

NETWORK AND NETWORKING DEVICES WORKSHOP(ITITC19)



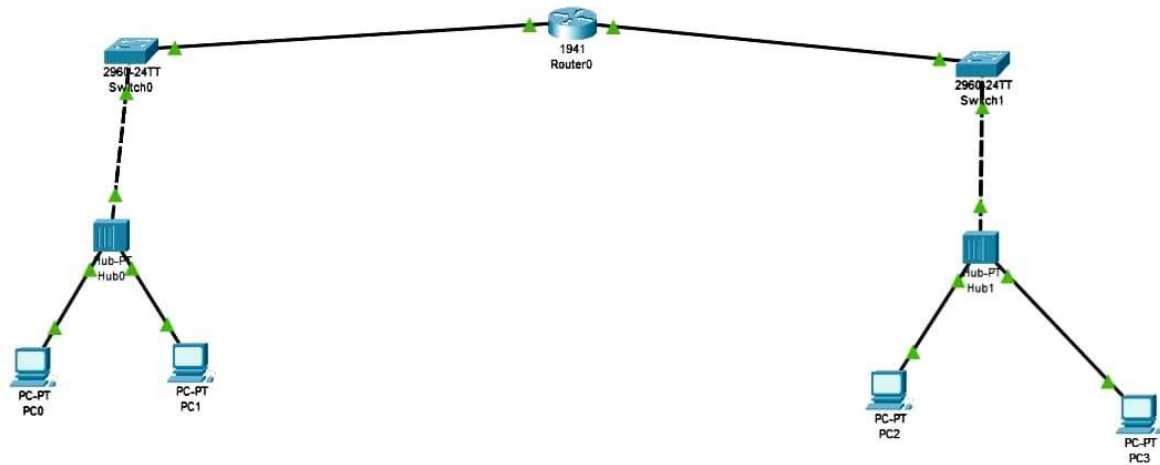
NAME: VAIBHAV AGGARWAL







CLASS: IT SEC-1

ROLL NO: 2021UIT3043

1) Establish a straight LAN configuration using:

- Hub
- Switch
- Router



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC2	PC3	ICMP		0.000	N	1	(edit)	(delete)
	Successful	PC1	PC2	ICMP		0.000	N	2	(edit)	(delete)

PC3

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static This address is already used in the network.

IPv4 Address: 192.168.5.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.5.3

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::290:21FF:FE5E:E2DE

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.5.2

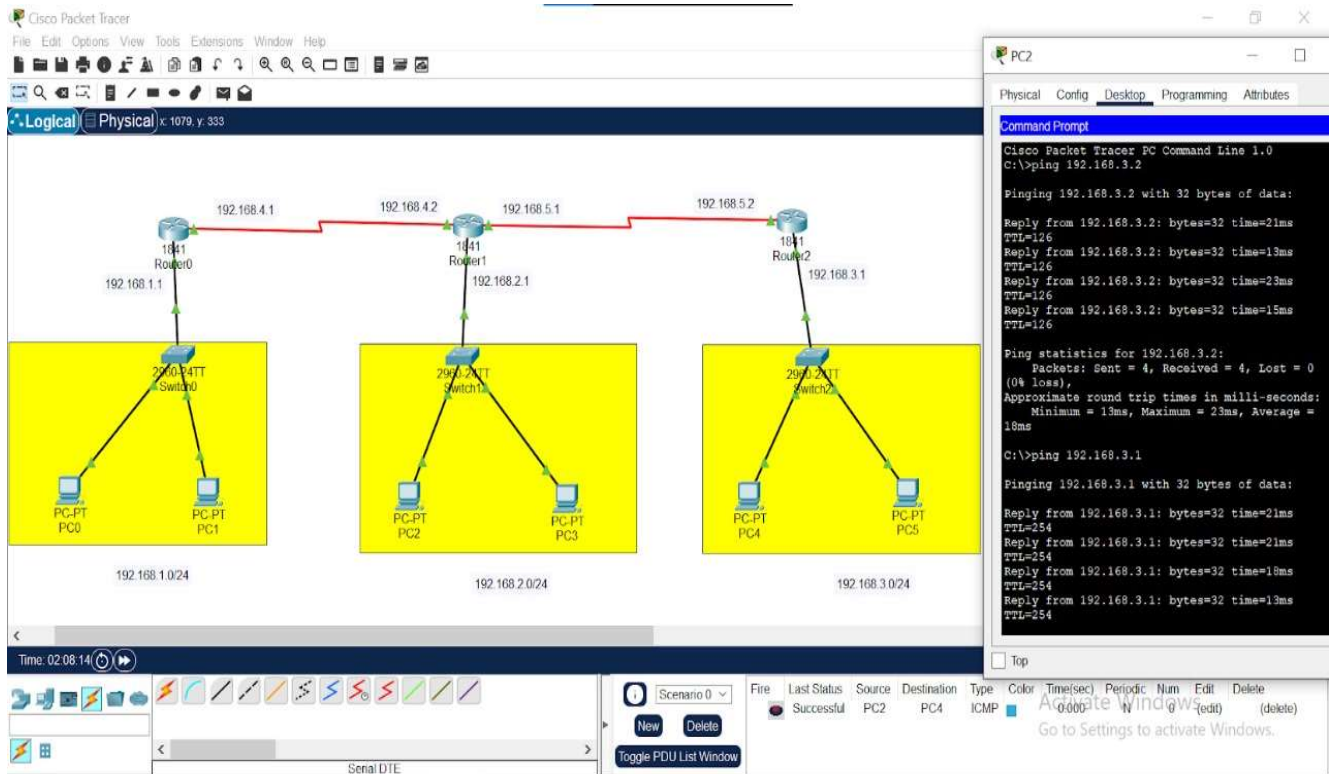
Pinging 192.168.5.2 with 32 bytes of data:

