

- XY: Last two digit of your student number. IP addressing other than your student number will not be evaluated. All subnet IPs are described in the topology. [Send the print screen of your topology.](#)
- Give last available IP address of the subnet to local network gateways (in this case Routers' FastEthernet : .254). Give first available addresses of the subnet to PCs.
- Perform data communication between **all computers**. (Pings between PCs are enough, dont need to ping inter-router networks). [Send pings/traceroutes.](#)
- Dynamic routing is not allowed. Use only **static routing**.
- **Static Routes** must be performed through shortest path. There should be a minimum number of entries as possible in routing tables. [Send the route tables of each router.](#)
- Name: Gamze Ergin
- Student ID: 2200356827
- Signature:

Grading	30p: All Nets Ping - optimum routing solution	25p: All Nets Ping - unnecessary routes	20p: Some Nets Ping	10p: Only LANs Ping	5p: Nothing works but all cables connected
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## 1- TOPOLOGY

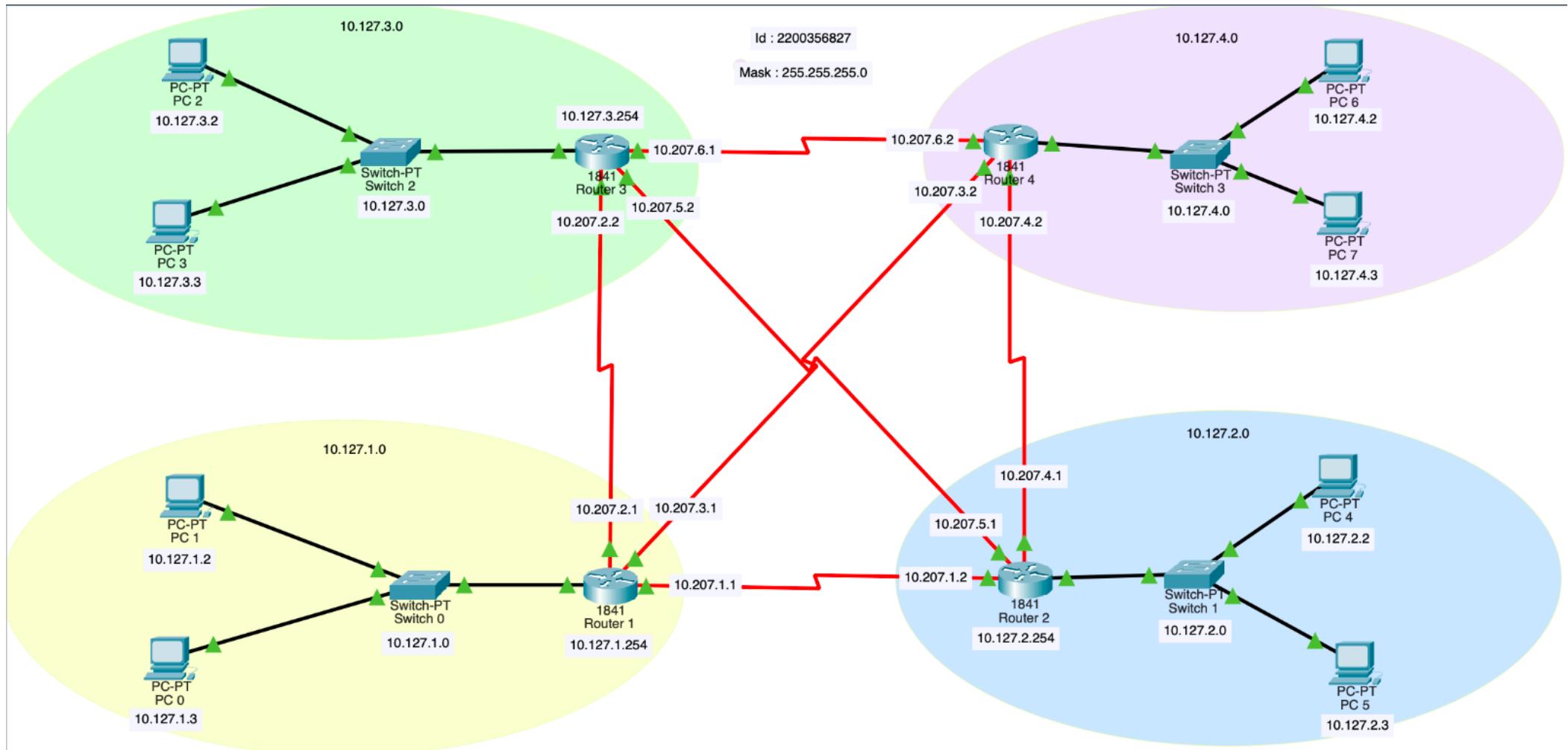


Figure 1: The topology

## 1-1) Topology Components

### a) PCs

All PC IP address information can be seen from these screenshots.

PC 0

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP  Static

IPv4 Address: 10.127.1.3

Subnet Mask: 255.255.255.0

Default Gateway: 10.127.1.254

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic  Static

IPv6 Address: /

Link Local Address: FE80::2D0:BCFF:FEB6:B5D9

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

Top

Figure 2: PC 0

PC 1

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP  Static

IPv4 Address: 100.127.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 10.127.1.254

