

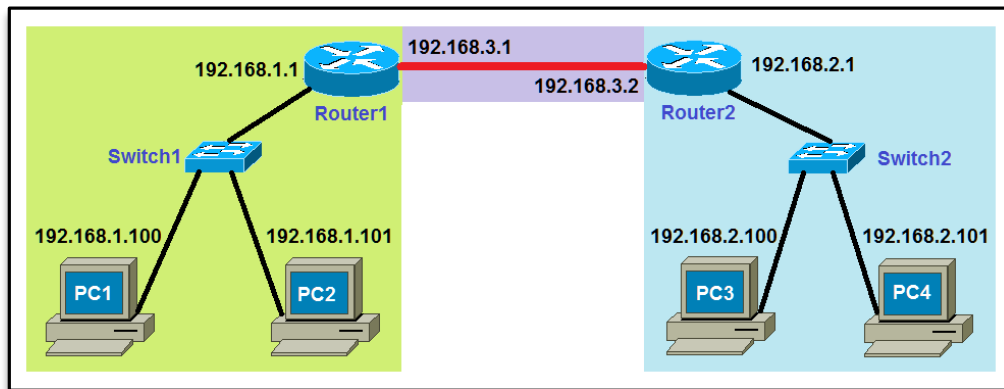
Packet Tracer Mini-Lab 04: Supplement

Configuring 2 LANs and 2 Routers with Config in Packet Tracer

CAVEAT: THE LABS IN CC2-180 MAY NOT WORK ENTIRELY AS PLANNED. WE WILL BE UTILIZING BOTH A SERVER 2012 R2 HOST PC AND VIRTUAL MACHINES (VMs) ON THE HOST PC, IN WHICH CASE THERE MAY BE UNFORESEEN ISSUES. AS SUCH WE WILL LIKELY GET SOME UNEXPECTED 'REAL WORLD' TROUBLESHOOTING PRACTICE AND MAY EVEN HAVE TO "WING IT"

Mini-Lab 04 Objective

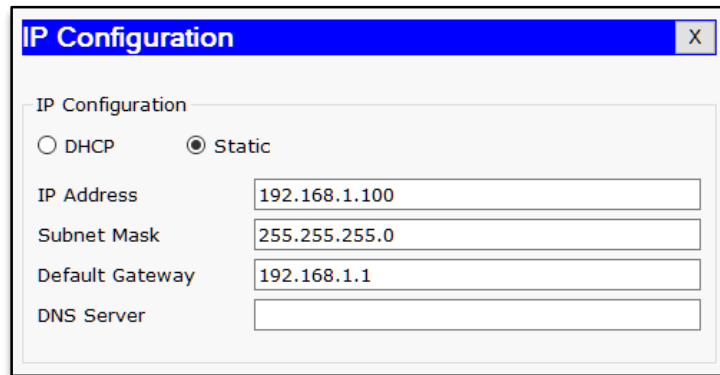
The lab provides further practice in a simulated environment using **Cisco's Packet Tracer** application.



1. Create two small **networks** using **4 PC** hosts, **2 switches**, **2 Routers** connected with **6 copper straight-through** cables and **1 serial** cable. **NOTE:** You will need to add a **WIC-2T** add-in (2-port asynchronous / synchronous serial network module) to each of the routers to use the serial cable. When you choose the serial cable, for this example I have put the DTE end on the right and the DCE end (the end with the little clock icon) on the left. More on DTE and DCE a bit later in this mini-lab.
2. Click on **PC1** and select the **Desktop** tab.

