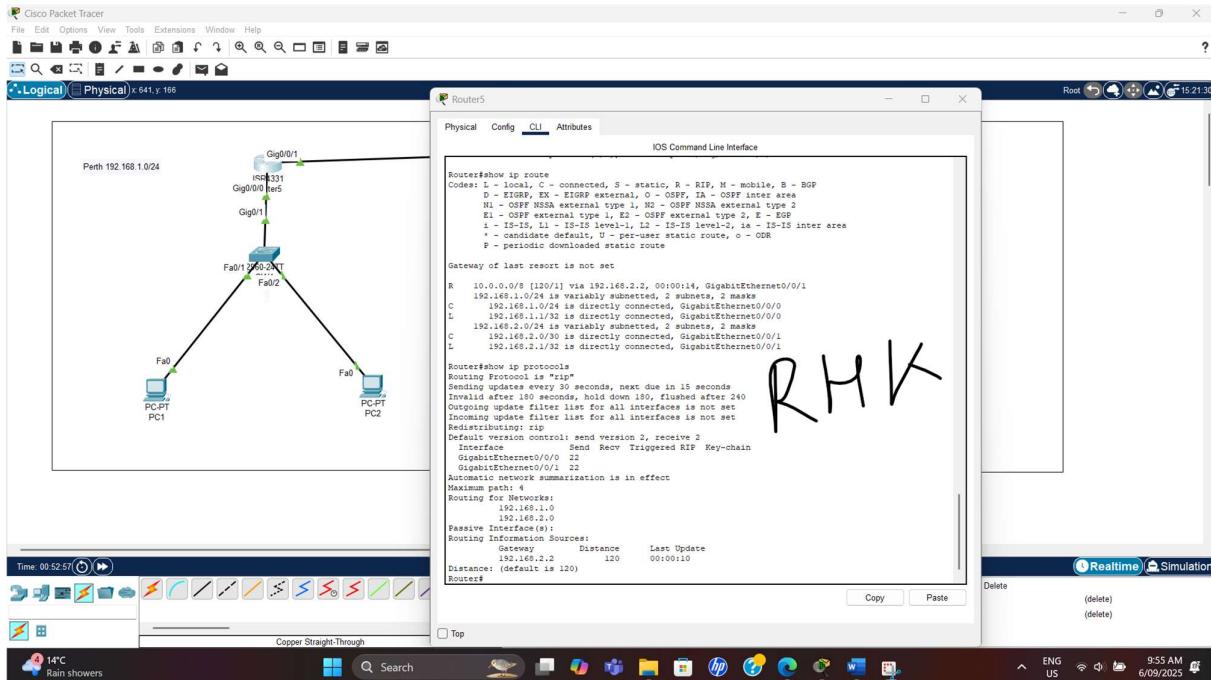
```
Router1# show ip protocols
Router2# show ip protocols
```

Ensure that **RIP version 2** is running and the **correct networks** are listed.

2 Screenshots of “**show ip protocols**” from both Routers (R1 & R2)



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Check Interface Status

On Router1, check if interfaces are up:

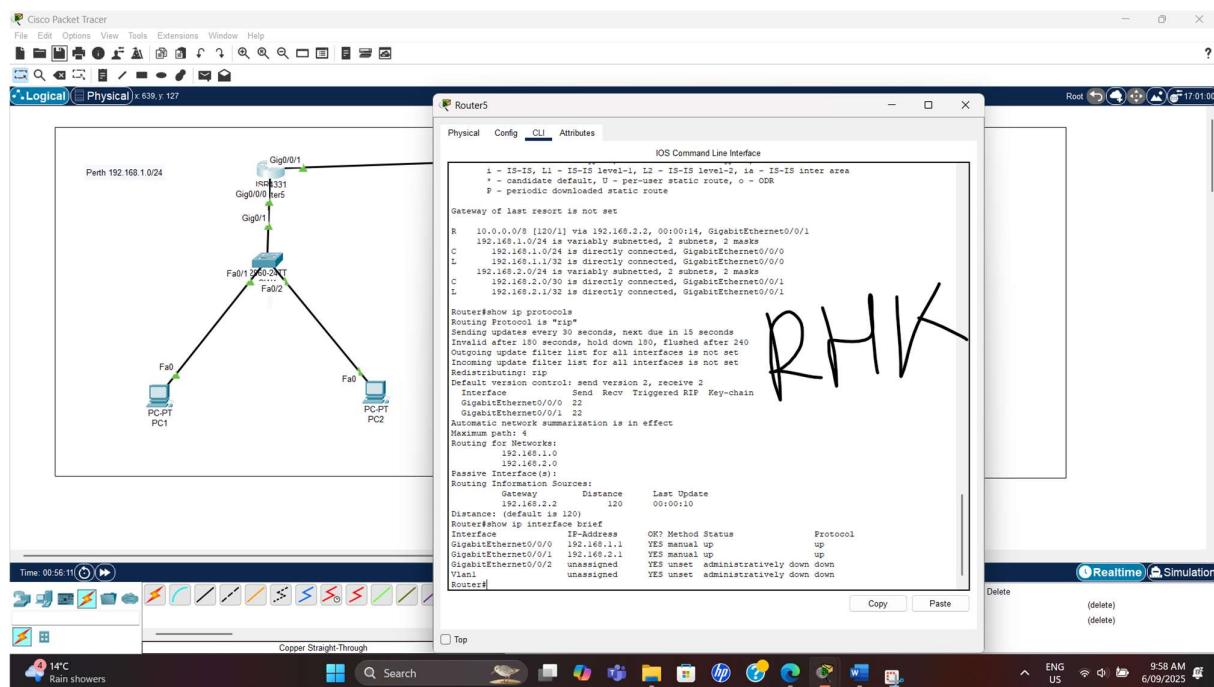
```
Router1# show ip interface brief
```

On Router2, check interfaces:

```
Router2# show ip interface brief
```

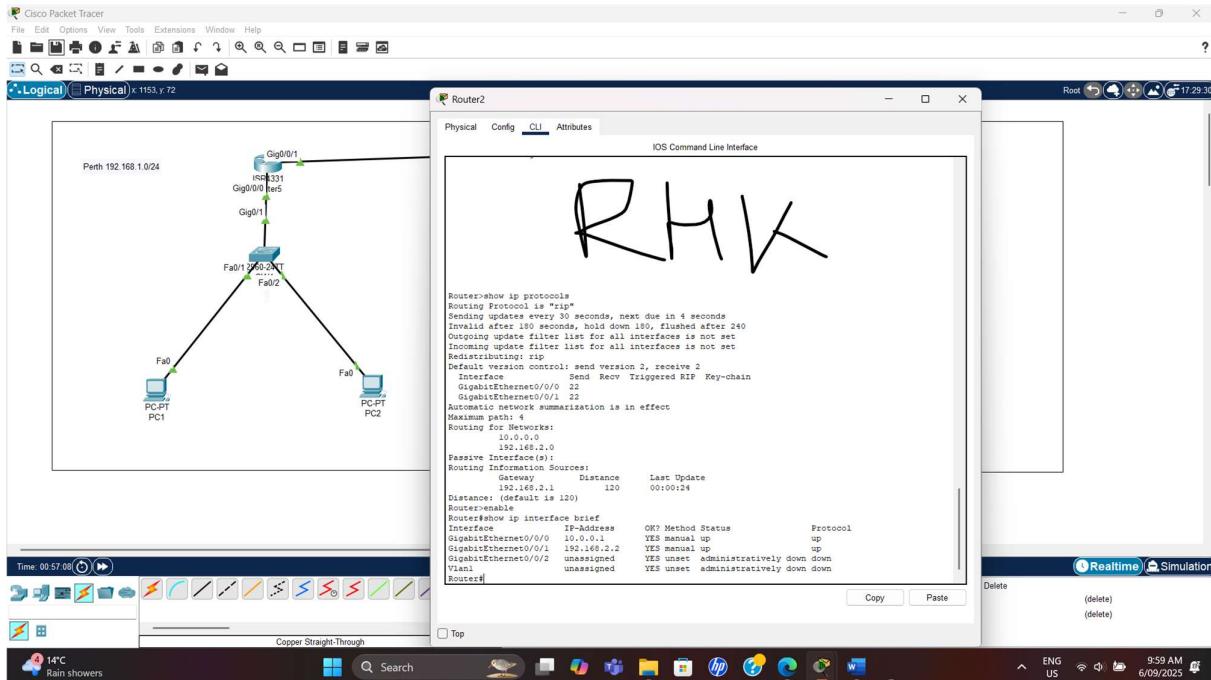
Look for "**up/up**" status on interfaces.