Reply from 192.168.5.2: bytes=32 time<1ms TTL=127
Reply from 192.168.5.2: bytes=32 time<1ms TTL=127
Reply from 192.168.5.2: bytes=32 time<1ms TTL=127
Reply from 192.168.5.2: bytes=32 time<1ms TTL=127

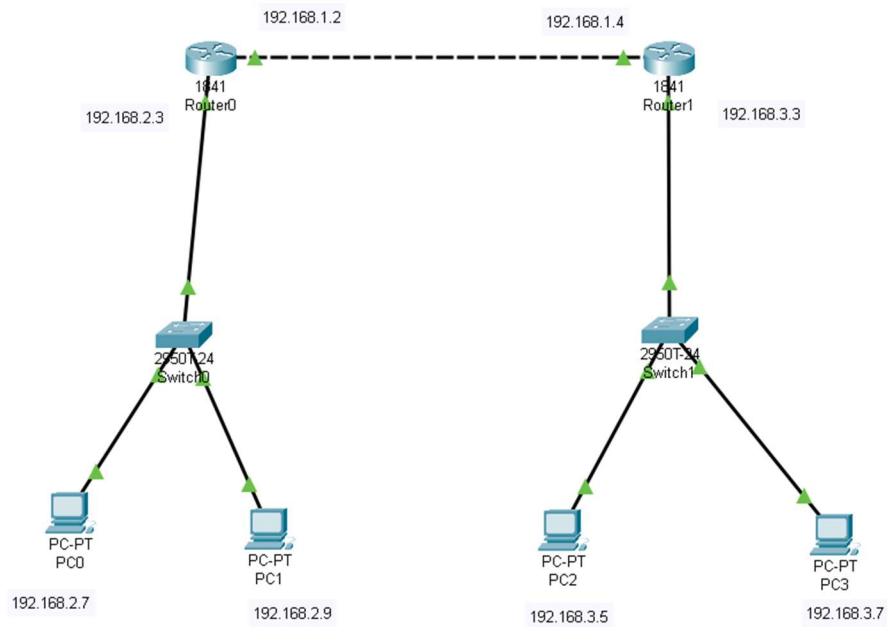
Ping statistics for 192.168.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

2) Document a basic network using 3 routers in a LAN configuration



3)STATIC ROUTING PROTOCOL



Step 1).Configure IP address and subnet mask and default gateway for all PC's

PC0

Physical Config Desktop Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.2.7

Subnet Mask 255.255.255.0

Default Gateway 192.168.2.3

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::206:2AFF:FE53:BDB1

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

Step2).Configure routers with IP adress and subnet mask

Router0

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- FastEthernet0/0
- FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.175A.1501

IP Configuration

IPv4 Address 192.168.1.2

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Router0

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- FastEthernet0/0
- FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.175A.1502