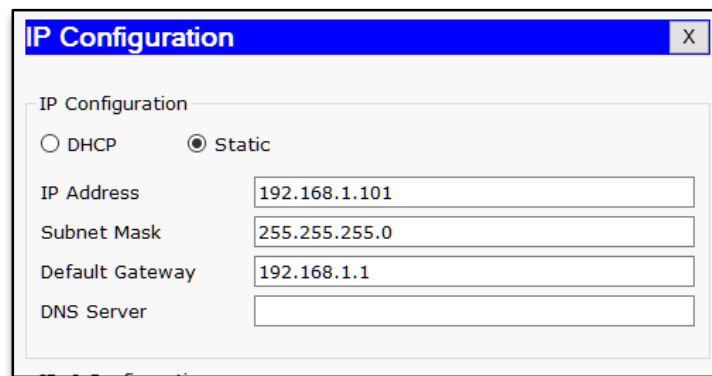


3. Select **IP Configuration**, and enter the following **address information**:



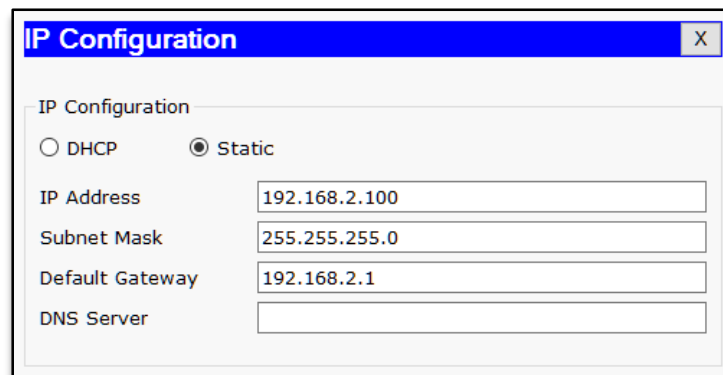
The screenshot shows a window titled "IP Configuration" with a close button (X) in the top right corner. The window contains a section labeled "IP Configuration" with two radio buttons: "DHCP" (unselected) and "Static" (selected). Below the radio buttons are four text input fields: "IP Address" containing "192.168.1.100", "Subnet Mask" containing "255.255.255.0", "Default Gateway" containing "192.168.1.1", and "DNS Server" which is empty.

4. Click on **PC2** and select the **Desktop** tab.
5. Select **IP Configuration**, and enter the following **address information**:



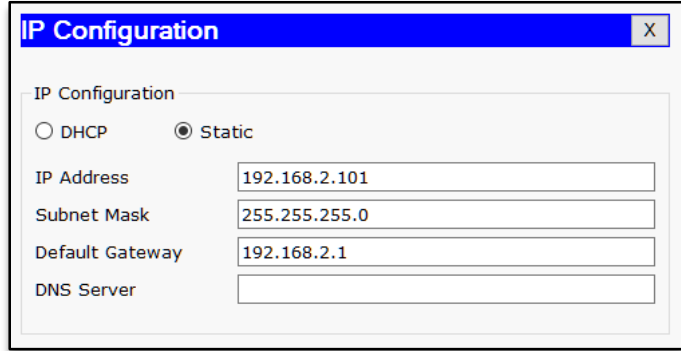
The screenshot shows a window titled "IP Configuration" with a close button (X) in the top right corner. The window contains a section labeled "IP Configuration" with two radio buttons: "DHCP" (unselected) and "Static" (selected). Below the radio buttons are four text input fields: "IP Address" containing "192.168.1.101", "Subnet Mask" containing "255.255.255.0", "Default Gateway" containing "192.168.1.1", and "DNS Server" which is empty.

6. Click on **PC3** and select the **Desktop** tab.
7. Select **IP Configuration**, and enter the following **address information**:



The screenshot shows a window titled "IP Configuration" with a close button (X) in the top right corner. The window contains a section labeled "IP Configuration" with two radio buttons: "DHCP" (unselected) and "Static" (selected). Below the radio buttons are four text input fields: "IP Address" containing "192.168.2.100", "Subnet Mask" containing "255.255.255.0", "Default Gateway" containing "192.168.2.1", and "DNS Server" which is empty.

8. Click on **PC4** and select the **Desktop** tab.
9. Select **IP Configuration**, and enter the following **address information**:



10. Roll the mouse cursor over **PC 1** to confirm the **address configuration** on the **popup box**.

```

Port          Link  IP Address      IPv6 Address      MAC Address
FastEthernet0 Up    192.168.1.100/24 <not set>         0060.7064.D252

Gateway: 192.168.1.1
DNS Server: <not set>
Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet
    
```

11. Roll the mouse cursor over **PC 2** to confirm the **address configuration** on the **popup box**.

```

Port          Link  IP Address      IPv6 Address      MAC Address
FastEthernet0 Up    192.168.1.101/24 <not set>         0030.F225.20E2

Gateway: 192.168.1.1
DNS Server: <not set>
Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet
    
```

12. Roll the mouse cursor over **PC 3** to confirm the **address configuration** on the **popup box**.

```

Port          Link  IP Address      IPv6 Address      MAC Address
FastEthernet0 Up    192.168.2.100/24 <not set>         0030.F265.8A82

Gateway: 192.168.2.1
DNS Server: <not set>
Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet
    
```

