

CSE307
Internet Networking Essentials

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GitHub Repository:

<https://github.com/LEOPRITAM01/CSE307-CA01.git>

Overview

A six-floor office building of NTE Network Solutions is equipped with a structured hybrid network that ensures efficient communication, scalability, and fault tolerance. The first two floors utilize a ring topology, facilitating continuous data transmission and redundancy. The next two floors adopt a star topology, enhancing centralized network management and performance. The final two floors implement a mesh topology, providing robust fault tolerance and direct device-to-device communication.

The first four floors operate with Class B private IPv4 addresses, ensuring internal connectivity while conserving public IP space. The last two floors leverage Class C public IPv4 addresses enabling seamless external communication. Each floor has a properly allocated IP scheme, ensuring uniqueness and efficient address utilization.

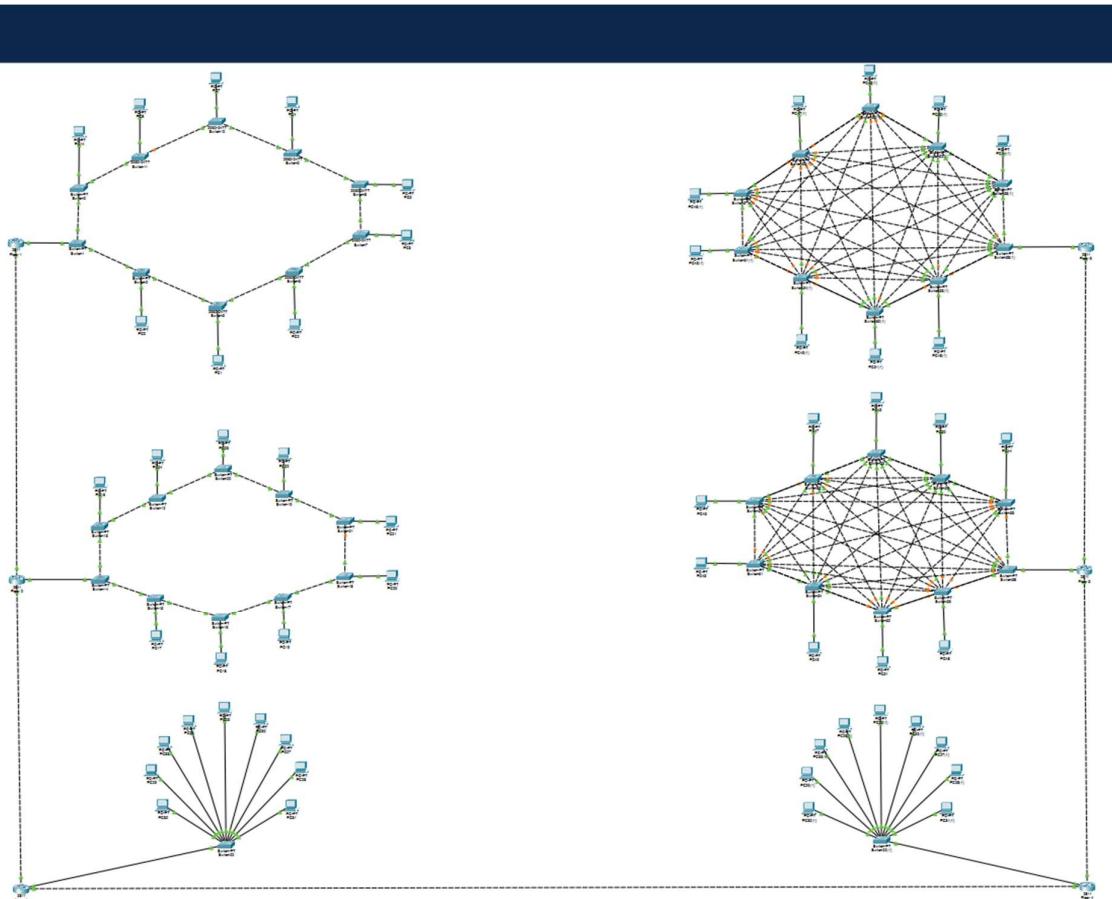
Dynamic routing protocols are implemented for inter-floor communication, allowing the network to adapt to changes and optimize data transfer paths. This approach enhances network resilience, prevents bottlenecks, and ensures smooth connectivity across all floors. Comprehensive testing, including ping validation, confirms the efficiency of the address scheme and routing strategy. With this well-structured design, NTE Network Solutions benefits from a scalable, high-performance, and future-ready network infrastructure.

Physical Scenario

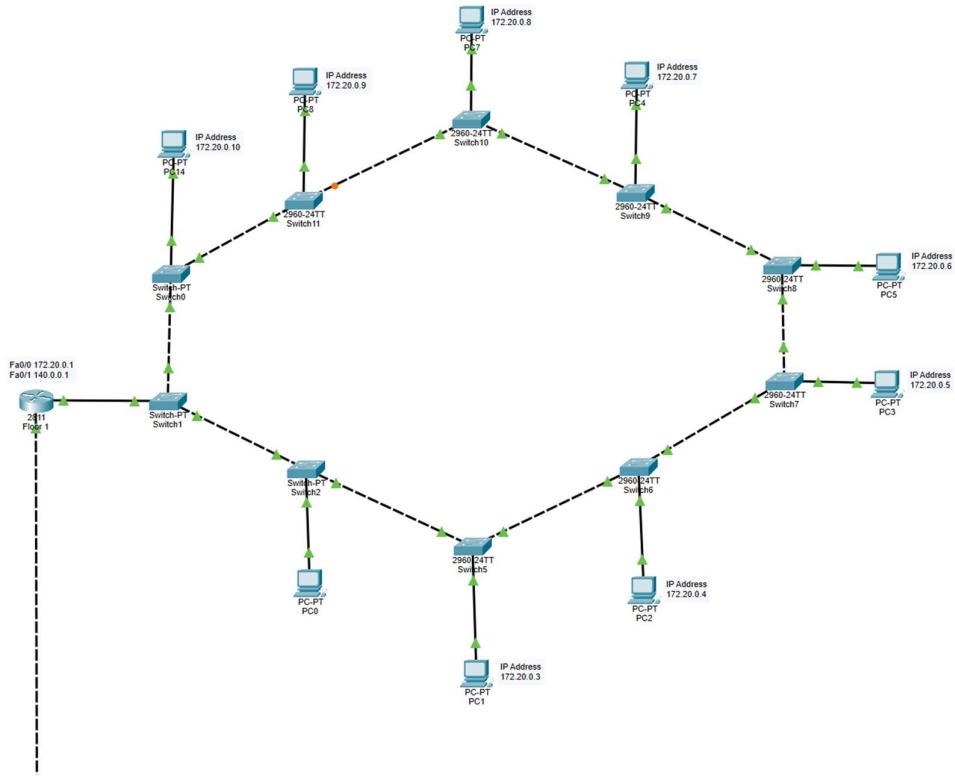
The six-floor office building of NTE Network Solutions is designed with a structured hybrid network to ensure seamless connectivity and future scalability. Each floor houses nine computers, strategically arranged to optimize performance and fault tolerance.

The first two floors implement a ring topology, where computers are interconnected in a circular structure, ensuring continuous data flow and redundancy. The next two floors operate under a star topology, with all computers connected to a central switch, simplifying network management and supporting expansion. The final two floors utilize a mesh topology, where direct device-to-device connections provide maximum reliability and fault tolerance.

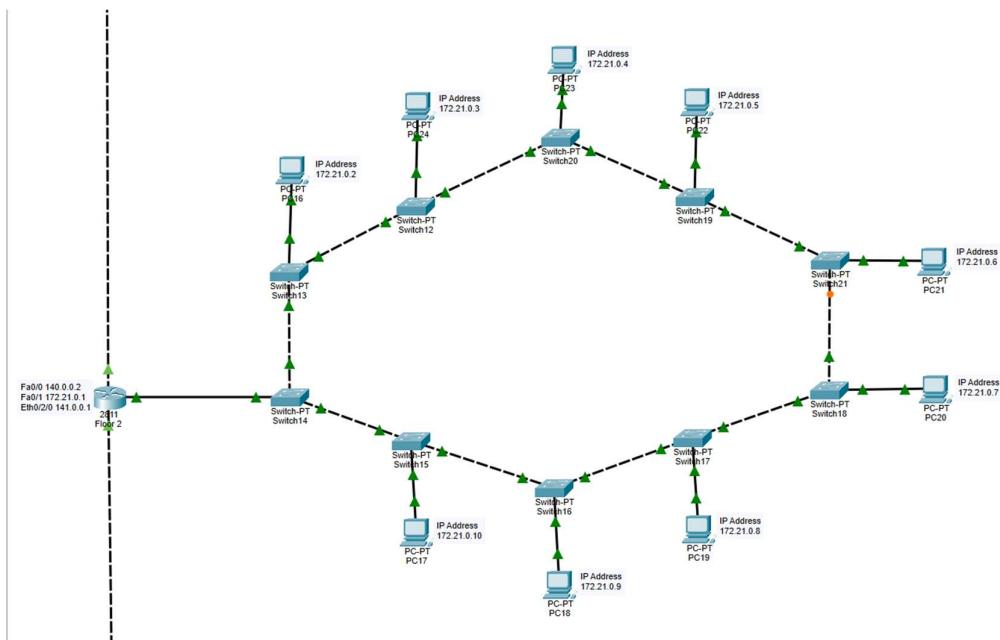
This well-integrated topology design ensures efficient communication, operational resilience, and scalability, creating a robust networking infrastructure throughout the building.