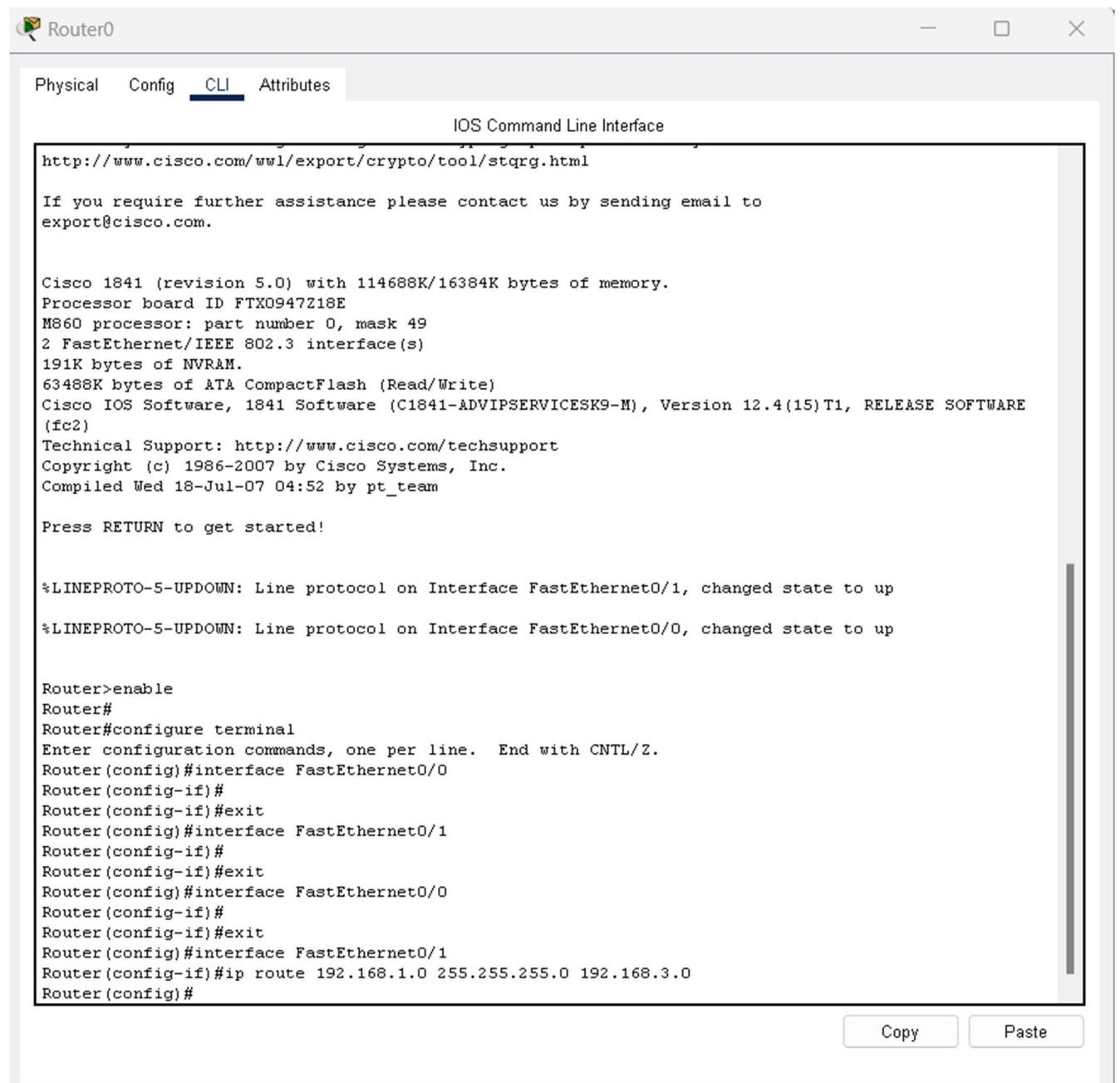
IP Configuration

IPv4 Address 192.168.2.3

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Step3). Assign the routes to the routers.



The screenshot shows a web browser window titled "Router0" with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the "IOS Command Line Interface". The text in the terminal window includes a URL, contact information, hardware details (Cisco 1841, 114688K/16384K memory, M860 processor), software version (12.4(15)T1), and a list of configuration commands. The commands configure interfaces FastEthernet0/0 and FastEthernet0/1, and set a static route. At the bottom right, there are "Copy" and "Paste" buttons.

```
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

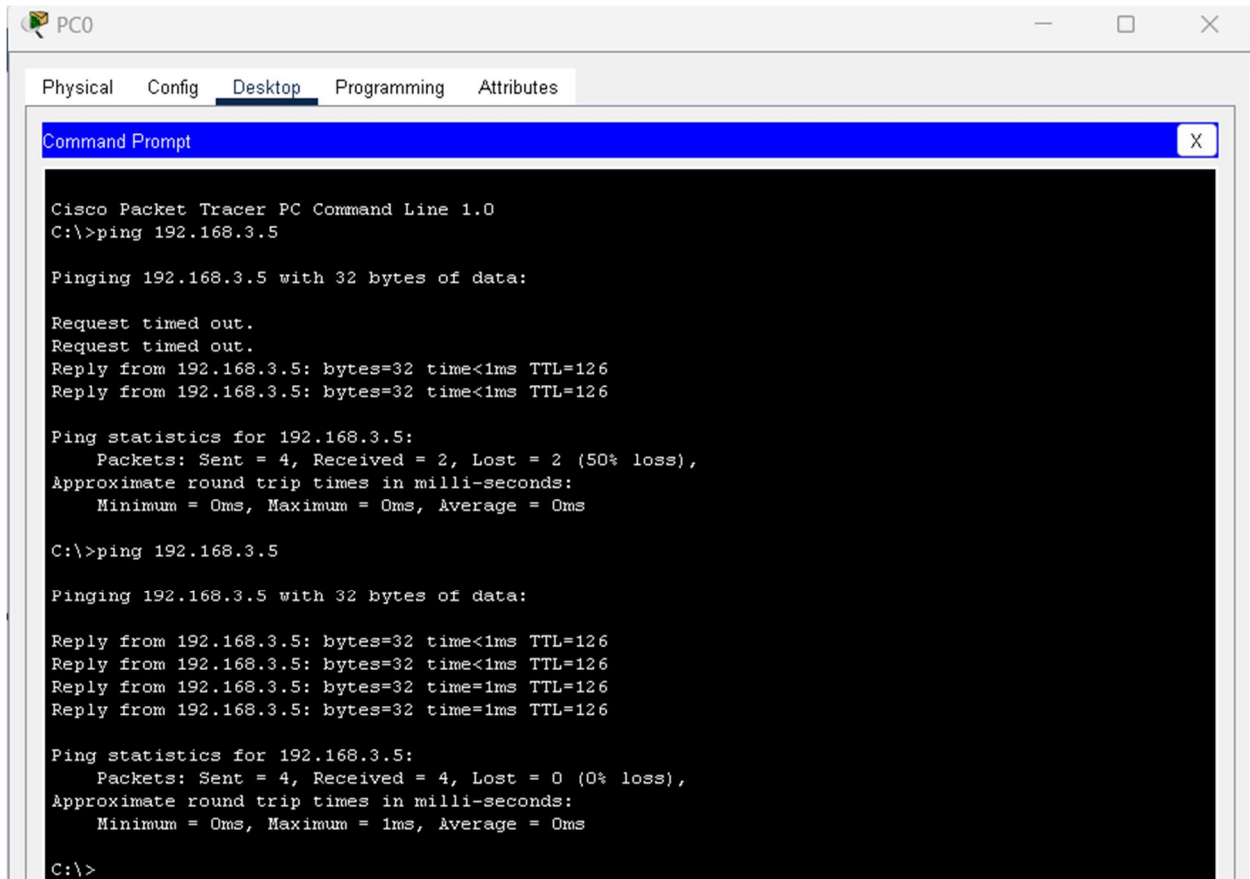
Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.
Processor board ID FTX0947218E
M860 processor: part number 0, mask 49
2 FastEthernet/IEEE 802.3 interface(s)
191K bytes of NVRAM.
63488K bytes of ATA CompactFlash (Read/Write)
Cisco IOS Software, 1841 Software (C1841-ADVIPSERVICESK9-M), Version 12.4(15)T1, RELEASE SOFTWARE
(fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip route 192.168.1.0 255.255.255.0 192.168.3.0
Router(config)#
```