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic  Static

IPv6 Address: /

Link Local Address: FE80::2E0:B0FF:FE59:7502

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

Top

Figure 3: PC 1

PC 2

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP  Static

IPv4 Address: 10.127.3.2

Subnet Mask: 255.255.255.0

Default Gateway: 10.127.3.254

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic  Static

IPv6 Address: /

Link Local Address: FE80::201:63FF:FE26:5D86

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

Top

Figure 4: PC 2

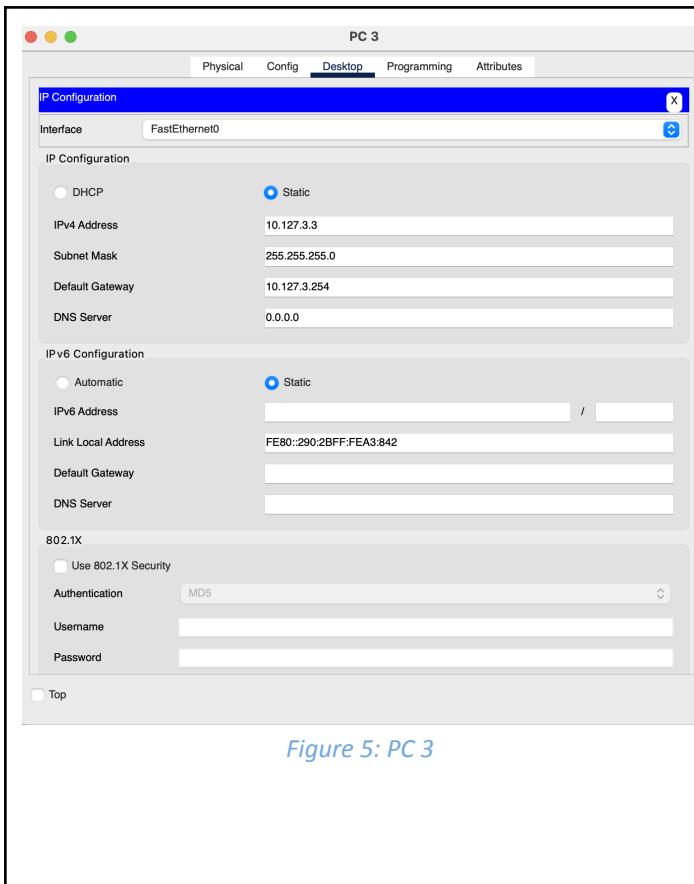


Figure 5: PC 3



Figure 6: PC 4

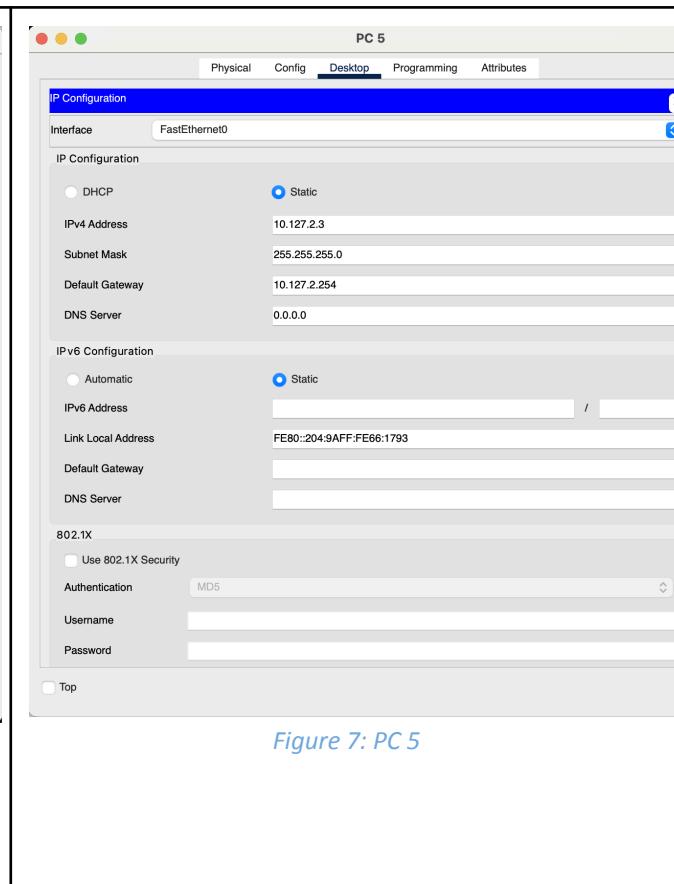


Figure 7: PC 5

**PC 6**

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface: FastEthernet0

IP Configuration

DHCP  Static

IPv4 Address: 10.127.4.2

Subnet Mask: 255.255.255.0

Default Gateway: 10.127.4.254

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic  Static

IPv6 Address: /

Link Local Address: FE80::201:43FF:FE1B:1510

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

Top

This screenshot shows the configuration window for PC 6. It displays the IP configuration for the FastEthernet0 interface, setting the IPv4 address to 10.127.4.2 with a static configuration. It also shows the IPv6 configuration with static settings and a link local address of FE80::201:43FF:FE1B:1510. The 802.1X section includes fields for authentication (MD5), username, password, and a top checkbox.

Figure 8: PC 6

**PC 7**

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface: FastEthernet0

IP Configuration

DHCP  Static

IPv4 Address: 10.127.4.3

Subnet Mask: 255.255.255.0

Default Gateway: 10.127.4.254

DNS Server: 0.0.0.0

IPv6 Configuration

Automatic  Static

IPv6 Address: /

Link Local Address: FE80::2D0:BCFF:FE90:A472

Default Gateway:

DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

Top

This screenshot shows the configuration window for PC 7. It displays the IP configuration for the FastEthernet0 interface, setting the IPv4 address to 10.127.4.3 with a static configuration. It also shows the IPv6 configuration with static settings and a link local address of FE80::2D0:BCFF:FE90:A472. The 802.1X section includes fields for authentication (MD5), username, password, and a top checkbox.

Figure 9: PC 7

## b) Routers

### b.1 Router 1

The screenshot displays two windows for Router 1. The left window shows the 'Config' tab selected, specifically the 'ROUTING' > 'Static' section. It lists three static routes:

- 10.127.2.0/24 via 10.207.1.2
- 10.127.3.0/24 via 10.207.2.2
- 10.127.4.0/24 via 10.207.3.2

The right window shows the 'Config' tab selected, specifically the 'INTERFACE' > 'FastEthernet0/0' section. It displays the following configuration for FastEthernet0/0:

- Port Status: On (checked)
- Bandwidth: 100 Mbps (radio button)
- Duplex: Full Duplex (radio button)
- MAC Address: 0003.E4C4.7301
- IP Configuration:
  - IPv4 Address: 10.127.1.254
  - Subnet Mask: 255.255.255.0
- Tx Ring Limit: 10

Below the right window, there is a box labeled 'Equivalent IOS Commands' containing the following text:

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up  
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up  
  
Router>enable  
Router#  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#
```

Figure 10-11: Router information belongs to Router 1

The figure consists of three side-by-side screenshots of a network configuration interface for Router 1. Each screenshot shows the configuration for a different serial port: Serial0/0/0, Serial0/0/1, and Serial0/1/0. The interface has tabs for Physical, Config (which is selected), CLI, and Attributes.

**Serial0/0/0 Configuration:**

- GLOBAL:** Port Status (On), Duplex (Full Duplex), Clock Rate (2000000).
- ROUTING:** Static, RIP.
- SWITCHING:** VLAN Database.
- INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0. Tx Ring Limit is set to 10.
- Equivalent IOS Commands:**

```
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
```

**Serial0/0/1 Configuration:**

- GLOBAL:** Port Status (On), Duplex (Full Duplex), Clock Rate (2000000).
- ROUTING:** Static, RIP.
- SWITCHING:** VLAN Database.
- INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0. Tx Ring Limit is set to 10.
- Equivalent IOS Commands:**

```
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#interface FastEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
```

**Serial0/1/0 Configuration:**

- GLOBAL:** Port Status (On), Duplex (Full Duplex), Clock Rate (2000000).
- ROUTING:** Static, RIP.
- SWITCHING:** VLAN Database.
- INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0. Tx Ring Limit is set to 10.
- Equivalent IOS Commands:**