13. Roll the mouse cursor over **PC 4** to confirm the **address configuration** on the **popup box**.

```

Port          Link  IP Address      IPv6 Address      MAC Address
FastEthernet0 Up    192.168.2.101/24 <not set>         00E0.A3A9.864B

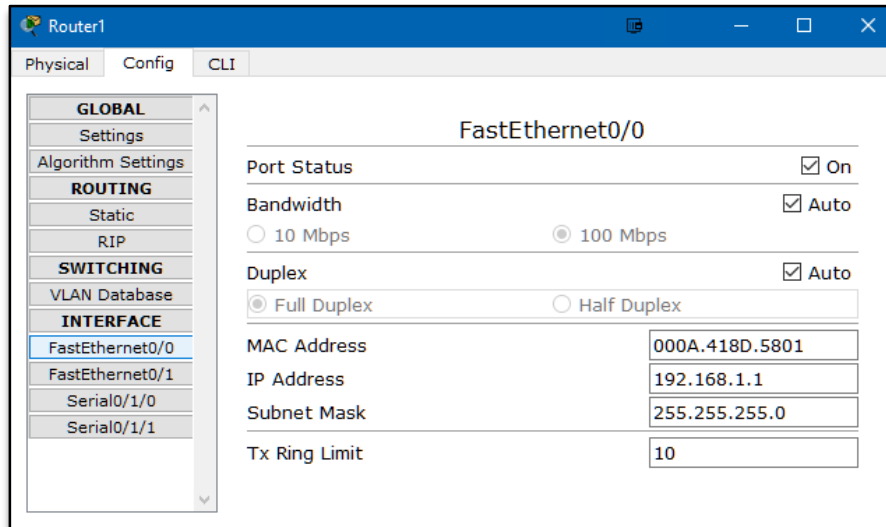
Gateway: 192.168.2.1
DNS Server: <not set>
Line Number: <not set>

Physical Location: Intercity, Home City, Corporate Office, Wiring Closet
    
```

14. Click on **Router 1**, and select the **Config** tab.

15. Select the **FastEthernet0/0** interface, and configure with the following:

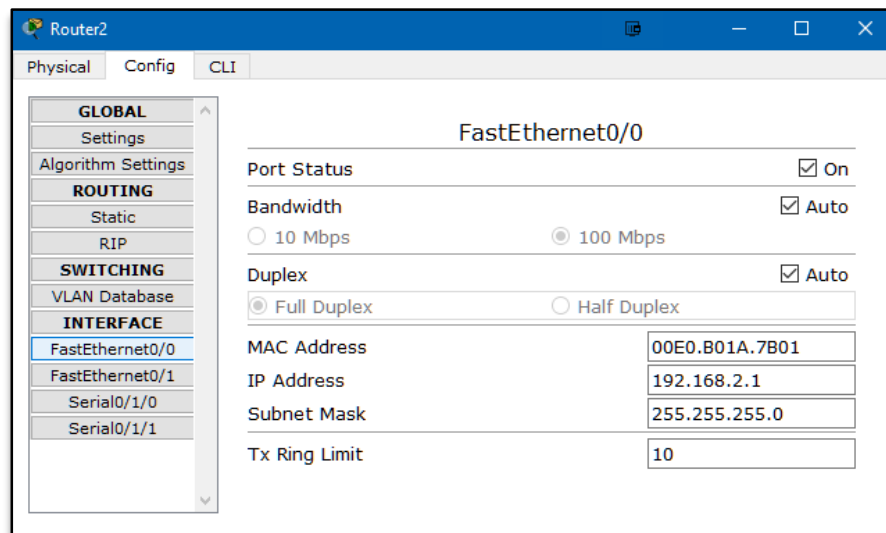
- Port Status:** On
- IP Address:** 192.168.1.1
- Subnet Mask:** 255.255.255.0