Step 4). TEST Ping in different network



```
PC0
Physical  Config  Desktop  Programming  Attributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.5

Pinging 192.168.3.5 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.3.5:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.3.5

Pinging 192.168.3.5 with 32 bytes of data:

Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time=1ms TTL=126
Reply from 192.168.3.5: bytes=32 time=1ms TTL=126

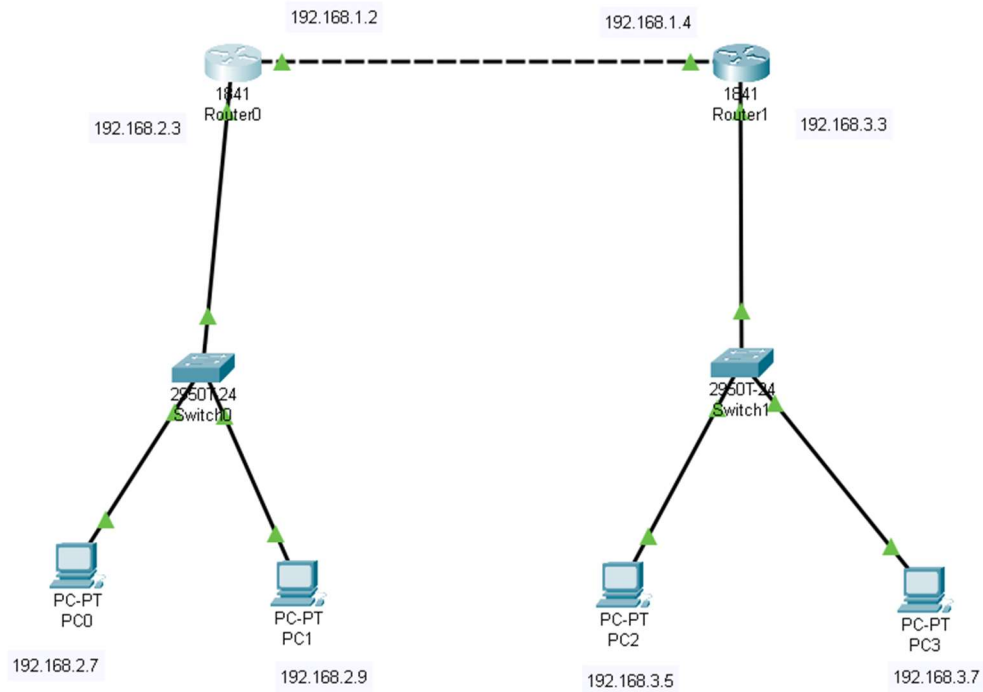
Ping statistics for 192.168.3.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```


4) DYNAMIC ROUTING PROTOCOL USING (RIP)



x: 342, y: 73

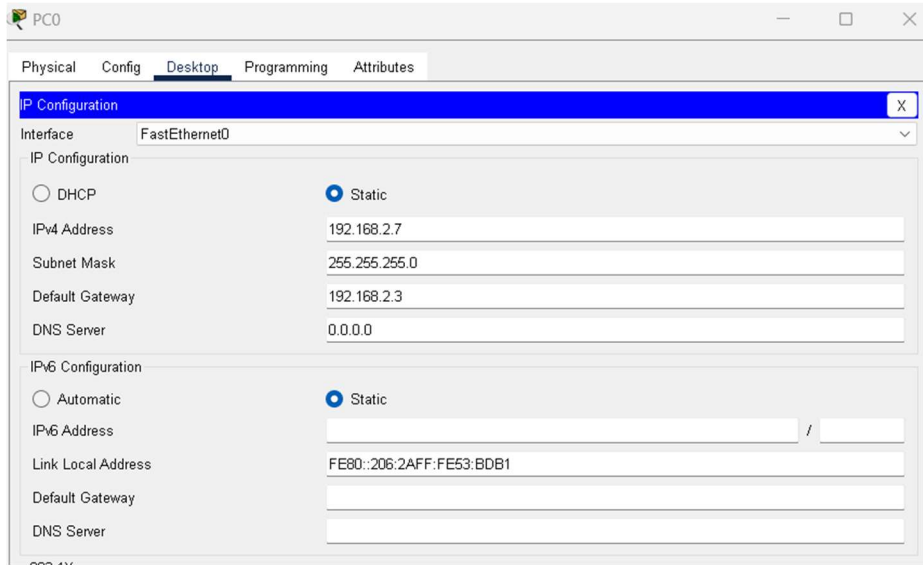


Scenario 0

New Delete

Fire	Last Status	Source	De
	Successful	PC0	
	Successful	PC2	
	Failed	PC0	

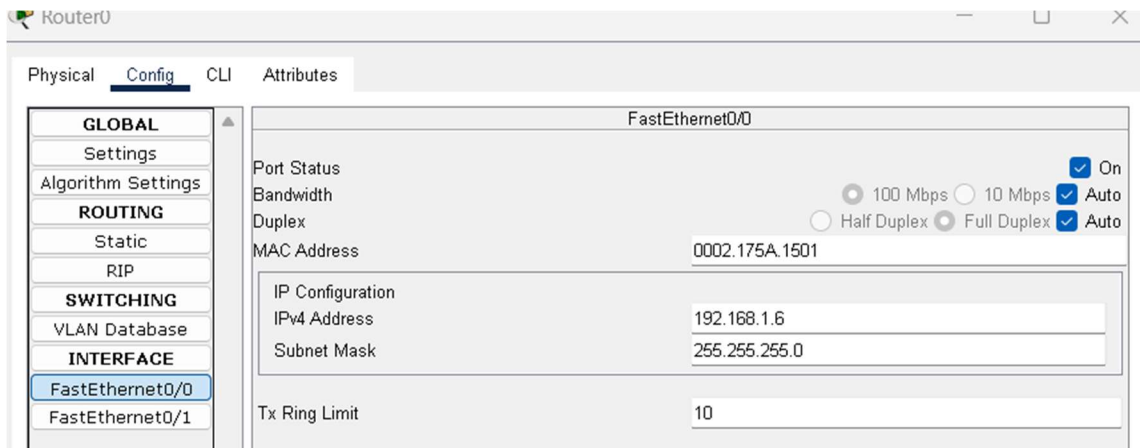
1. Configure IP address and subnet mask and default gateway for all PC's



The screenshot shows the configuration window for PC0. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Static' radio button is chosen. The IPv4 Address is set to 192.168.2.7, Subnet Mask to 255.255.255.0, and Default Gateway to 192.168.2.3. The DNS Server is set to 0.0.0.0. Under 'IPv6 Configuration', the 'Static' radio button is also chosen, with a Link Local Address of FE80::206:2AFF:FE53:B0B1.

