



**Faculty of Engineering & Technology Electrical &
Computer Engineering Department**

**ENCS3320
Computer Networks**

Project II Report

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Abstract

This report outlines the construction and validation of a network in Cisco Packet Tracer, aimed at reinforcing theoretical knowledge through practical application. Guided by objectives to master network simulation, IP subnetting, device configuration, and routing protocol establishment, the project involved setting up a topology with designated servers and end devices, configuring OSPF routing, and ensuring operational integrity through ping, traceroute, and server functionality tests.

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Part 0: IP Subnetting and Assignment

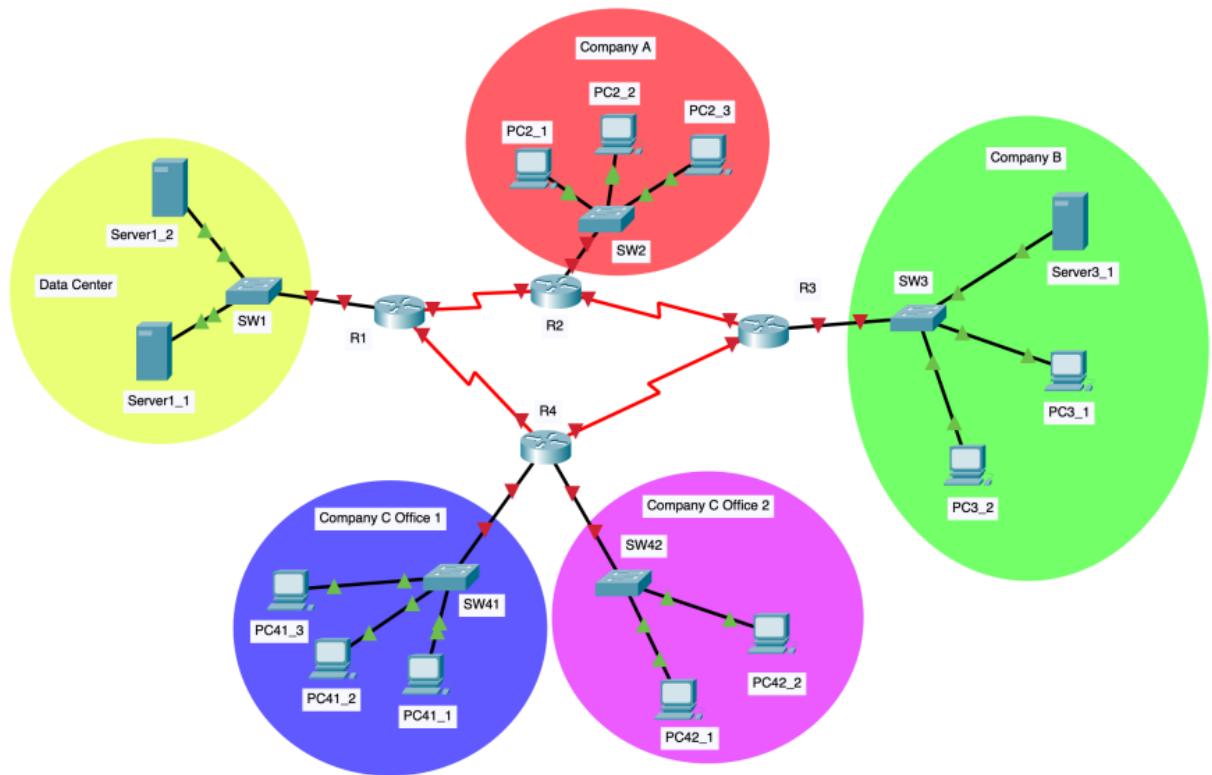


Figure 1: The Network Layout

As we see in the figure, we have a network consisting of 9 subnets. To determine the subnets, detach each interface from its host or router. Since the id is 1210478, then the IP address is 200.4.10.0/25.

Procedure of Subnetting

To achieve the most optimal solution, we based our approach on the number of end devices in each network. For instance, if a network contains 26 devices, we allocate 5 bits for the host address, allowing for 32 devices. Similarly, for a network with 12 devices, we use 4 bits for the host address, accommodating up to 16 devices. This topology is detailed in Table 1.

Table 1: Subnetting details

Subnet	Subnet Mask “using the slash notation”	Network IP	Broadcast IP	First IP	Last IP	Max. Number of IPs in this subnet
R1-R2 Link	255.255.255.252/30	200.4.10.104	200.4.10.7	200.4.10.5	200.4.10.6	$2^2 - 2 = 2$
R2-R3 Link	255.255.255.252/30	200.4.10.108	200.4.10.111	200.4.10.9	200.4.10.10	$2^2 - 2 = 2$
R3-R4 Link	255.255.255.252/30	200.4.10.112	200.4.10.115	200.4.10.113	200.4.10.114	$2^2 - 2 = 2$
R4-R1 Link	255.255.255.252/30	200.4.10.116	200.4.10.119	200.4.10.117	200.4.10.118	$2^2 - 2 = 23$
Data Center	255.255.255.248/30	200.4.10.96	200.4.10.103	200.4.10.97	200.4.10.102	$2^3 - 2 = 6$
Company A	255.255.255.224/27	200.4.10.0	200.4.10.31	200.4.10.1	200.4.10.30	$2^5 - 2 = 30$
Company B	255.255.255.224/27	200.4.10.32	200.4.10.63	200.4.10.33	200.4.10.62	$2^5 - 2 = 30$
Company C Office 1	255.255.255.240/28	200.4.10.64	200.4.10.79	200.4.10.65	200.4.10.78	$2^4 - 2 = 14$
Company C Office 2	255.255.255.240/28	200.4.10.80	200.4.10.95	200.4.10.81	200.4.10.94	$2^4 - 2 = 14$

Part 1: Building the Topology

In this part, we use packet tracer to build the topology based on the IPs found in Part0.

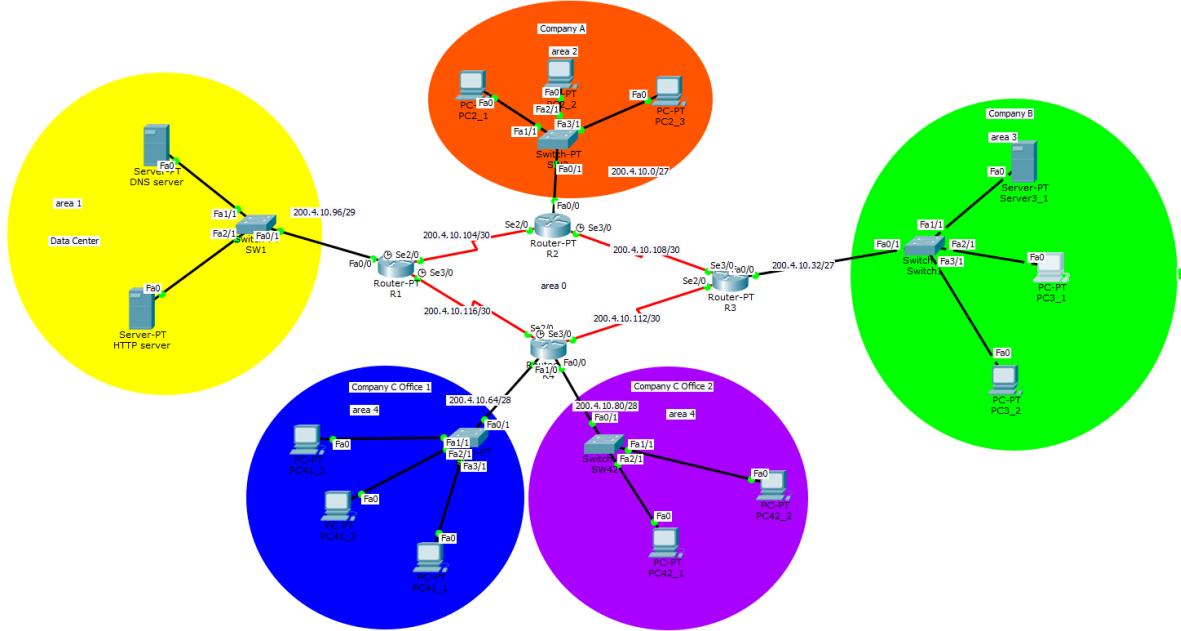


Figure 2: Built Topology using Packet Tracer

As we see in Figure 2 the topology is divided into areas with a specified IP address to each area as shown in Table 2.

Table 2: Areas IPs

Area	Area Number	Area IP	Area Color
Routers	0	Each subnet has an IP, Within range: 200.4.10.104/30 – 200.4.10.116/30	-
Data Center	1	200.4.10.96/29	Yellow
Company A	2	200.4.10.0/27	Orange
Company B	3	200.4.10.32/32	Green
Company C – Office 1	4	200.4.10.64/28	Blue
Company A – Office 2	4	200.4.10.80/20	Violet

Routers Configurations

The configuration of the routers was carried out in accordance with the details presented in Table 1, which is depicted in Figure 2, taking into account one of the student IDs in our group which is "1210478".

For Router 1 (R1), the FastEthernet0/0 interface has been assigned the IP address 200.4.10.97 with a subnet mask of 255.255.255.248. Additionally, its Serial2/0 port has been configured with the IP address 200.4.10.106 and a subnet mask of 255.255.255.252. The Serial3/0 port on the same router has been assigned an IP address of 200.4.10.117, using a subnet mask of 255.255.255.252. These configurations are illustrated in Figures 3, 4, and 5.

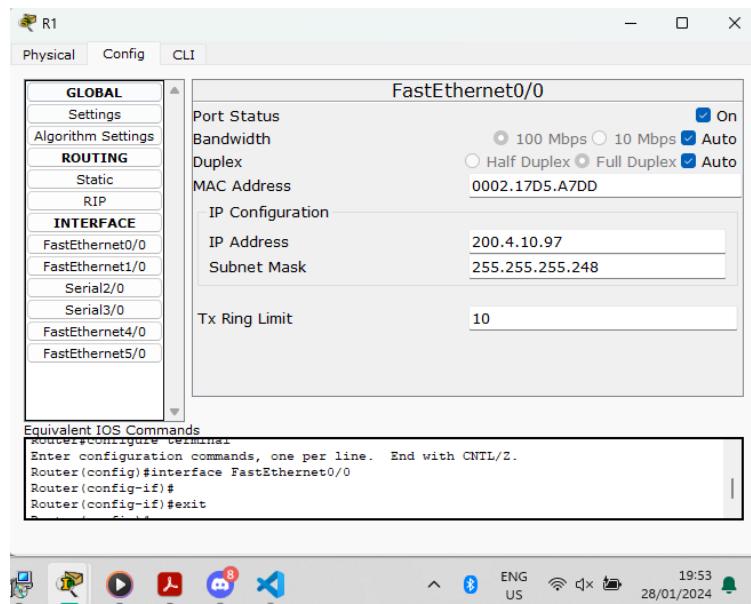


Figure 3: R1 Ethernet0/0 Configurations

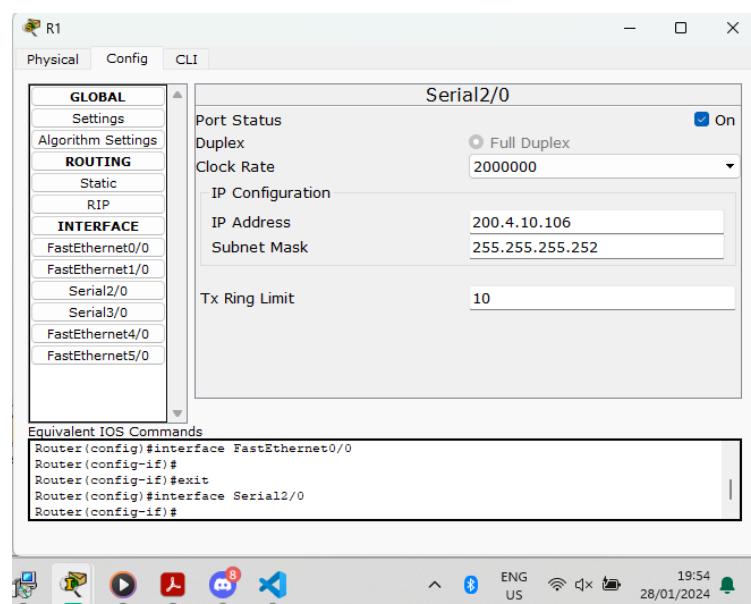


Figure 4: R1 Serial2/0 Configurations

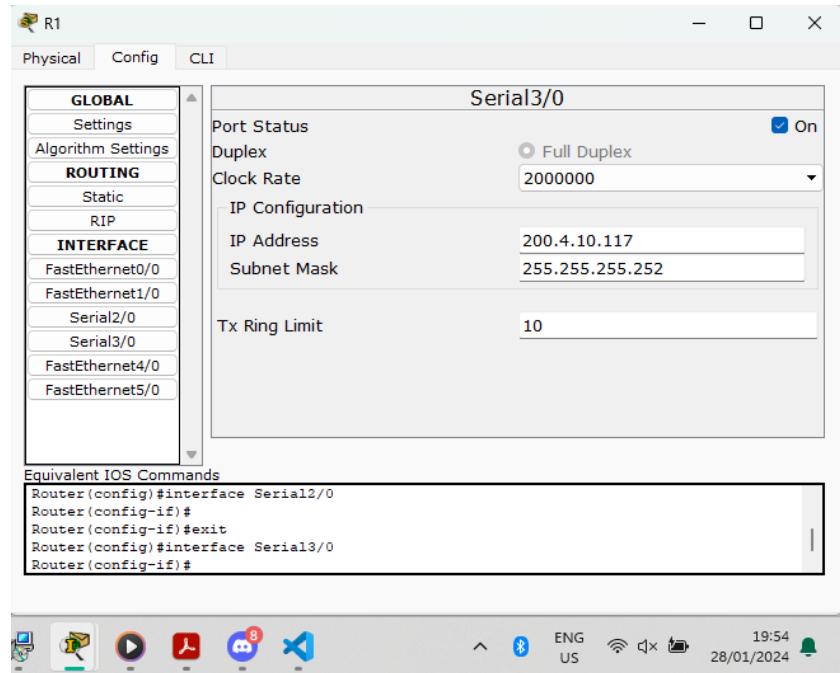


Figure 5: R1 Serial3/0 Configurations

For Router 2 (R2), the FastEthernet0/0 interface has been assigned the IP address 200.4.10.1 with a subnet mask of 255.255.255.224. Additionally, its Serial2/0 port has been configured with the IP address 200.2.10.105 and a subnet mask of 255.255.255.252. The Serial3/0 port on the same router has been assigned an IP address of 200.4.10.109, using a subnet mask of 255.255.255.252. These configurations are illustrated in Figures 6, 7, and 8.

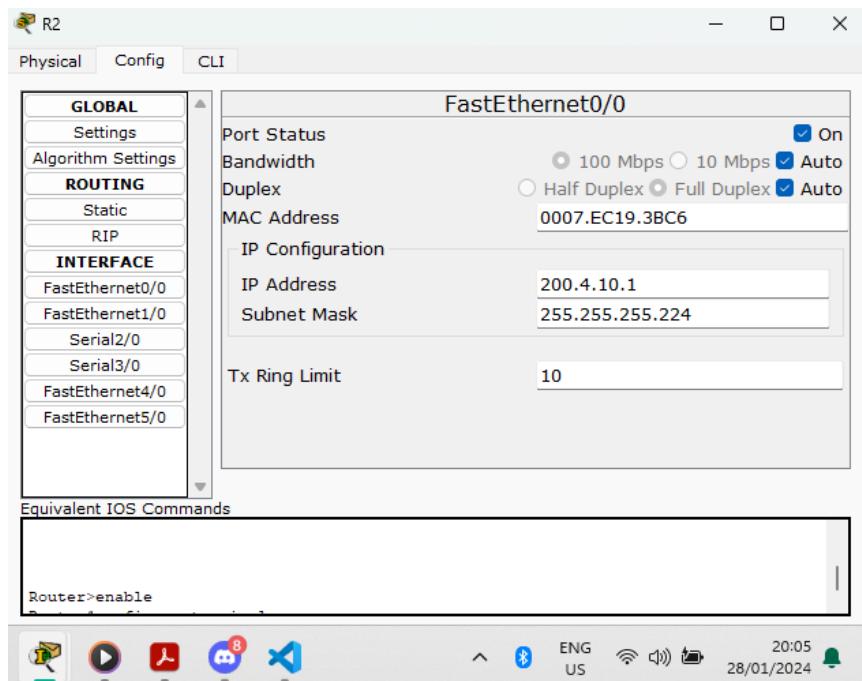


Figure 6: R2 Ethernet0/0 Configurations

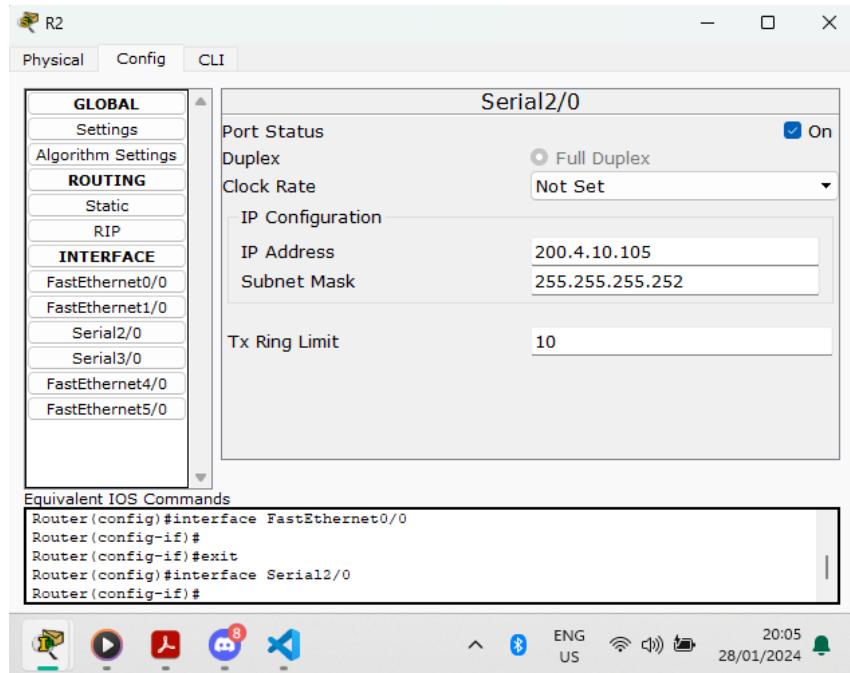


Figure 7: R2 Serial2/0 Configurations

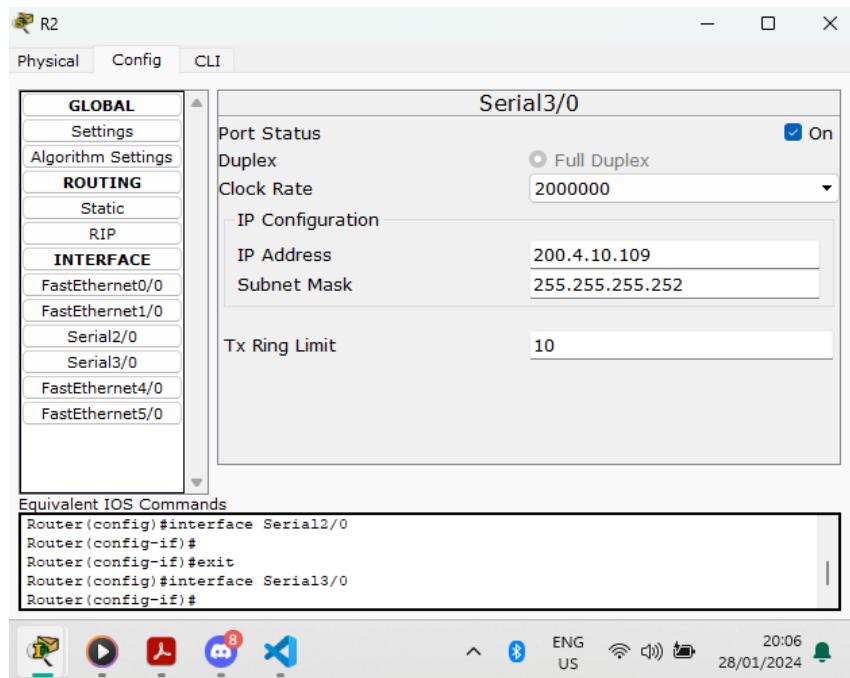


Figure 8: R2 Serial3/0 Configurations

For Router 3 (R3), the FastEthernet0/0 interface has been assigned the IP address 200.4.10.33 with a subnet mask of 255.255.255.224. Additionally, its Serial2/0 port has been configured with the IP address 200.2.10.114 and a subnet mask of 255.255.255.252. The Serial3/0 port on the same router has been assigned an IP address of 200.4.10.110, using a subnet mask of 255.255.255.252. These configurations are illustrated in Figures 9, 10, and 11.

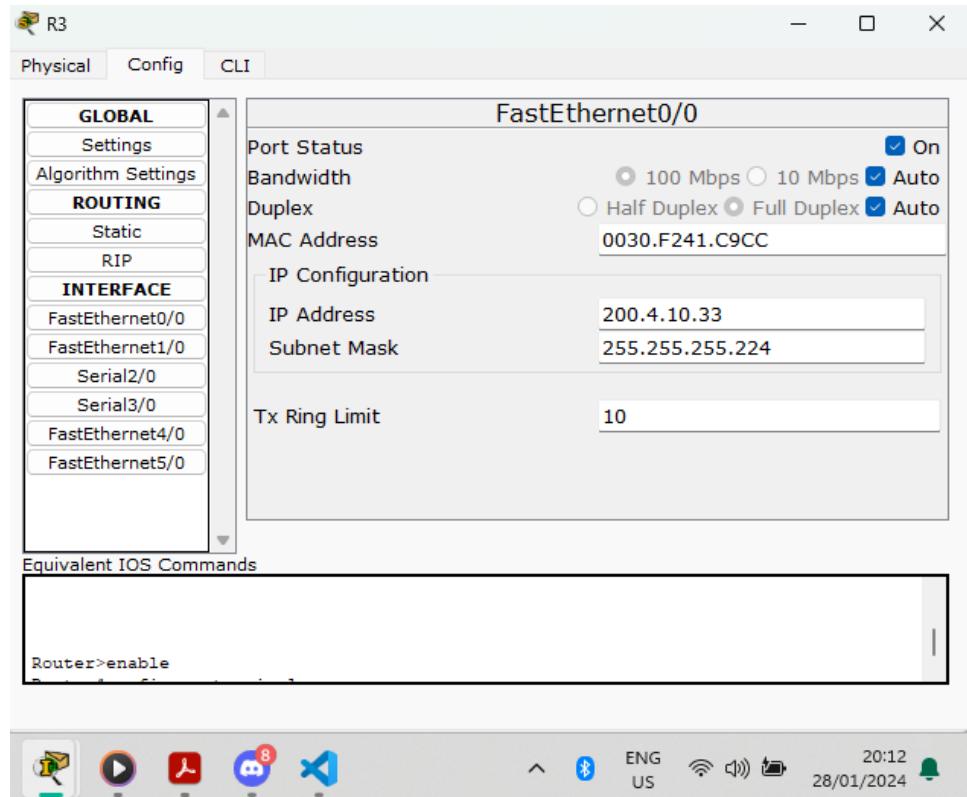


Figure 9: R3 Ethernet0/0 Configurations

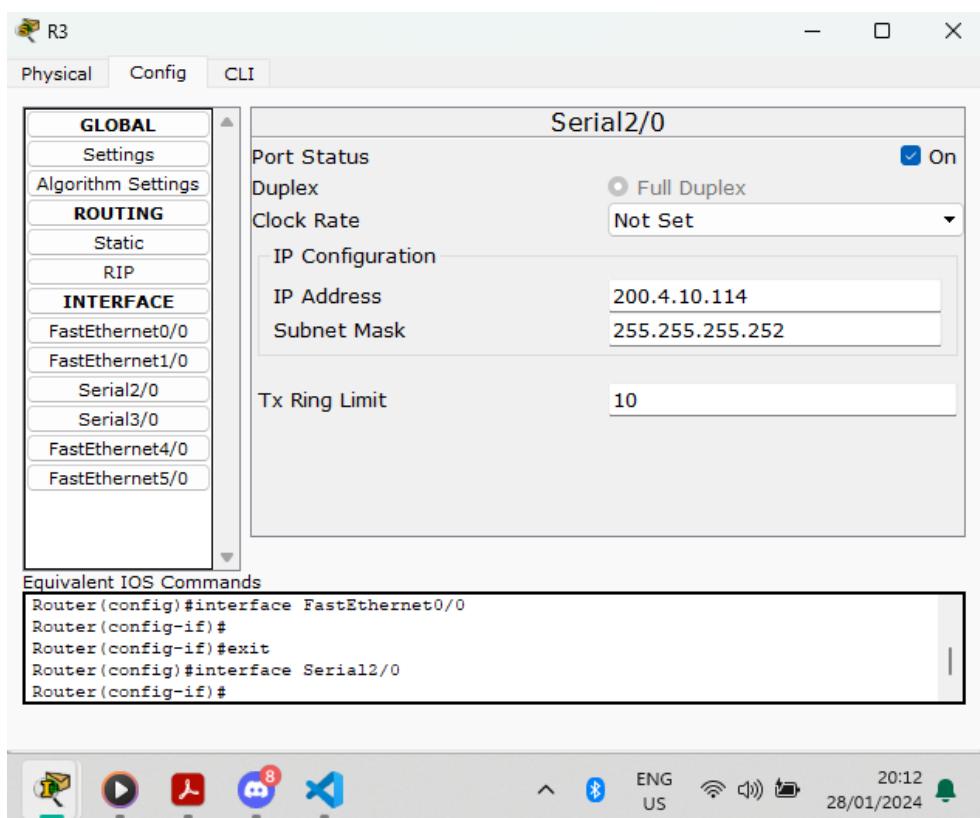


Figure 10: R3 Serial2/0 Configurations

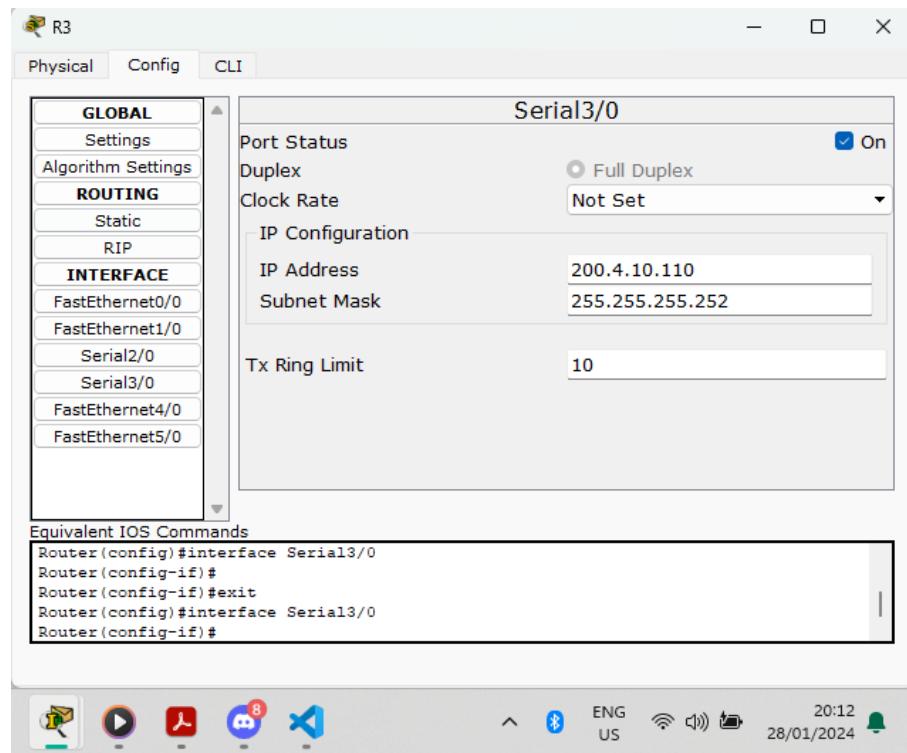


Figure 11: R3 Serial3/0 Configurations

For Router 4 (R4), the FastEthernet0/0 interface has been assigned the IP address 200.4.10.33 with a subnet mask of 255.255.255.224. The FastEthernet1/0 interface has been assigned the IP address 200.4.10.33 with a subnet mask of 255.255.255.224. Additionally, its Serial2/0 port has been configured with the IP address 200.2.10.114 and a subnet mask of 255.255.255.252. The Serial3/0 port on the same router has been assigned an IP address of 200.4.10.110, using a subnet mask of 255.255.255.252. These configurations are illustrated in Figures 12, 11, 13, and 14.

