CSE307

Internet Networking Essentials

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LOVELY PROFESSIONAL UNIVERSITY

GitHub Repository:

https://github.com/KOTHAPU/Internet-Networking

Overview

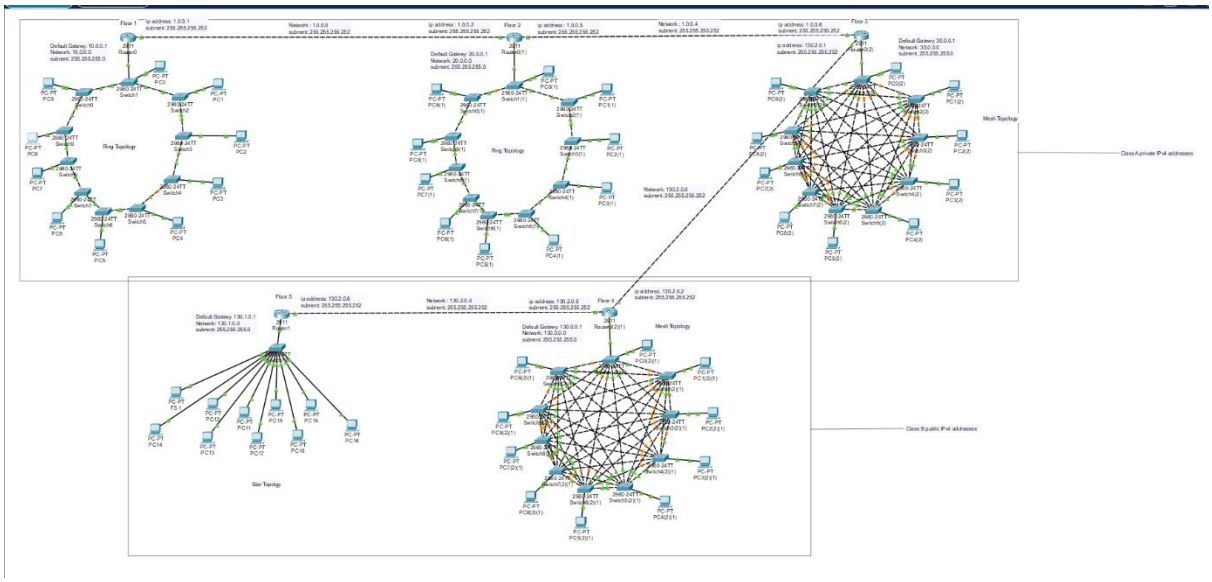
The five-floor office building of LT Network Solutions features a hybrid network architecture optimized for reliability, scalability, and seamless communication. The first two floors implement a ring topology, ensuring continuous data flow with built-in redundancy. The next two floors utilize a mesh topology, enhancing fault tolerance through direct device-to-device connections. The final floor follows a star topology, providing centralized management and simplified network maintenance.

For IP addressing, the first three floors are assigned Class A private IPv4 addresses, supporting internal operations with ample address space. Meanwhile, the remaining two floors use Class B public IPv4 addresses, enabling external connectivity while maintaining a structured allocation.

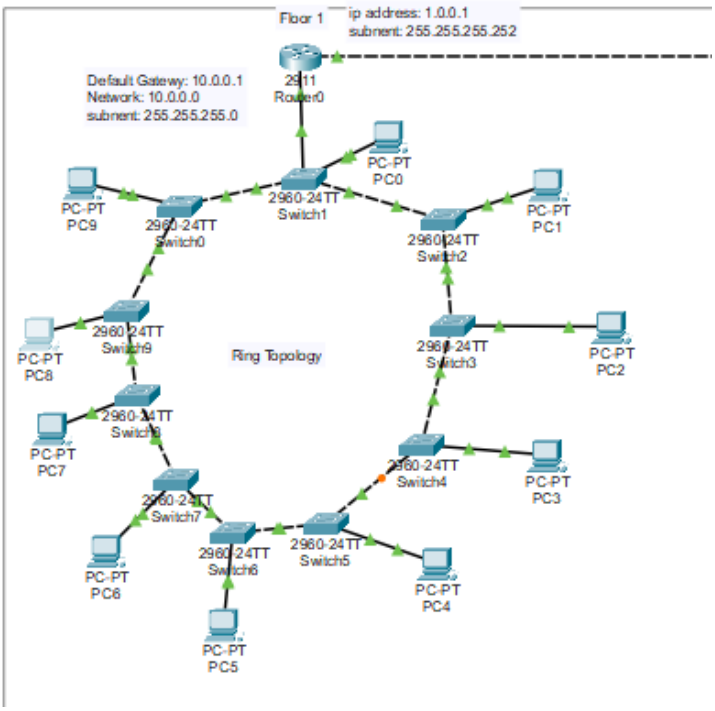
A static routing strategy is implemented for predictable and efficient inter-floor communication, eliminating unnecessary route changes. Strategic placement of routers, switches, and access points ensures optimal network performance. Each floor is equipped with dedicated default gateways and well-defined static routes, allowing smooth inter-department connectivity. This structured approach delivers a secure, high-performance, and scalable networking solution for the organization.

Physical Scenario

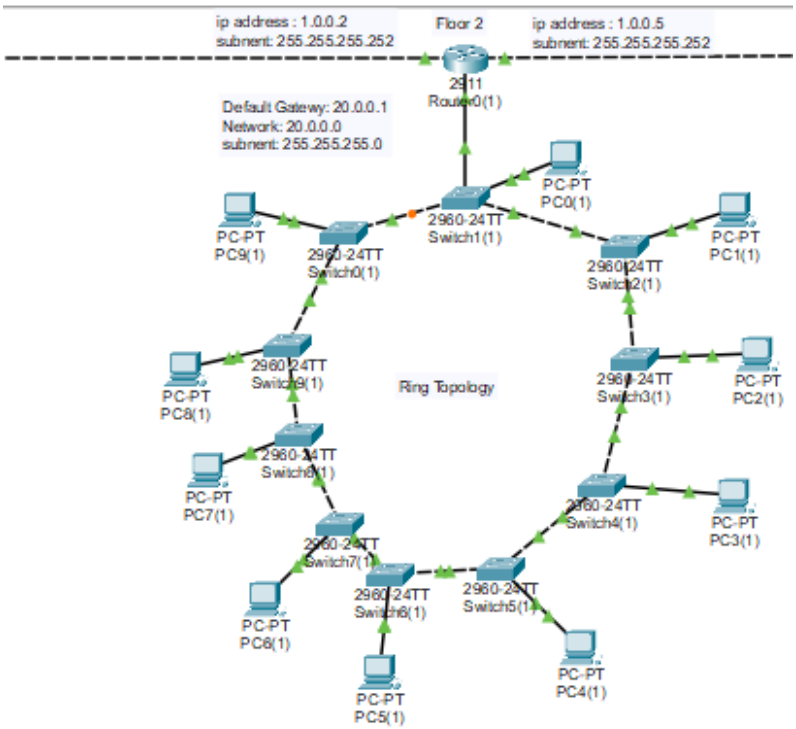
The five-floor office building integrates a hybrid network topology to ensure efficient communication and scalability. Each floor consists of 10 computers, strategically connected for reliability. The first two floors implement a ring topology, enabling continuous data flow and redundancy for improved network resilience. The next two floors adopt a mesh topology, where direct device-to-device connections enhance fault tolerance and reliability. The final floor utilizes a star topology, connecting all computers to a central switch for simplified management and expansion. A classful IP addressing scheme assigns Class A private addresses to the first three floors and Class B public addresses to the last two. This structured approach provides seamless connectivity, high performance, and scalability throughout the office network.



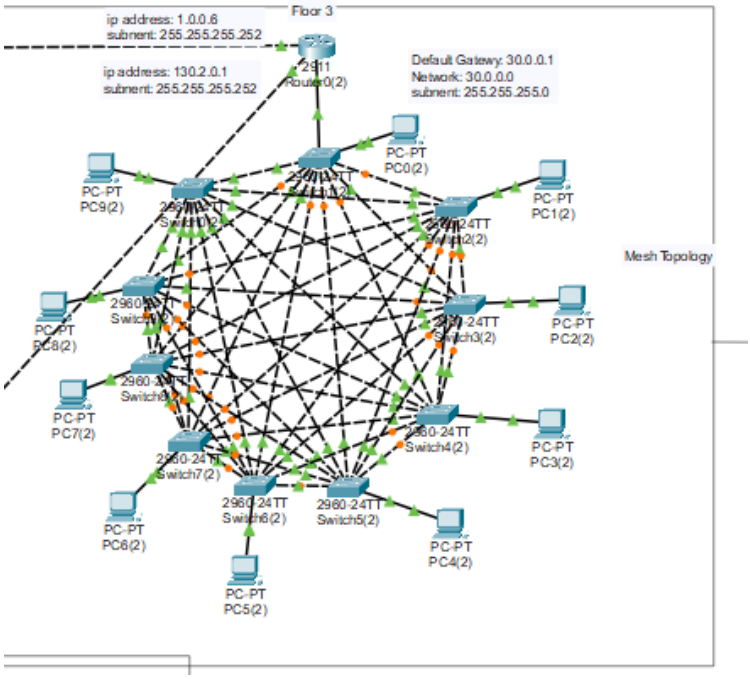
- 1st Floor (Lan 1)



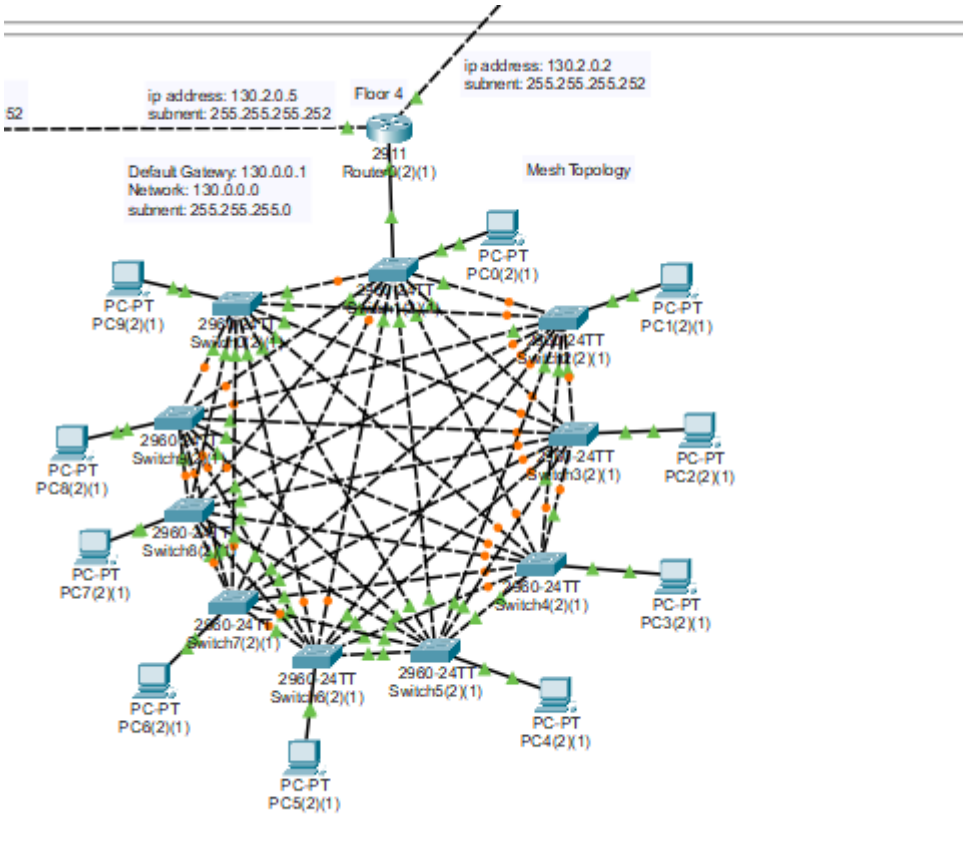
- 2nd Floor (Lan 2)



