CSE307

Internet Networking Essentials

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Roll Number: 49

Section: K23UP

GitHub Repository:

https://github.com/ayubeh1513/Internet-Networking-CA-1

Overview

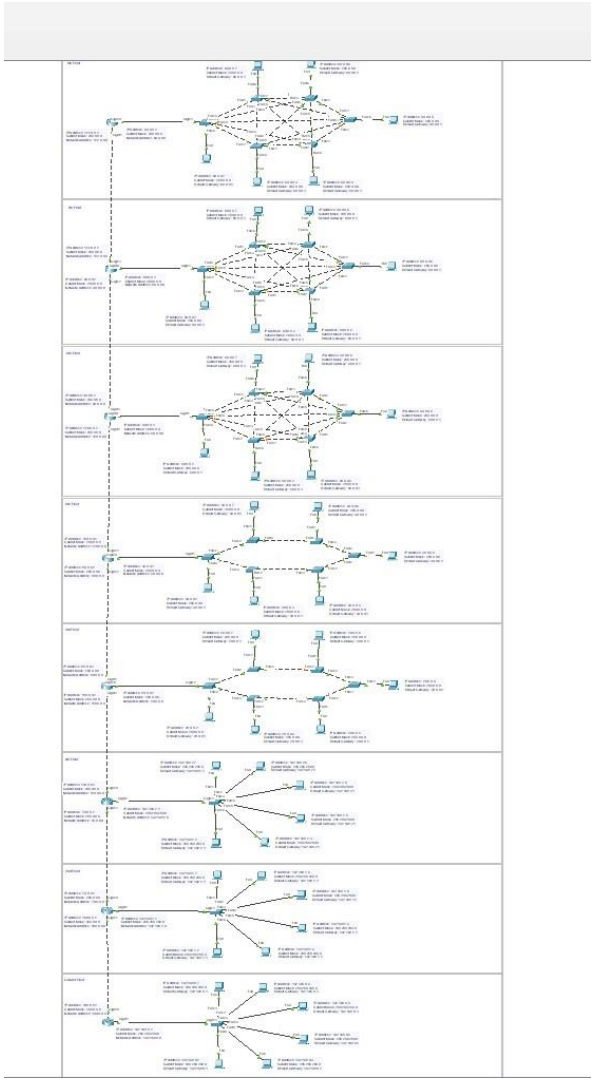
An eight-floor office building implements a well-designed hybrid network that provides both efficient communication and scalable and tolerant network functionality. The six computers on each of the first three floors use star topology to connect to a centralized switch which enhances management capabilities. Data transmission through the ring topology design in the following two floors maintains continuous data flow as well as system redundancy. All devices on the final three floors benefit from mesh topology which ensures maximum tolerance through their straight device-to-device connections.

The first three floors receive Class C private IPv4 addresses but Class A public IPv4 addresses power the remaining floors to connect with external networks. Routers in this topology follow a bus arrangement to communicate using Class A public IP addresses as they connect between each other.

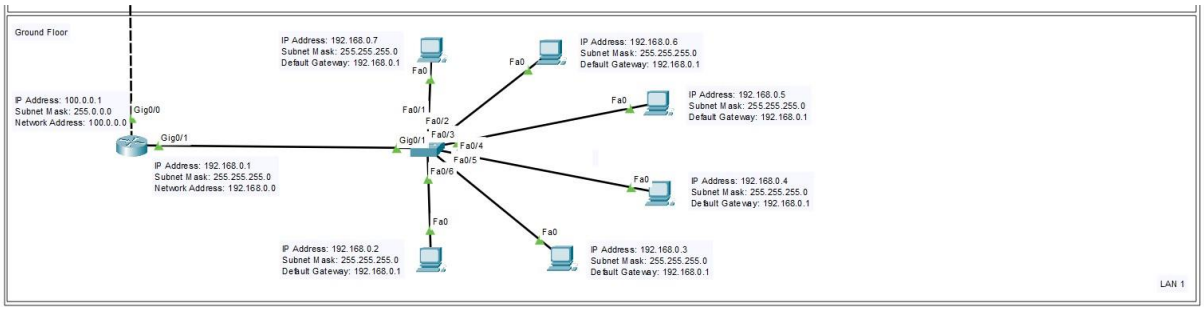
Inter-floor communication remains predictable in static routing because it prevents useless route changes. All floors experience smooth connectivity according to ping tests that validate both the address scheme and routing design. An organized method provides an organization with secure operations along with scalable and highperformance networking services.

Physical Scenario

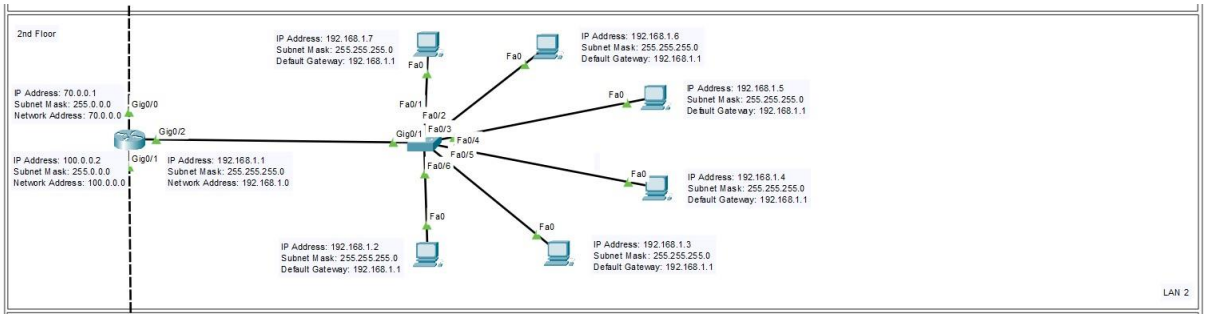
The eight-storied office structure contains organizational networking elements which maximize operational connectivity and administrative expandability. Six computers in each of the first three floors function under a star topology which connects to a central switch to make management simpler while accommodating growth needs. A ring topology covers the following two floors through circular computer connections that maintain redundancy for improved data flow efficiency. The mesh topology connection between devices throughout the last three floors provides complete tolerance and high levels of reliability. The combination of topologies provides good performance as well as operational resiliency and extends scalability throughout the building's footprint.



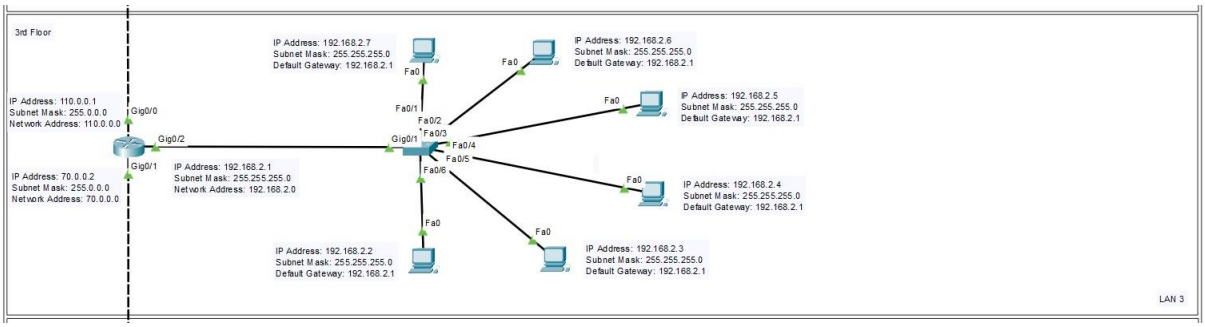
- Ground Floor (Lan 1)



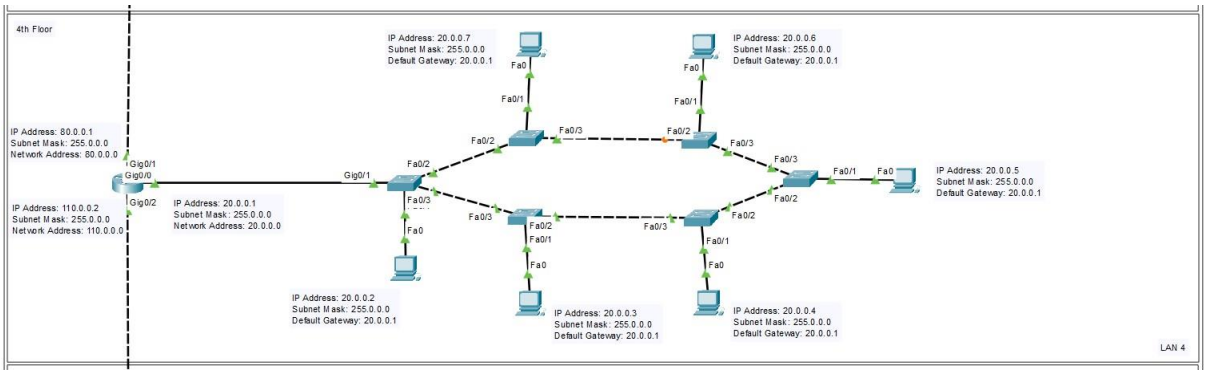
- 2nd Floor (Lan 2)



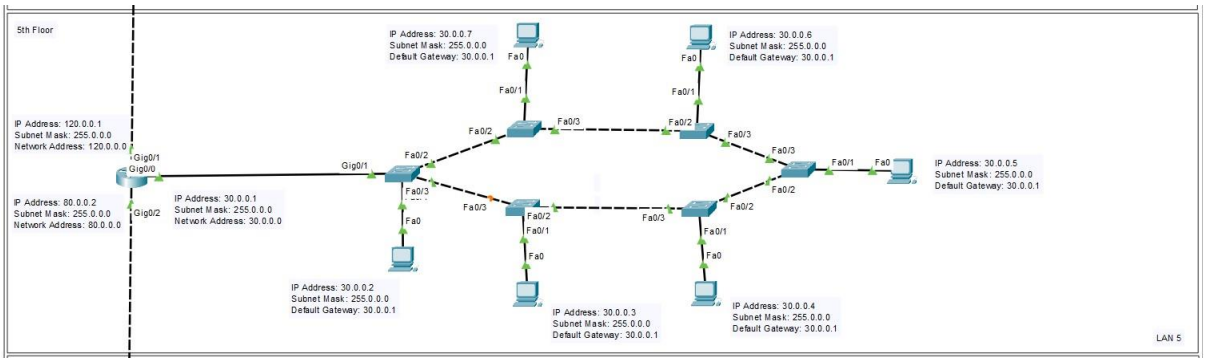
- 3rd Floor (Lan 3)



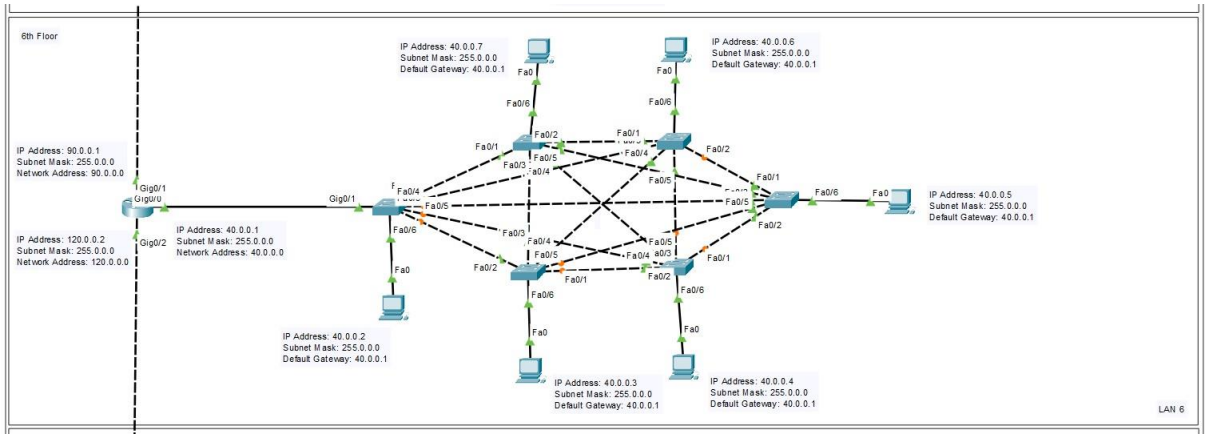
- 4th Floor (Lan 4)



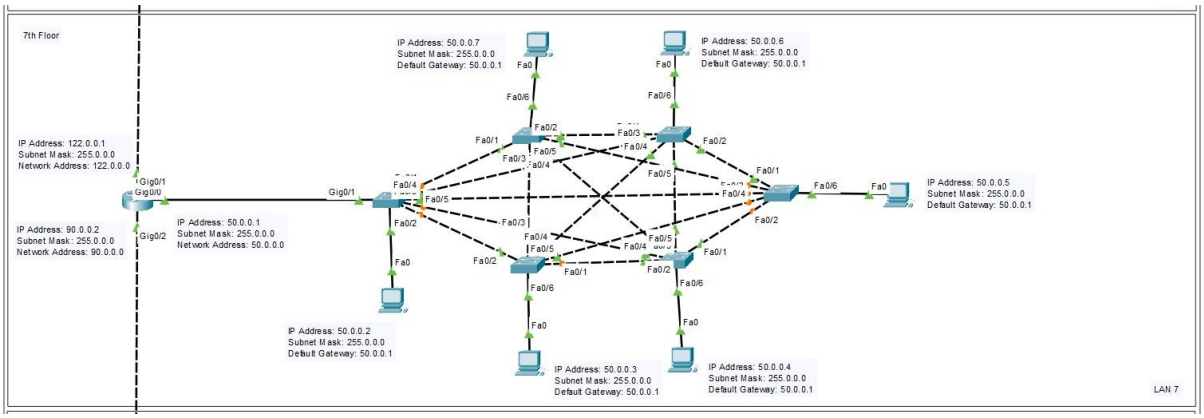
- 5th Floor (Lan 5)



- 6th Floor (Lan 6)



- 7th Floor (Lan 7)



- 8th Floor (Lan 8)

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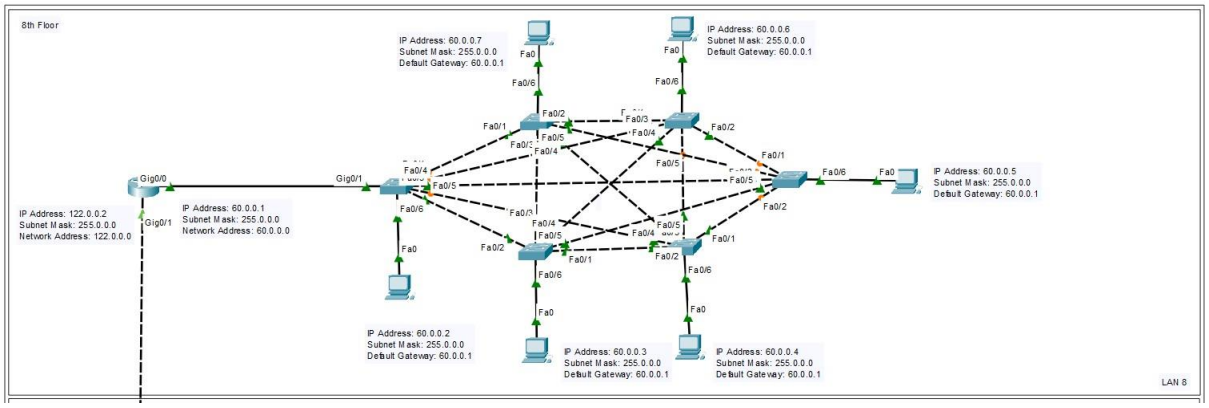
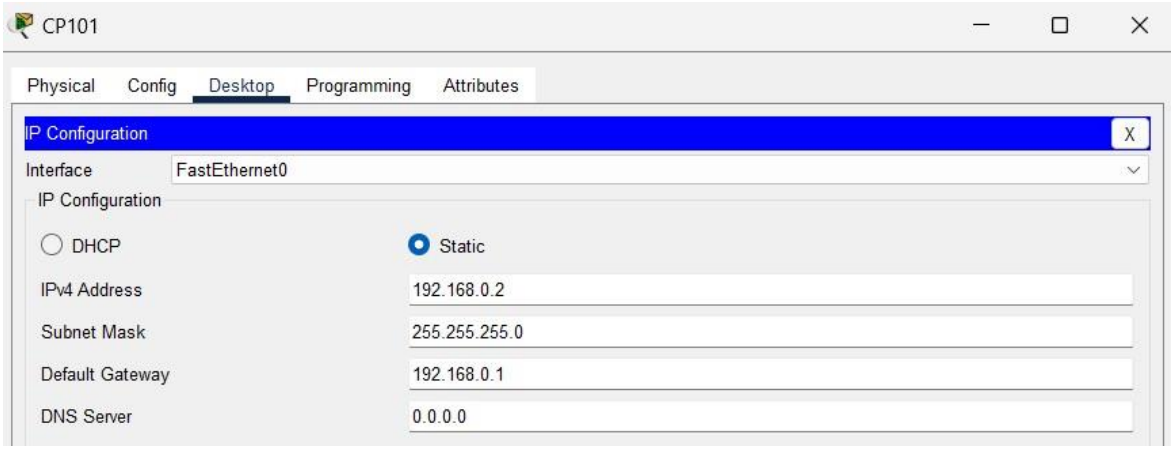

8th Floor
IP Address: 60.0.0.7
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
IP Address: 60.0.0.6
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
Gig0/0
Gig0/1
Gig0/1
IP Address: 122.0.0.2
Subnet Mask: 255.0.0.0
Network Address: 122.0.0.0
IP Address: 60.0.0.1
Subnet Mask: 255.0.0.0
Network Address: 60.0.0.0
IP Address: 60.0.0.5
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
IP Address: 60.0.0.2
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
IP Address: 60.0.0.3
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
IP Address: 60.0.0.4
Subnet Mask: 255.0.0.0
Default Gateway: 60.0.0.1
LAN 8

IP Address Allocation

The organization has established a planned IP addressing format to allow smooth network connectivity among the eight-floor workplace. Each floor of the three initial sections will receive Class C private IPv4 addresses which provide exclusive addressings for six computers each floor while maintaining network security. Class A public IPv4 addresses will be assigned to the remaining five floors which enables extensive external connections. The routers utilize a bus topology to link their network segments with each router using Class A public IPv4 addresses for router-to-router communication establishing effortless data transmission between network segments. Network performance shows maximum scalability alongside unique IP allocation while ensuring optimized network connections throughout all different floors of the building.