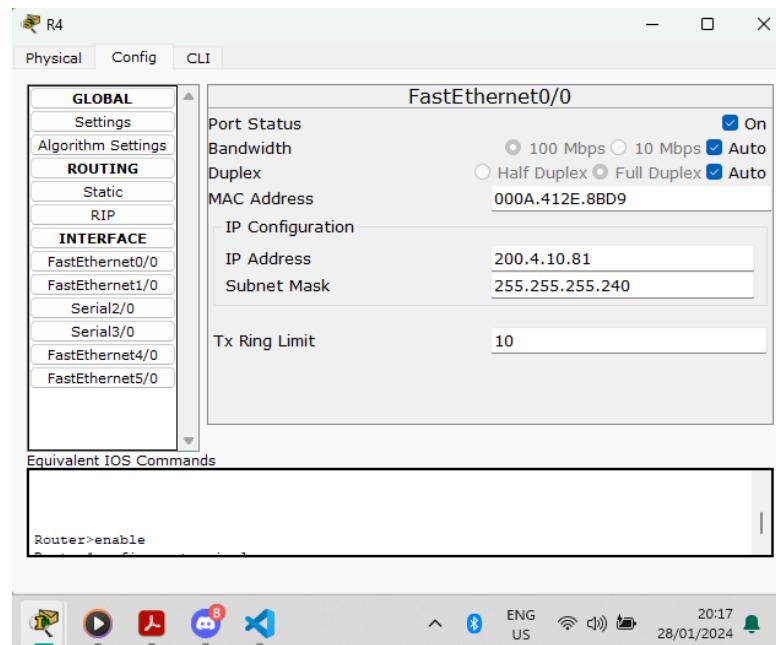


Figure 12: R4 Ethernet0/0 Configurations

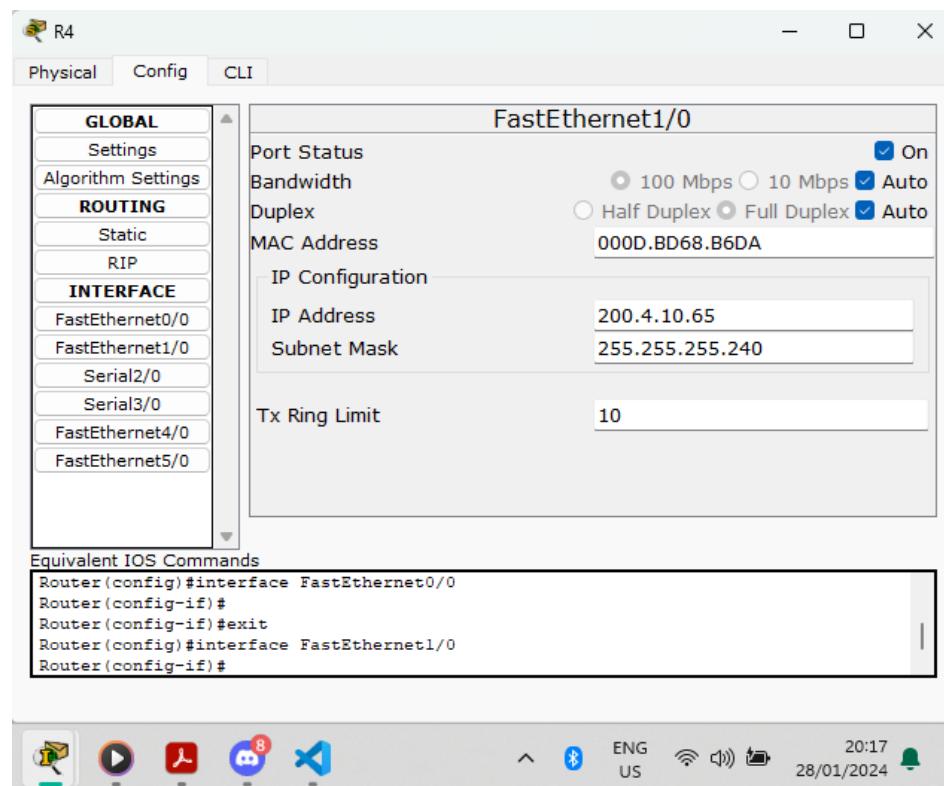


Figure 13: R4 Ethernet1/0 Configurations

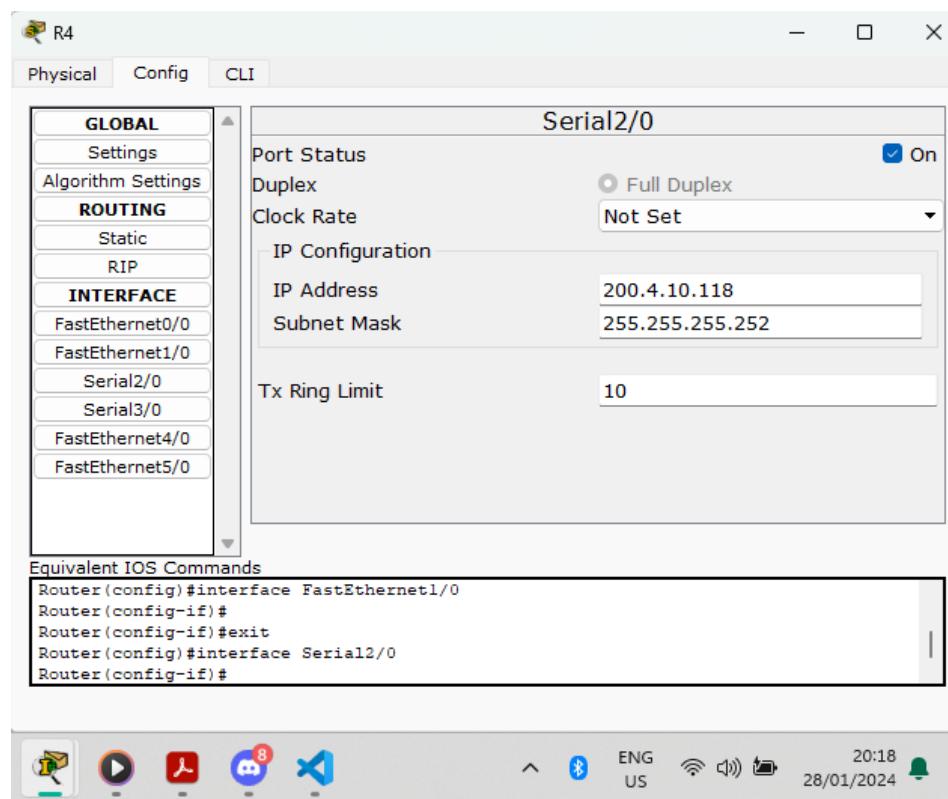


Figure 14: R4 Serial2/0 Configurations

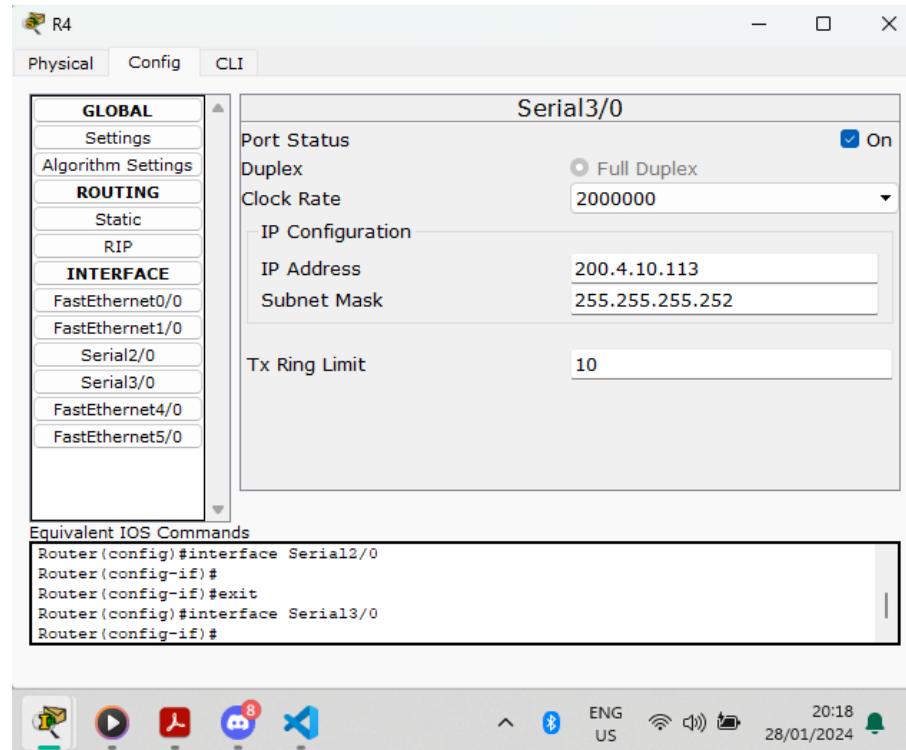


Figure 15: R4 Serial3/0 Configurations

Servers Configurations

For the DNS server, identified as server2_1, we configured the server's IP address, subnet mask, default gateway, and DNS server using the values shown in Figure 17.

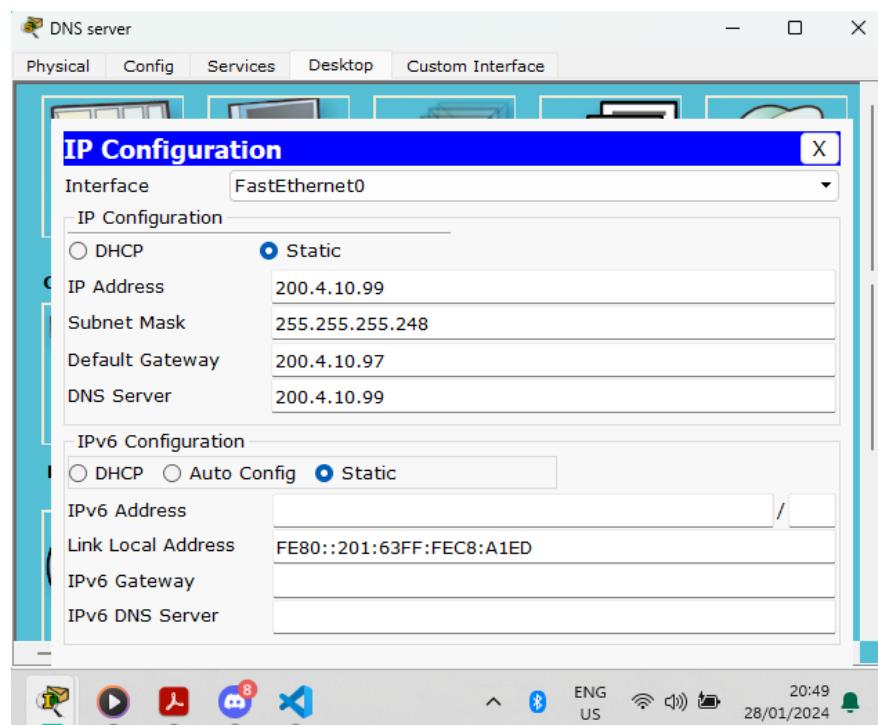


Figure 16: DNS Server Configurations

For the HTTP server, known as server2_1, we configured the server's IP address, subnet mask, default gateway, and DNS server values with the parameters shown in Figure 19.

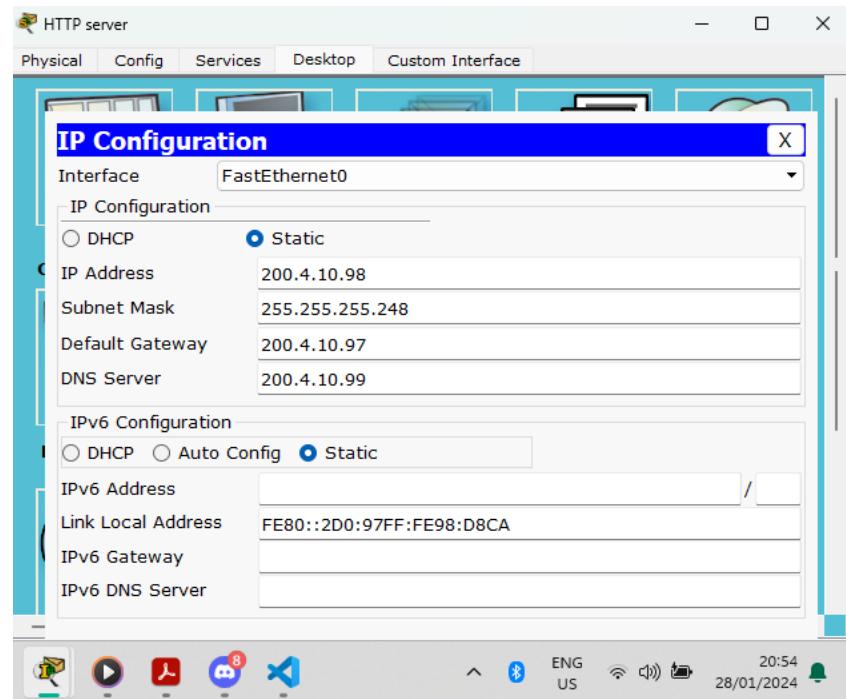


Figure 17: HTTP Server Configurations

For Server3_1, the final server which serves as the mail server in Company B's area, we configured its IP address, subnet mask, default gateway, and DNS server values with the parameters shown in Figure 20.

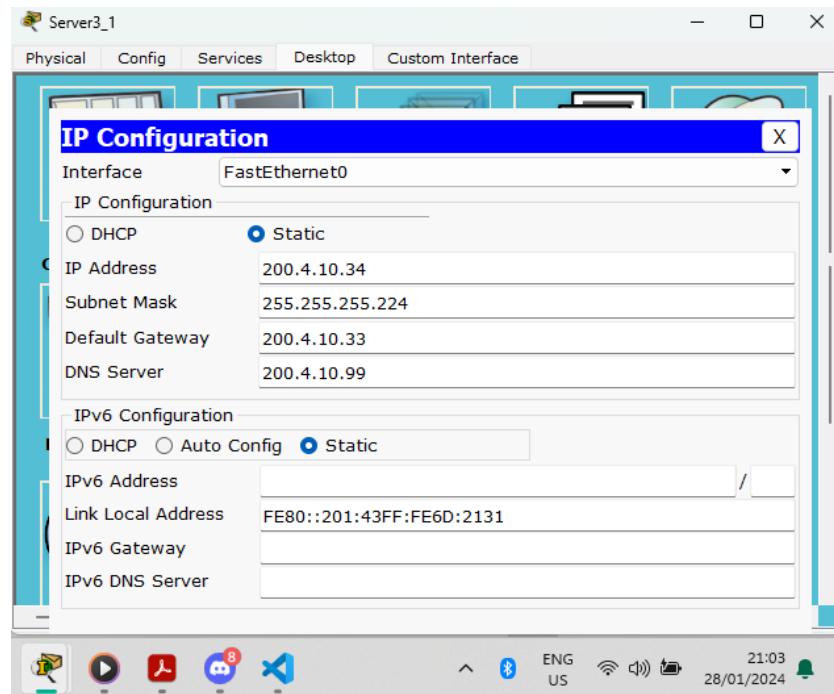


Figure 18: Mail Server Configurations

Finally, we set up the IP address, subnet mask, default gateway, and DNS server for each of our 10 PCs, located in different areas, which are all provided in Figures 19 through 28.

