Faculty of Engineering and Technology

Electrical and Computer Engineering Department

Computer Networks– ENCS3320

Packet Tracer Project Report

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Section: 2 and 1

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Abstract

The main of this project to learn how to use packet tracer, learn how to do the IP subnetting and assignment, learn how to configure end devices like PCs and servers learn how to setup the routing algorithms on the routers and learn how to test and debug the design.

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Procedure and explanation

Part 0: IP subnetting and assignment

You are required to assign the IP addresses of the routers and end devices with respect to one of the student IDs in your group:

Since my Groupmate ID is 1200183, we choose it uniquely to get the IP as: **200.1.10.0/25**

The given Ip we will work with is Class C, meaning the following:

The subnet mask will be like the following:

200.1.10.0 000 0000
255.255.255.1 000 0000 => 10000000 is 128 in decimal. So, the subnet mask will be

255.255.255.128 /25

Underlined numbers are the Network we can use and work with for network connections.

Hince the IPs for network will start with 200.1.11.x For first links, 200.1.12.x For next four links. “Skips 0 for roots ‘Main network IP”.

To calculate Broadcast IPs:

Is Oring between Network IP and invert Subnet Mask:

200. 1. 11.0 000 0001
000.000.000.0 111 1111
200. 1. 11.0 111 1111 => **200.1.11.127 For first Link, and so on for others as well.**

Network IP for first Connection is 200.1.11.0, Second is 200.1.12.0 for roots between routers.

Network IP for center is 200.1.10.0, For Company A 200.1.20.0, For Company B 200.1.30.0, For Company C 200.1.40.0. and 200.1.41.0

Subnet	Subnet Mask/25	Network IP'Hosts'	Broadcast IP	First IP	Last IP	Max# IP
R1-R2 Link	255.255.255.128	200.1.11.1	200.1.11.127	200.1.11.1	200.1.11.126	126
R2-R3 Link	255.255.255.128	200.1.11.3	200.1.11.127	200.1.11.1	200.1.11.126	126
R3-R4 Link	255.255.255.128	200.1.11.5	200.1.11.127	200.1.11.1	200.1.11.126	126
R4-R1 Link	255.255.255.128	200.1.11.4	200.1.11.127	200.1.11.1	200.1.11.126	126
R1-R4 Link	255.255.255.128	200.1.12.1	200.1.12.127	200.1.12.1	200.1.12.126	126
R4-R3 Link	255.255.255.128	200.1.12.2	200.1.12.127	200.1.12.1	200.1.12.126	126
R3-R2 Link	255.255.255.128	200.1.12.3	200.1.12.127	200.1.12.1	200.1.12.126	126
R2-R1 Link	255.255.255.128	200.1.12.4	200.1.12.127	200.1.12.1	200.1.12.126	126
Data Center	255.255.255.128	200.1.10.1	200.1.10.127	200.1.10.1	200.1.10.126	126
Company A	255.255.255.128	200.1.20.1	200.1.20.127	200.1.20.1	200.1.20.126	126
Company B	255.255.255.128	200.1.30.1	200.1.30.127	200.1.30.1	200.1.30.126	126
Company C1	255.255.255.128	200.1.40.1	200.1.40.127	200.1.40.1	200.1.40.126	126
Company C2	255.255.255.128	200.1.41.1	200.1.41.127	200.1.41.1	200.1.41.126	126

Table 1 Subnets IPS

Part1: Building the topology

Build the topology given in Figure 1 using packet tracer based on the IPs found in Part0 and do the appropriate subnetting.

1. Topology:

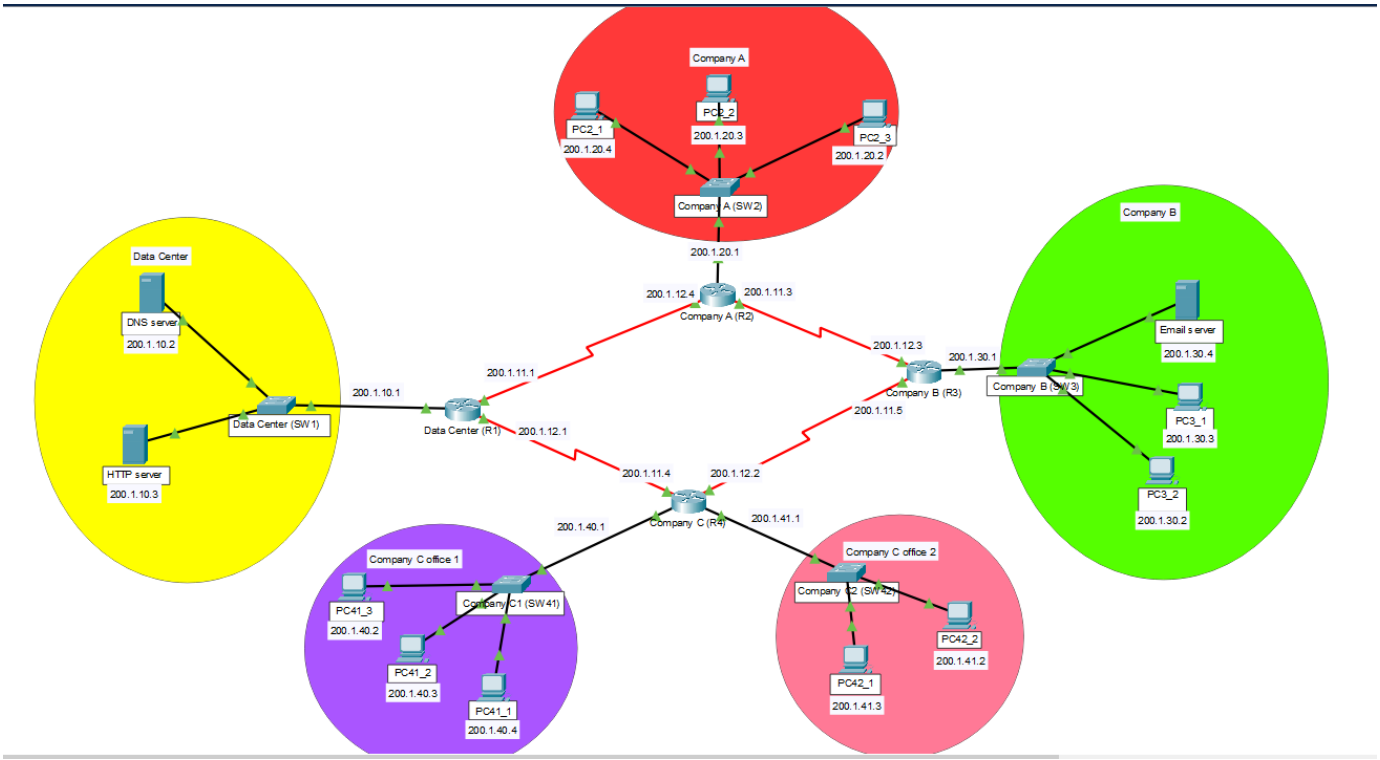

Figure 1 Building the topology

2. Configure the interfaces of all routers

Each port of the routers has been given an IP address according to the subnet it was connecting to.

Data Center Router (R1):

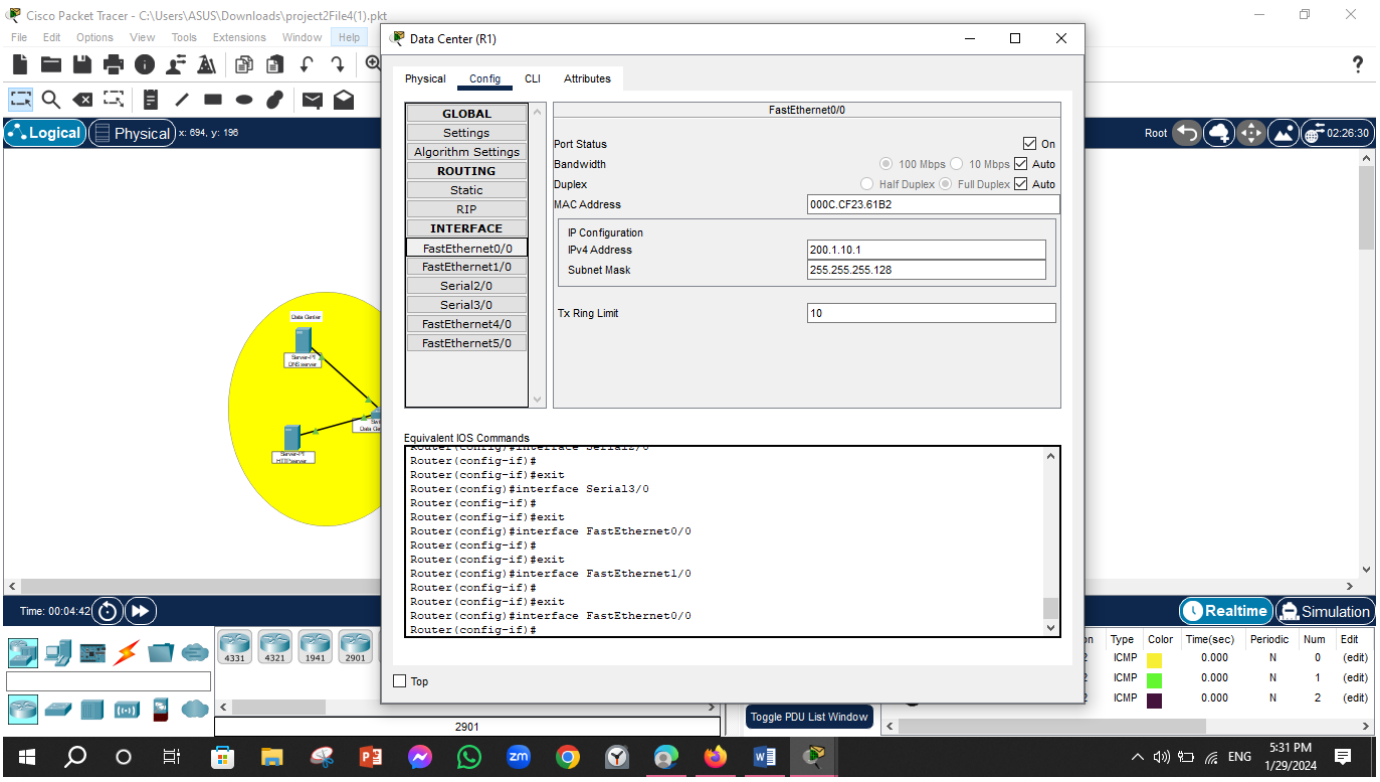

Figure 2 : R1-FE 0/0

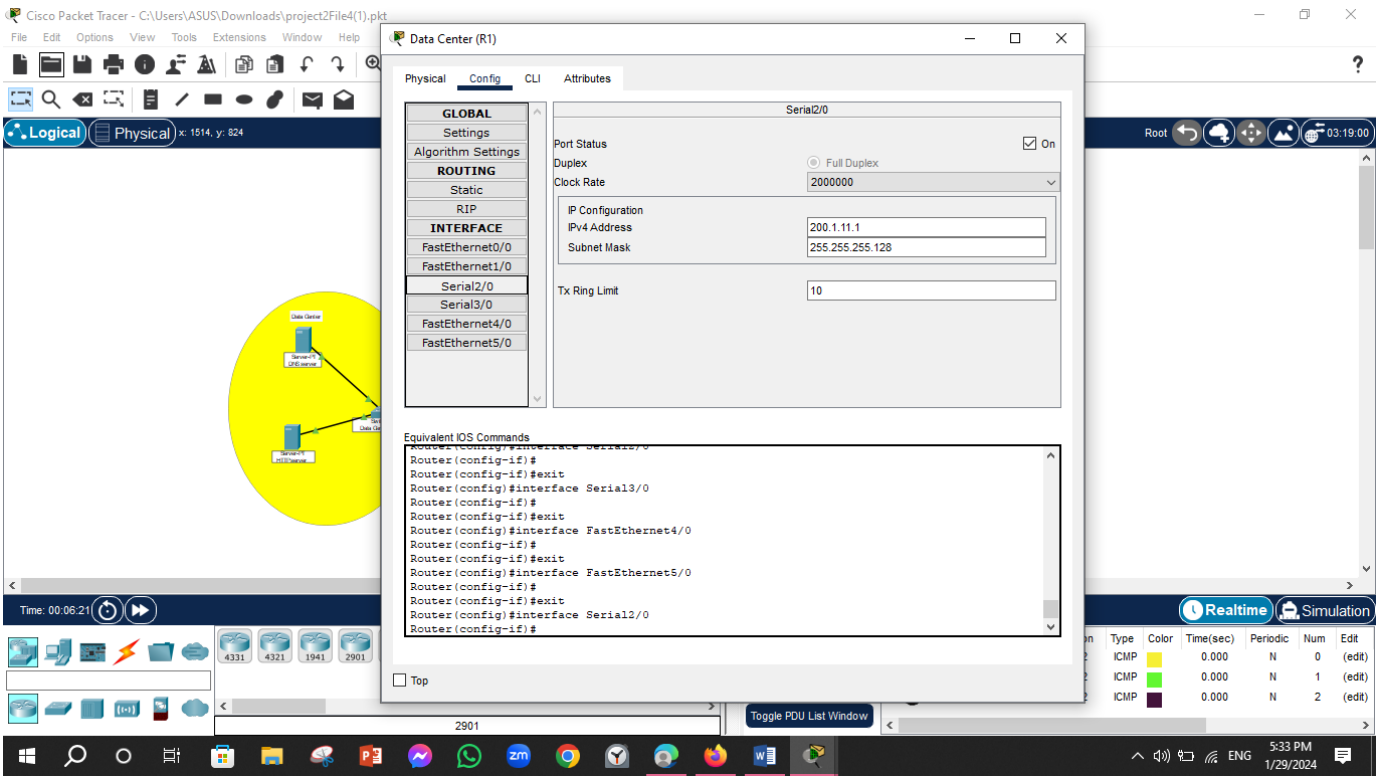

Figure 3 : R1-Serial 2/0

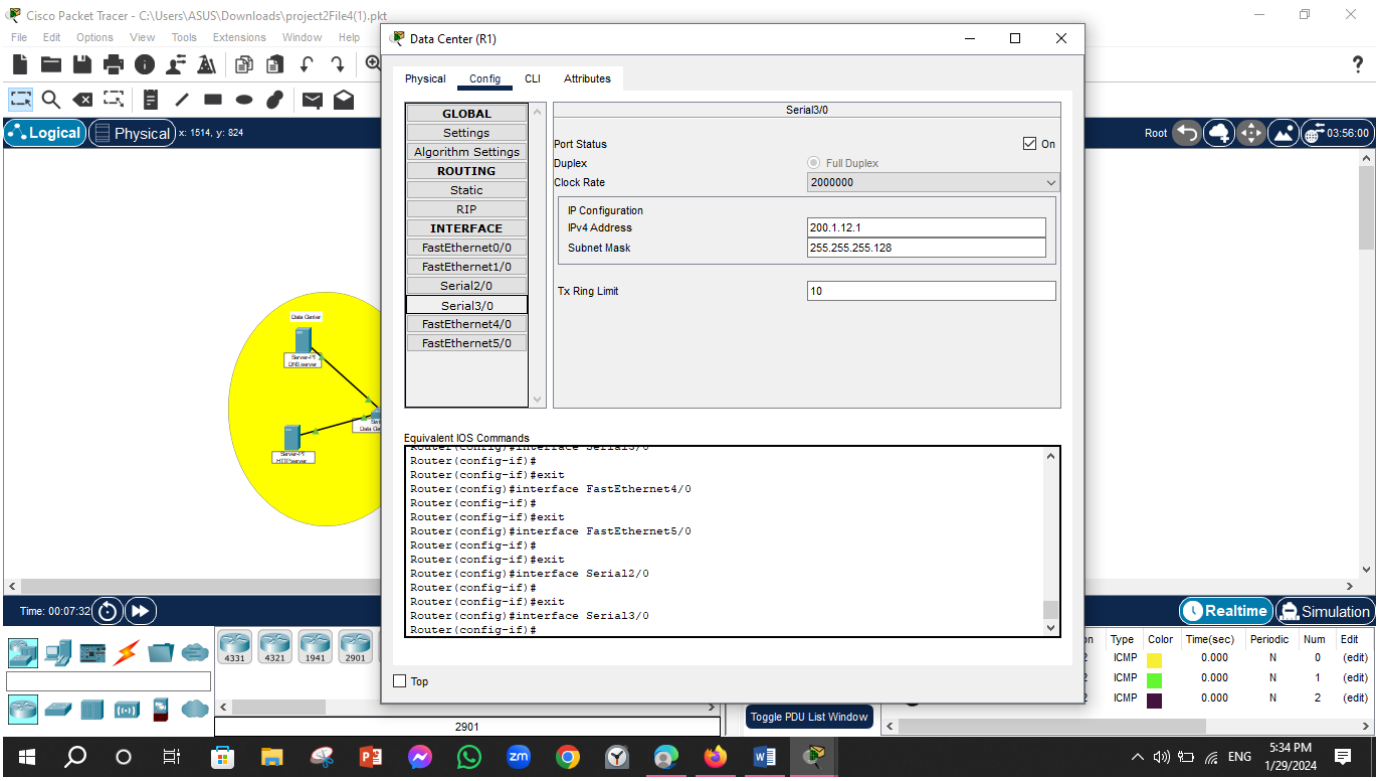

Figure 4 : R1-Serial 3/0

Company A Router (R2):