- LAN 1 (Network Address: 192.168.0.0)



- LAN 2 (Network Address: 192.168.1.0)

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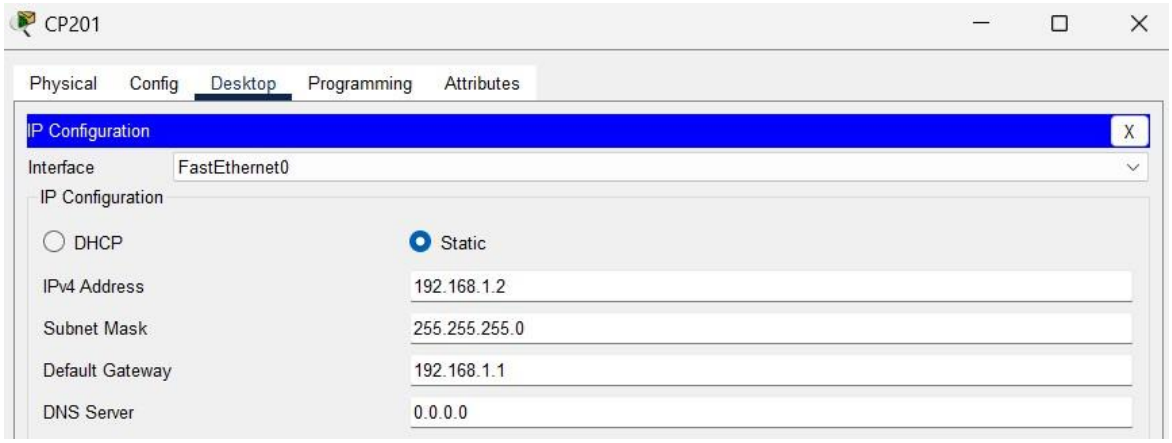
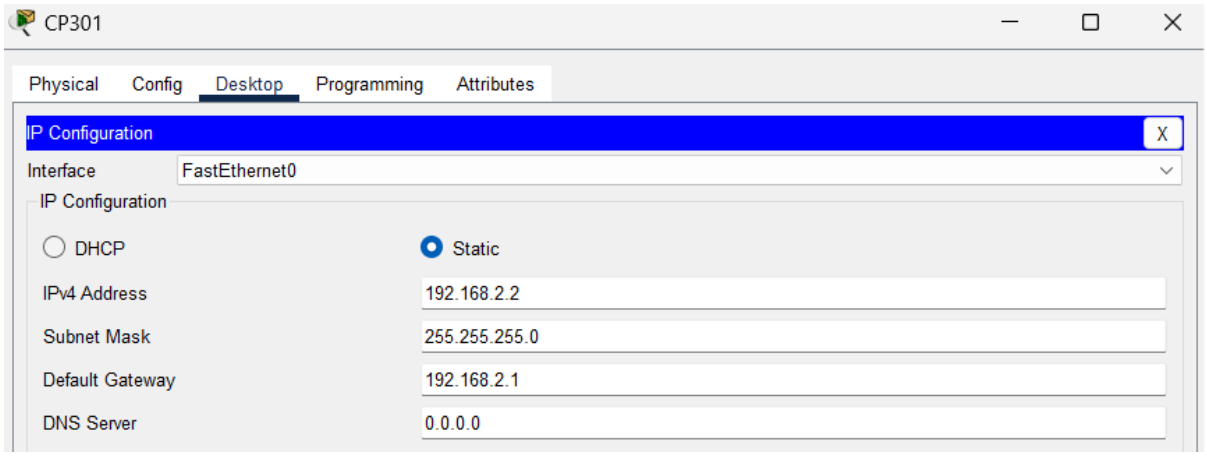
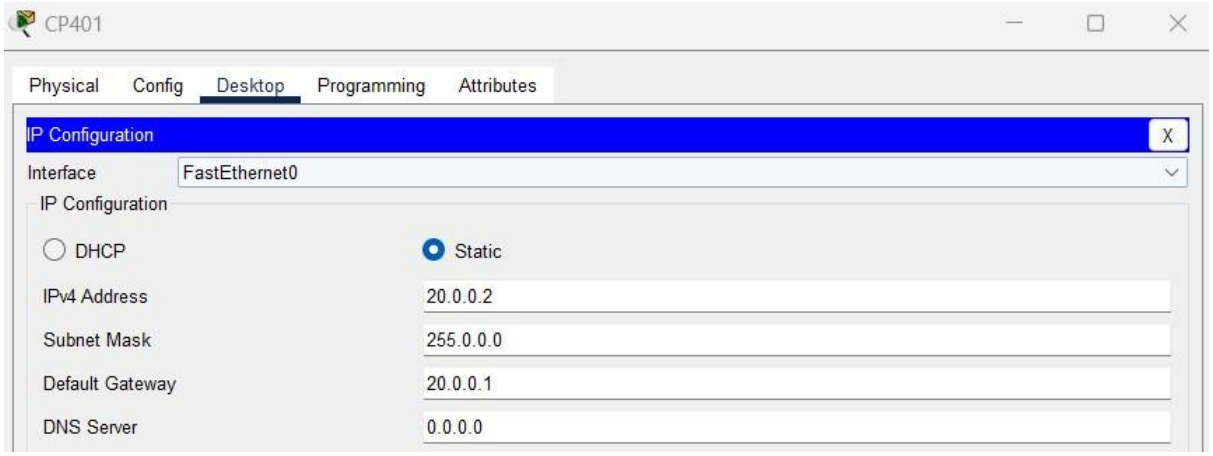


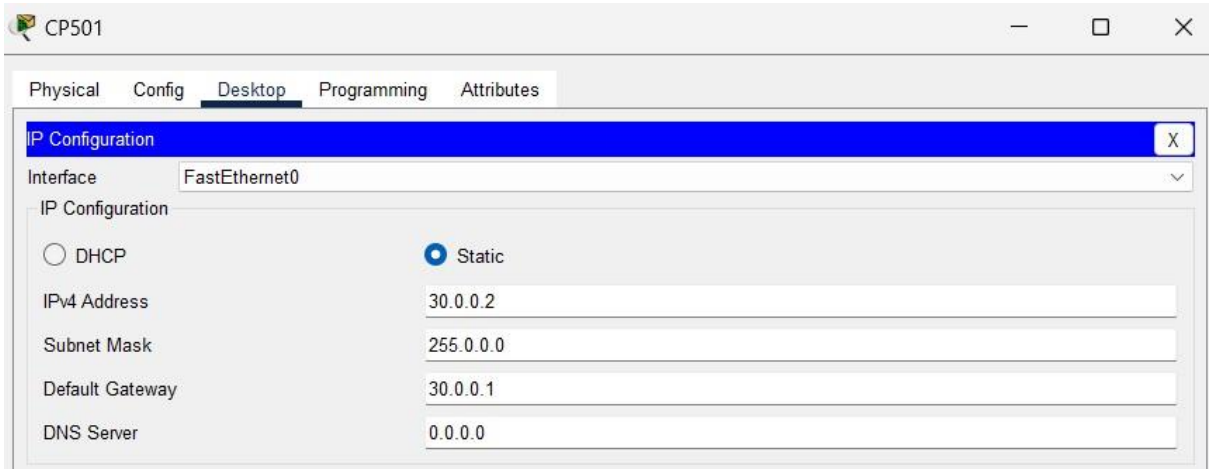
LAN 3 (Network Address: 192.168.2.0)



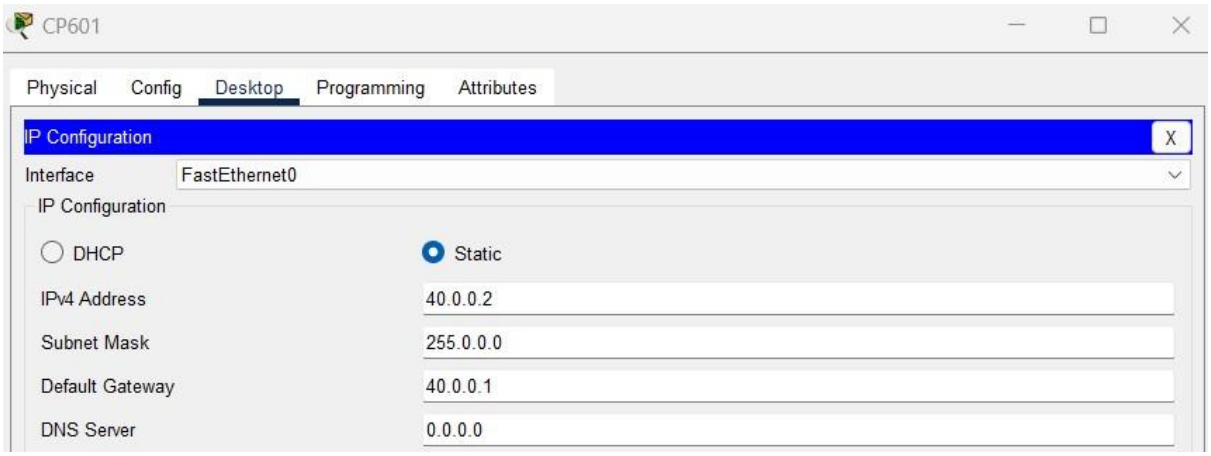
- LAN 4 (Network Address: 20.0.0.0)



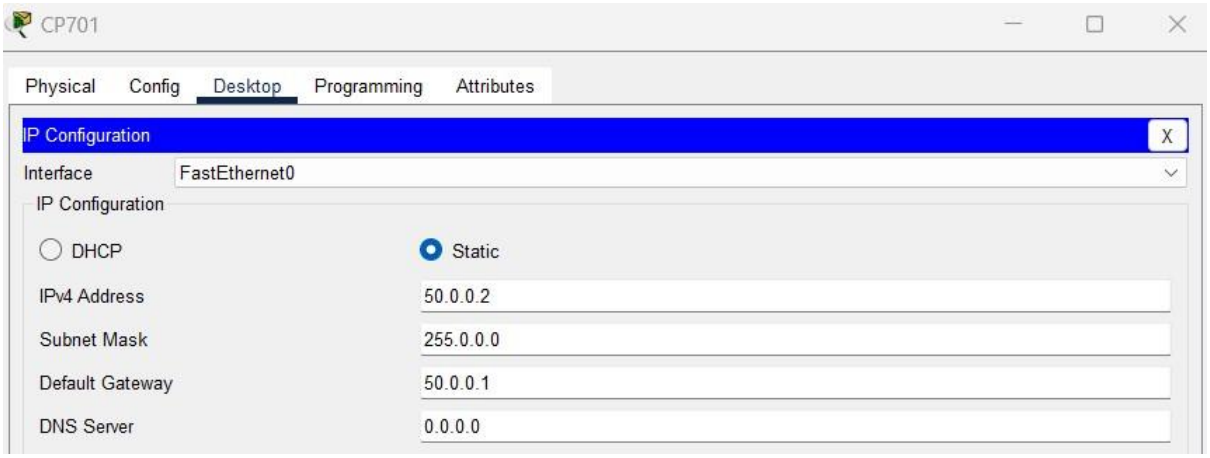
- LAN 5 (Network Address: 30.0.0.0)


CP501
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
30.0.0.2
Subnet Mask
255.0.0.0
Default Gateway
30.0.0.1
DNS Server
0.0.0.0

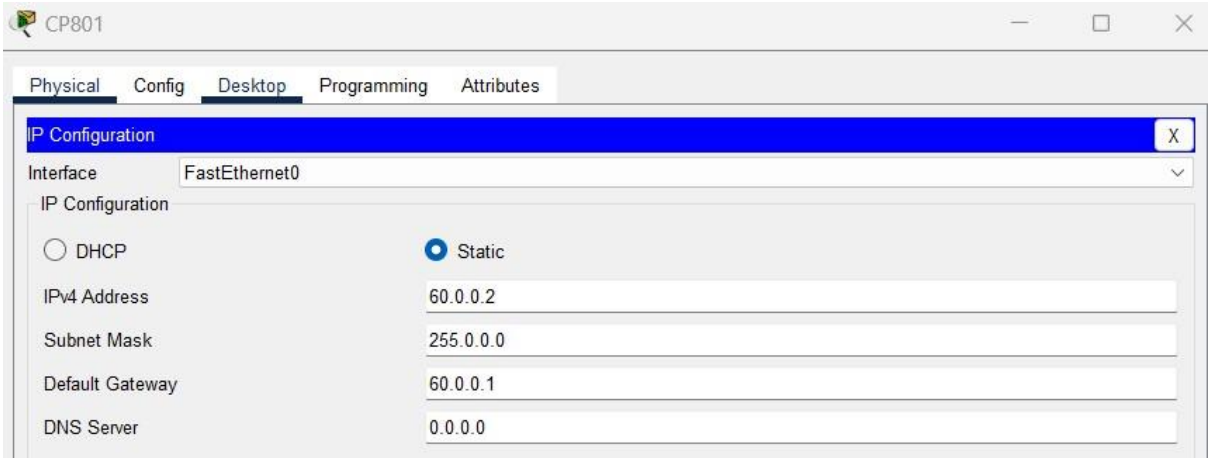
- LAN 6 (Network Address: 40.0.0.0)



- LAN 7 (Network Address: 50.0.0.0)



- LAN 8 (Network Address: 60.0.0.0)



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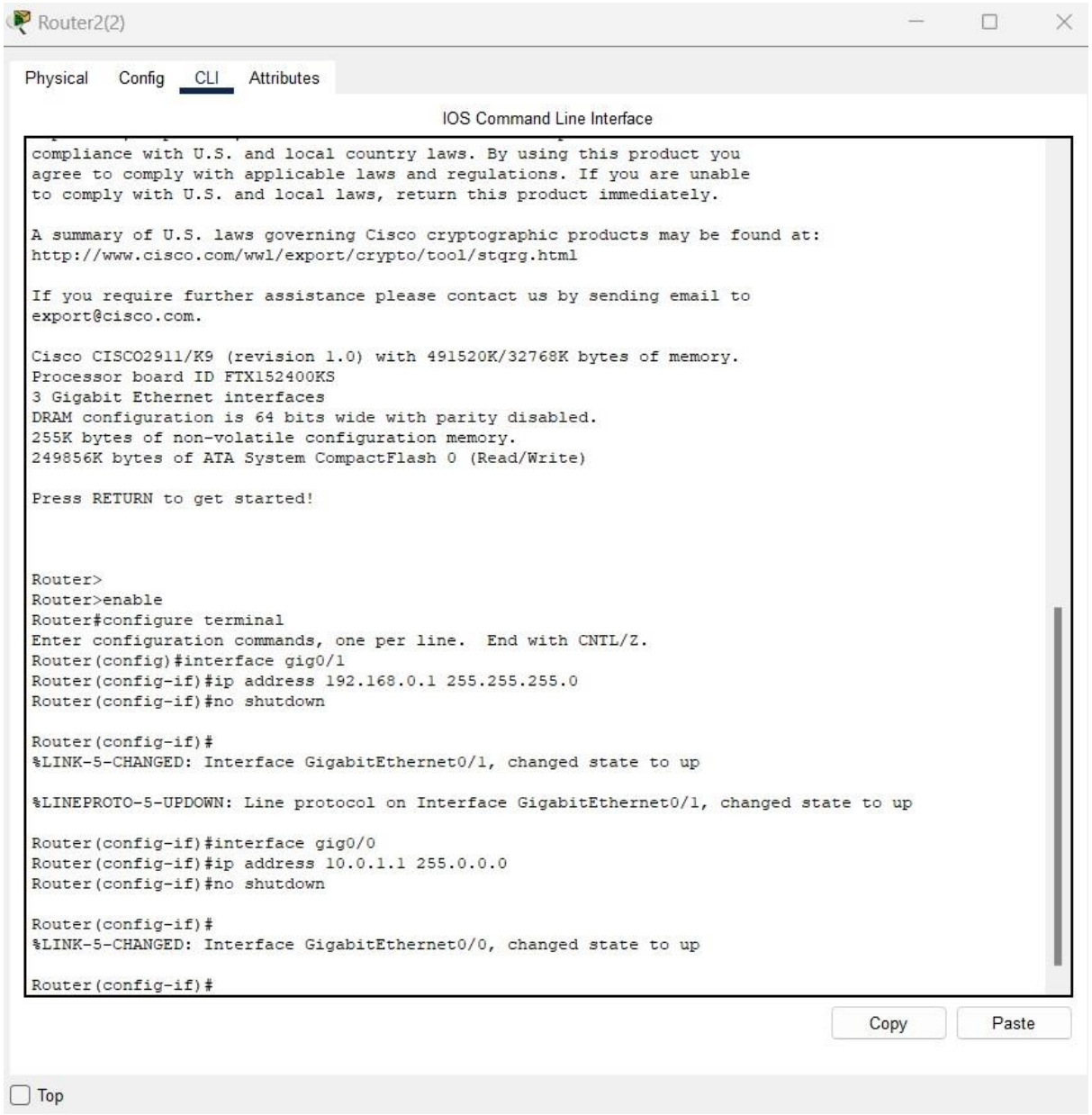
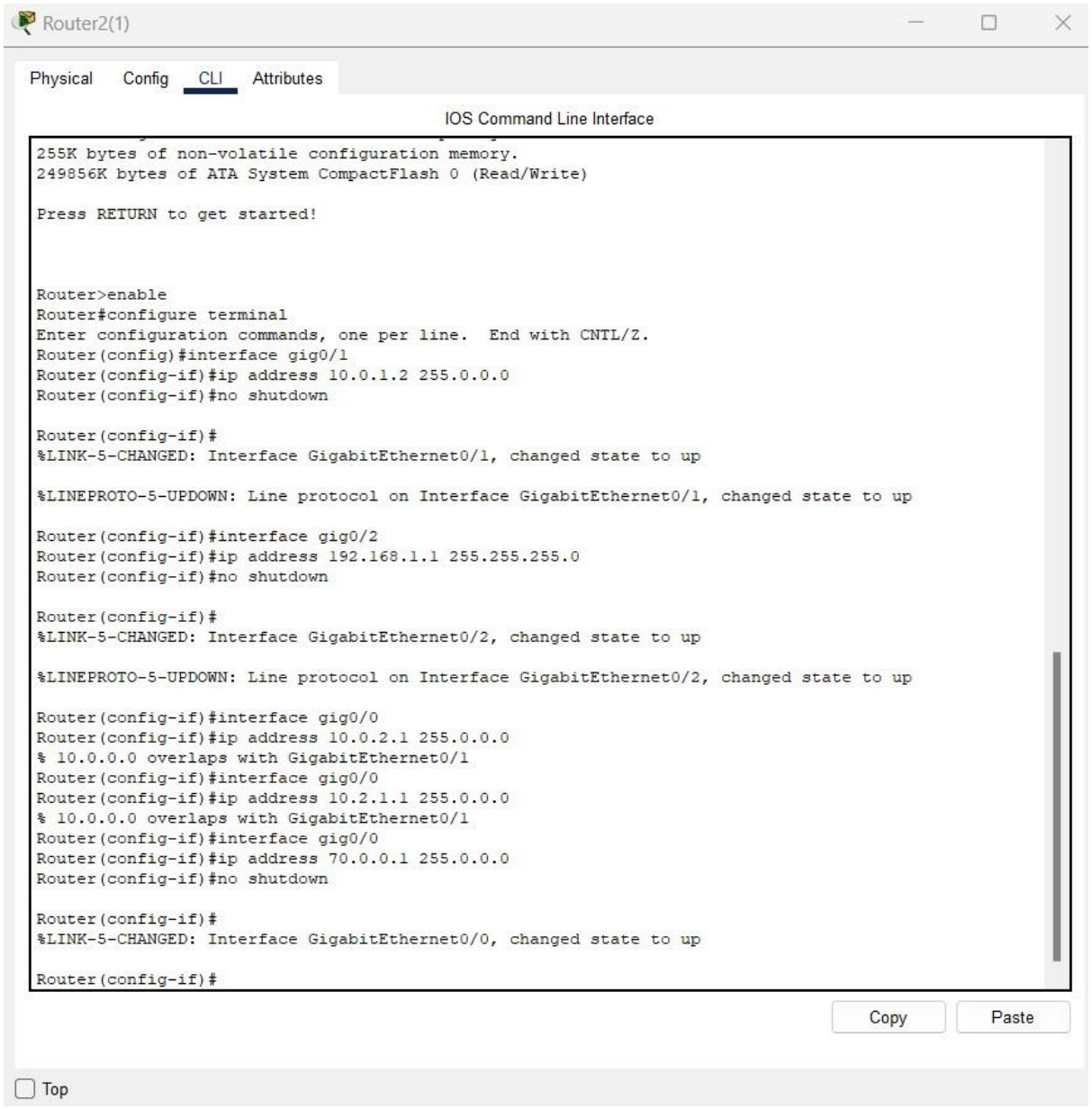
Router 1