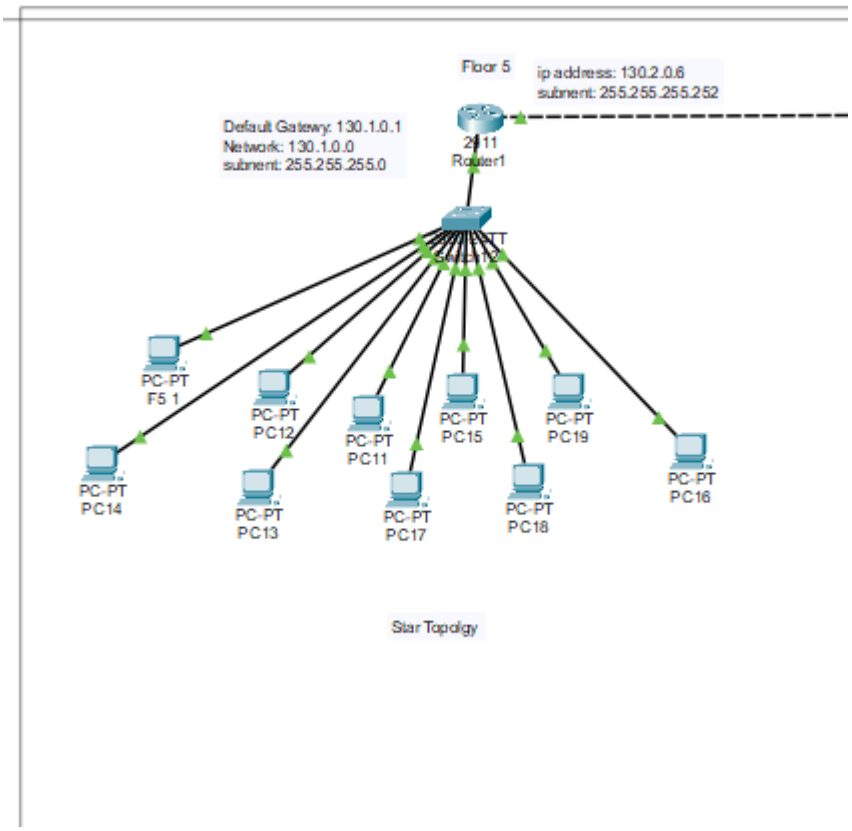
- 3rd Floor (Lan 3)



- 4th Floor (Lan 4)



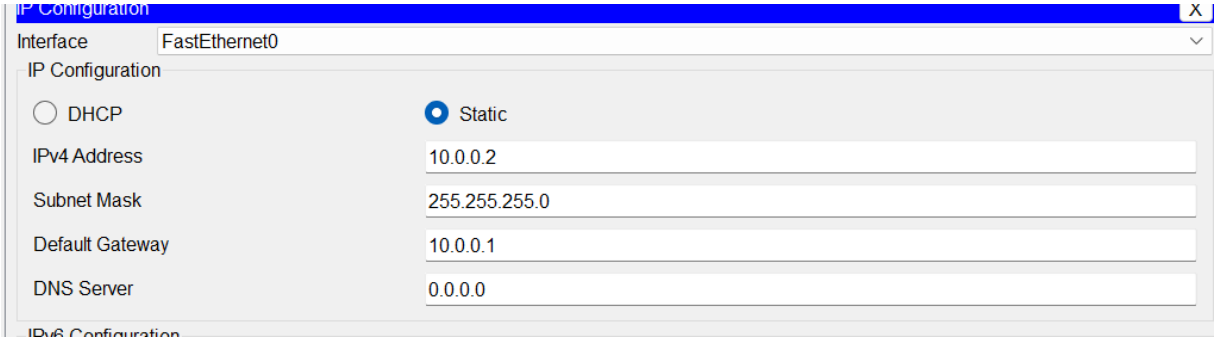
- 5th Floor (Lan 5)



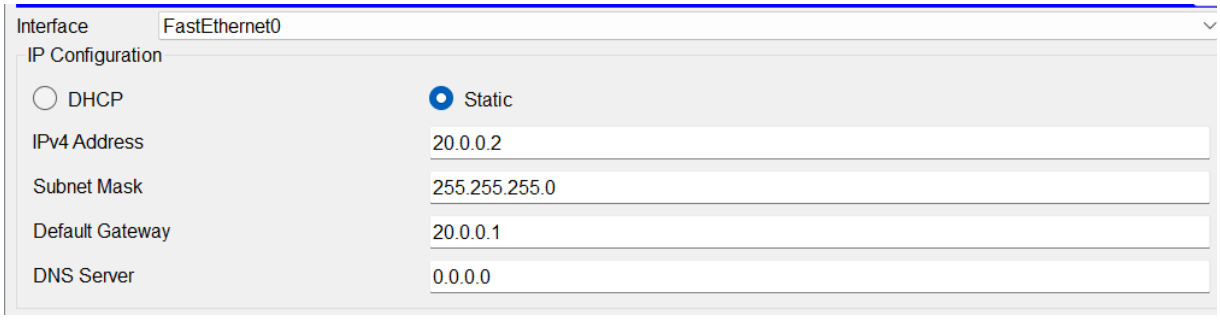
IP Address Allocation

The organization has implemented a structured IP addressing scheme to ensure seamless network connectivity across the five-floor office building. The first three floors utilize Class A private IPv4 addresses, providing secure and exclusive addressing for 10 computers per floor while maintaining internal communication efficiency. The remaining two floors are assigned Class B public IPv4 addresses, enabling broader external connectivity. Unique IP allocation ensures smooth data transmission across all floors, optimizing network performance, scalability, and reliability throughout the organization.

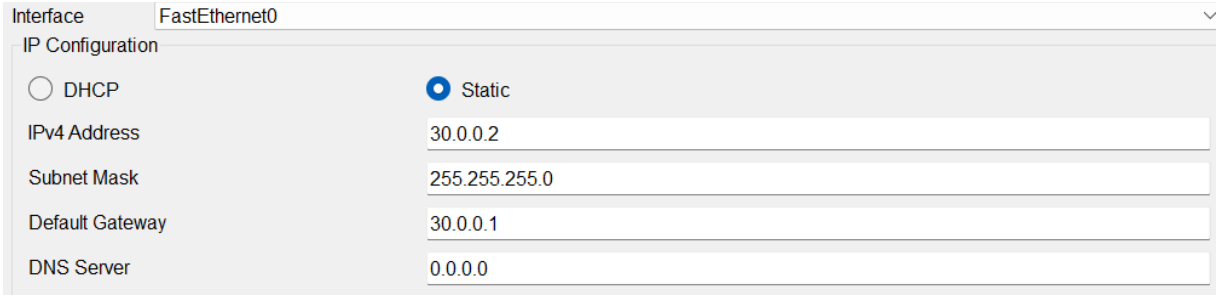
- LAN 1 (Network Address: 10.0.0.0)



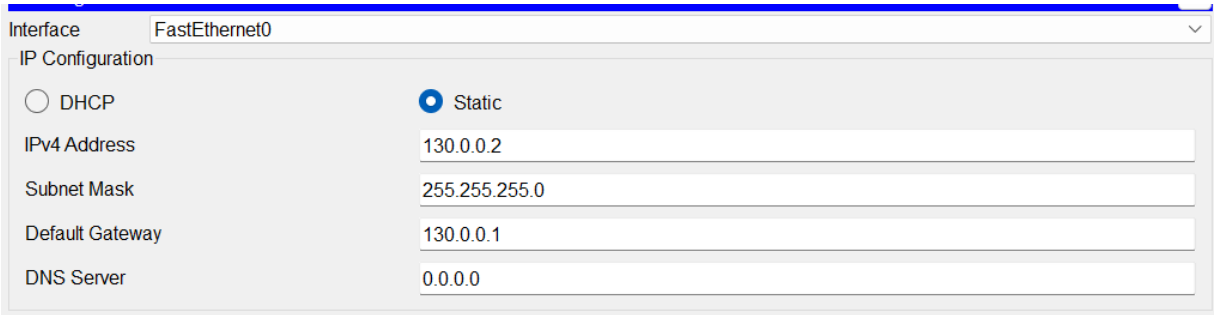
- LAN 2 (Network Address:20.0.0.0)



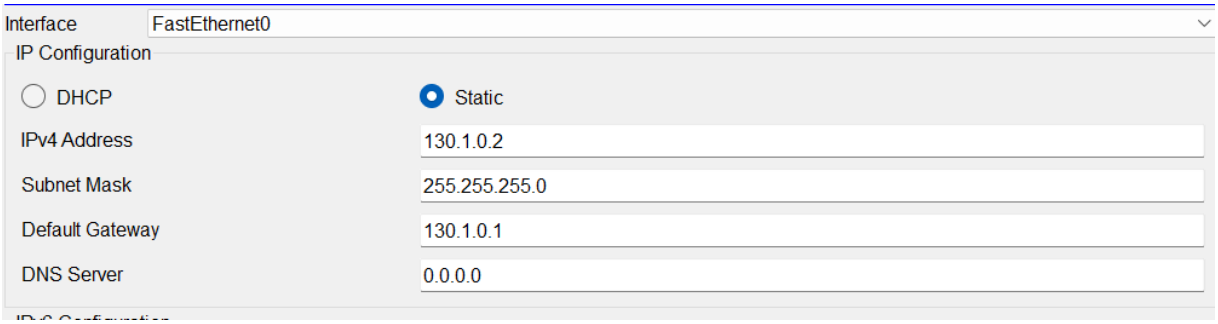
- LAN 3 (Network Address: 30.0.0.0)



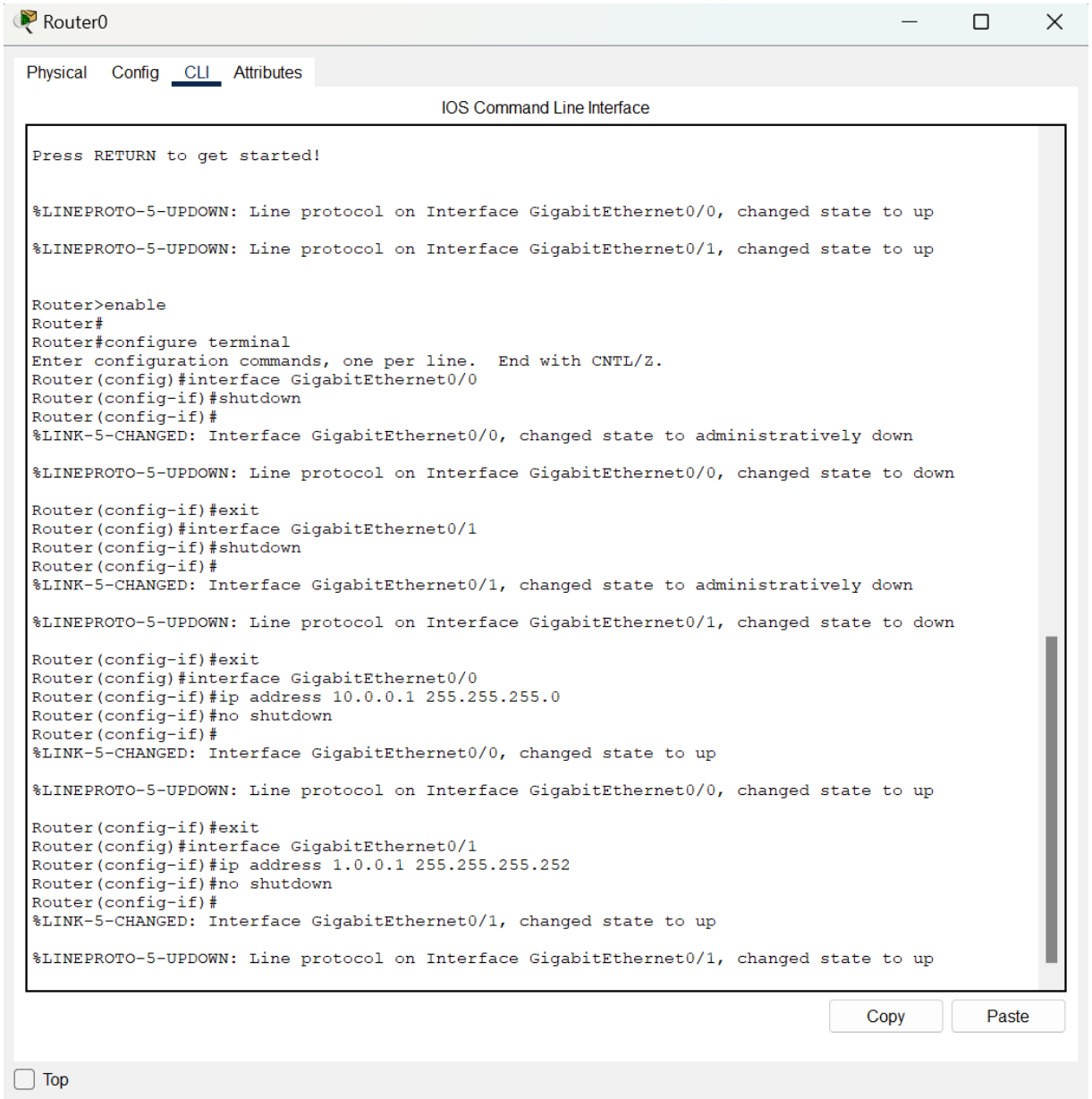
- LAN 4 (Network Address: 130.0.0.0)