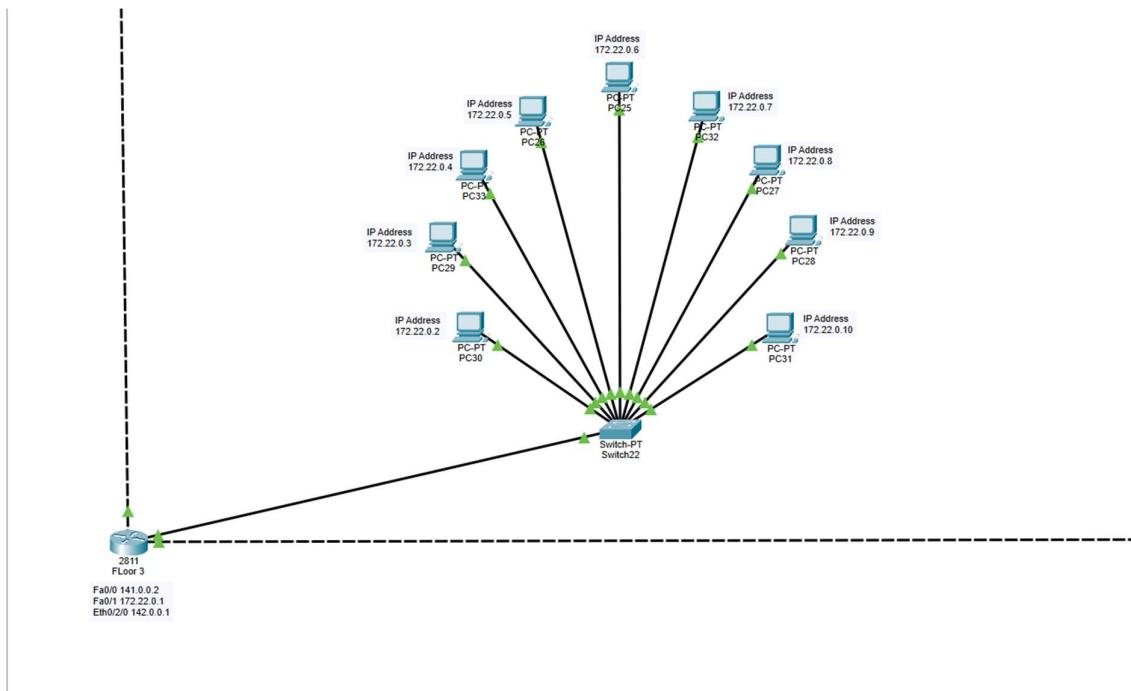
- Ground Floor (Lan 1)



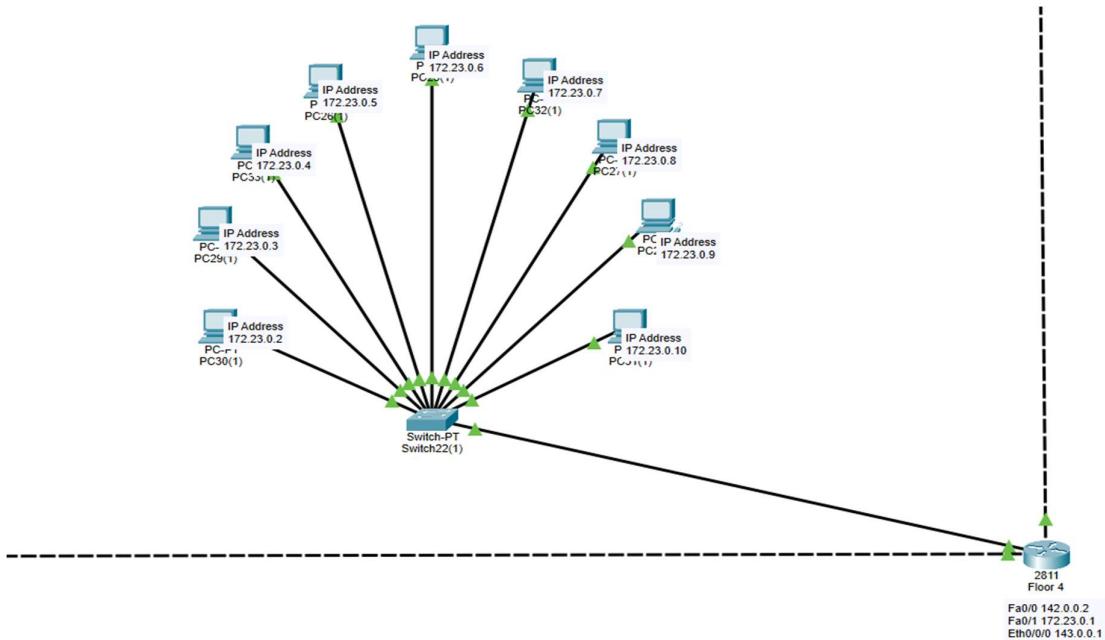
- 2nd Floor (Lan 2)



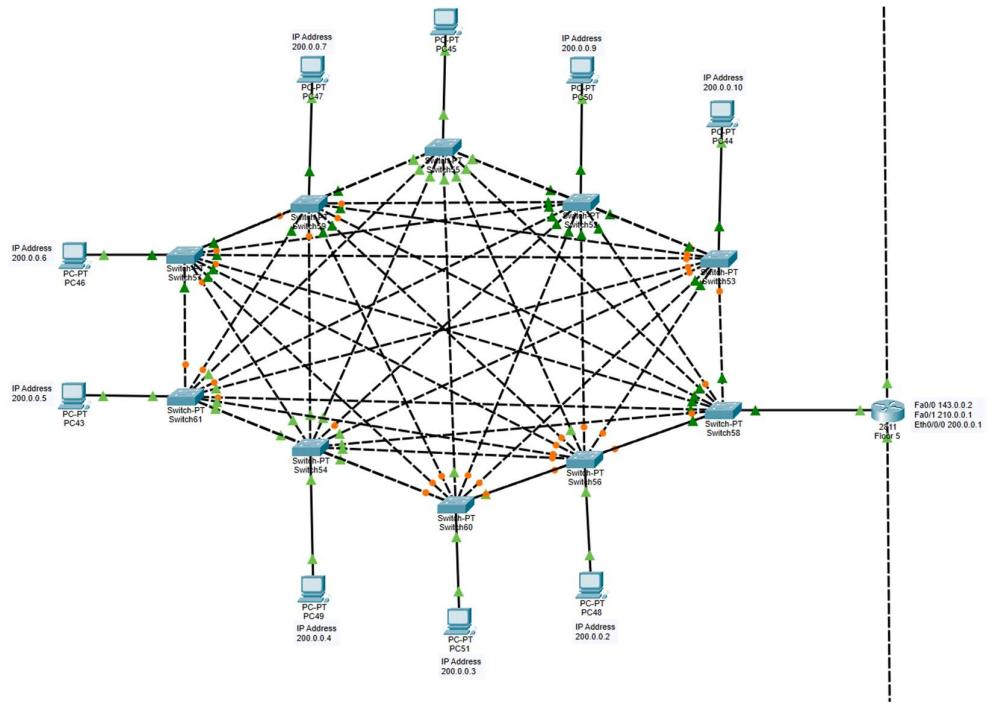
- 3rd Floor (Lan 3)



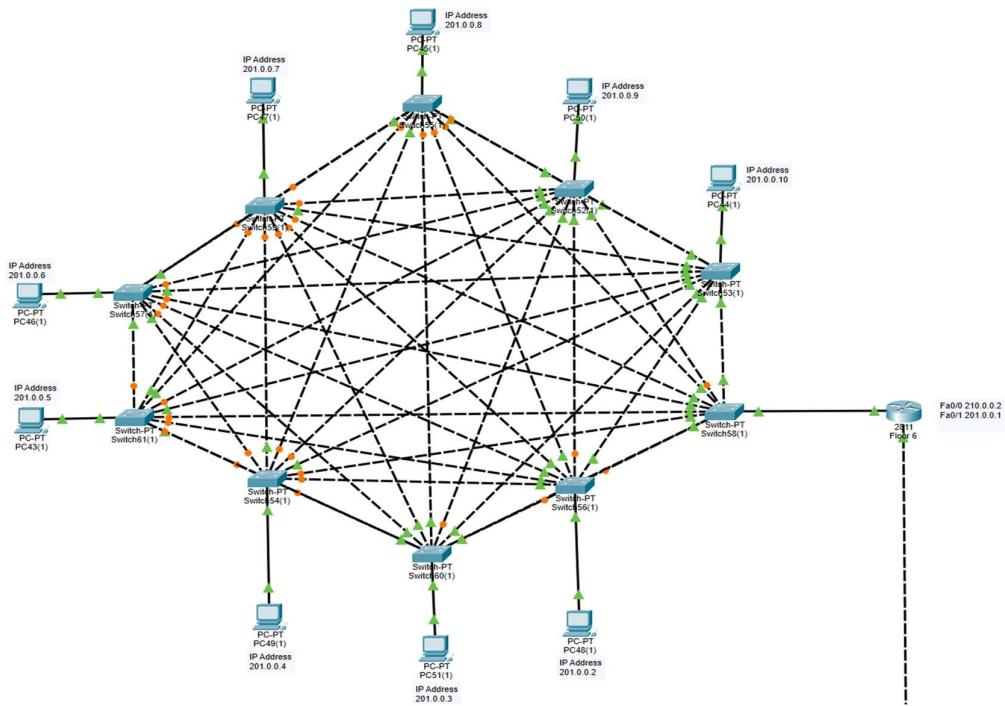
- 4th Floor (Lan 4)



- 5th Floor (Lan 5)



- 6th Floor (Lan 6)



IP Address Allocation

NTE Network Solutions has implemented a structured IP addressing scheme to ensure seamless network connectivity across its six-floor office building. The first four floors are assigned Class B private IPv4 addresses, providing unique addressing for nine computers per floor while maintaining internal network security. The last two floors utilize Class C public IPv4 addresses, enabling efficient external communication.