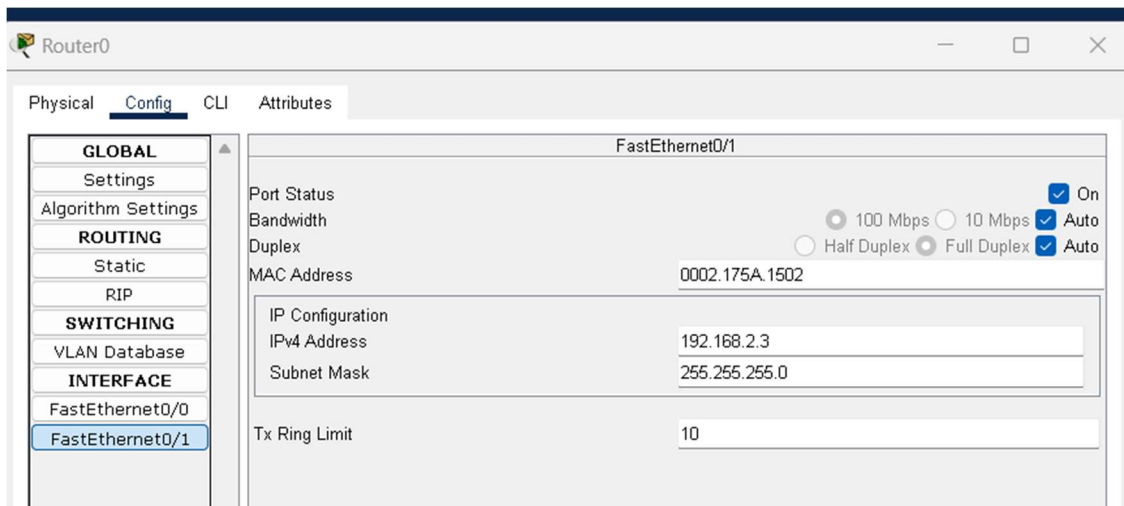
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.2.7
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.3
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::206:2AFF:FE53:B0B1
Default Gateway	
DNS Server	

2. Configure routers with IP address and subnet mask



The screenshot shows the configuration window for Router0, specifically for the FastEthernet0/0 interface. The 'Config' tab is selected. The 'Static' radio button is chosen for IP Configuration. The IPv4 Address is set to 192.168.1.6 and the Subnet Mask to 255.255.255.0. The MAC Address is 0002.175A.1501. The Tx Ring Limit is set to 10. The Port Status is 'On', Bandwidth is '100 Mbps', Duplex is 'Full Duplex', and both are set to 'Auto'.

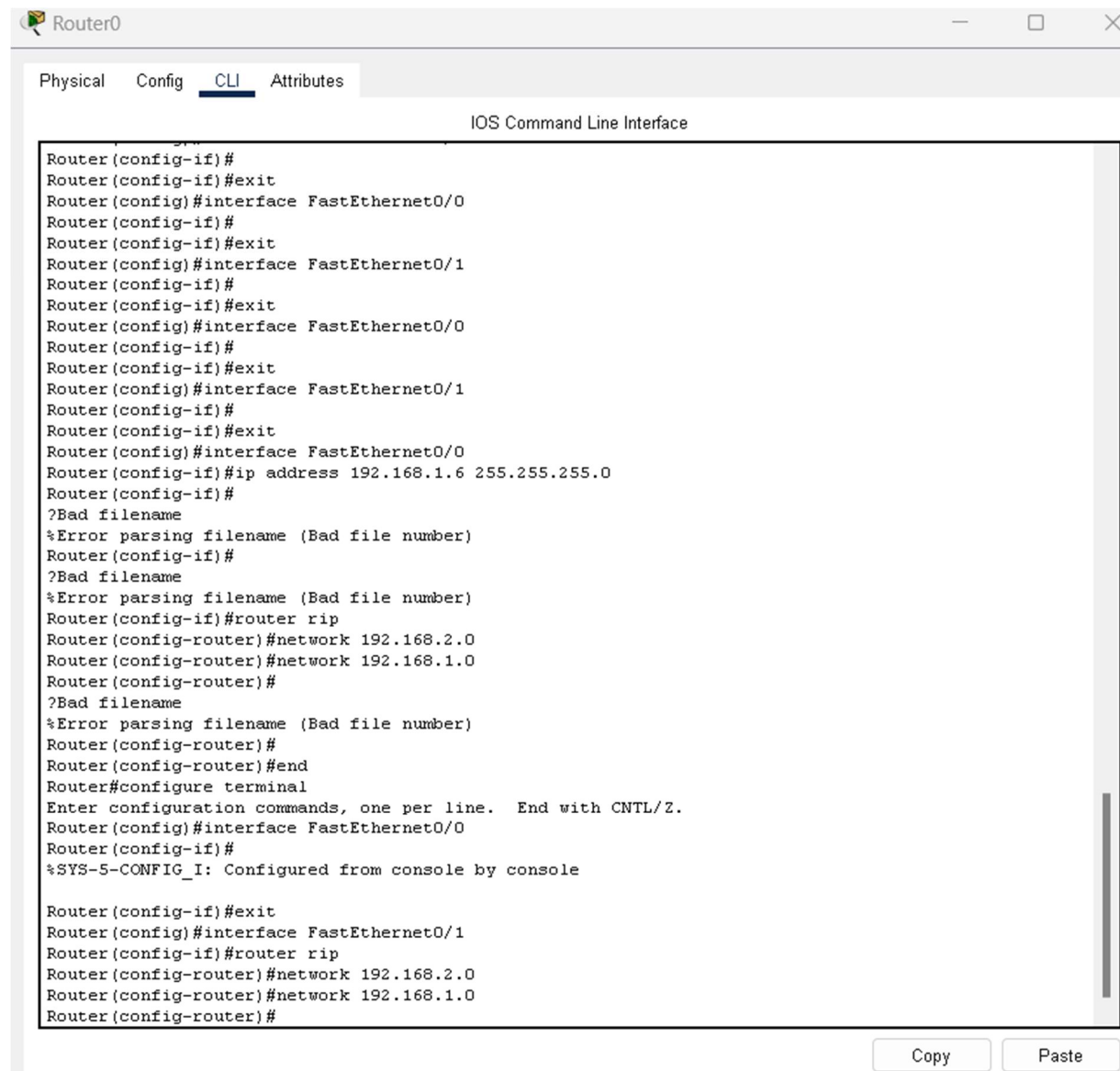
FastEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0002.175A.1501
IP Configuration	
IPv4 Address	192.168.1.6
Subnet Mask	255.255.255.0
Tx Ring Limit	10



The screenshot shows the configuration window for Router0, specifically for the FastEthernet0/1 interface. The 'Config' tab is selected. The 'Static' radio button is chosen for IP Configuration. The IPv4 Address is set to 192.168.2.3 and the Subnet Mask to 255.255.255.0. The MAC Address is 0002.175A.1502. The Tx Ring Limit is set to 10. The Port Status is 'On', Bandwidth is '100 Mbps', Duplex is 'Full Duplex', and both are set to 'Auto'.