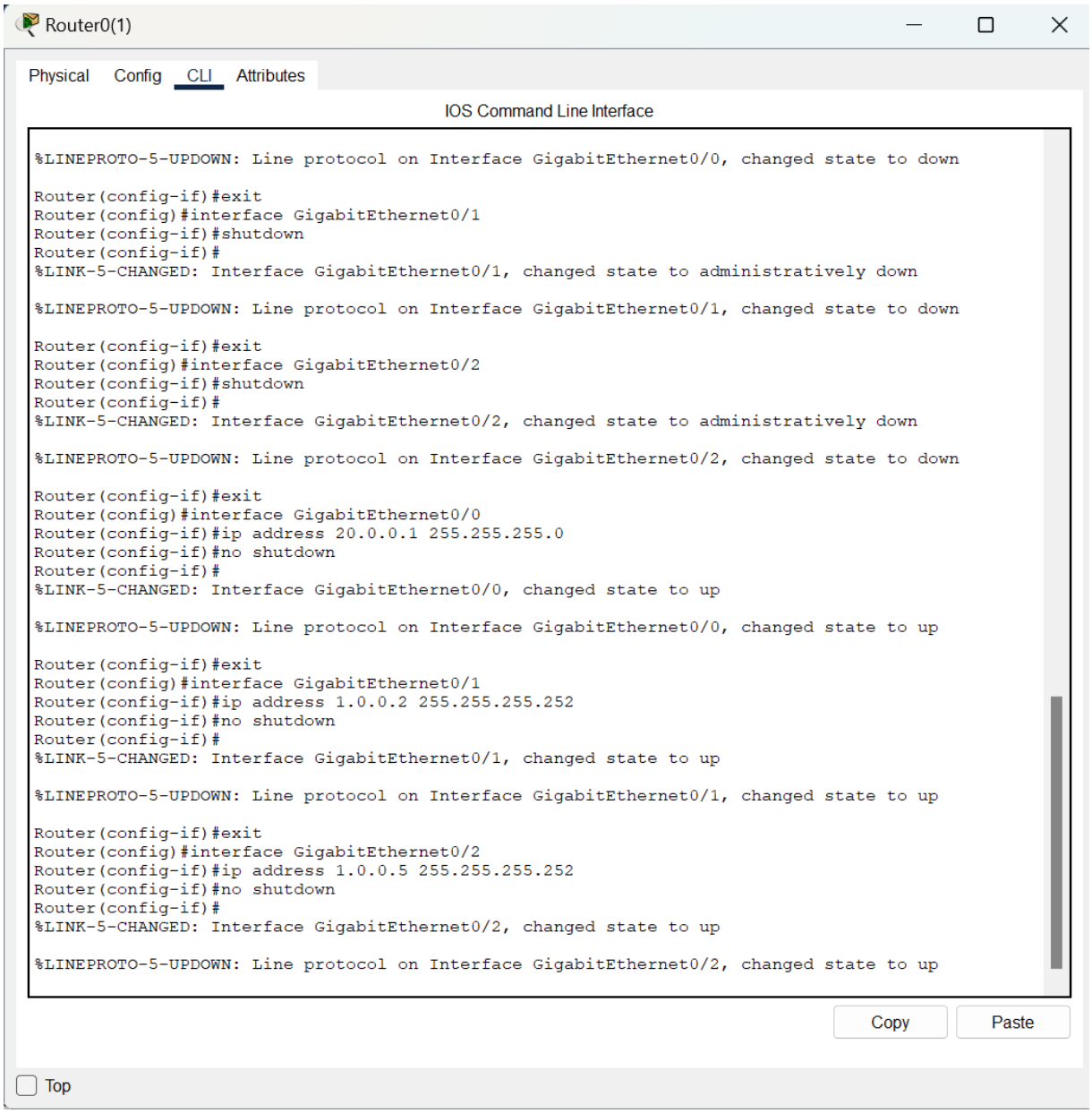
- LAN 5 (Network Address: 130.1.0.0)



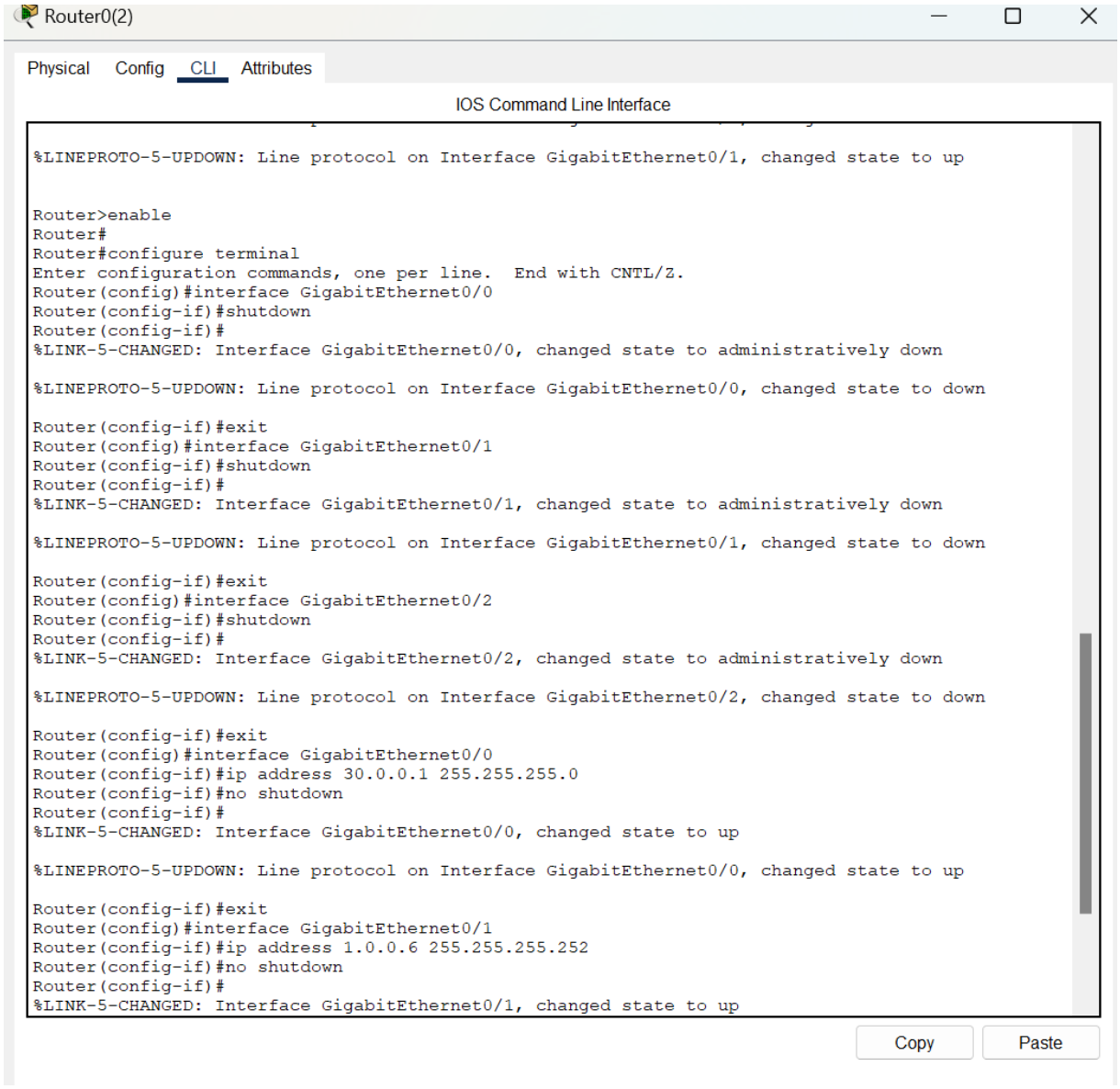
- Router 1



- Router 2


Router0(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 20.0.0.1 255.255.255.0
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)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 1.0.0.2 255.255.255.252
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)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#ip address 1.0.0.5 255.255.255.252
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
Copy
Paste
Top

- Router 3


Router0(2)
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 30.0.0.1 255.255.255.0
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)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 1.0.0.6 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
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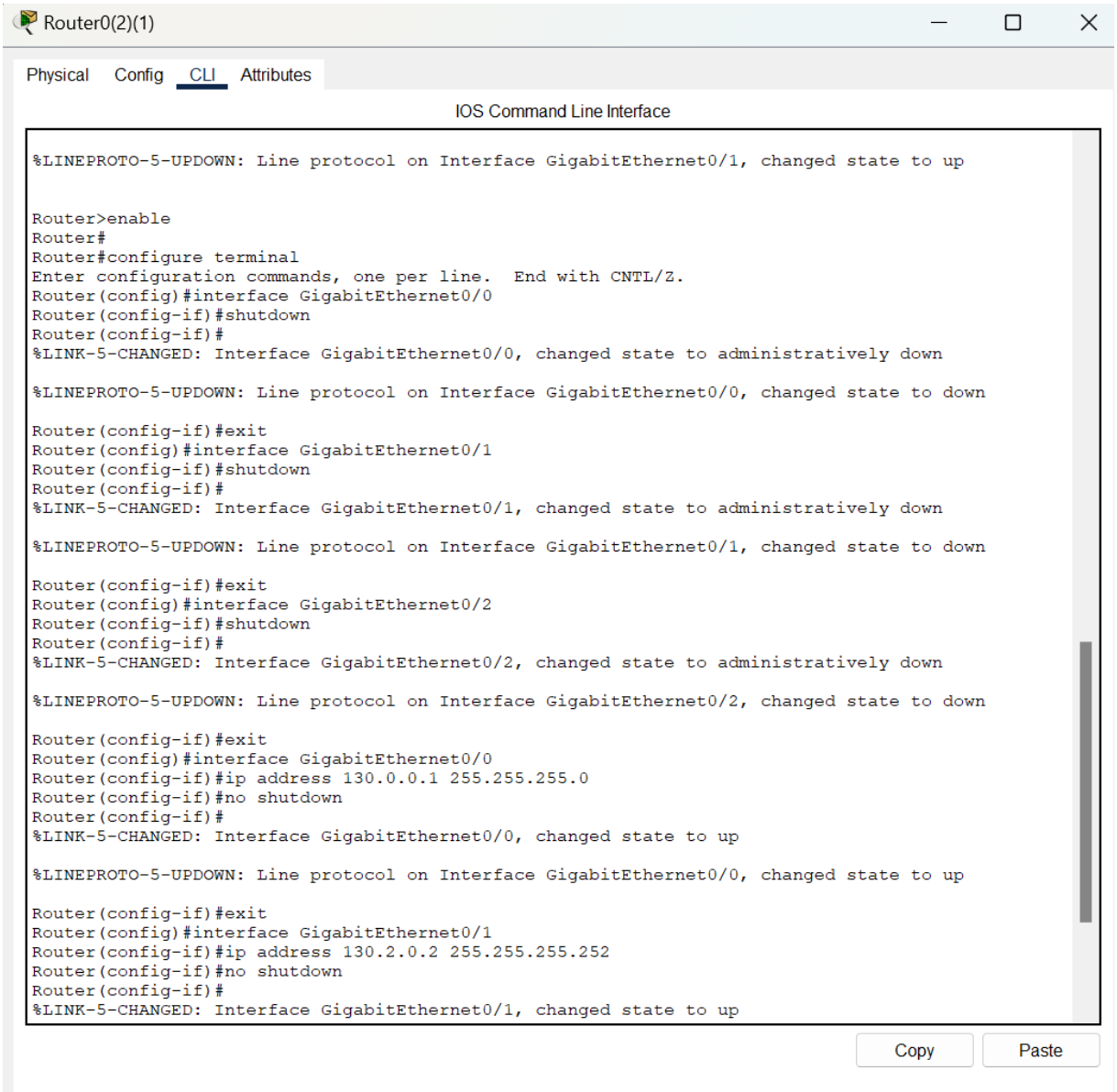
- Router 4