Router2(2)
Physical
Config
CLI
Attributes
IOS Command Line Interface
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.
A summary of U.S. laws governing Cisco cryptographic products may be found at:
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 CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/1
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 10.0.1.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
Copy
Paste
Top

- Router 2


Router2(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/1
Router(config-if)#ip address 10.0.1.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#interface gig0/2
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 GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 10.0.2.1 255.0.0.0
% 10.0.0.0 overlaps with GigabitEthernet0/1
Router(config-if)#interface gig0/0
Router(config-if)#ip address 10.2.1.1 255.0.0.0
% 10.0.0.0 overlaps with GigabitEthernet0/1
Router(config-if)#interface gig0/0
Router(config-if)#ip address 70.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
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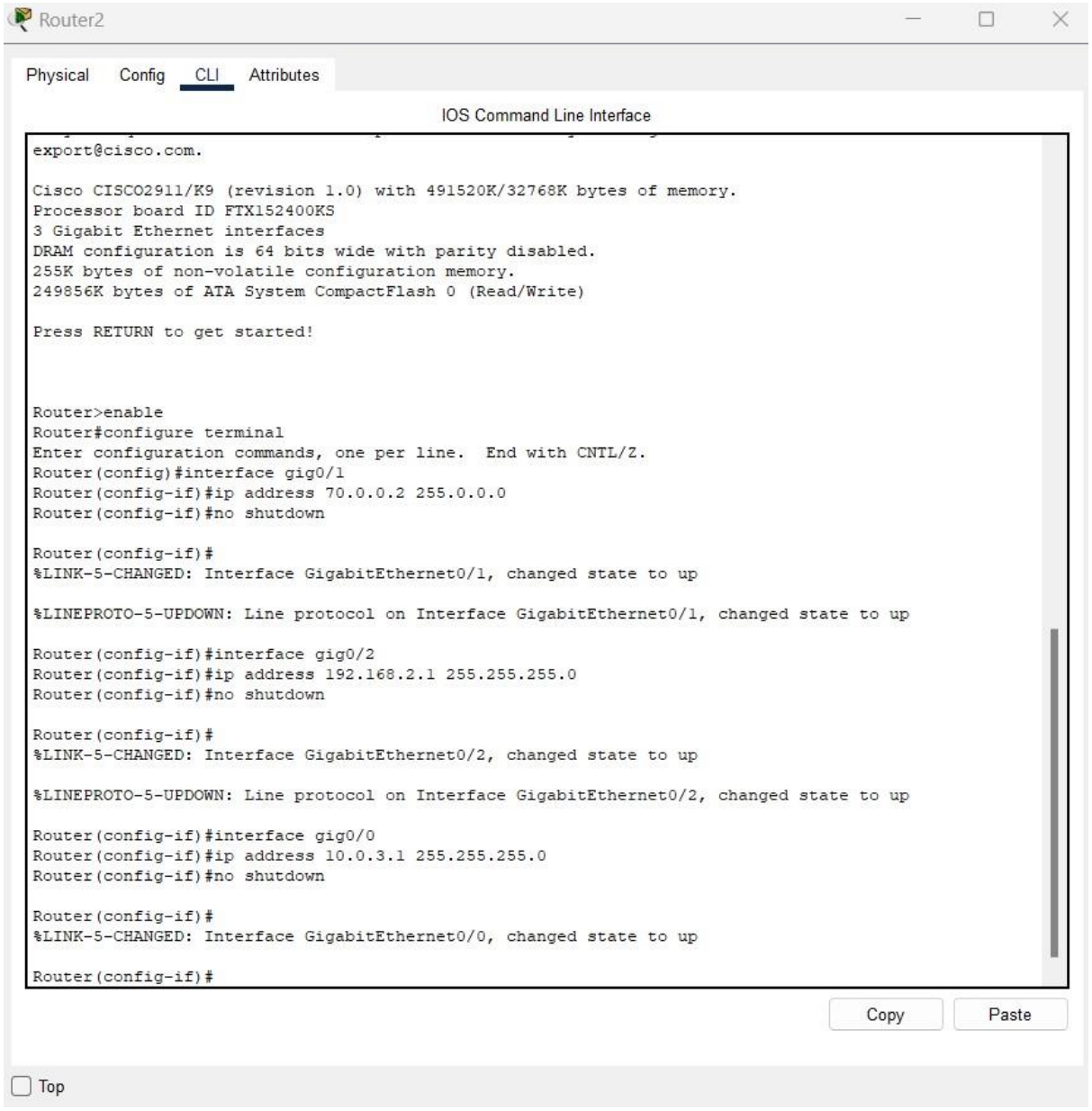
Top

- Router 3


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
export@cisco.com.
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/1
Router(config-if)#ip address 70.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#interface gig0/2
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 10.0.3.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
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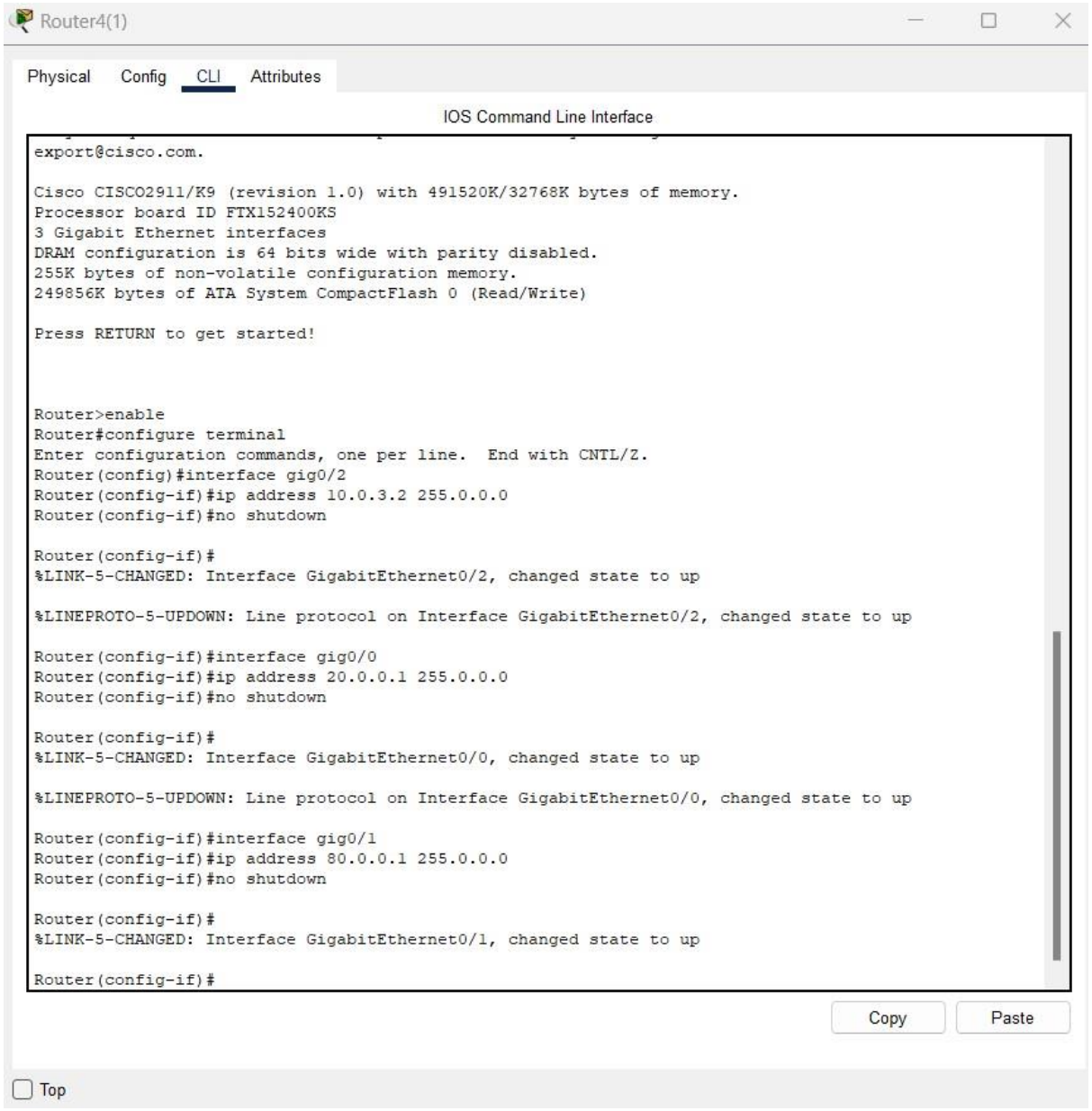
Top

- Router 4


Router4(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
export@cisco.com.
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/2
Router(config-if)#ip address 10.0.3.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#interface gig0/1
Router(config-if)#ip address 80.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
Router(config-if)#
Copy
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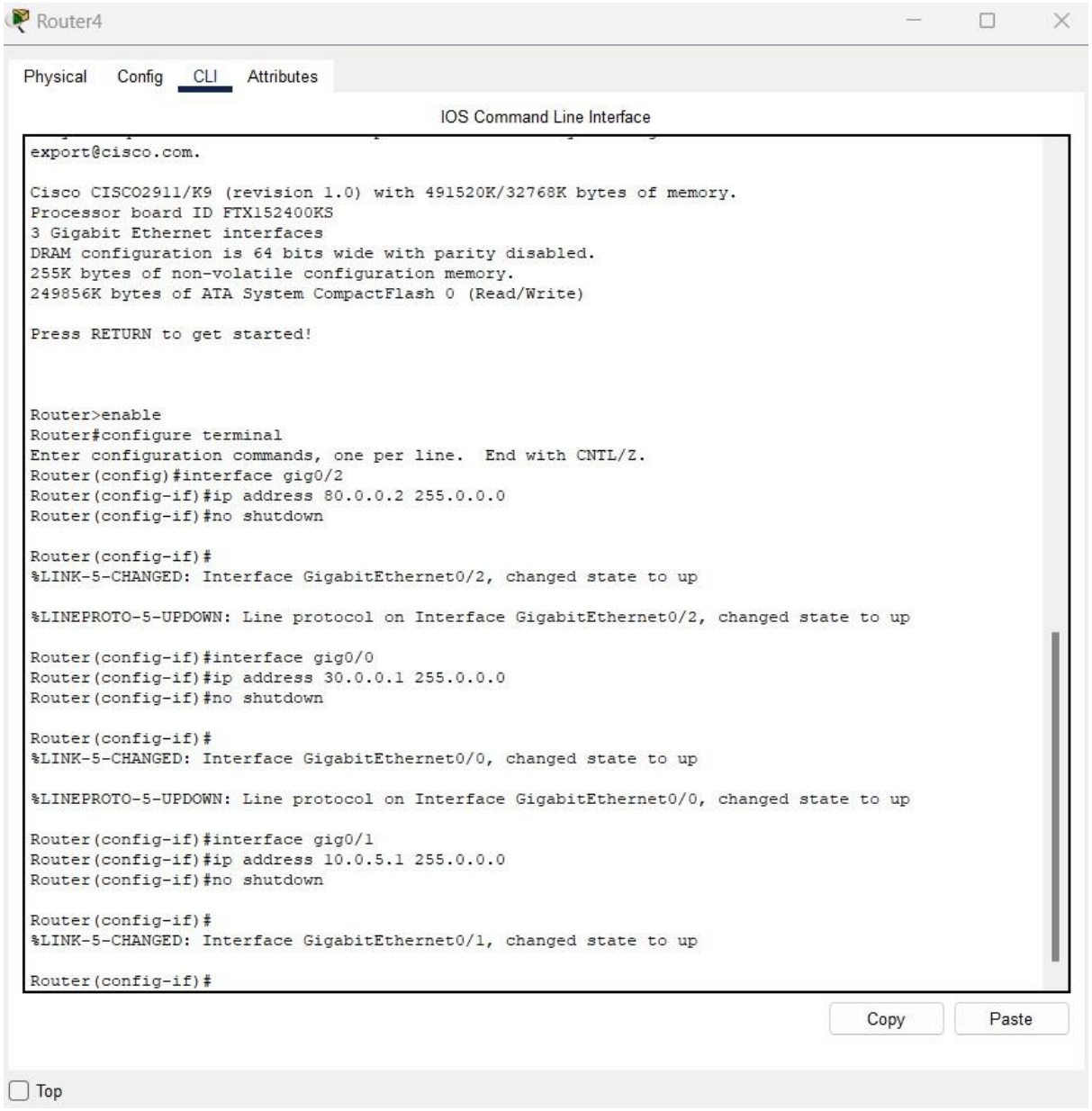
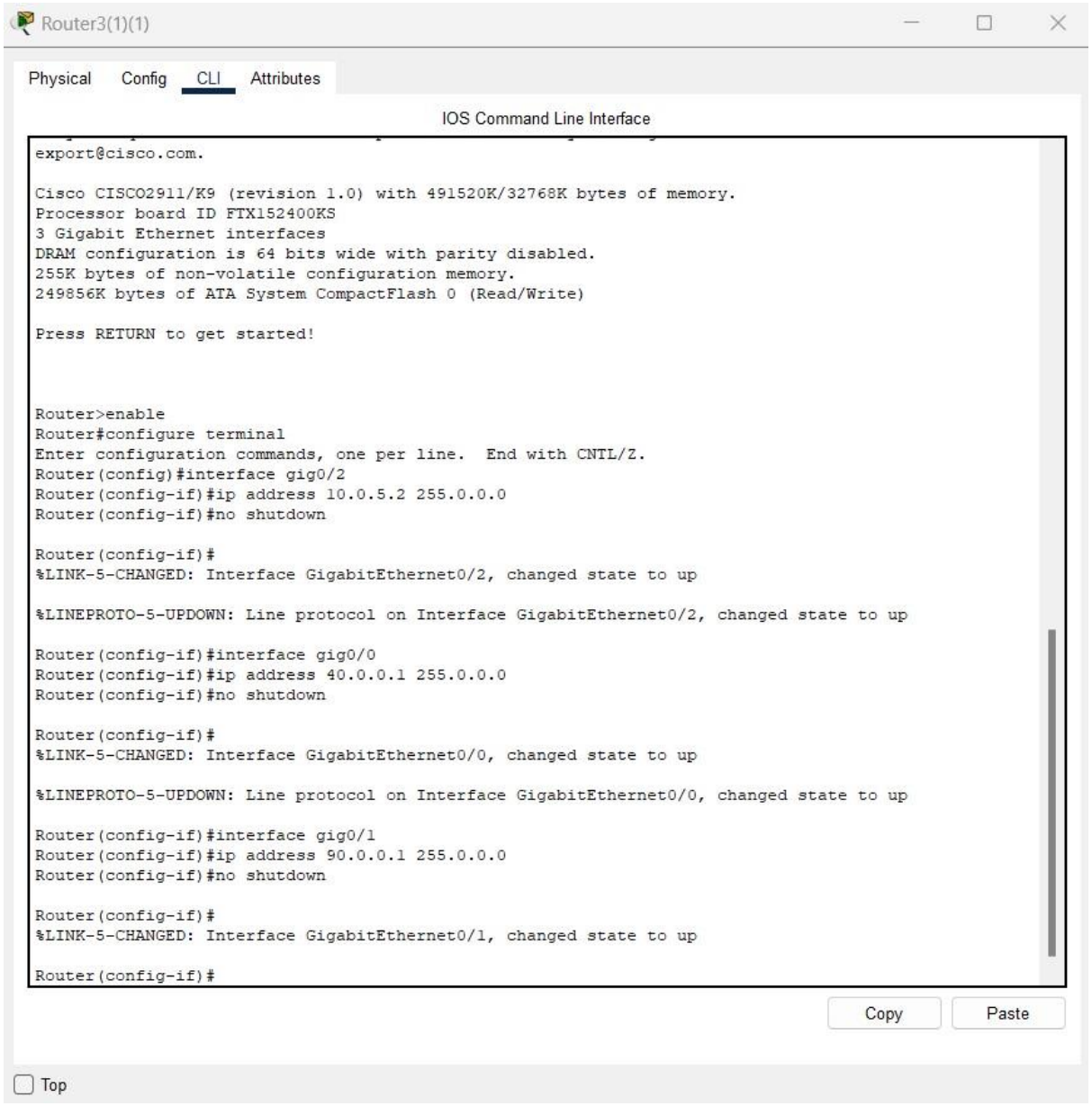
- Router 5