Routers interconnecting the network segments operate under a dynamic routing strategy, optimizing data transmission and adaptability. This structured approach ensures unique IP allocation, smooth inter-floor connectivity, and scalable network performance across the entire organization.

- LAN 1 (Network Address: 172.20.0.0)

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

DHCP Static

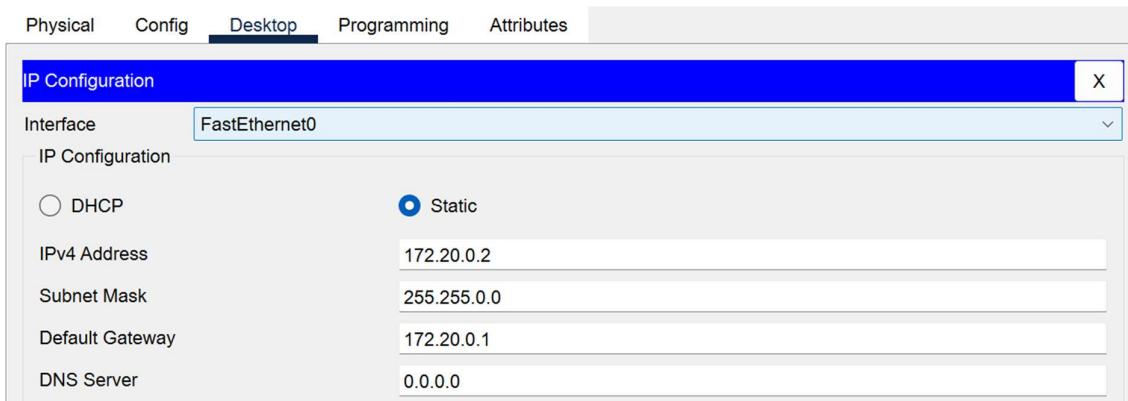
IPv4 Address: 172.20.0.2

Subnet Mask: 255.255.0.0

Default Gateway: 172.20.0.1

DNS Server: 0.0.0.0

X



- LAN 2 (Network Address: 172.21.0.0)

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

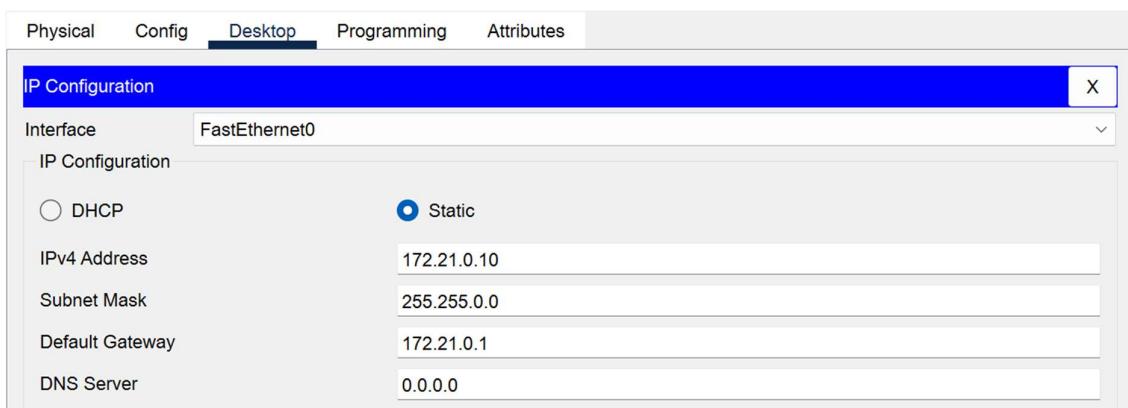
DHCP Static

IPv4 Address: 172.21.0.10

Subnet Mask: 255.255.0.0

Default Gateway: 172.21.0.1

DNS Server: 0.0.0.0



- LAN 3 (Network Address: 172.22.0.0)

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration:

<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address:	172.22.0.2
Subnet Mask:	255.255.0.0
Default Gateway:	172.22.0.1
DNS Server:	0.0.0.0

- LAN 4 (Network Address: 172.23.0.0)

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration:

<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address:	172.23.0.2
Subnet Mask:	255.255.0.0
Default Gateway:	172.23.0.1
DNS Server:	0.0.0.0

- LAN 5 (Network Address: 200.0.0.0)

Physical Config **Desktop** Programming Attributes

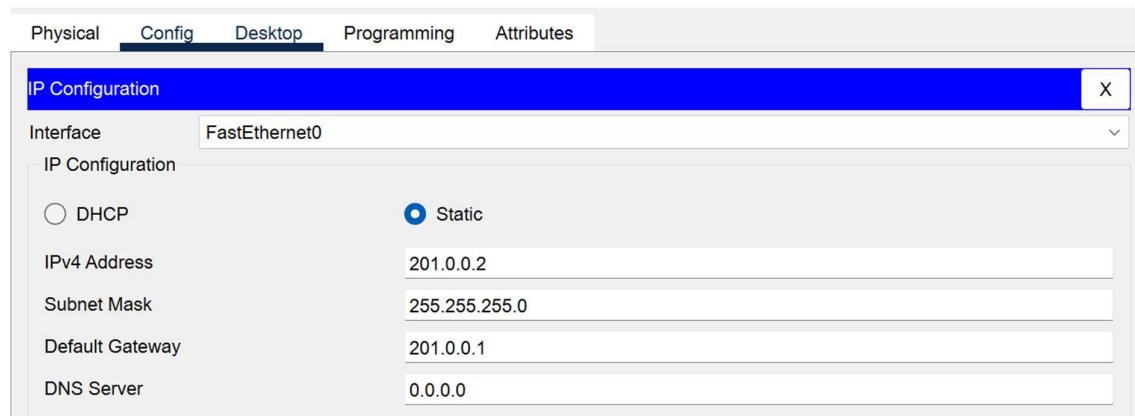
IP Configuration

Interface: FastEthernet0

IP Configuration:

<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address:	200.0.0.2
Subnet Mask:	255.255.255.0
Default Gateway:	200.0.0.1
DNS Server:	0.0.0.0

- LAN 6 (Network Address: 201.0.0.0)



- Router 1

Floor 1

Physical Config **CLI** Attributes

IOS Command Line Interface

```

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#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

      140.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        140.0.0.0/16 is directly connected, FastEthernet0/1
L        140.0.0.1/32 is directly connected, FastEthernet0/1
R        141.0.0.0/16 [120/1] via 140.0.0.2, 00:00:15, FastEthernet0/1
R        142.0.0.0/16 [120/2] via 140.0.0.2, 00:00:15, FastEthernet0/1
R        143.0.0.0/16 [120/3] via 140.0.0.2, 00:00:15, FastEthernet0/1
          172.20.0.0/16 is variably subnetted, 2 subnets, 2 masks
C          172.20.0.0/16 is directly connected, FastEthernet0/0
L          172.20.0.1/32 is directly connected, FastEthernet0/0
R          172.21.0.0/16 [120/1] via 140.0.0.2, 00:00:15, FastEthernet0/1
R          172.22.0.0/16 [120/2] via 140.0.0.2, 00:00:15, FastEthernet0/1
R          172.23.0.0/16 [120/3] via 140.0.0.2, 00:00:15, FastEthernet0/1
--More--

```

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● Router 2

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: L - local, C - 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

  140.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        140.0.0.0/16 is directly connected, FastEthernet0/0
L        140.0.0.2/32 is directly connected, FastEthernet0/0
  141.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        141.0.0.0/16 is directly connected, Ethernet0/2/0
L        141.0.0.1/32 is directly connected, Ethernet0/2/0
  142.0.0.0/16 [120/1] via 141.0.0.2, 00:00:18, Ethernet0/2/0
R  143.0.0.0/16 [120/2] via 141.0.0.2, 00:00:18, Ethernet0/2/0
R  172.20.0.0/16 [120/1] via 140.0.0.1, 00:00:02, FastEthernet0/0
  172.21.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        172.21.0.0/16 is directly connected, FastEthernet0/1
L        172.21.0.1/32 is directly connected, FastEthernet0/1
--More--
```

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● Router 3

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: L - local, C - 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

  R    140.0.0.0/16 [120/1] via 141.0.0.1, 00:00:14, FastEthernet0/0
  141.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        141.0.0.0/16 is directly connected, FastEthernet0/0
L        141.0.0.2/32 is directly connected, FastEthernet0/0
  142.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        142.0.0.0/16 is directly connected, Ethernet0/2/0
L        142.0.0.1/32 is directly connected, Ethernet0/2/0
  143.0.0.0/16 [120/1] via 142.0.0.2, 00:00:25, Ethernet0/2/0
R  172.20.0.0/16 [120/2] via 141.0.0.1, 00:00:14, FastEthernet0/0
R  172.21.0.0/16 [120/1] via 141.0.0.1, 00:00:14, FastEthernet0/0
  172.22.0.0/16 is variably subnetted, 2 subnets, 2 masks
C        172.22.0.0/16 is directly connected, FastEthernet0/1
--More--
```