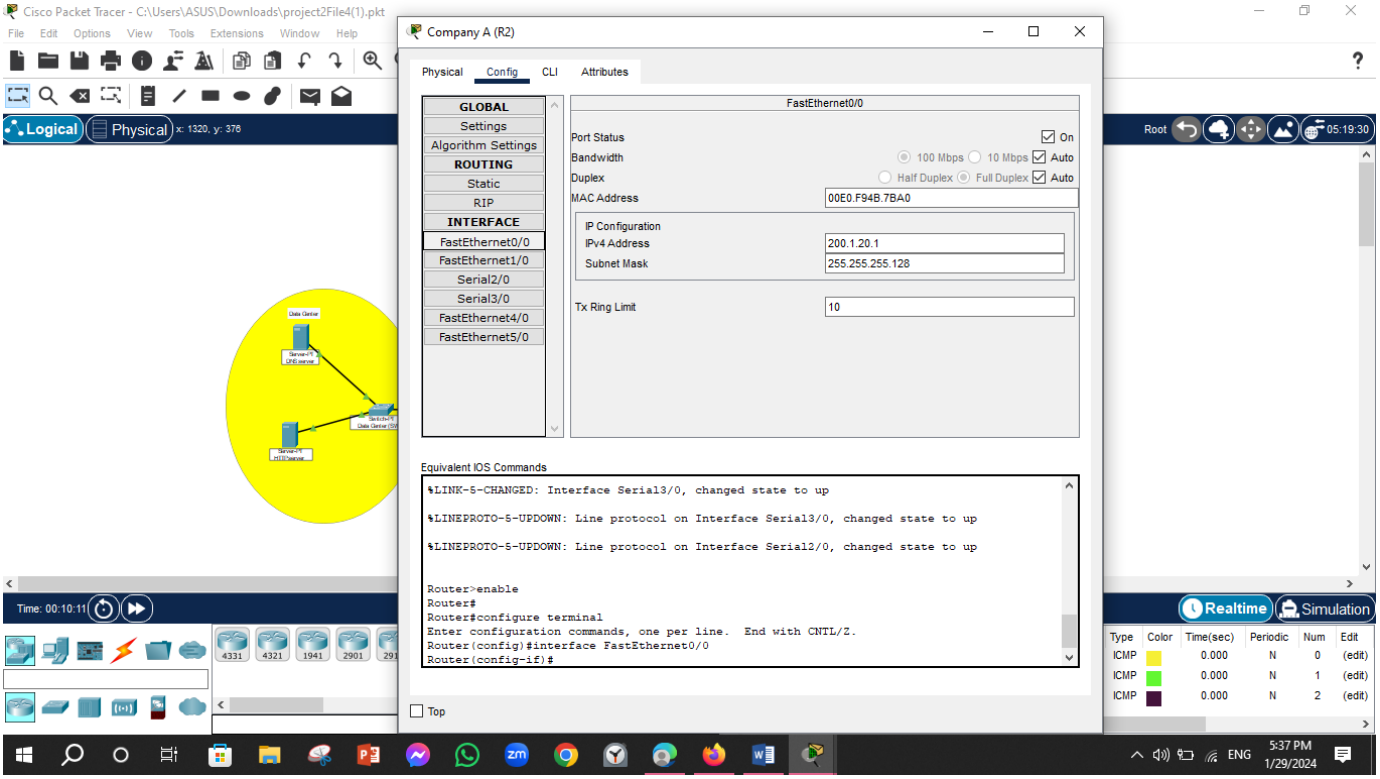

Figure 5 : R2-FE 0/0

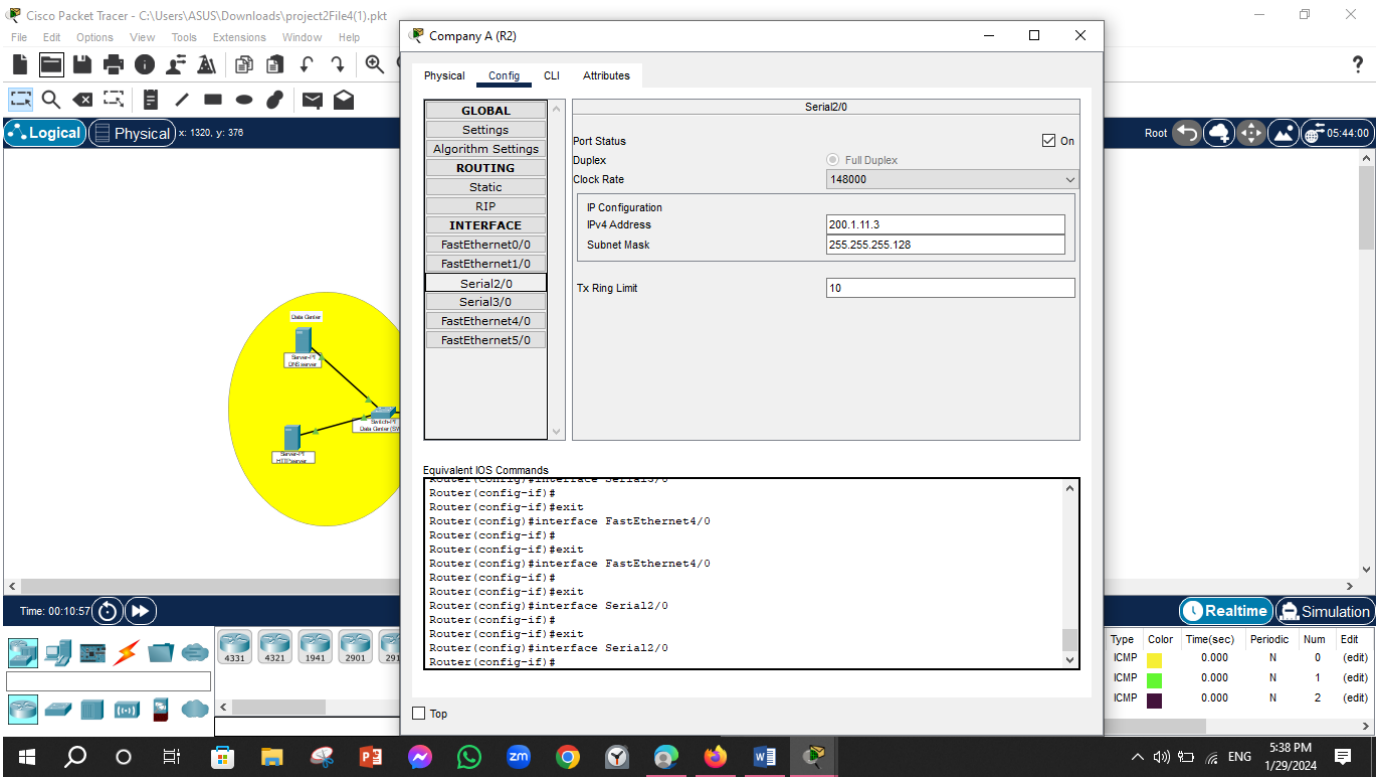

Figure 6 : R2-Serial 2/0

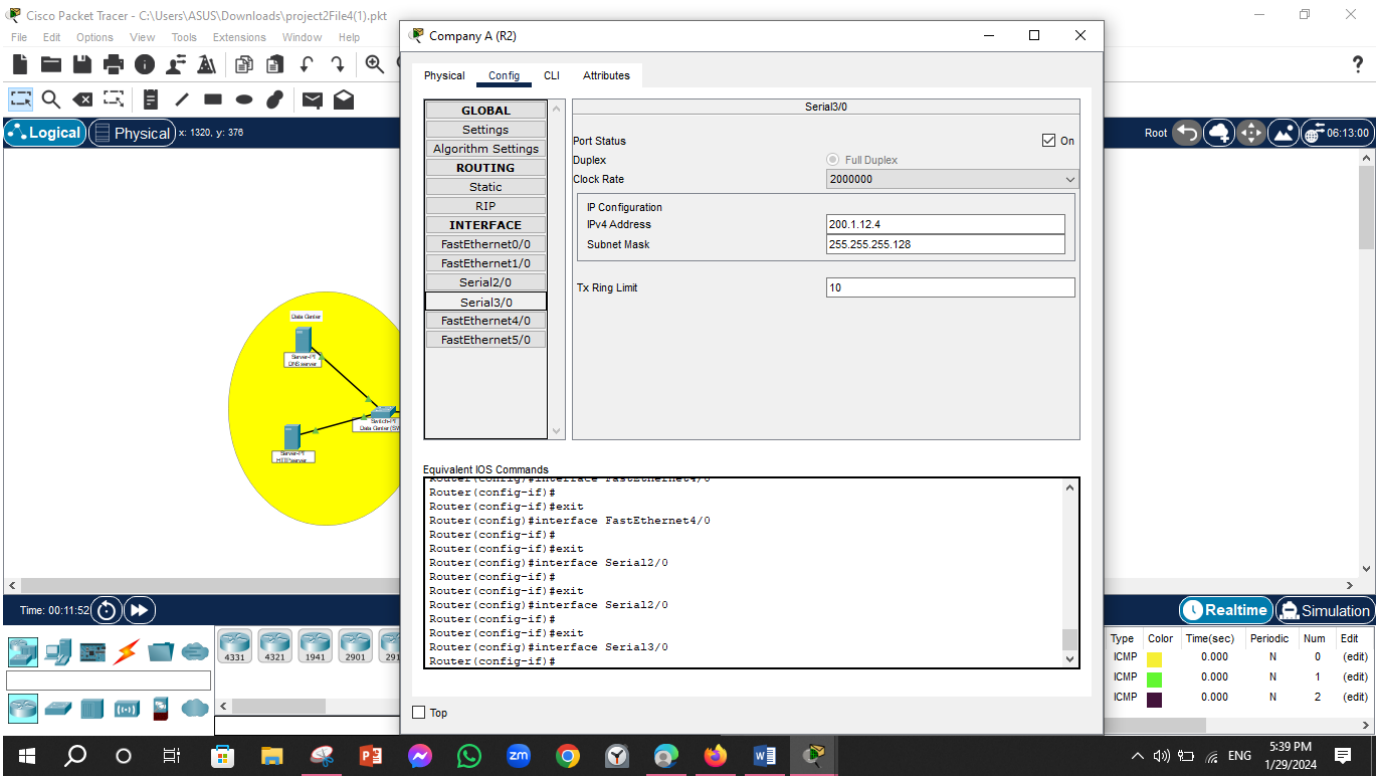

Figure 7 : R2-Serial 3/0

Company B Router (R3):

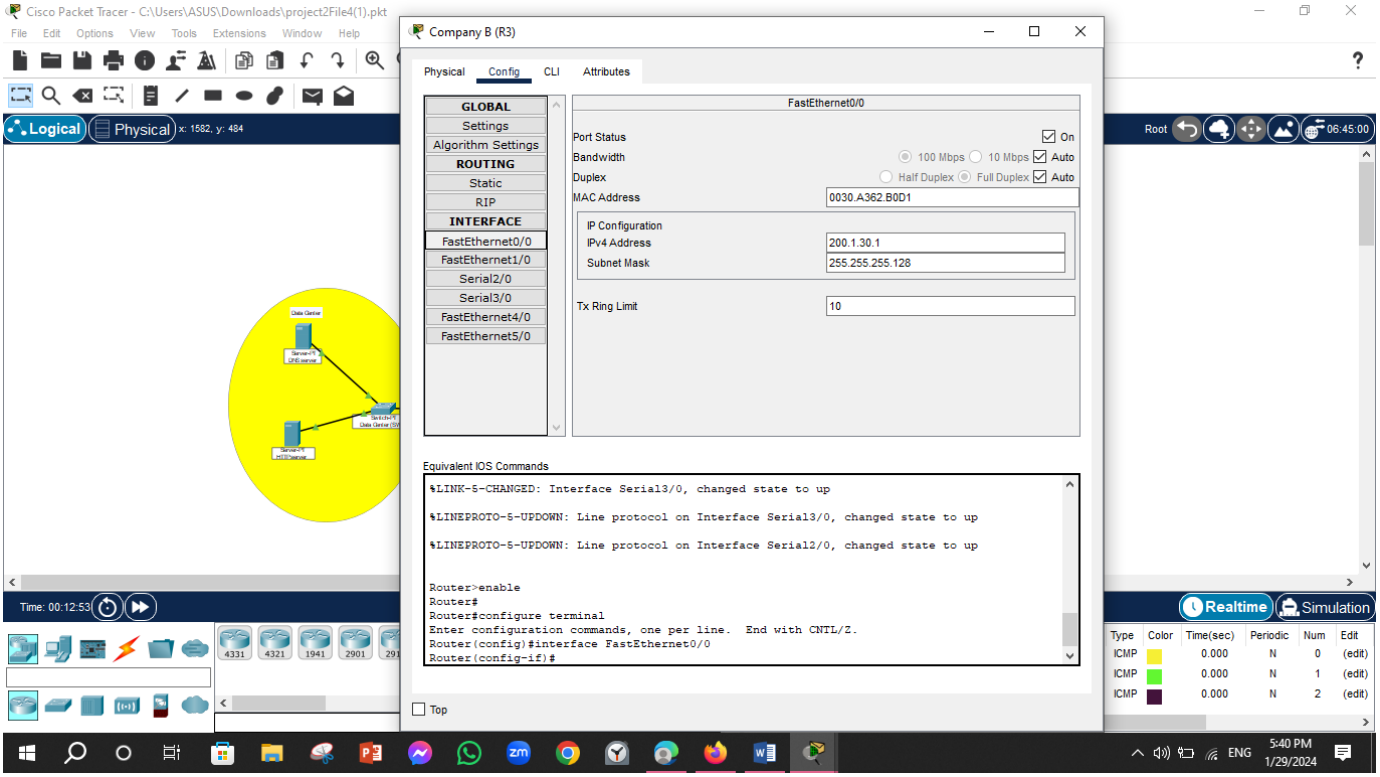

Figure 8 : R3-FE 0/0

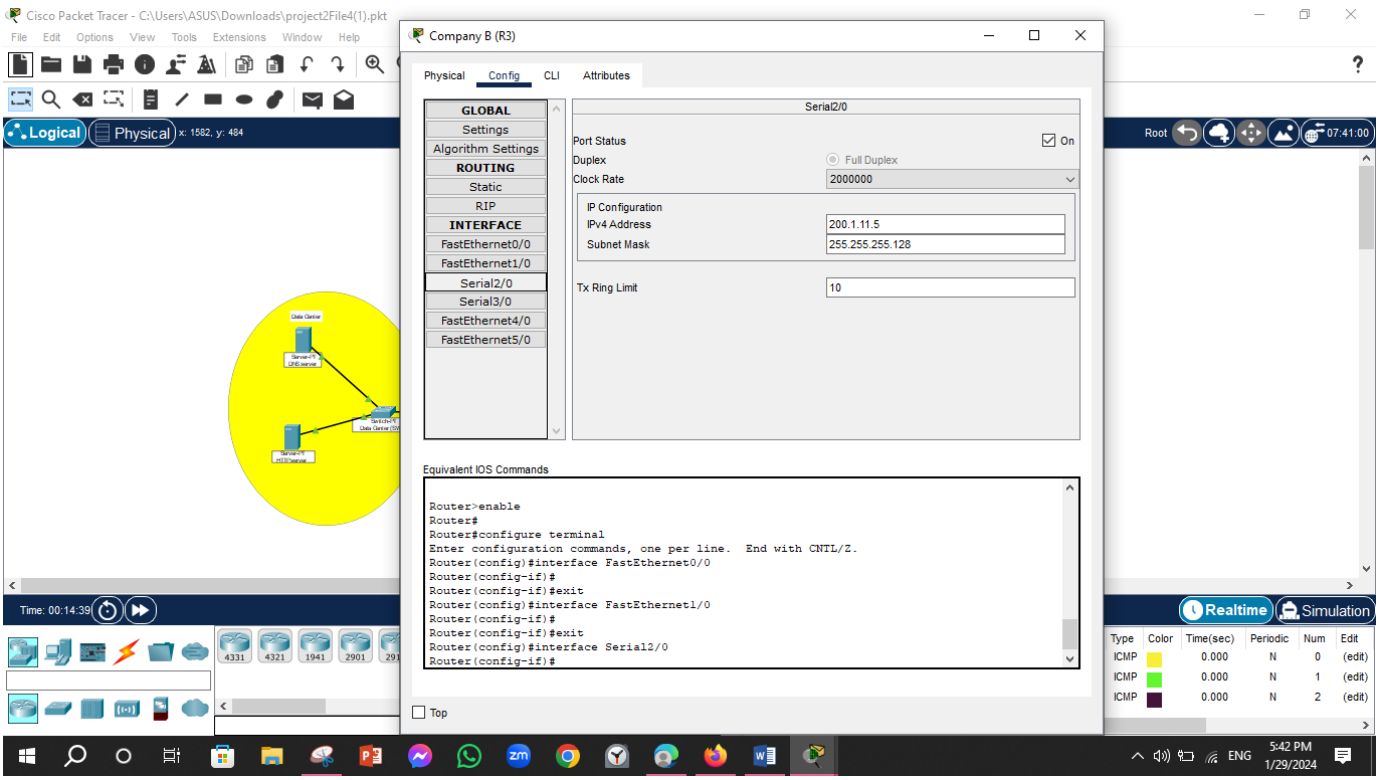

Figure 9 : R3-Serial 2/0

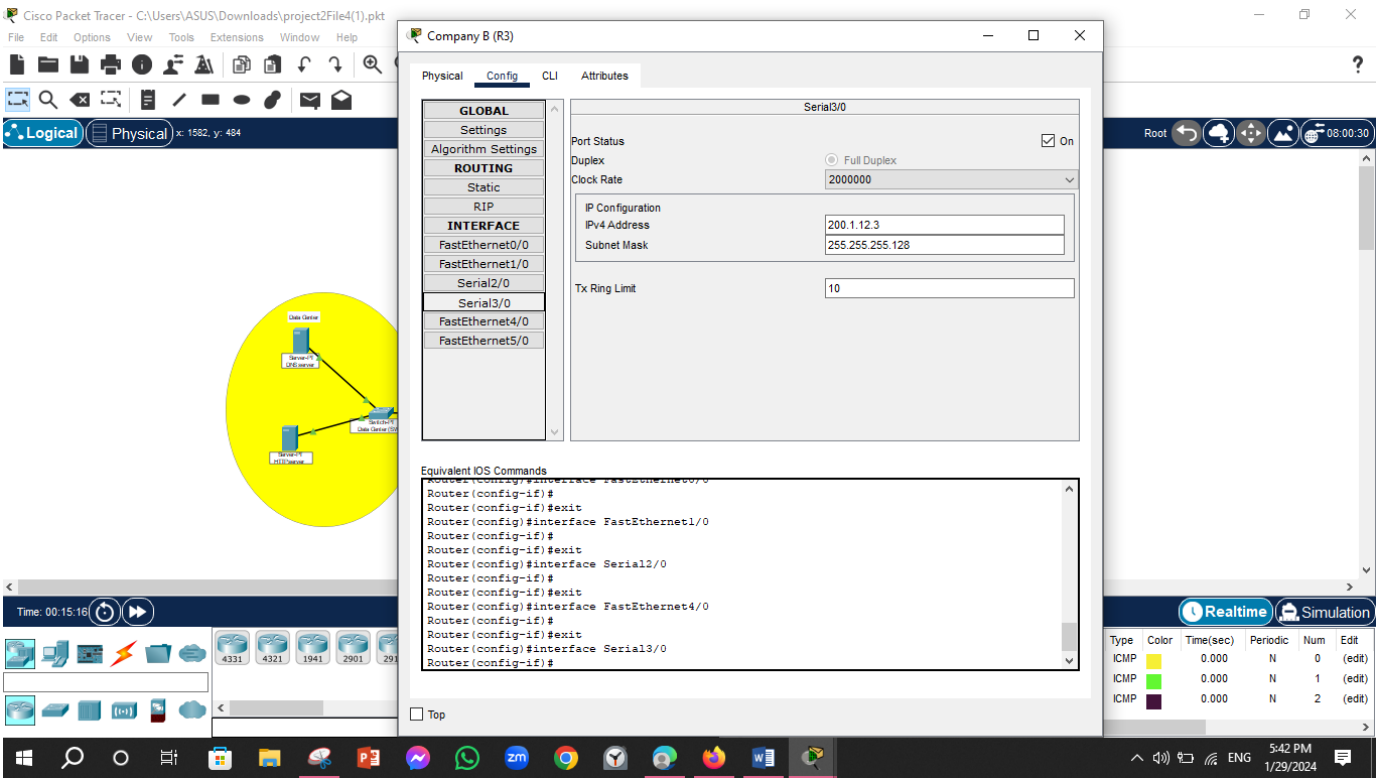

Figure 10 : R3-Serial 3/0

Company C Router (R4):