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
export@cisco.com.
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/2
Router(config-if)#ip address 80.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#interface gig0/1
Router(config-if)#ip address 10.0.5.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
Router(config-if)#
Copy
Paste
Top

- Router 6


Router3(1)(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
export@cisco.com.
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/2
Router(config-if)#ip address 10.0.5.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#interface gig0/1
Router(config-if)#ip address 90.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
Router(config-if)#
Copy
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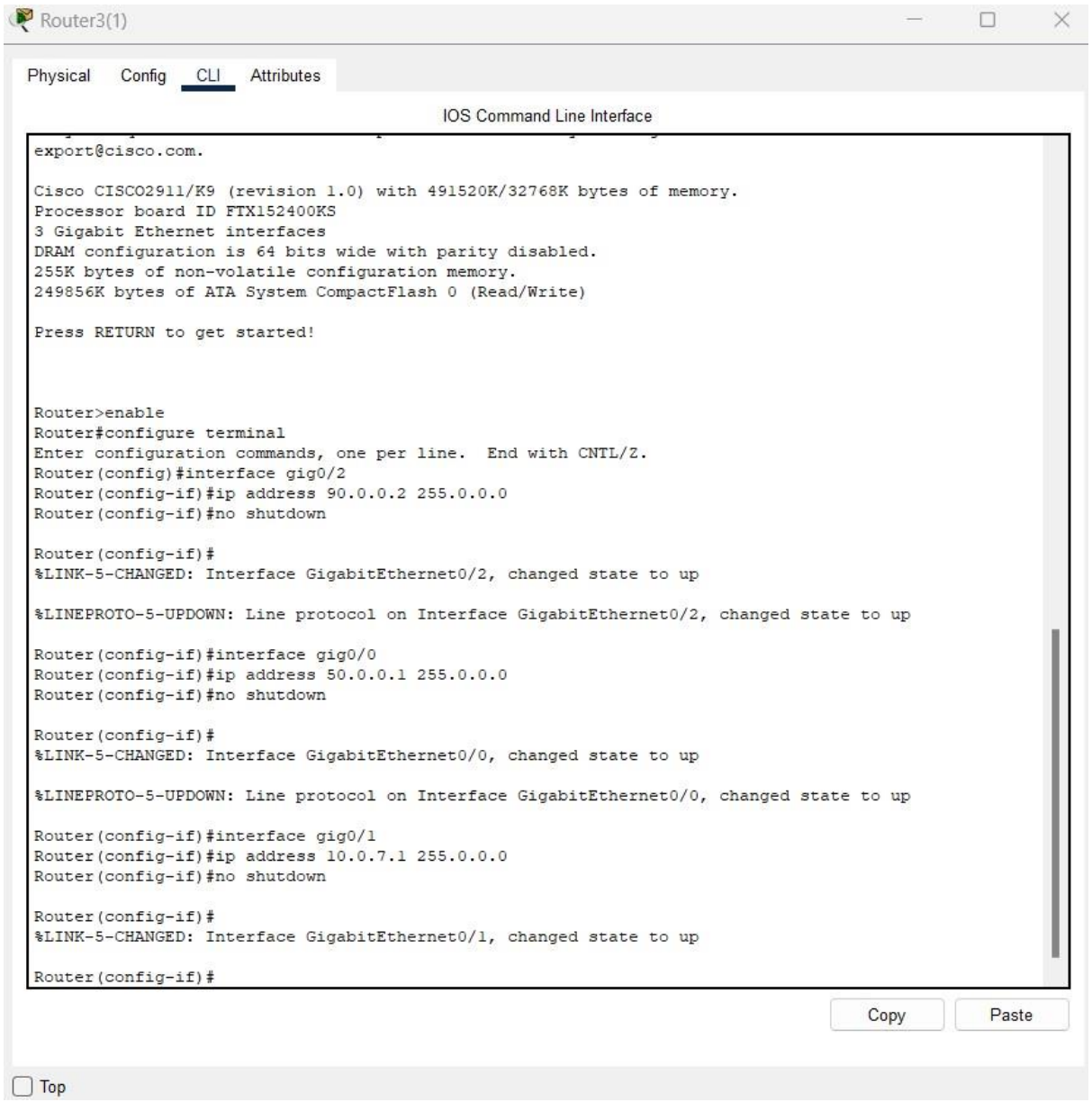
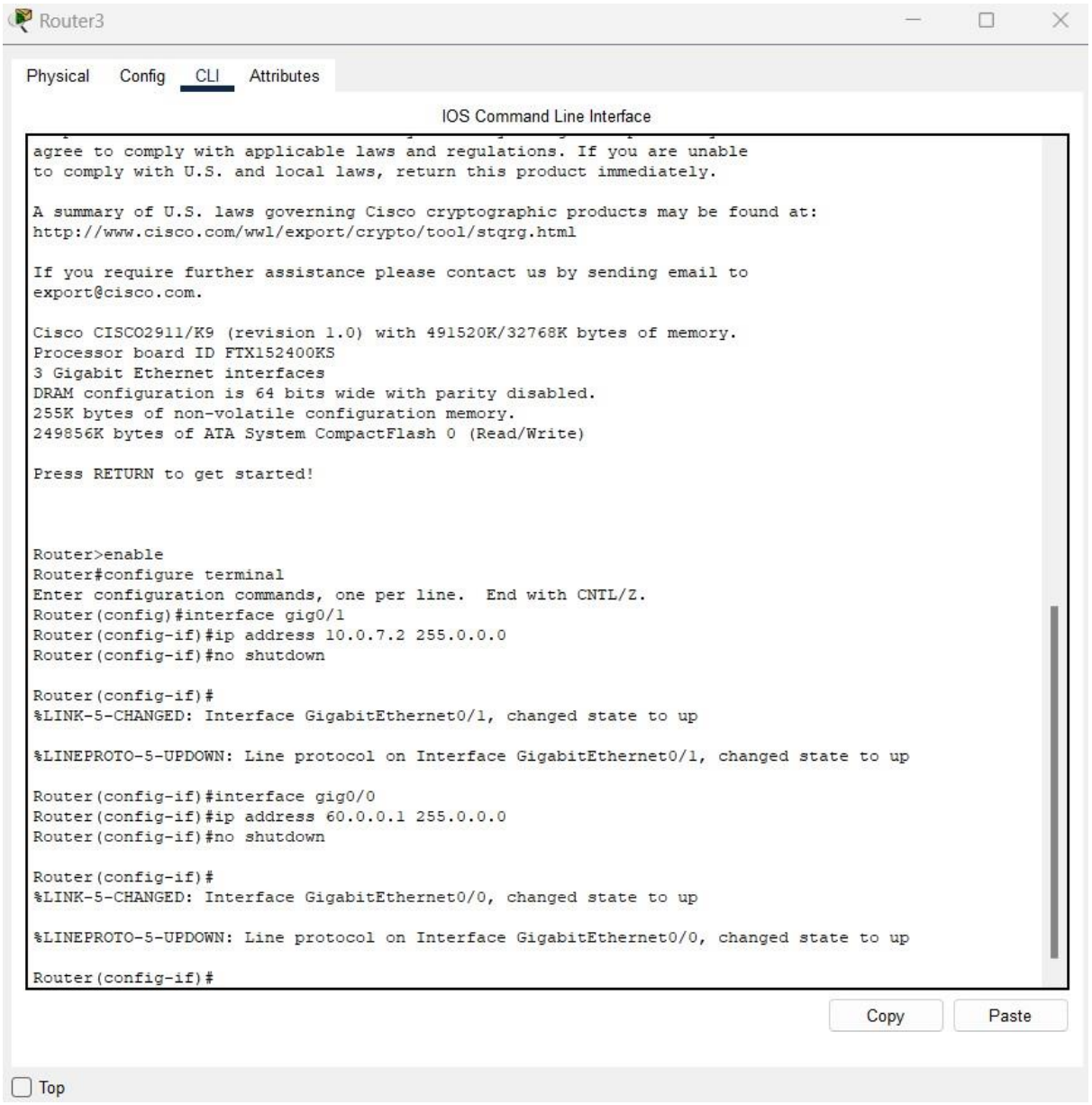
Top

- Router 7


Router3(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
export@cisco.com.
Cisco CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/2
Router(config-if)#ip address 90.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 50.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#interface gig0/1
Router(config-if)#ip address 10.0.7.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
Router(config-if)#
Copy
Paste
Top

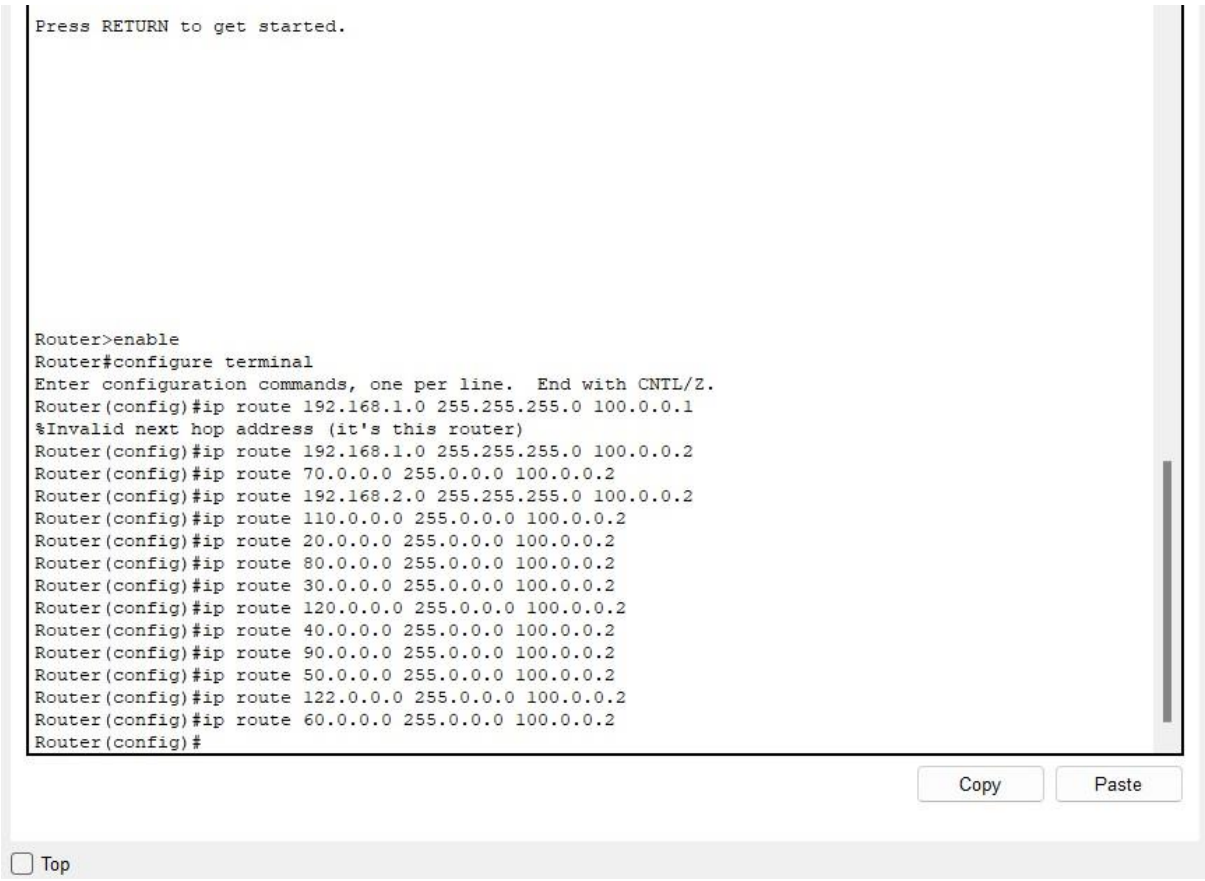
- Router 8


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.
A summary of U.S. laws governing Cisco cryptographic products may be found at:
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 CISCO2911/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
3 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gig0/1
Router(config-if)#ip address 10.0.7.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#interface gig0/0
Router(config-if)#ip address 60.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#
Copy
Paste
Top

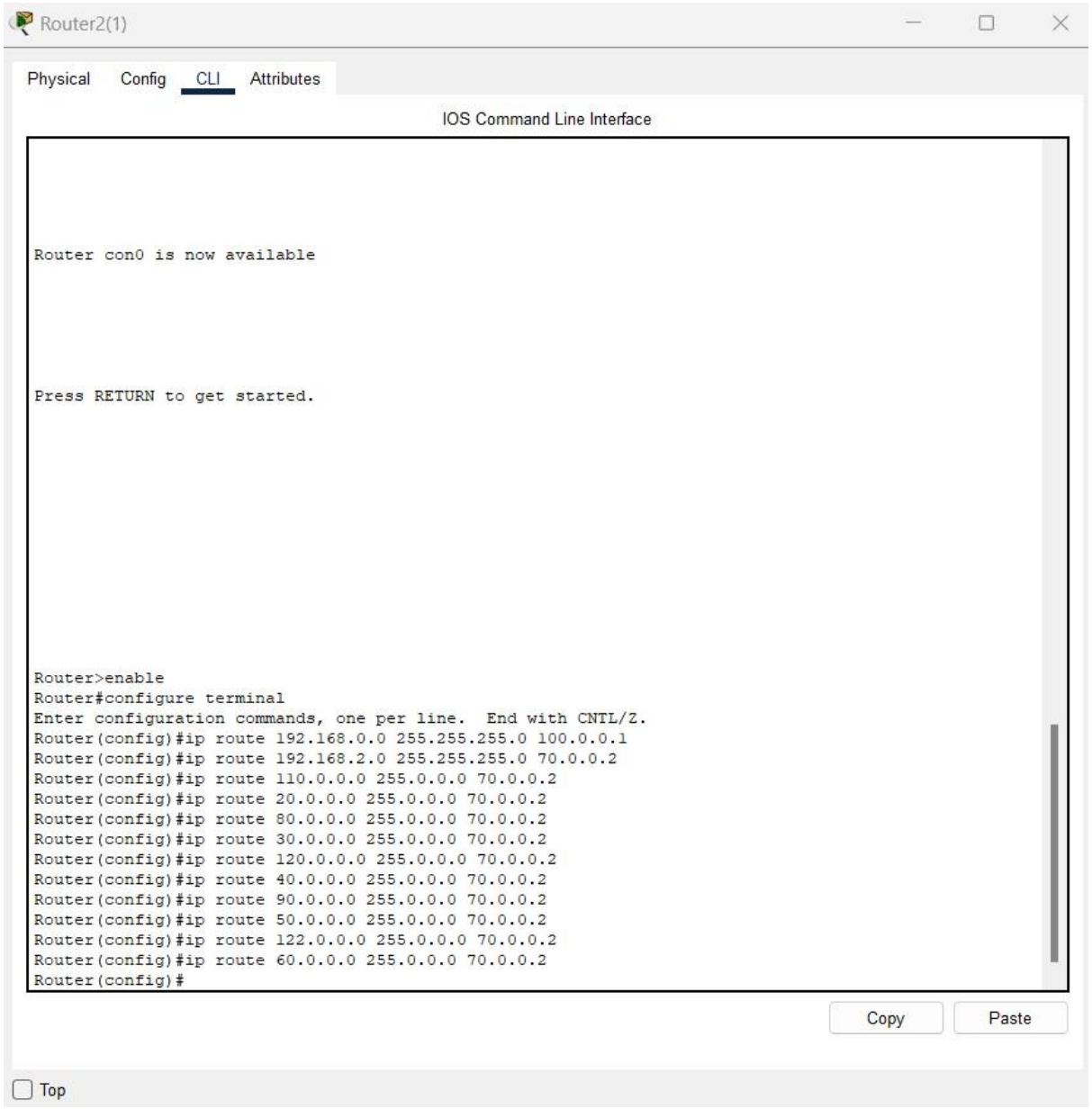
Static Routing

The office building requires static routing for inter-floor communication which will deliver controlled and predictable data transmission. The networks on each floor will include manually set routes to manage traffic flow with minimal effort while avoiding dynamic routing protocol resource utilization. The manual configuration of routes through this method offers security benefits with simplified routing structures while providing route stability since manual intervention is needed for changes. A bus topology connects all routers in this network so static routes create efficient transmission paths between floors to establish continuous connectivity. The technique performs well with orderly networks when traffic follows established patterns because it enables optimal performance alongside reduced unnecessary route modifications.