```
Router(config)#interface Serial0/1/0
Router(config-if)#no shutdown
Router(config-if)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#exit
```

Figure 12-13-14: Router connections to Router 1

## b.2 Router 2

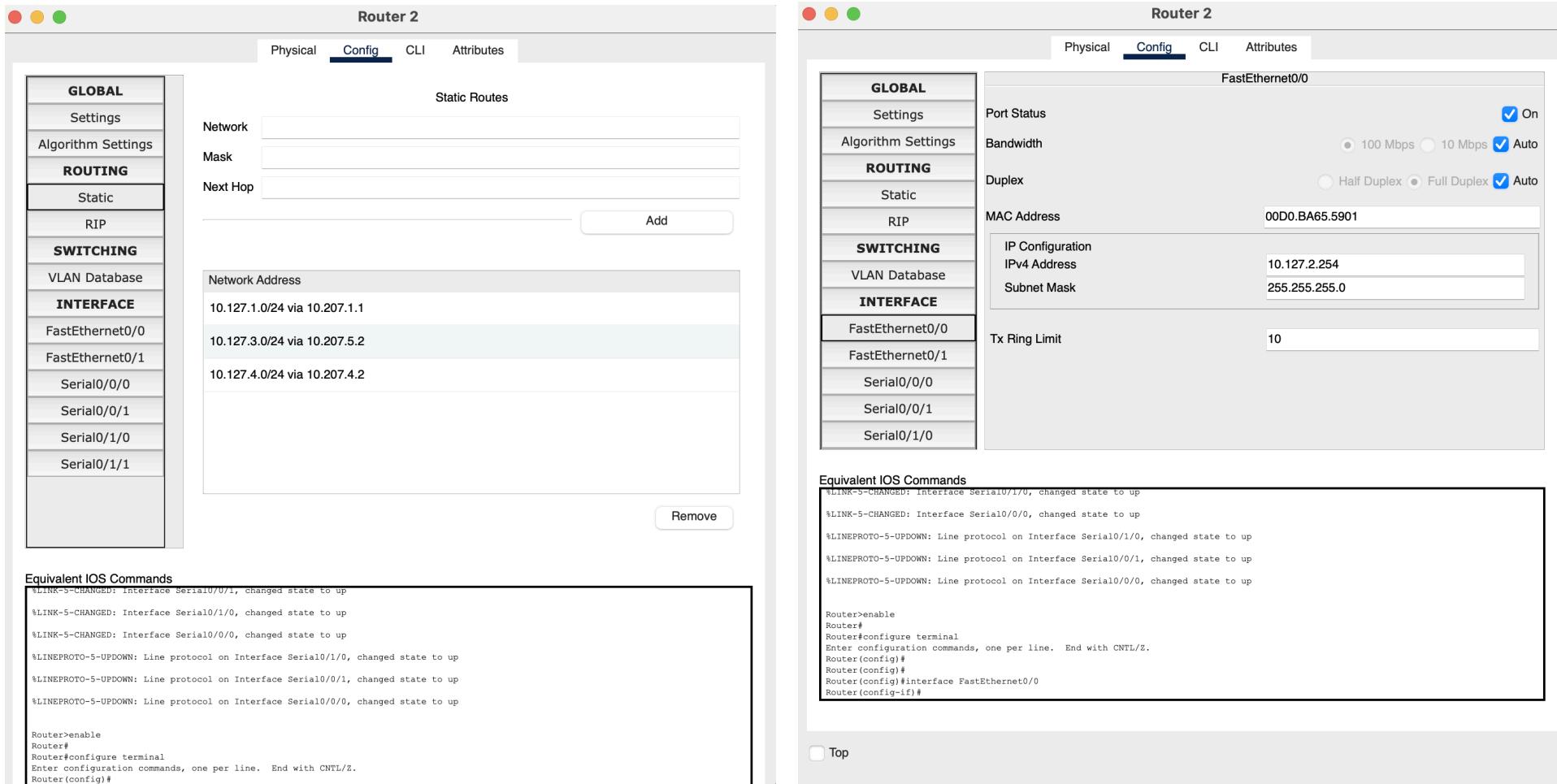
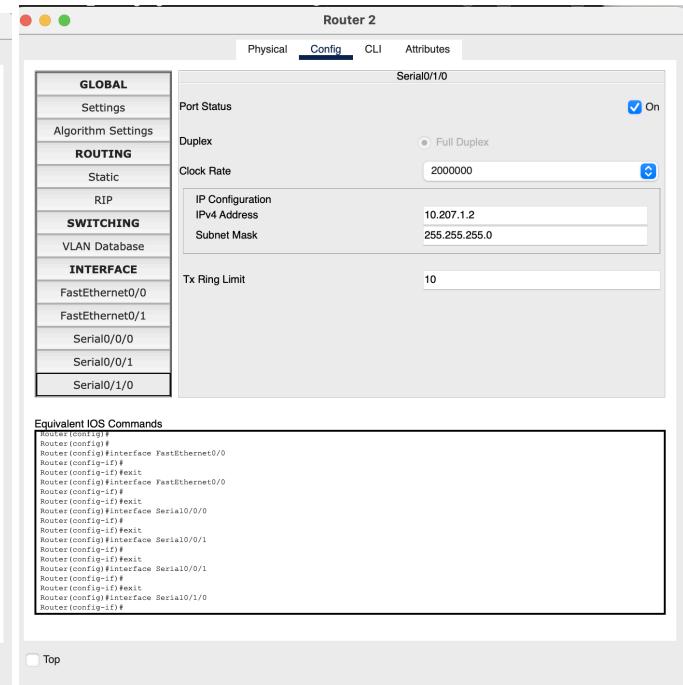
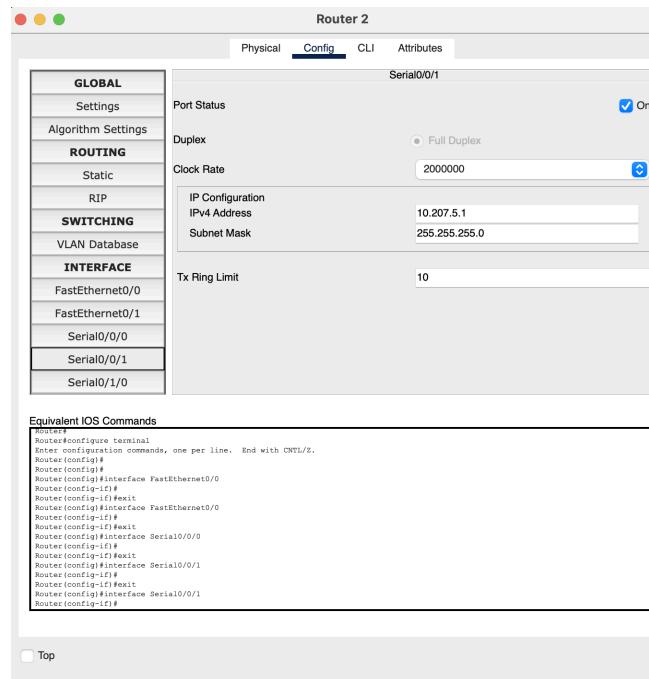
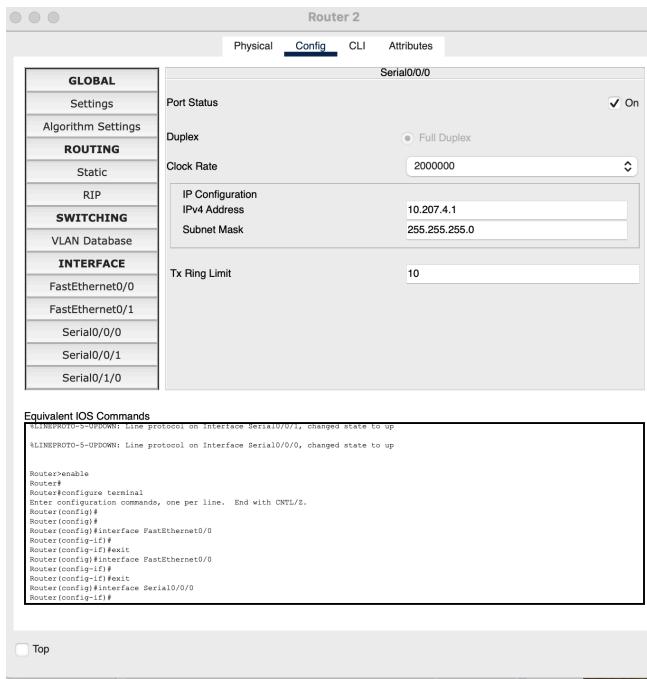
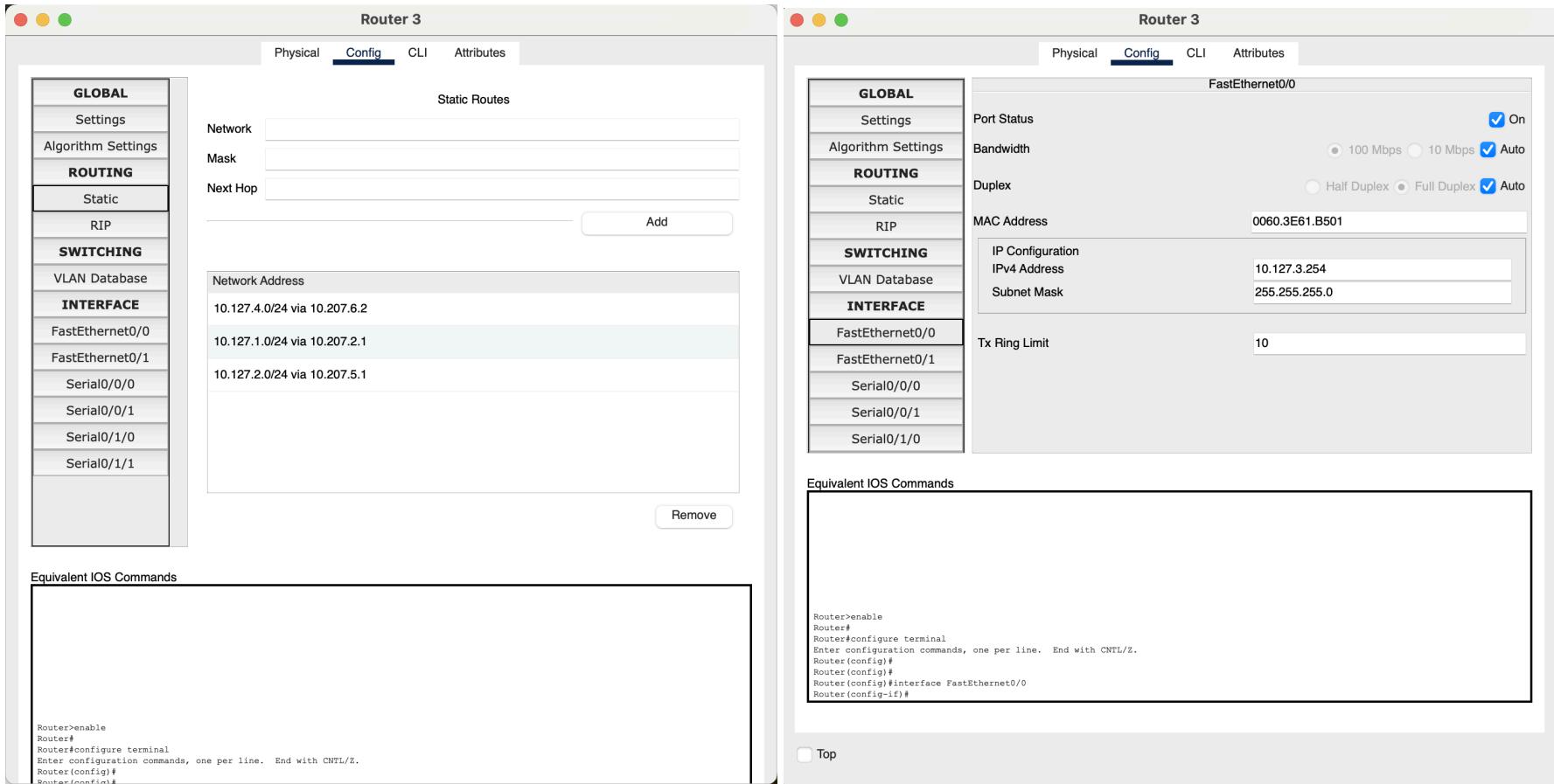


Figure 15-16: Router information belongs to Router 2



*Figure 17-18: Router connections to Router 2*

### b.3 Router 3



*Figure 19-20: Router information belongs to Router 3*

**Router 3 Configuration Screenshots:**

- Router 3 - Serial0/0/0 Configuration:**
  - GLOBAL:** Settings, Algorithm Settings, Routing (Static), RIP.
  - ROUTING:** Static.
  - SWITCHING:** VLAN Database.
  - INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0.
  - Serial0/0/0:** Port Status (On, Full Duplex), Clock Rate (2000000), IP Configuration (IPv4 Address: 10.207.6.1, Subnet Mask: 255.255.255.0), Tx Ring Limit (10).
- Router 3 - Serial0/0/1 Configuration:**
  - GLOBAL:** Settings, Algorithm Settings, Routing (Static), RIP.
  - ROUTING:** Static.
  - SWITCHING:** VLAN Database.
  - INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0.
  - Serial0/0/1:** Port Status (On, Full Duplex), Clock Rate (2000000), IP Configuration (IPv4 Address: 10.207.5.2, Subnet Mask: 255.255.255.0), Tx Ring Limit (10).
- Router 3 - Serial0/1/0 Configuration:**
  - GLOBAL:** Settings, Algorithm Settings, Routing (Static), RIP.
  - ROUTING:** Static.
  - SWITCHING:** VLAN Database.
  - INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0.
  - Serial0/1/0:** Port Status (On, Full Duplex), Clock Rate (2000000), IP Configuration (IPv4 Address: 10.207.2.2, Subnet Mask: 255.255.255.0), Tx Ring Limit (10).

**Equivalent IOS Commands:**

- Router 3 - Serial0/0/0:**