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● Router 4

```
%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
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0/0, changed state to up

Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

R    140.0.0.0/16 [120/2] via 142.0.0.1, 00:00:05, FastEthernet0/0
R    141.0.0.0/16 [120/1] via 142.0.0.1, 00:00:05, FastEthernet0/0
      142.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      142.0.0.0/16 is directly connected, FastEthernet0/0
L      142.0.0.2/32 is directly connected, FastEthernet0/0
      143.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      143.0.0.0/16 is directly connected, Ethernet0/0/0
L      143.0.0.1/32 is directly connected, Ethernet0/0/0
R    172.20.0.0/16 [120/3] via 142.0.0.1, 00:00:05, FastEthernet0/0
R    172.21.0.0/16 [120/2] via 142.0.0.1, 00:00:05, FastEthernet0/0
R    172.22.0.0/16 [120/1] via 142.0.0.1, 00:00:05, FastEthernet0/0
      172.23.0.0/16 is variably subnetted, 2 subnets, 2 masks
--More-- |
```

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● Router 5

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0/0, changed state to up

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

R    140.0.0.0/16 [120/3] via 143.0.0.1, 00:00:01, FastEthernet0/0
R    141.0.0.0/16 [120/2] via 143.0.0.1, 00:00:01, FastEthernet0/0
R    142.0.0.0/16 [120/1] via 143.0.0.1, 00:00:01, FastEthernet0/0
      143.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C      143.0.0.0/16 is directly connected, FastEthernet0/0
L      143.0.0.2/32 is directly connected, FastEthernet0/0
R    172.20.0.0/16 [120/4] via 143.0.0.1, 00:00:01, FastEthernet0/0
R    172.21.0.0/16 [120/3] via 143.0.0.1, 00:00:01, FastEthernet0/0
R    172.22.0.0/16 [120/2] via 143.0.0.1, 00:00:01, FastEthernet0/0
      172.23.0.0/16 [120/1] via 143.0.0.1, 00:00:01, FastEthernet0/0
      200.0.0.0/24 is variably subnetted, 2 subnets, 2 masks
C      200.0.0.0/24 is directly connected, Ethernet0/0/0
--More-- |
```

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- Router 6