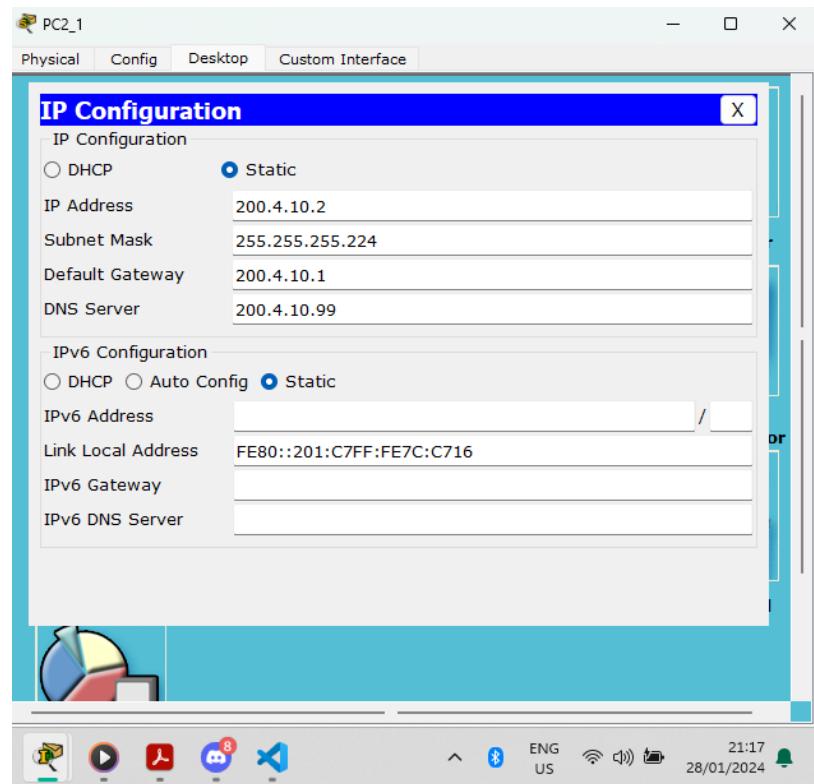


Figure 19: PC2_1 Configuration

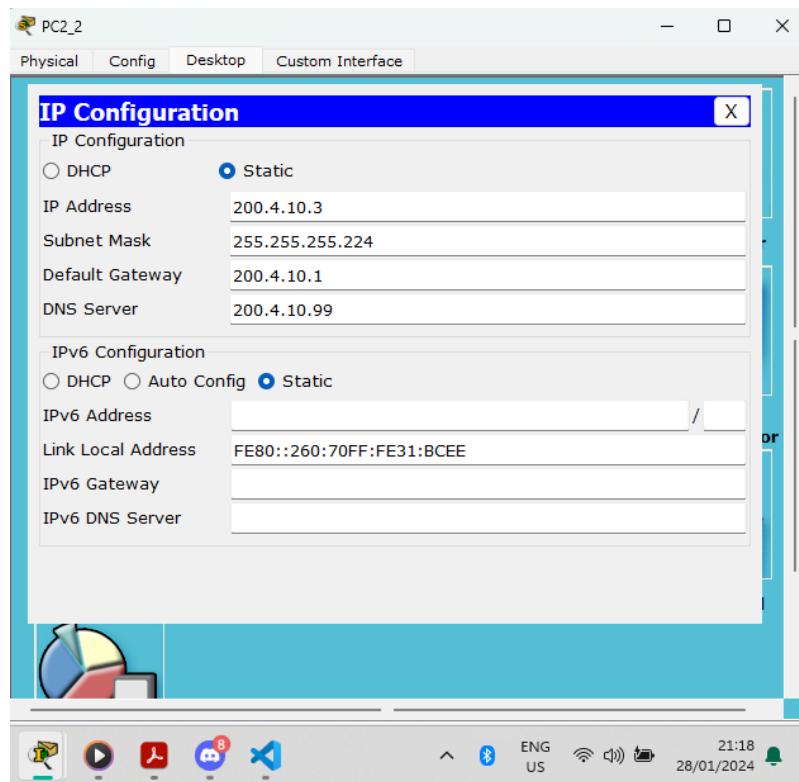


Figure 20: PC2_2 Configuration

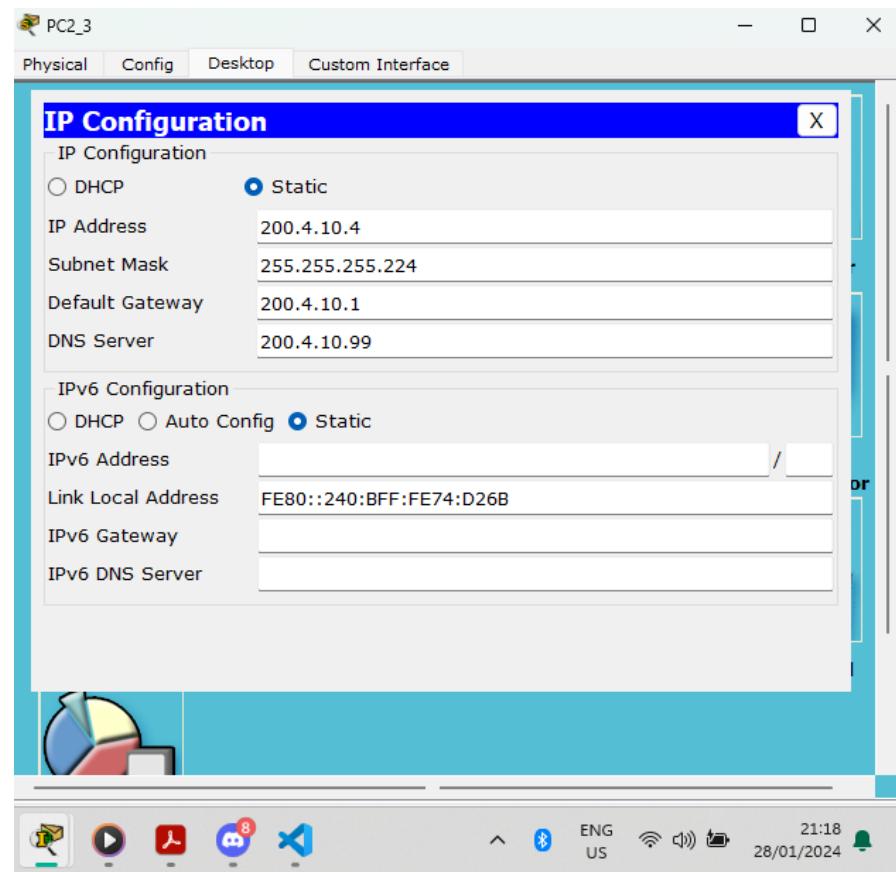


Figure 21: PC2_3 Configuration

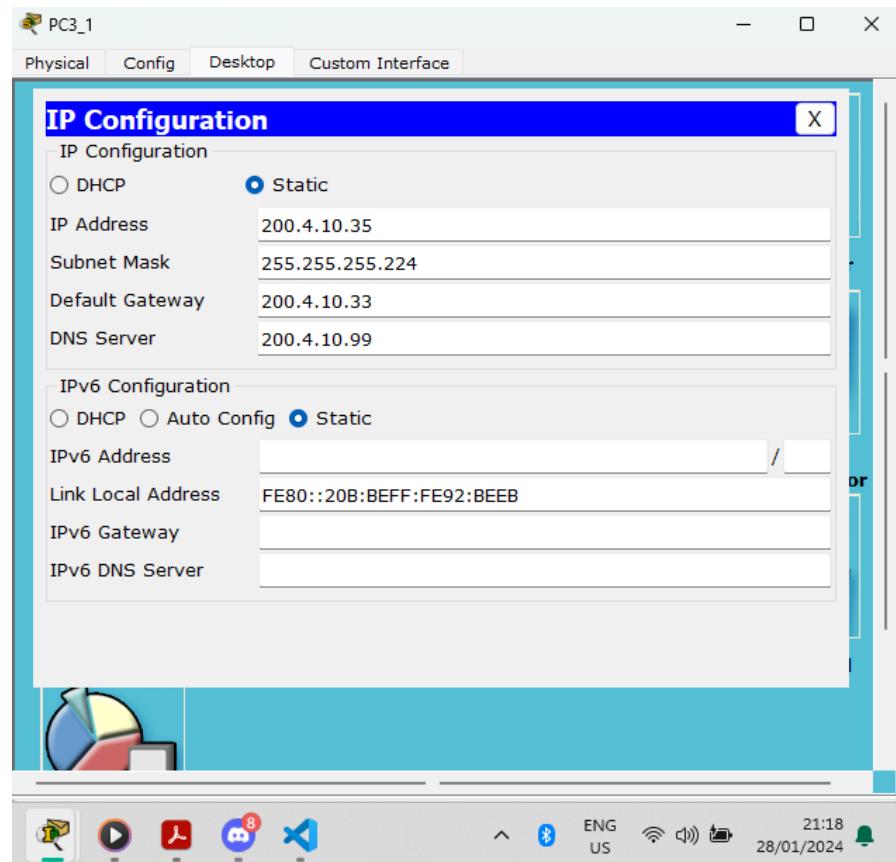


Figure 22: PC3_1 Configuration

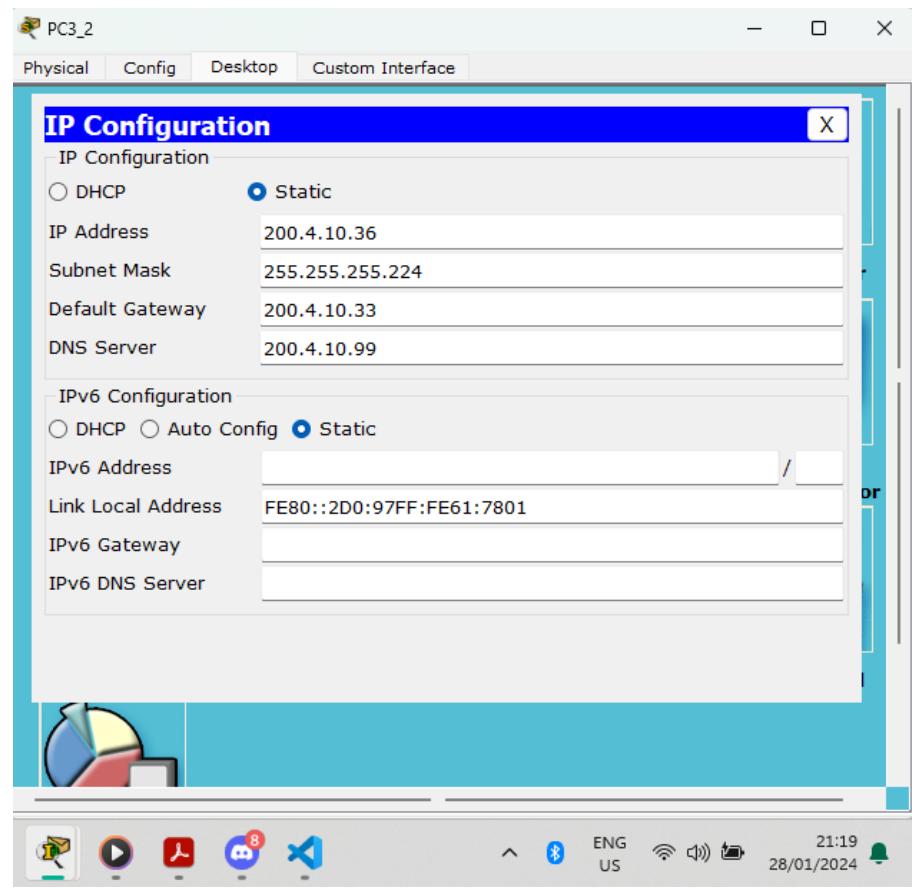


Figure 23: PC3_2 Configuration

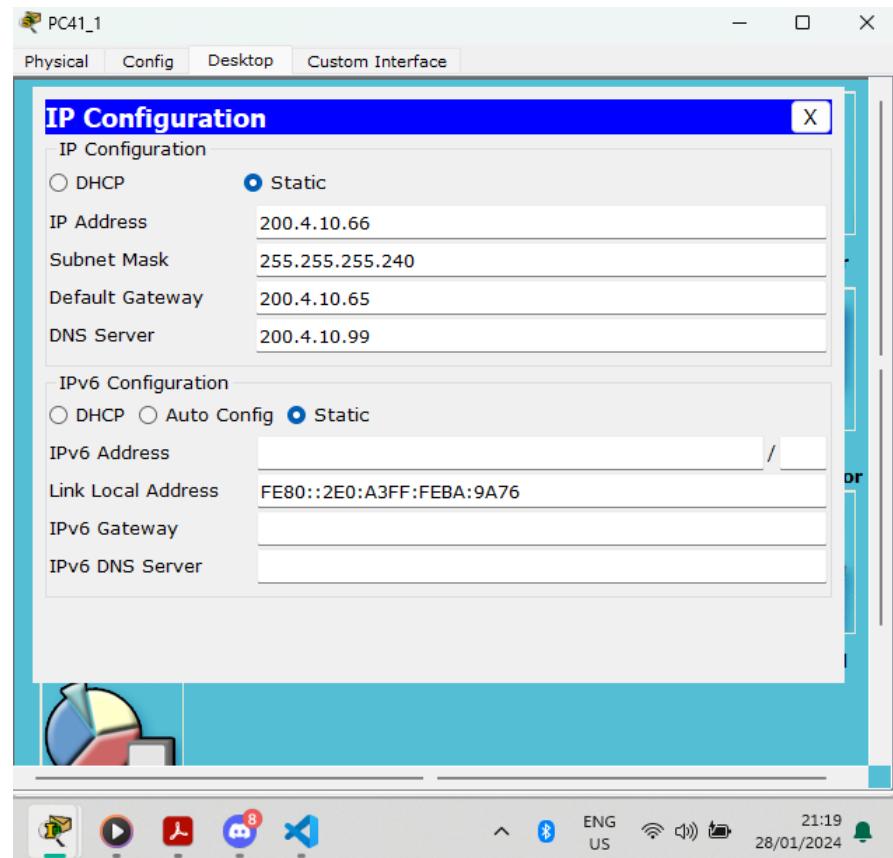


Figure 24: PC41_1 Configuration

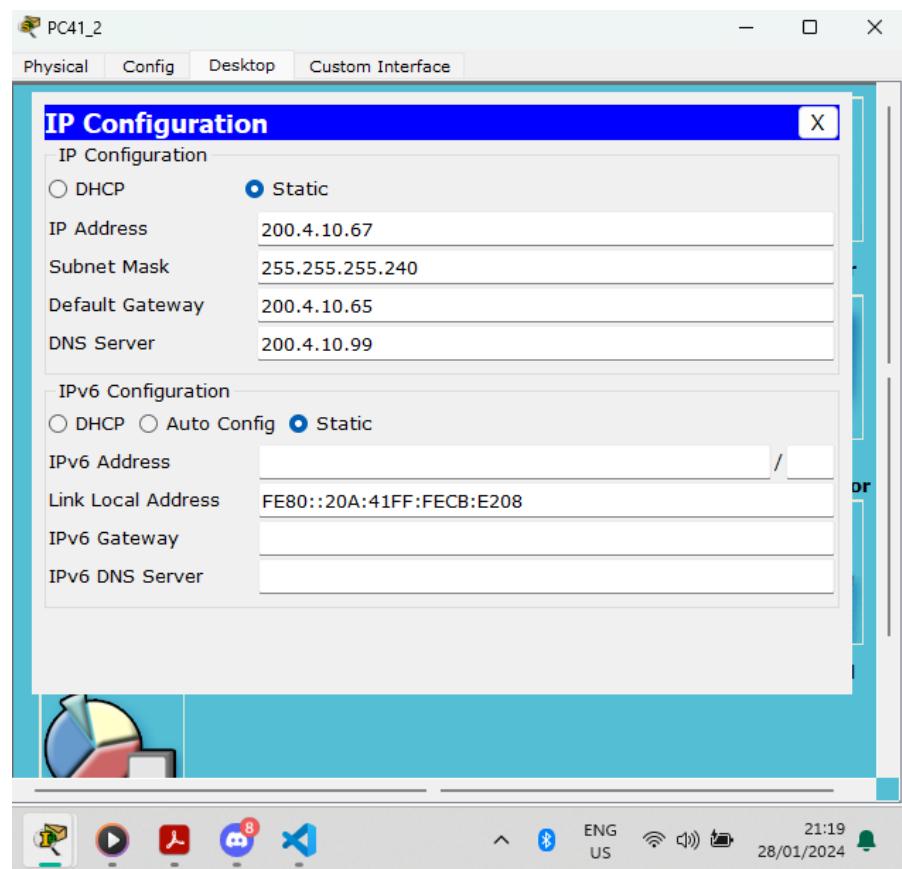


Figure 25: PC41_2 Configuration

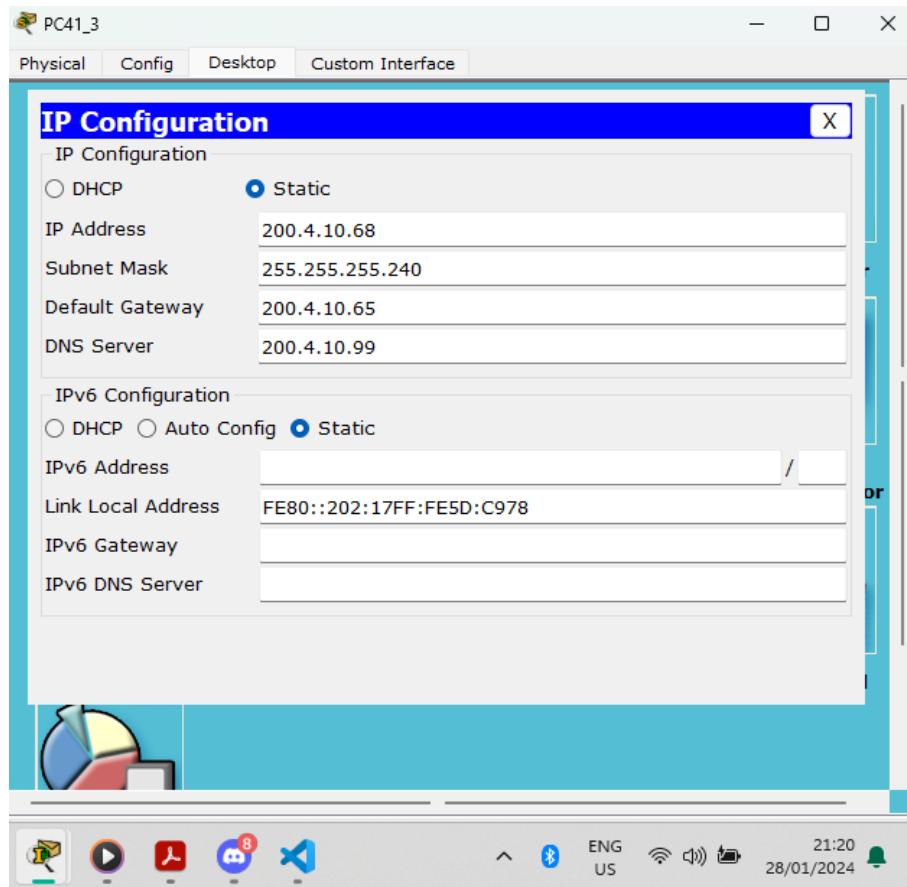


Figure 26: PC41_3 Configuration

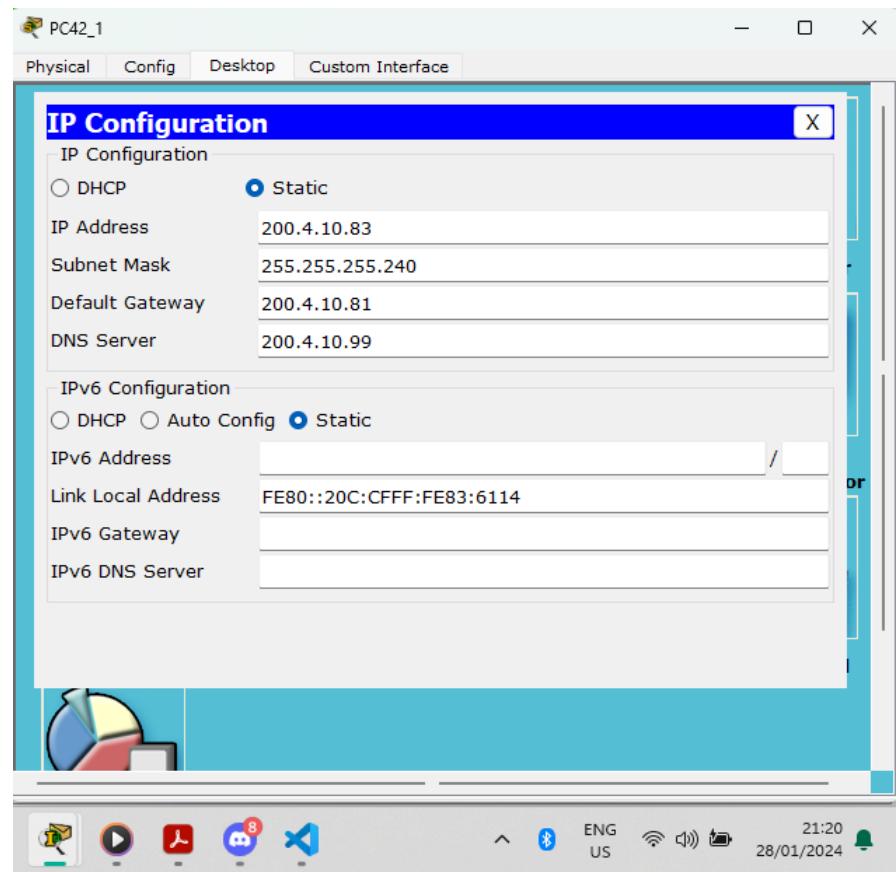


Figure 27: PC42_1 Configuration

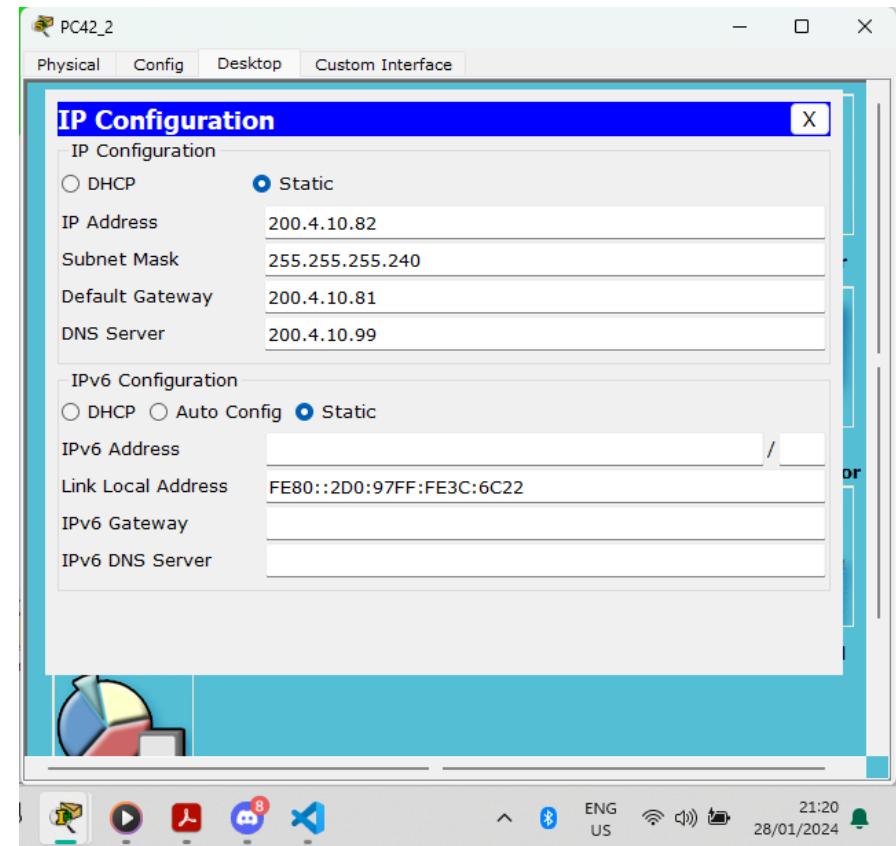


Figure 28: PC42_2 Configuration

Part 2: Configuring Servers

In the HTTP server, we activated both HTTP and HTTPS services, and uploaded the necessary files, including HTML document (Figure 30) and images, to the file manager. As shown in Figure 29.

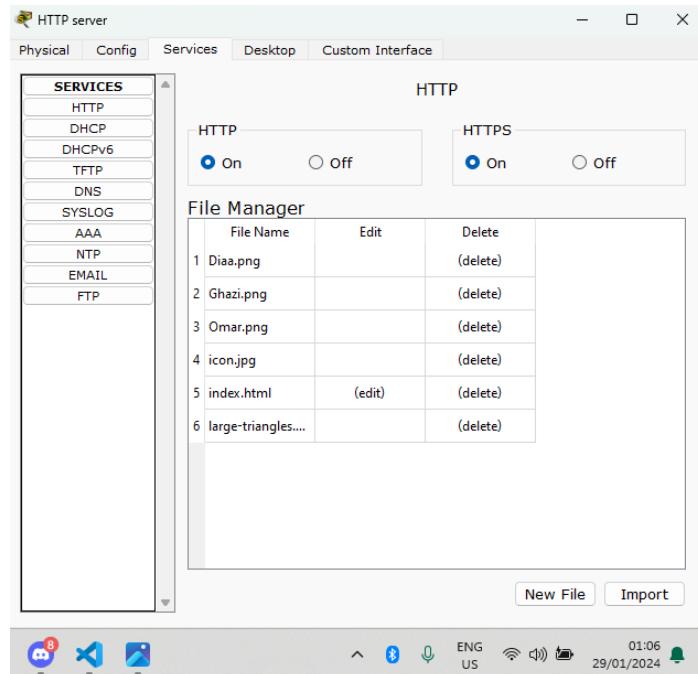


Figure 29: HTTP Server Configuration

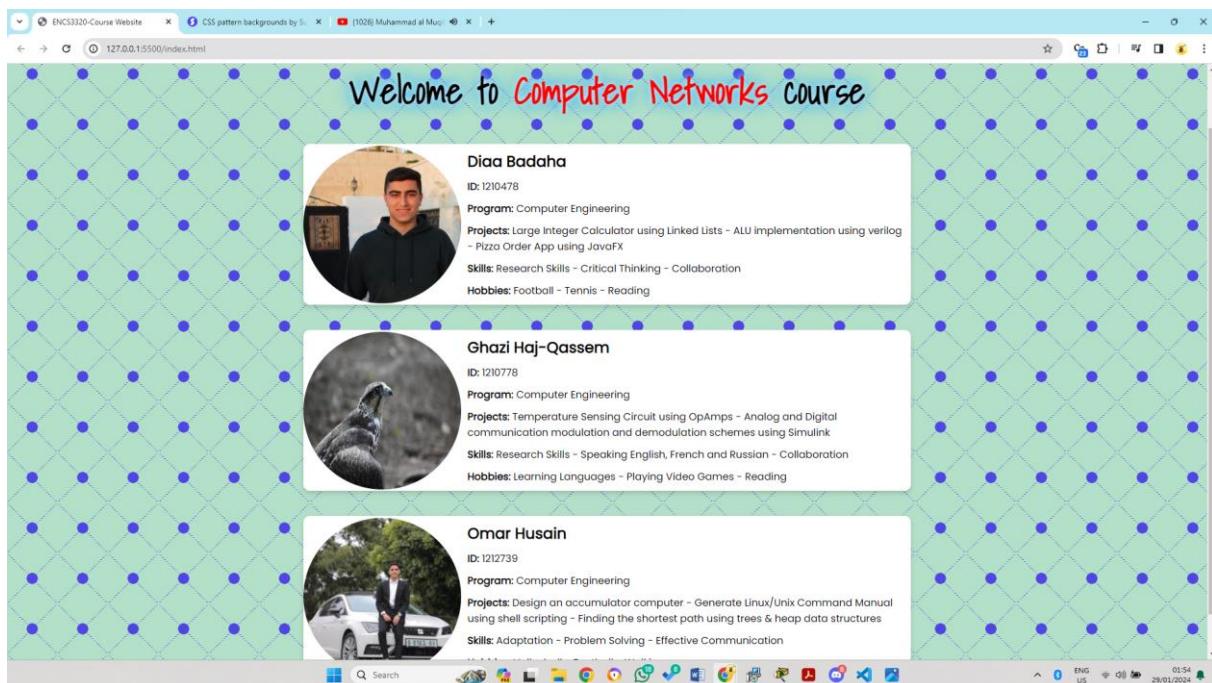


Figure 30: Designed HTML Webpage

Regarding the DNS server, as shown in Figure 30, we registered the domain name www.FirstSem2024.com with an A record and linked it to the IP address of the HTTP server, which is "200.4.10.98".

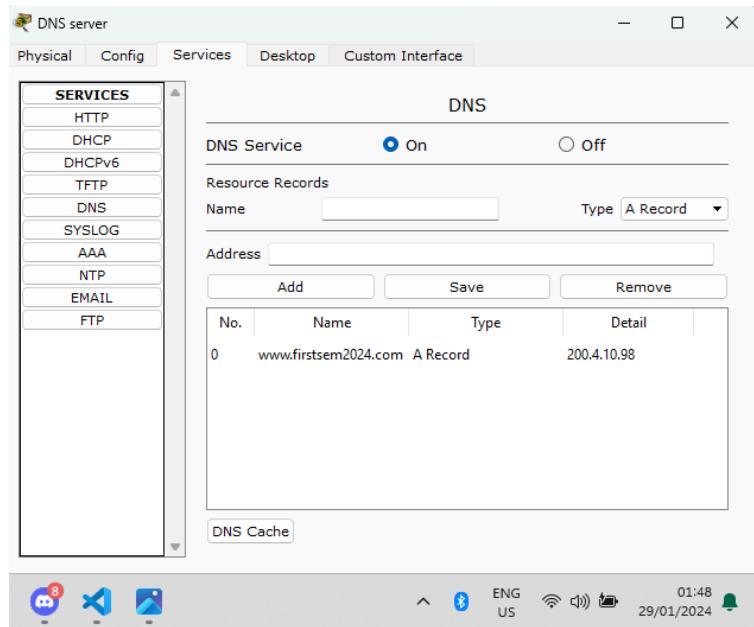


Figure 31: DNS Server Configuration

For the Mail Server (Server3_1), we created a username and password for each PC, taking into account the email server domain (ENCS3320.edu). The usernames correspond to the device names, excluding the underscore (such as PC21, PC31, PC411, PC421). For all these accounts, we set a uniform password: “A2024”.

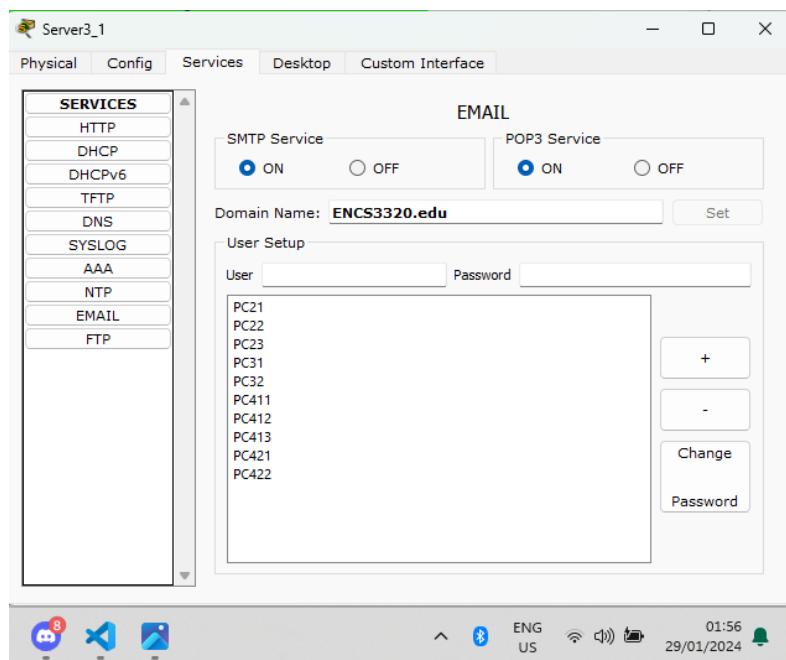


Figure 32: Added Usernames in MAIL Server

Part 3: Applying routing protocol

In this phase, we implemented OSPF on each router to establish connections between them, with the specific details outlined in Table 3 and Figures 33 through 36.

Table 3: Routing Details

Figure	Router	Network	Area connected to network
Figure 1	Router 1	200.4.10.96	Area 1
		200.4.10.116	Area 0
		200.4.10.104	Area 0
Figure 2	Router 2	200.4.10.0	Area 2
		200.4.10.104	Area 0
		200.4.10.108	Area 0
Figure 3	Router 3	200.4.10.32	Area 3
		200.4.10.108	Area 0
		200.4.10.112	Area 0
Figure 4	Router 4	200.4.10.64	Area 4
		200.4.10.80	Area 4
		200.4.10.116	Area 0
		200.4.10.112	Area 0

```
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#router ospf 10
Router(config-router)#network 200.4.10.96
% Incomplete command.
Router(config-router)#network 200.4.10.96 0.0.0.7 area 1
Router(config-router)#network 200.4.10.116 0.0.0.3 area 0
Router(config-router)#network 200.4.10.104 0.0.0.3 area 0
Router(config-router)#
Copy Paste
16:29 28/01/2024
```

Figure 33: Applying OSPF on Router 1

R2

Physical Config CLI

IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 200.4.10.0 0.0.0.31 area 2
Router(config-router)#network 200.4.10.104 0.0.0.3 area 0
Router(config-router)#network 200.4.1
08:00:55: %OSPF-5-ADJCHG: Process 10, Nbr 200.4.10.117 on Serial2/0 from LOADING to
FULL, Loading Done

^
* Invalid input detected at '^' marker.