```
Router>enable
Router# Router#configure terminal
Router(config)# configuration commands, one per line. End with CNTL/Z.
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 10.207.6.1 255.255.255.0
Router(config-if)# exit
Router(config)# interface Serial0/0/0
Router(config-if)# exit
Router(config)# interface Serial0/0/0
Router(config-if)# exit
```
- Router 3 - Serial0/0/1:**

```
Router>enable
Router# Router#configure terminal
Router(config)# configuration commands, one per line. End with CNTL/Z.
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 10.207.5.2 255.255.255.0
Router(config-if)# exit
Router(config)# interface Serial0/0/1
Router(config-if)# ip address 10.207.5.2 255.255.255.0
Router(config-if)# exit
Router(config)# interface Serial0/0/1
Router(config-if)# ip address 10.207.5.2 255.255.255.0
Router(config-if)# exit
```
- Router 3 - Serial0/1/0:**

```
Router>enable
Router# Router#configure terminal
Router(config)# configuration commands, one per line. End with CNTL/Z.
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 10.207.2.2 255.255.255.0
Router(config-if)# exit
Router(config)# interface Serial0/1/0
Router(config-if)# ip address 10.207.2.2 255.255.255.0
Router(config-if)# exit
Router(config)# interface Serial0/1/0
Router(config-if)# ip address 10.207.2.2 255.255.255.0
Router(config-if)# exit
```

Top

Figure 21-22-23: Router connections to Router 3

## b.4 Router 4

**Router 4 Configuration Screenshots**

**Left Panel (Config Tab): Static Routes**

- GLOBAL:** Settings, Algorithm Settings
- ROUTING:** Static, RIP
- SWITCHING:** VLAN Database
- INTERFACE:** FastEthernet0/0, FastEthernet0/1, Serial0/0/0, Serial0/0/1, Serial0/1/0, Serial0/1/1

**Right Panel (Physical Tab): Interface FastEthernet0/0**

- Port Status:** On (checked), Bandwidth (100 Mbps), Duplex (Full Duplex), MAC Address (000C.CF21.9101)
- IP Configuration:** IPv4 Address (10.127.4.254), Subnet Mask (255.255.255.0)
- Tx Ring Limit:** 10

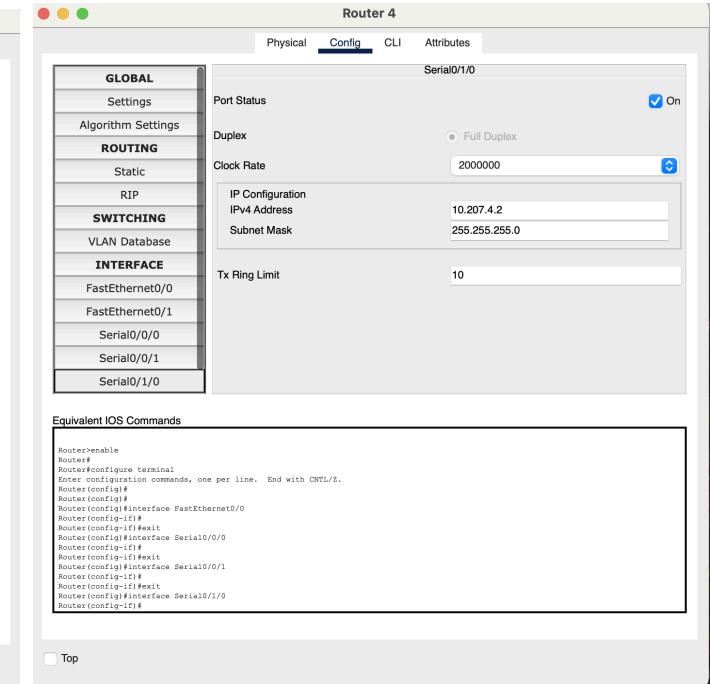
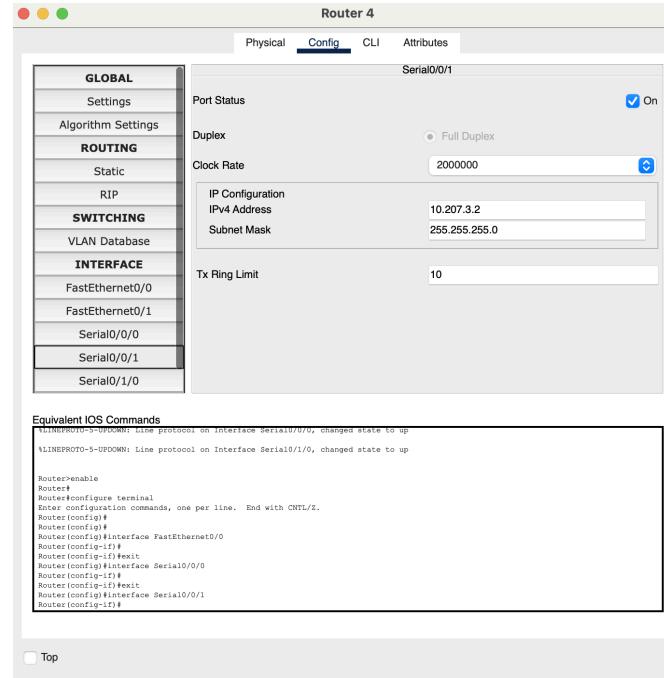
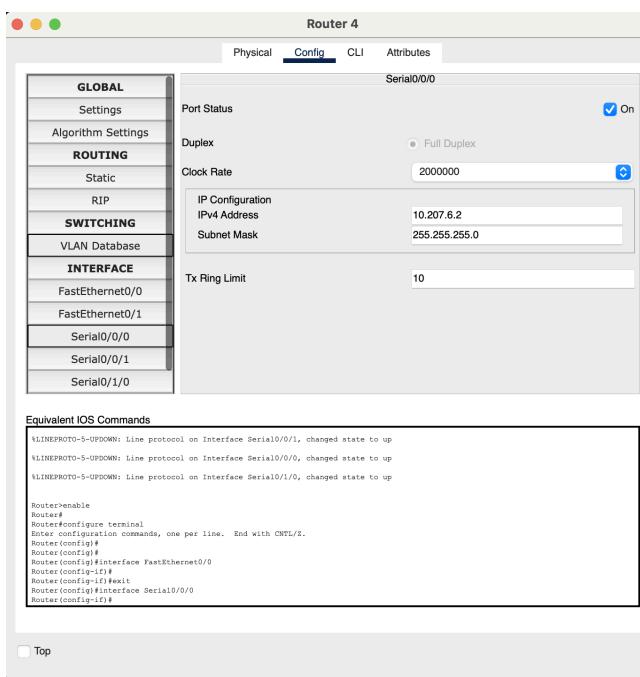
**Equivalent IOS Commands**

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#