Router0(2)(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 130.0.0.1 255.255.255.0
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)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 130.2.0.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
Copy
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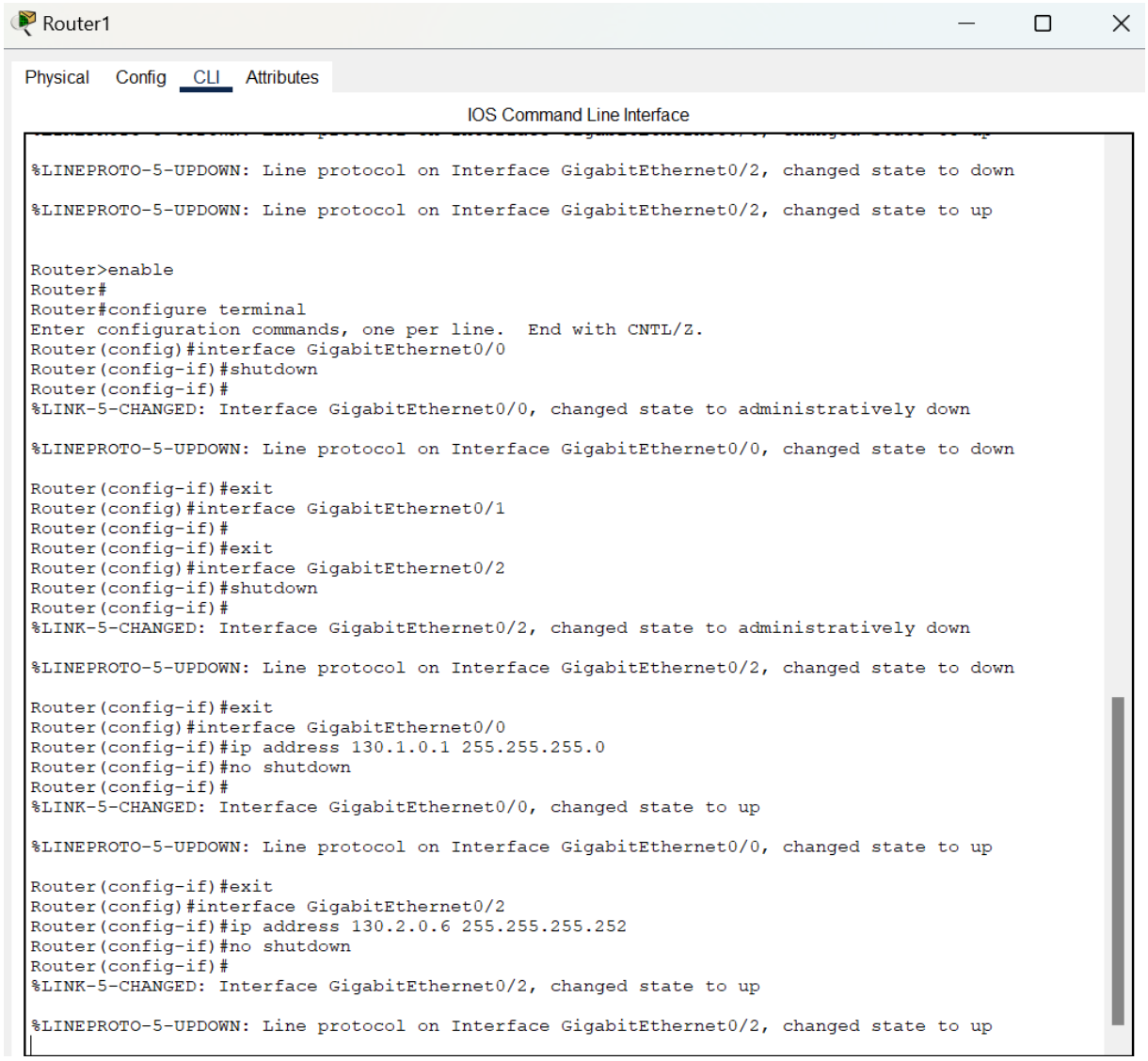
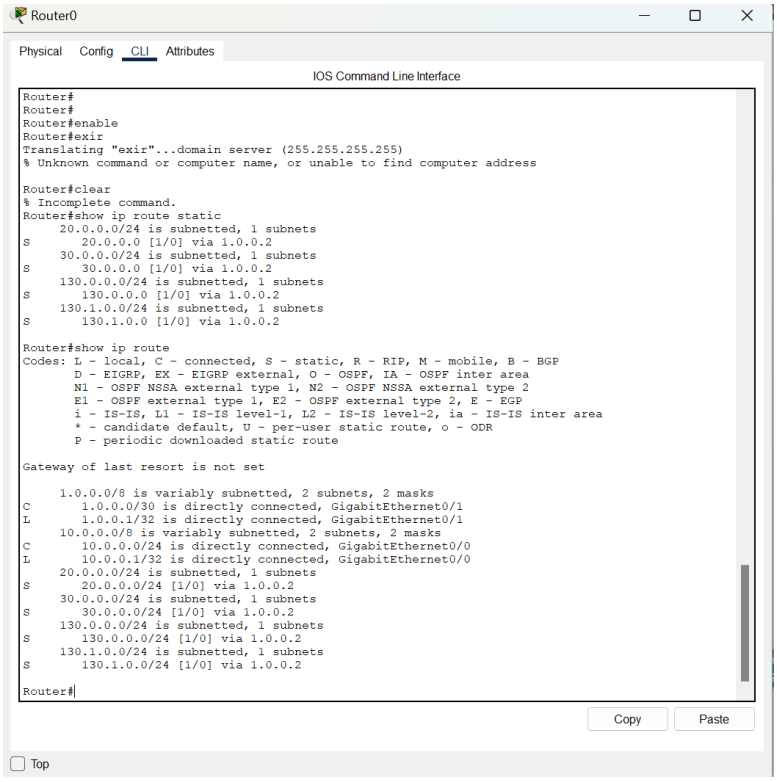
- Router 5


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 130.1.0.1 255.255.255.0
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)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#ip address 130.2.0.6 255.255.255.252
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