16. Click on **Router 2**, and select the **Config** tab.

17. Select the **FastEthernet0/0** interface, and configure with the following:

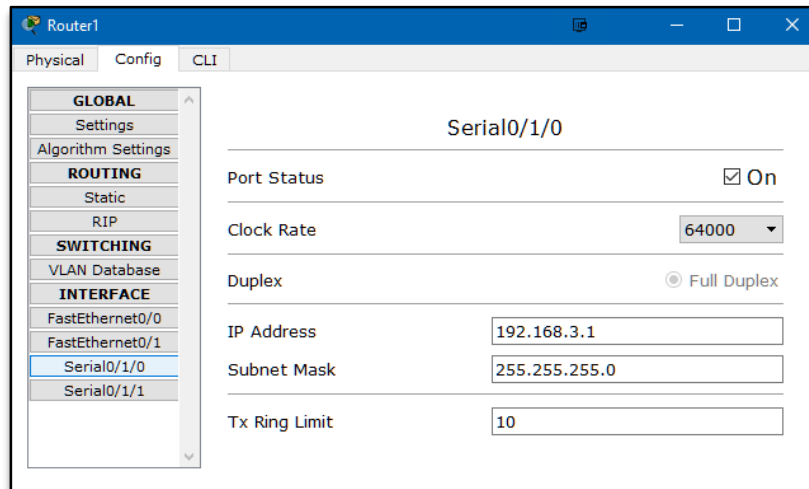
- Port Status:** On
- IP Address:** 192.168.2.1
- Subnet Mask:** 255.255.255.0



18. Click on **Router 1**, and select the **Config** tab.

19. Select the **Serial0/1/0** interface, and configure with the following:

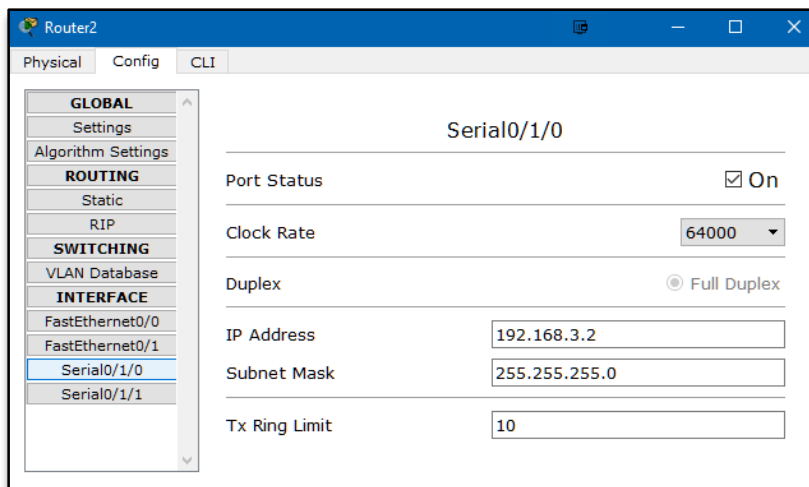
- a. **Port Status:** On
- b. **Clock Rate:** 64000 (required for DCE 'clock' end of serial connection)
- c. **IP Address:** 192.168.3.1
- d. **Subnet Mask:** 255.255.255.0



20. Click on **Router 2**, and select the **Config** tab.

21. Select the **Serial0/1/0** interface, and configure with the following:

- a. **Port Status:** On
- b. **Clock Rate:** default (not required for DTE end of serial connection)
- c. **IP Address:** 192.168.3.2
- d. **Subnet Mask:** 255.255.255.0





A NOTE ABOUT DTE AND DCE: DTE stands for *Data Terminal Equipment* and DCE stands for *Data Communication Equipment*. DCE provides clock rate, and DTE receives the clock rate being an 'end' or 'terminating' device. In Packet Tracer, when you select a serial cable, you notice the two red 'lightning bolt' icons are either DCE or DTE. The DCE side of the cable has a little clock associated with the icon and the DTE side of the cable does not. Whichever way you connect the cable to your routers, the DCE side always gets any clock rate changes but the DTE side does not. This will become more obvious when setting up the routers manually using CLI. Just remember that the 'C' in DCE might also mean 'clock' and the 'T' in DTE might also mean 'terminate' (as to 'end'). See [link](#) for detailed discussion.

Now, at this point, PC1 and PC2 could ping each other, and both could ping the router's fa0/0 interface (192.168.1.1), *and* they could both ping the serial 0/1/0 interface (192.168.3.1) on Router 1 but are unable to ping the serial 0/1/0 interface (192.168.3.2) on Router 2 or any of the devices beyond it.

The same holds true for PC3 and PC4, but in reverse.