2 Screenshots of “*show ip interface brief*” from both Routers (R1 & R2)





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Check for Routing Issues

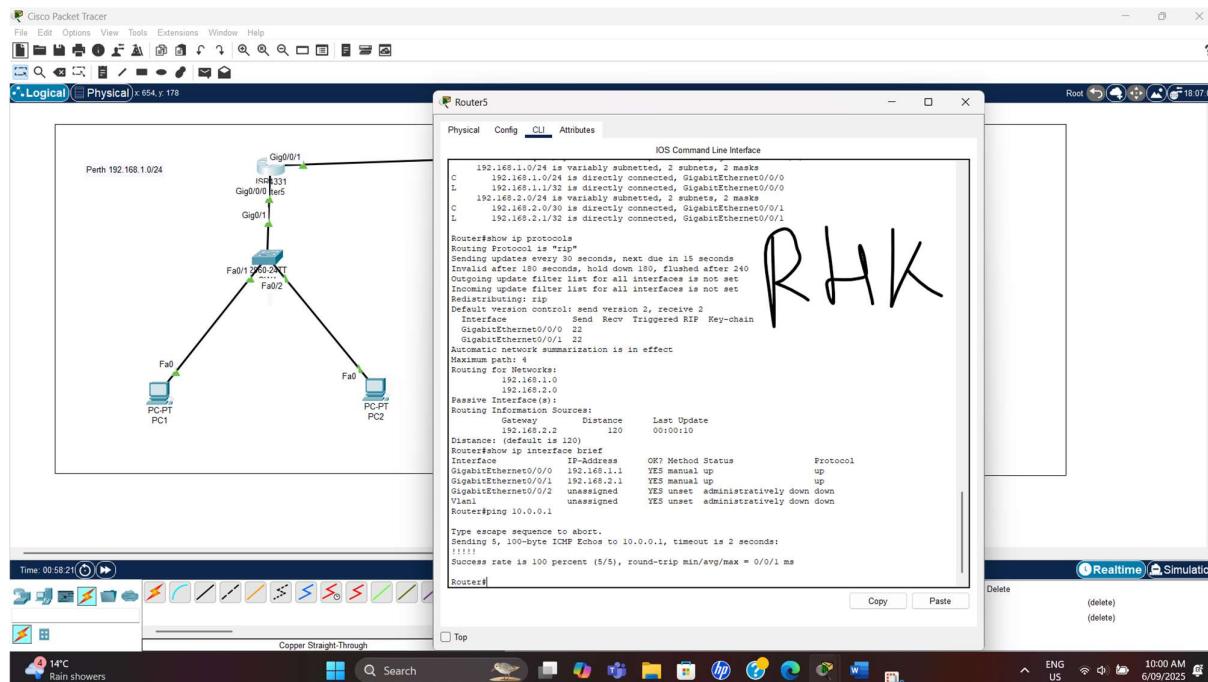
From Router1, test if it can reach Router2's LAN (10.0.0.1):

```
Router1# ping 10.0.0.1
```

From Router2, test if it can reach Router1's LAN (192.168.1.1):

```
Router2# ping 192.168.1.1
```

2 Screenshots of ping between Routers and LANs (R1 -> LAN2 & R2 -> LAN1)





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