```

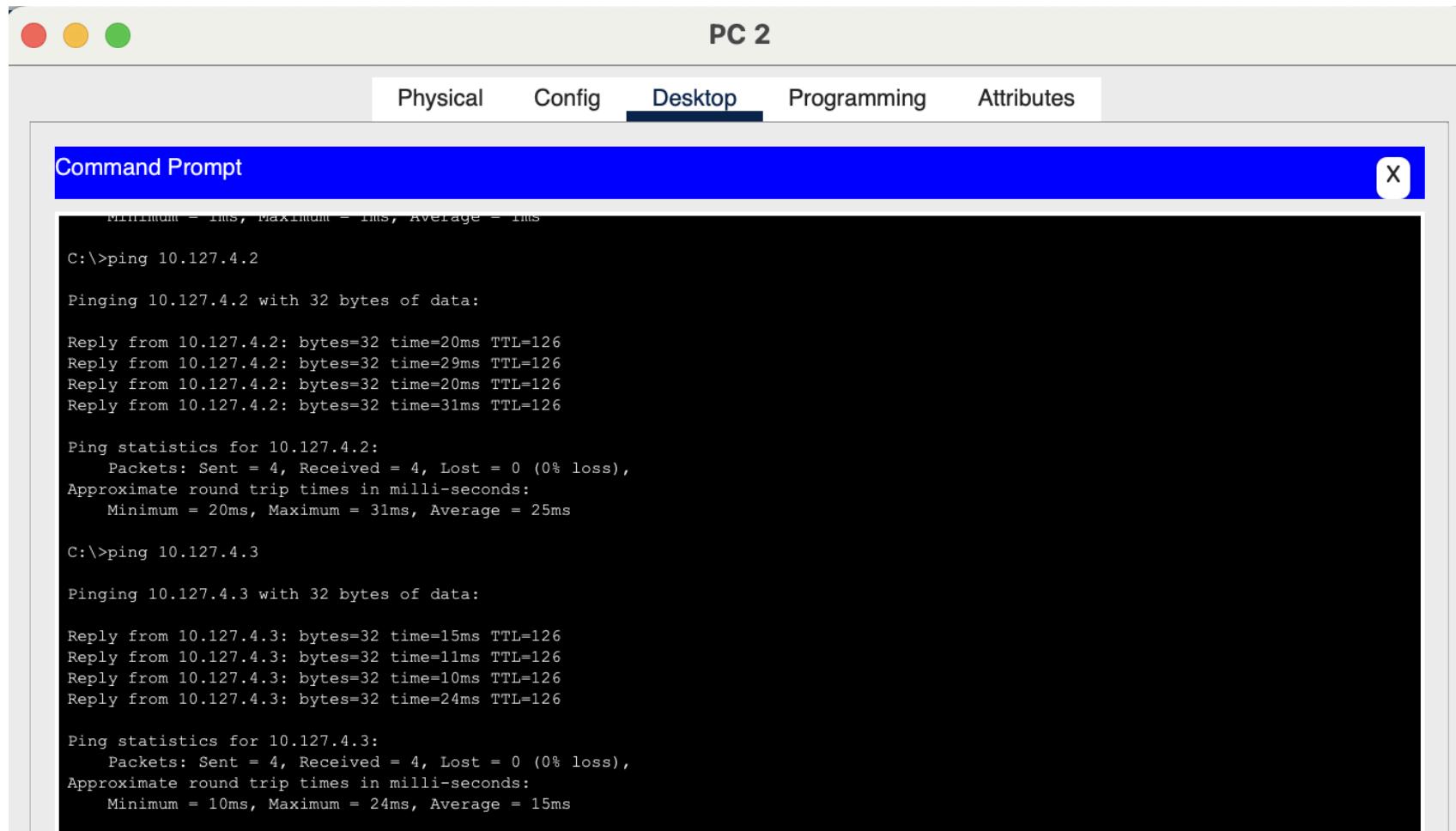
Figure 24-25: Router information belongs to Router 4



*Figure 26-27-28: Router connections to Router 4*

### 3- Pinging

a) *Pinging other computers from 10.127.3.3 Ip address.*



The screenshot shows a computer interface titled "PC 2". At the top, there are three colored circles (red, yellow, green) and a menu bar with tabs: Physical, Config, Desktop (which is selected), Programming, and Attributes. Below the menu is a blue header bar labeled "Command Prompt" with a close button ("X"). The main window displays the output of several ping commands:

```
Minimum = 1ms, Maximum = 1ms, Average = 1ms
C:\>ping 10.127.4.2

Pinging 10.127.4.2 with 32 bytes of data:

Reply from 10.127.4.2: bytes=32 time=20ms TTL=126
Reply from 10.127.4.2: bytes=32 time=29ms TTL=126
Reply from 10.127.4.2: bytes=32 time=20ms TTL=126
Reply from 10.127.4.2: bytes=32 time=31ms TTL=126

Ping statistics for 10.127.4.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 31ms, Average = 25ms

C:\>ping 10.127.4.3

Pinging 10.127.4.3 with 32 bytes of data:

Reply from 10.127.4.3: bytes=32 time=15ms TTL=126
Reply from 10.127.4.3: bytes=32 time=11ms TTL=126
Reply from 10.127.4.3: bytes=32 time=10ms TTL=126
Reply from 10.127.4.3: bytes=32 time=24ms TTL=126

Ping statistics for 10.127.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 24ms, Average = 15ms
```

Figure 29: Screenshot from PC2

```
C:\>ping 10.127.2.2

Pinging 10.127.2.2 with 32 bytes of data:

Request timed out.
Reply from 10.127.2.2: bytes=32 time=16ms TTL=126
Reply from 10.127.2.2: bytes=32 time=1ms TTL=126
Reply from 10.127.2.2: bytes=32 time=9ms TTL=126

Ping statistics for 10.127.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 16ms, Average = 8ms

C:\>ping 10.127.2.3

Pinging 10.127.2.3 with 32 bytes of data:

Reply from 10.127.2.3: bytes=32 time=20ms TTL=126
Reply from 10.127.2.3: bytes=32 time=28ms TTL=126
Reply from 10.127.2.3: bytes=32 time=25ms TTL=126
Reply from 10.127.2.3: bytes=32 time=21ms TTL=126

Ping statistics for 10.127.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 28ms, Average = 23ms
```

```
C:\>ping 10.127.1.3

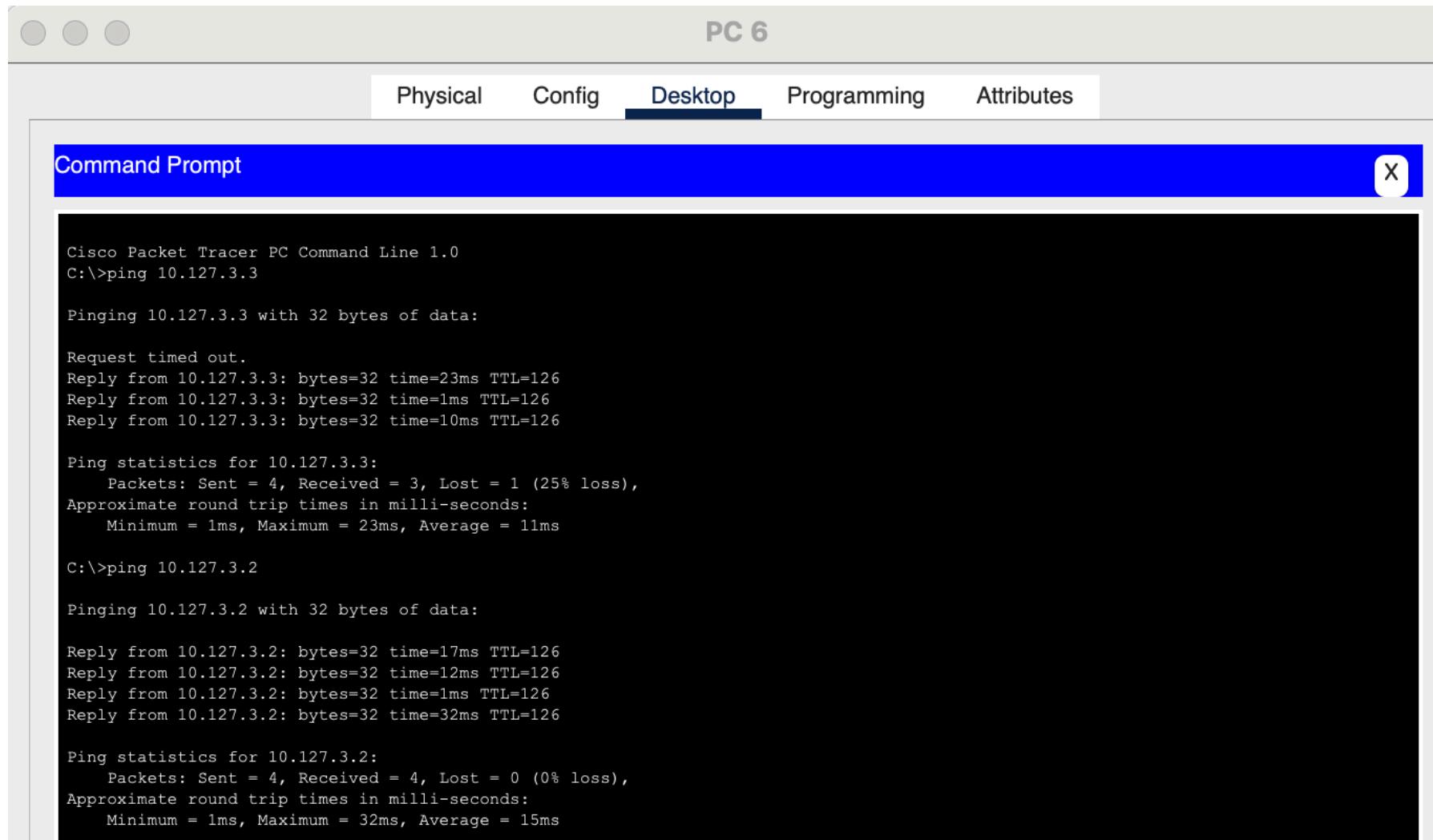
Pinging 10.127.1.3 with 32 bytes of data:

Reply from 10.127.1.3: bytes=32 time=16ms TTL=126
Reply from 10.127.1.3: bytes=32 time=1ms TTL=126
Reply from 10.127.1.3: bytes=32 time=24ms TTL=126
Reply from 10.127.1.3: bytes=32 time=21ms TTL=126

Ping statistics for 10.127.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 24ms, Average = 15ms
```