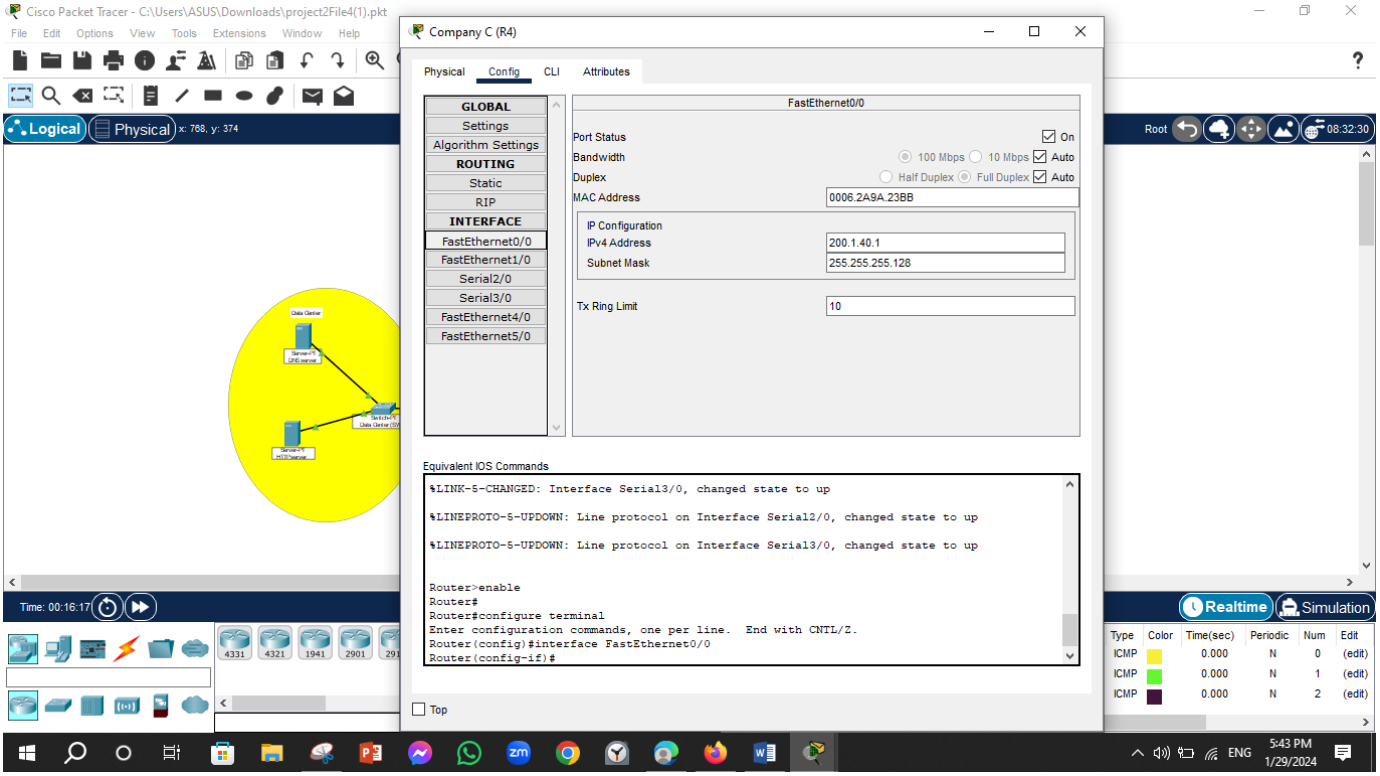

Figure 11 : R4-FE 0/0

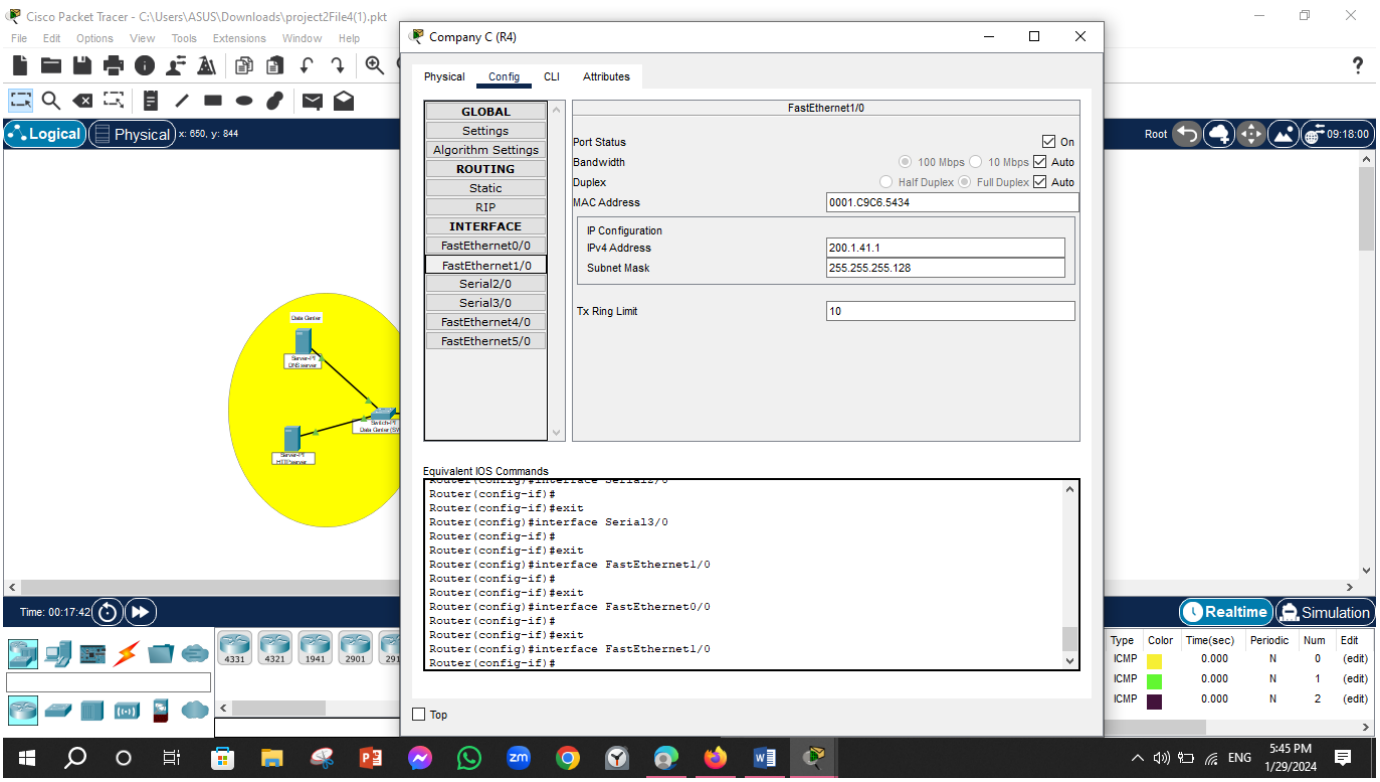

Figure 12 : R4-FE 1/0

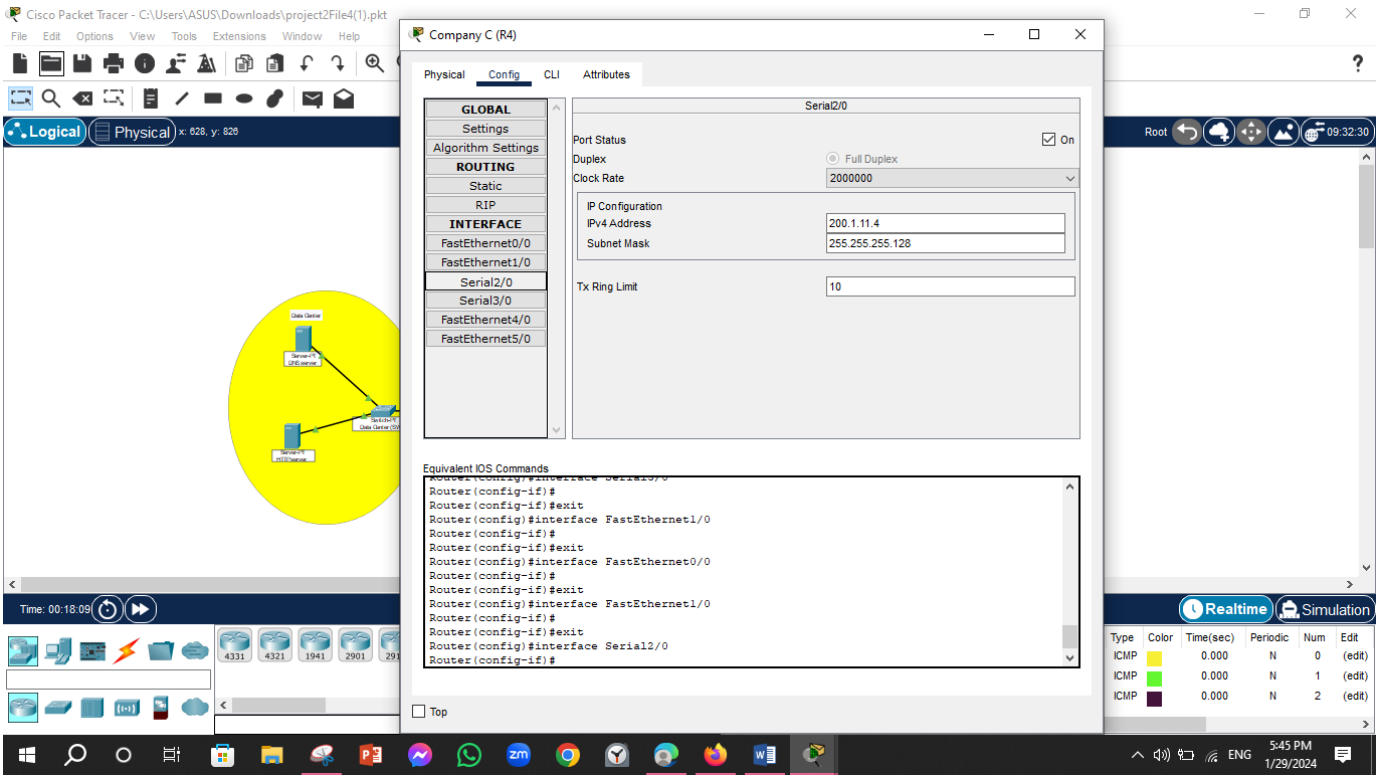

Figure 13 : R4-Serial 2/0

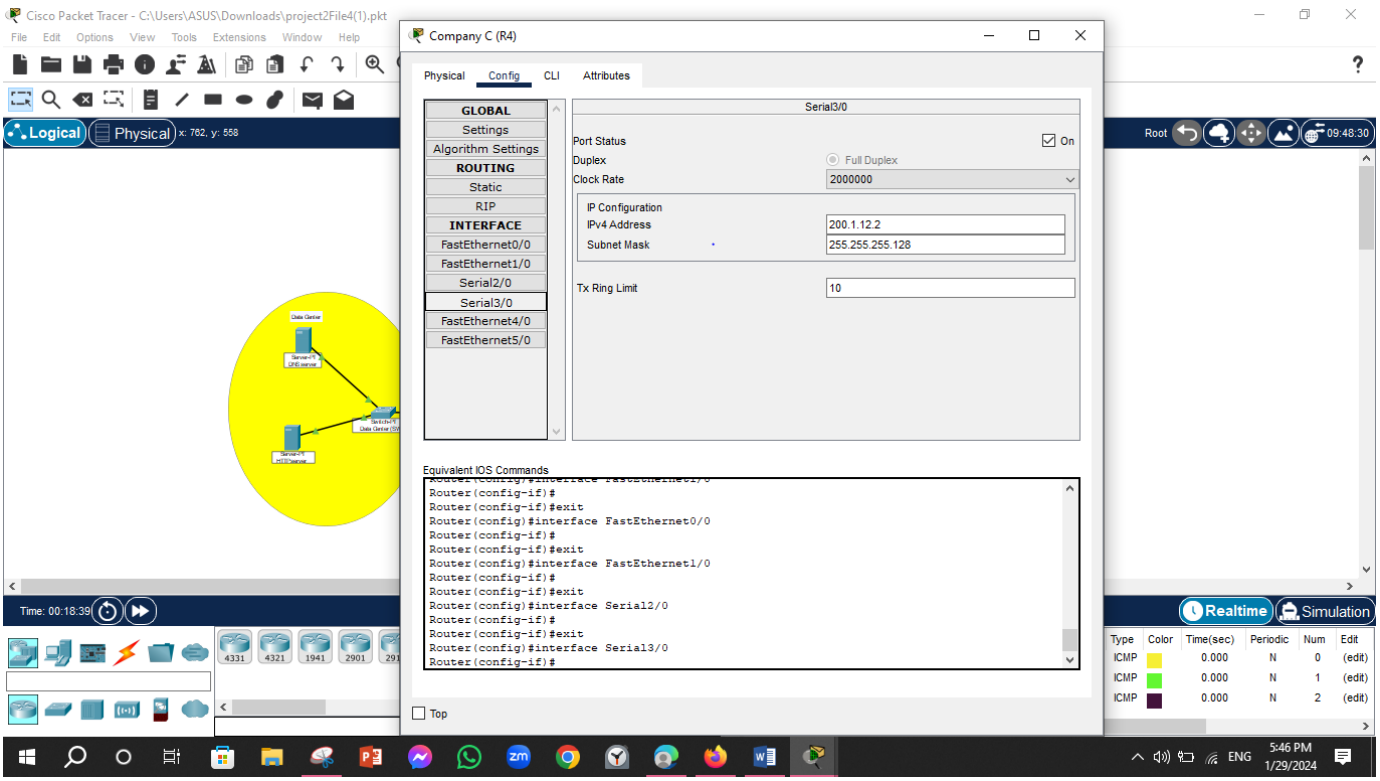

Figure 14 : R4-Serial 3/0

3. Configuring the end devices IPs as static IPs

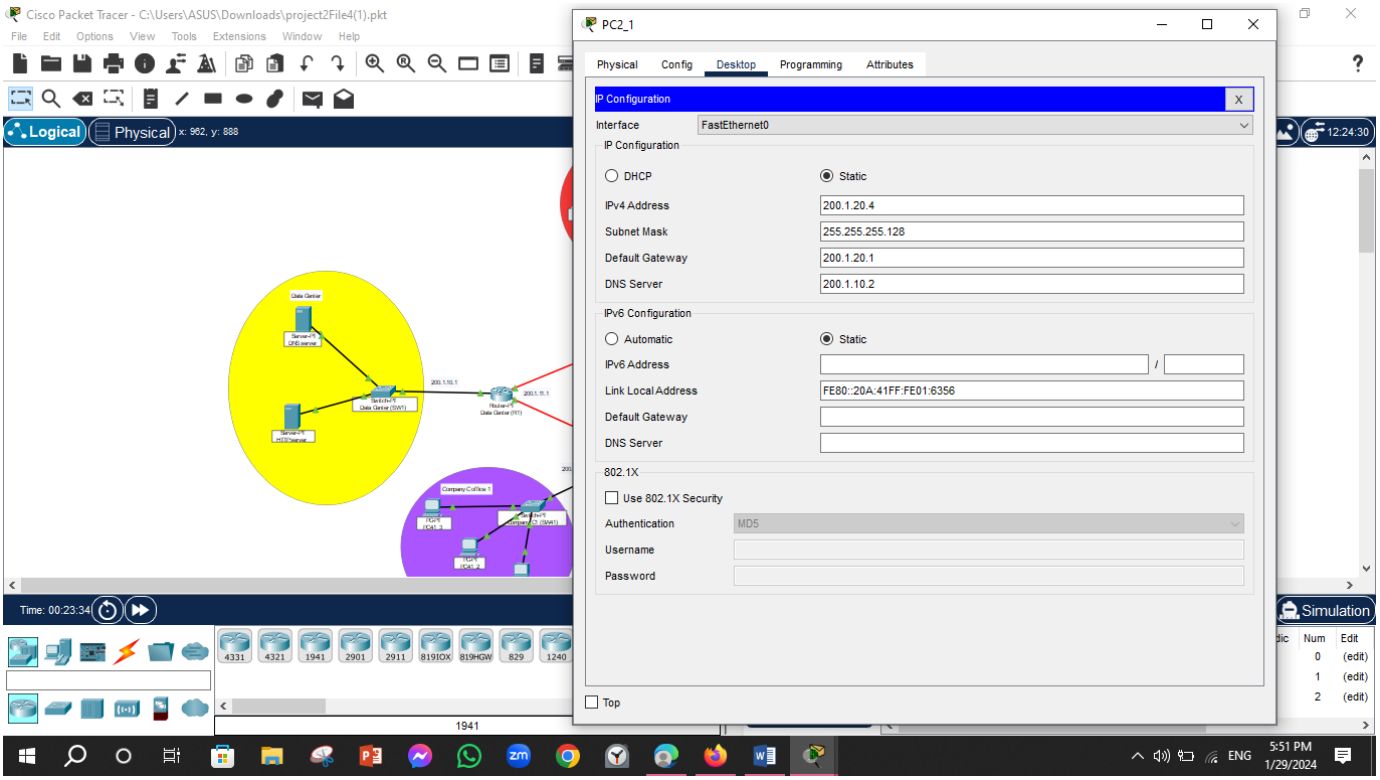

Figure 15 : PC2-1 configuration

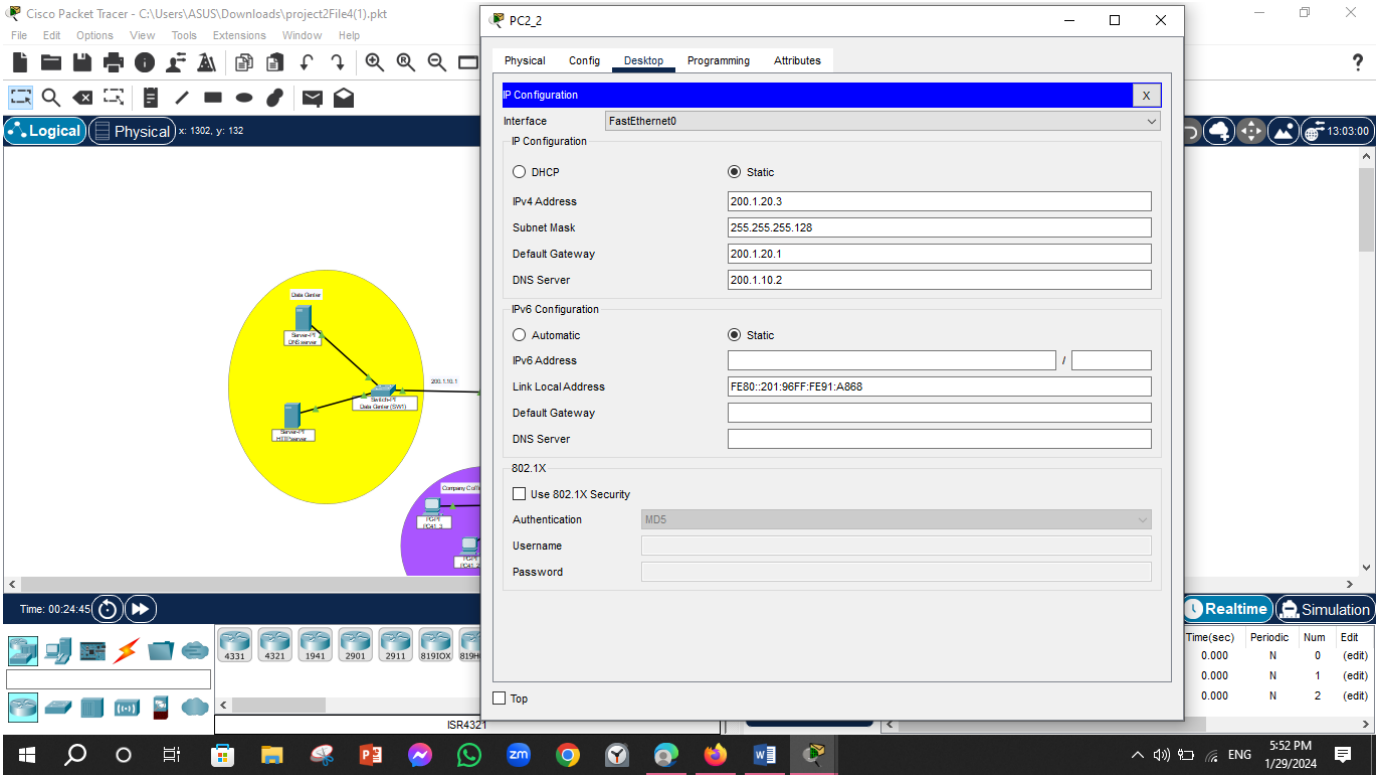

Figure 16 : PC2-2 configuration

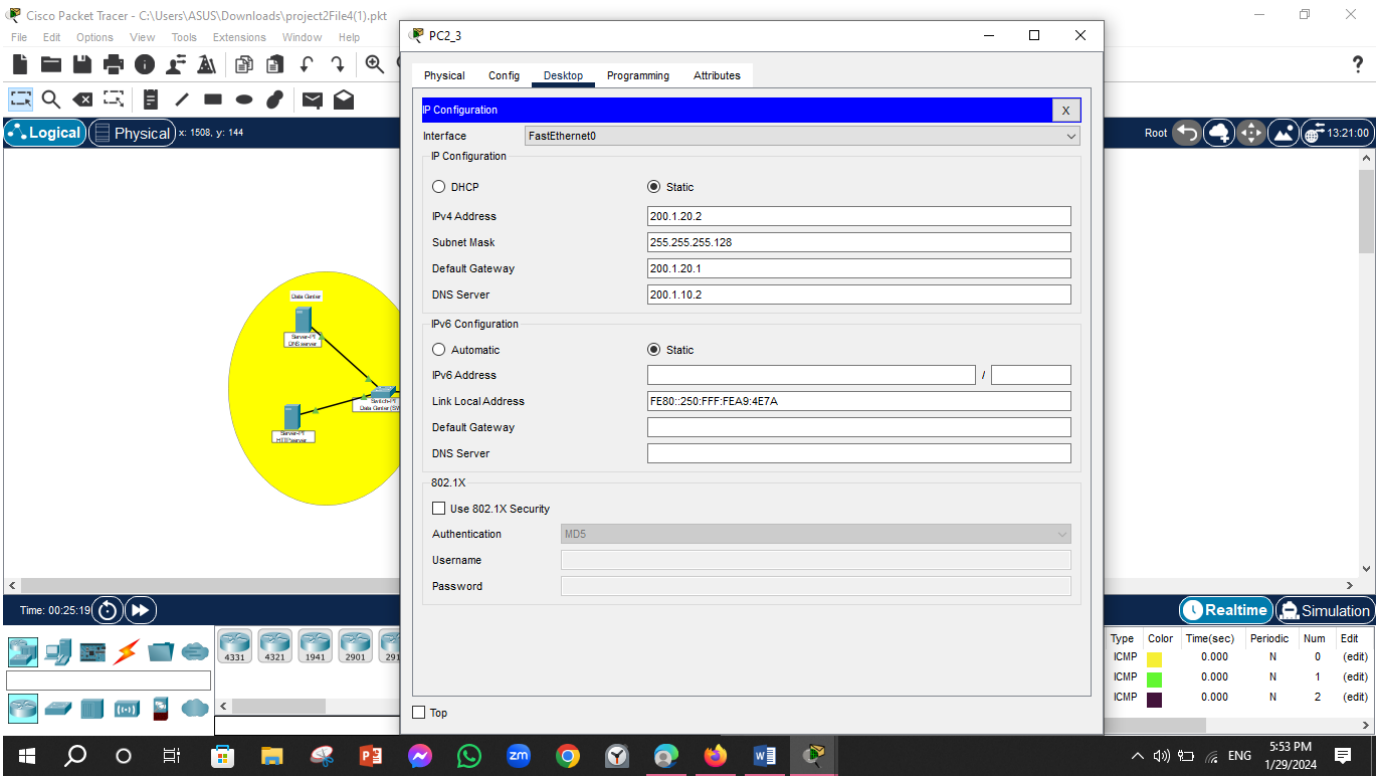

Figure 17 : PC2-3 configuration

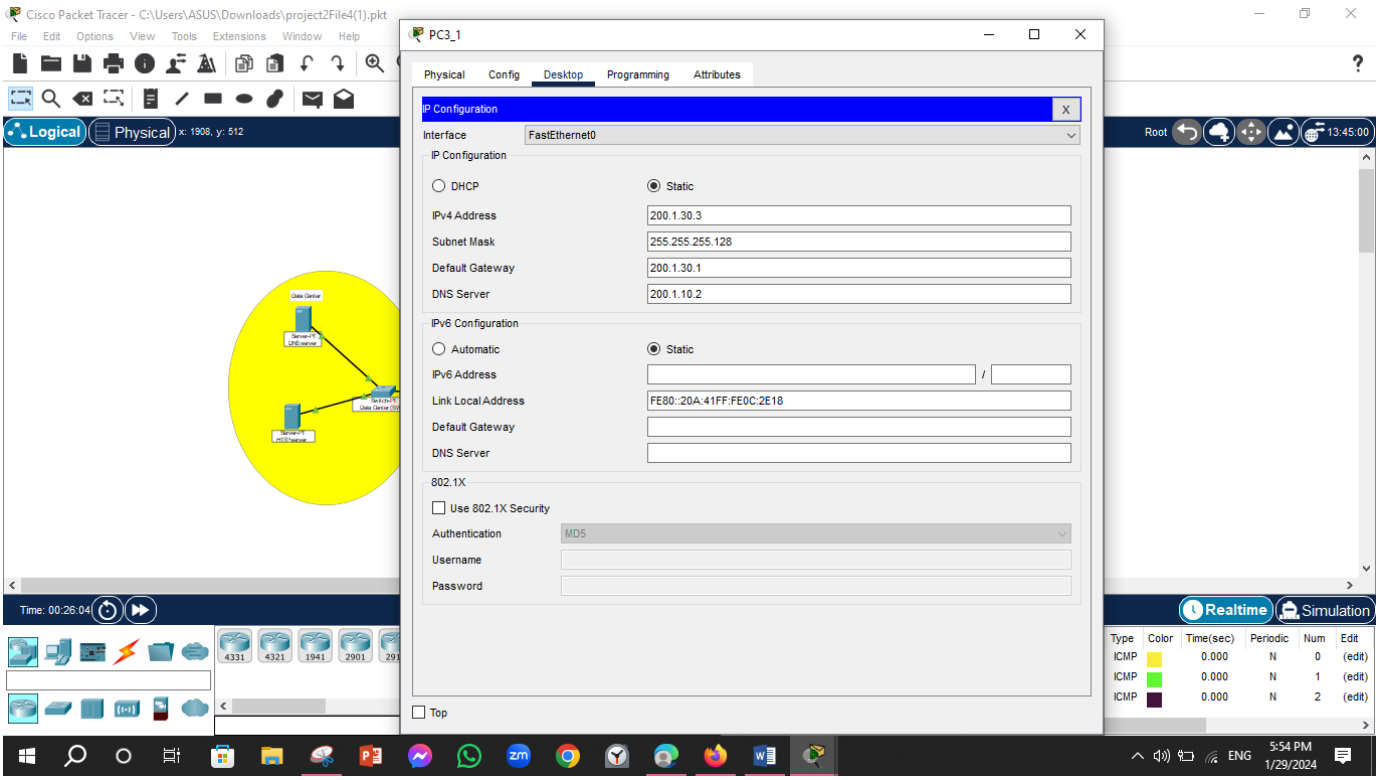

Figure 18 : PC3-1 configuration

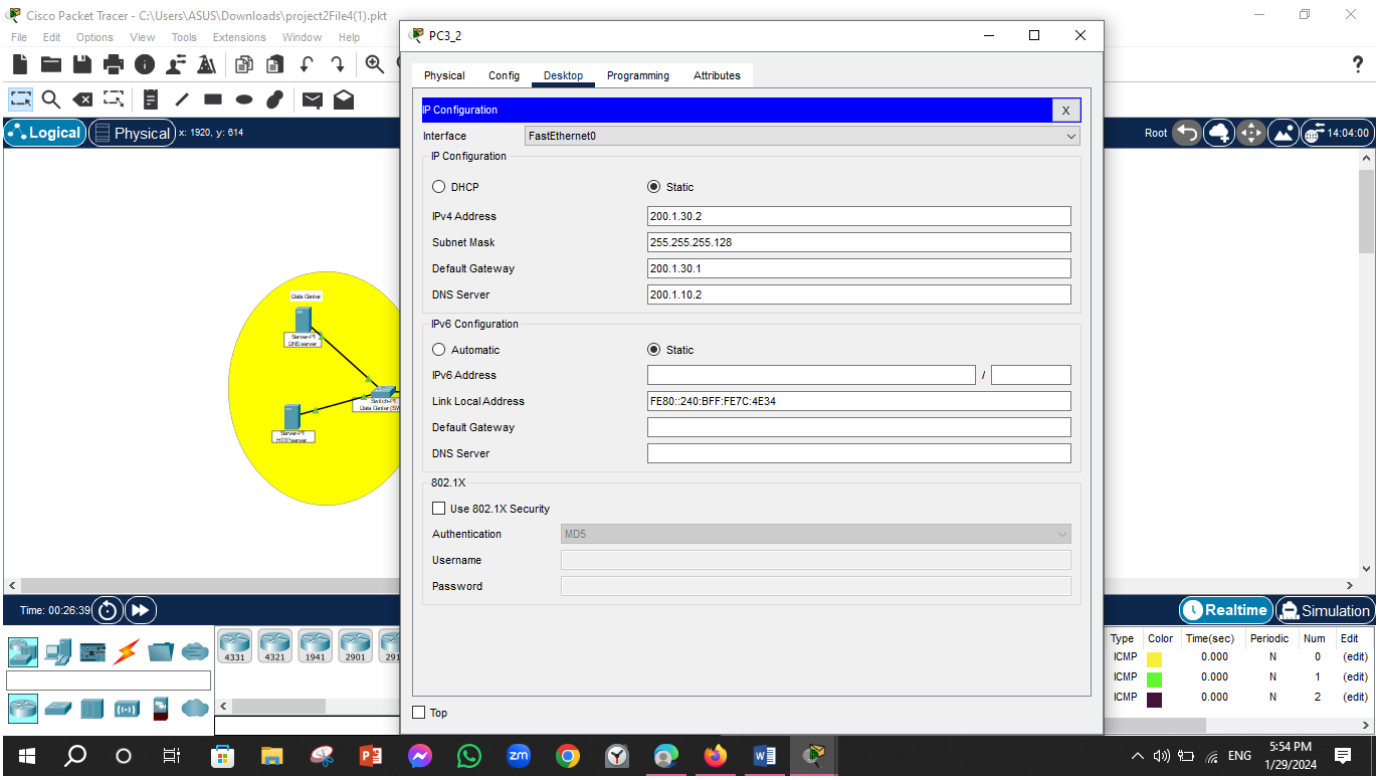

Figure 19 : PC3-2 configuration

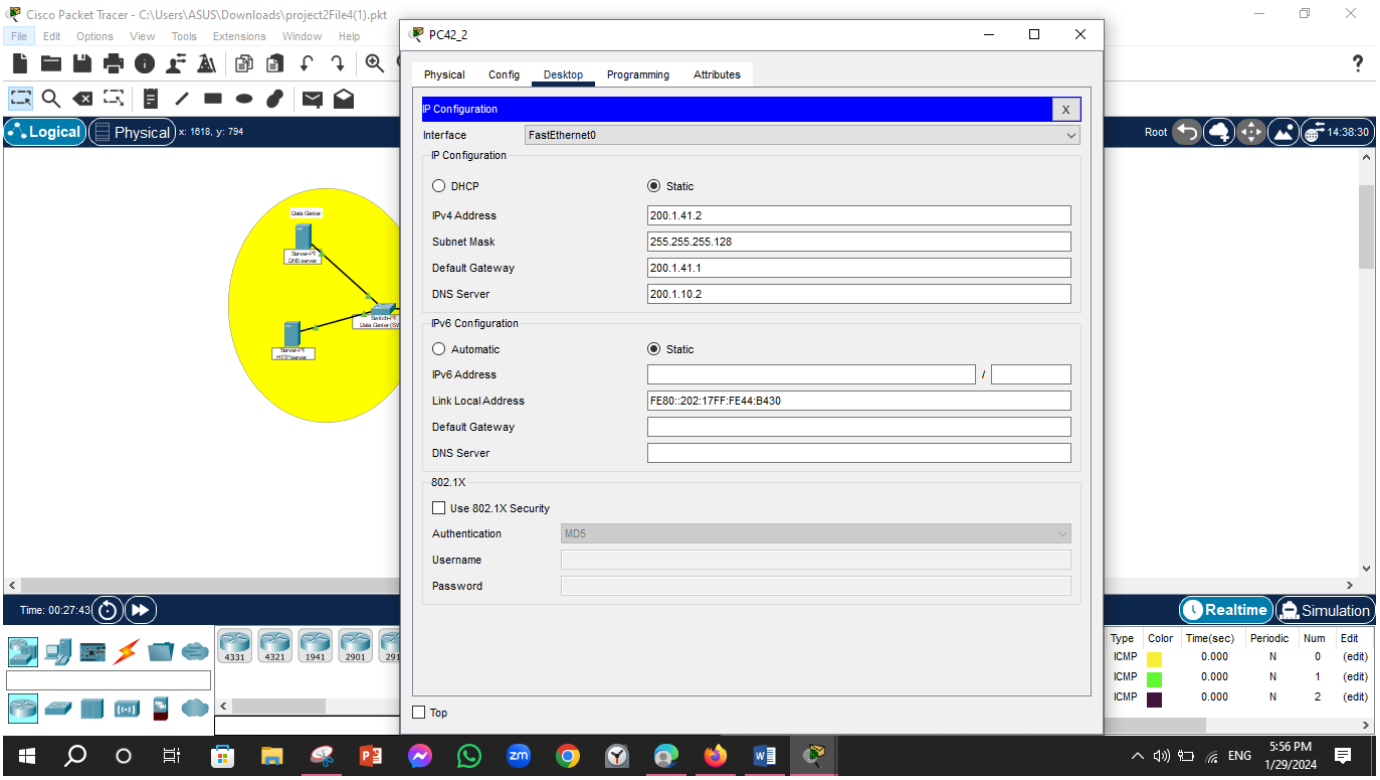

Figure 20 : PC42-2 configuration

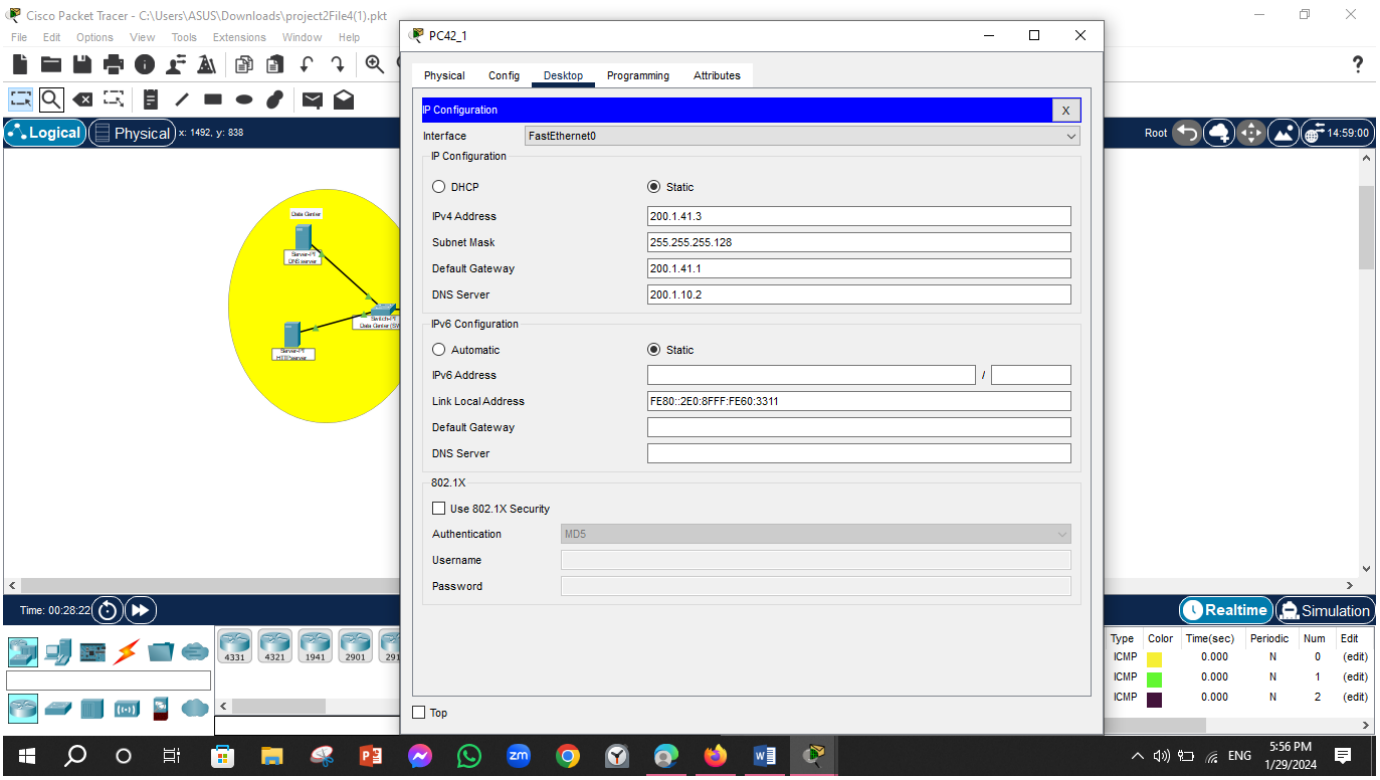

Figure 21 : PC42-1 configuration

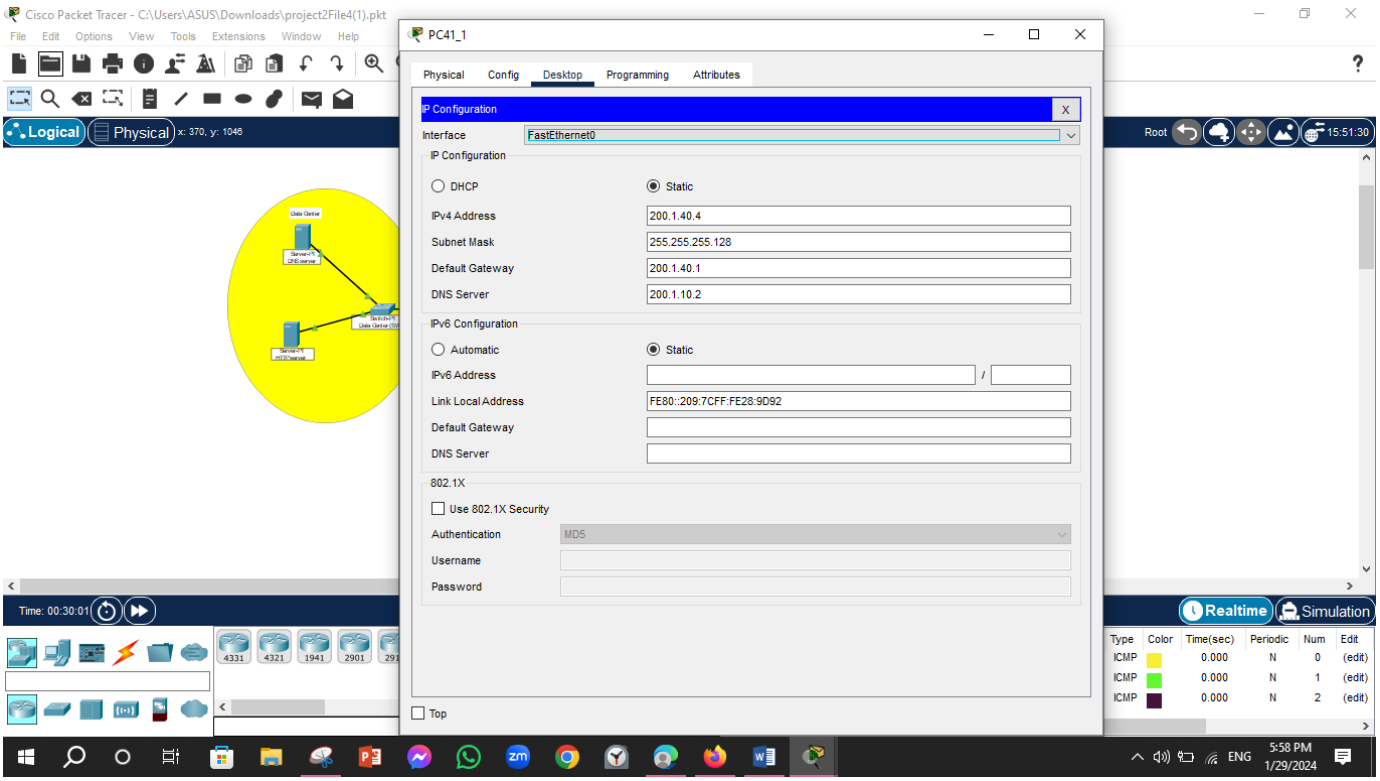