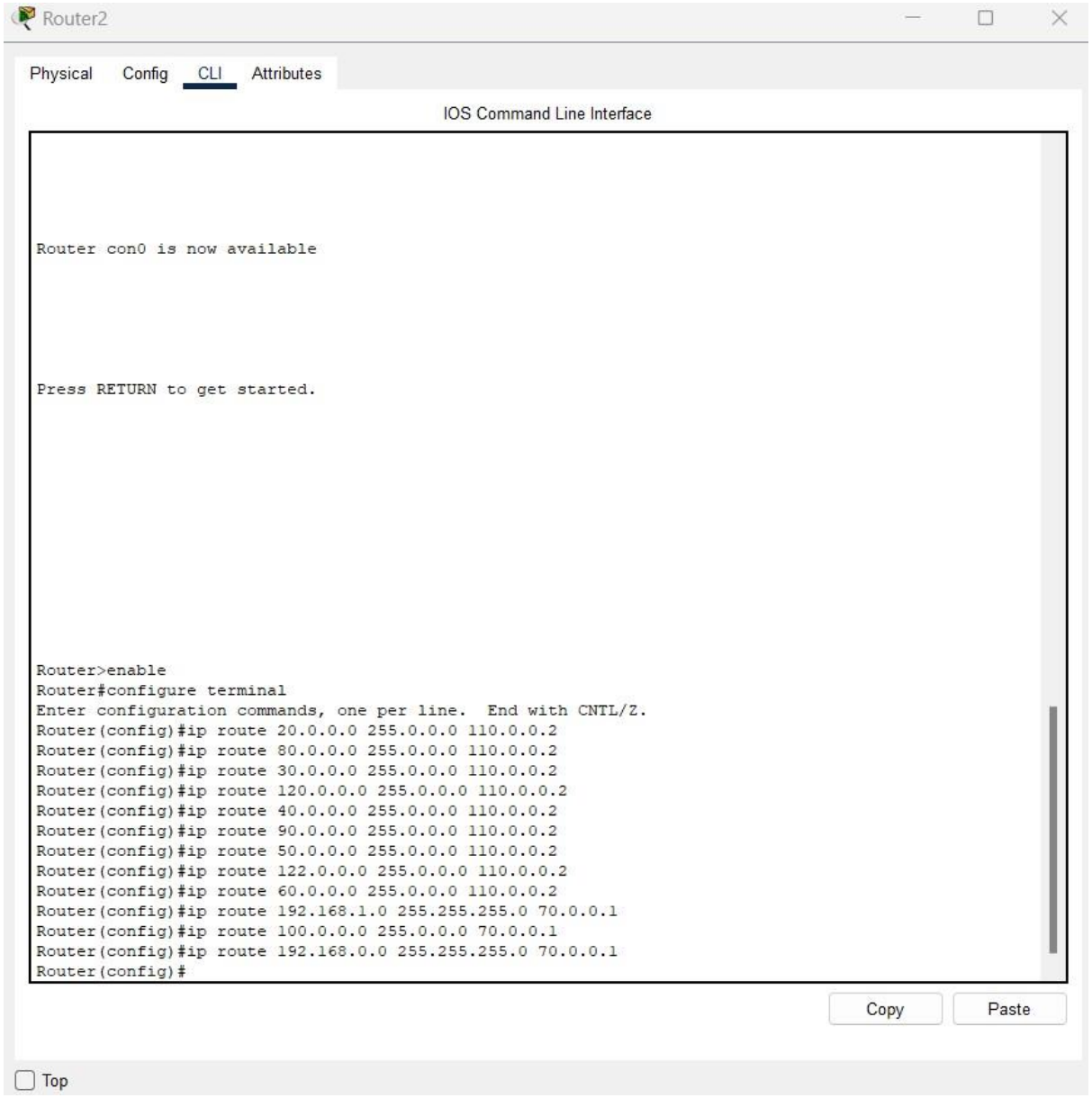
- Router 1



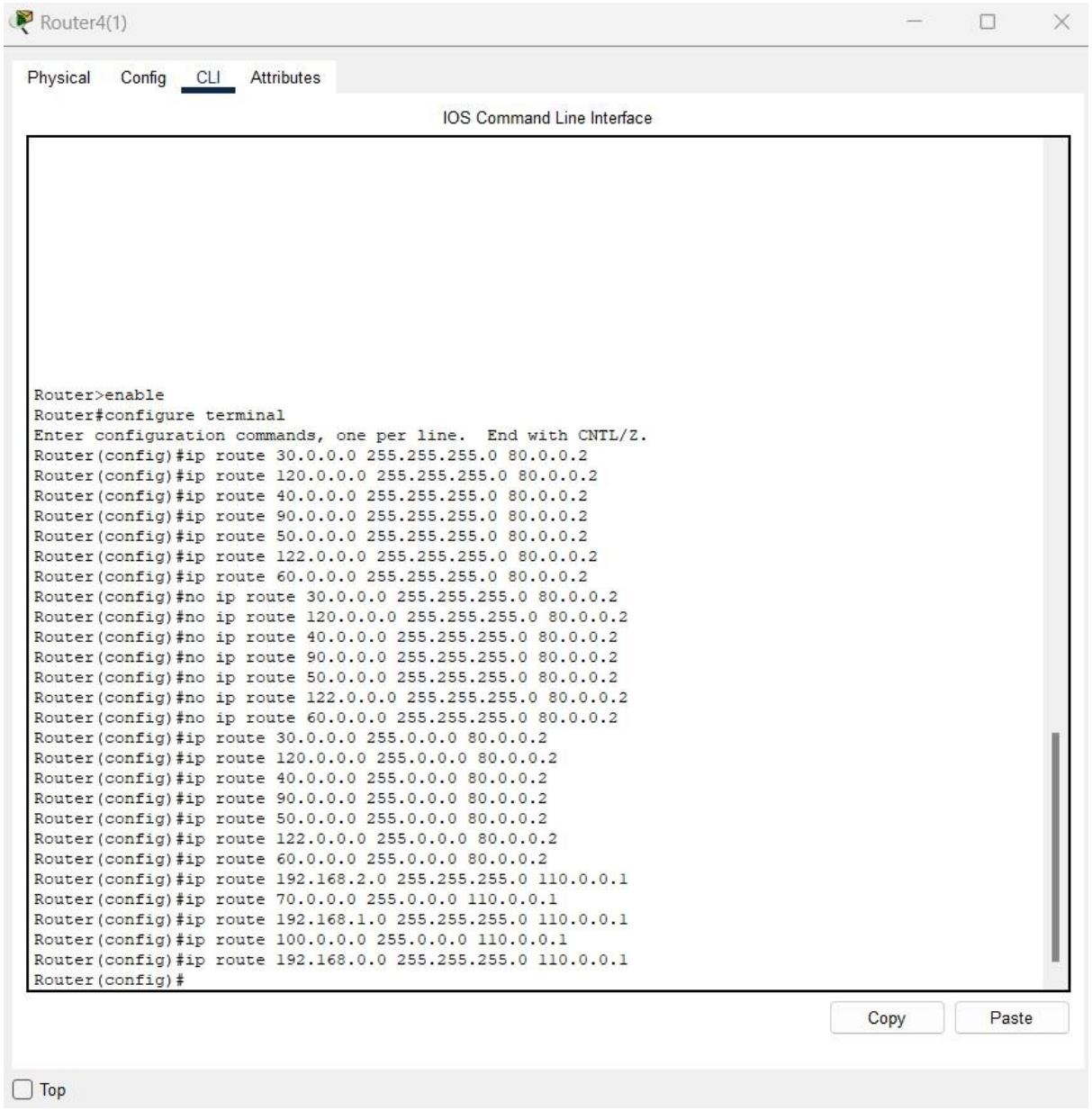
- Router 2


Router2(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
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)#ip route 192.168.0.0 255.255.255.0 100.0.0.1
Router(config)#ip route 192.168.2.0 255.255.255.0 70.0.0.2
Router(config)#ip route 110.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 20.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 80.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 120.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 90.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 50.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 122.0.0.0 255.0.0.0 70.0.0.2
Router(config)#ip route 60.0.0.0 255.0.0.0 70.0.0.2
Router(config)#
Copy
Paste
Top

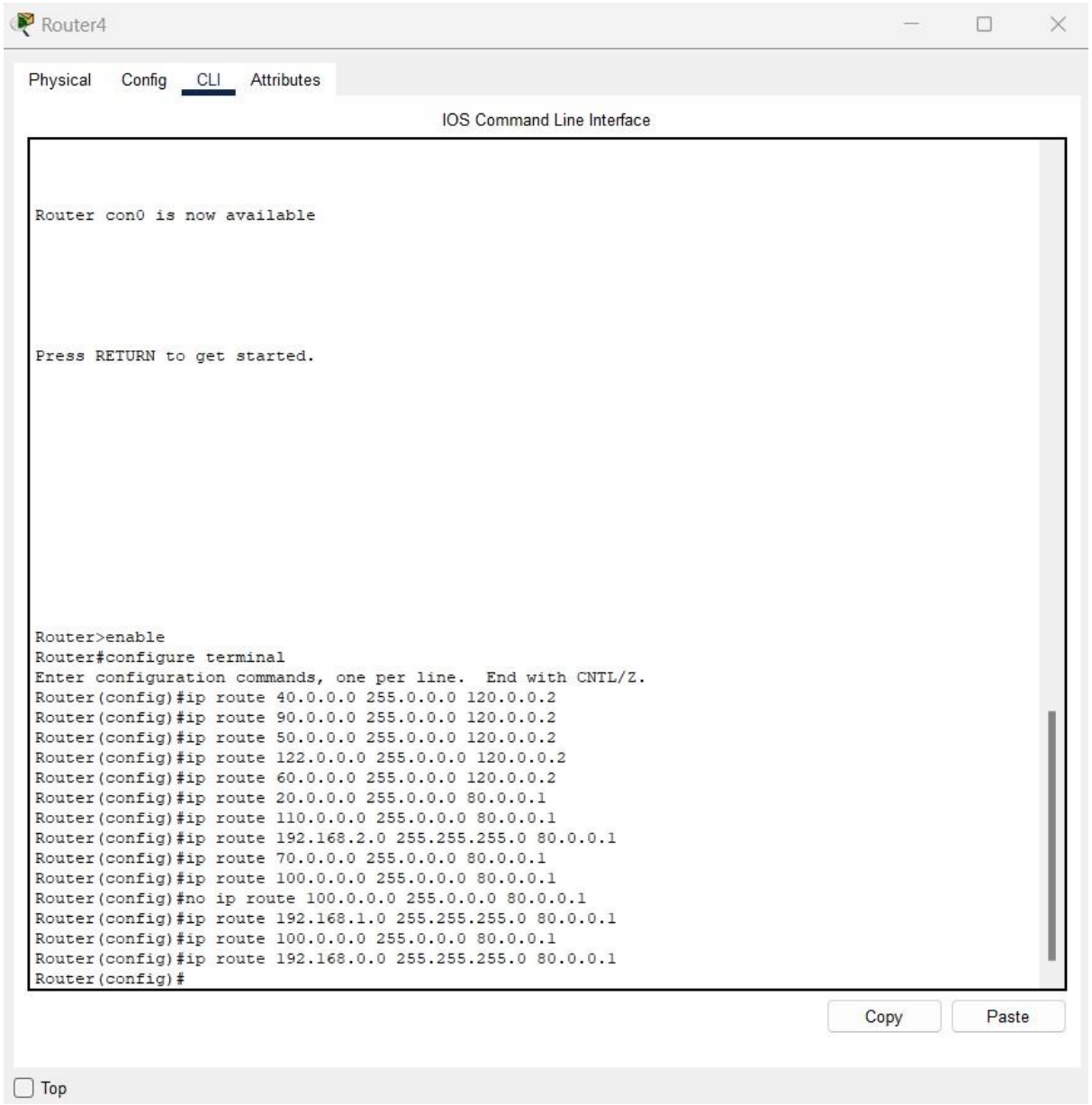
- Router 3


Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
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)#ip route 20.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 80.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 120.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 90.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 50.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 122.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 60.0.0.0 255.0.0.0 110.0.0.2
Router(config)#ip route 192.168.1.0 255.255.255.0 70.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 70.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 70.0.0.1
Router(config)#
Copy
Paste
Top

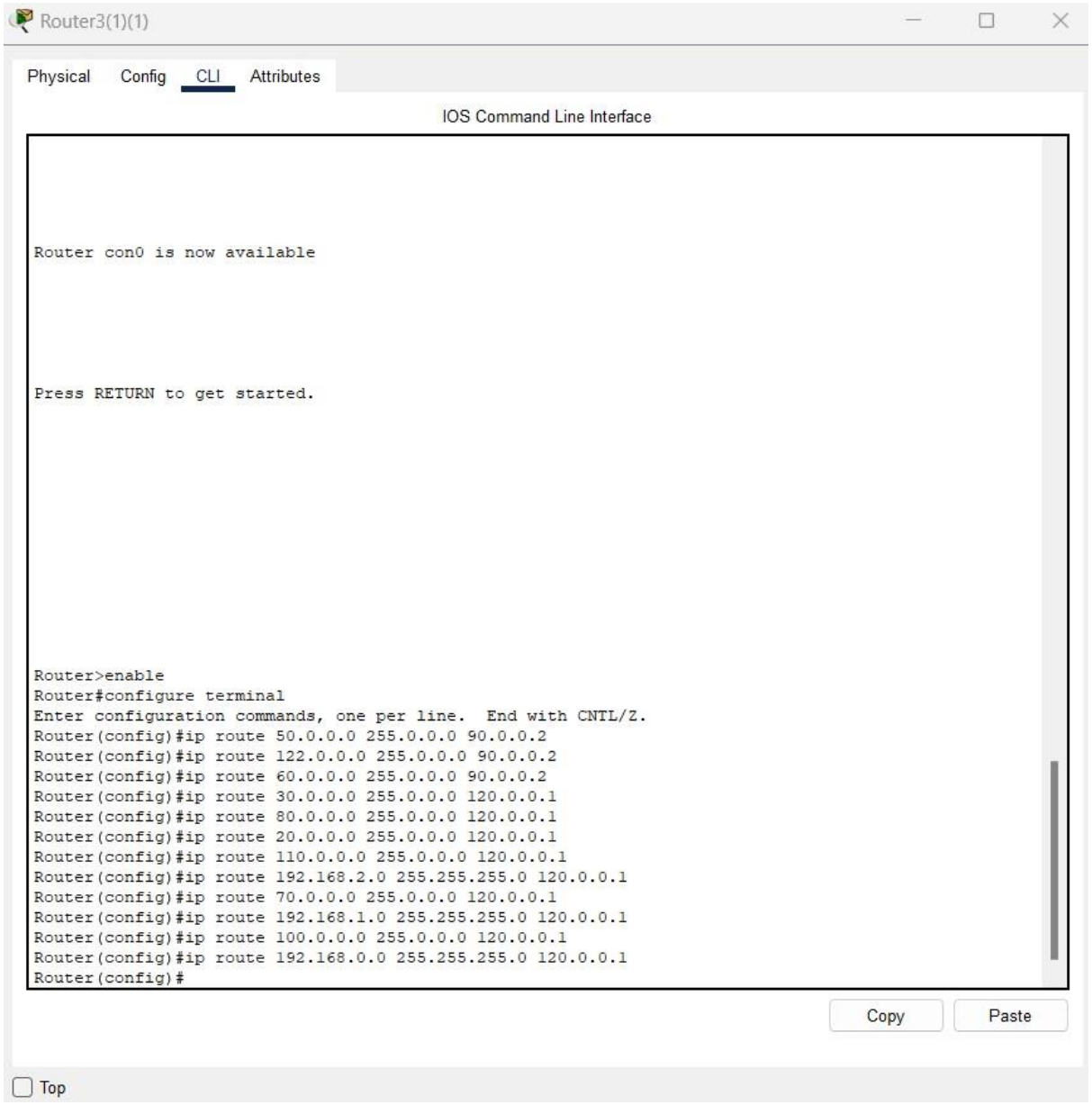
- Router 4


Router4(1)
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)#ip route 30.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 120.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 40.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 90.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 50.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 122.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 60.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 30.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 120.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 40.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 90.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 50.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 122.0.0.0 255.255.255.0 80.0.0.2
Router(config)#no ip route 60.0.0.0 255.255.255.0 80.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 120.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 90.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 50.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 122.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 60.0.0.0 255.0.0.0 80.0.0.2
Router(config)#ip route 192.168.2.0 255.255.255.0 110.0.0.1
Router(config)#ip route 70.0.0.0 255.0.0.0 110.0.0.1
Router(config)#ip route 192.168.1.0 255.255.255.0 110.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 110.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 110.0.0.1
Router(config)#
Copy
Paste
Top

- Router 5


Router4
Physical
Config
CLI
Attributes
IOS Command Line Interface
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)#ip route 40.0.0.0 255.0.0.0 120.0.0.2
Router(config)#ip route 90.0.0.0 255.0.0.0 120.0.0.2
Router(config)#ip route 50.0.0.0 255.0.0.0 120.0.0.2
Router(config)#ip route 122.0.0.0 255.0.0.0 120.0.0.2
Router(config)#ip route 60.0.0.0 255.0.0.0 120.0.0.2
Router(config)#ip route 20.0.0.0 255.0.0.0 80.0.0.1
Router(config)#ip route 110.0.0.0 255.0.0.0 80.0.0.1
Router(config)#ip route 192.168.2.0 255.255.255.0 80.0.0.1
Router(config)#ip route 70.0.0.0 255.0.0.0 80.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 80.0.0.1
Router(config)#no ip route 100.0.0.0 255.0.0.0 80.0.0.1
Router(config)#ip route 192.168.1.0 255.255.255.0 80.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 80.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 80.0.0.1
Router(config)#
Copy
Paste
Top