Figure 30-31: Screenshot from PC2

**b)Pinging other computers from 10.127.3.3 Ip address.**



The screenshot shows a window titled "PC 6" with tabs for Physical, Config, Desktop (which is selected), Programming, and Attributes. Below the tabs is a blue header bar with "Command Prompt" and a close button (X). The main area displays the output of a ping session:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.127.3.3

Pinging 10.127.3.3 with 32 bytes of data:

Request timed out.
Reply from 10.127.3.3: bytes=32 time=23ms TTL=126
Reply from 10.127.3.3: bytes=32 time=1ms TTL=126
Reply from 10.127.3.3: bytes=32 time=10ms TTL=126

Ping statistics for 10.127.3.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 23ms, Average = 11ms

C:\>ping 10.127.3.2

Pinging 10.127.3.2 with 32 bytes of data:

Reply from 10.127.3.2: bytes=32 time=17ms TTL=126
Reply from 10.127.3.2: bytes=32 time=12ms TTL=126
Reply from 10.127.3.2: bytes=32 time=1ms TTL=126
Reply from 10.127.3.2: bytes=32 time=32ms TTL=126

Ping statistics for 10.127.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 32ms, Average = 15ms
```

Figure 32: Screenshot from PC6

PC 6

Physical Config Desktop Programming Attributes

Command Prompt X

```
C:\>ping 10.127.2.2

Pinging 10.127.2.2 with 32 bytes of data:

Reply from 10.127.2.2: bytes=32 time=17ms TTL=126
Reply from 10.127.2.2: bytes=32 time=1ms TTL=126
Reply from 10.127.2.2: bytes=32 time=22ms TTL=126
Reply from 10.127.2.2: bytes=32 time=31ms TTL=126

Ping statistics for 10.127.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 31ms, Average = 17ms

C:\>ping 10.127.2.3

Pinging 10.127.2.3 with 32 bytes of data:

Reply from 10.127.2.3: bytes=32 time=16ms TTL=126
Reply from 10.127.2.3: bytes=32 time=47ms TTL=126
Reply from 10.127.2.3: bytes=32 time=25ms TTL=126
Reply from 10.127.2.3: bytes=32 time=2ms TTL=126

Ping statistics for 10.127.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 47ms, Average = 22ms

C:\>ping 10.127.1.3

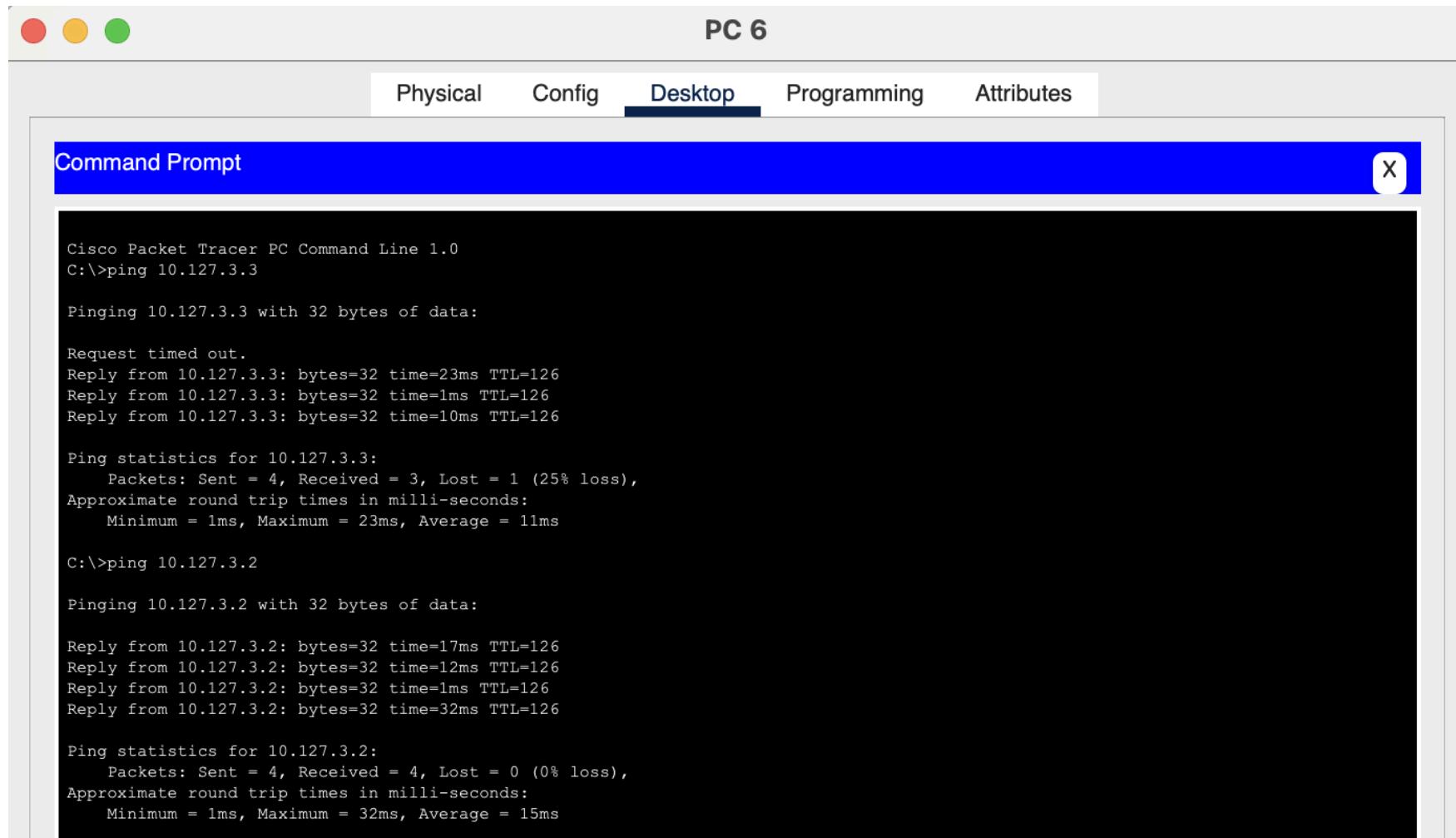
Pinging 10.127.1.3 with 32 bytes of data:

Reply from 10.127.1.3: bytes=32 time=44ms TTL=126
Reply from 10.127.1.3: bytes=32 time=29ms TTL=126
Reply from 10.127.1.3: bytes=32 time=31ms TTL=126
Reply from 10.127.1.3: bytes=32 time=18ms TTL=126

Ping statistics for 10.127.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 44ms, Average = 30ms
```

Figure 33: Screenshot from PC6

c)Pinging other computers from 10.127.2.3 Ip address.



The screenshot shows a window titled "PC 6" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is selected. A blue header bar says "Command Prompt" and has an "X" button. The main area displays the output of a ping command:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.127.3.3

Pinging 10.127.3.3 with 32 bytes of data:

Request timed out.
Reply from 10.127.3.3: bytes=32 time=23ms TTL=126
Reply from 10.127.3.3: bytes=32 time=1ms TTL=126
Reply from 10.127.3.3: bytes=32 time=10ms TTL=126

Ping statistics for 10.127.3.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 23ms, Average = 11ms

C:\>ping 10.127.3.2

Pinging 10.127.3.2 with 32 bytes of data:

Reply from 10.127.3.2: bytes=32 time=17ms TTL=126
Reply from 10.127.3.2: bytes=32 time=12ms TTL=126
Reply from 10.127.3.2: bytes=32 time=1ms TTL=126
Reply from 10.127.3.2: bytes=32 time=32ms TTL=126

Ping statistics for 10.127.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 32ms, Average = 15ms
```

Figure 34: Screenshot from PC5

The screenshot shows a software application window titled "PC 6". At the top, there are three colored circles (red, yellow, green) and a menu bar with tabs: Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is currently selected. Below the menu is a blue header bar with the text "Command Prompt" and a close button ("X"). The main area contains a black terminal window displaying the results of several ping commands. The output includes the command entered, the target IP address, the number of bytes sent, the time taken for each reply, the Time-to-Live (TTL), and statistics for the round trip times.

```
Minimum = 1ms, Maximum = 32ms, Average = 15ms
C:\>ping 10.127.2.2

Pinging 10.127.2.2 with 32 bytes of data:

Reply from 10.127.2.2: bytes=32 time=17ms TTL=126
Reply from 10.127.2.2: bytes=32 time=1ms TTL=126
Reply from 10.127.2.2: bytes=32 time=22ms TTL=126
Reply from 10.127.2.2: bytes=32 time=31ms TTL=126

Ping statistics for 10.127.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 31ms, Average = 17ms

C:\>ping 10.127.2.3

Pinging 10.127.2.3 with 32 bytes of data:

Reply from 10.127.2.3: bytes=32 time=16ms TTL=126
Reply from 10.127.2.3: bytes=32 time=47ms TTL=126
Reply from 10.127.2.3: bytes=32 time=25ms TTL=126
Reply from 10.127.2.3: bytes=32 time=2ms TTL=126

Ping statistics for 10.127.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 47ms, Average = 22ms

C:\>ping 10.127.1.3

Pinging 10.127.1.3 with 32 bytes of data:

Reply from 10.127.1.3: bytes=32 time=44ms TTL=126
Reply from 10.127.1.3: bytes=32 time=29ms TTL=126
Reply from 10.127.1.3: bytes=32 time=31ms TTL=126
Reply from 10.127.1.3: bytes=32 time=18ms TTL=126

Ping statistics for 10.127.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 44ms, Average = 30ms
```