Router(config-router)#
Router(config-router)#network 200.4.10.108 0.0.0.3 area 0
Router(config-router)#

```

Copy Paste

16:33 28/01/2024

Figure 34: Applying OSPF on Router 2

R3

Physical Config CLI

IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 200.4.10.32 0.0.0.31 area 3
^
* Invalid input detected at '^' marker.

Router(config-router)#
Router(config-router)#network 200.4.10.32 0.0.0.31 area 3
Router(config-router)#network 200.4.10.108 0.0.0.3 area 0
Router(config-router)#network 200.4.10.112 0.0.0.3 area 0
Router(config-router)#
08:03:42: %OSPF-5-ADJCHG: Process 10, Nbr 200.4.10.109 on Serial3/0 from LOADING
to FULL, Loading Done

```

Copy Paste

16:37 28/01/2024

Figure 35: Applying OSPF on Router 3

The screenshot shows the Cisco Packet Tracer interface for Router 4. The window title is "R4". The tabs at the top are "Physical", "Config" (which is selected), and "CLI". The main area is titled "IOS Command Line Interface". The CLI output shows the configuration of OSPF on Router 4:

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 10
Router(config-router)#network 200.4.10.64 0.0.0.15 area 4
Router(config-router)#network 200.4.10.80 0.0.0.15 area 4
Router(config-router)#network 200.4.10.116 0.0.0.3 area 0
Router(config-router)#network 200.4.10.112 0.0.0.3 area 0
08:05:10: %OSPF-5-ADJCHG: Process 10, Nbr 200.4.10.117 on Serial2/0 from LOADING to FULL, Loading Done

Router(config-router)#network 200.4.10.112 0.0.0.3 area 0
Router(config-router)#
08:05:23: %OSPF-5-ADJCHG: Process 10, Nbr 200.4.10.114 on Serial3/0 from LOADING to FULL, Loading Done
```

At the bottom right of the CLI window are "Copy" and "Paste" buttons. Below the CLI window is a system tray with icons for network, volume, and battery, along with system status indicators like signal strength, battery level, and a notification bell. The date and time are shown as "28/01/2024 16:40".

Figure 36: Applying OSPF on Router 4

Part 4: Testing connectivity, routes, website, and emails

Testing Connectivity and Routes

PC2_1

```
PC2_1
Physical Config Desktop Custom Interface

Command Prompt
C:\ping 120 4.10.3
Pinging 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3 bytes=32 time<1ms TTL=128

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC:\ping 200 4.10.4
Pinging 200 4.10.4 with 32 bytes of data:
Reply from 200.4.10.4 bytes=32 time<1ms TTL=128

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC:\ping 200 4.10.36
Pinging 200 4.10.36 with 32 bytes of data:
Reply from 200.4.10.36 bytes=32 time=7ms TTL=126
Reply from 200.4.10.36 bytes=32 time=1ms TTL=126
Reply from 200.4.10.36 bytes=32 time=1ms TTL=126
Reply from 200.4.10.36 bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 7ms

PC:\ping 200 4.10.36
Pinging 200 4.10.36 with 32 bytes of data:
Reply from 200.4.10.36 bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC:\ping 200 4.10.42
Pinging 200 4.10.42 with 32 bytes of data:
Reply from 200.4.10.42 bytes=32 time=2ms TTL=125
Reply from 200.4.10.42 bytes=32 time=2ms TTL=125
Reply from 200.4.10.42 bytes=32 time=2ms TTL=125
```

Figure 37: Ping Command Results from PC2_1 between All Other PCs – 1

```
RQ_1
Physical Config Desktop Custom Interface

Command Prompt
Reply from 200.4.10.83 bytes=32 time<1ms TTL=128
Ping statistics for 200.4.10.83:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 10ms, Average = 4ms
PCping 200.4.10.83

Ping 200.4.10.83 with 32 bytes of data:
Reply from 200.4.10.83: bytes=32 time<1ms TTL=128

Ping statistics for 200.4.10.83:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 10ms, Average = 4ms
PCping 200.4.10.83

Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time<2ms TTL=128

Ping statistics for 200.4.10.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 40ms, Average = 23ms
PCping 200.4.10.66

Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time<2ms TTL=128

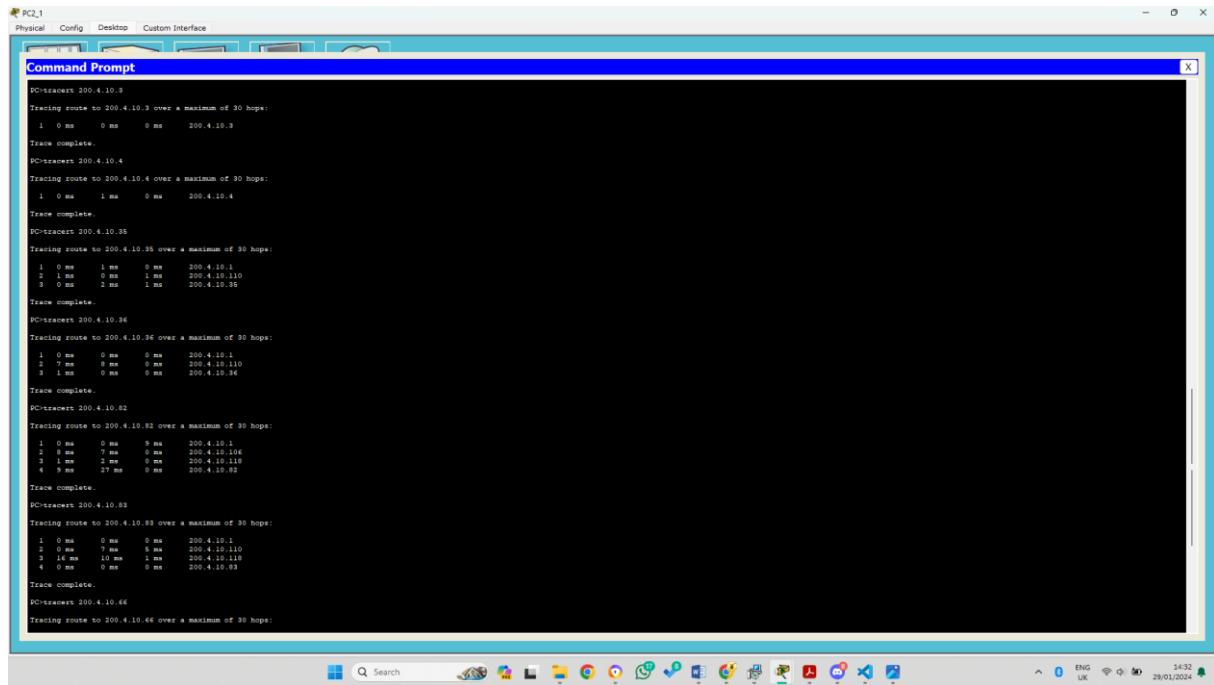
Ping statistics for 200.4.10.67:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 3ms, Average = 2ms
PCping 200.4.10.67

Ping 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time<2ms TTL=128
Reply from 200.4.10.68: bytes=32 time<2ms TTL=128
Reply from 200.4.10.68: bytes=32 time<2ms TTL=128
Reply from 200.4.10.68: bytes=32 time<1ms TTL=128

Ping statistics for 200.4.10.68:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 2ms, Average = 10ms
```

Figure 38: Ping Command Results from PC2_1 between All Other PCs – 2

The 2 previous Figures display the results of a series of ping tests conducted from PC2_1 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

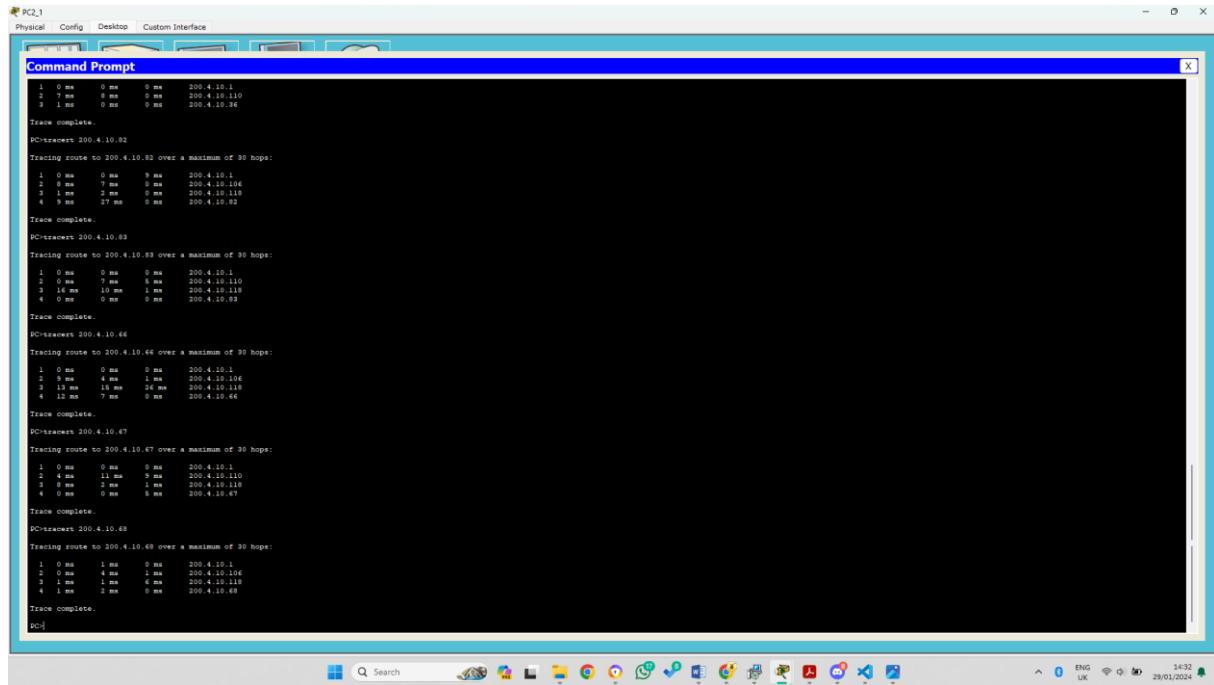


```

PC2_1 Physical Config Desktop Custom Interface
Command Prompt
PCtraceroute 200.4.10.9
Tracing route to 200.4.10.9 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.9
Trace complete.
PCtraceroute 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
  0 ms   1 ms   0 ms  200.4.10.4
Trace complete.
PCtraceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  0 ms   1 ms   0 ms  200.4.10.1
  1 ms   0 ms   1 ms  200.4.10.110
  0 ms   2 ms   1 ms  200.4.10.36
Trace complete.
PCtraceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  0 ms   1 ms   0 ms  200.4.10.1
  1 ms   0 ms   1 ms  200.4.10.110
  0 ms   0 ms   0 ms  200.4.10.36
Trace complete.
PCtraceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  0 ms   0 ms   9 ms  200.4.10.1
  1 ms   7 ms   9 ms  200.4.10.116
  1 ms   2 ms   0 ms  200.4.10.118
  9 ms   27 ms   0 ms  200.4.10.82
Trace complete.
PCtraceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  1 ms   7 ms   0 ms  200.4.10.110
  16 ms   10 ms   1 ms  200.4.10.118
  0 ms   0 ms   0 ms  200.4.10.82
Trace complete.
PCtraceroute 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:

```

Figure 39: Tracert Command Results from PC2_1 between All Other PCs – 1



```

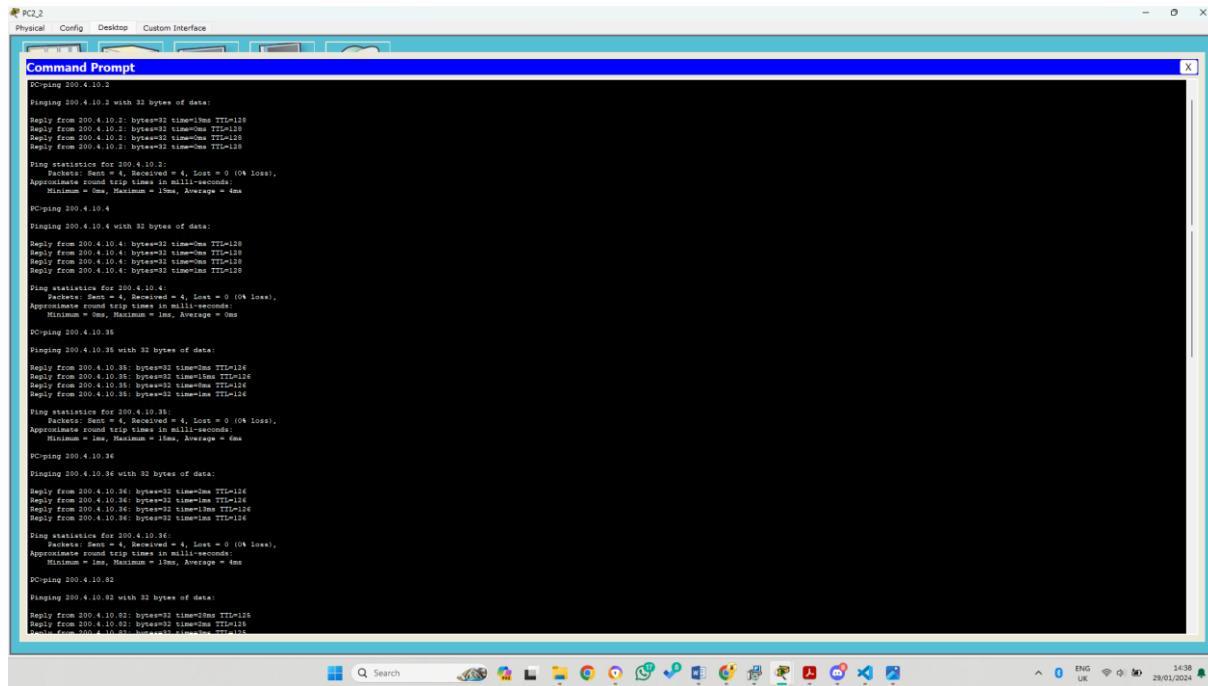
PC2_1 Physical Config Desktop Custom Interface
Command Prompt
PCtraceroute 200.4.10.9
Tracing route to 200.4.10.9 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  1 ms   0 ms   0 ms  200.4.10.110
  0 ms   1 ms   0 ms  200.4.10.9
Trace complete.
PCtraceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  0 ms   0 ms   9 ms  200.4.10.1
  1 ms   7 ms   9 ms  200.4.10.116
  1 ms   2 ms   0 ms  200.4.10.118
  9 ms   27 ms   0 ms  200.4.10.82
Trace complete.
PCtraceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  1 ms   7 ms   0 ms  200.4.10.110
  16 ms   10 ms   1 ms  200.4.10.118
  0 ms   0 ms   0 ms  200.4.10.82
Trace complete.
PCtraceroute 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  1 ms   4 ms   1 ms  200.4.10.116
  1 ms   1 ms   6 ms  200.4.10.118
  1 ms   2 ms   0 ms  200.4.10.66
Trace complete.
PCtraceroute 200.4.10.67
Tracing route to 200.4.10.67 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  0 ms   11 ms   0 ms  200.4.10.110
  0 ms   2 ms   1 ms  200.4.10.118
  0 ms   0 ms   5 ms  200.4.10.67
Trace complete.
PCtraceroute 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
  0 ms   0 ms   0 ms  200.4.10.1
  0 ms   4 ms   1 ms  200.4.10.116
  1 ms   1 ms   6 ms  200.4.10.118
  1 ms   2 ms   0 ms  200.4.10.68
Trace complete.
PC[]

```

Figure 40: Tracert Command Results from PC2_1 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC2_1, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC2_2



```
PC2_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.2
Pinging 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.4
Pinging 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.86
Pinging 200.4.10.86 with 32 bytes of data:
Reply from 200.4.10.86: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.86:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.36
Pinging 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.82
Pinging 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.66
Pinging 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

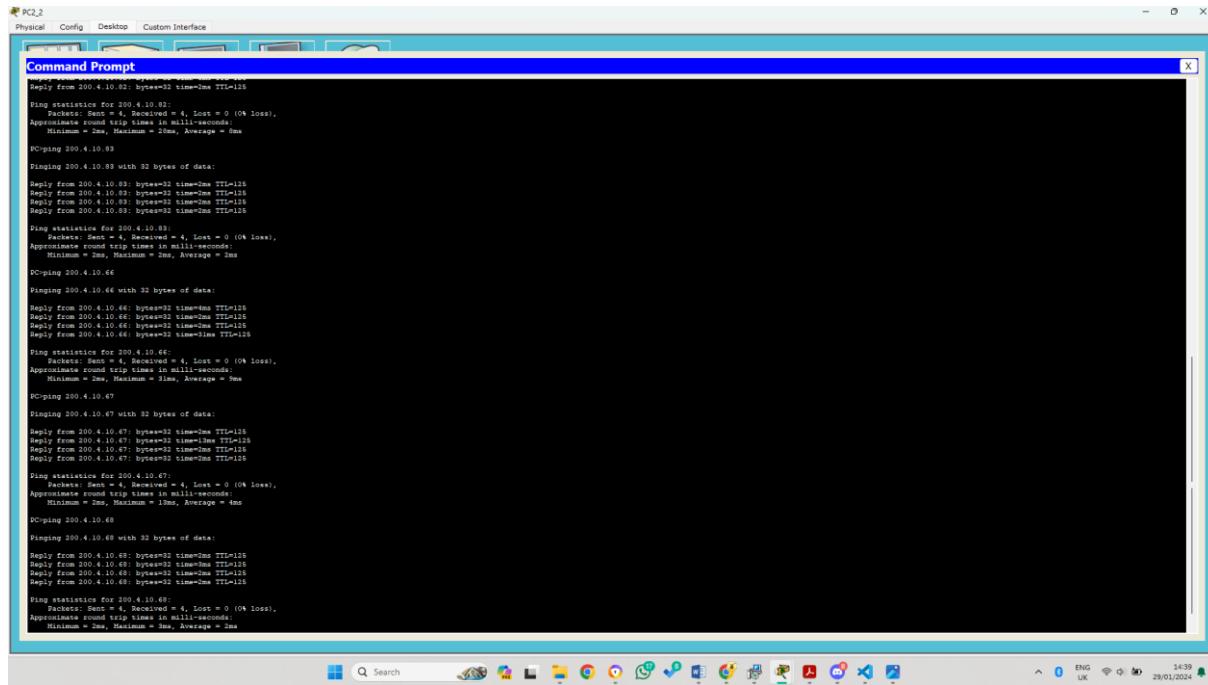
PC-ping 200.4.10.67
Pinging 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.68
Pinging 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 41: Ping Command Results from PC2_2 between All Other PCs – 1



```
PC2_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.92
Reply from 200.4.10.92: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.92:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.89
Pinging 200.4.10.89 with 32 bytes of data:
Reply from 200.4.10.89: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.89:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.66
Pinging 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.67
Pinging 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.68
Pinging 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 42: Ping Command Results from PC2_2 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC2_2 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC2_2
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
1  0 ms      0 ms      1 ms      200.4.10.3
Trace complete.

PC-tracers 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.4
Trace complete.

PC-tracers 200.4.10.35
Tracing route to 200.4.10.35 over a maximum of 30 hops:
1  0 ms      1 ms      1 ms      200.4.10.1
2  0 ms      2 ms      3 ms      200.4.10.110
3  0 ms      0 ms      0 ms      200.4.10.35
Trace complete.

PC-tracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  13 ms     1 ms      1 ms      200.4.10.110
3  0 ms      1 ms      3 ms      200.4.10.36
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  0 ms      1 ms      1 ms      200.4.10.110
3  1 ms      17 ms     1 ms      200.4.10.82
4  1 ms      0 ms      1 ms      200.4.10.82
Trace complete.

PC-tracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
1  0 ms      0 ms      1 ms      200.4.10.1
2  0 ms      1 ms      1 ms      200.4.10.110
3  1 ms      23 ms     0 ms      200.4.10.83
4  1 ms      1 ms      2 ms      200.4.10.83
Trace complete.

PC-tracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  0 ms      1 ms      1 ms      200.4.10.110
3  1 ms      1 ms      1 ms      200.4.10.66
4  1 ms      0 ms      1 ms      200.4.10.66
Trace complete.

```

Figure 43: Tracert Command Results from PC2_2 between All Other PCs – 1

```

PC2_2
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
1  0 ms      2 ms      1 ms      200.4.10.1
2  0 ms      0 ms      0 ms      200.4.10.110
3  0 ms      0 ms      0 ms      200.4.10.3
Trace complete.

PC-tracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  13 ms     1 ms      1 ms      200.4.10.110
3  0 ms      1 ms      3 ms      200.4.10.36
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  1 ms      1 ms      1 ms      200.4.10.106
3  1 ms      1 ms      17 ms     200.4.10.110
4  1 ms      0 ms      1 ms      200.4.10.82
Trace complete.

PC-tracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
1  0 ms      0 ms      0 ms      200.4.10.1
2  1 ms      4 ms      0 ms      200.4.10.110
3  1 ms      23 ms     0 ms      200.4.10.83
4  1 ms      1 ms      2 ms      200.4.10.83
Trace complete.

PC-tracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
1  1 ms      0 ms      0 ms      200.4.10.1
2  0 ms      0 ms      0 ms      200.4.10.110
3  1 ms      1 ms      2 ms      200.4.10.66
4  7 ms      17 ms     8 ms      200.4.10.66
Trace complete.

PC-tracers 200.4.10.67
Tracing route to 200.4.10.67 over a maximum of 30 hops:
1  0 ms      2 ms      0 ms      200.4.10.1
2  0 ms      1 ms      1 ms      200.4.10.110
3  0 ms      22 ms     1 ms      200.4.10.118
4  0 ms      1 ms      5 ms      200.4.10.67
Trace complete.

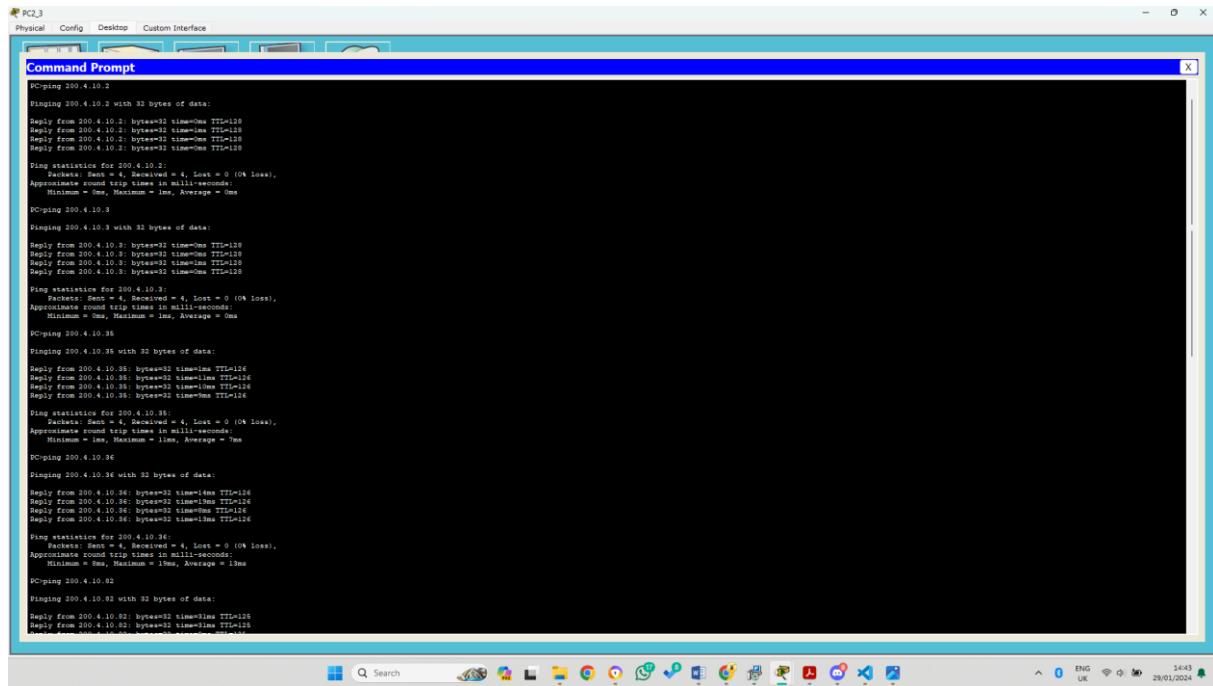
pc:

```

Figure 44: Tracert Command Results from PC2_2 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC2_2, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC2_3



```
PC2_3
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.2
Ping 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.3
Ping 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.36
Ping 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.86
Ping 200.4.10.86 with 32 bytes of data:
Reply from 200.4.10.86: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.86:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.82
Ping 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=125
Reply from 200.4.10.82: bytes=32 time=1ms TTL=125

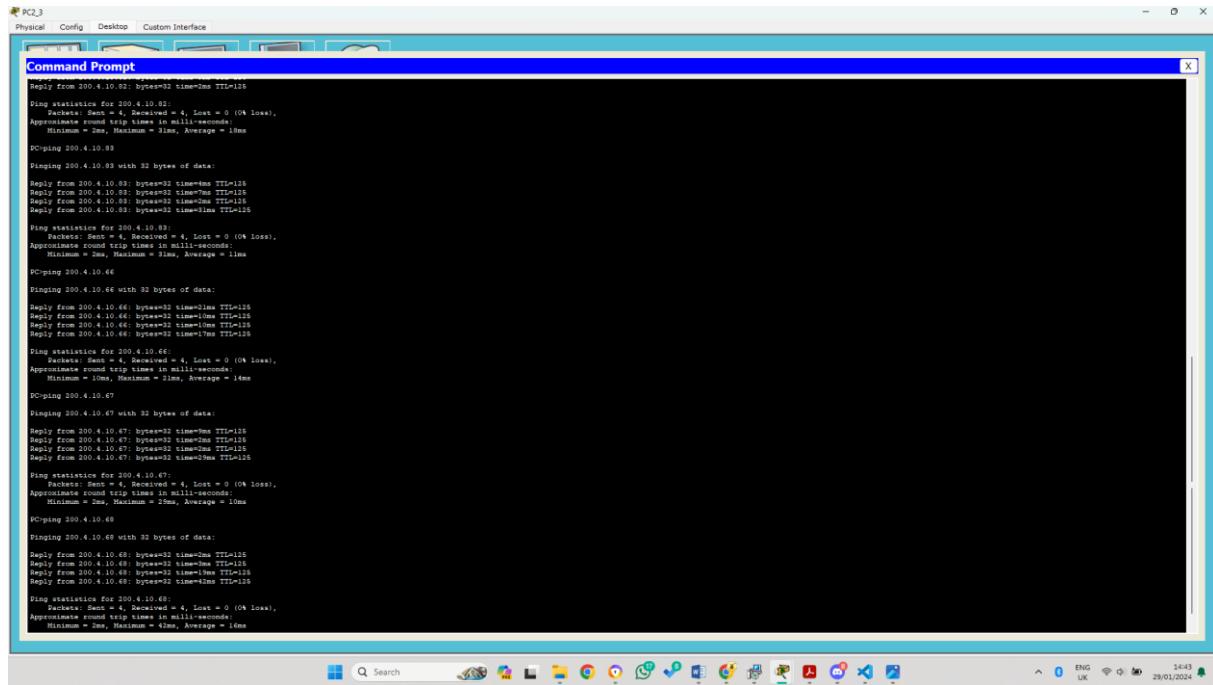
Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 45: Ping Command Results from PC2_3 between All Other PCs – 1



```
PC2_3
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.82
Ping 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.89
Ping 200.4.10.89 with 32 bytes of data:
Reply from 200.4.10.89: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.89:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=125

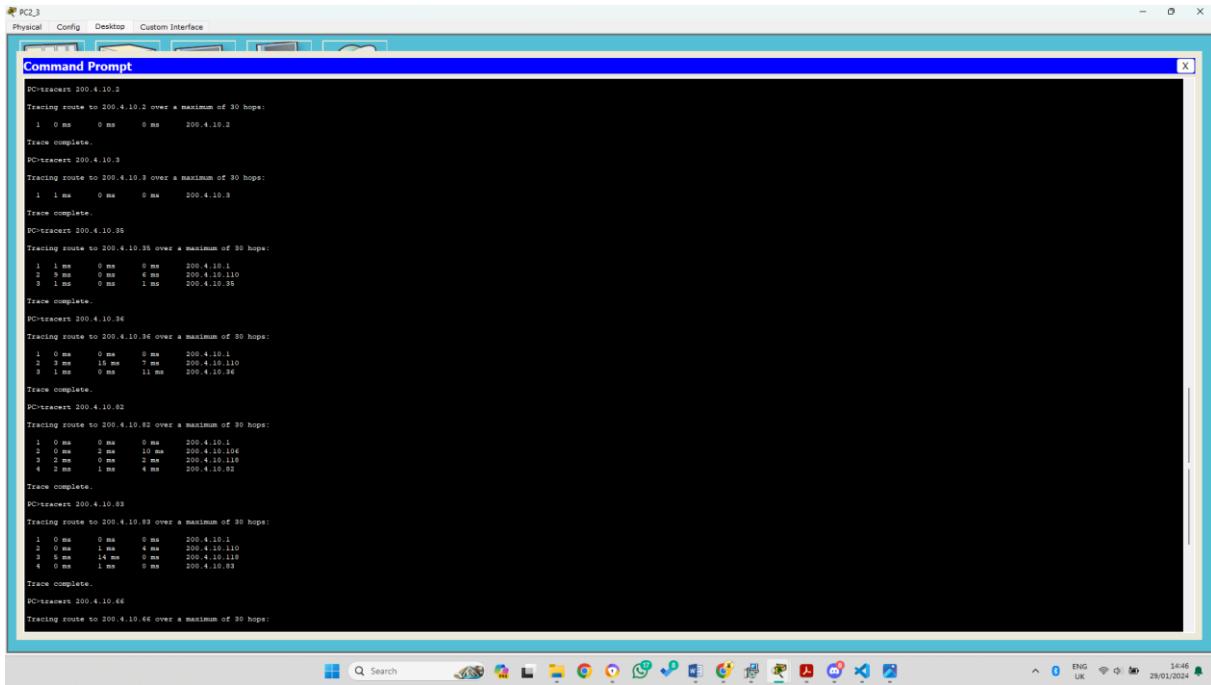
Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 46: Ping Command Results from PC2_3 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC2_3 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

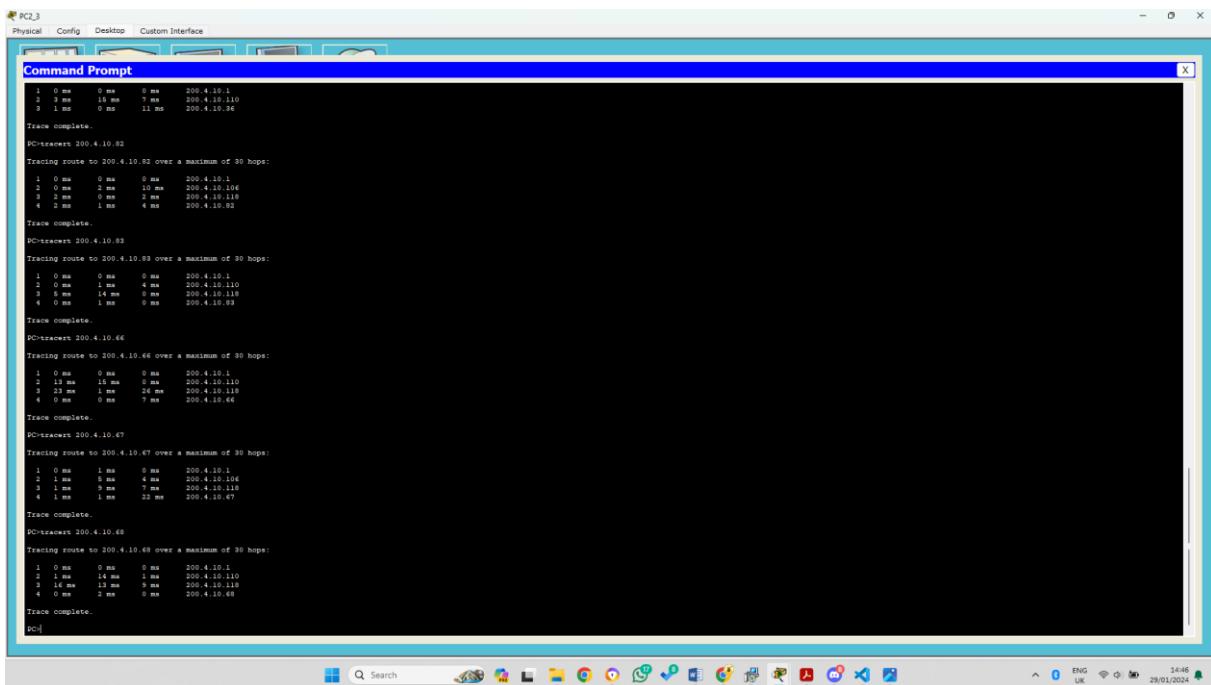


```

PC2_3
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.2
Trace complete.
PC-tracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
  1  1 ms   0 ms   0 ms  200.4.10.3
Trace complete.
PC-tracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  1 ms   0 ms   0 ms  200.4.10.1
  2  9 ms   0 ms   6 ms  200.4.10.110
  3  1 ms   0 ms   1 ms  200.4.10.36
Trace complete.
PC-tracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  11 ms  0 ms   3 ms  200.4.10.110
  3  1 ms   0 ms   11 ms 200.4.10.36
Trace complete.
PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  0 ms   2 ms   10 ms 200.4.10.106
  3  0 ms   2 ms   2 ms  200.4.10.118
  4  3 ms   1 ms   4 ms  200.4.10.82
Trace complete.
PC-tracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  0 ms   4 ms   0 ms  200.4.10.110
  3  5 ms   14 ms  0 ms  200.4.10.118
  4  0 ms   1 ms   0 ms  200.4.10.83
Trace complete.
PC-tracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
pc|

```

Figure 47: Tracert Command Results from PC2_3 between All Other PCs – 1



```

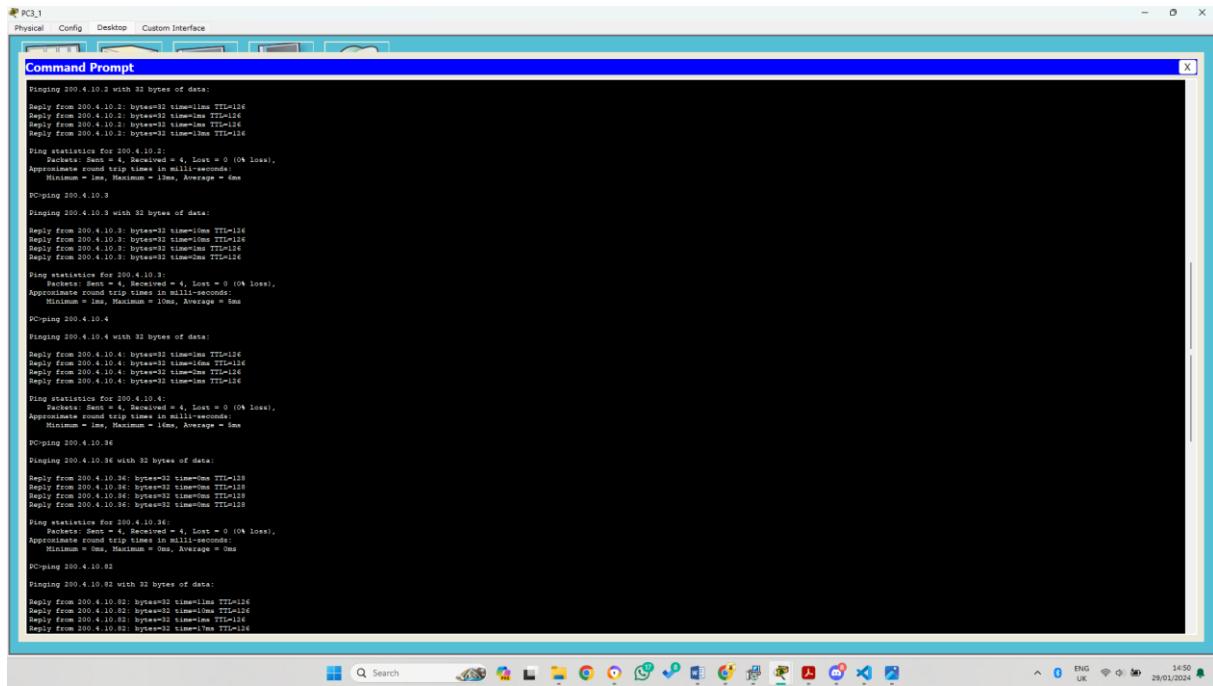
PC2_3
Physical Config Desktop Custom Interface
Command Prompt
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  3 ms   15 ms  7 ms  200.4.10.110
  3  1 ms   0 ms   11 ms 200.4.10.36
Trace complete.
PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  0 ms   2 ms   10 ms 200.4.10.106
  3  0 ms   2 ms   2 ms  200.4.10.118
  4  2 ms   1 ms   4 ms  200.4.10.82
Trace complete.
PC-tracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  0 ms   4 ms   0 ms  200.4.10.110
  3  5 ms   14 ms  0 ms  200.4.10.118
  4  0 ms   1 ms   0 ms  200.4.10.83
Trace complete.
PC-tracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  13 ms  15 ms  0 ms  200.4.10.110
  3  0 ms   2 ms   2 ms  200.4.10.118
  4  0 ms   0 ms   7 ms  200.4.10.66
Trace complete.
PC-tracers 200.4.10.67
Tracing route to 200.4.10.67 over a maximum of 30 hops:
  1  0 ms   1 ms   0 ms  200.4.10.1
  2  1 ms   5 ms   4 ms  200.4.10.106
  3  0 ms   2 ms   1 ms  200.4.10.118
  4  1 ms   1 ms   22 ms 200.4.10.67
Trace complete.
PC-tracers 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
  1  0 ms   0 ms   0 ms  200.4.10.1
  2  14 ms  13 ms  5 ms  200.4.10.110
  3  0 ms   2 ms   0 ms  200.4.10.68
Trace complete.
pc|

```

Figure 48: Tracert Command Results from PC2_3 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC2_3, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC3_1



```
PC3_1
Physical Config Desktop Custom Interface

Command Prompt

Ping statistics for 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time<1ms TTL=126
Reply from 200.4.10.2: bytes=32 time=1ms TTL=126
Reply from 200.4.10.2: bytes=32 time=1ms TTL=126
Reply from 200.4.10.2: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.3

Ping statistics for 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time<1ms TTL=126
Reply from 200.4.10.3: bytes=32 time=1ms TTL=126
Reply from 200.4.10.3: bytes=32 time=1ms TTL=126
Reply from 200.4.10.3: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.4

Ping statistics for 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time<1ms TTL=126
Reply from 200.4.10.4: bytes=32 time=1ms TTL=126
Reply from 200.4.10.4: bytes=32 time=1ms TTL=126
Reply from 200.4.10.4: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.4

Ping statistics for 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time<1ms TTL=126
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.36

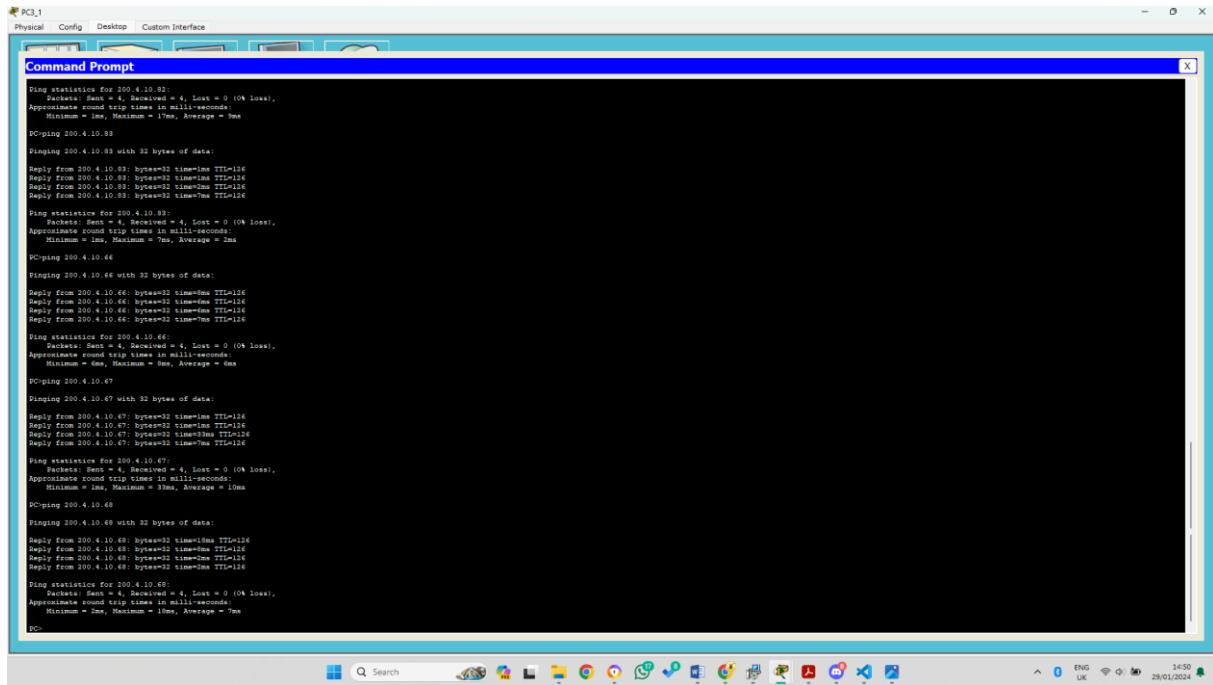
Ping statistics for 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time<1ms TTL=126
Reply from 200.4.10.82: bytes=32 time=1ms TTL=126
Reply from 200.4.10.82: bytes=32 time=1ms TTL=126
Reply from 200.4.10.82: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.82

Ping statistics for 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time<1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.66

Ping statistics for 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time<1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.67

Ping statistics for 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time<1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.68
```

Figure 49: Ping Command Results from PC3_1 between All Other PCs – 1



```
PC3_1
Physical Config Desktop Custom Interface

Command Prompt

Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 17ms, Average = 9ms
PCping 200.4.10.82

Ping statistics for 200.4.10.88 with 32 bytes of data:
Reply from 200.4.10.88: bytes=32 time<1ms TTL=126
Reply from 200.4.10.88: bytes=32 time=1ms TTL=126
Reply from 200.4.10.88: bytes=32 time=1ms TTL=126
Reply from 200.4.10.88: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.88:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 7ms, Average = 2ms
PCping 200.4.10.88

Ping statistics for 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time<1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.66

Ping statistics for 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time<1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.67

Ping statistics for 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time<1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126
Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms
PCping 200.4.10.68
```

Figure 50: Ping Command Results from PC3_1 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC3_1 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC3_1
Physical Config Desktop Custom Interface
Command Prompt
PC>traceroute 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
  1  0 ms      1 ms      0 ms      200.4.10.33
  2  0 ms      6 ms      1 ms      200.4.10.109
  3  0 ms      0 ms      0 ms      200.4.10.2
Trace complete.

PC>traceroute 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.33
  2  0 ms      2 ms      1 ms      200.4.10.109
  3  5 ms      1 ms      0 ms      200.4.10.3
Trace complete.

PC>traceroute 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
  1  1 ms      0 ms      0 ms      200.4.10.33
  2  7 ms      0 ms      1 ms      200.4.10.109
  3  1 ms      10 ms     3 ms      200.4.10.4
Trace complete.

PC>traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.36
Trace complete.

PC>traceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.33
  2  16 ms     1 ms      1 ms      200.4.10.113
  3  1 ms      3 ms      0 ms      200.4.10.82
Trace complete.

PC>traceroute 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
  1  0 ms      0 ms      1 ms      200.4.10.33
  2  0 ms      0 ms      1 ms      200.4.10.113
  3  0 ms      0 ms      0 ms      200.4.10.88
Trace complete.

PC>traceroute 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:

```

Figure 51: Tracert Command Results from PC3_1 between All Other PCs – 1

```

PC3_1
Physical Config Desktop Custom Interface
Command Prompt
Trace complete.

PC>traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.36
Trace complete.

PC>traceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.33
  2  16 ms     1 ms      1 ms      200.4.10.113
  3  1 ms      3 ms      0 ms      200.4.10.82
Trace complete.

PC>traceroute 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
  1  0 ms      0 ms      1 ms      200.4.10.33
  2  0 ms      0 ms      1 ms      200.4.10.113
  3  0 ms      0 ms      0 ms      200.4.10.88
Trace complete.

PC>traceroute 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  1  1 ms      0 ms      0 ms      200.4.10.33
  2  0 ms      0 ms      0 ms      200.4.10.113
  3  1 ms      1 ms      1 ms      200.4.10.66
Trace complete.

PC>traceroute 200.4.10.47
Tracing route to 200.4.10.47 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.33
  2  0 ms      0 ms      9 ms      200.4.10.113
  3  0 ms      16 ms     1 ms      200.4.10.47
Trace complete.

PC>traceroute 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
  1  0 ms      0 ms      0 ms      200.4.10.33
  2  0 ms      0 ms      9 ms      200.4.10.113
  3  0 ms      1 ms      0 ms      200.4.10.68
Trace complete.

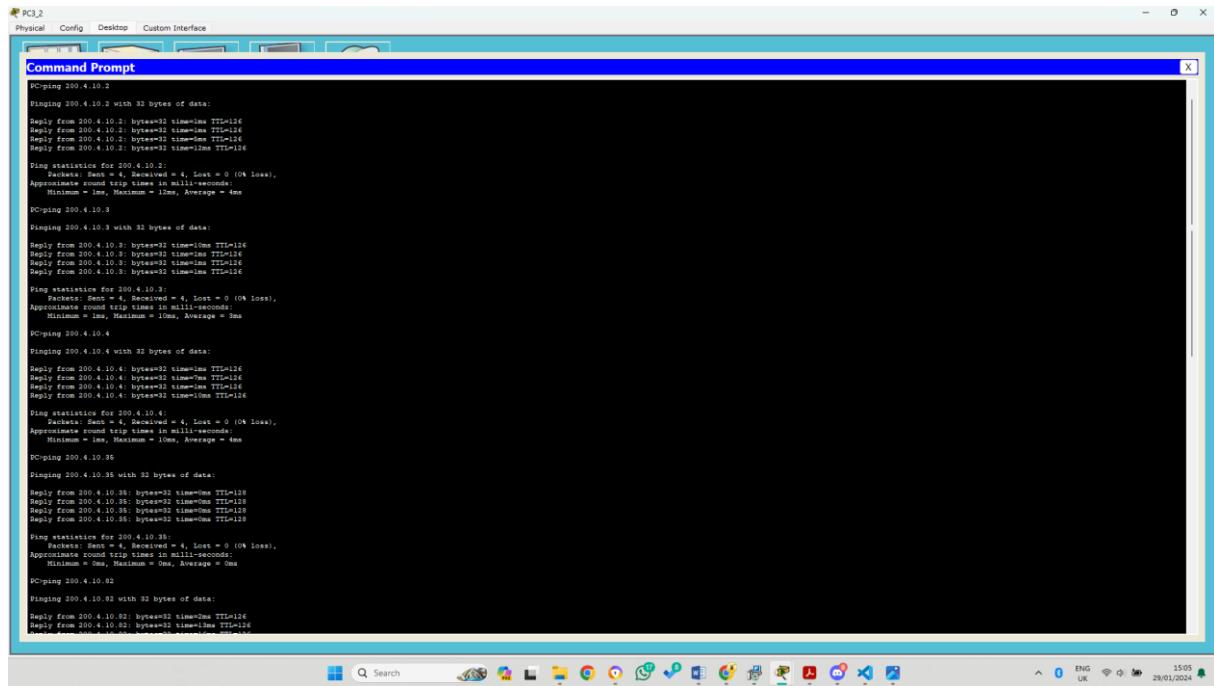
pc>

```

Figure 52: Tracert Command Results from PC3_1 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC3_1, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC3_2



```
PC3_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.2
Ping 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms
PC-ping 200.4.10.3
Ping 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms
PC-ping 200.4.10.4
Ping 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms
PC-ping 200.4.10.8
Ping 200.4.10.8 with 32 bytes of data:
Reply from 200.4.10.8: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.9
Ping 200.4.10.9 with 32 bytes of data:
Reply from 200.4.10.9: bytes=32 time=1ms TTL=126

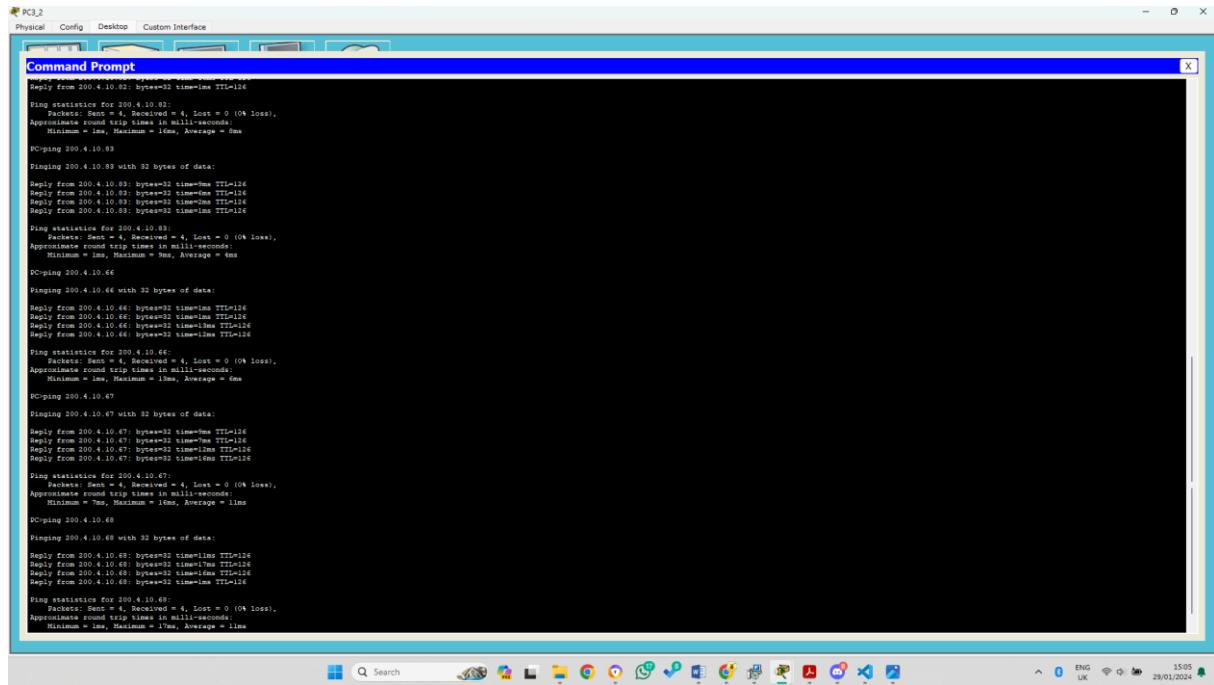
Ping statistics for 200.4.10.9:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 9ms, Average = 4ms
PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 10ms, Average = 1ms
PC-ping 200.4.10.68
Ping 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 53: Ping Command Results from PC3_2 between All Other PCs – 1



```
PC3_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.92
Ping 200.4.10.92 with 32 bytes of data:
Reply from 200.4.10.92: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.92:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.99
Ping 200.4.10.99 with 32 bytes of data:
Reply from 200.4.10.99: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.99:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 9ms, Average = 4ms
PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 10ms, Average = 1ms
PC-ping 200.4.10.68
Ping 200.4.10.68 with 32 bytes of data:
Reply from 200.4.10.68: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.68:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 54: Ping Command Results from PC3_2 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC3_2 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC3_2
Physical Config Desktop Custom Interface
Command Prompt
PC>tracert 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  1 ms    3 ms    0 ms    200.4.10.109
  3  0 ms    2 ms    0 ms    200.4.10.2
Trace complete.

PC>tracert 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
  1  0 ms    1 ms    0 ms    200.4.10.33
  2  1 ms    1 ms    0 ms    200.4.10.109
  3  0 ms    1 ms    0 ms    200.4.10.3
Trace complete.

PC>tracert 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    1 ms    1 ms    200.4.10.109
  3  7 ms    1 ms    0 ms    200.4.10.4
Trace complete.

PC>tracert 200.4.10.35
Tracing route to 200.4.10.35 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
Trace complete.

PC>tracert 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    0 ms    0 ms    200.4.10.113
  3  0 ms    0 ms    1 ms    200.4.10.82
Trace complete.

PC>tracert 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    1 ms    0 ms    200.4.10.113
  3  0 ms    10 ms   0 ms    200.4.10.88
Trace complete.

PC>tracert 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:

```

Figure 55: Tracert Command Results from PC3_2 between All Other PCs – 1

```

PC3_2
Physical Config Desktop Custom Interface
Command Prompt
Trace complete.

PC>tracert 200.4.10.38
Tracing route to 200.4.10.38 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.38
Trace complete.

PC>tracert 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    0 ms    0 ms    200.4.10.113
  3  0 ms    0 ms    1 ms    200.4.10.82
Trace complete.

PC>tracert 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    1 ms    0 ms    200.4.10.113
  3  0 ms    10 ms   0 ms    200.4.10.88
Trace complete.

PC>tracert 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  1  0 ms    0 ms    1 ms    200.4.10.33
  2  0 ms    1 ms    1 ms    200.4.10.113
  3  1 ms    0 ms    0 ms    200.4.10.66
Trace complete.

PC>tracert 200.4.10.47
Tracing route to 200.4.10.47 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    0 ms    0 ms    200.4.10.113
  3  0 ms    0 ms    0 ms    200.4.10.47
Trace complete.

PC>tracert 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.33
  2  0 ms    10 ms   0 ms    200.4.10.113
  3  9 ms    0 ms    1 ms    200.4.10.68
Trace complete.

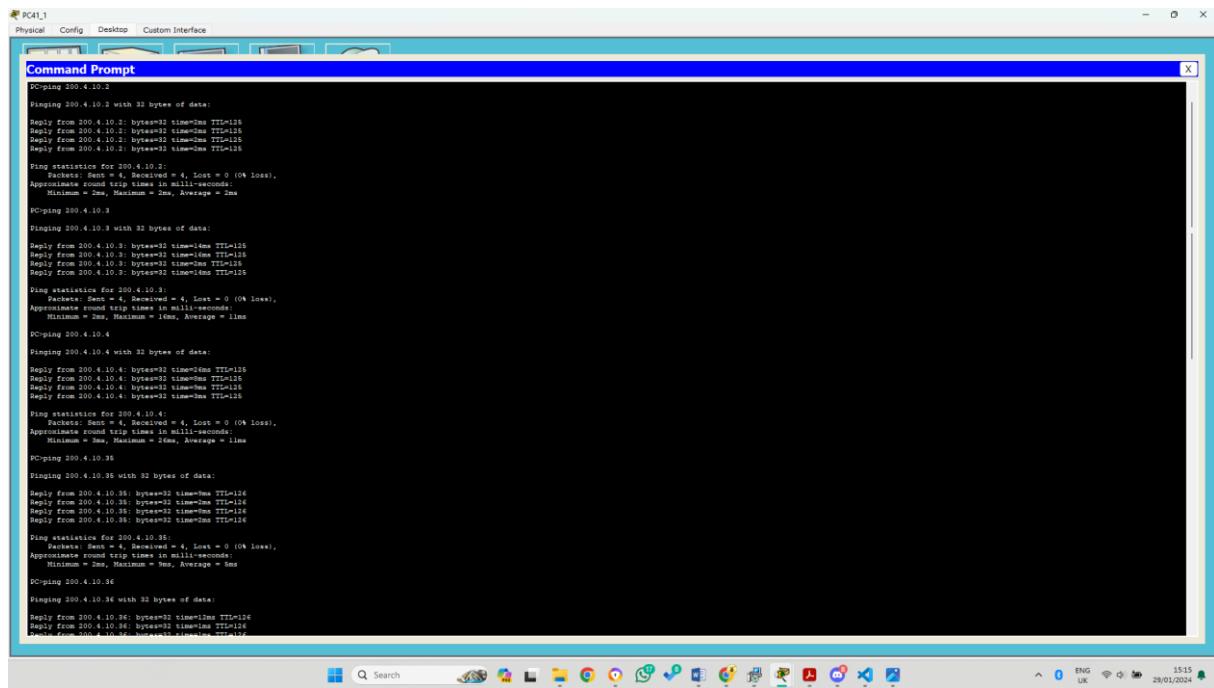
pc>

```

Figure 56: Tracert Command Results from PC3_2 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC3_2, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC41_1



```
PC41_1
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.2
Pinging 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.3
Pinging 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.4
Pinging 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.5
Pinging 200.4.10.5 with 32 bytes of data:
Reply from 200.4.10.5: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.36
Pinging 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.36:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.82
Pinging 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.82:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.83
Pinging 200.4.10.83 with 32 bytes of data:
Reply from 200.4.10.83: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.83:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

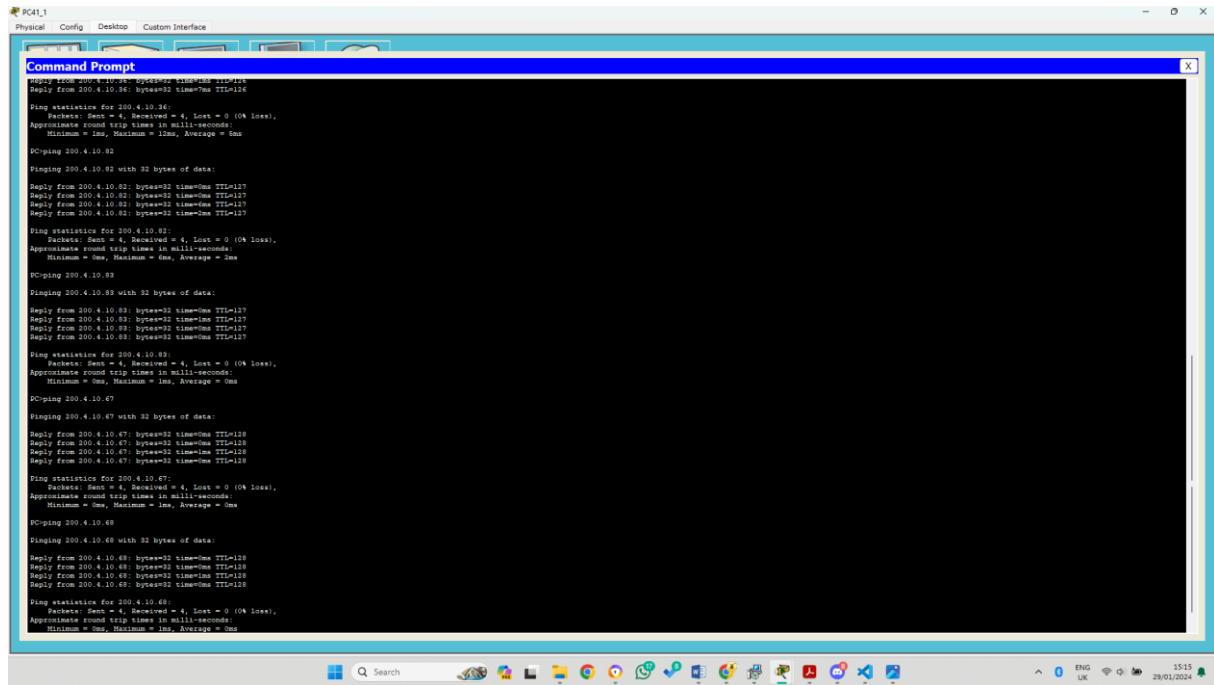
PC-ping 200.4.10.47
Pinging 200.4.10.47 with 32 bytes of data:
Reply from 200.4.10.47: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.47:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.69
Pinging 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.69:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 57: Ping Command Results from PC41_1 between All Other PCs – 1



```
PC41_1
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.36
Pinging 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.36:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.82
Pinging 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.82:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.83
Pinging 200.4.10.83 with 32 bytes of data:
Reply from 200.4.10.83: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.83:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.47
Pinging 200.4.10.47 with 32 bytes of data:
Reply from 200.4.10.47: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.47:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.69
Pinging 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.69:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 58: Ping Command Results from PC41_1 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC41_1 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC41_1
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
  1  0 ms    1 ms    0 ms    200.4.10.6
  2  0 ms    16 ms   0 ms    200.4.10.117
  3  0 ms    2 ms    0 ms    200.4.10.115
  4  1 ms    3 ms    5 ms    200.4.10.2
Trace complete.

PC-tracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
  1  0 ms    0 ms    1 ms    200.4.10.6
  2  16 ms   1 ms    0 ms    200.4.10.114
  3  0 ms    11 ms   1 ms    200.4.10.105
  4  3 ms    14 ms   1 ms    200.4.10.3
Trace complete.

PC-tracers 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  0 ms    16 ms   0 ms    200.4.10.117
  3  0 ms    13 ms   0 ms    200.4.10.115
  4  3 ms    12 ms   0 ms    200.4.10.4
Trace complete.

PC-tracers 200.4.10.38
Tracing route to 200.4.10.38 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  0 ms    1 ms    1 ms    200.4.10.114
  3  0 ms    0 ms    1 ms    200.4.10.38
Trace complete.

PC-tracers 200.4.10.96
Tracing route to 200.4.10.96 over a maximum of 30 hops:
  1  1 ms    0 ms    0 ms    200.4.10.6
  2  1 ms    9 ms    0 ms    200.4.10.114
  3  0 ms    0 ms    0 ms    200.4.10.96
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  0 ms    1 ms    0 ms    200.4.10.82
Trace complete.

```

Figure 59: Traceroute Command Results from PC41_1 between All Other PCs – 1

```

PC41_1
Physical Config Desktop Custom Interface
Command Prompt
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  13 ms   10 ms   0 ms    200.4.10.117
  3  13 ms   10 ms   0 ms    200.4.10.115
  4  12 ms   12 ms   0 ms    200.4.10.4
Trace complete.

PC-tracers 200.4.10.38
Tracing route to 200.4.10.38 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  1 ms    1 ms    1 ms    200.4.10.114
  3  0 ms    0 ms    1 ms    200.4.10.38
Trace complete.

PC-tracers 200.4.10.96
Tracing route to 200.4.10.96 over a maximum of 30 hops:
  1  1 ms    0 ms    0 ms    200.4.10.6
  2  1 ms    9 ms    0 ms    200.4.10.114
  3  0 ms    0 ms    0 ms    200.4.10.96
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  0 ms    1 ms    0 ms    200.4.10.82
Trace complete.

PC-tracers 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.6
  2  0 ms    0 ms    1 ms    200.4.10.88
Trace complete.

PC-tracers 200.4.10.47
Tracing route to 200.4.10.47 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.67
Trace complete.

PC-tracers 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
  1  0 ms    0 ms    0 ms    200.4.10.68
Trace complete.

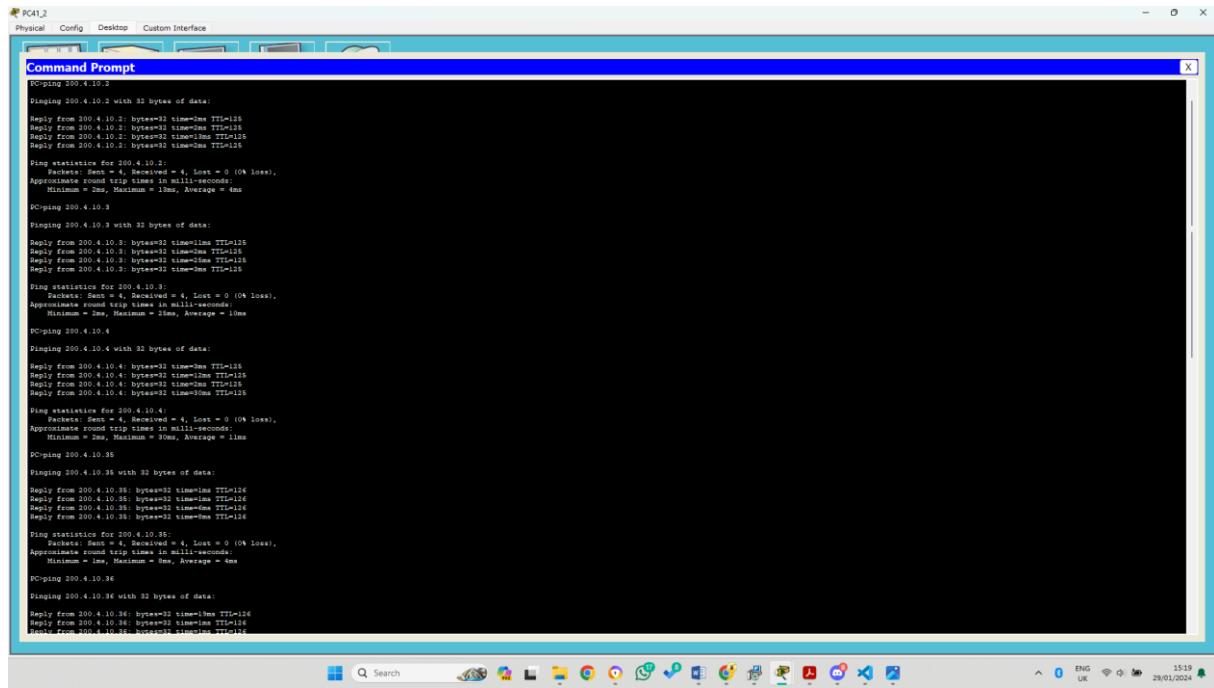
pc>

```

Figure 60: Traceroute Command Results from PC41_1 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC41_1, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC41_2



```
PC41_2
Physical Config Desktop Custom Interface

Command Prompt
C:\>ping 200.4.10.2

Pinging 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.3

Pinging 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.4

Pinging 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.38

Pinging 200.4.10.38 with 32 bytes of data:
Reply from 200.4.10.38: bytes=32 time=1ms TTL=125

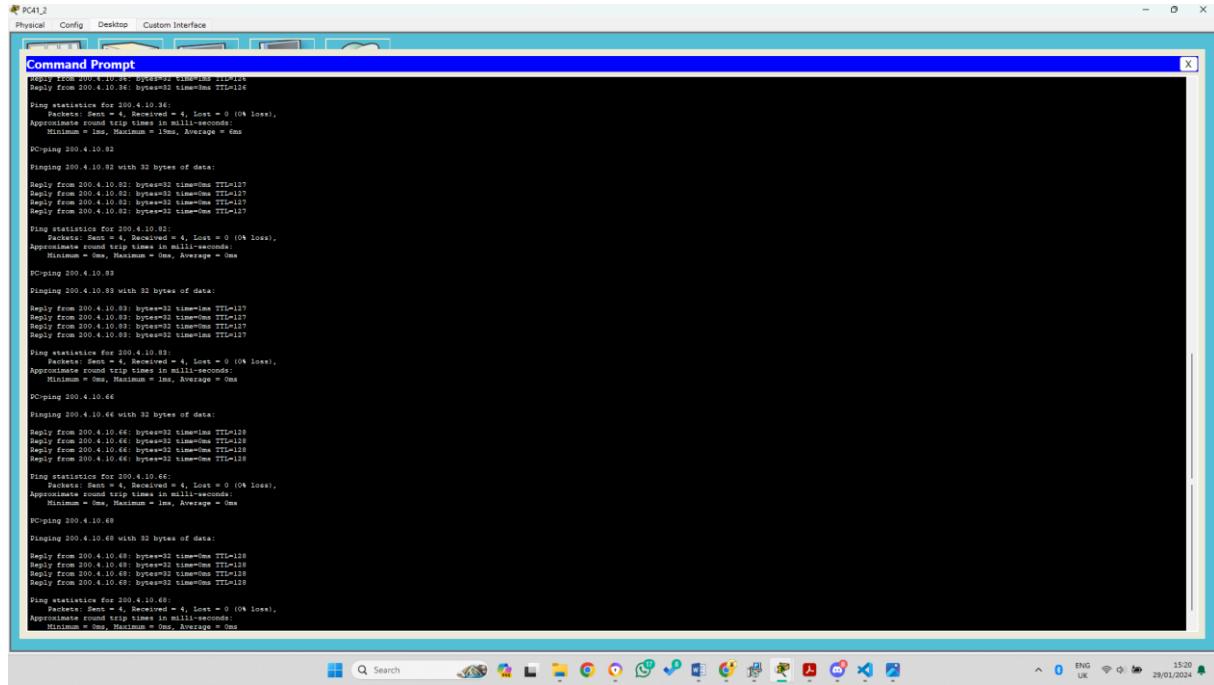
Ping statistics for 200.4.10.38:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.96

Pinging 200.4.10.96 with 32 bytes of data:
Reply from 200.4.10.96: bytes=32 time=1ms TTL=125
Reply from 200.4.10.96: bytes=32 time=1ms TTL=125
Reply from 200.4.10.96: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.96:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 61: Ping Command Results from PC41_2 between All Other PCs – 1



```
PC41_2
Physical Config Desktop Custom Interface

Command Prompt
C:\>ping 200.4.10.36

Pinging 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.36:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.82

Pinging 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.82:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.83

Pinging 200.4.10.83 with 32 bytes of data:
Reply from 200.4.10.83: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.83:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.66

Pinging 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 200.4.10.69

Pinging 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.69:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 62: Ping Command Results from PC41_2 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC41_2 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC41_2
Physical Config Desktop Custom Interface
Command Prompt
PC-traceroute 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
1  0 ms    0 ms    1 ms    200.4.10.45
2  1 ms    1 ms    4 ms    200.4.10.114
3  1 ms    19 ms   16 ms   200.4.10.106
4  13 ms   1 ms    1 ms    200.4.10.2
Trace complete.

PC-traceroute 200.4.10.8
Tracing route to 200.4.10.8 over a maximum of 30 hops:
1  0 ms    0 ms    7 ms    200.4.10.45
2  0 ms    0 ms    5 ms    200.4.10.117
3  17 ms   2 ms    1 ms    200.4.10.106
4  1 ms    0 ms    0 ms    200.4.10.8
Trace complete.

PC-traceroute 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
1  1 ms    0 ms    0 ms    200.4.10.45
2  4 ms    0 ms    0 ms    200.4.10.114
3  1 ms    9 ms    1 ms    200.4.10.106
4  11 ms   2 ms    0 ms    200.4.10.4
Trace complete.

PC-traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms    1 ms    0 ms    200.4.10.45
2  7 ms    1 ms    9 ms    200.4.10.114
3  0 ms    0 ms    0 ms    200.4.10.36
Trace complete.

PC-traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms    1 ms    0 ms    200.4.10.45
2  1 ms    9 ms   11 ms   200.4.10.114
3  0 ms    1 ms   11 ms   200.4.10.36
Trace complete.

PC-traceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1  0 ms    0 ms    0 ms    200.4.10.45
2  0 ms    0 ms    2 ms    200.4.10.82
Trace complete.

```

Figure 63: Tracert Command Results from PC41_2 between All Other PCs – 1

```

PC41_2
Physical Config Desktop Custom Interface
Command Prompt
1  1 ms    0 ms    0 ms    200.4.10.45
2  0 ms    0 ms    0 ms    200.4.10.114
3  1 ms    9 ms   11 ms   200.4.10.106
4  11 ms   3 ms    0 ms    200.4.10.4
Trace complete.

PC-traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms    1 ms    0 ms    200.4.10.45
2  0 ms    1 ms    9 ms    200.4.10.114
3  0 ms    0 ms    0 ms    200.4.10.36
Trace complete.

PC-traceroute 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
1  0 ms    0 ms    8 ms    200.4.10.45
2  1 ms    1 ms   11 ms   200.4.10.114
3  0 ms    1 ms   11 ms   200.4.10.36
Trace complete.

PC-traceroute 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1  0 ms    0 ms    0 ms    200.4.10.45
2  0 ms    0 ms    3 ms    200.4.10.82
Trace complete.

PC-traceroute 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
1  0 ms    0 ms    0 ms    200.4.10.45
2  0 ms    0 ms    1 ms    200.4.10.88
Trace complete.

PC-traceroute 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
1  0 ms    0 ms    9 ms    200.4.10.66
Trace complete.

PC-traceroute 200.4.10.68
Tracing route to 200.4.10.68 over a maximum of 30 hops:
1  0 ms    0 ms    1 ms    200.4.10.68
Trace complete.

pc|

```

Figure 64: Tracert Command Results from PC41_2 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC41_2, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC41_3

```
PC41_3
Physical Config Desktop Custom Interface

Command Prompt
C:\ping 200.4.10.2

Ping statistics for 200.4.10.2:
Pinging 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\ping 200.4.10.3

Ping statistics for 200.4.10.3:
Pinging 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\ping 200.4.10.4

Ping statistics for 200.4.10.4:
Pinging 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\ping 200.4.10.35

Ping statistics for 200.4.10.35:
Pinging 200.4.10.35 with 32 bytes of data:
Reply from 200.4.10.35: bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.35:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\ping 200.4.10.36

Ping statistics for 200.4.10.36:
Pinging 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=128
Reply from 200.4.10.36: bytes=32 time=1ms TTL=128
Reply from 200.4.10.36: bytes=32 time=1ms TTL=128
```

Figure 65: Ping Command Results from PC41_3 between All Other PCs – 1

PC41_3

Physical Config Desktop Custom Interface

Command Prompt

```
Reply from 200.4.10.36 bytes=32 time=1ms TTL=128
Reply from 200.4.10.36 bytes=32 time=1ms TTL=128

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.82

Ping 200.4.10.82 with 32 bytes of data:
Reply from 200.4.10.82 bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.82:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PCping 200.4.10.88

Ping 200.4.10.88 with 32 bytes of data:
Reply from 200.4.10.88 bytes=32 time=0ms TTL=127

Ping statistics for 200.4.10.88:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PCping 200.4.10.64

Ping 200.4.10.64 with 32 bytes of data:
Reply from 200.4.10.64 bytes=32 time=0ms TTL=128

Ping statistics for 200.4.10.64:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PCping 200.4.10.66

Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66 bytes=32 time=0ms TTL=128

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PCping 200.4.10.67

Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67 bytes=32 time=0ms TTL=128

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 66: Ping Command Results from PC41_3 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC41_3 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC41_3
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 0 ms      1 ms      0 ms      200.4.10.117
3 0 ms      2 ms      1 ms      200.4.10.115
4 1 ms      0 ms      1 ms      200.4.10.2
Trace complete.

PC-tracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 1 ms      0 ms      16 ms     200.4.10.114
3 0 ms      0 ms      1 ms      200.4.10.105
4 10 ms    13 ms     12 ms     200.4.10.3
Trace complete.

PC-tracers 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
1 0 ms      1 ms      0 ms      200.4.10.6
2 0 ms      0 ms      0 ms      200.4.10.117
3 0 ms      11 ms    16 ms     200.4.10.115
4 1 ms      1 ms      1 ms      200.4.10.4
Trace complete.

PC-tracers 200.4.10.38
Tracing route to 200.4.10.38 over a maximum of 30 hops:
1 0 ms      1 ms      0 ms      200.4.10.6
2 0 ms      12 ms    0 ms     200.4.10.114
3 0 ms      0 ms      0 ms      200.4.10.38
Trace complete.

PC-tracers 200.4.10.96
Tracing route to 200.4.10.96 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 1 ms      1 ms      0 ms     200.4.10.114
3 0 ms      0 ms      1 ms      200.4.10.96
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 0 ms      0 ms      0 ms     200.4.10.82
Trace complete.