- Router 6


Router3(1)(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
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)#ip route 50.0.0.0 255.0.0.0 90.0.0.2
Router(config)#ip route 122.0.0.0 255.0.0.0 90.0.0.2
Router(config)#ip route 60.0.0.0 255.0.0.0 90.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 80.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 20.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 110.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 192.168.2.0 255.255.255.0 120.0.0.1
Router(config)#ip route 70.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 192.168.1.0 255.255.255.0 120.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 120.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 120.0.0.1
Router(config)#
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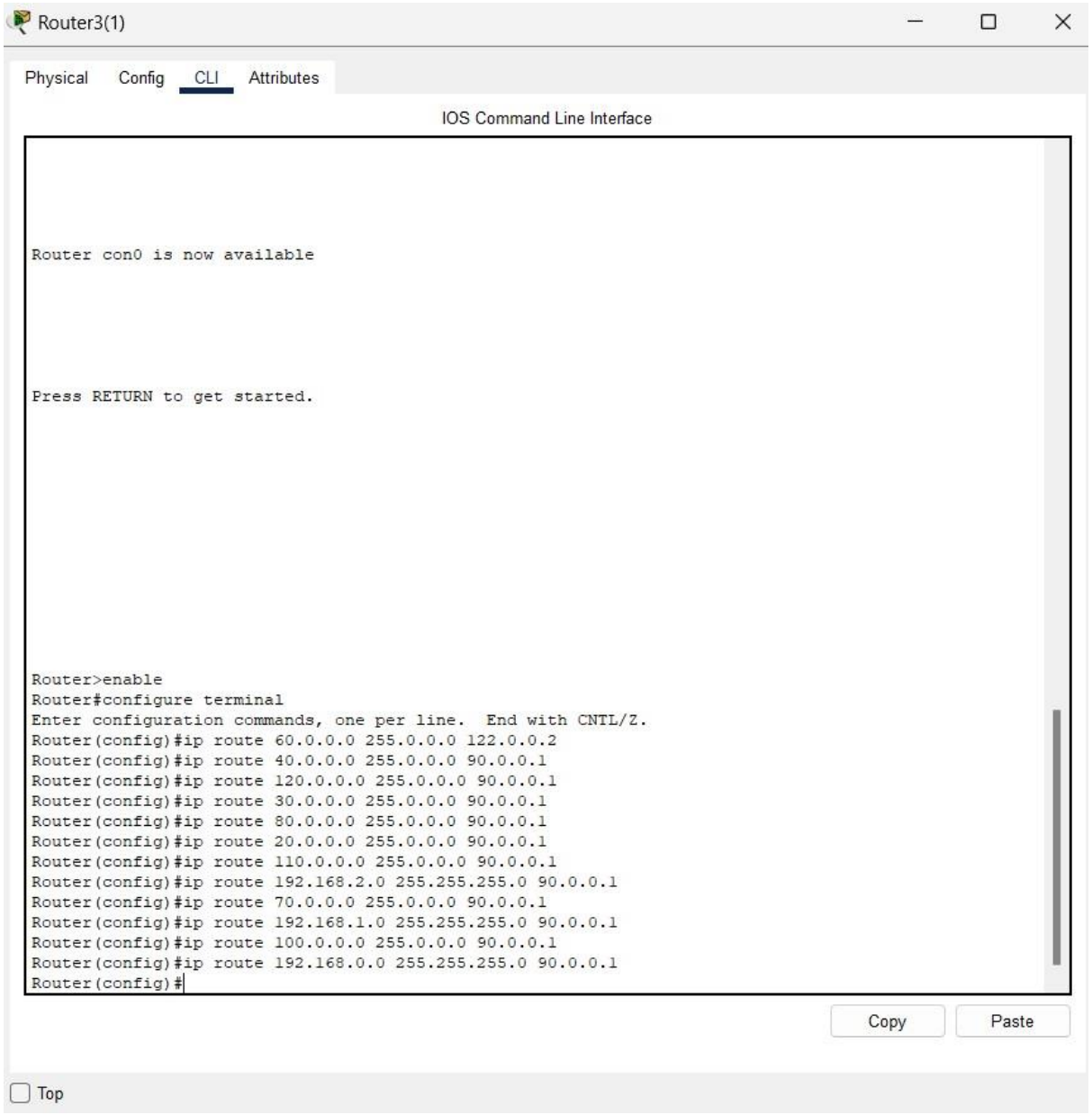
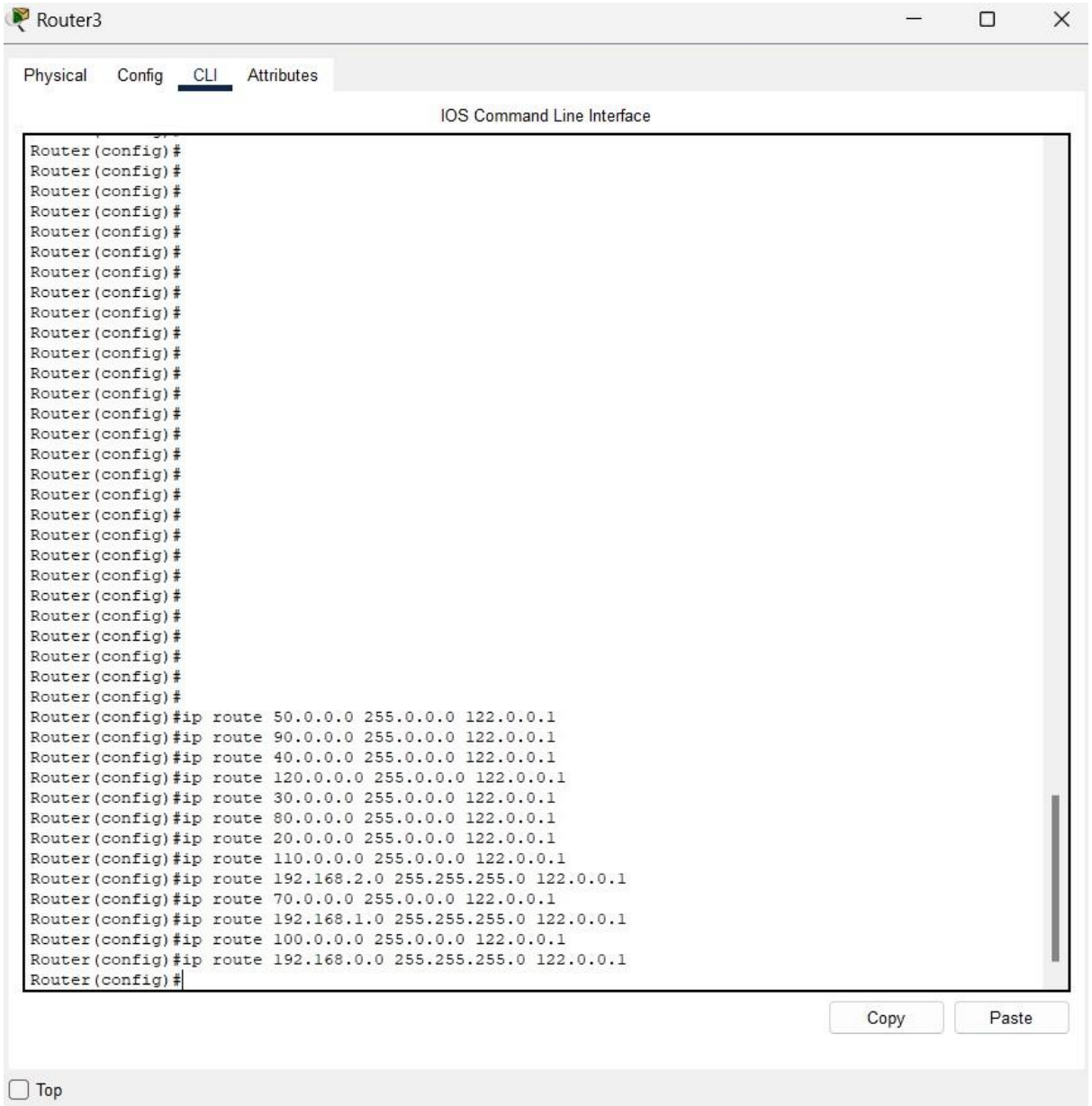
Top

- Router 7


Router3(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
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)#ip route 60.0.0.0 255.0.0.0 122.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 120.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 30.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 80.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 20.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 110.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 192.168.2.0 255.255.255.0 90.0.0.1
Router(config)#ip route 70.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 192.168.1.0 255.255.255.0 90.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 90.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 90.0.0.1
Router(config)#
Copy
Paste
Top

- Router 8


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
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Router(config)#
Router(config)#
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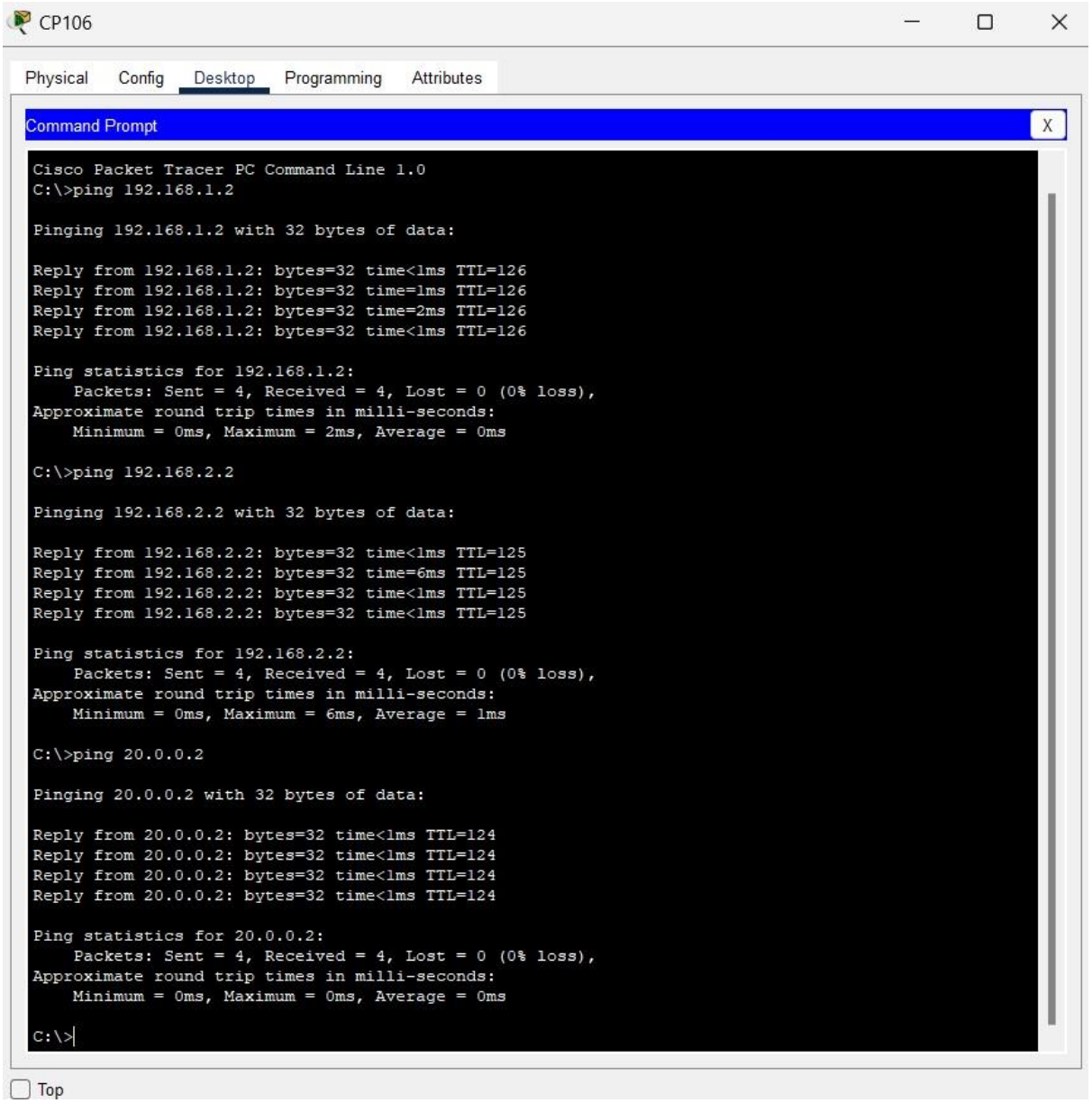
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#ip route 50.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 90.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 40.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 120.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 30.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 80.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 20.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 110.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 192.168.2.0 255.255.255.0 122.0.0.1
Router(config)#ip route 70.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 192.168.1.0 255.255.255.0 122.0.0.1
Router(config)#ip route 100.0.0.0 255.0.0.0 122.0.0.1
Router(config)#ip route 192.168.0.0 255.255.255.0 122.0.0.1
Router(config)#
Copy
Paste
Top

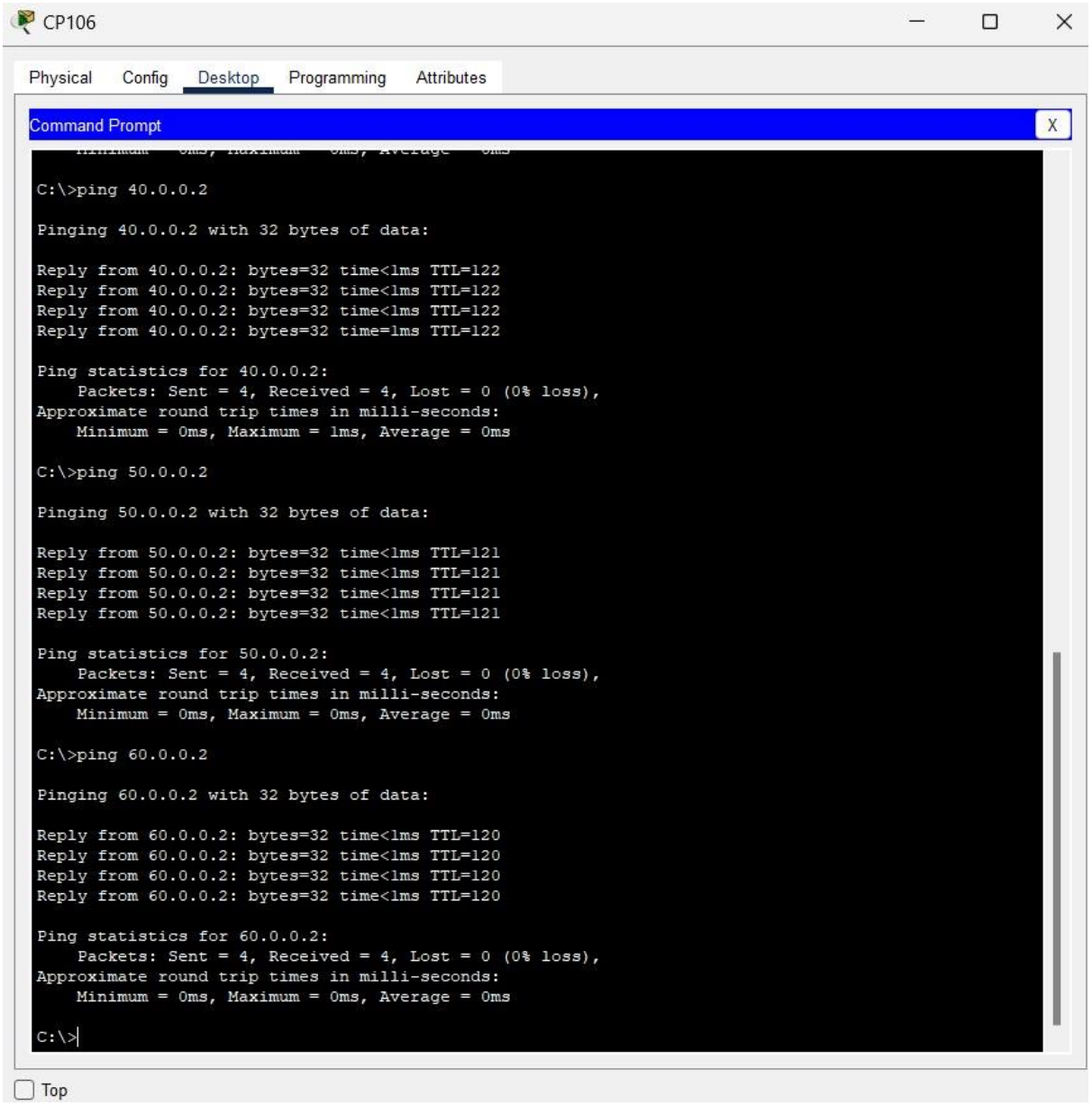
Communication Between LANs

The successful ping test verifies that every Local Area Network (LAN) located across eight floors communicates without problems. Every Local Area Network which has its designated classful IP range achieves successful ICMP echo communication with all other networks in the building. The established static routing protocol maintains predetermined network routes to enable efficient floor-to-floor data connection. All devices on the Floors 1-3 Class C private network possess a dual capability for intra-network communication as well as external connectivity to the Class A public network devices that exist on Floors 4-8 through router configuration. The bus topology successfully links all routers to facilitate constant data transmission which provides swift and dependable network connections. Network design and routing effectiveness is verified when packets sent from various floors reach all intended destinations without suffering any losses according to ping test results.