Figure 22 : PC41-1 configuration

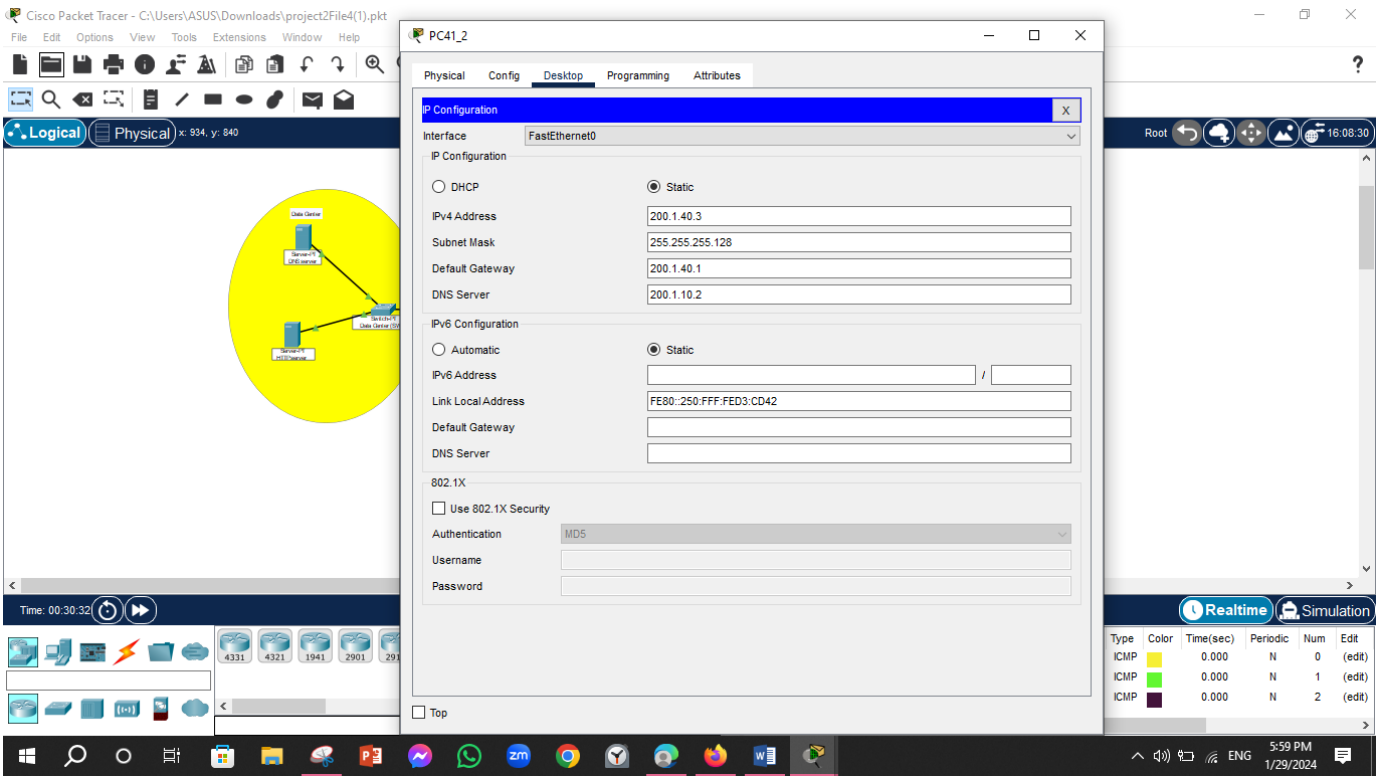

Figure 23 : PC41-2 configuration

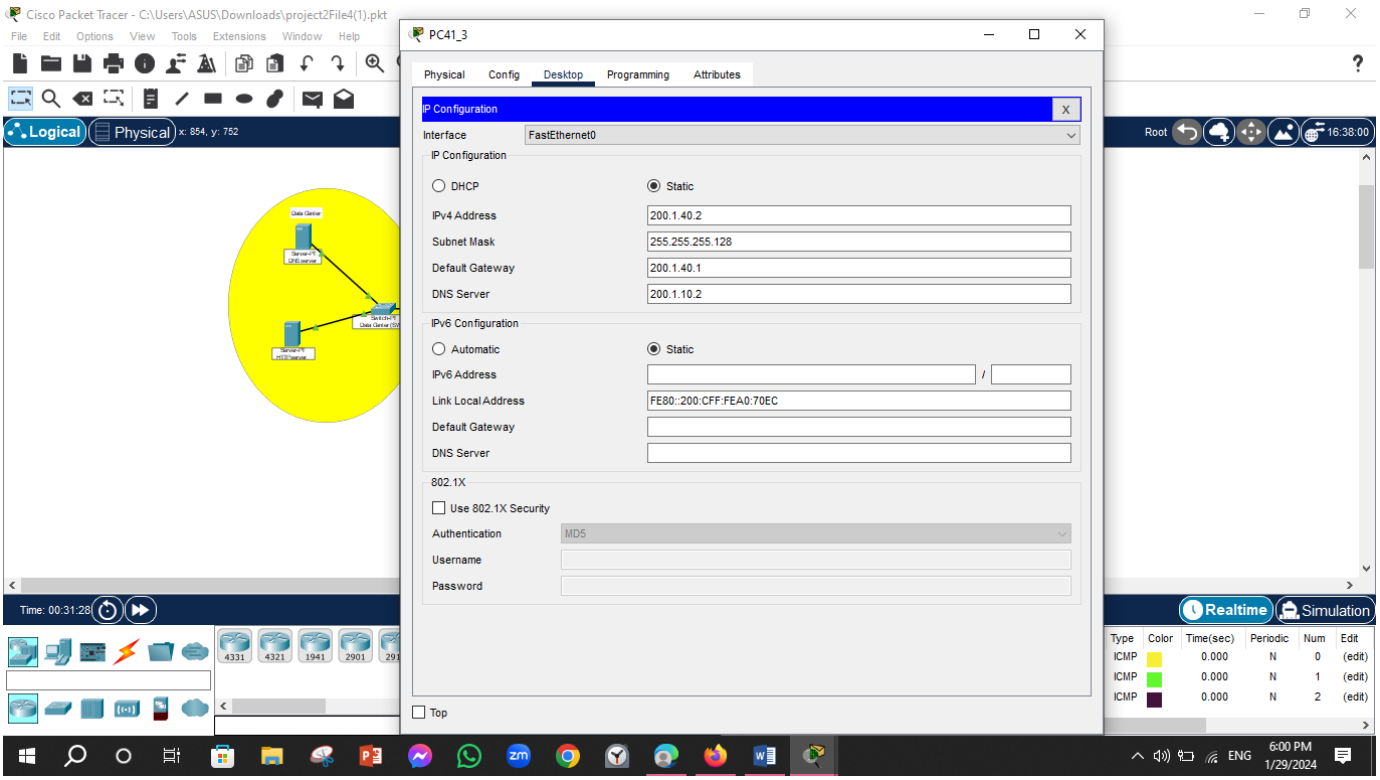

Figure 24 : PC41-3 configuration

Part2: Configuring servers

Index.html code:

```
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title><span style="font-family: Georgia; color: #333;">ENCS3320-Course Website</span></title>
<style>
body {
font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
margin: 0;
padding: 0;
background-color: #f8f9fa;
color: #343a40;
}
header {
background-color: #733e8a;
color: #fff;
padding: 20px;
text-align: center;
}
h1 {
margin: 0;
font-size: 2.5em;
}
.bold-text {
font-weight: bold;
}
.container {
max-width: 800px;
margin: 20px auto;
padding: 20px;
background-color: #fff;
border-radius: 10px;
box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
}
.member {
margin-bottom: 20px;
padding: 15px;
background-color: #f8e7ff;
border-radius: 8px;
color: #180842;
}
.member h2 {
color: #000b3c;
margin-bottom: 10px;
}
</style>
</head>
<body>
<header>
```

```
<h1><span style="font-family: impact;">ENCS3320-Course Website</span></h1>
<p class="bold-text">Welcome to <span style="color: rgb(255, 0, 0);">Computer Networks</span> course</p>
</header>
<div class="container">
<section class="members">
<div class="member">
<h2>Dana Ghnimat 1200031</h2>
<p> have the hobby of drawing and writing , I wrote multiple projects,such as media rental in java, as well text message encryption and decryption in shell for linux lab</p>
</div>
<div class="member">
<h2>Shahd Ali 1200183</h2>
<p>I like programming specifically Front end types , like make a websites using web languages like HTML, CSS, and JavaScript. In my free time I like to watch football matches and reading </p>
</div>
</section>
</div>
</body>
</html>
```