```
Floor 6
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

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

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

R    140.0.0.0/16 [120/4] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    141.0.0.0/16 [120/3] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    142.0.0.0/16 [120/2] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    143.0.0.0/16 [120/1] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    172.20.0.0/16 [120/5] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    172.21.0.0/16 [120/4] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    172.22.0.0/16 [120/3] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    172.23.0.0/16 [120/2] via 210.0.0.1, 00:00:17, FastEthernet0/0
R    200.0.0.0/24 [120/1] via 210.0.0.1, 00:00:17, FastEthernet0/0
      201.0.0.0/24 is variably subnetted, 2 subnets, 2 masks
C      201.0.0.0/24 is directly connected, FastEthernet0/1
L      201.0.0.1/32 is directly connected, FastEthernet0/1
--More--
```

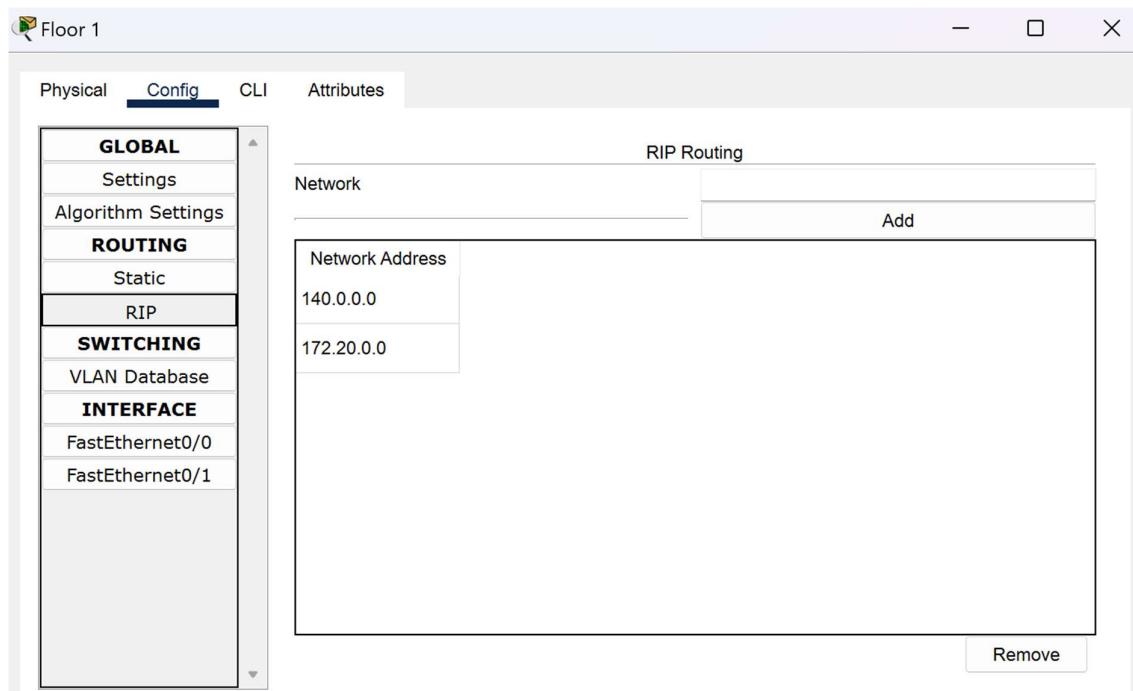
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Dynamic Routing

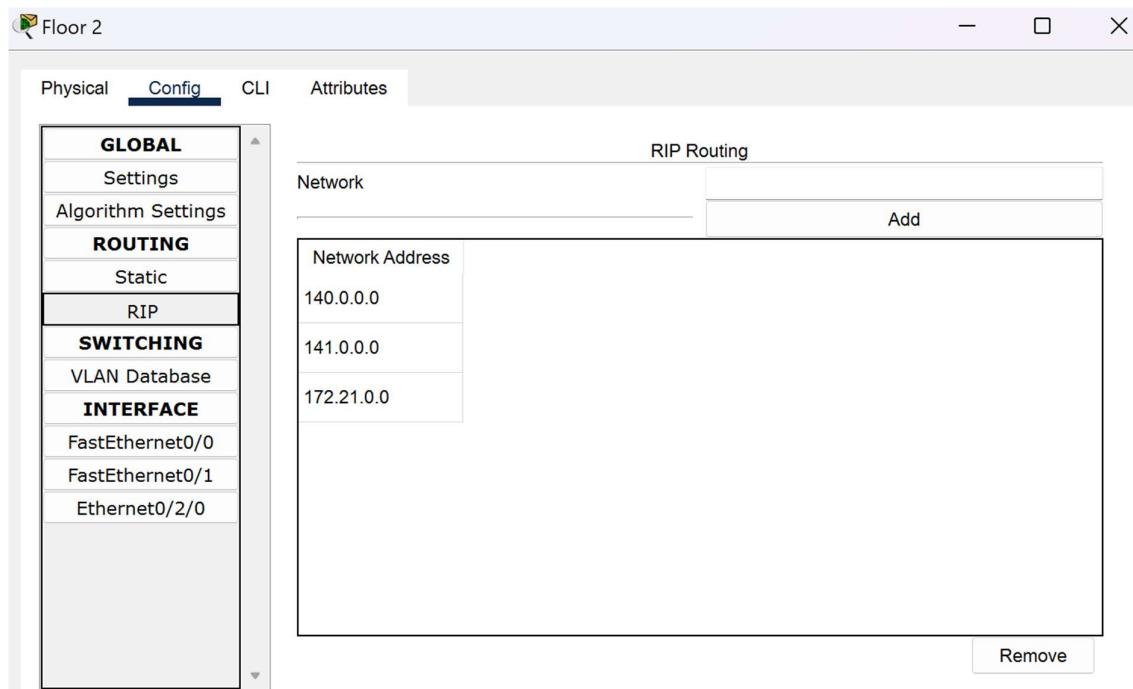
NTE Network Solutions employs dynamic routing for inter-floor communication, ensuring adaptability and efficient data transmission. Routers across all six floors automatically learn and update routes, optimizing traffic flow without requiring manual intervention. This approach enhances network scalability, reduces administrative overhead, and allows for quick adjustments in case of topology changes or failures.

By leveraging dynamic routing protocols, the network efficiently manages inter-floor connectivity, balancing performance and reliability. The continuous route optimization ensures minimal downtime and maximized efficiency, making the network highly resilient and future ready.

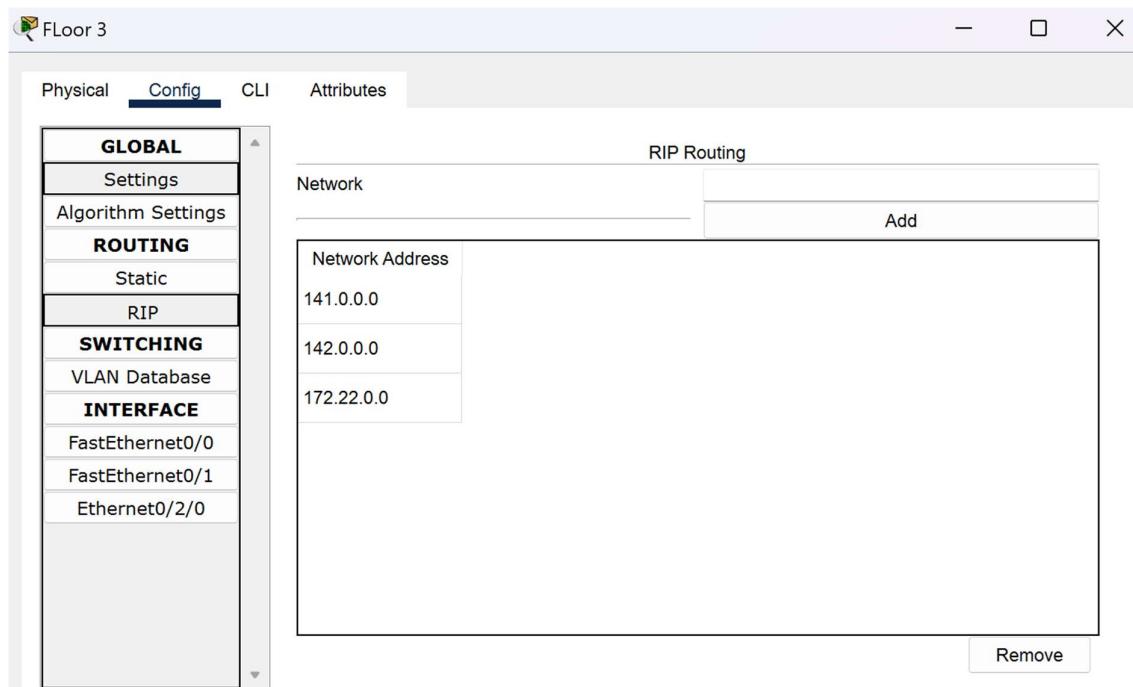
- Router 1



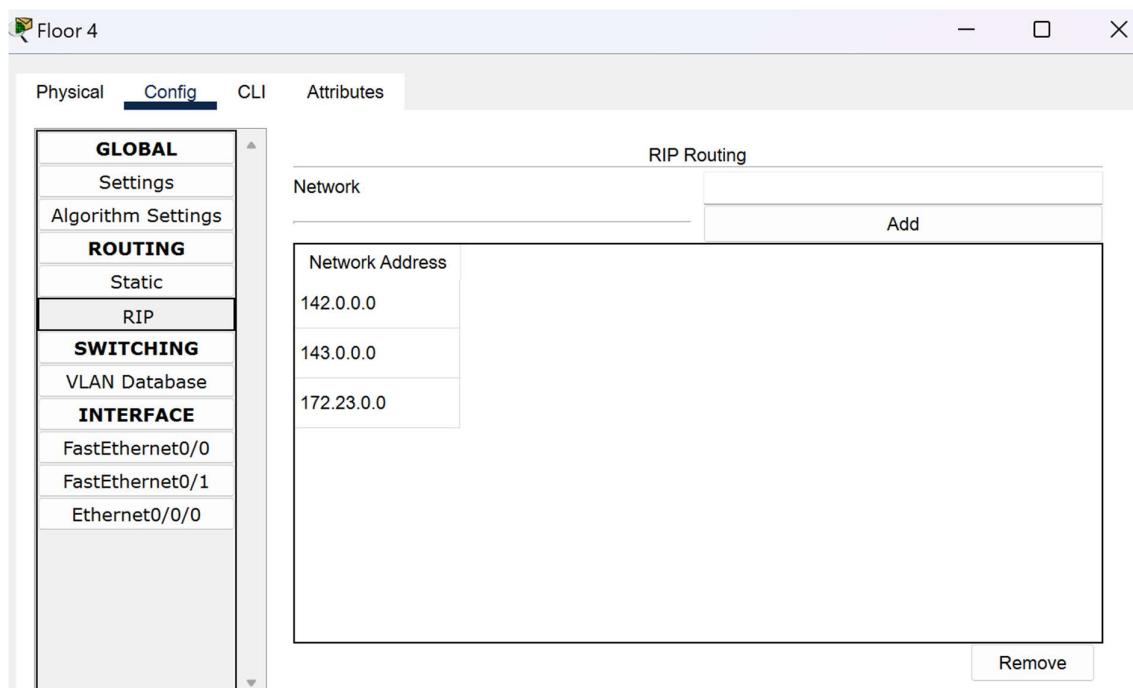
- Router 2



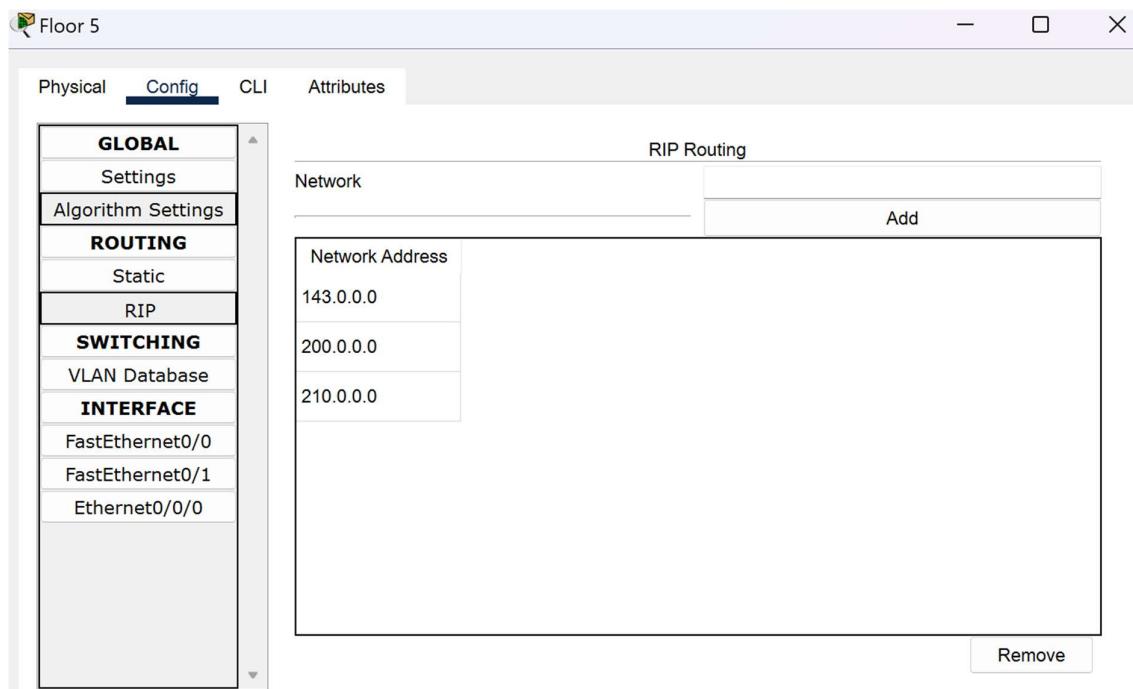
- Router 3



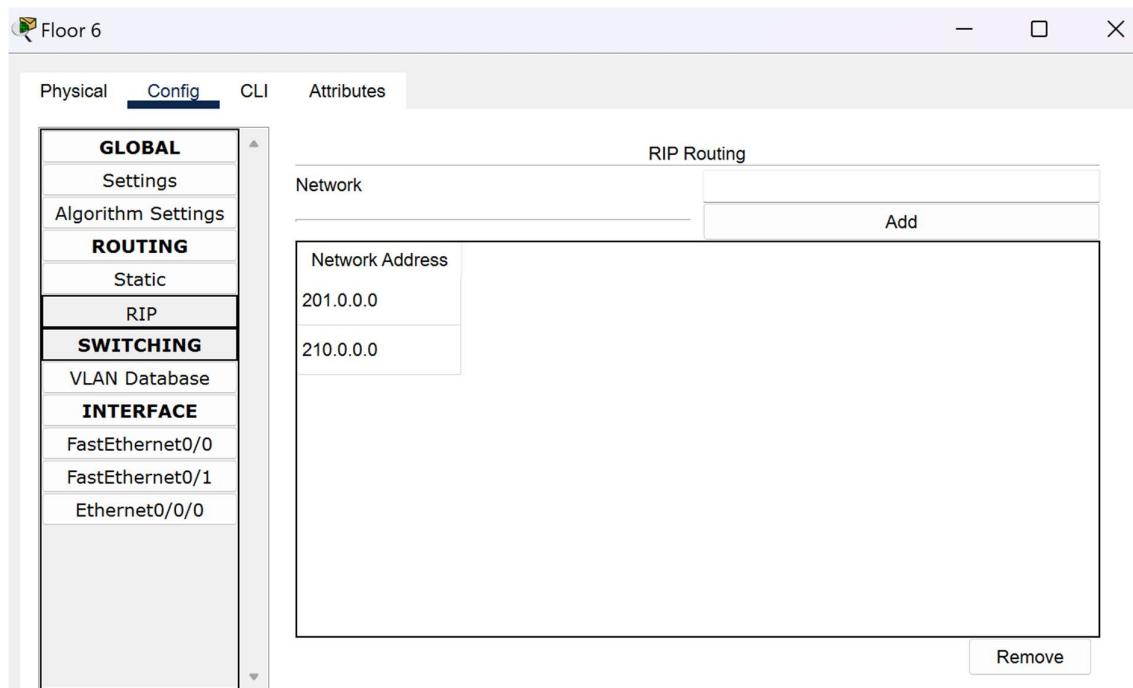
- Router 4



- Router 5



- Router 6

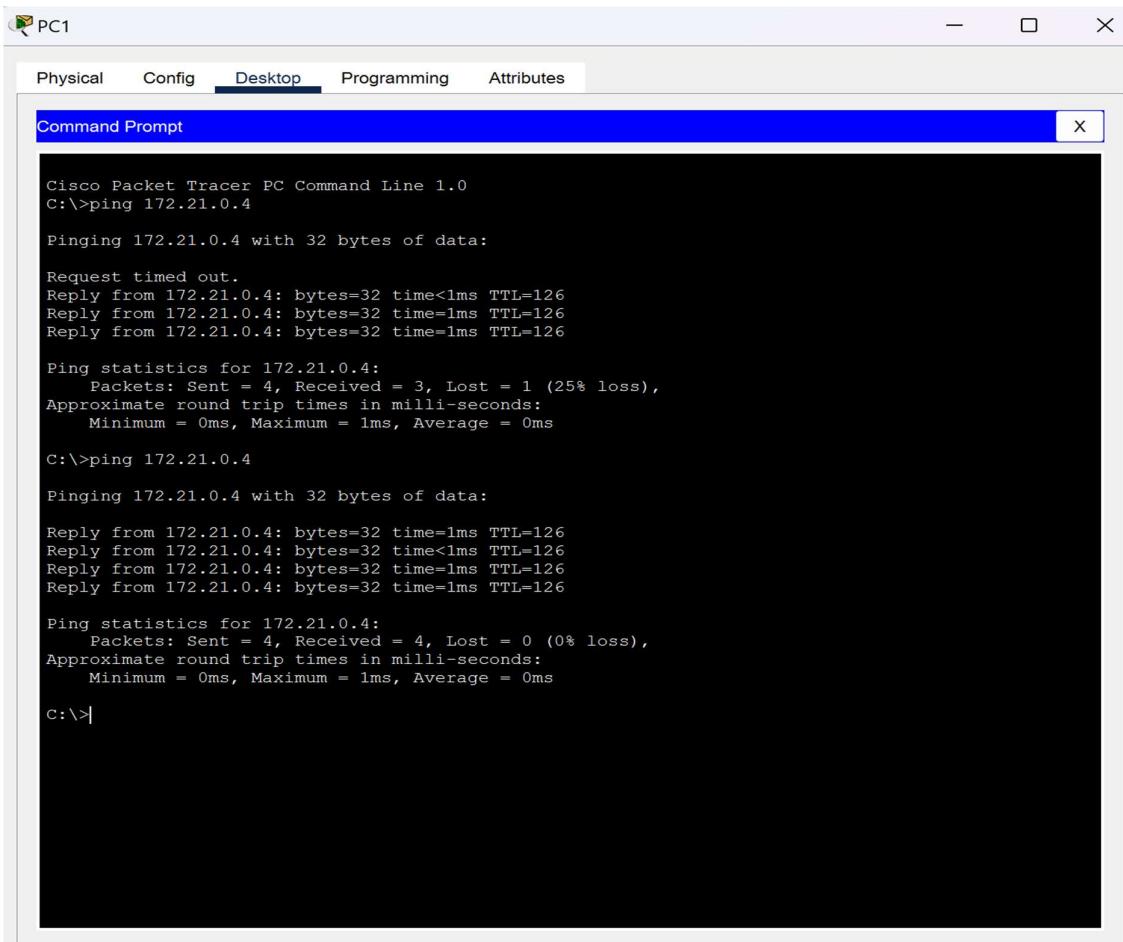


Communication Between LANs