FastEthernet0/1	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0002.175A.1502
IP Configuration	
IPv4 Address	192.168.2.3
Subnet Mask	255.255.255.0
Tx Ring Limit	10

3. Configure RIP routing algorithm for routers



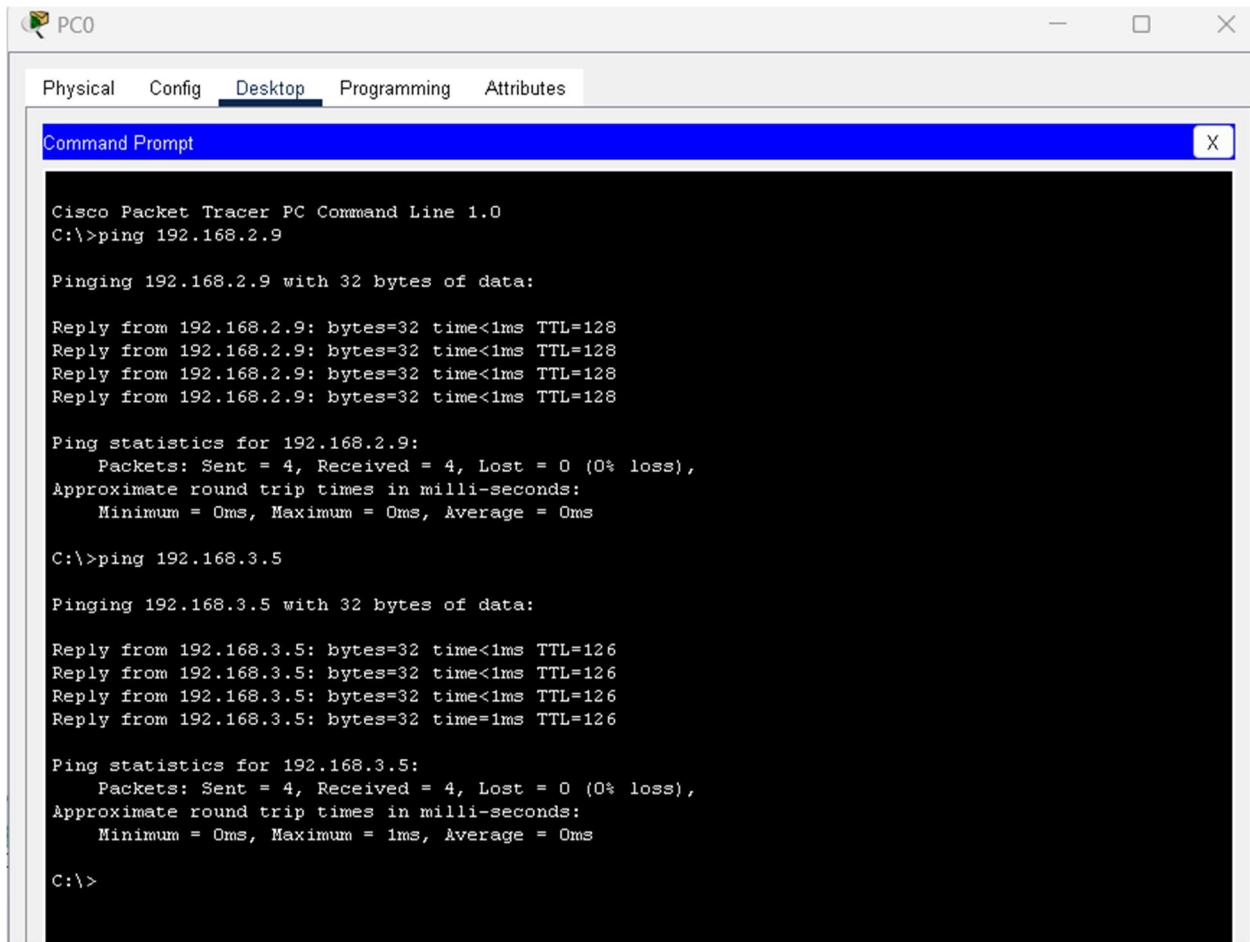
The screenshot shows a web-based interface for a router named Router0. The 'CLI' tab is selected, displaying the IOS Command Line Interface. The configuration process is as follows:

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.6 255.255.255.0
Router(config-if)#
?Bad filename
%Error parsing filename (Bad file number)
Router(config-if)#
?Bad filename
%Error parsing filename (Bad file number)
Router(config-if)#router rip
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.1.0
Router(config-router)#
?Bad filename
%Error parsing filename (Bad file number)
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
%SYS-5-CONFIG_I: Configured from console by console

Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#router rip
Router(config-router)#network 192.168.2.0
Router(config-router)#network 192.168.1.0
Router(config-router)#
```