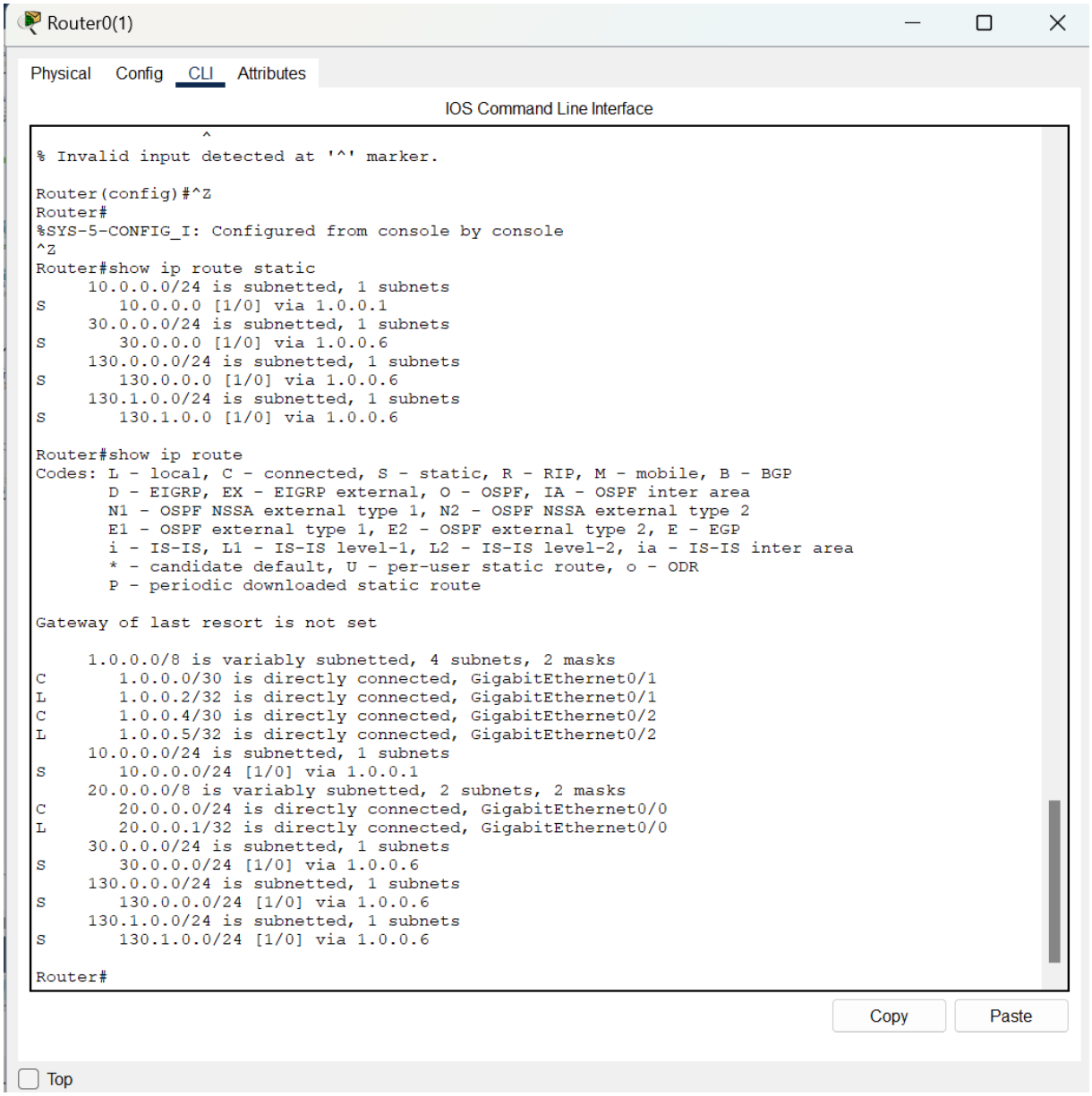
Static Routing

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


Router0(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
^
% Invalid input detected at '^' marker.
Router(config)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
^Z
Router#show ip route static
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0 [1/0] via 1.0.0.1
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0 [1/0] via 1.0.0.6
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0 [1/0] via 1.0.0.6
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0 [1/0] via 1.0.0.6
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
1.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C 1.0.0.0/30 is directly connected, GigabitEthernet0/1
L 1.0.0.2/32 is directly connected, GigabitEthernet0/1
C 1.0.0.4/30 is directly connected, GigabitEthernet0/2
L 1.0.0.5/32 is directly connected, GigabitEthernet0/2
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0/24 [1/0] via 1.0.0.1
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/24 is directly connected, GigabitEthernet0/0
L 20.0.0.1/32 is directly connected, GigabitEthernet0/0
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0/24 [1/0] via 1.0.0.6
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0/24 [1/0] via 1.0.0.6
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0/24 [1/0] via 1.0.0.6
Router#
Copy
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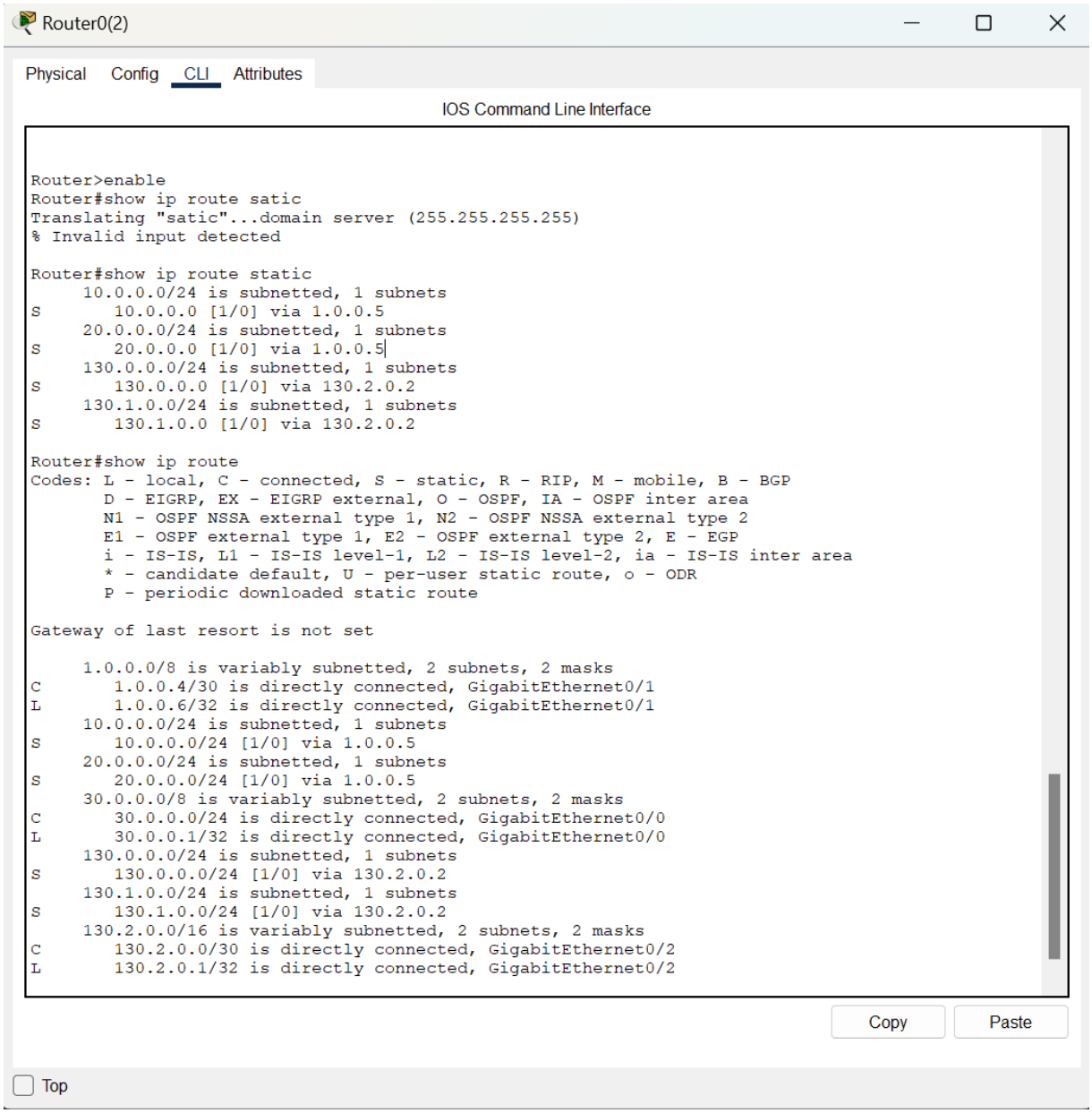
Top

- Router 3


Router0(2)
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#show ip route satic
Translating "satic"...domain server (255.255.255.255)
% Invalid input detected
Router#show ip route static
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0 [1/0] via 1.0.0.5
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0 [1/0] via 1.0.0.5
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0 [1/0] via 130.2.0.2
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0 [1/0] via 130.2.0.2
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 1.0.0.4/30 is directly connected, GigabitEthernet0/1
L 1.0.0.6/32 is directly connected, GigabitEthernet0/1
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0/24 [1/0] via 1.0.0.5
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0/24 [1/0] via 1.0.0.5
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/24 is directly connected, GigabitEthernet0/0
L 30.0.0.1/32 is directly connected, GigabitEthernet0/0
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0/24 [1/0] via 130.2.0.2
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0/24 [1/0] via 130.2.0.2
130.2.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 130.2.0.0/30 is directly connected, GigabitEthernet0/2
L 130.2.0.1/32 is directly connected, GigabitEthernet0/2
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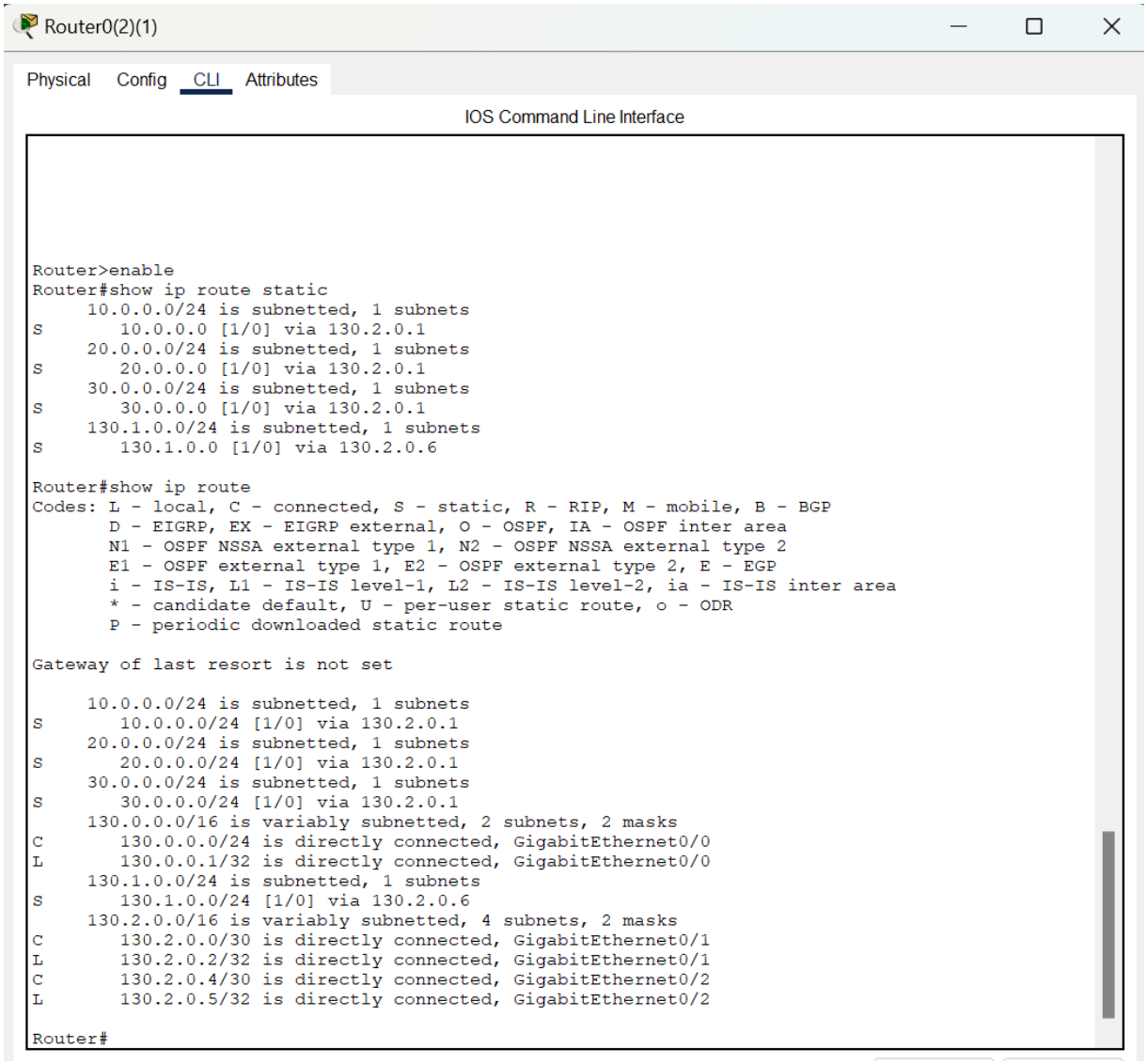
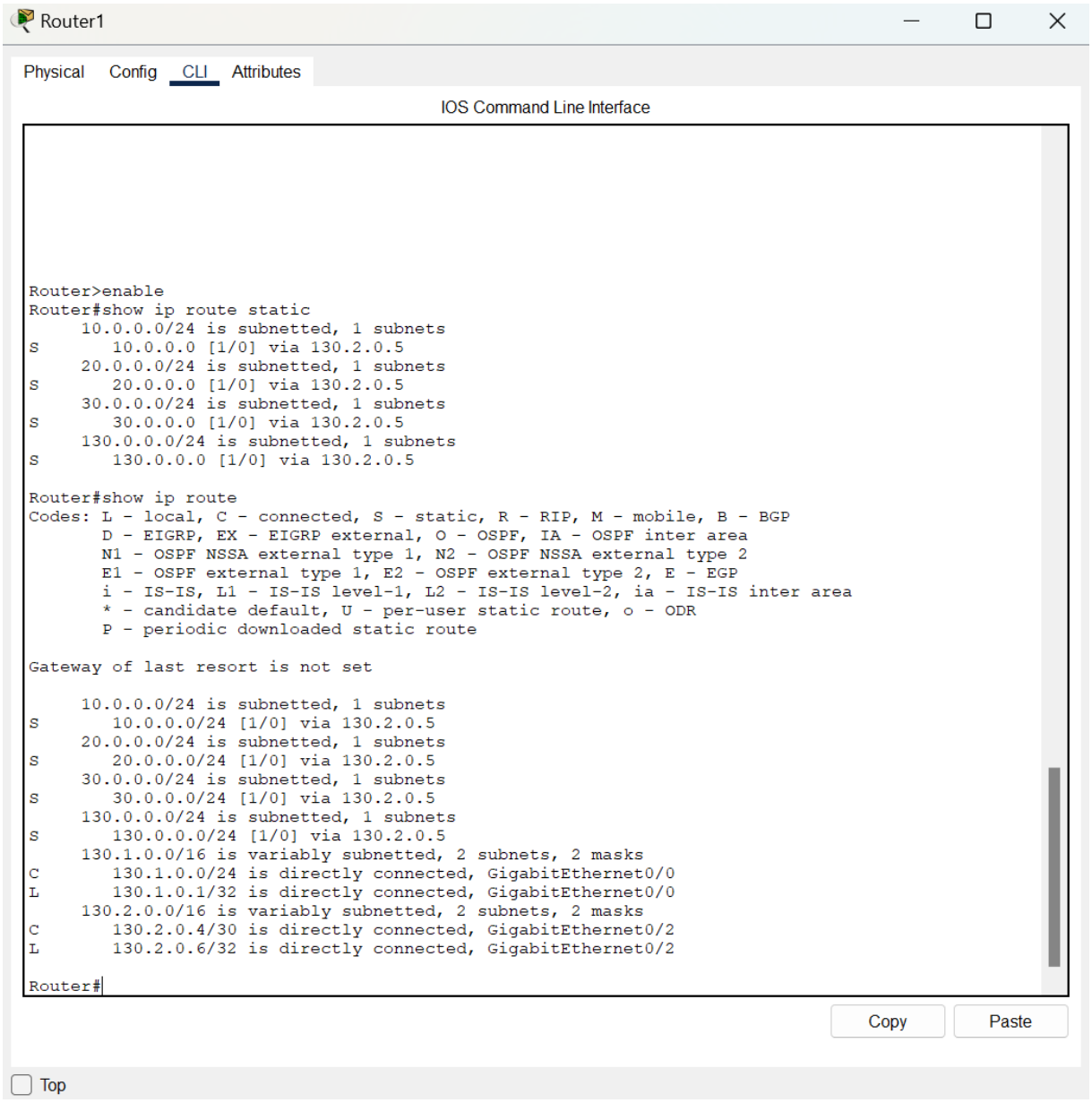
Top

- Router 4


Router0(2)(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#show ip route static
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0 [1/0] via 130.2.0.1
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0 [1/0] via 130.2.0.1
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0 [1/0] via 130.2.0.1
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0 [1/0] via 130.2.0.6
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0/24 [1/0] via 130.2.0.1
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0/24 [1/0] via 130.2.0.1
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0/24 [1/0] via 130.2.0.1
130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 130.0.0.0/24 is directly connected, GigabitEthernet0/0
L 130.0.0.1/32 is directly connected, GigabitEthernet0/0
130.1.0.0/24 is subnetted, 1 subnets
S 130.1.0.0/24 [1/0] via 130.2.0.6
130.2.0.0/16 is variably subnetted, 4 subnets, 2 masks
C 130.2.0.0/30 is directly connected, GigabitEthernet0/1
L 130.2.0.2/32 is directly connected, GigabitEthernet0/1
C 130.2.0.4/30 is directly connected, GigabitEthernet0/2
L 130.2.0.5/32 is directly connected, GigabitEthernet0/2
Router#