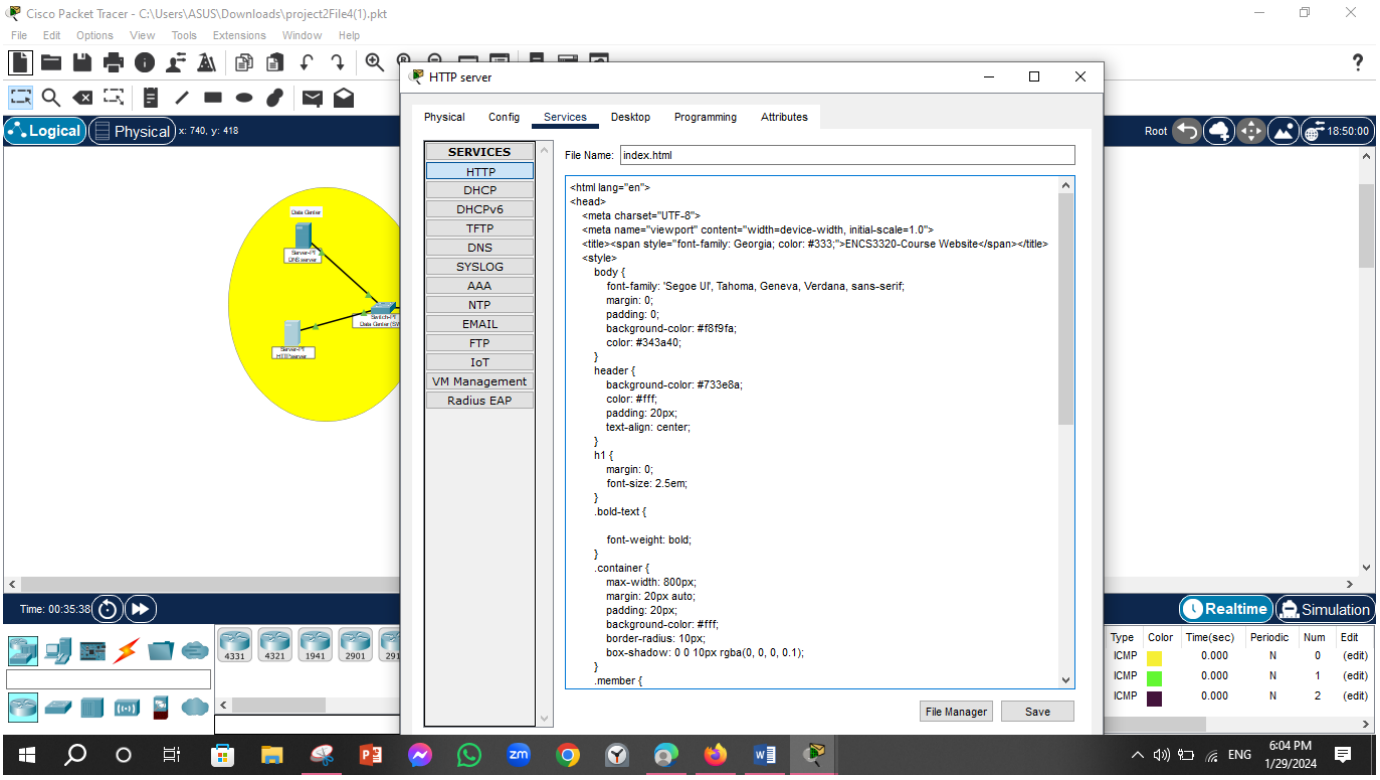

Figure 25 : HTML code for HTTP server

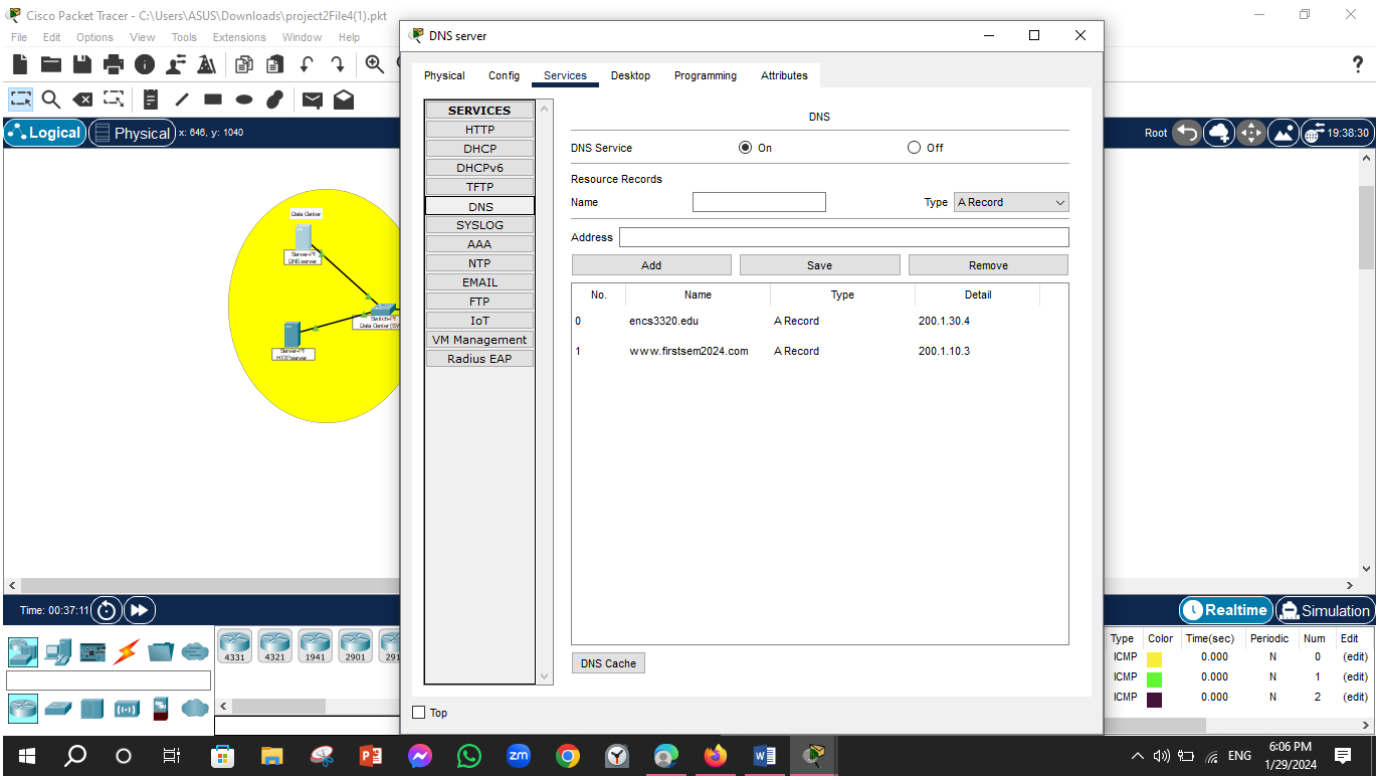

Figure 26 : DNS server connection with (HTTP & Mail) server

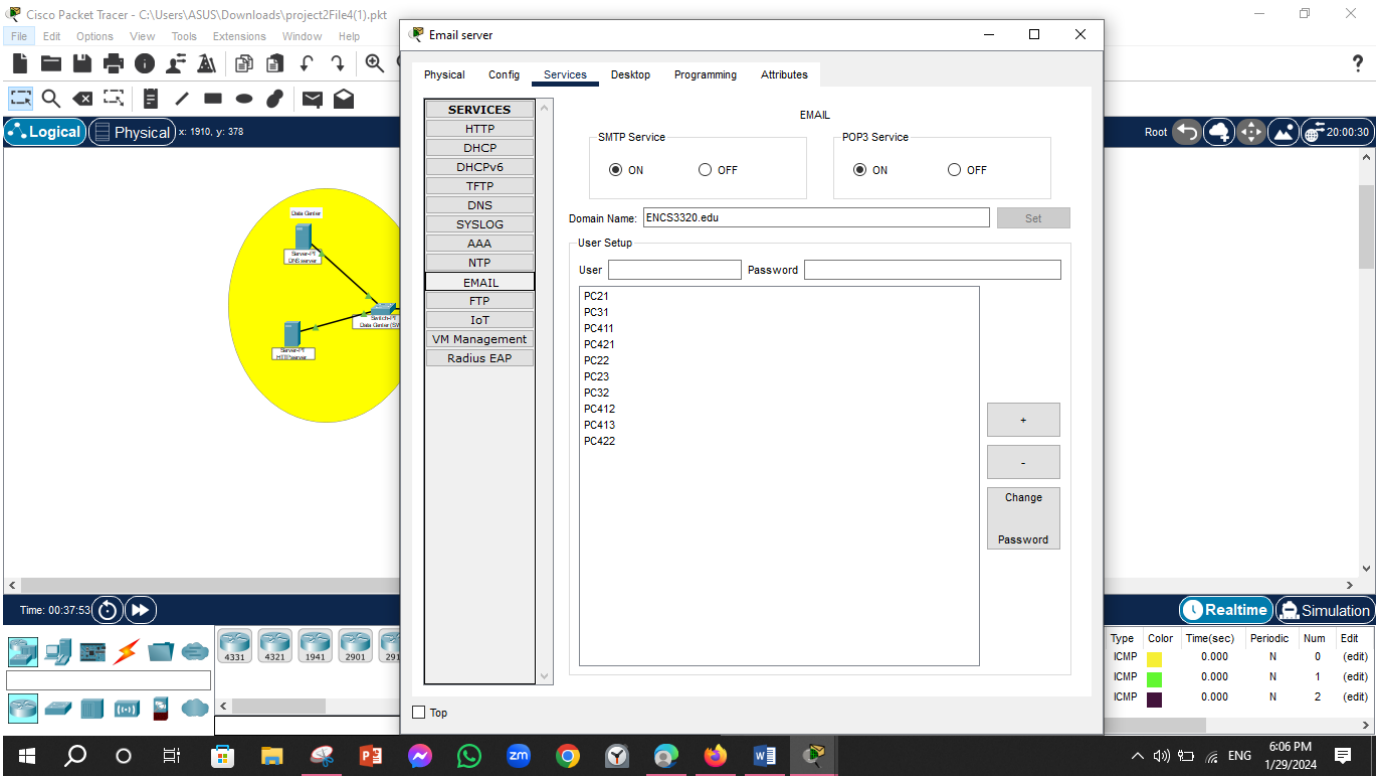

Figure 27 : usernames/passwords for all PCs

Part3: Applying routing protocol

You need to use open shortest path protocol (OSPF) on all routers given that the process id is 10 and the areas as follows: Data center (Yellow): area 1, Company 1 (Red): area 2, Company 2 (Green): area 3. Company 3 (Purple and Pink): area 4. Core: area 0.

We used RIP (Routing Information Protocol), Hence the OSPF Protocol couldn't let us connect the Routes together, as so we made RIP connection to insure the runnability of the network. As well as choosing the best path in this network will work as same as choosing the shortest path since they are only 4, and have a cycle between them.

For Data Center area:

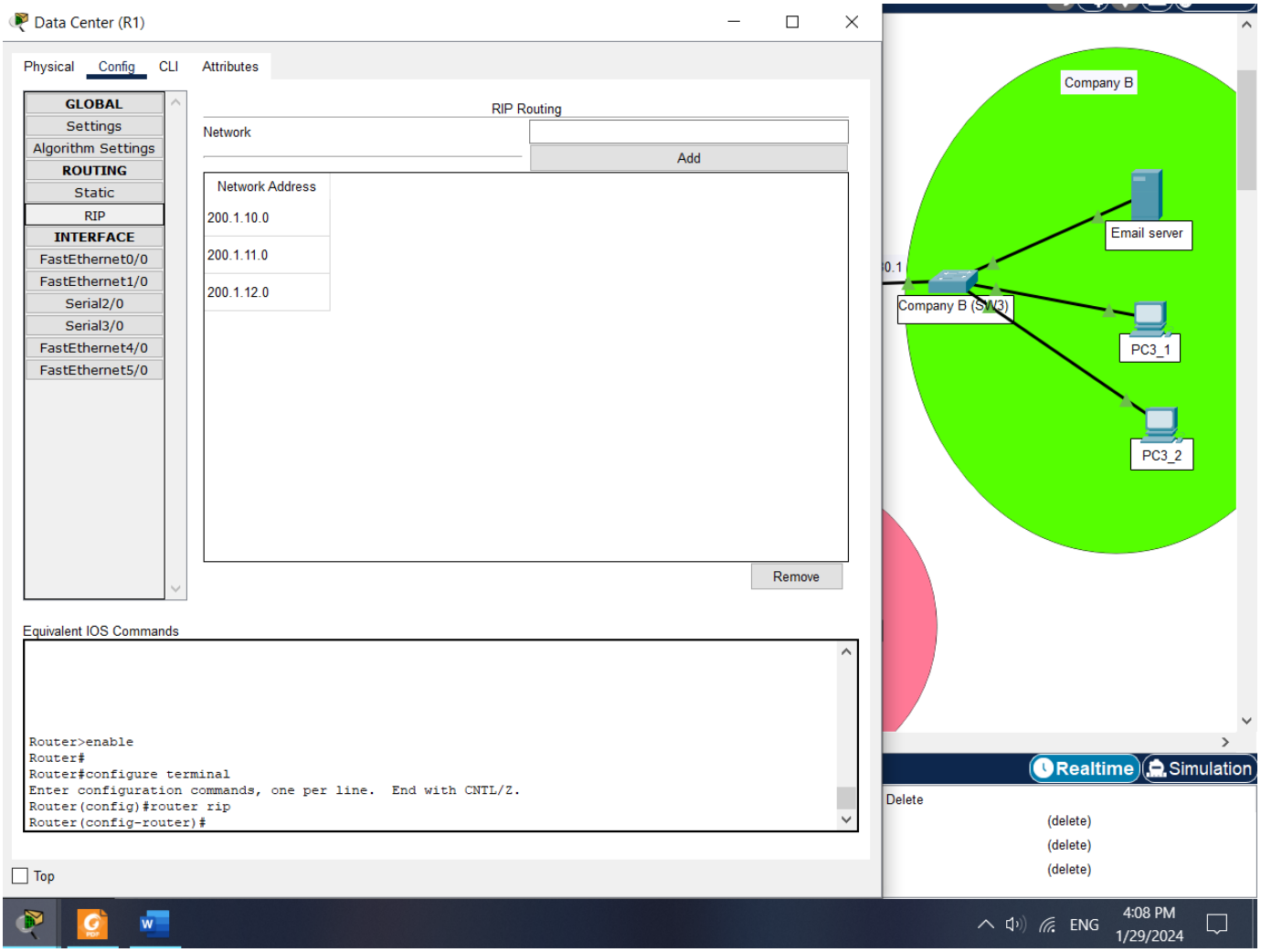

Figure 28 Data Center area

For Company A:

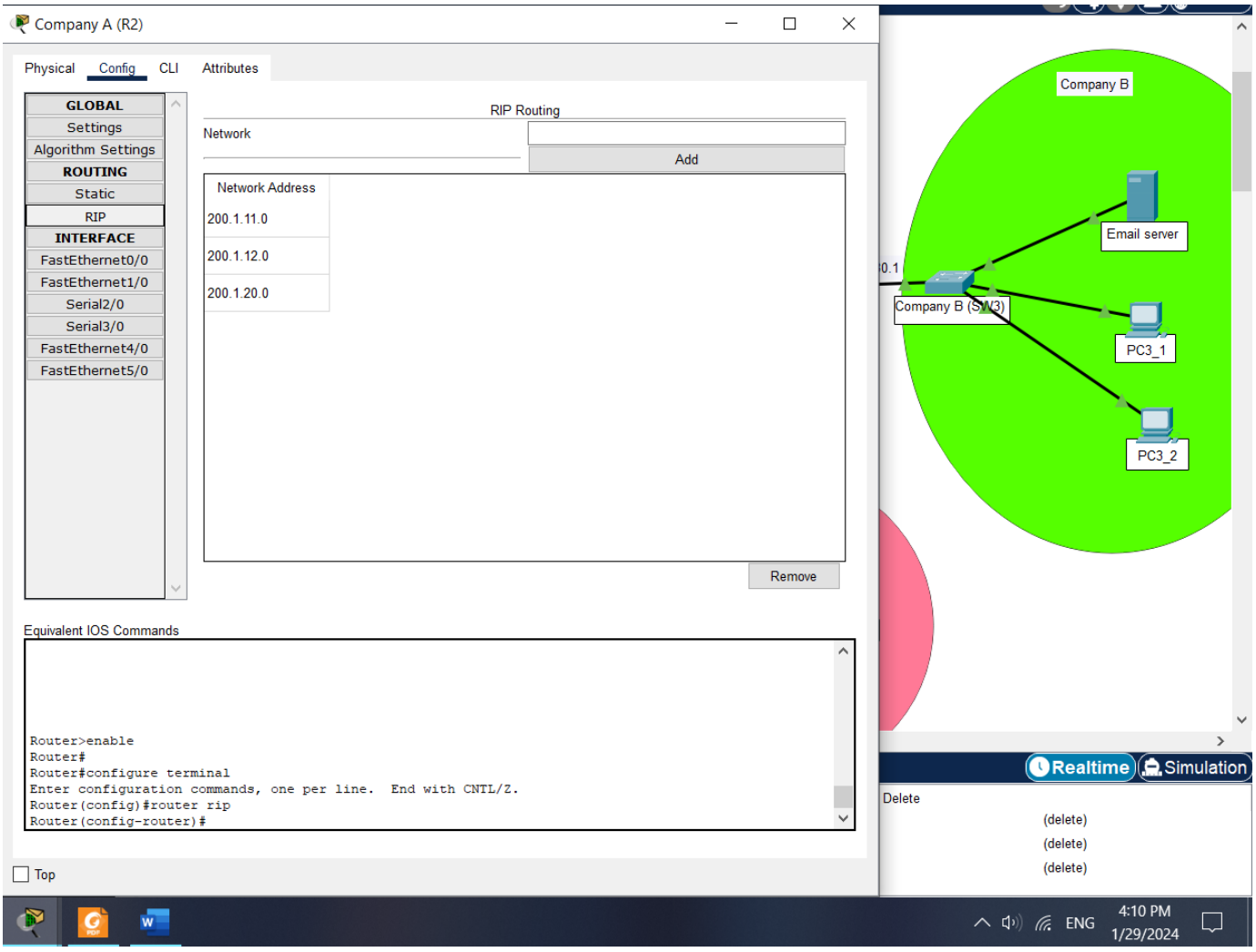

Figure 29 Company A

For Company B:

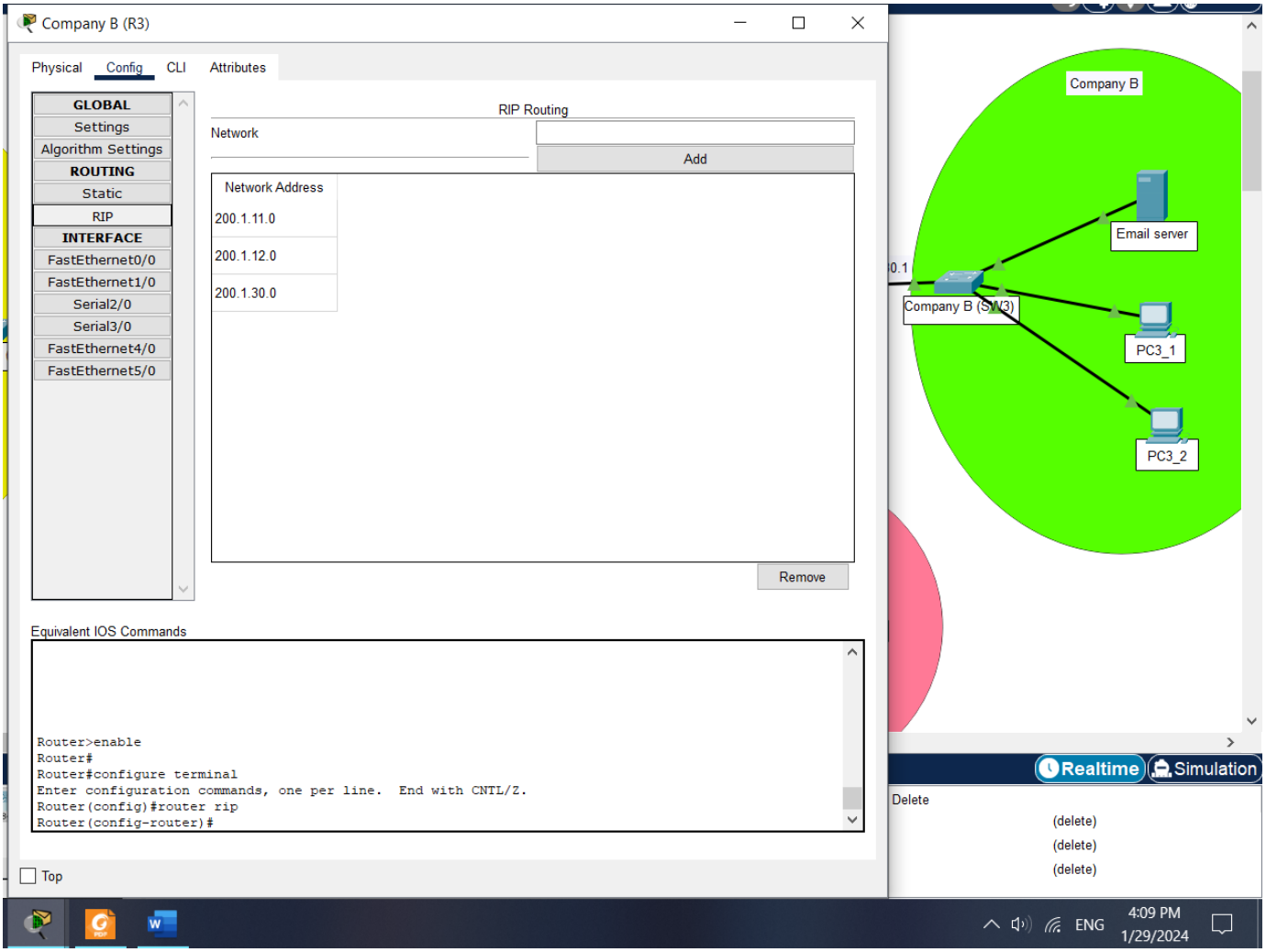

Figure 30 Company B:

For company C:

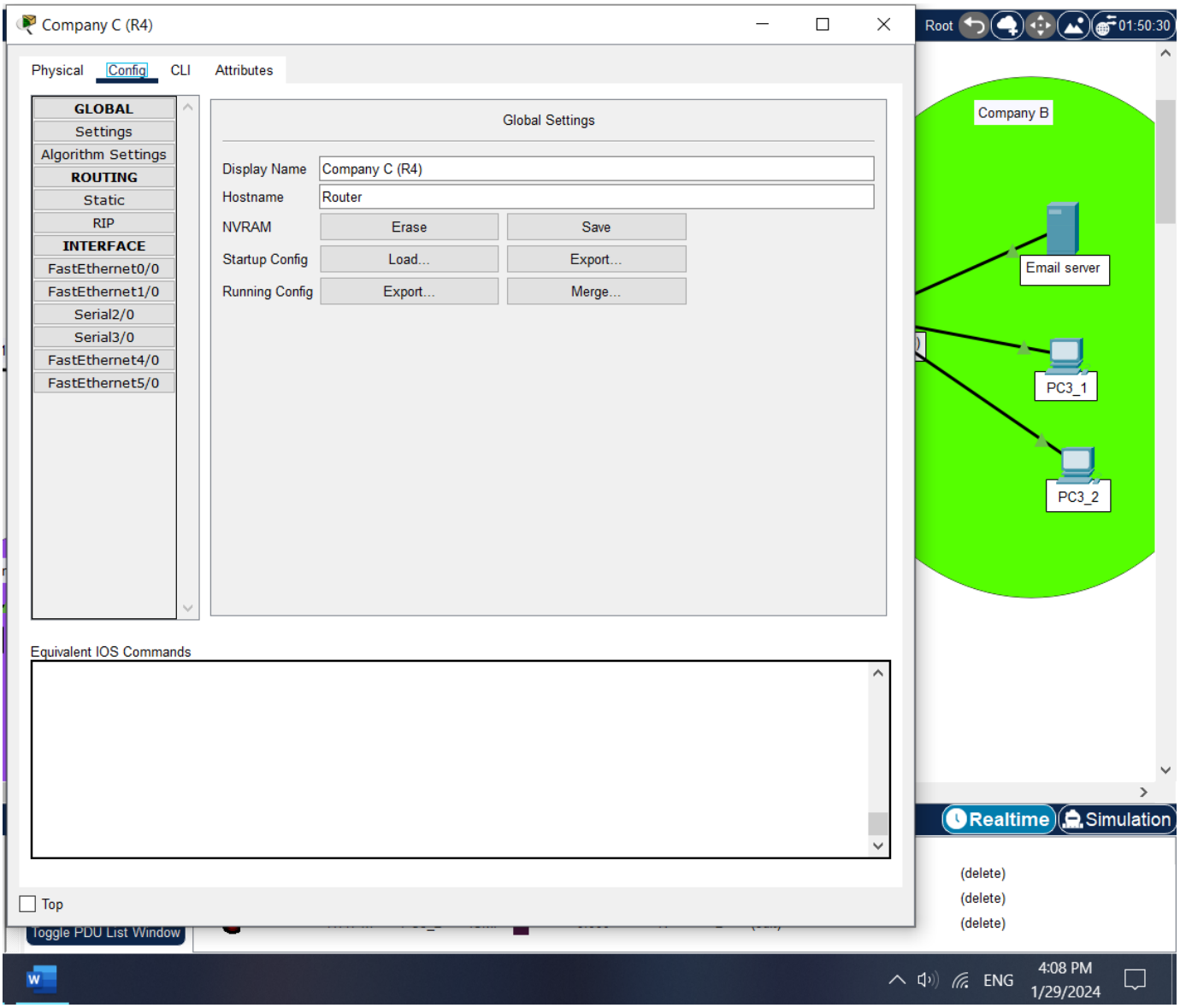

Figure 31 Company C

Part4: Testing connectivity, routes, website, and emails:

1. Pcs pinging each other and tracert in the same subnet:

All pcs could ping and tracert other pcs in their subnets and through different subnets in the next section.