At the bottom right of the CLI window, there are 'Copy' and 'Paste' buttons.

4. TEST (1)Ping in same network (2)Ping in different network



The screenshot shows a Cisco Packet Tracer PC Command Prompt window. The window has a title bar with 'PC0' and standard minimize, maximize, and close buttons. Below the title bar are tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes', with 'Desktop' currently selected. The Command Prompt window itself has a blue title bar with 'Command Prompt' and a close button. The text inside the Command Prompt is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.9

Pinging 192.168.2.9 with 32 bytes of data:

Reply from 192.168.2.9: bytes=32 time<1ms TTL=128
Reply from 192.168.2.9: bytes=32 time<1ms TTL=128
Reply from 192.168.2.9: bytes=32 time<1ms TTL=128
Reply from 192.168.2.9: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.9:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.3.5

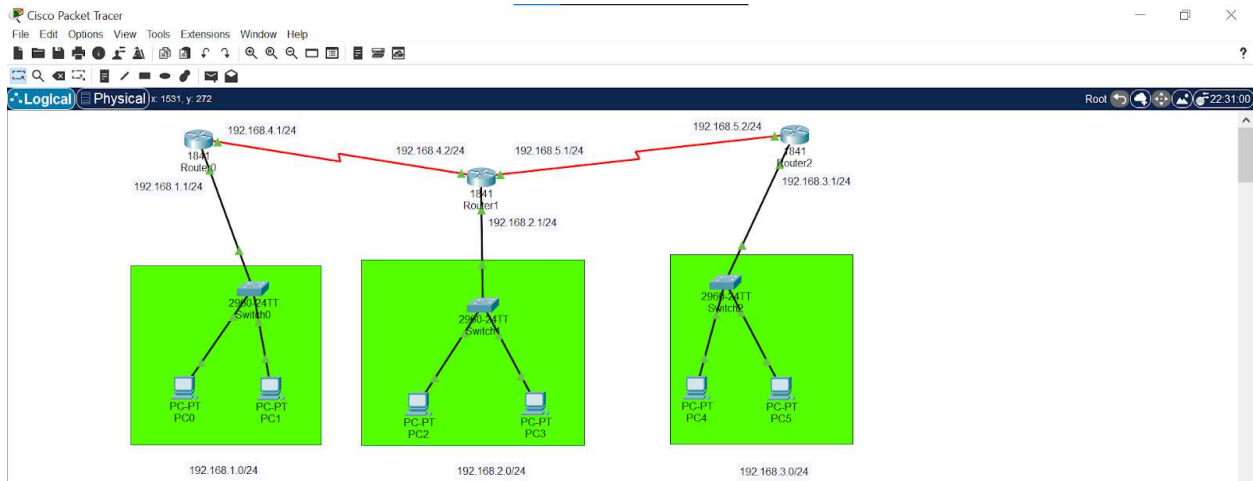
Pinging 192.168.3.5 with 32 bytes of data:

Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time<1ms TTL=126
Reply from 192.168.3.5: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.3.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

5) Explore the working of netstat ping and traceout command.