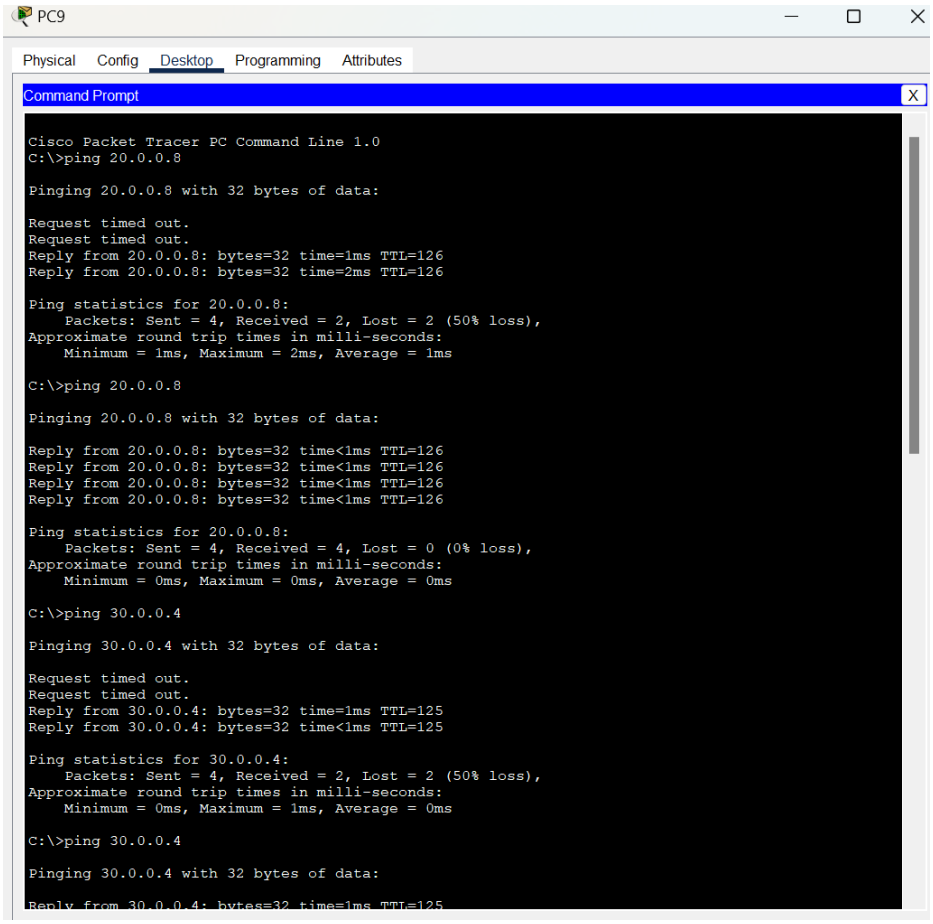
- Router 5


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>enable
Router#show ip route static
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0 [1/0] via 130.2.0.5
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0 [1/0] via 130.2.0.5
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0 [1/0] via 130.2.0.5
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0 [1/0] via 130.2.0.5
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/24 is subnetted, 1 subnets
S 10.0.0.0/24 [1/0] via 130.2.0.5
20.0.0.0/24 is subnetted, 1 subnets
S 20.0.0.0/24 [1/0] via 130.2.0.5
30.0.0.0/24 is subnetted, 1 subnets
S 30.0.0.0/24 [1/0] via 130.2.0.5
130.0.0.0/24 is subnetted, 1 subnets
S 130.0.0.0/24 [1/0] via 130.2.0.5
130.1.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 130.1.0.0/24 is directly connected, GigabitEthernet0/0
L 130.1.0.1/32 is directly connected, GigabitEthernet0/0
130.2.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 130.2.0.4/30 is directly connected, GigabitEthernet0/2
L 130.2.0.6/32 is directly connected, GigabitEthernet0/2
Router#
Copy
Paste
Top

Communication Between LANs

The successful ping test verifies that all Local Area Networks (LANs) across the five-floor office building communicate without issues. Each floor's network, assigned a designated classful IP range, achieves successful ICMP echo communication with all other floors. The established static routing maintains predefined paths, ensuring efficient data transmission between floors. Devices on Floors 1-3, using Class A private IPs, can communicate internally and with Floors 4-5, which operate on Class B public IPs, through properly configured routers. The bus topology effectively links all routers, enabling continuous data flow and stable inter-floor communication. Ping test results confirm network reliability, with packets successfully reaching their destinations without loss.