Figure 35: Screenshot from PC5

**d)Pinging other computers from 10.127.1.3 Ip address.**

The screenshot shows a window titled "PC 0" with tabs for Physical, Config, Desktop (selected), Programming, and Attributes. A "Command Prompt" window is open, displaying the output of several ping commands. The output is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.127.3.3

Pinging 10.127.3.3 with 32 bytes of data:

Reply from 10.127.3.3: bytes=32 time=11ms TTL=126
Reply from 10.127.3.3: bytes=32 time=26ms TTL=126
Reply from 10.127.3.3: bytes=32 time=1ms TTL=126
Reply from 10.127.3.3: bytes=32 time=9ms TTL=126

Ping statistics for 10.127.3.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 26ms, Average = 11ms

C:\>ping 10.127.3.2

Pinging 10.127.3.2 with 32 bytes of data:

Reply from 10.127.3.2: bytes=32 time=20ms TTL=126
Reply from 10.127.3.2: bytes=32 time=1ms TTL=126
Reply from 10.127.3.2: bytes=32 time=40ms TTL=126
Reply from 10.127.3.2: bytes=32 time=2ms TTL=126

Ping statistics for 10.127.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 40ms, Average = 15ms

C:\>ping 10.127.2.2

Pinging 10.127.2.2 with 32 bytes of data:

Reply from 10.127.2.2: bytes=32 time=20ms TTL=126
Reply from 10.127.2.2: bytes=32 time=26ms TTL=126
Reply from 10.127.2.2: bytes=32 time=33ms TTL=126
Reply from 10.127.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 10.127.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 33ms, Average = 20ms

C:\>ping 10.127.2.3

Pinging 10.127.2.3 with 32 bytes of data:

Reply from 10.127.2.3: bytes=32 time=20ms TTL=126
Reply from 10.127.2.3: bytes=32 time=31ms TTL=126
Reply from 10.127.2.3: bytes=32 time=20ms TTL=126
Reply from 10.127.2.3: bytes=32 time=1ms TTL=126
```

Figure 36: Screenshot from PC0

```
C:\>ping 10.127.2.3

Pinging 10.127.2.3 with 32 bytes of data:

Reply from 10.127.2.3: bytes=32 time=20ms TTL=126
Reply from 10.127.2.3: bytes=32 time=31ms TTL=126
Reply from 10.127.2.3: bytes=32 time=20ms TTL=126
Reply from 10.127.2.3: bytes=32 time=1ms TTL=126

Ping statistics for 10.127.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 31ms, Average = 18ms

C:\>ping 10.127.4.3

Pinging 10.127.4.3 with 32 bytes of data:

Reply from 10.127.4.3: bytes=32 time=26ms TTL=126
Reply from 10.127.4.3: bytes=32 time=33ms TTL=126
Reply from 10.127.4.3: bytes=32 time=35ms TTL=126
Reply from 10.127.4.3: bytes=32 time=15ms TTL=126

Ping statistics for 10.127.4.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 15ms, Maximum = 35ms, Average = 27ms

C:\>ping 10.127.4.2

Pinging 10.127.4.2 with 32 bytes of data:

Reply from 10.127.4.2: bytes=32 time=18ms TTL=126
Reply from 10.127.4.2: bytes=32 time=35ms TTL=126
Reply from 10.127.4.2: bytes=32 time=3ms TTL=126
Reply from 10.127.4.2: bytes=32 time=1ms TTL=126

Ping statistics for 10.127.4.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 35ms, Average = 14ms

C:\>
```

Figure 37: Screenshot from PC0

## 4- Routers IP Routing Table

### a) Router 1

Router#show ip route  
Codes: C - connected, S - static, I - IGRP, 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  
  
10.0.0.0/24 is subnetted, 7 subnets  
C 10.127.1.0 is directly connected, FastEthernet0/0  
S 10.127.2.0 [1/0] via 10.207.1.2  
S 10.127.3.0 [1/0] via 10.207.2.2  
S 10.127.4.0 [1/0] via 10.207.3.2  
C 10.207.1.0 is directly connected, Serial0/0/1  
C 10.207.2.0 is directly connected, Serial0/0/0  
C 10.207.3.0 is directly connected, Serial0/0/0

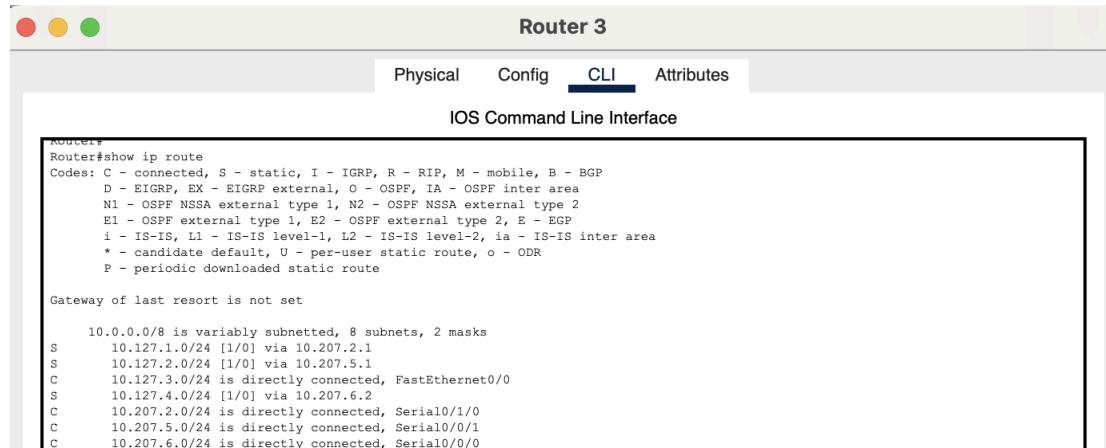
Figure 38: Screenshot from Router 1

### b) Router 2

Router#show ip route  
Codes: C - connected, S - static, I - IGRP, 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  
  
10.0.0.0/24 is subnetted, 7 subnets  
S 10.127.1.0 [1/0] via 10.207.1.1  
C 10.127.2.0 is directly connected, FastEthernet0/0  
S 10.127.3.0 [1/0] via 10.207.5.2  
S 10.127.4.0 [1/0] via 10.207.4.2  
C 10.207.1.0 is directly connected, Serial0/1/0  
C 10.207.4.0 is directly connected, Serial0/0/0  
C 10.207.5.0 is directly connected, Serial0/0/1

Figure 39: Screenshot from Router 2

### c) Router 3



The screenshot shows the Router 3 interface with the 'CLI' tab selected. The title bar says 'Router 3'. Below it is a menu bar with 'Physical', 'Config', 'CLI' (which is highlighted in blue), and 'Attributes'. The main area is titled 'IOS Command Line Interface' and contains the output of the 'show ip route' command. The output shows a single route entry for 10.0.0.0/8:

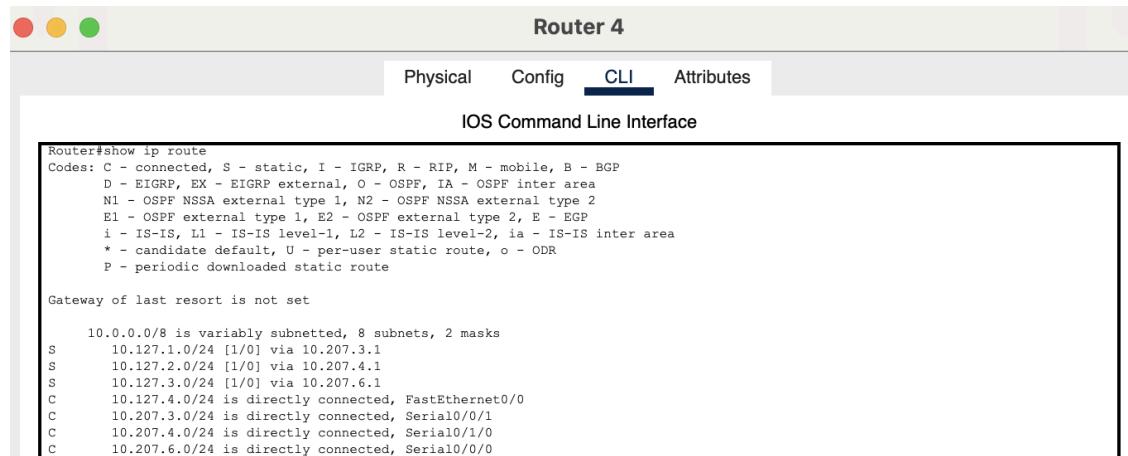
```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
      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, 8 subnets, 2 masks
S   10.127.1.0/24 [1/0] via 10.207.2.1
S   10.127.2.0/24 [1/0] via 10.207.5.1
C   10.127.3.0/24 is directly connected, FastEthernet0/0
S   10.127.4.0/24 [1/0] via 10.207.6.2
C   10.207.2.0/24 is directly connected, Serial0/1/0
C   10.207.5.0/24 is directly connected, Serial0/0/1
C   10.207.6.0/24 is directly connected, Serial0/0/0
```

Figure 40: Screenshot from Router 3

### d) Router 4



The screenshot shows the Router 4 interface with the 'CLI' tab selected. The title bar says 'Router 4'. Below it is a menu bar with 'Physical', 'Config', 'CLI' (which is highlighted in blue), and 'Attributes'. The main area is titled 'IOS Command Line Interface' and contains the output of the 'show ip route' command. The output shows a single route entry for 10.0.0.0/8:

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

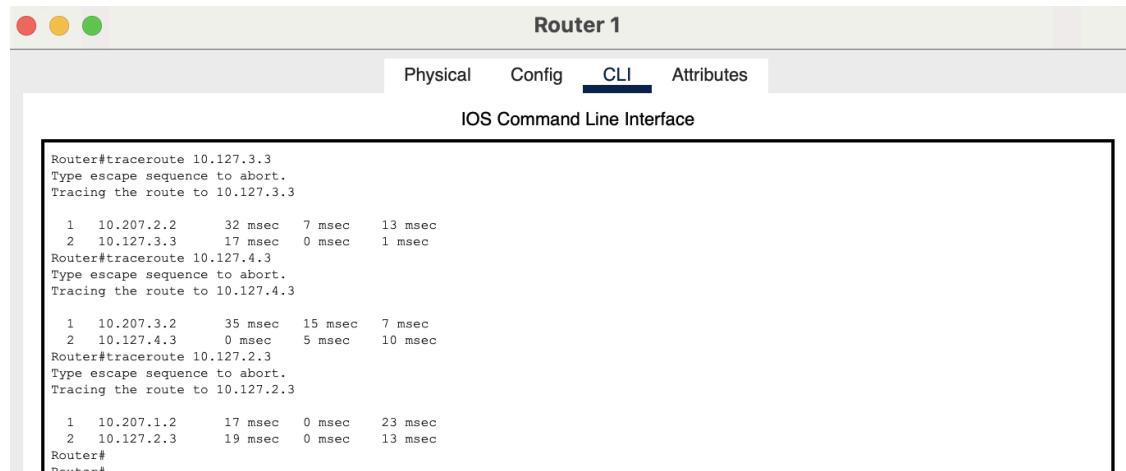
Gateway of last resort is not set

  10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
S   10.127.1.0/24 [1/0] via 10.207.3.1
S   10.127.2.0/24 [1/0] via 10.207.4.1
S   10.127.3.0/24 [1/0] via 10.207.6.1
C   10.127.4.0/24 is directly connected, FastEthernet0/0
C   10.207.3.0/24 is directly connected, Serial0/0/1
C   10.207.4.0/24 is directly connected, Serial0/1/0
C   10.207.6.0/24 is directly connected, Serial0/0/0
```