- From LAN 1

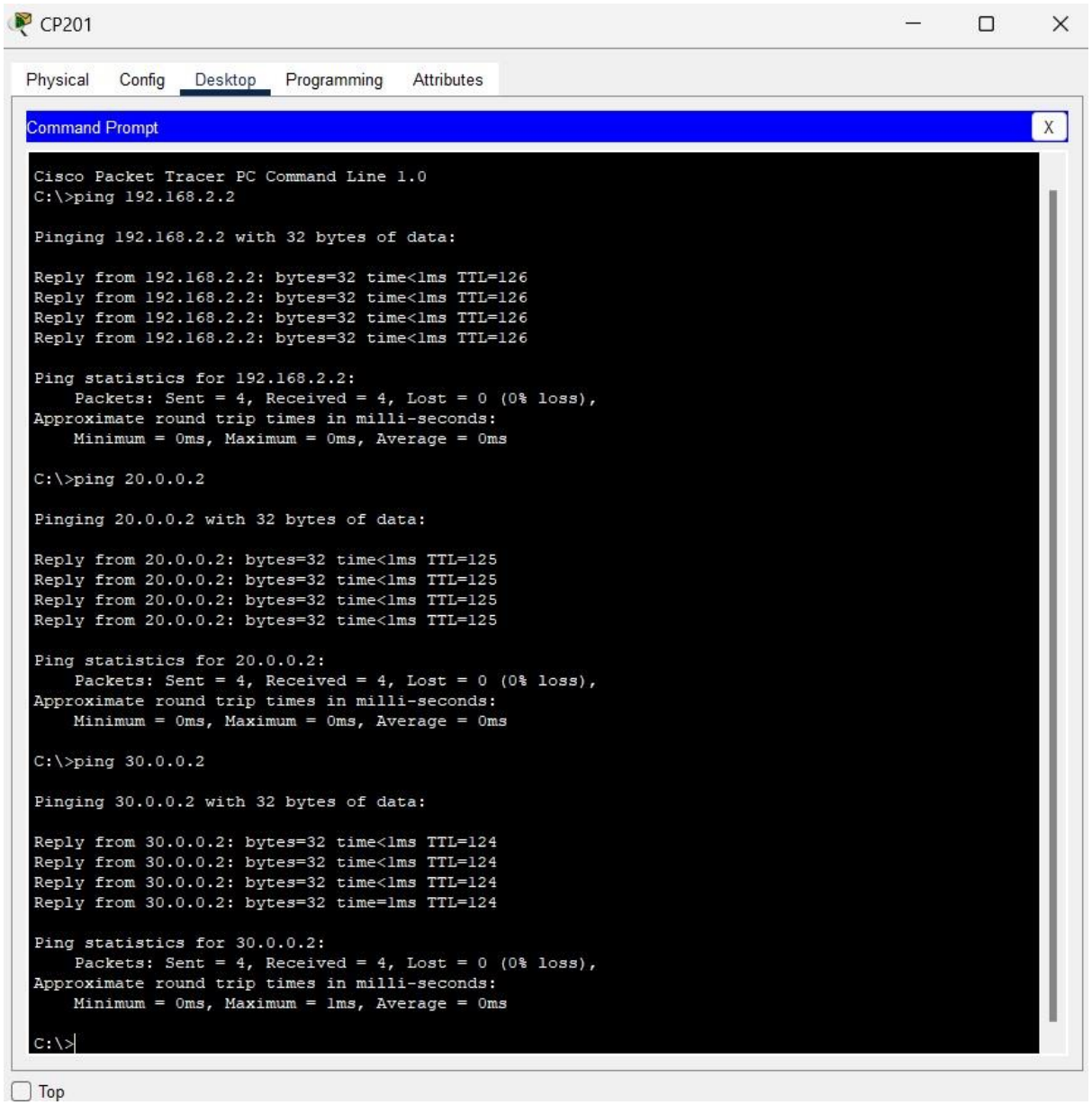


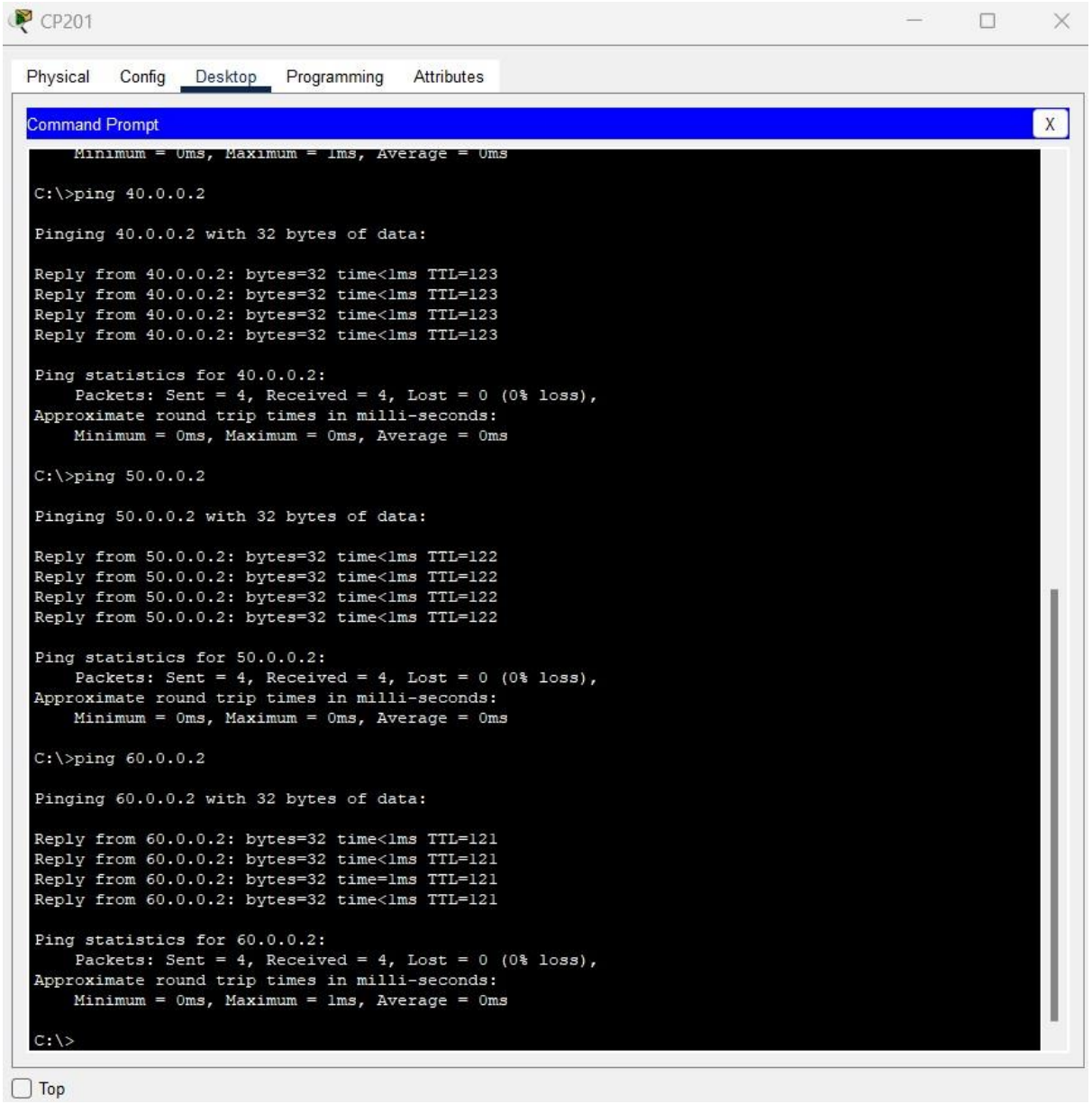

```
C:\>ping 30.0.0.2

Pinging 30.0.0.2 with 32 bytes of data:

Reply from 30.0.0.2: bytes=32 time<1ms TTL=123
Reply from 30.0.0.2: bytes=32 time<1ms TTL=123
Reply from 30.0.0.2: bytes=32 time<1ms TTL=123
Reply from 30.0.0.2: bytes=32 time<1ms TTL=123

Ping statistics for 30.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```


CP106
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time<1ms TTL=122
Reply from 40.0.0.2: bytes=32 time<1ms TTL=122
Reply from 40.0.0.2: bytes=32 time<1ms TTL=122
Reply from 40.0.0.2: bytes=32 time=1ms TTL=122
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 50.0.0.2
Pinging 50.0.0.2 with 32 bytes of data:
Reply from 50.0.0.2: bytes=32 time<1ms TTL=121
Reply from 50.0.0.2: bytes=32 time<1ms TTL=121
Reply from 50.0.0.2: bytes=32 time<1ms TTL=121
Reply from 50.0.0.2: bytes=32 time<1ms TTL=121
Ping statistics for 50.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time<1ms TTL=120
Reply from 60.0.0.2: bytes=32 time<1ms TTL=120
Reply from 60.0.0.2: bytes=32 time<1ms TTL=120
Reply from 60.0.0.2: bytes=32 time<1ms TTL=120
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top

• From LAN

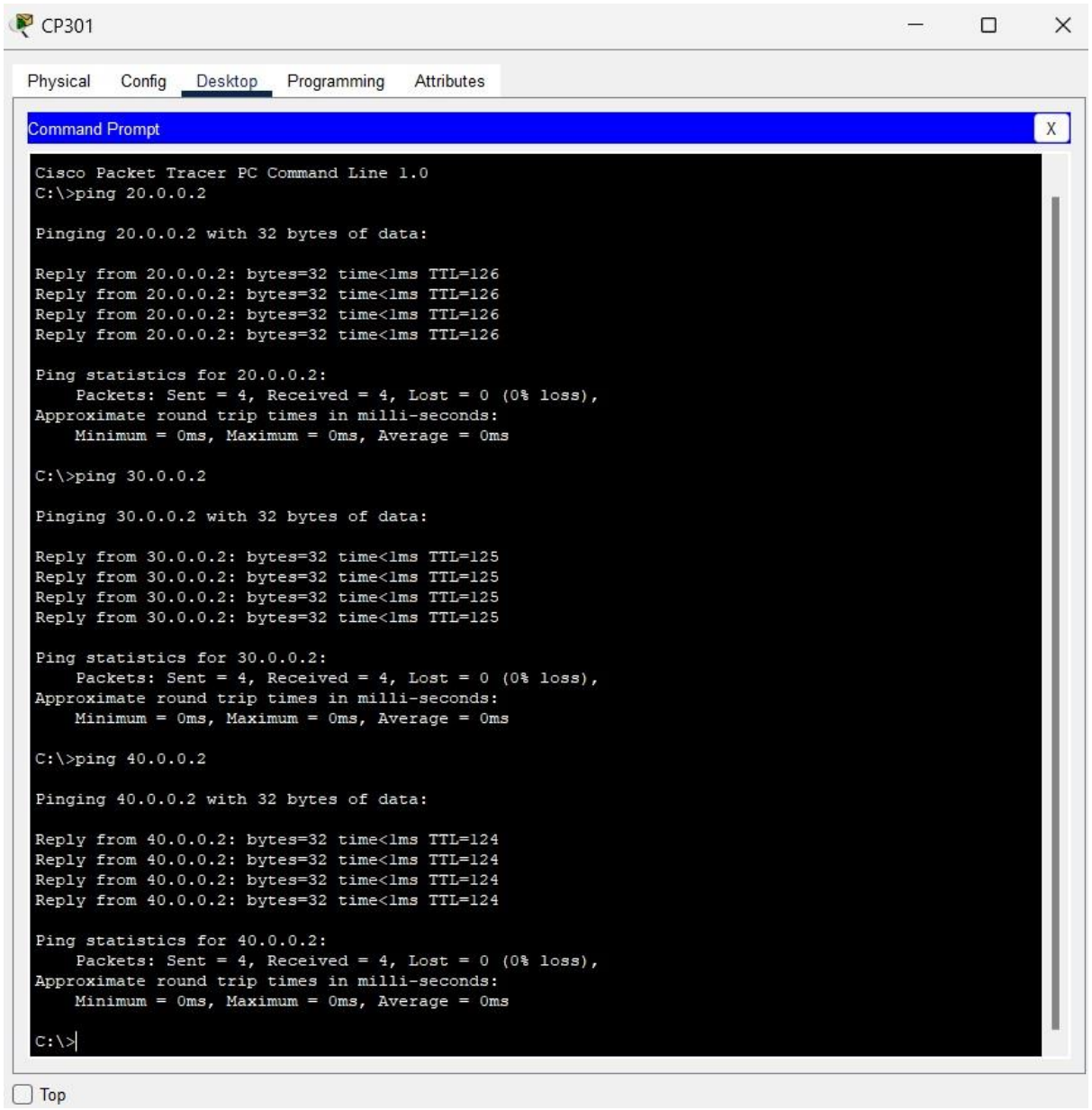
2

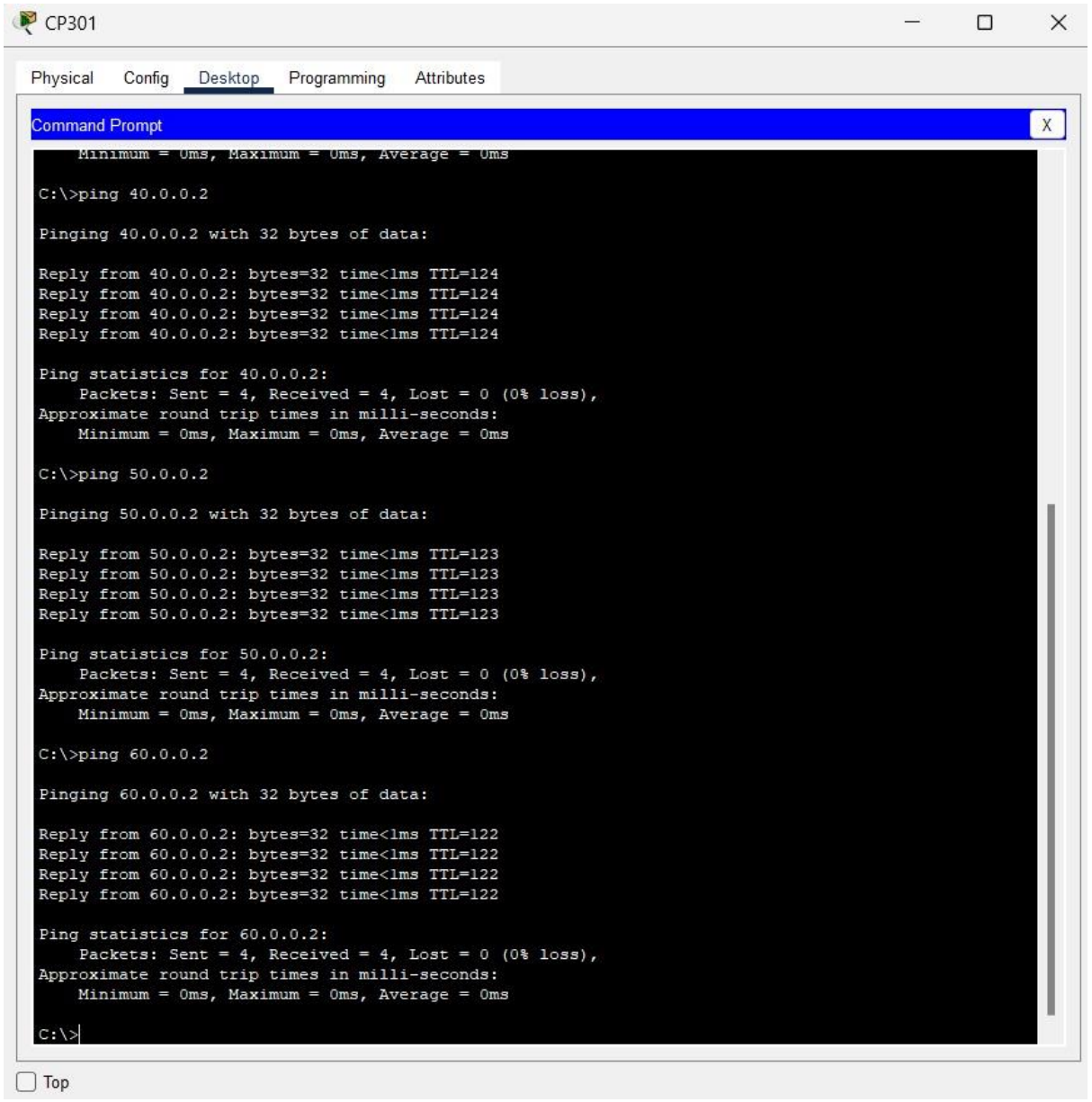

CP201
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.2
Pinging 192.168.2.2 with 32 bytes of data:
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Ping statistics for 192.168.2.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:
Reply from 20.0.0.2: bytes=32 time<1ms TTL=125
Reply from 20.0.0.2: bytes=32 time<1ms TTL=125
Reply from 20.0.0.2: bytes=32 time<1ms TTL=125
Reply from 20.0.0.2: bytes=32 time<1ms TTL=125
Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 30.0.0.2
Pinging 30.0.0.2 with 32 bytes of data:
Reply from 30.0.0.2: bytes=32 time<1ms TTL=124
Reply from 30.0.0.2: bytes=32 time<1ms TTL=124
Reply from 30.0.0.2: bytes=32 time<1ms TTL=124
Reply from 30.0.0.2: bytes=32 time=1ms TTL=124
Ping statistics for 30.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
Top


CP201
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time<1ms TTL=123
Reply from 40.0.0.2: bytes=32 time<1ms TTL=123
Reply from 40.0.0.2: bytes=32 time<1ms TTL=123
Reply from 40.0.0.2: bytes=32 time<1ms TTL=123
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 50.0.0.2
Pinging 50.0.0.2 with 32 bytes of data:
Reply from 50.0.0.2: bytes=32 time<1ms TTL=122
Reply from 50.0.0.2: bytes=32 time<1ms TTL=122
Reply from 50.0.0.2: bytes=32 time<1ms TTL=122
Reply from 50.0.0.2: bytes=32 time<1ms TTL=122
Ping statistics for 50.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time<1ms TTL=121
Reply from 60.0.0.2: bytes=32 time<1ms TTL=121
Reply from 60.0.0.2: bytes=32 time=1ms TTL=121
Reply from 60.0.0.2: bytes=32 time<1ms TTL=121
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
Top

• From LAN

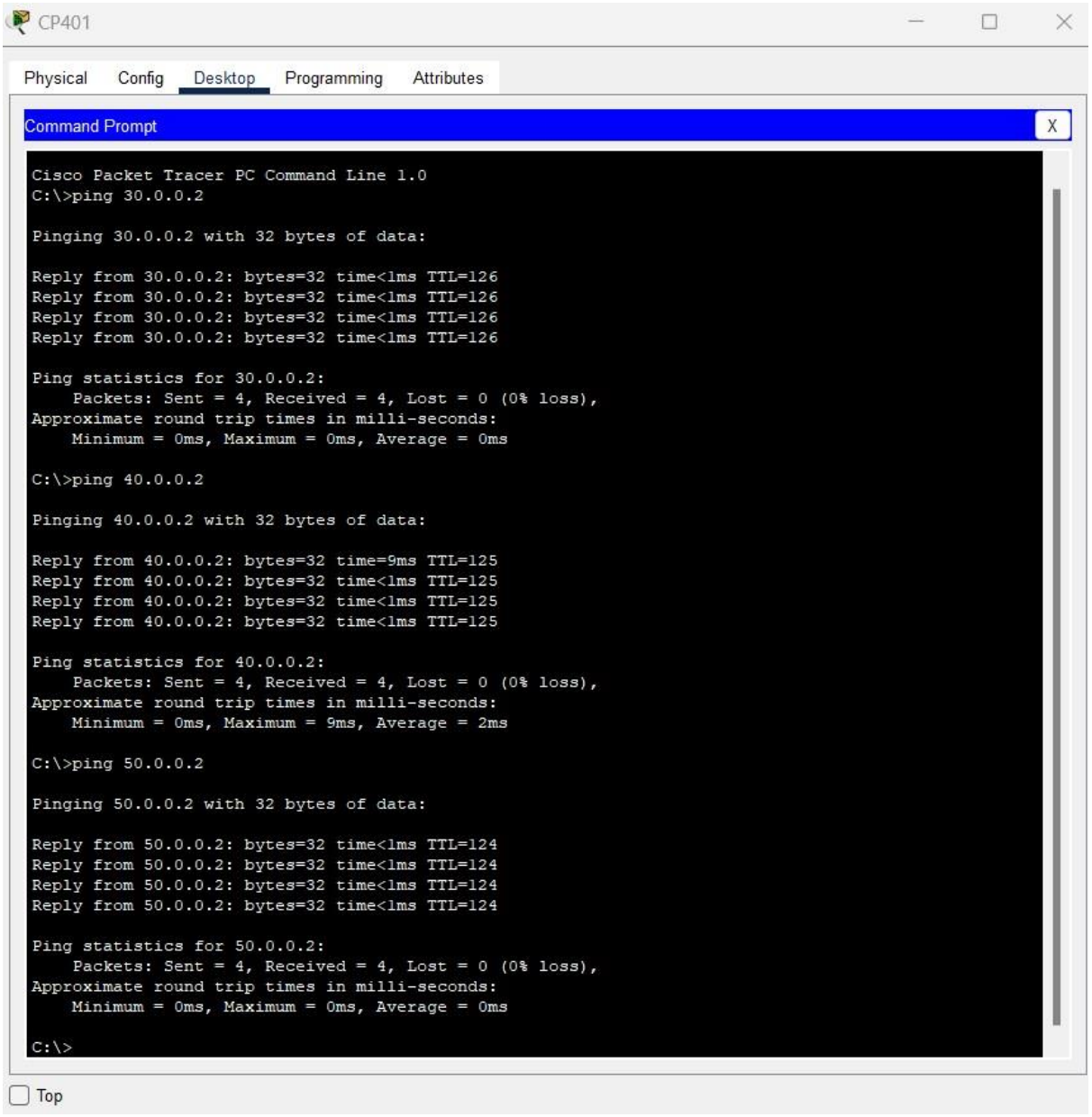
3

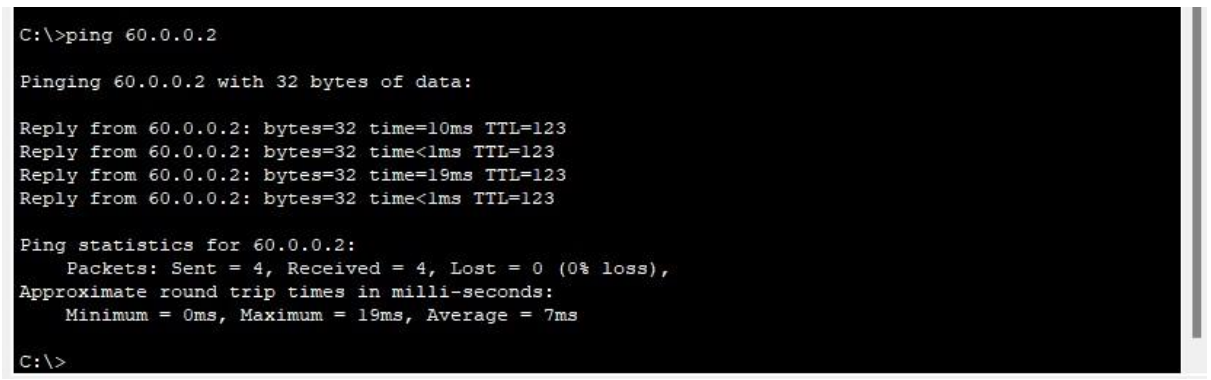

CP301
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 20.0.0.2
Pinging 20.0.0.2 with 32 bytes of data:
Reply from 20.0.0.2: bytes=32 time<1ms TTL=126
Reply from 20.0.0.2: bytes=32 time<1ms TTL=126
Reply from 20.0.0.2: bytes=32 time<1ms TTL=126
Reply from 20.0.0.2: bytes=32 time<1ms TTL=126
Ping statistics for 20.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 30.0.0.2
Pinging 30.0.0.2 with 32 bytes of data:
Reply from 30.0.0.2: bytes=32 time<1ms TTL=125
Reply from 30.0.0.2: bytes=32 time<1ms TTL=125
Reply from 30.0.0.2: bytes=32 time<1ms TTL=125
Reply from 30.0.0.2: bytes=32 time<1ms TTL=125
Ping statistics for 30.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top


CP301
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Reply from 40.0.0.2: bytes=32 time<1ms TTL=124
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 50.0.0.2
Pinging 50.0.0.2 with 32 bytes of data:
Reply from 50.0.0.2: bytes=32 time<1ms TTL=123