```

Figure 67: Traceroute Command Results from PC41_3 between All Other PCs – 1

```

PC41_3
Physical Config Desktop Custom Interface
Command Prompt
PC-tracers 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
1 0 ms      1 ms      0 ms      200.4.10.6
2 0 ms      0 ms      0 ms      200.4.10.117
3 0 ms      21 ms    16 ms     200.4.10.115
4 1 ms      1 ms      1 ms      200.4.10.4
Trace complete.

PC-tracers 200.4.10.38
Tracing route to 200.4.10.38 over a maximum of 30 hops:
1 0 ms      1 ms      0 ms      200.4.10.6
2 0 ms      12 ms    0 ms     200.4.10.114
3 0 ms      0 ms      0 ms      200.4.10.38
Trace complete.

PC-tracers 200.4.10.96
Tracing route to 200.4.10.96 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 1 ms      1 ms      0 ms     200.4.10.114
3 0 ms      0 ms      1 ms      200.4.10.96
Trace complete.

PC-tracers 200.4.10.82
Tracing route to 200.4.10.82 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 0 ms      0 ms      0 ms     200.4.10.82
Trace complete.

PC-tracers 200.4.10.88
Tracing route to 200.4.10.88 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.6
2 0 ms      0 ms      7 ms     200.4.10.88
Trace complete.

PC-tracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
1 0 ms      1 ms      0 ms      200.4.10.66
Trace complete.

PC-tracers 200.4.10.67
Tracing route to 200.4.10.67 over a maximum of 30 hops:
1 0 ms      0 ms      0 ms      200.4.10.67
Trace complete.

pc>

```

Figure 68: Traceroute Command Results from PC41_3 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC41_3, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC42_1

```
PC42_1
Physical Config Desktop Custom Interface

Command Prompt
PCping 200.4.10.2
Ping 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.3
Ping 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.4
Ping 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.35
Ping 200.4.10.35 with 32 bytes of data:
Reply from 200.4.10.35: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.35:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.36
Ping 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.44
Ping 200.4.10.44 with 32 bytes of data:
Reply from 200.4.10.44: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.44:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.47
Ping 200.4.10.47 with 32 bytes of data:
Reply from 200.4.10.47: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.47:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 69: Ping Command Results from PC42_1 between All Other PCs – 1

```
PC42_1
Physical Config Desktop Custom Interface

Command Prompt
PCping 200.4.10.36
Ping 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.44
Ping 200.4.10.44 with 32 bytes of data:
Reply from 200.4.10.44: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.44:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.47
Ping 200.4.10.47 with 32 bytes of data:
Reply from 200.4.10.47: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.47:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PCping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 70: Ping Command Results from PC42_1 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC42_1 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC42_1
Physical Config Desktop Custom Interface
Command Prompt
PC

```

Figure 71: Traceroute Command Results from PC42_1 between All Other PCs – 1

```

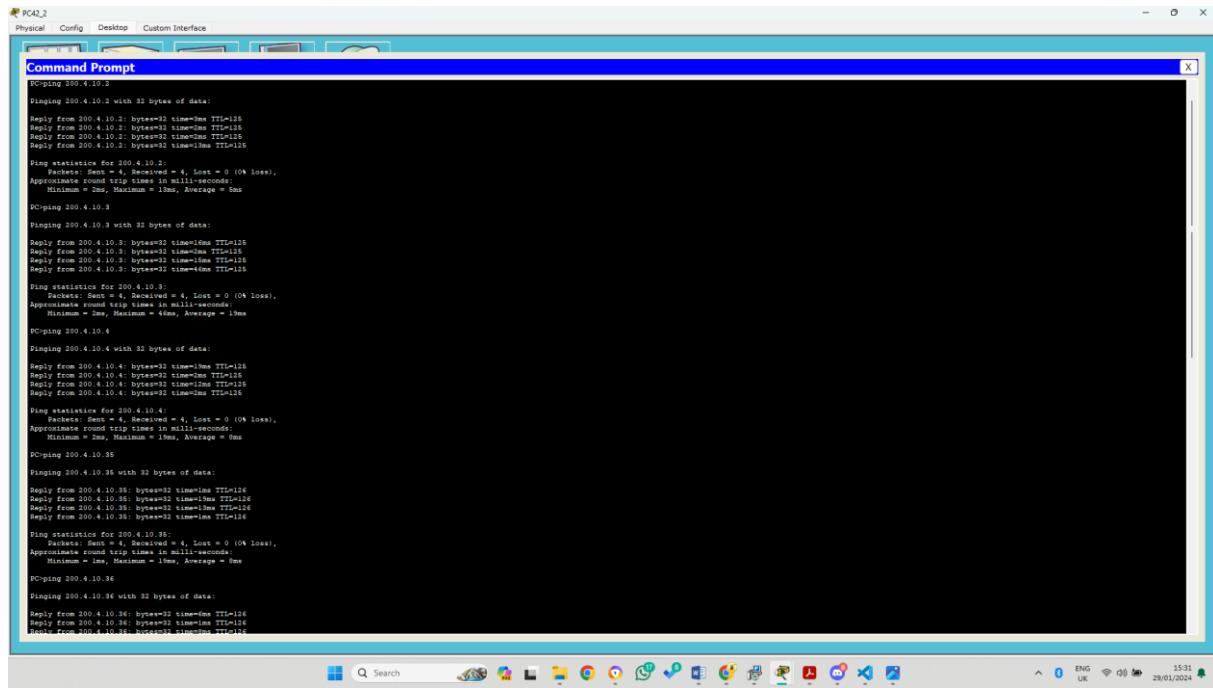
PC42_1
Physical Config Desktop Custom Interface
Command Prompt
PC

```

Figure 72: Traceroute Command Results from PC42_1 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC42_1, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

PC42_2



```
PC42_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.2
Ping 200.4.10.2 with 32 bytes of data:
Reply from 200.4.10.2: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.3
Ping 200.4.10.3 with 32 bytes of data:
Reply from 200.4.10.3: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 4ms, Average = 1ms

PC-ping 200.4.10.4
Ping 200.4.10.4 with 32 bytes of data:
Reply from 200.4.10.4: bytes=32 time=1ms TTL=125

Ping statistics for 200.4.10.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.38
Ping 200.4.10.38 with 32 bytes of data:
Reply from 200.4.10.38: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.38:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.36
Ping 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

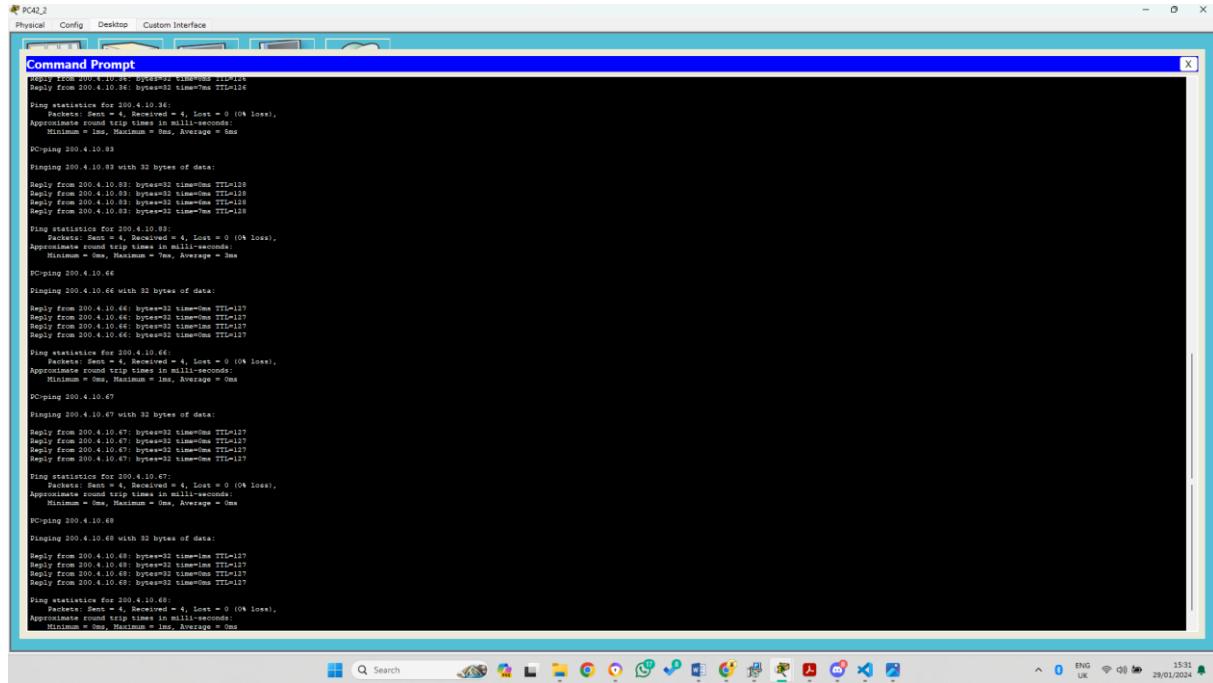
PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 73: Ping Command Results from PC42_2 between All Other PCs – 1



```
PC42_2
Physical Config Desktop Custom Interface

Command Prompt
PC-ping 200.4.10.36
Ping 200.4.10.36 with 32 bytes of data:
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126
Reply from 200.4.10.36: bytes=32 time=1ms TTL=126

Ping statistics for 200.4.10.36:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.66
Ping 200.4.10.66 with 32 bytes of data:
Reply from 200.4.10.66: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.66:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.67
Ping 200.4.10.67 with 32 bytes of data:
Reply from 200.4.10.67: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.67:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC-ping 200.4.10.69
Ping 200.4.10.69 with 32 bytes of data:
Reply from 200.4.10.69: bytes=32 time=1ms TTL=127

Ping statistics for 200.4.10.69:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figure 74: Ping Command Results from PC42_2 between All Other PCs – 2

The Figures above display the results of a series of ping tests conducted from PC42_2 to all other PCs in the network. In each test, four packets were sent, and the results confirm successful delivery with no packets lost or requests timed out. This demonstrates reliable network connections among the devices.

```

PC42_2
Physical Config Desktop Custom Interface
Command Prompt
PCtracers 200.4.10.2
Tracing route to 200.4.10.2 over a maximum of 30 hops:
  0 ms       0 ms       0 ms   200.4.10.81
  2  0 ms       2 ms       0 ms   200.4.10.117
  3  13 ms      11 ms      4 ms   200.4.10.106
  4  0 ms       5 ms       1 ms   200.4.10.5
Trace complete.

PCtracers 200.4.10.3
Tracing route to 200.4.10.3 over a maximum of 30 hops:
  1  0 ms       0 ms       1 ms   200.4.10.81
  2  0 ms       6 ms       0 ms   200.4.10.114
  3  9 ms       3 ms       4 ms   200.4.10.105
  4  13 ms      13 ms      24 ms   200.4.10.3
Trace complete.

PCtracers 200.4.10.4
Tracing route to 200.4.10.4 over a maximum of 30 hops:
  1  0 ms       0 ms       0 ms   200.4.10.81
  2  1 ms       4 ms       9 ms   200.4.10.117
  3  0 ms       0 ms      21 ms   200.4.10.105
  4  1 ms       1 ms       1 ms   200.4.10.4
Trace complete.

PCtracers 200.4.10.35
Tracing route to 200.4.10.35 over a maximum of 30 hops:
  1  0 ms       0 ms       0 ms   200.4.10.81
  2  9 ms       13 ms      0 ms   200.4.10.114
  3  0 ms       0 ms       0 ms   200.4.10.35
Trace complete.

PCtracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  0 ms       1 ms       5 ms   200.4.10.81
  2  0 ms       4 ms       1 ms   200.4.10.114
  3  0 ms       0 ms       1 ms   200.4.10.36
Trace complete.

PCtracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
  1  0 ms       0 ms       0 ms   200.4.10.83
Trace complete.

PCtracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  1  0 ms       1 ms       0 ms   200.4.10.81
  2  0 ms       0 ms       0 ms   200.4.10.66
Trace complete.

pc:

```

Figure 75: Traceroute Command Results from PC42_2 between All Other PCs – 1

```

PC42_2
Physical Config Desktop Custom Interface
Command Prompt
  1  1 ms       4 ms       9 ms   200.4.10.81
  2  1 ms       0 ms      21 ms   200.4.10.105
  3  0 ms       1 ms       1 ms   200.4.10.35
Trace complete.

PCtracers 200.4.10.35
Tracing route to 200.4.10.35 over a maximum of 30 hops:
  1  0 ms       0 ms       0 ms   200.4.10.81
  2  9 ms       13 ms      0 ms   200.4.10.114
  3  0 ms       0 ms       0 ms   200.4.10.35
Trace complete.

PCtracers 200.4.10.36
Tracing route to 200.4.10.36 over a maximum of 30 hops:
  1  0 ms       1 ms       0 ms   200.4.10.81
  2  0 ms       4 ms       0 ms   200.4.10.114
  3  0 ms       0 ms       1 ms   200.4.10.36
Trace complete.

PCtracers 200.4.10.83
Tracing route to 200.4.10.83 over a maximum of 30 hops:
  1  0 ms       0 ms       0 ms   200.4.10.83
Trace complete.

PCtracers 200.4.10.66
Tracing route to 200.4.10.66 over a maximum of 30 hops:
  1  0 ms       1 ms       0 ms   200.4.10.81
  2  0 ms       0 ms       0 ms   200.4.10.66
Trace complete.