- From LAN 1

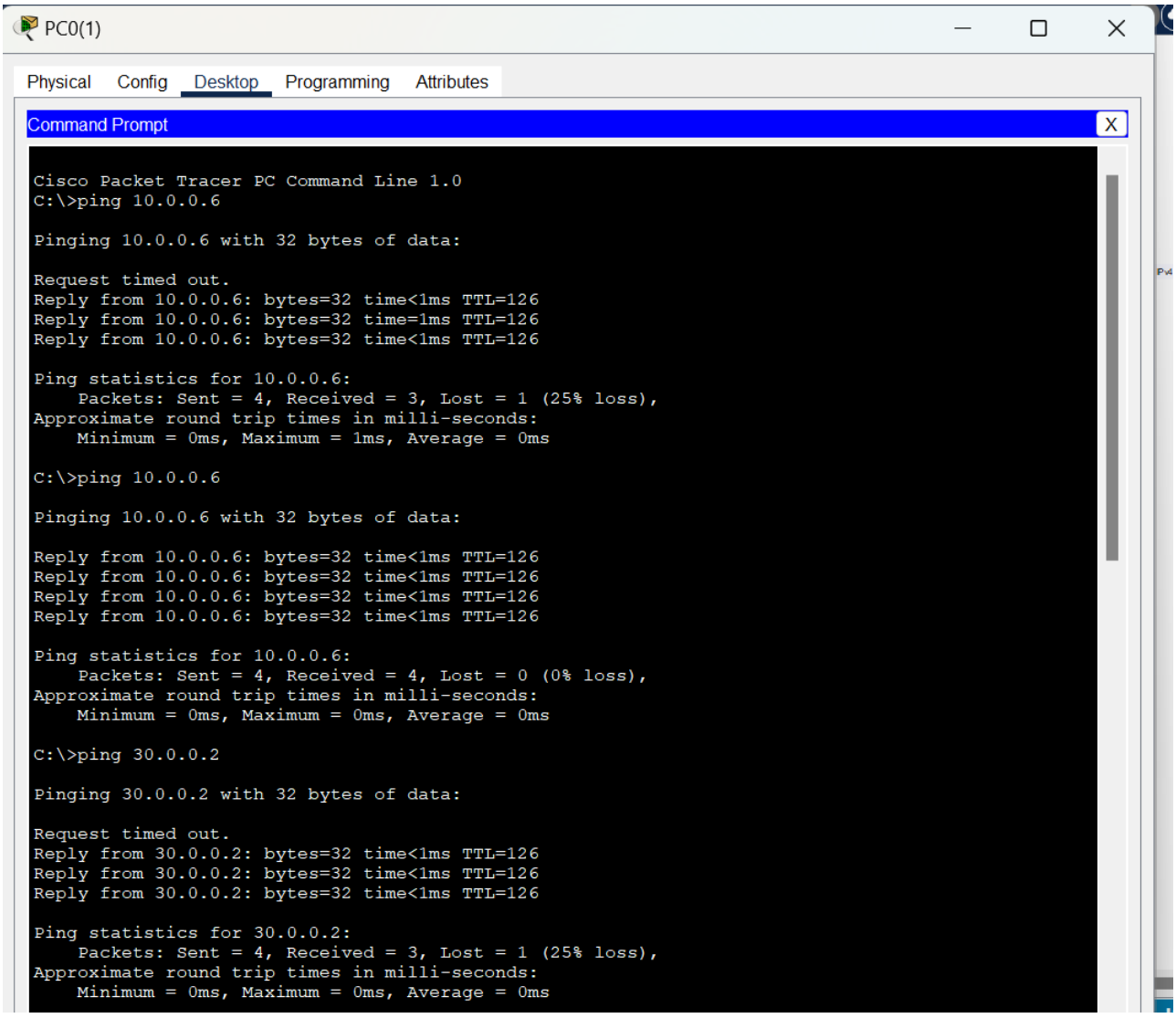


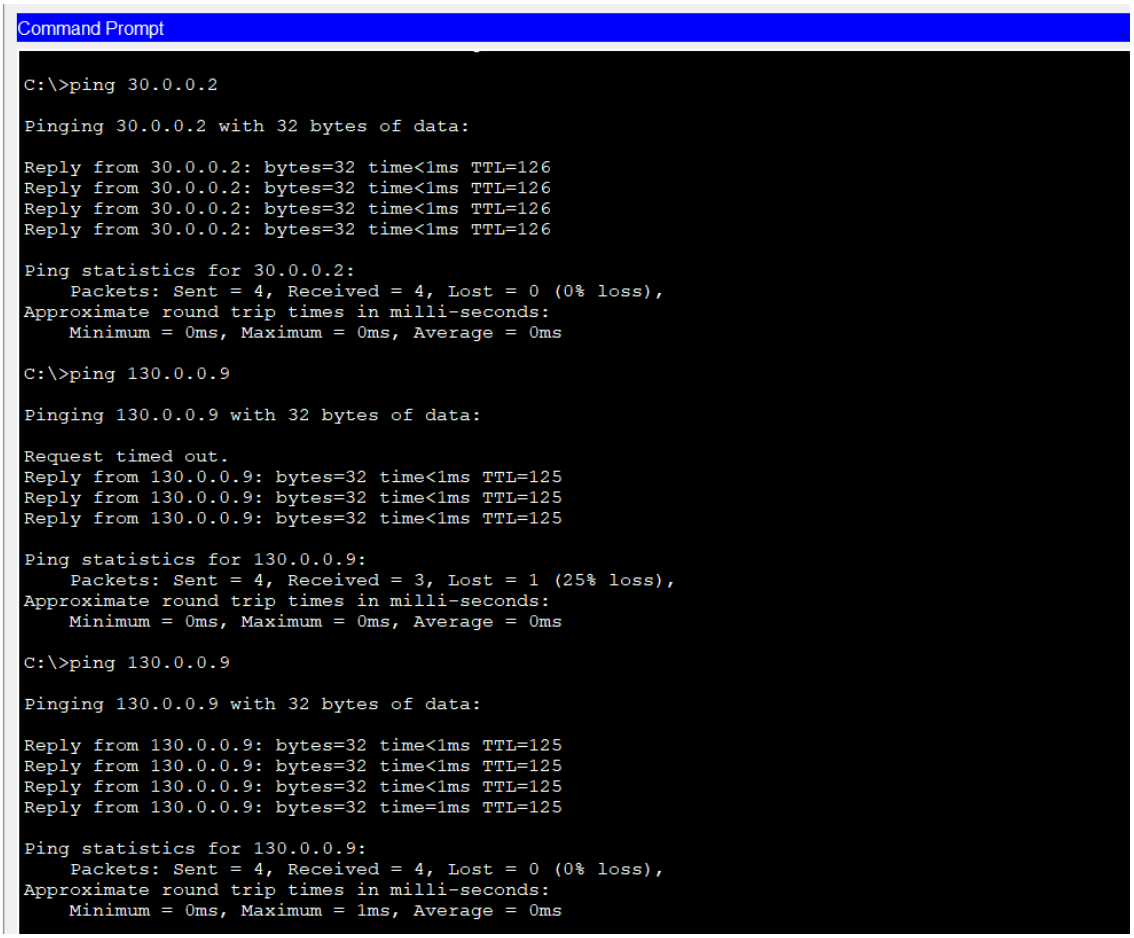
Command Prompt

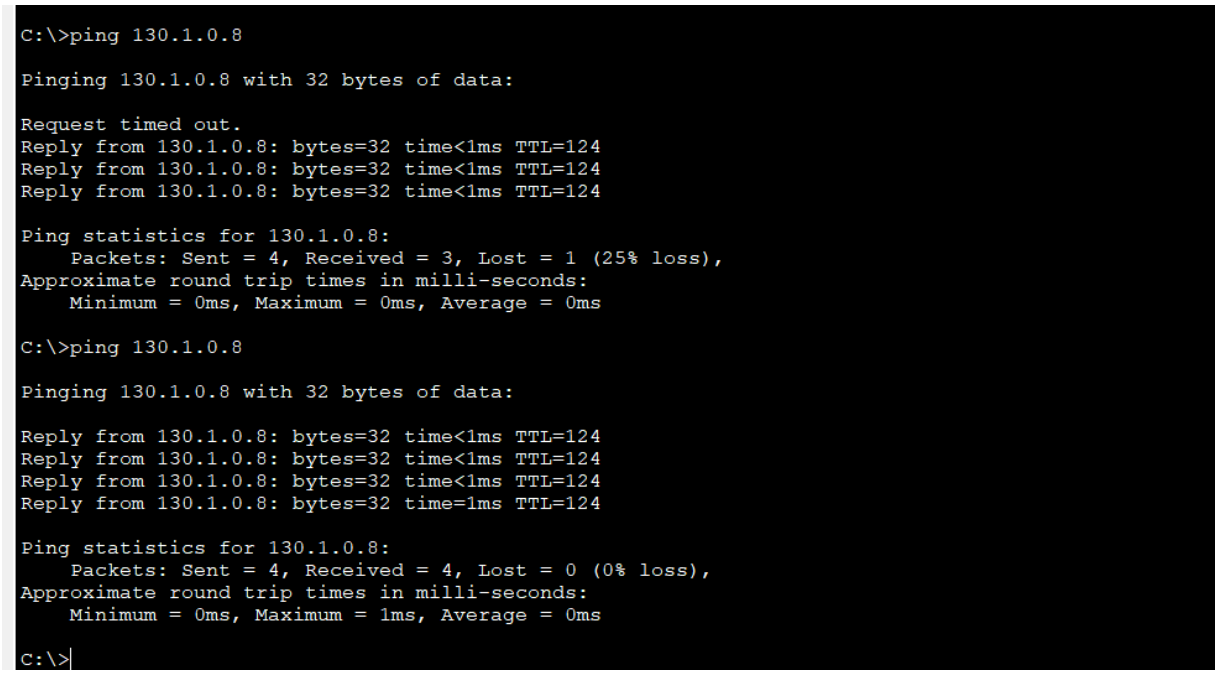
```
C:\>ping 30.0.0.4

Pinging 30.0.0.4 with 32 bytes of data:

Reply from 30.0.0.4: bytes=32 time=1ms TTL=125
Reply from 30.0.0.4: bytes=32 time<1ms TTL=125
Reply from 30.0.0.4: bytes=32 time<1ms TTL=125
Reply from 30.0.0.4: bytes=32 time<1ms TTL=125

Ping statistics for 30.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 130.0.0.3

Pinging 130.0.0.3 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124

Ping statistics for 130.0.0.3:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 130.0.0.3

Pinging 130.0.0.3 with 32 bytes of data:

Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time=17ms TTL=124

Ping statistics for 130.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 17ms, Average = 4ms
```

```
C:\>ping 130.0.0.3

Pinging 130.0.0.3 with 32 bytes of data:

Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time<1ms TTL=124
Reply from 130.0.0.3: bytes=32 time=17ms TTL=124

Ping statistics for 130.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 17ms, Average = 4ms

C:\>ping 130.1.0.5

Pinging 130.1.0.5 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 130.1.0.5: bytes=32 time<1ms TTL=123
Reply from 130.1.0.5: bytes=32 time<1ms TTL=123

Ping statistics for 130.1.0.5:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 130.1.0.5

Pinging 130.1.0.5 with 32 bytes of data:

Reply from 130.1.0.5: bytes=32 time<1ms TTL=123
Reply from 130.1.0.5: bytes=32 time<1ms TTL=123
Reply from 130.1.0.5: bytes=32 time<1ms TTL=123
Reply from 130.1.0.5: bytes=32 time<1ms TTL=123

Ping statistics for 130.1.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

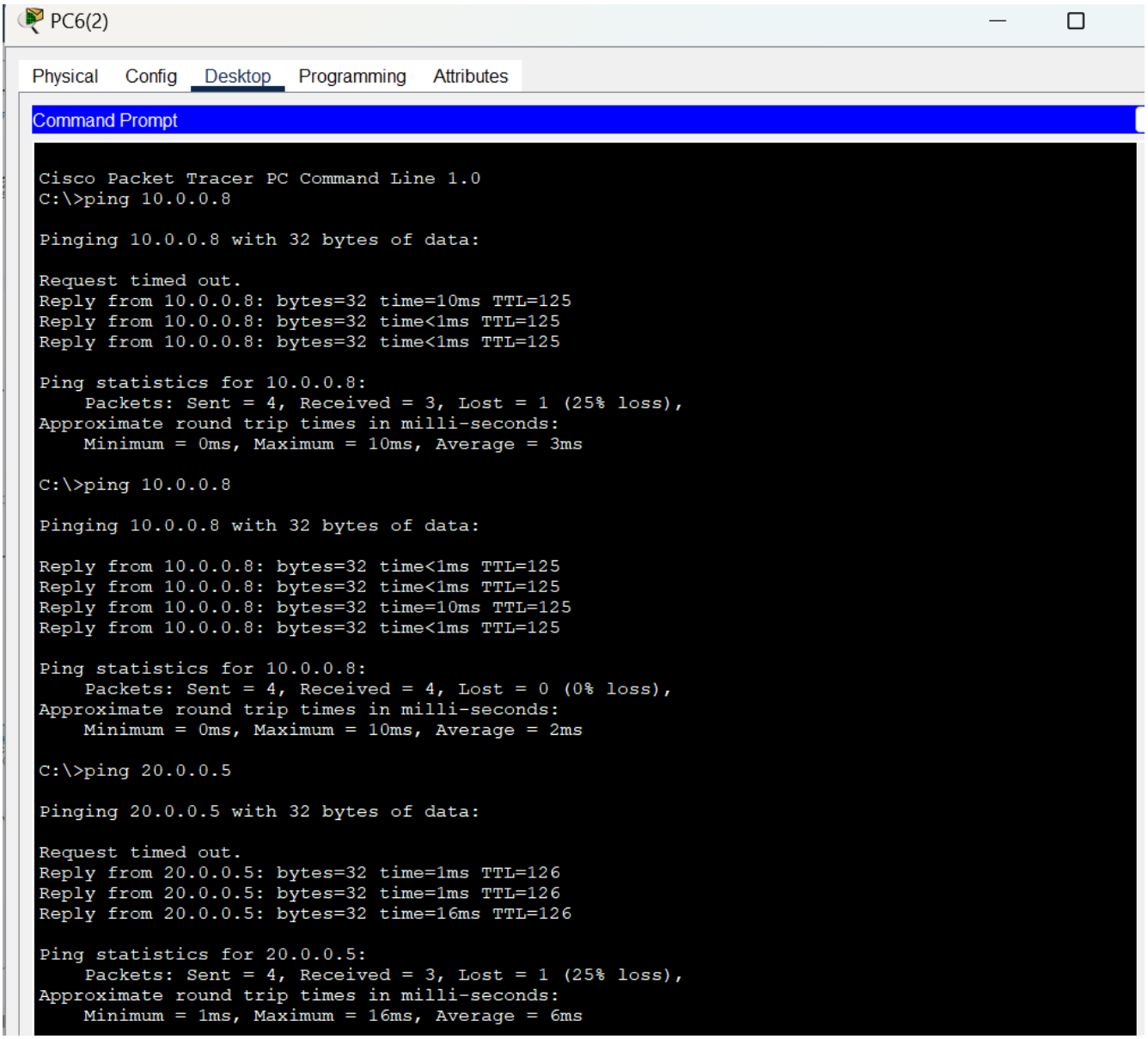
- From LAN 2


PC0(1)
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.6
Pinging 10.0.0.6 with 32 bytes of data:
Request timed out.
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Reply from 10.0.0.6: bytes=32 time=1ms TTL=126
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Ping statistics for 10.0.0.6:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 10.0.0.6
Pinging 10.0.0.6 with 32 bytes of data:
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Reply from 10.0.0.6: bytes=32 time<1ms TTL=126
Ping statistics for 10.0.0.6:
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:
Request timed out.
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 = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms


Command Prompt
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 130.0.0.9
Pinging 130.0.0.9 with 32 bytes of data:
Request timed out.
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Ping statistics for 130.0.0.9:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 130.0.0.9
Pinging 130.0.0.9 with 32 bytes of data:
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Reply from 130.0.0.9: bytes=32 time<1ms TTL=125
Reply from 130.0.0.9: bytes=32 time=1ms TTL=125
Ping statistics for 130.0.0.9:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms


C:\>ping 130.1.0.8
Pinging 130.1.0.8 with 32 bytes of data:
Request timed out.
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Ping statistics for 130.1.0.8:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 130.1.0.8
Pinging 130.1.0.8 with 32 bytes of data:
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Reply from 130.1.0.8: bytes=32 time<1ms TTL=124
Reply from 130.1.0.8: bytes=32 time=1ms TTL=124
Ping statistics for 130.1.0.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>

- From LAN 3

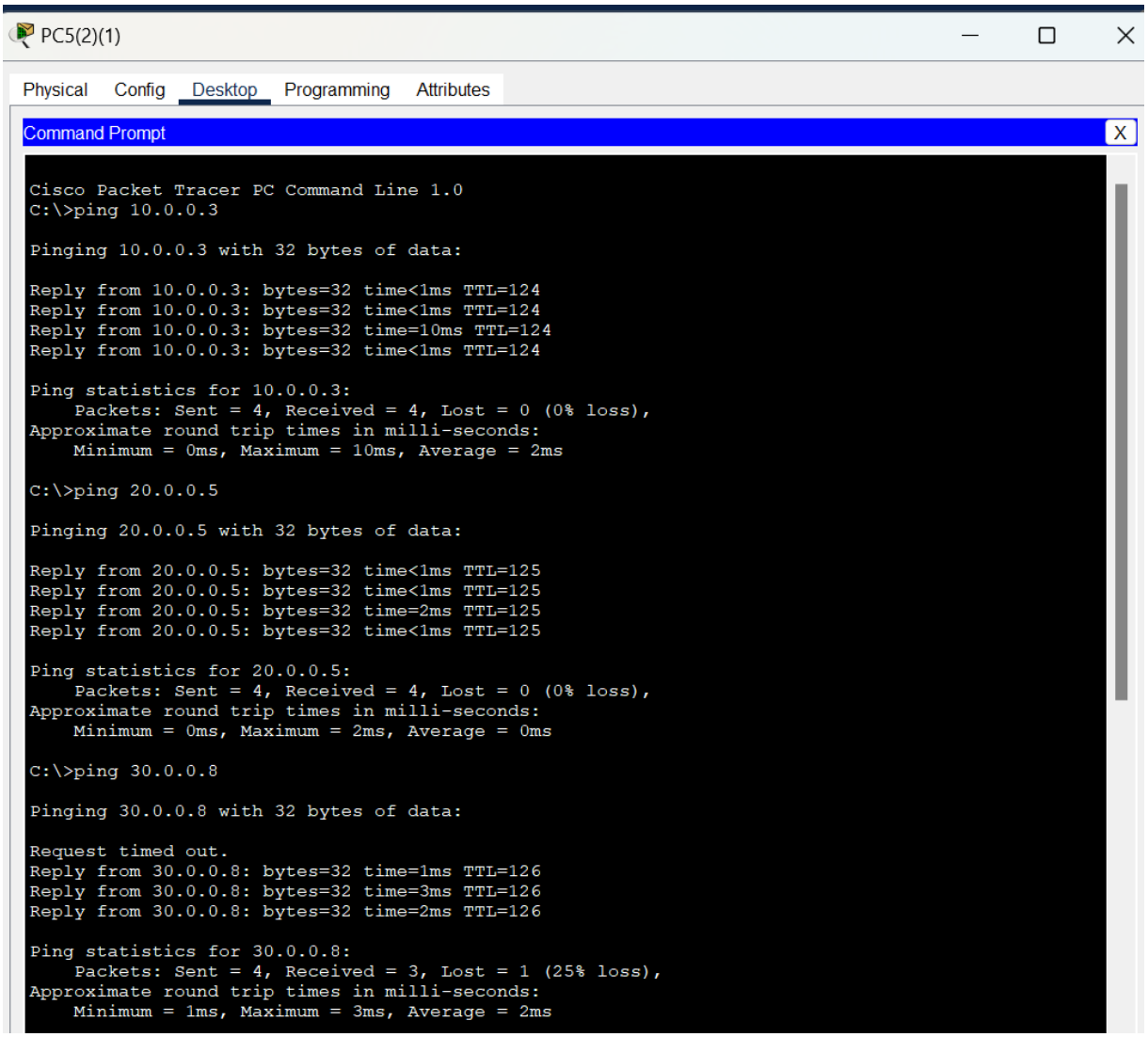

PC6(2)
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.8
Pinging 10.0.0.8 with 32 bytes of data:
Request timed out.
Reply from 10.0.0.8: bytes=32 time=10ms TTL=125
Reply from 10.0.0.8: bytes=32 time<1ms TTL=125
Reply from 10.0.0.8: bytes=32 time<1ms TTL=125
Ping statistics for 10.0.0.8:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 3ms
C:\>ping 10.0.0.8
Pinging 10.0.0.8 with 32 bytes of data:
Reply from 10.0.0.8: bytes=32 time<1ms TTL=125
Reply from 10.0.0.8: bytes=32 time<1ms TTL=125
Reply from 10.0.0.8: bytes=32 time=10ms TTL=125
Reply from 10.0.0.8: bytes=32 time<1ms TTL=125
Ping statistics for 10.0.0.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 2ms
C:\>ping 20.0.0.5
Pinging 20.0.0.5 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.5: bytes=32 time=1ms TTL=126
Reply from 20.0.0.5: bytes=32 time=1ms TTL=126
Reply from 20.0.0.5: bytes=32 time=16ms TTL=126
Ping statistics for 20.0.0.5:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 16ms, Average = 6ms

Command Prompt