The reason is, the routers only know about their immediate networks, but not any of the remote networks. In order to get all the devices communicating across all networks, **static routes** have to be setup in the routers letting the routers know about the other networks, and what interfaces act as portals to these other networks. Let's set up these static routes on both routers using Config.

```
PC>ping 192.168.3.1

Pinging 192.168.3.1 with 32 bytes of data:

Reply from 192.168.3.1: bytes=32 time=0ms TTL=255
Reply from 192.168.3.1: bytes=32 time=1ms TTL=255
Reply from 192.168.3.1: bytes=32 time=0ms TTL=255
Reply from 192.168.3.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

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

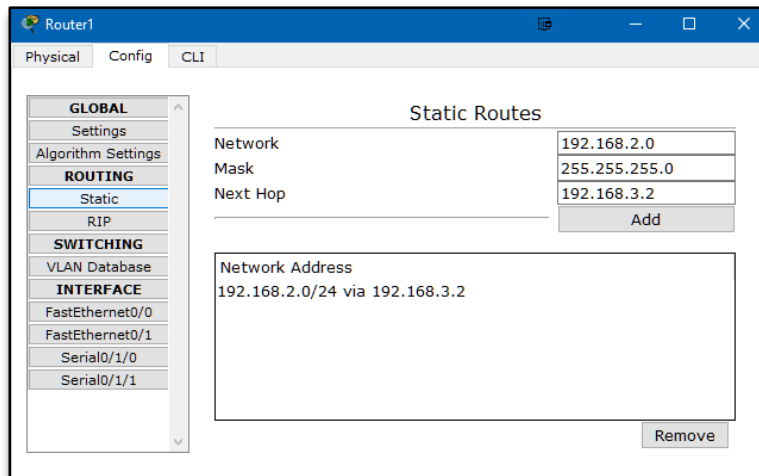
Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

22. Click on **Router 1**, and select the **Config** tab.

23. Under **Routing**, select **Static**, and configure with the following:

- a. **Network:** 192.168.2.0
- b. **Mask:** 255.255.255.0
- c. **Next Hop:** 192.168.3.2

Then click the **Add** button

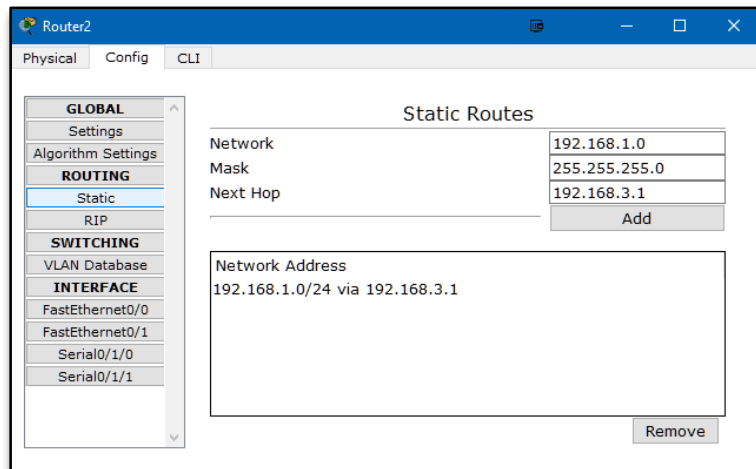


24. Click on **Router 2**, and select the **Config** tab.

25. Under **Routing**, select **Static**, and configure with the following:

- a. **Network:** 192.168.1.0
- b. **Mask:** 255.255.255.0
- c. **Next Hop:** 192.168.3.1

Then click the **Add** button



26. Now all devices should be able to ping all the interfaces and other devices successfully ☺

27. Click on **PC1**, and select the **Desktop** tab.



28. Select **Command Prompt**, and try pinging each of the following:

- a. Ping 192.168.1.100 (itself)
- b. ping 192.168.1.101 (PC2)
- c. ping 192.168.1.1 (Router 1 fa0/0)
- d. ping 192.168.3.1 (router 1 s0/1/0)
- e. ping 192.168.3.2 (router 2 s0/1/0)
- f. ping 192.168.2.1 (router 2 fa0/0)
- g. ping 192.168.2.100 (PC3)
- h. ping 192.168.2.101 (PC4)

```

Command Prompt
Pinging 192.168.2.101 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.101: bytes=32 time=5ms TTL=126
Reply from 192.168.2.101: bytes=32 time=1ms TTL=126
Reply from 192.168.2.101: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.101:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 5ms, Average = 2ms