pc:

```

Figure 76: Traceroute Command Results from PC42_2 between All Other PCs – 2

The Figures above show the results of a sequence of traceroute tests conducted from PC42_2, mapping the routes to every PC within the network. Displaying the hop-by-hop paths and latencies for each destination IP address.

Testing Website

In this testing operation, we navigated to the domain www.FirstSem2024.com from the browsers on each PC. This domain, registered in the DNS server, is associated with the IP address "200.4.10.98" of our HTTP server where our website files (HTML and images). The site was successfully reached from every PC, as demonstrated in Figures 77-80.

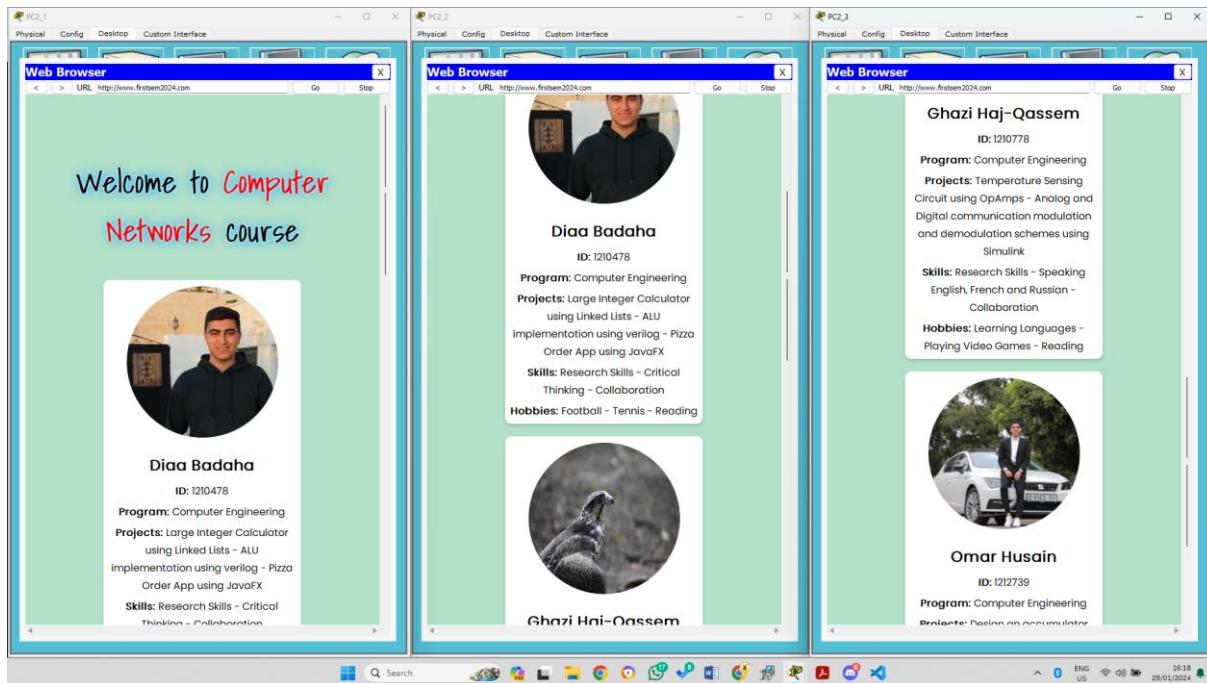


Figure 77: Website Testing on PC2_1, PC2_1 and PC2_3

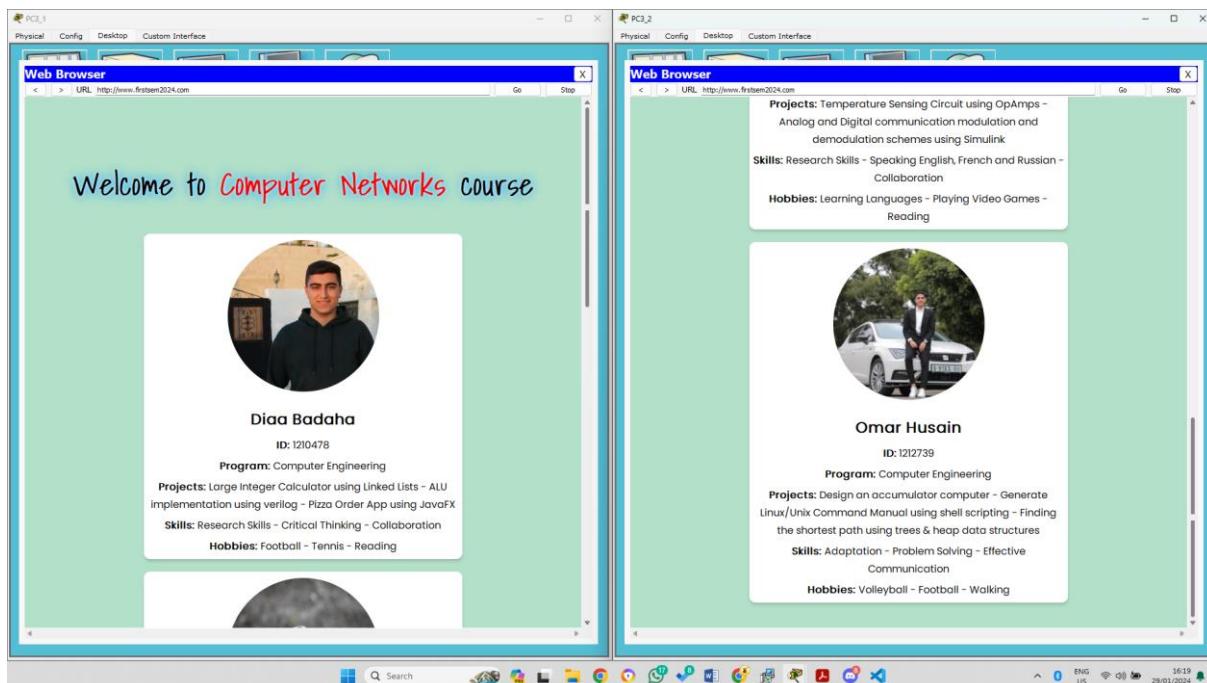


Figure 78: Website Testing on PC3_1 and PC3_2

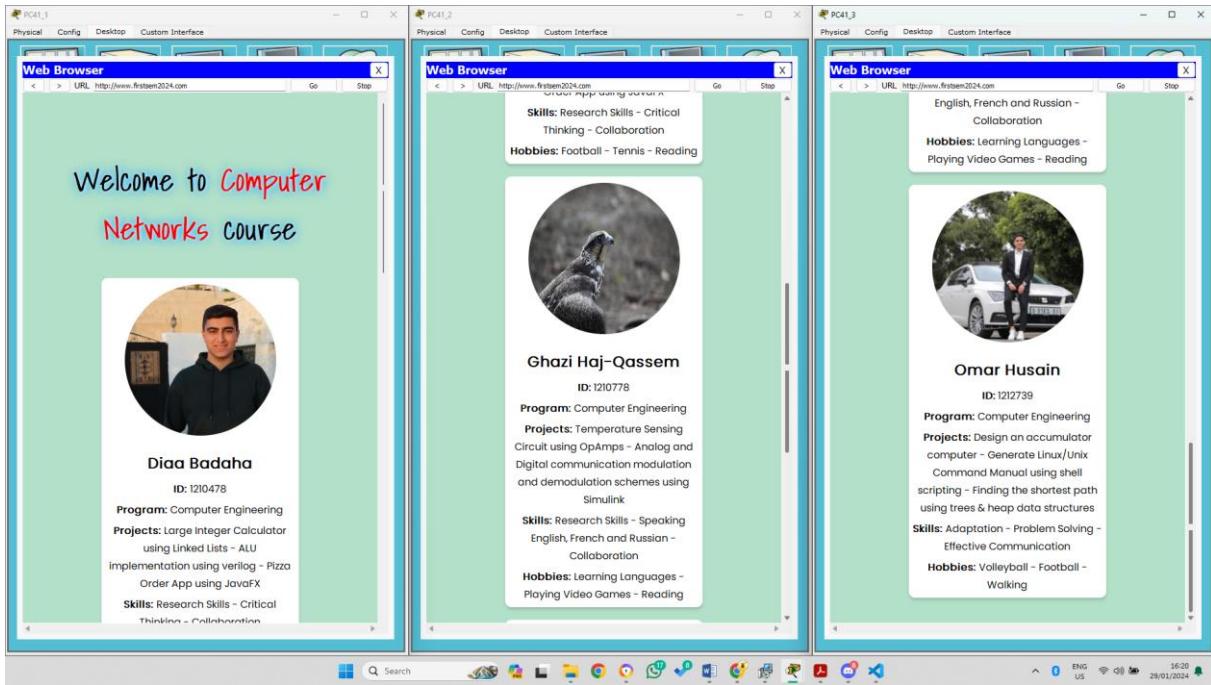


Figure 79: Website Testing on PC41_1, PC41_2 and PC41_3

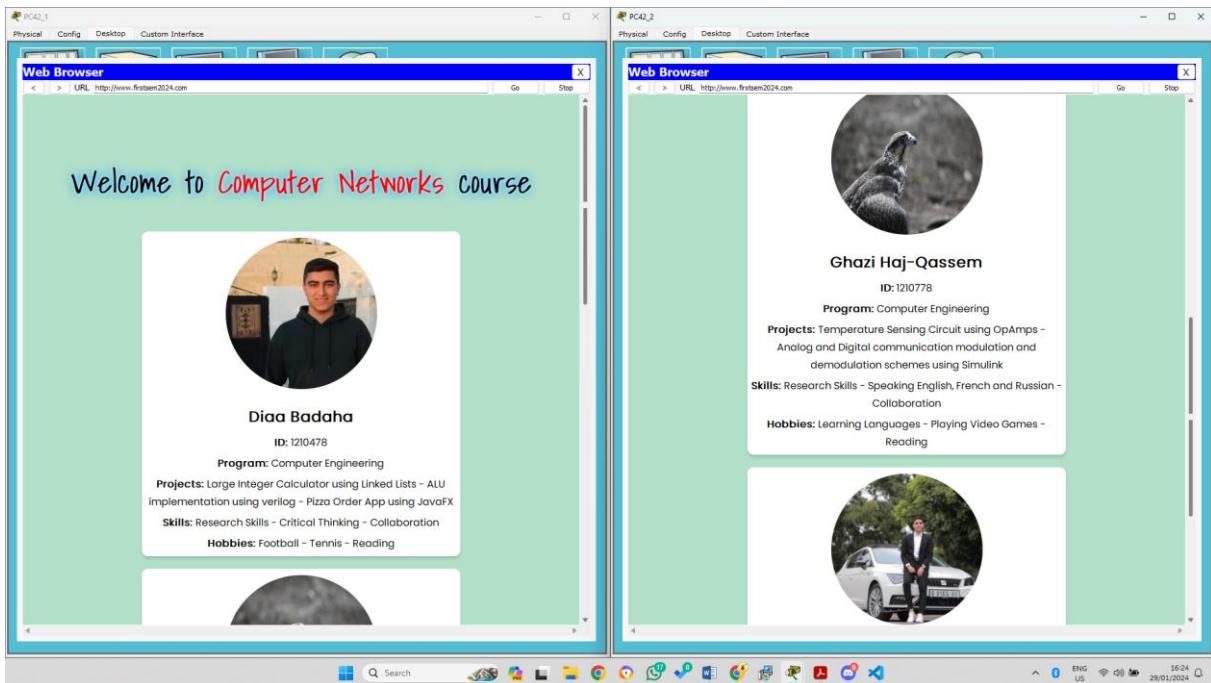


Figure 80: Website Testing on PC42_1, PC42_2 and PC42_3

Testing Emails

For the email testing process, rather than testing every email send-receive combination across the PCs, we ensured that each PC could send at least one email and receive another successfully. This simple testing confirms the reliability of our network's connectivity, with the successful send and receive operations on each PC shown in Figures 81-90.

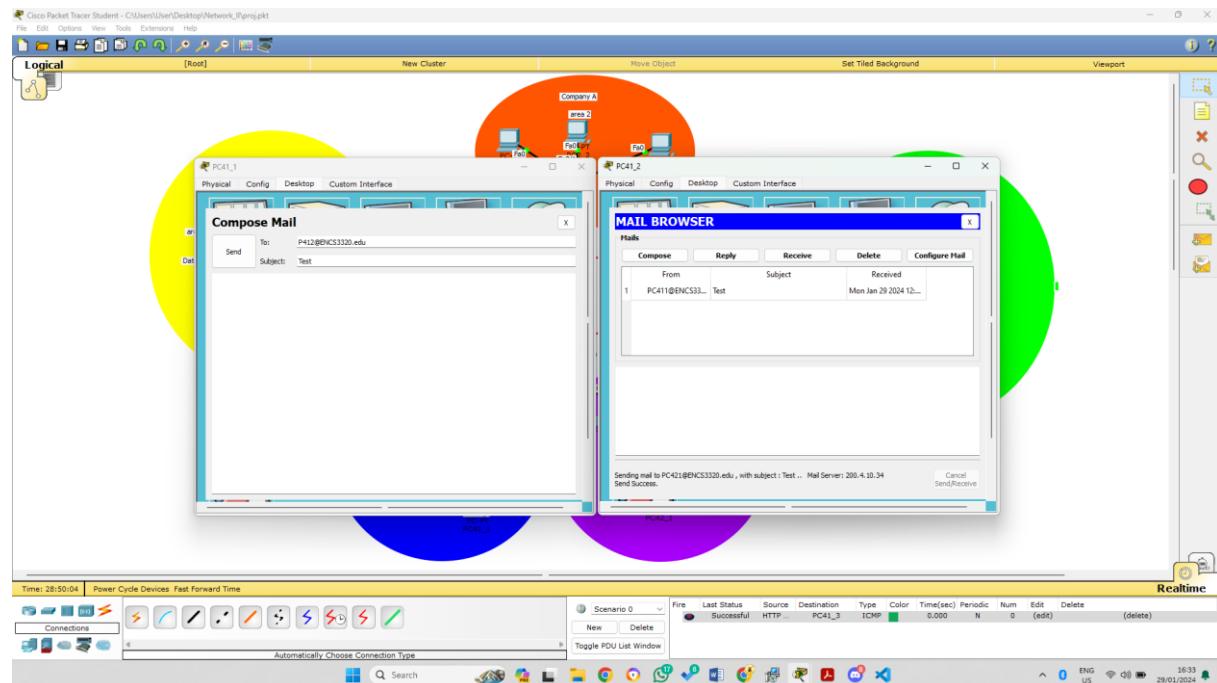


Figure 81: Sending an Email from PC41_1 to PC41_2

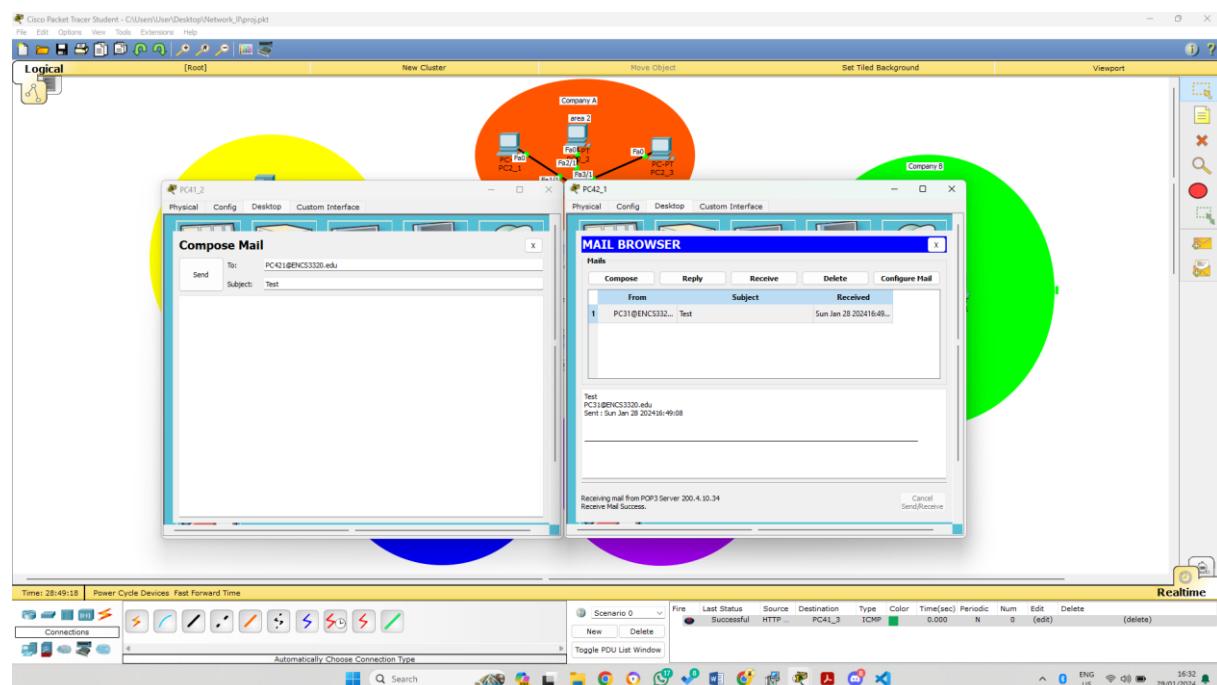


Figure 82: Sending an Email from PC41_2 to PC42_1

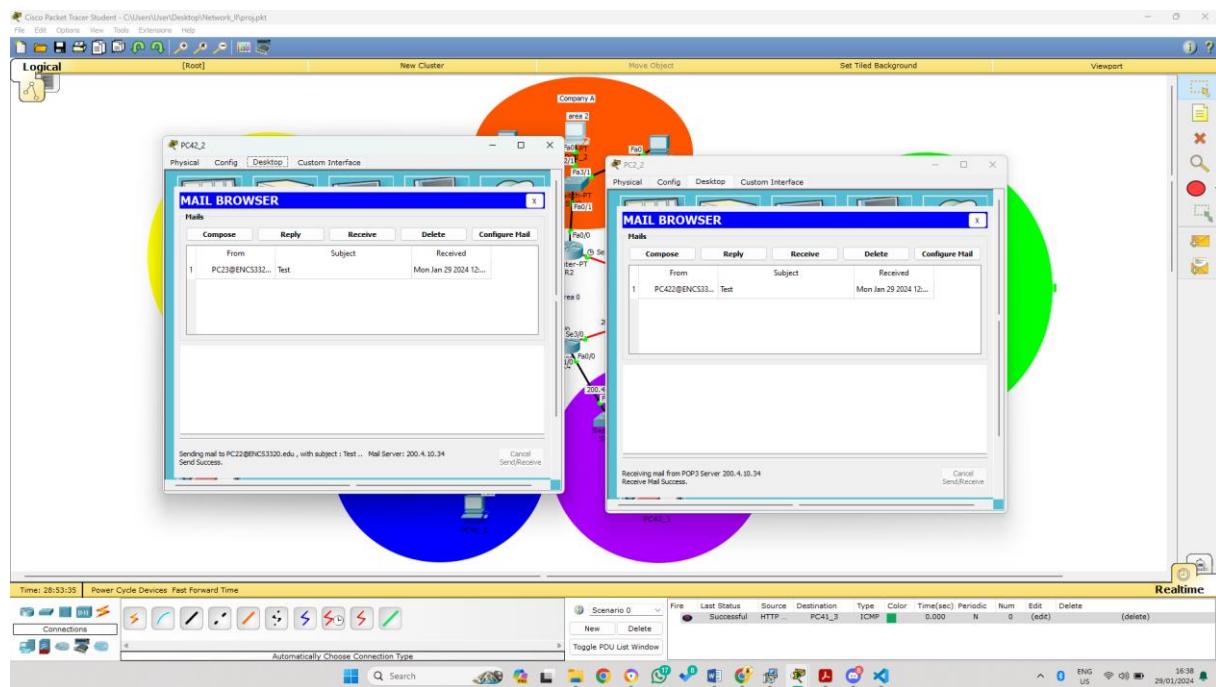


Figure 83: Sending an Email from PC42_2 to PC2_2

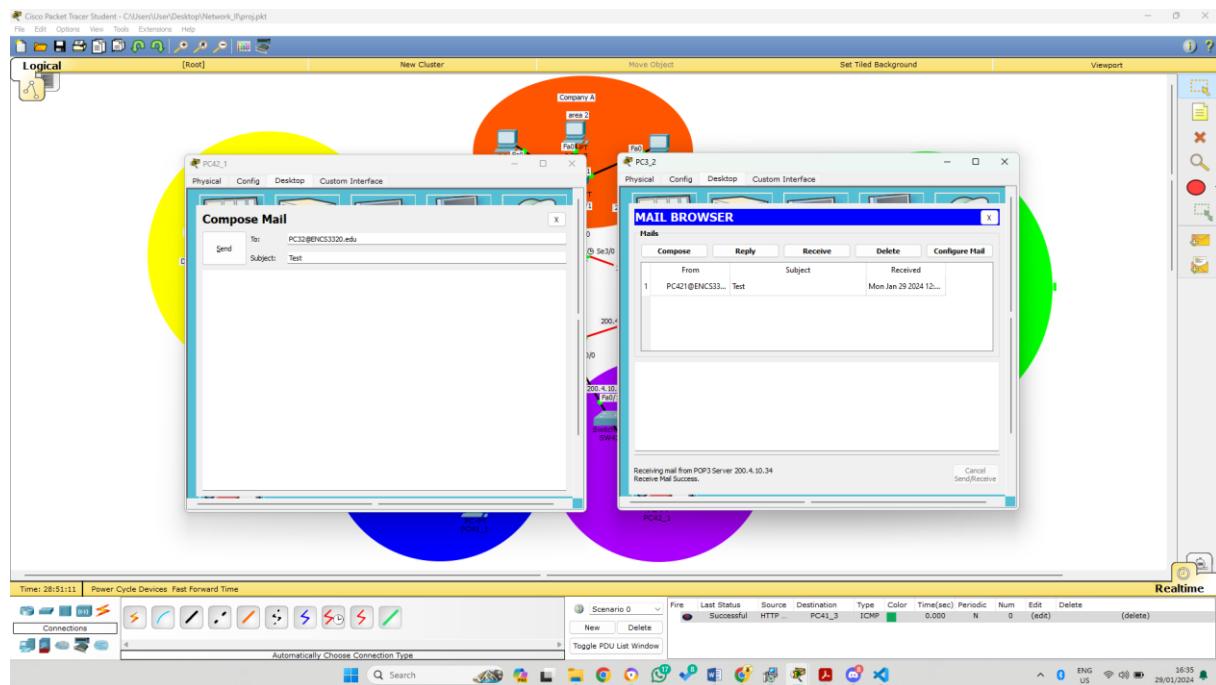


Figure 84: Sending an Email from PC42_1 to PC3_2

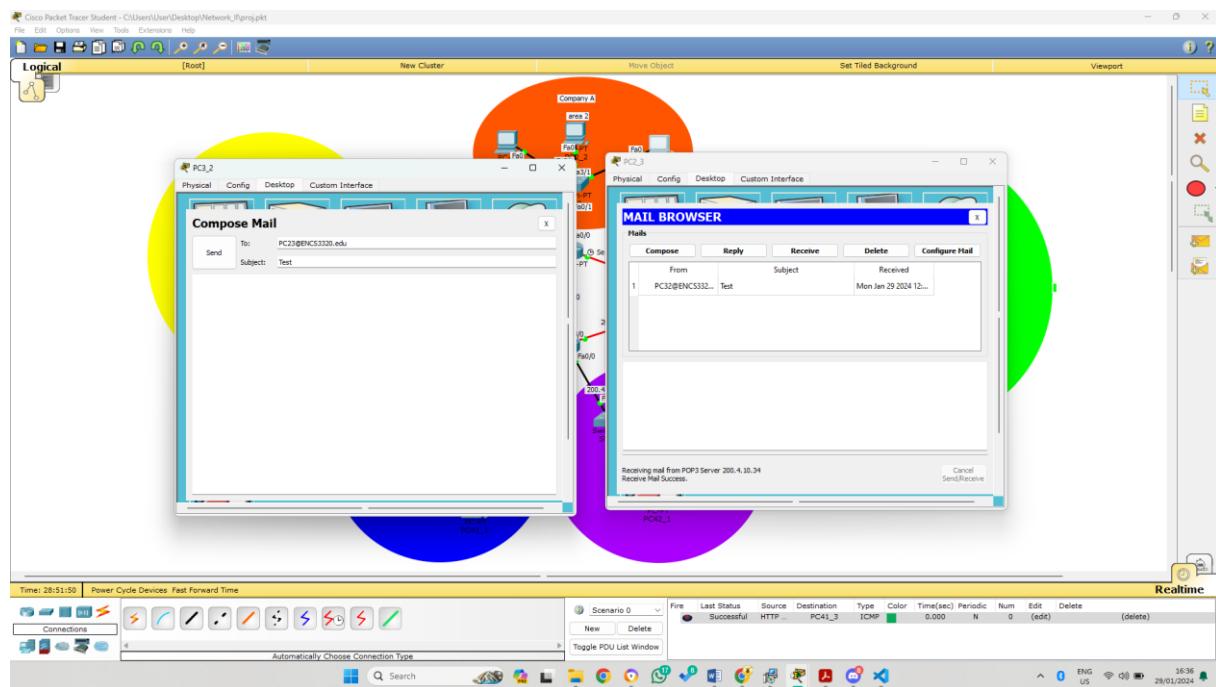


Figure 85: Sending an Email from PC3_2 to PC2_3

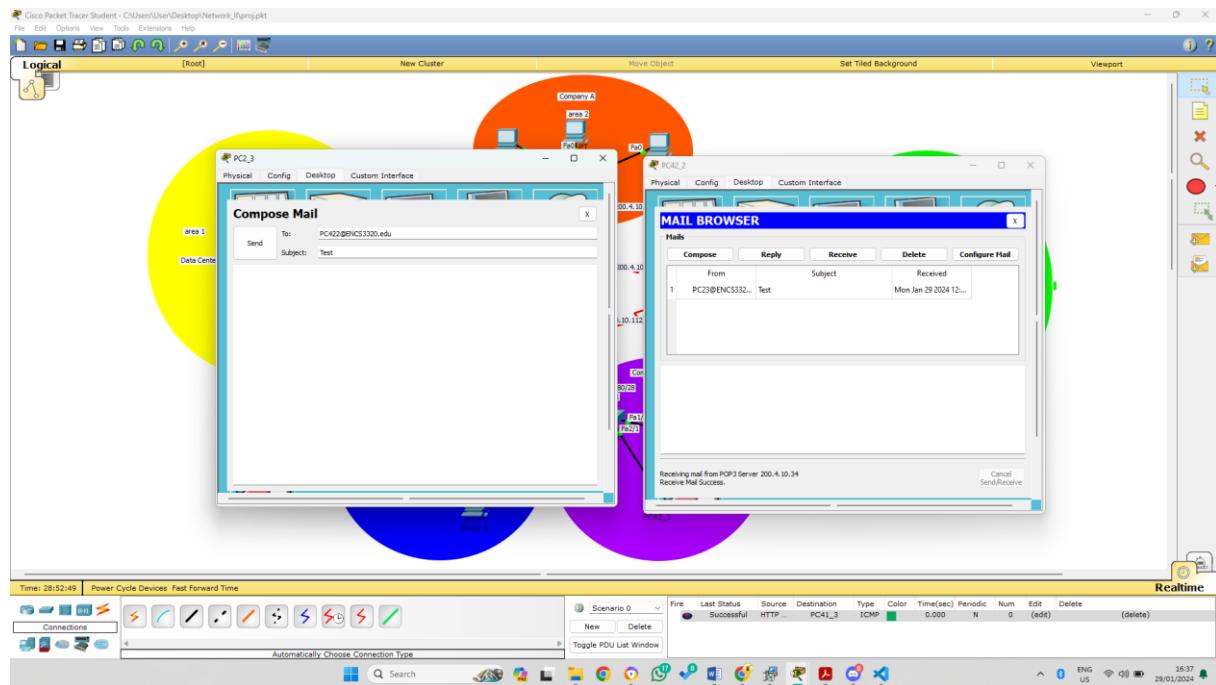


Figure 86: Sending an Email from PC2_3 to PC42_2

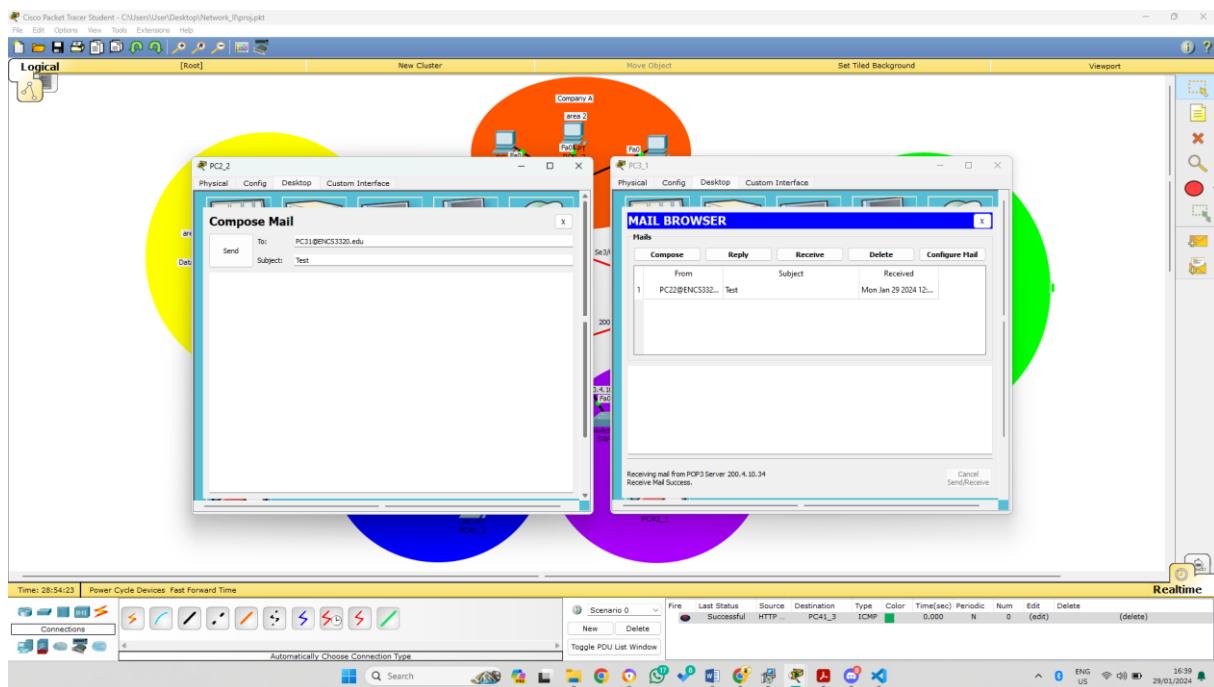


Figure 87: Sending an Email from PC2_2 to PC3_1

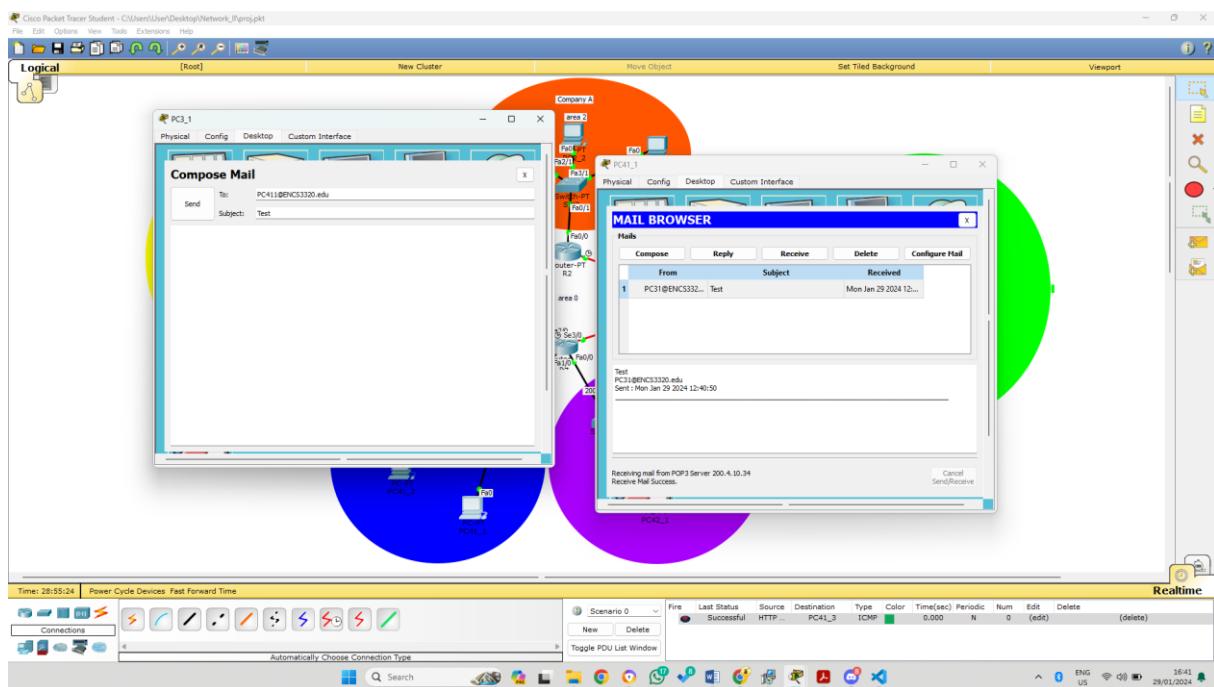


Figure 88: Sending an Email from PC3_1 to PC41_1

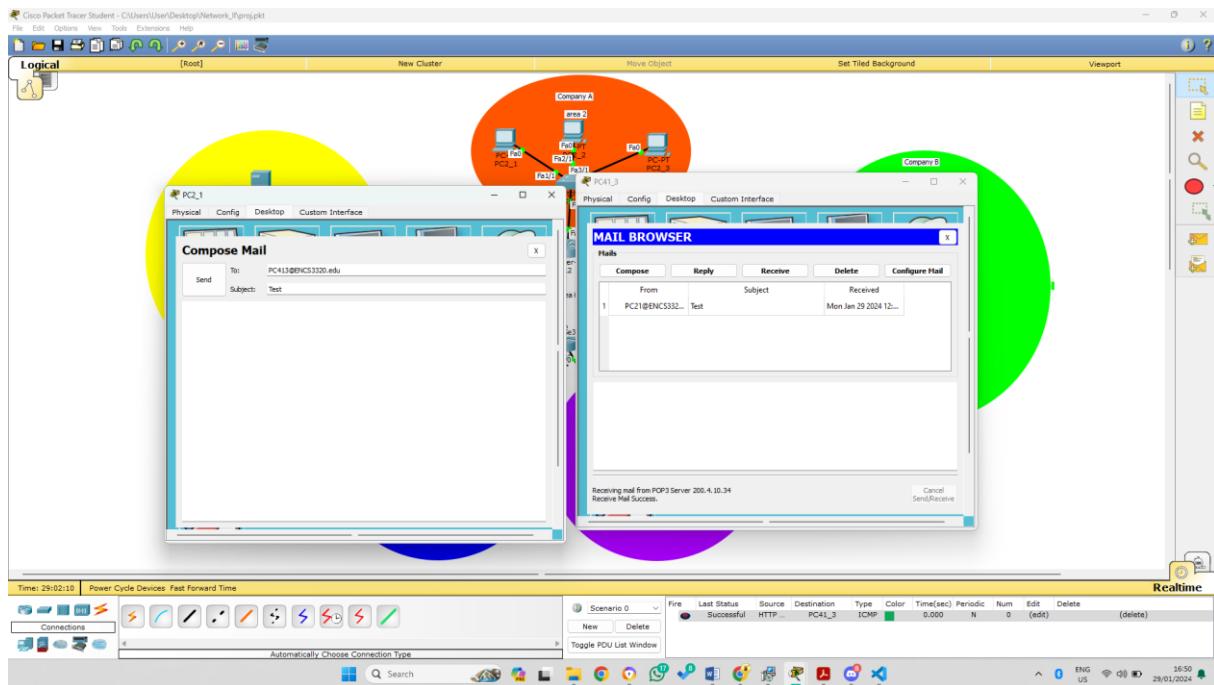


Figure 89: Sending an Email from PC2_1 to PC41_3

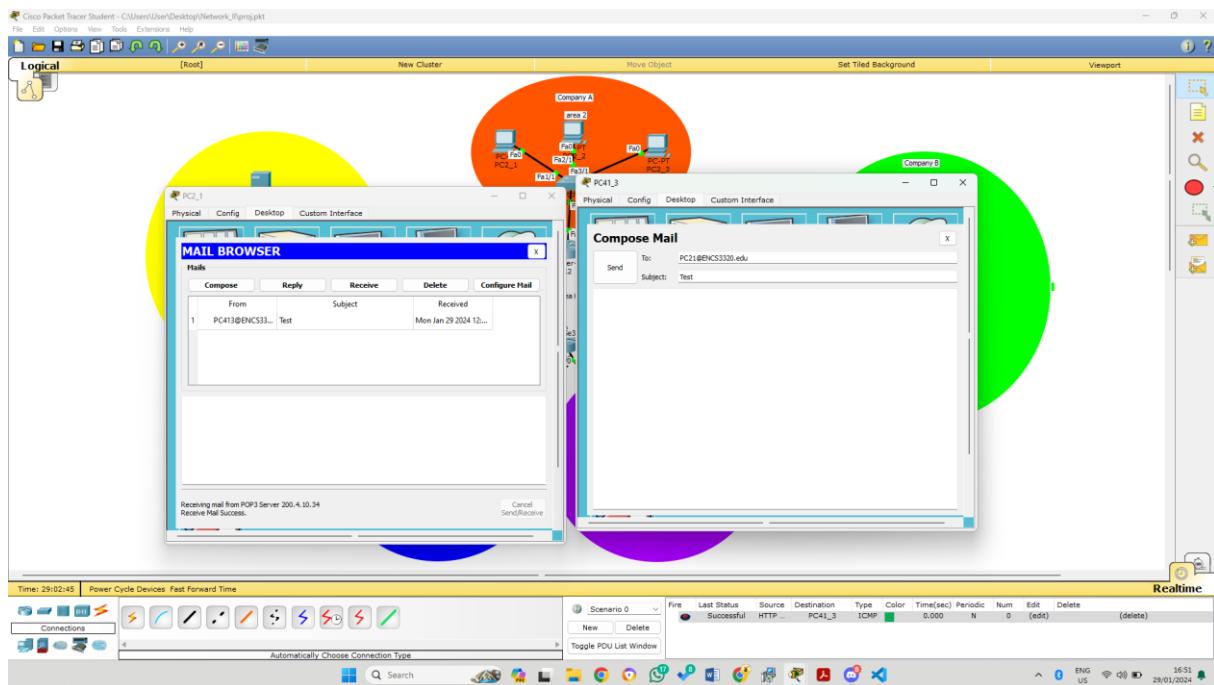


Figure 90: Sending an Email from PC41_3 to PC2_1

Conclusion

In completing this project, practical understanding of network design is deepened by using Cisco Packet Tracer to create a robust network encompassing a range of servers, end devices, and switches. The theoretical subnetting concepts learned in lectures were brought to life as they were implemented, enhancing one's comprehension of the subject. To ensure the network's operational integrity, a series of tests was conducted that included using the ping and tracert commands, sending and receiving emails and navigating a webpage from various end devices. These activities confirmed the reliability of the network and cements one's knowledge in a real-world context.