```
C:\>ping 20.0.0.5

Pinging 20.0.0.5 with 32 bytes of data:

Reply from 20.0.0.5: bytes=32 time=1ms TTL=126
Reply from 20.0.0.5: bytes=32 time=10ms TTL=126
Reply from 20.0.0.5: bytes=32 time<1ms TTL=126
Reply from 20.0.0.5: bytes=32 time<1ms TTL=126

Ping statistics for 20.0.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 2ms

C:\>ping 130.0.0.7

Pinging 130.0.0.7 with 32 bytes of data:

Request timed out.
Reply from 130.0.0.7: bytes=32 time=13ms TTL=126
Reply from 130.0.0.7: bytes=32 time<1ms TTL=126
Reply from 130.0.0.7: bytes=32 time<1ms TTL=126

Ping statistics for 130.0.0.7:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 13ms, Average = 4ms

C:\>ping 130.0.0.7

Pinging 130.0.0.7 with 32 bytes of data:

Reply from 130.0.0.7: bytes=32 time<1ms TTL=126
Reply from 130.0.0.7: bytes=32 time<1ms TTL=126
Reply from 130.0.0.7: bytes=32 time<1ms TTL=126
Reply from 130.0.0.7: bytes=32 time<1ms TTL=126

Ping statistics for 130.0.0.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

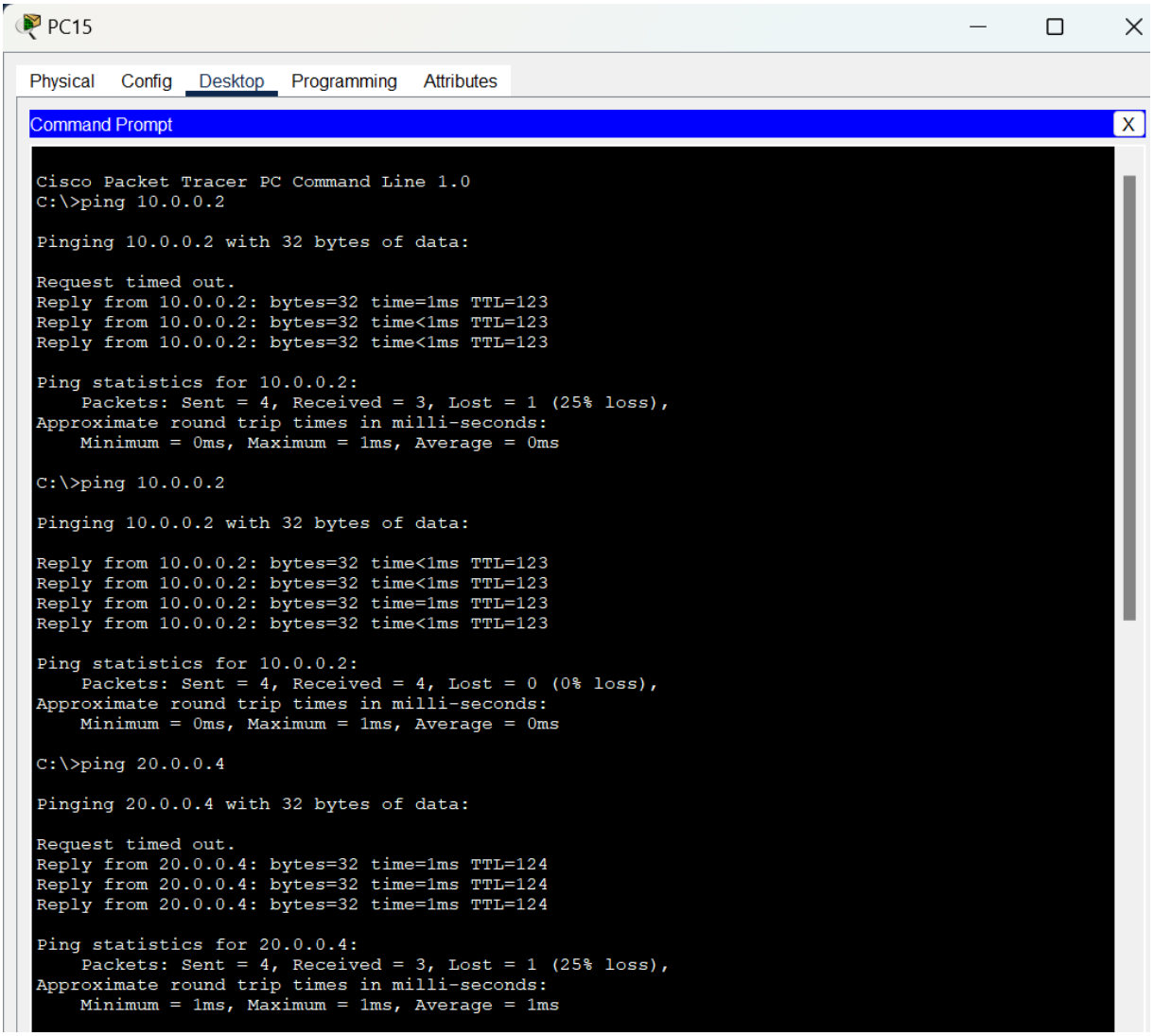
```
C:\>ping 130.1.0.4

Pinging 130.1.0.4 with 32 bytes of data:

Request timed out.
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125

Ping statistics for 130.1.0.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 130.1.0.4

Pinging 130.1.0.4 with 32 bytes of data:

Reply from 130.1.0.4: bytes=32 time<1ms TTL=125
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125
Reply from 130.1.0.4: bytes=32 time<1ms TTL=125

Ping statistics for 130.1.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- From LAN 4


PC5(2)(1)
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time<1ms TTL=124
Reply from 10.0.0.3: bytes=32 time<1ms TTL=124
Reply from 10.0.0.3: bytes=32 time=10ms TTL=124
Reply from 10.0.0.3: bytes=32 time<1ms TTL=124
Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 2ms
C:\>ping 20.0.0.5
Pinging 20.0.0.5 with 32 bytes of data:
Reply from 20.0.0.5: bytes=32 time<1ms TTL=125
Reply from 20.0.0.5: bytes=32 time<1ms TTL=125
Reply from 20.0.0.5: bytes=32 time=2ms TTL=125
Reply from 20.0.0.5: bytes=32 time<1ms TTL=125
Ping statistics for 20.0.0.5:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 2ms, Average = 0ms
C:\>ping 30.0.0.8
Pinging 30.0.0.8 with 32 bytes of data:
Request timed out.
Reply from 30.0.0.8: bytes=32 time=1ms TTL=126
Reply from 30.0.0.8: bytes=32 time=3ms TTL=126
Reply from 30.0.0.8: bytes=32 time=2ms TTL=126
Ping statistics for 30.0.0.8:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 3ms, Average = 2ms

```
C:\>ping 30.0.0.8

Pinging 30.0.0.8 with 32 bytes of data:

Reply from 30.0.0.8: bytes=32 time<1ms TTL=126
Reply from 30.0.0.8: bytes=32 time<1ms TTL=126
Reply from 30.0.0.8: bytes=32 time<1ms TTL=126
Reply from 30.0.0.8: bytes=32 time<1ms TTL=126

Ping statistics for 30.0.0.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 130.1.0.6

Pinging 130.1.0.6 with 32 bytes of data:

Request timed out.
Reply from 130.1.0.6: bytes=32 time<1ms TTL=126
Reply from 130.1.0.6: bytes=32 time=71ms TTL=126
Reply from 130.1.0.6: bytes=32 time<1ms TTL=126

Ping statistics for 130.1.0.6:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 71ms, Average = 23ms

C:\>ping 130.1.0.6

Pinging 130.1.0.6 with 32 bytes of data:

Reply from 130.1.0.6: bytes=32 time<1ms TTL=126
Reply from 130.1.0.6: bytes=32 time<1ms TTL=126
Reply from 130.1.0.6: bytes=32 time<1ms TTL=126
Reply from 130.1.0.6: bytes=32 time=25ms TTL=126

Ping statistics for 130.1.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 25ms, Average = 6ms

C:\>
```

- From LAN 5


PC15
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Request timed out.
Reply from 10.0.0.2: bytes=32 time=1ms TTL=123
Reply from 10.0.0.2: bytes=32 time<1ms TTL=123
Reply from 10.0.0.2: bytes=32 time<1ms TTL=123
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2: bytes=32 time<1ms TTL=123
Reply from 10.0.0.2: bytes=32 time<1ms TTL=123
Reply from 10.0.0.2: bytes=32 time=1ms TTL=123
Reply from 10.0.0.2: bytes=32 time<1ms TTL=123
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 20.0.0.4
Pinging 20.0.0.4 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Ping statistics for 20.0.0.4:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms

Command Prompt

```
C:\>ping 20.0.0.4

Pinging 20.0.0.4 with 32 bytes of data:

Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Reply from 20.0.0.4: bytes=32 time=1ms TTL=124
Reply from 20.0.0.4: bytes=32 time=2ms TTL=124

Ping statistics for 20.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>ping 30.0.0.6

Pinging 30.0.0.6 with 32 bytes of data:

Reply from 30.0.0.6: bytes=32 time<1ms TTL=125
Reply from 30.0.0.6: bytes=32 time<1ms TTL=125
Reply from 30.0.0.6: bytes=32 time=1ms TTL=125
Reply from 30.0.0.6: bytes=32 time<1ms TTL=125

Ping statistics for 30.0.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 130.0.0.8

Pinging 130.0.0.8 with 32 bytes of data:

Request timed out.
Reply from 130.0.0.8: bytes=32 time<1ms TTL=126
Reply from 130.0.0.8: bytes=32 time<1ms TTL=126
Reply from 130.0.0.8: bytes=32 time=11ms TTL=126

Ping statistics for 130.0.0.8:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 3ms
```

```
C:\>ping 130.0.0.8

Pinging 130.0.0.8 with 32 bytes of data:

Reply from 130.0.0.8: bytes=32 time=30ms TTL=126
Reply from 130.0.0.8: bytes=32 time=1ms TTL=126
Reply from 130.0.0.8: bytes=32 time<1ms TTL=126
Reply from 130.0.0.8: bytes=32 time=1ms TTL=126

Ping statistics for 130.0.0.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 30ms, Average = 8ms

C:\>
```