1. Ping Command

The ping command is a very common method used to troubleshoot accessibility of devices. It uses a series of Internet Control Message Protocol (ICMP) Echo messages to determine:

- Whether a remote host is active or inactive.
- The round-trip delay used to communicate with the host.
- Packet loss.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.2: bytes=32 time=7ms TTL=125
Reply from 192.168.3.2: bytes=32 time=2ms TTL=125
Reply from 192.168.3.2: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 7ms, Average = 3ms

C:\>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.3: bytes=32 time=14ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126
Reply from 192.168.2.3: bytes=32 time=10ms TTL=126

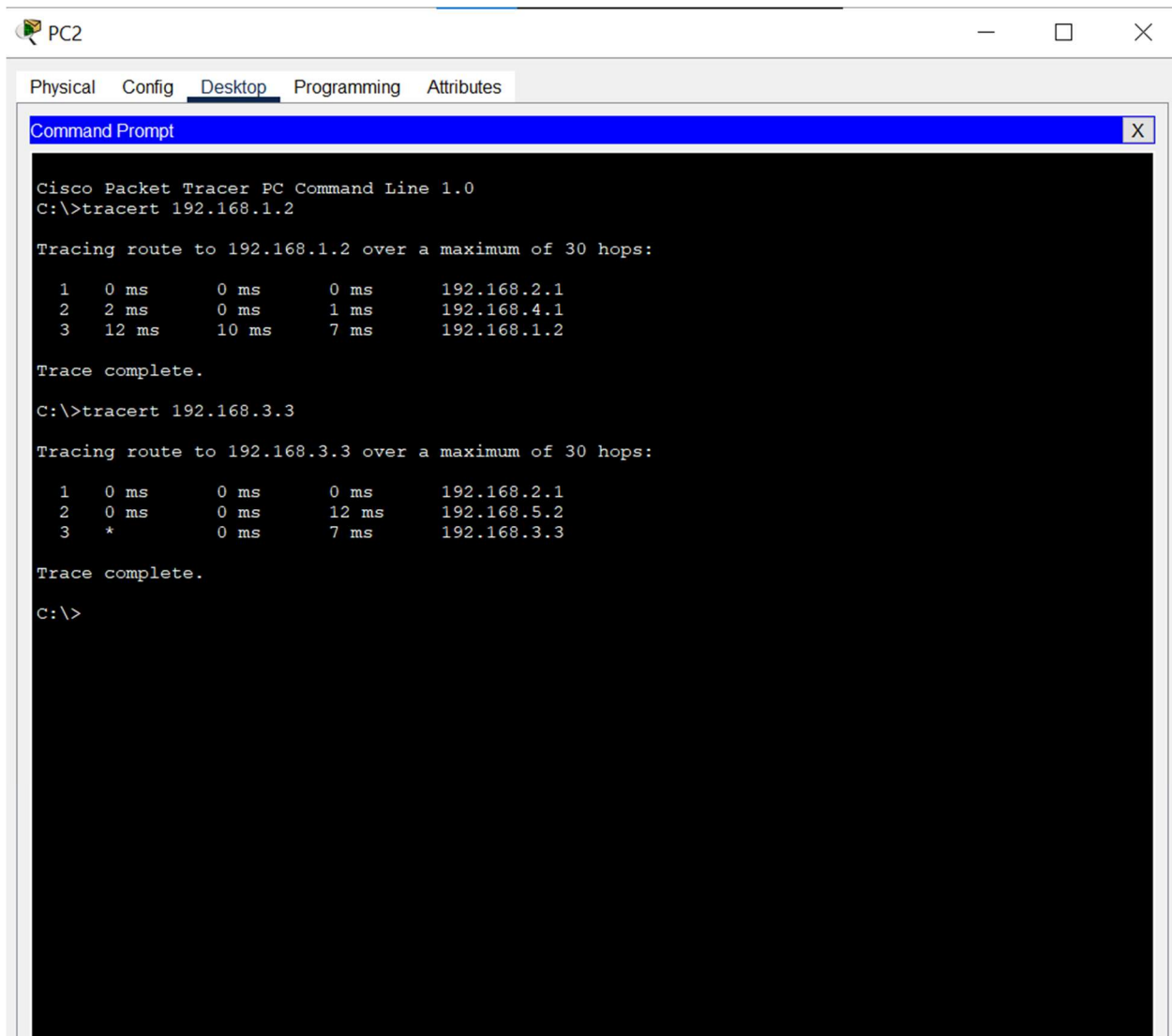
Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 8ms

C:\>|
```

2.Trace route:

'Tracert' command in Cisco.

The traceroute command is used to discover the routes that packets actually take when they travel to their destination.



The screenshot shows a Cisco Packet Tracer PC Command Prompt window for PC2. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, and the Command Prompt window is open. The prompt shows the execution of the 'tracert' command to reach 192.168.1.2 and 192.168.3.3, displaying hop-by-hop IP addresses and round-trip times.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.1.2

Tracing route to 192.168.1.2 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.2.1
  2  2 ms    0 ms    1 ms    192.168.4.1
  3 12 ms   10 ms    7 ms    192.168.1.2

Trace complete.

C:\>tracert 192.168.3.3

Tracing route to 192.168.3.3 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.2.1
  2  0 ms    0 ms   12 ms   192.168.5.2
  3  *        0 ms    7 ms    192.168.3.3

Trace complete.

C:\>
```