PC>ping 192.168.2.101

Pinging 192.168.2.101 with 32 bytes of data:

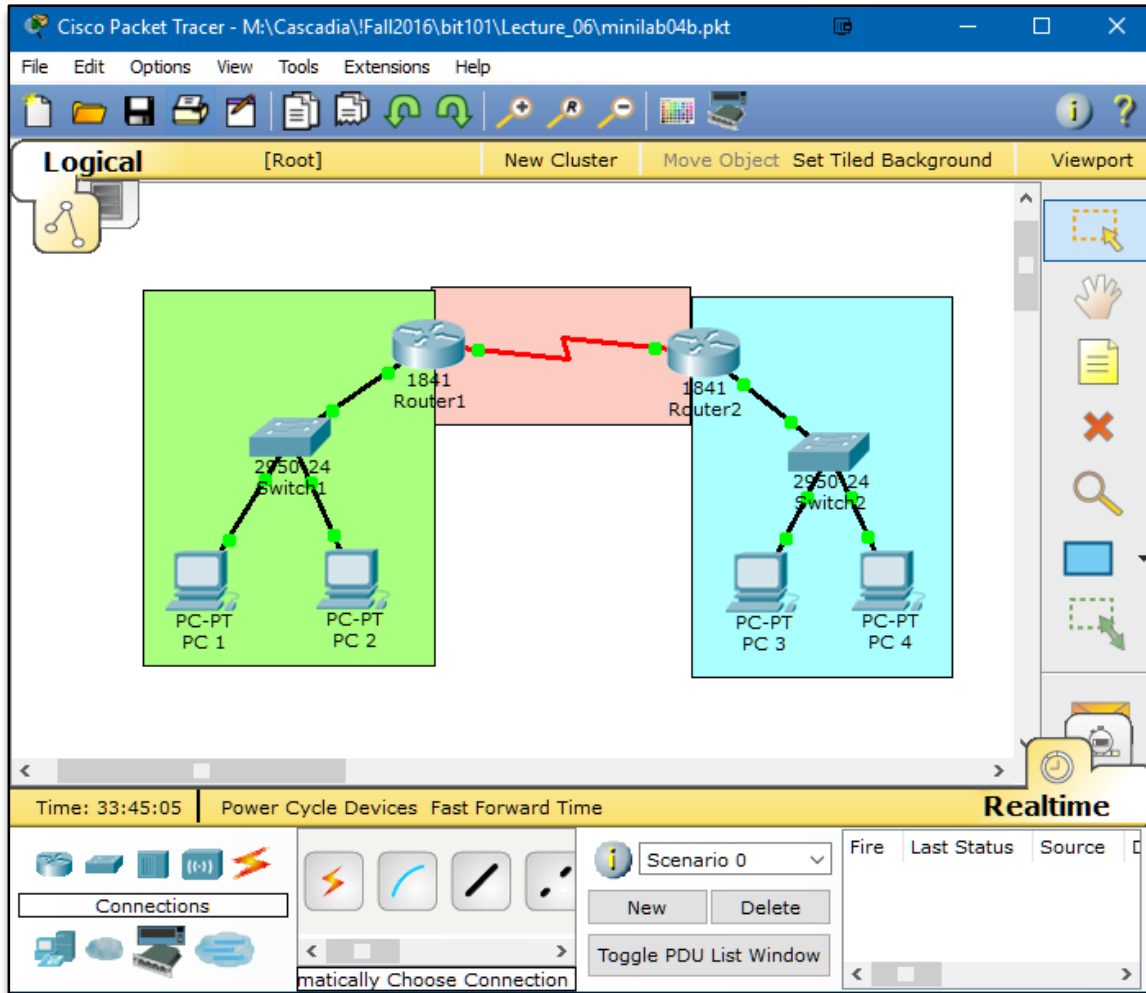
Reply from 192.168.2.101: bytes=32 time=7ms TTL=126
Reply from 192.168.2.101: bytes=32 time=2ms TTL=126
Reply from 192.168.2.101: bytes=32 time=1ms TTL=126
Reply from 192.168.2.101: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.2.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 7ms, Average = 3ms

PC>

```

29. Test doing the same from **PC2**, **PC3**, and **PC4**



END OF MINI-LAB 04