Reply from 50.0.0.2: bytes=32 time<1ms TTL=123
Reply from 50.0.0.2: bytes=32 time<1ms TTL=123
Reply from 50.0.0.2: bytes=32 time<1ms TTL=123
Ping statistics for 50.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time<1ms TTL=122
Reply from 60.0.0.2: bytes=32 time<1ms TTL=122
Reply from 60.0.0.2: bytes=32 time<1ms TTL=122
Reply from 60.0.0.2: bytes=32 time<1ms TTL=122
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top

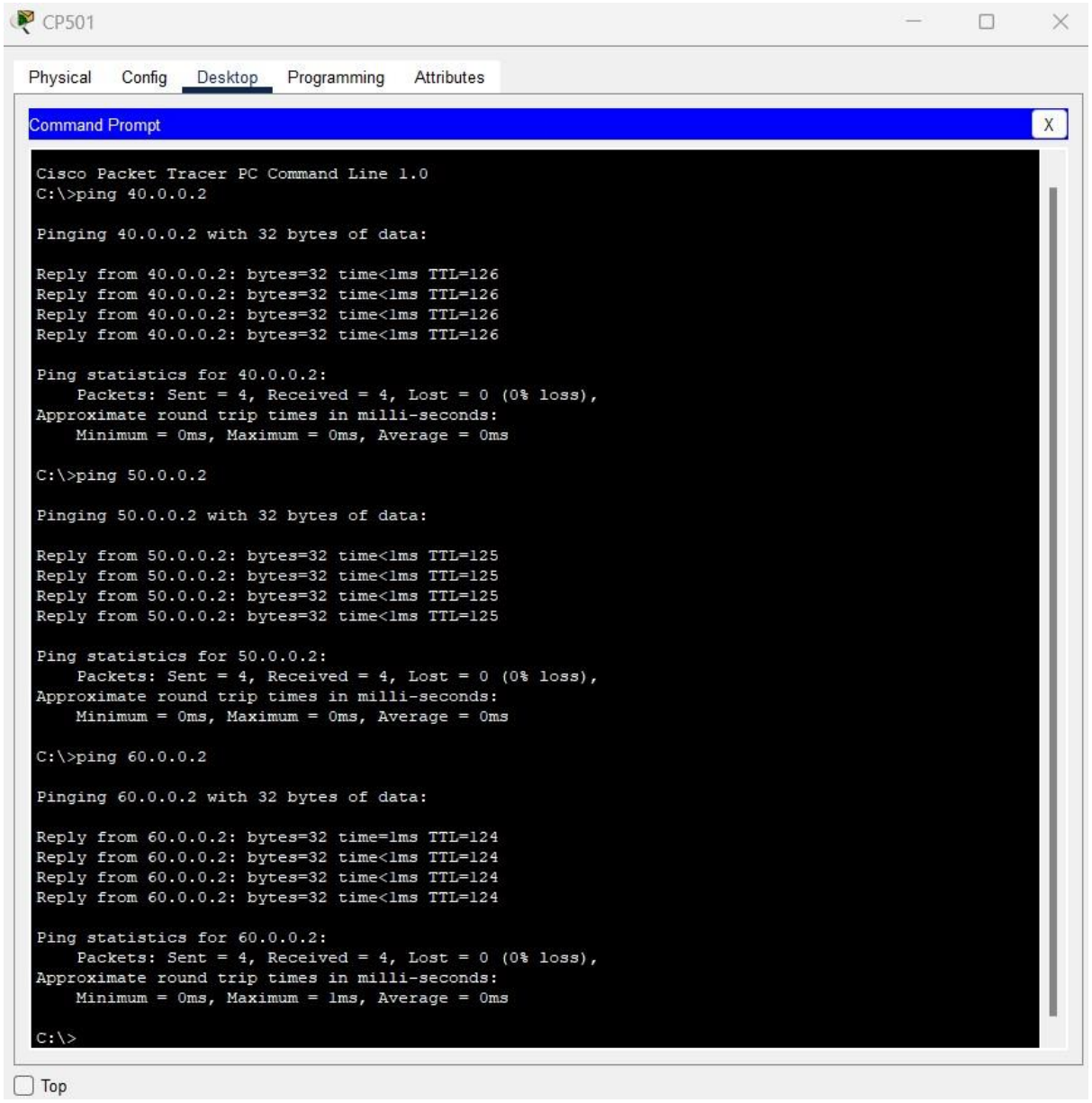
- From LAN

- From LAN 4

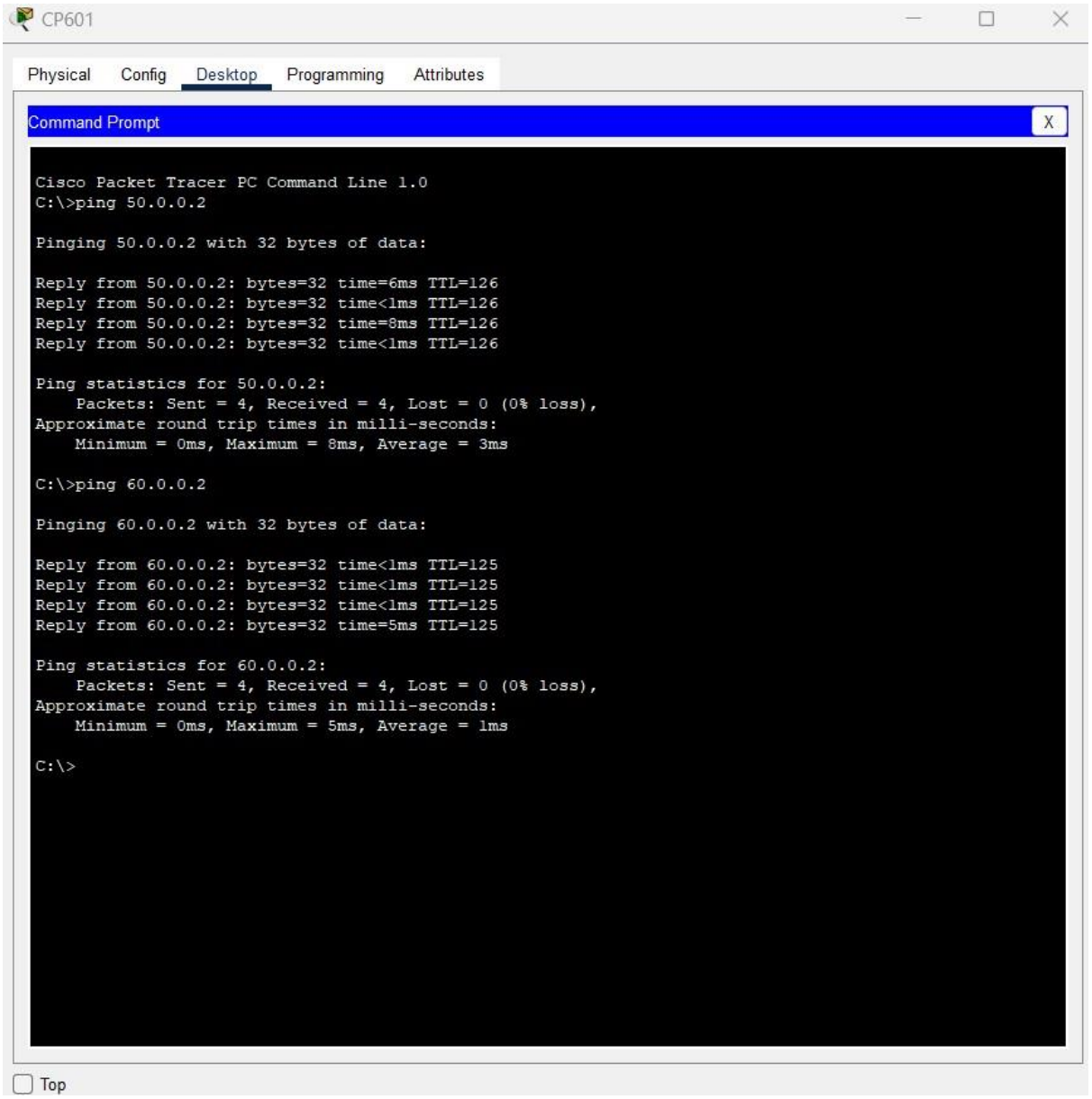

CP401
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 30.0.0.2
Pinging 30.0.0.2 with 32 bytes of data:
Reply from 30.0.0.2: bytes=32 time<1ms TTL=126
Reply from 30.0.0.2: bytes=32 time<1ms TTL=126
Reply from 30.0.0.2: bytes=32 time<1ms TTL=126
Reply from 30.0.0.2: bytes=32 time<1ms TTL=126
Ping statistics for 30.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time=9ms TTL=125
Reply from 40.0.0.2: bytes=32 time<1ms TTL=125
Reply from 40.0.0.2: bytes=32 time<1ms TTL=125
Reply from 40.0.0.2: bytes=32 time<1ms TTL=125
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 9ms, Average = 2ms
C:\>ping 50.0.0.2
Pinging 50.0.0.2 with 32 bytes of data:
Reply from 50.0.0.2: bytes=32 time<1ms TTL=124
Reply from 50.0.0.2: bytes=32 time<1ms TTL=124
Reply from 50.0.0.2: bytes=32 time<1ms TTL=124
Reply from 50.0.0.2: bytes=32 time<1ms TTL=124
Ping statistics for 50.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top


C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time=10ms TTL=123
Reply from 60.0.0.2: bytes=32 time<1ms TTL=123
Reply from 60.0.0.2: bytes=32 time=19ms TTL=123
Reply from 60.0.0.2: bytes=32 time<1ms TTL=123
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 19ms, Average = 7ms
C:\>

- From LAN 5

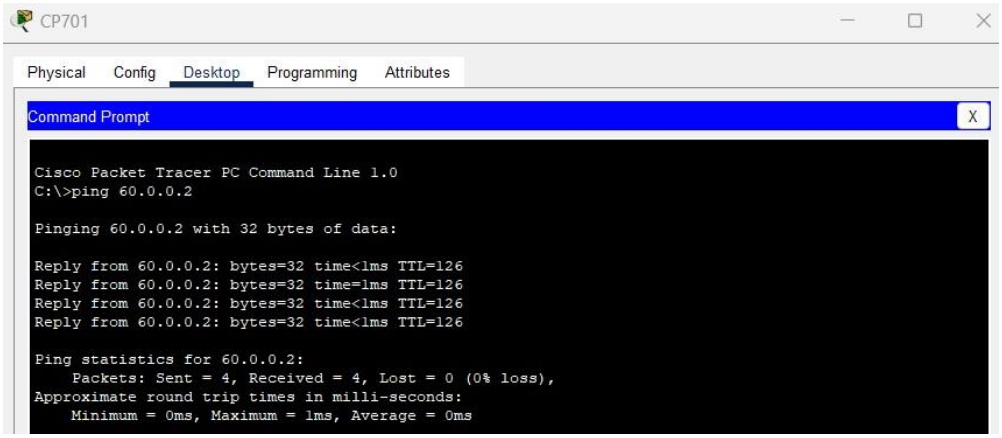

CP501
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 40.0.0.2
Pinging 40.0.0.2 with 32 bytes of data:
Reply from 40.0.0.2: bytes=32 time<1ms TTL=126
Reply from 40.0.0.2: bytes=32 time<1ms TTL=126
Reply from 40.0.0.2: bytes=32 time<1ms TTL=126
Reply from 40.0.0.2: bytes=32 time<1ms TTL=126
Ping statistics for 40.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 50.0.0.2
Pinging 50.0.0.2 with 32 bytes of data:
Reply from 50.0.0.2: bytes=32 time<1ms TTL=125
Reply from 50.0.0.2: bytes=32 time<1ms TTL=125
Reply from 50.0.0.2: bytes=32 time<1ms TTL=125
Reply from 50.0.0.2: bytes=32 time<1ms TTL=125
Ping statistics for 50.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time=1ms TTL=124
Reply from 60.0.0.2: bytes=32 time<1ms TTL=124
Reply from 60.0.0.2: bytes=32 time<1ms TTL=124
Reply from 60.0.0.2: bytes=32 time<1ms TTL=124
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
Top

- From LAN 6



- From LAN 7

- From LAN 7


CP701
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 60.0.0.2
Pinging 60.0.0.2 with 32 bytes of data:
Reply from 60.0.0.2: bytes=32 time<1ms TTL=126
Reply from 60.0.0.2: bytes=32 time=1ms TTL=126
Reply from 60.0.0.2: bytes=32 time<1ms TTL=126
Reply from 60.0.0.2: bytes=32 time<1ms TTL=126
Ping statistics for 60.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms

Ping Table

Test ID	From	To	Result
101	LAN 1	LAN 2	Successful
102	LAN 1	LAN 3	Successful
103	LAN 1	LAN 4	Successful
104	LAN 1	LAN 5	Successful
105	LAN 1	LAN 6	Successful
106	LAN 1	LAN 7	Successful
107	LAN 1	LAN 8	Successful
108	LAN 2	LAN 3	Successful
109	LAN 2	LAN 4	Successful
110	LAN 2	LAN 5	Successful
111	LAN 2	LAN 6	Successful
112	LAN 2	LAN 7	Successful
113	LAN 2	LAN 8	Successful
114	LAN 3	LAN 4	Successful
115	LAN 3	LAN 5	Successful
116	LAN 3	LAN 6	Successful
117	LAN 3	LAN 7	Successful
118	LAN 3	LAN 8	Successful
119	LAN 4	LAN 5	Successful
120	LAN 4	LAN 6	Successful
121	LAN 4	LAN 7	Successful
122	LAN 4	LAN 8	Successful
123	LAN 5	LAN 6	Successful
124	LAN 5	LAN 7	Successful

125	LAN 5	LAN 8	Successful
126	LAN 6	LAN 7	Successful
127	LAN 6	LAN 8	Successful
128	LAN 7	LAN 8	Successful