Successful ping tests confirm seamless communication between all Local Area Networks (LANs) across the six-floor office building of NTE Network Solutions. Each LAN, assigned its respective classful IP range, achieves uninterrupted ICMP echo exchanges, ensuring reliable data transmission.

Dynamic routing enables efficient inter-floor connectivity, allowing devices on the first four floors with Class B private IPs to communicate effortlessly with the last two floors utilizing Class C public IPs. The routing strategy dynamically adapts to network changes, optimizing traffic flow and preventing disruptions. Verified through comprehensive testing, the network architecture ensures consistent, high-performance connectivity across all floors.

- From LAN 1 to LAN 2



The screenshot shows a window titled "PC1" with tabs for Physical, Config, Desktop (which is selected), Programming, and Attributes. Inside, a "Command Prompt" window displays the output of a ping test. The command entered was "ping 172.21.0.4". The output shows three replies from the target IP, followed by statistics: 4 packets sent, 3 received, 1 lost (25% loss). The approximate round trip times are listed as minimum 0ms, maximum 1ms, and average 0ms. The process is then repeated for another ping to the same address.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.21.0.4

Pinging 172.21.0.4 with 32 bytes of data:

Request timed out.
Reply from 172.21.0.4: bytes=32 time<1ms TTL=126
Reply from 172.21.0.4: bytes=32 time=1ms TTL=126
Reply from 172.21.0.4: bytes=32 time=1ms TTL=126

Ping statistics for 172.21.0.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.21.0.4

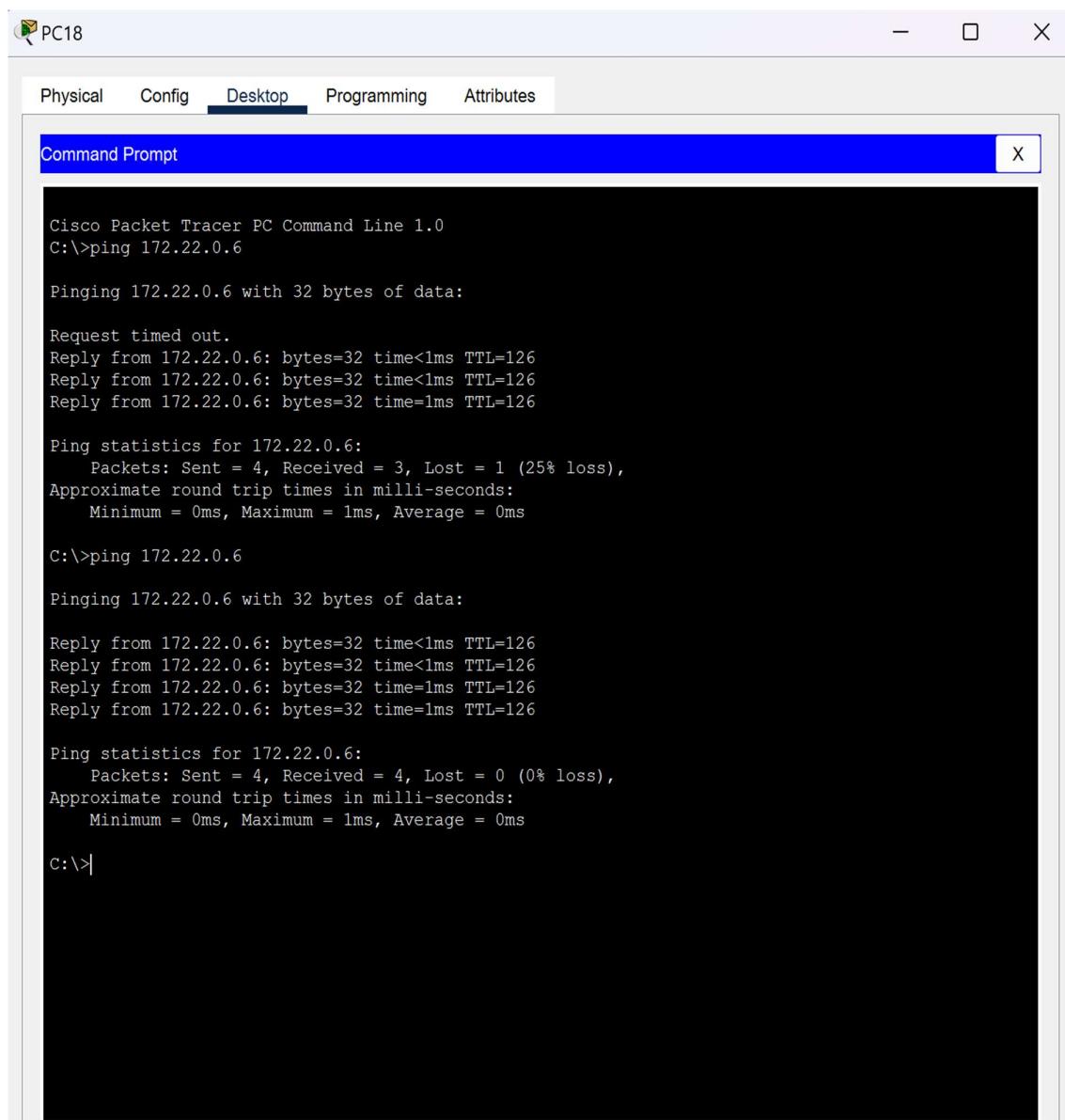
Pinging 172.21.0.4 with 32 bytes of data:

Reply from 172.21.0.4: bytes=32 time=1ms TTL=126
Reply from 172.21.0.4: bytes=32 time<1ms TTL=126
Reply from 172.21.0.4: bytes=32 time=1ms TTL=126
Reply from 172.21.0.4: bytes=32 time=1ms TTL=126

Ping statistics for 172.21.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- From LAN 2 to LAN 3



The screenshot shows a window titled "PC18" with tabs for Physical, Config, Desktop (selected), Programming, and Attributes. The main area is a "Command Prompt" window with the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.22.0.6