Figure 41: Screenshot from Router 4

## 5- TraceRoute

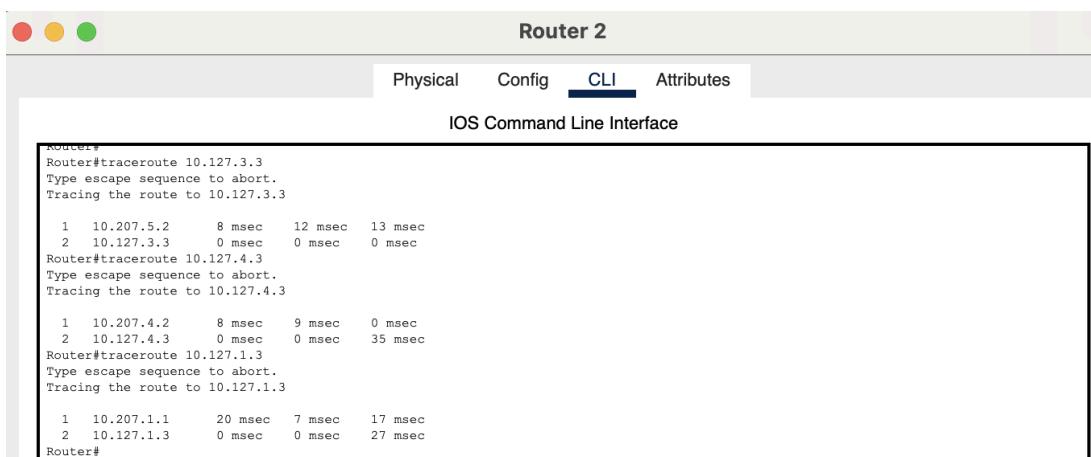
### a) Router 1



Router#traceroute 10.127.3.3  
Type escape sequence to abort.  
Tracing the route to 10.127.3.3  
  
1 10.207.2.2 32 msec 7 msec 13 msec  
2 10.127.3.3 17 msec 0 msec 1 msec  
Router#traceroute 10.127.4.3  
Type escape sequence to abort.  
Tracing the route to 10.127.4.3  
  
1 10.207.3.2 35 msec 15 msec 7 msec  
2 10.127.4.3 0 msec 5 msec 10 msec  
Router#traceroute 10.127.2.3  
Type escape sequence to abort.  
Tracing the route to 10.127.2.3  
  
1 10.207.1.2 17 msec 0 msec 23 msec  
2 10.127.2.3 19 msec 0 msec 13 msec  
Router#  
Router#

Figure 42: Screenshot from Router 1

### b) Router 2



Router#  
Router#traceroute 10.127.3.3  
Type escape sequence to abort.  
Tracing the route to 10.127.3.3  
  
1 10.207.5.2 8 msec 12 msec 13 msec  
2 10.127.3.3 0 msec 0 msec 0 msec  
Router#traceroute 10.127.4.3  
Type escape sequence to abort.  
Tracing the route to 10.127.4.3  
  
1 10.207.4.2 8 msec 9 msec 0 msec  
2 10.127.4.3 0 msec 0 msec 35 msec  
Router#traceroute 10.127.1.3  
Type escape sequence to abort.  
Tracing the route to 10.127.1.3  
  
1 10.207.1.1 20 msec 7 msec 17 msec  
2 10.127.1.3 0 msec 0 msec 27 msec  
Router#  
Router#

Figure 43: Screenshot from Router 2

### c) Router 3

The screenshot shows a window titled "Router 3" with a tab bar at the top: Physical, Config, **CLI**, and Attributes. The main area is labeled "IOS Command Line Interface". It displays the output of several traceroute commands:

```
Router#traceroute 10.127.1.3
Type escape sequence to abort.
Tracing the route to 10.127.1.3

 1  10.207.2.1      31 msec   11 msec   8 msec
 2  10.127.1.3      0 msec    0 msec   29 msec

Router#traceroute 10.127.2.3
Type escape sequence to abort.
Tracing the route to 10.127.2.3

 1  10.207.5.1      43 msec    7 msec   16 msec
 2  10.127.2.3      23 msec   12 msec    0 msec

Router#traceroute 10.127.4.3
Type escape sequence to abort.
Tracing the route to 10.127.4.3

 1  10.207.6.2      8 msec    6 msec   9 msec
 2  10.127.4.3      12 msec   17 msec   10 msec
```

Figure 44: Screenshot from Router 3

### d) Router 4

The screenshot shows a window titled "Router 4" with a tab bar at the top: Physical, Config, **CLI**, and Attributes. The main area is labeled "IOS Command Line Interface". It displays the output of several traceroute commands:

```
Router#traceroute 10.127.1.3
Type escape sequence to abort.
Tracing the route to 10.127.1.3

 1  10.207.3.1      21 msec   12 msec   18 msec
 2  10.127.1.3      0 msec    25 msec   18 msec

Router#traceroute 10.127.2.3
Type escape sequence to abort.
Tracing the route to 10.127.2.3

 1  10.207.4.1      1 msec    11 msec   21 msec
 2  10.127.2.3      17 msec   4 msec    17 msec

Router#traceroute 10.127.3.3
Type escape sequence to abort.
Tracing the route to 10.127.3.3

 1  10.207.6.1      7 msec    7 msec   28 msec
 2  10.127.3.3      12 msec   0 msec   20 msec
```

Figure 45: Screenshot from Router 4