Pinging 172.22.0.6 with 32 bytes of data:

Request timed out.
Reply from 172.22.0.6: bytes=32 time<1ms TTL=126
Reply from 172.22.0.6: bytes=32 time<1ms TTL=126
Reply from 172.22.0.6: bytes=32 time=1ms TTL=126

Ping statistics for 172.22.0.6:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 172.22.0.6

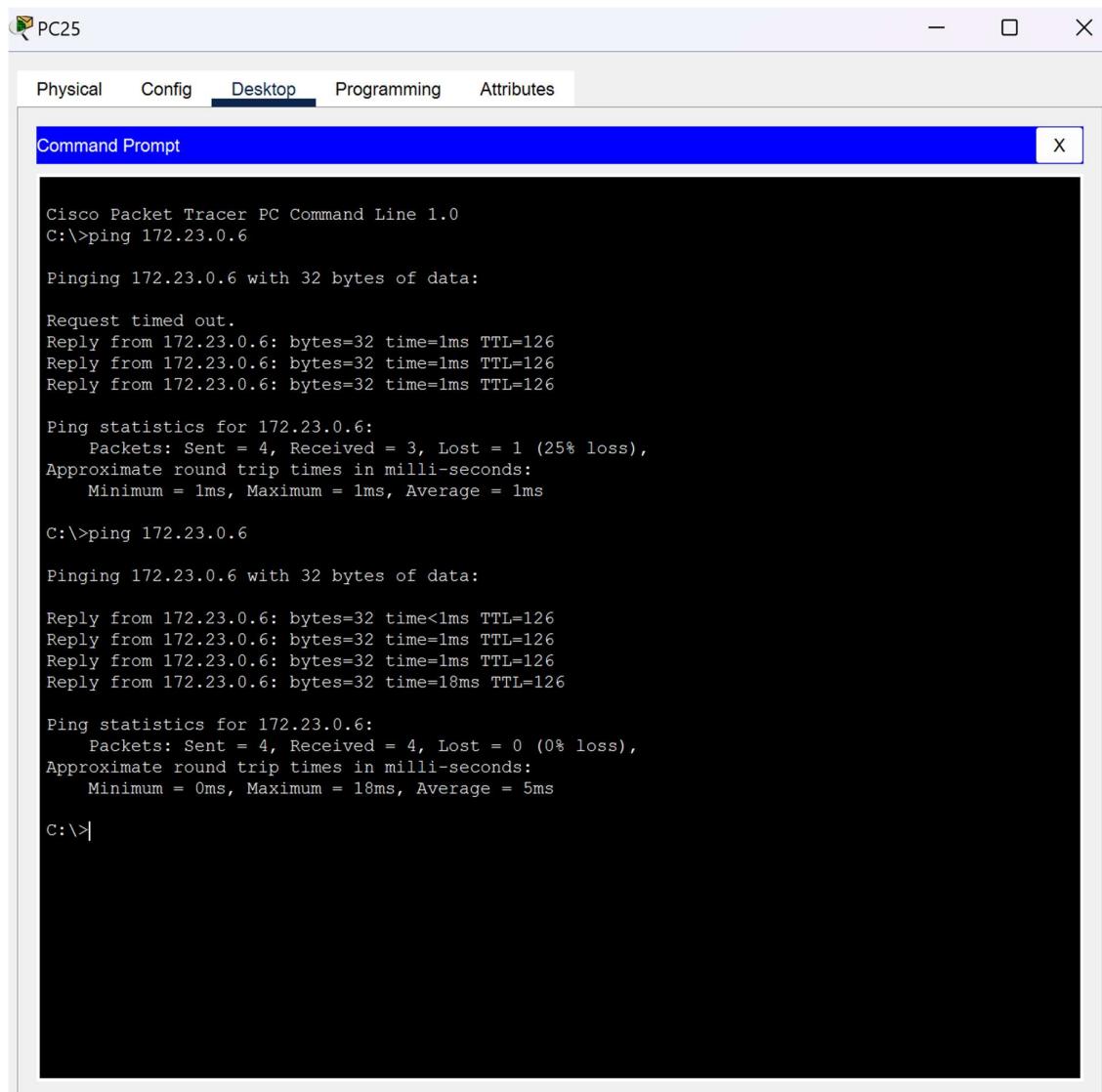
Pinging 172.22.0.6 with 32 bytes of data:

Reply from 172.22.0.6: bytes=32 time<1ms TTL=126
Reply from 172.22.0.6: bytes=32 time<1ms TTL=126
Reply from 172.22.0.6: bytes=32 time=1ms TTL=126
Reply from 172.22.0.6: bytes=32 time=1ms TTL=126

Ping statistics for 172.22.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

- From LAN 3 to LAN 4



The screenshot shows a window titled "PC25" with a tab bar containing "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the tab bar is a blue header bar with the text "Command Prompt" and a close button ("X"). The main area of the window displays the output of a Cisco Packet Tracer command-line interface. The output shows two ping sessions. The first session, starting at C:\>ping 172.23.0.6, results in three replies from 172.23.0.6 with 1ms latency each, followed by statistics showing 25% loss. The second session, starting at C:\>ping 172.23.0.6, results in four replies from 172.23.0.6 with latencies of <1ms, 1ms, 1ms, and 18ms, followed by statistics showing 0% loss.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.23.0.6

Pinging 172.23.0.6 with 32 bytes of data:
Request timed out.
Reply from 172.23.0.6: bytes=32 time=1ms TTL=126
Reply from 172.23.0.6: bytes=32 time=1ms TTL=126
Reply from 172.23.0.6: bytes=32 time=1ms TTL=126

Ping statistics for 172.23.0.6:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

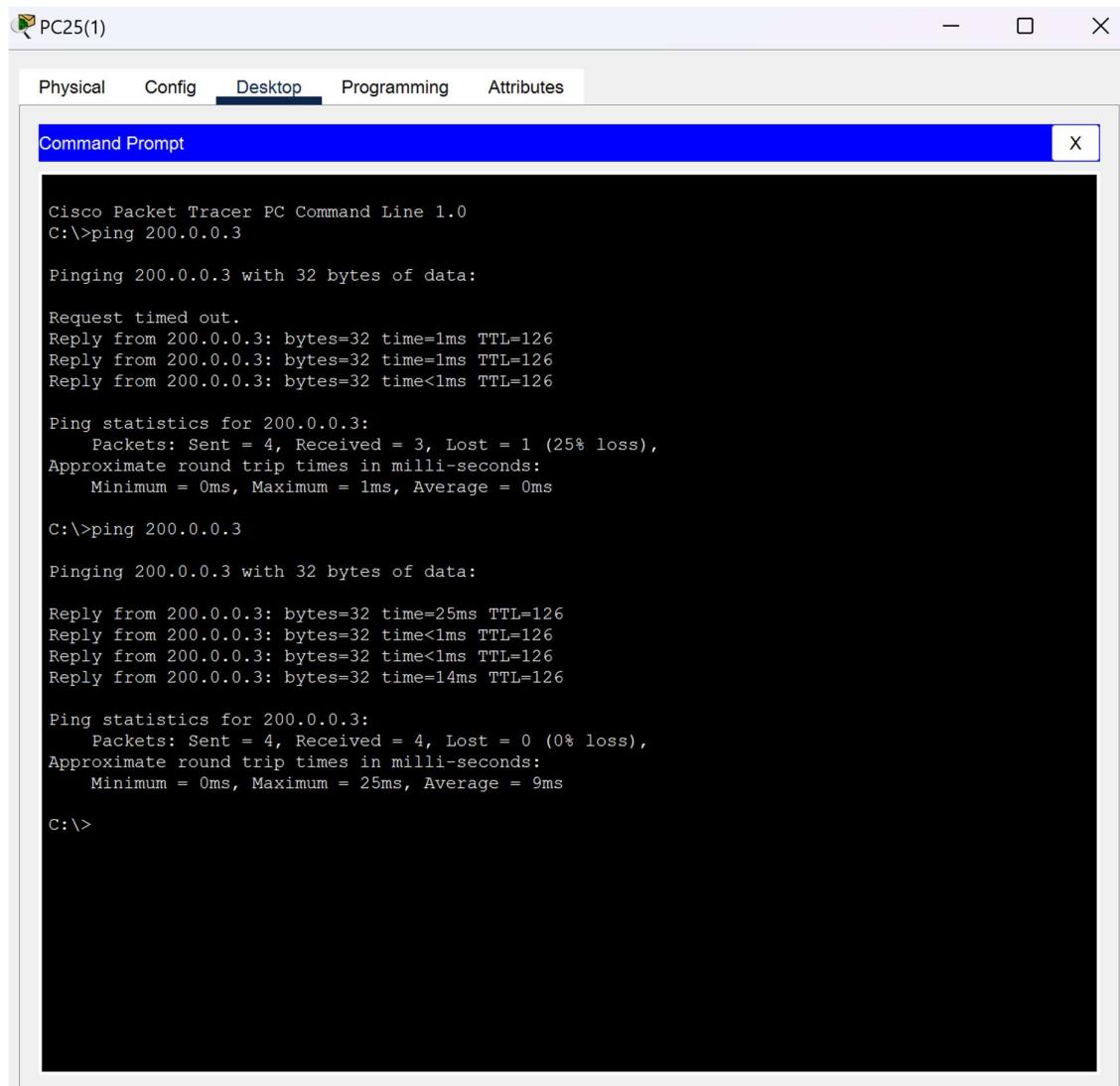
C:\>ping 172.23.0.6

Pinging 172.23.0.6 with 32 bytes of data:
Reply from 172.23.0.6: bytes=32 time<1ms TTL=126
Reply from 172.23.0.6: bytes=32 time=1ms TTL=126
Reply from 172.23.0.6: bytes=32 time=1ms TTL=126
Reply from 172.23.0.6: bytes=32 time=18ms TTL=126

Ping statistics for 172.23.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 18ms, Average = 5ms

C:\>
```

- From LAN 4 to LAN 5



The screenshot shows a Cisco Packet Tracer window titled "PC25(1)". The "Desktop" tab is selected in the top menu bar. Below the menu is a "Command Prompt" window with a blue header bar containing the title "Command Prompt" and a close button "X". The main area of the window displays the output of a ping command. The text reads:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 200.0.0.3

Pinging 200.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 200.0.0.3: bytes=32 time=1ms TTL=126
Reply from 200.0.0.3: bytes=32 time=1ms TTL=126
Reply from 200.0.0.3: bytes=32 time<1ms TTL=126

Ping statistics for 200.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 200.0.0.3

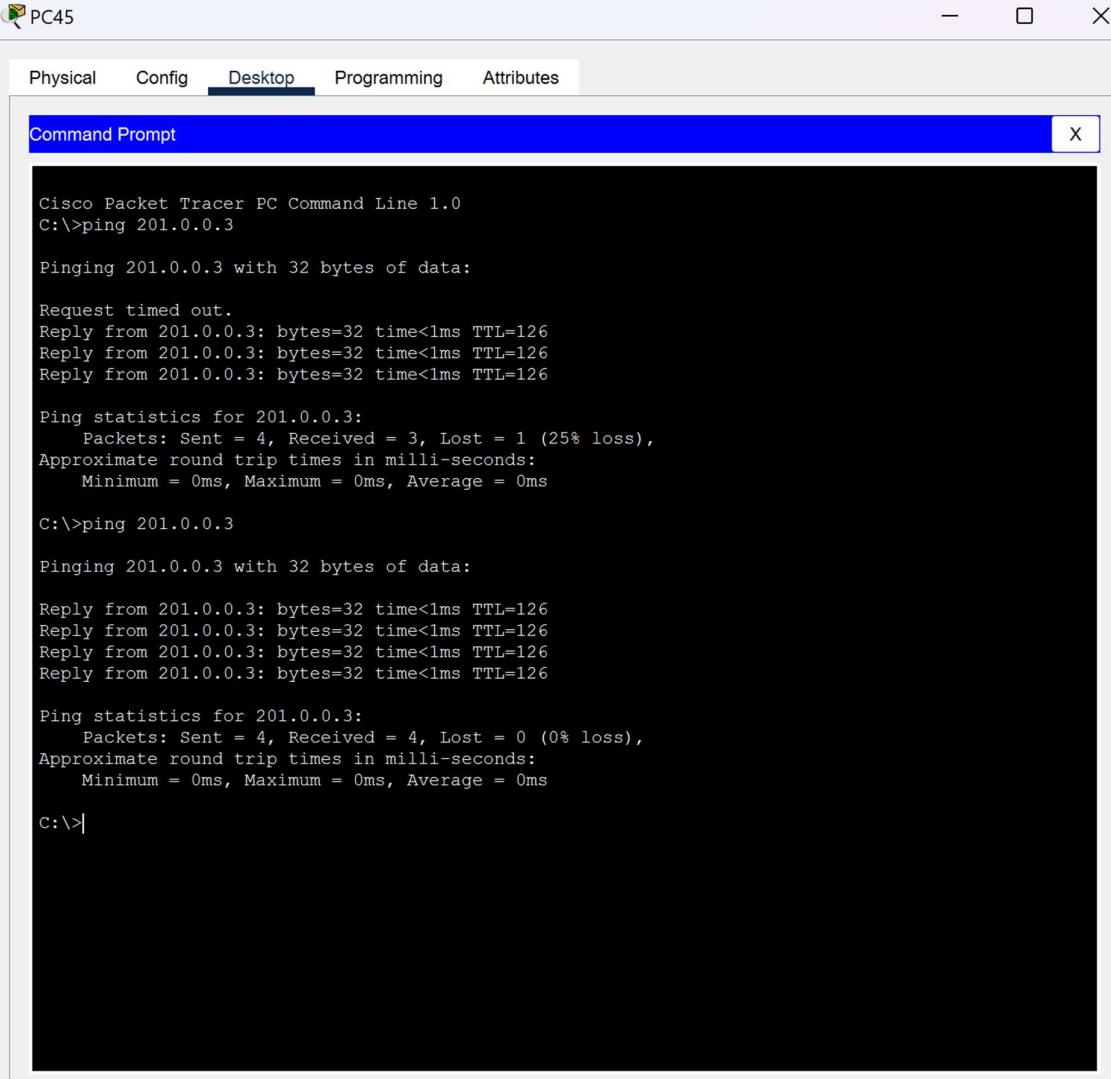
Pinging 200.0.0.3 with 32 bytes of data:

Reply from 200.0.0.3: bytes=32 time=25ms TTL=126
Reply from 200.0.0.3: bytes=32 time<1ms TTL=126
Reply from 200.0.0.3: bytes=32 time<1ms TTL=126
Reply from 200.0.0.3: bytes=32 time=14ms TTL=126

Ping statistics for 200.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 25ms, Average = 9ms

C:\>
```

- From LAN 5 to LAN 6



The screenshot shows a window titled "Command Prompt" within the Cisco Packet Tracer software. The window has a blue header bar with the title and a close button. Below the header is a menu bar with tabs: Physical, Config, Desktop (which is selected), Programming, and Attributes. The main area of the window displays the output of a ping command. The text in the window reads:

```
Cisco Packet Tracer PC Command Line 1.0
C:>ping 201.0.0.3

Pinging 201.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 201.0.0.3: bytes=32 time<1ms TTL=126
Reply from 201.0.0.3: bytes=32 time<1ms TTL=126
Reply from 201.0.0.3: bytes=32 time<1ms TTL=126

Ping statistics for 201.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>ping 201.0.0.3

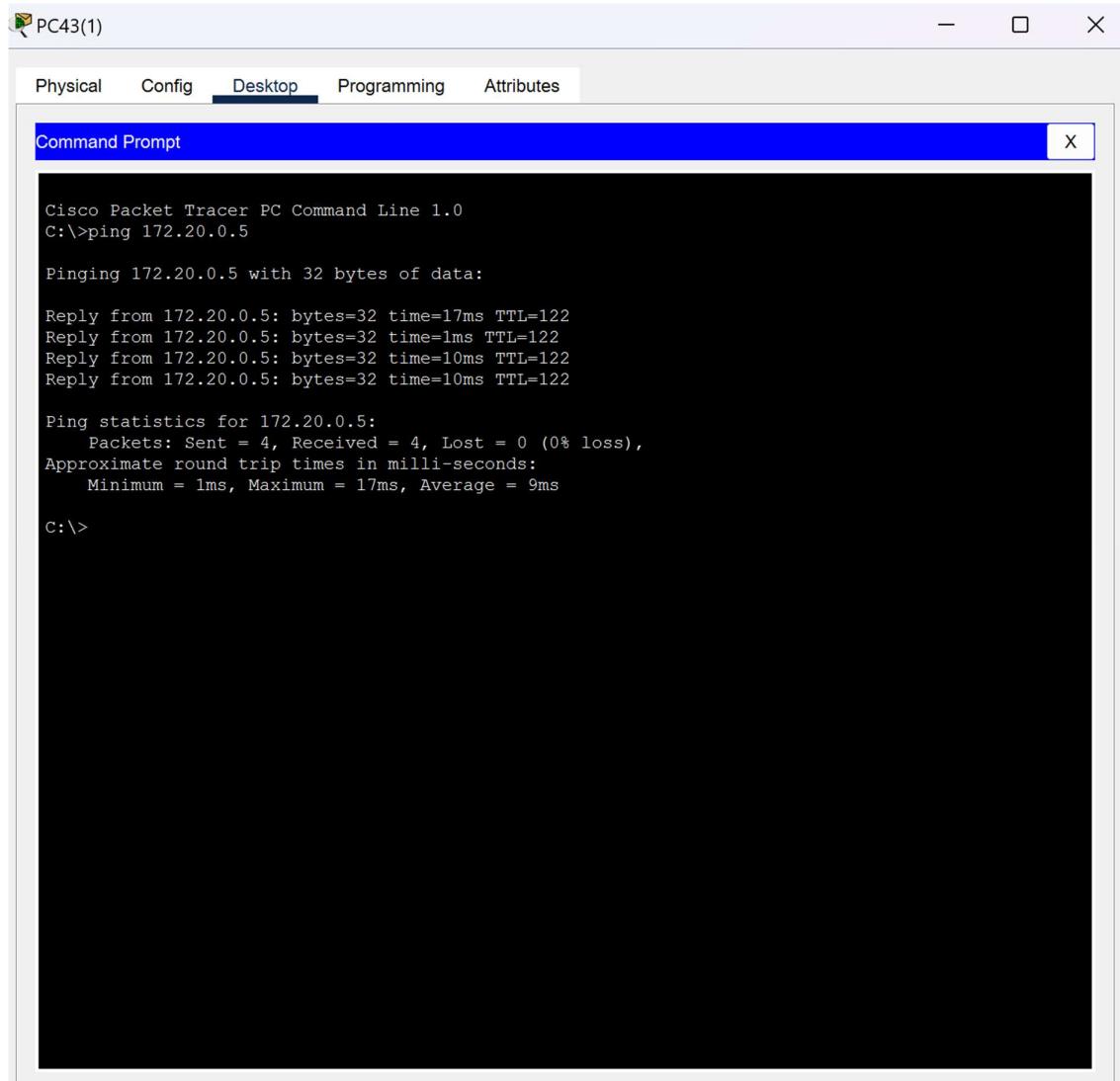
Pinging 201.0.0.3 with 32 bytes of data:

Reply from 201.0.0.3: bytes=32 time<1ms TTL=126

Ping statistics for 201.0.0.3:
    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 6 to LAN 1



The image shows a screenshot of the Cisco Packet Tracer software interface. The window title is "PC43(1)". The tab bar at the top includes "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the tabs is a blue header bar with the text "Command Prompt" and a close button ("X"). The main area of the window is a black terminal window displaying the output of a ping command. The text in the terminal is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.20.0.5

Pinging 172.20.0.5 with 32 bytes of data:

Reply from 172.20.0.5: bytes=32 time=17ms TTL=122
Reply from 172.20.0.5: bytes=32 time=1ms TTL=122
Reply from 172.20.0.5: bytes=32 time=10ms TTL=122
Reply from 172.20.0.5: bytes=32 time=10ms TTL=122

Ping statistics for 172.20.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 17ms, Average = 9ms

C:\>
```