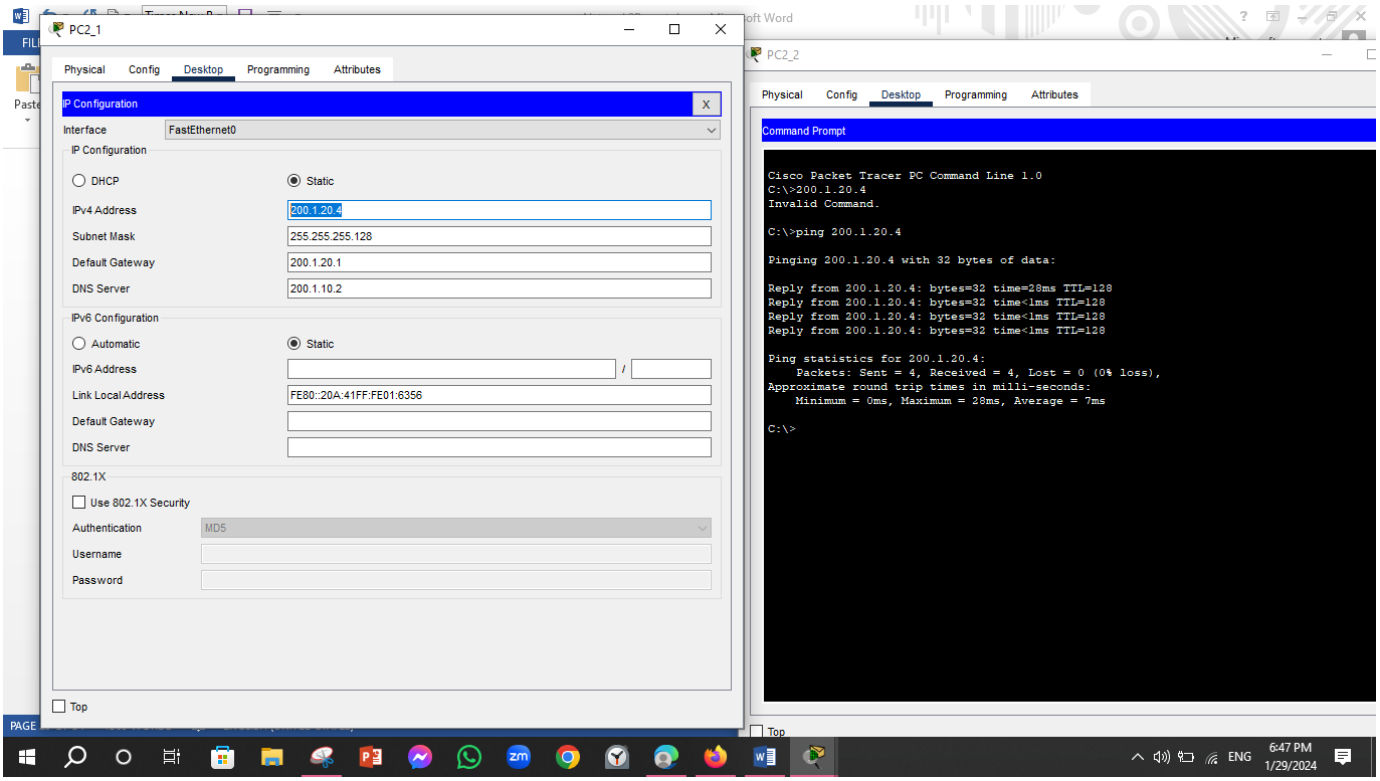

Figure 32 : pc2-2 pinging and tracert to pc2-1

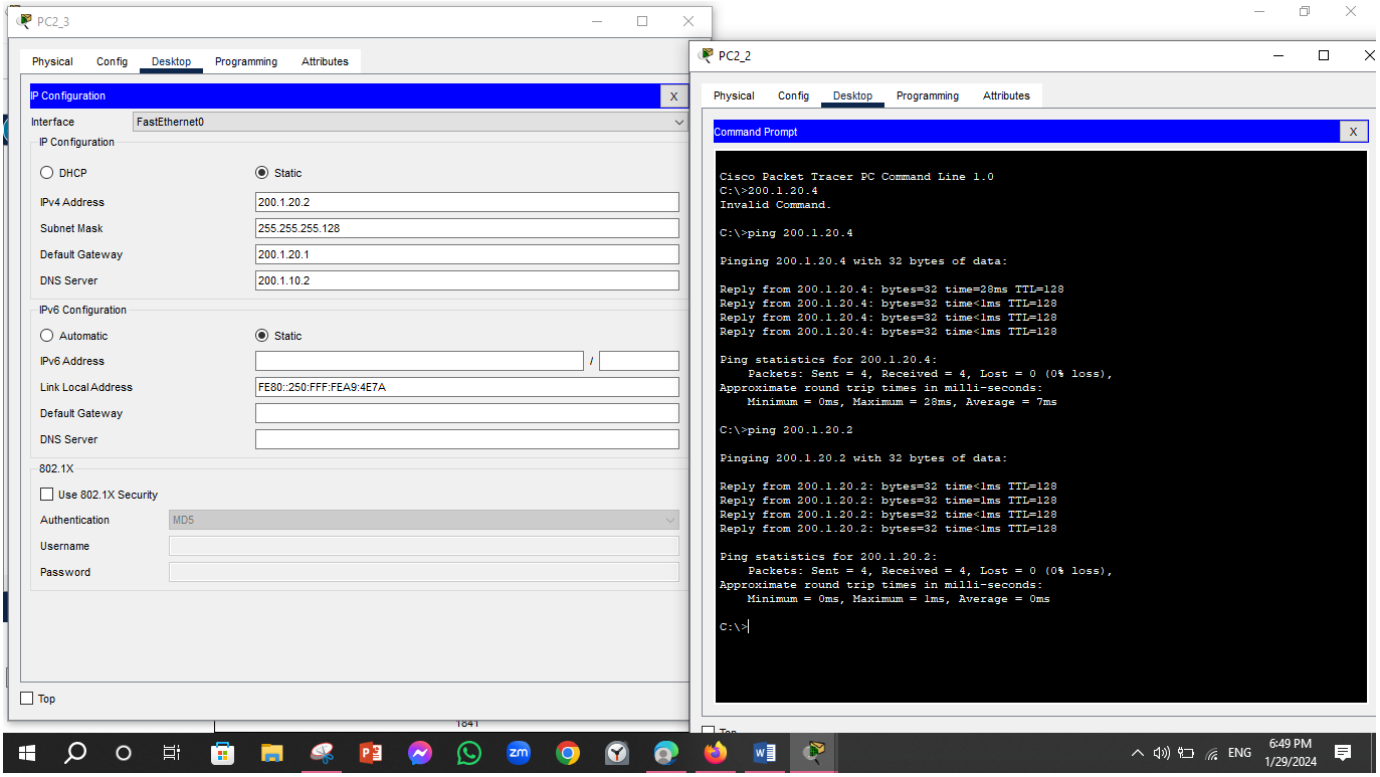

Figure 33 : pc2-2 pinging and tracert to pc2-3

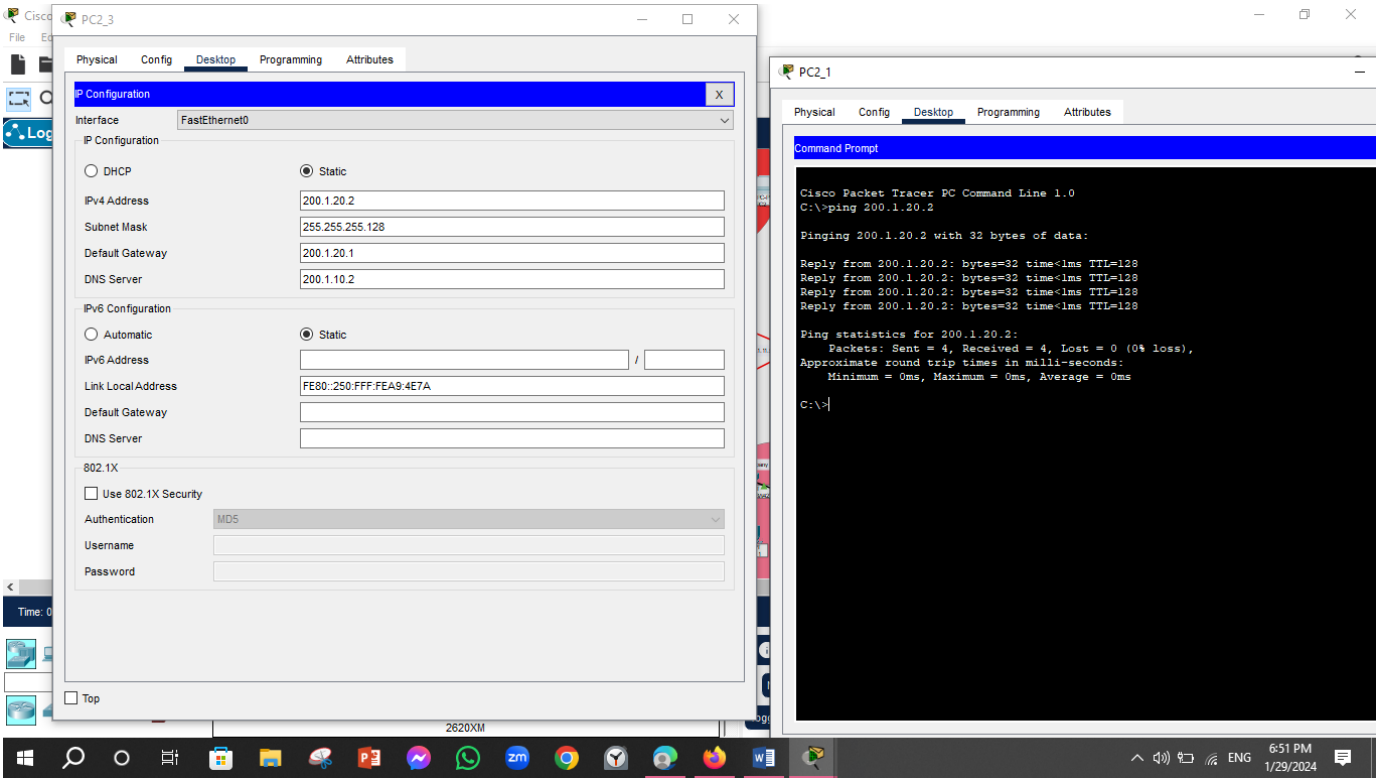

Figure 34 : pc2-1 pinging and tracert to pc2-3

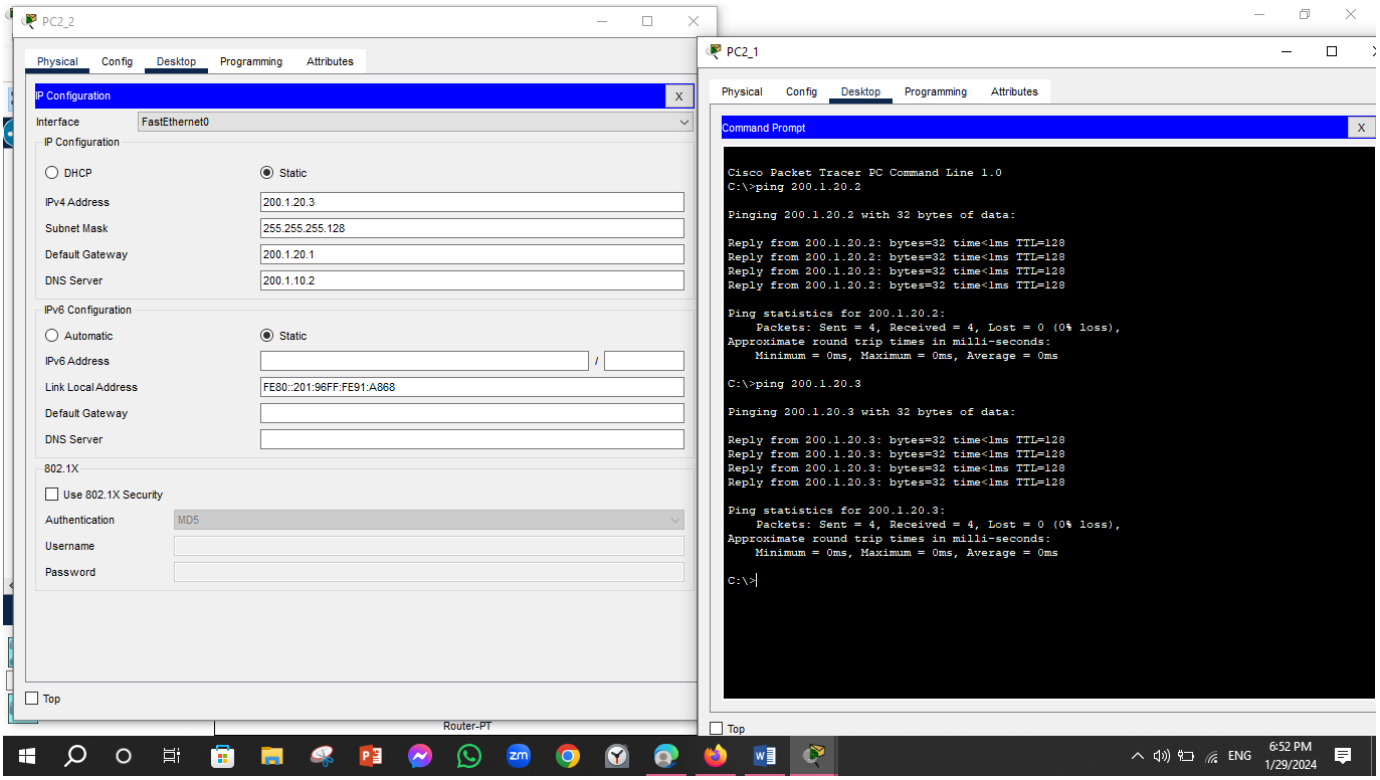

Figure 35 : pc2-1 pinging and tracert to pc2-2

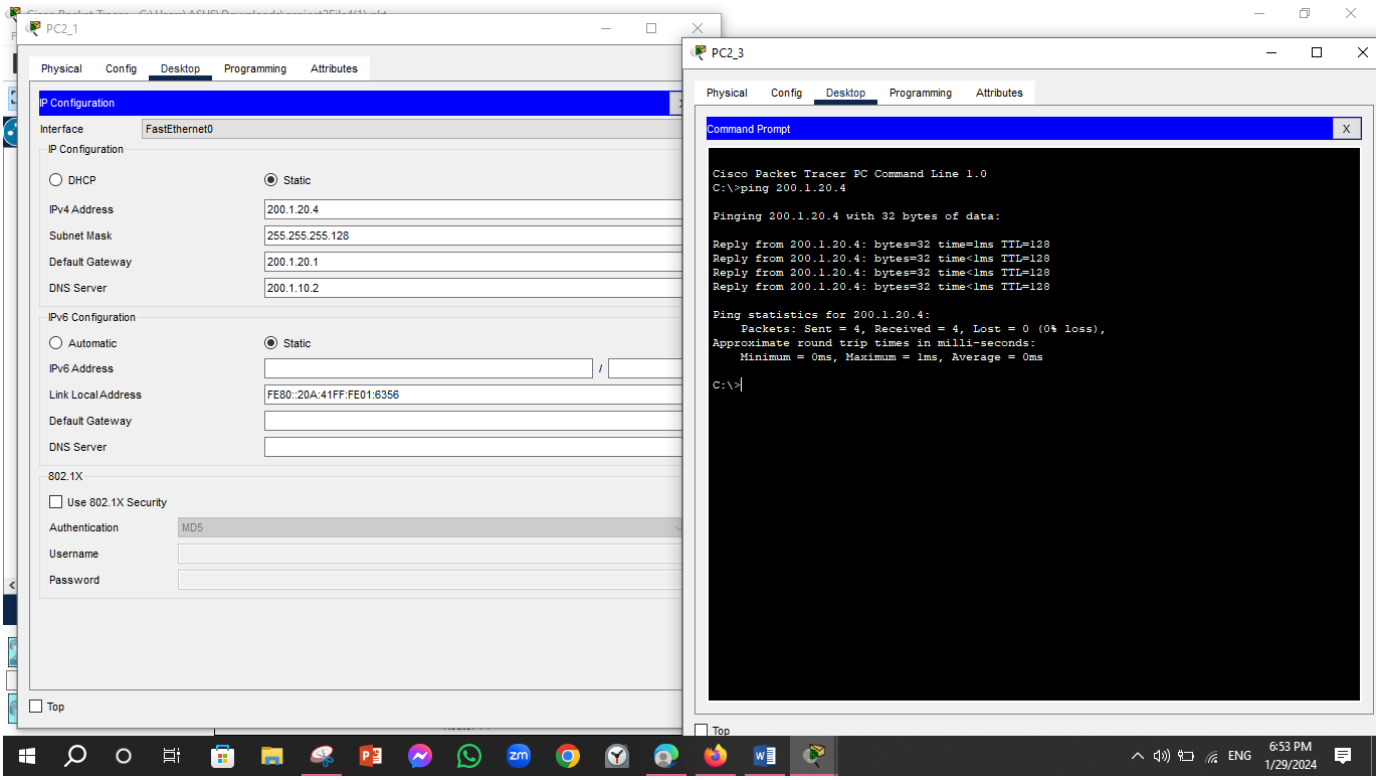

Figure 36 : pc2-3 pinging and tracert to pc2-1

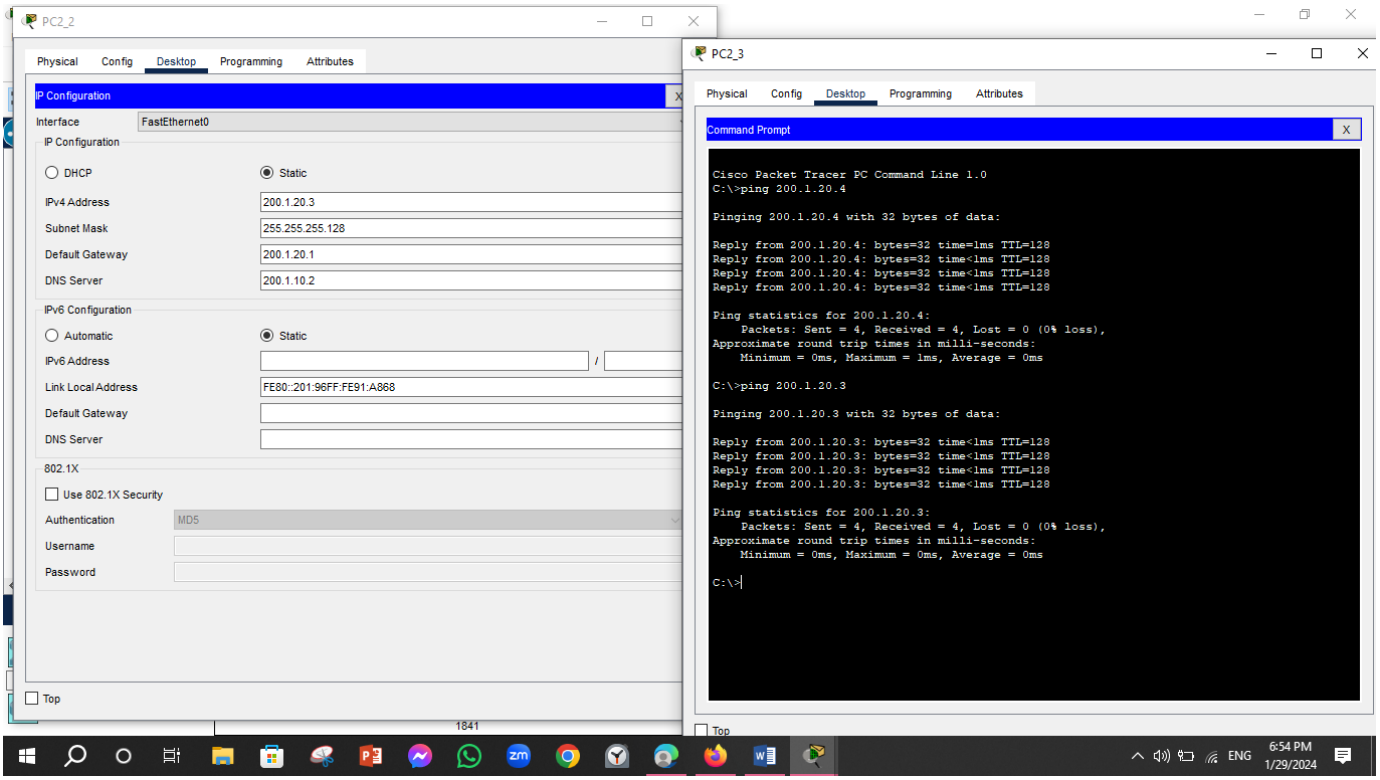

Figure 37 : pc2-3 pinging and tracert to pc2-2

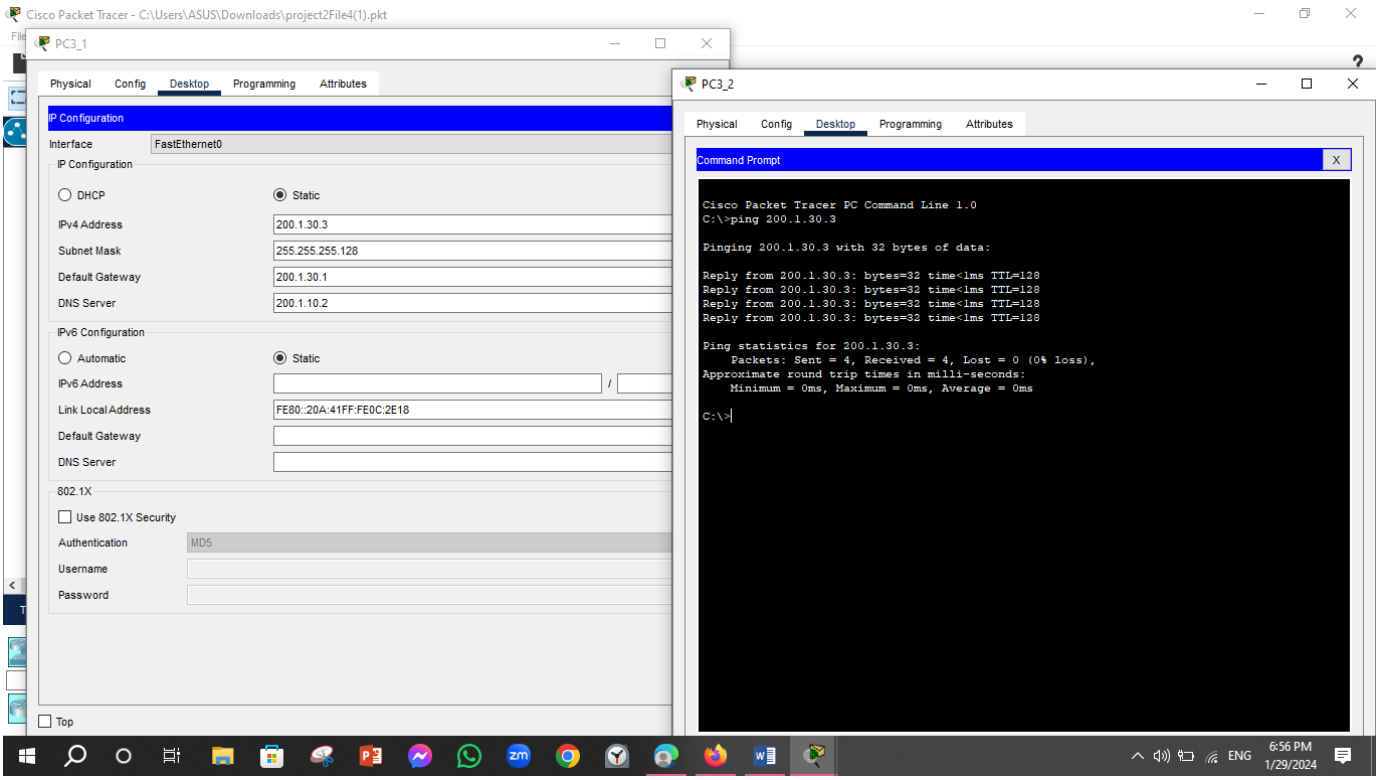

Figure 38 :pc3-2 pinging and tracert to pc3-1

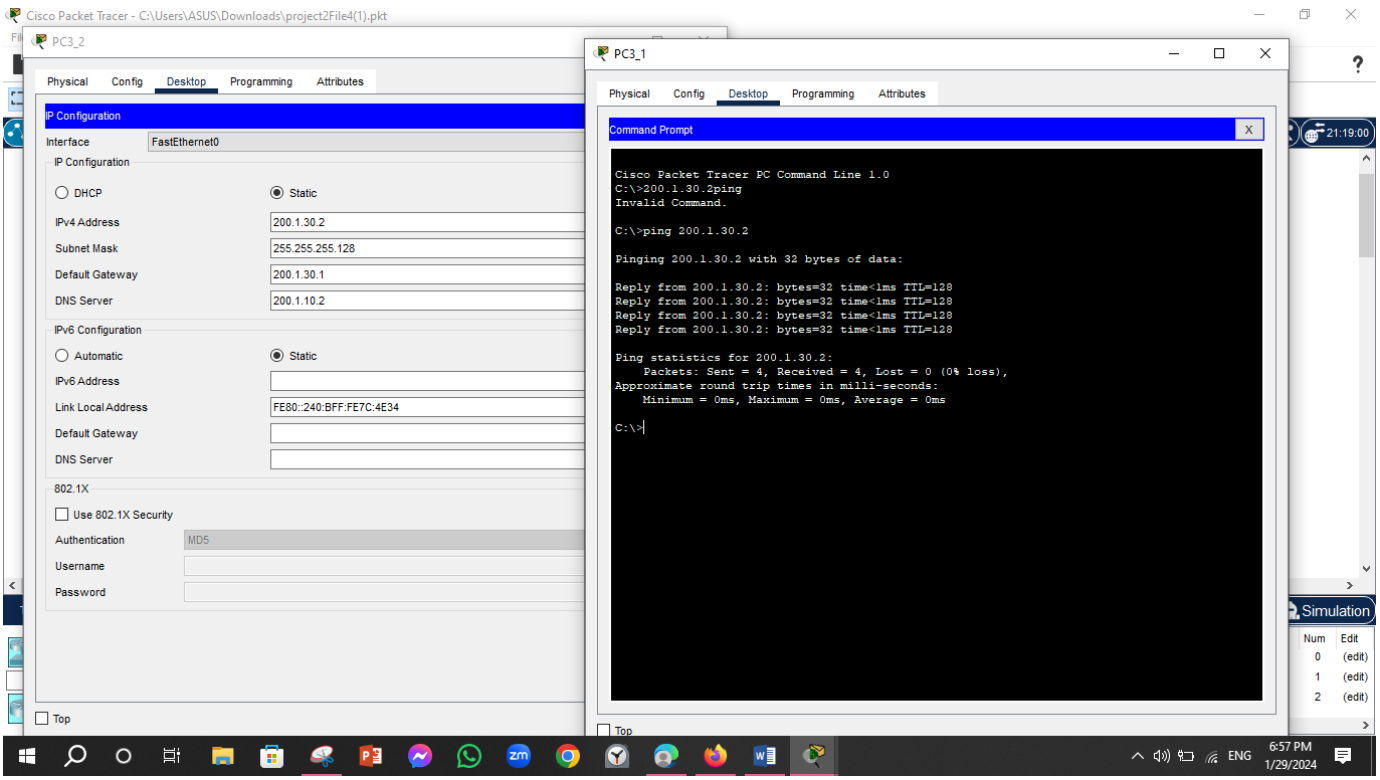

Figure 39 : pc3-1 pinging and tracert to pc3-2

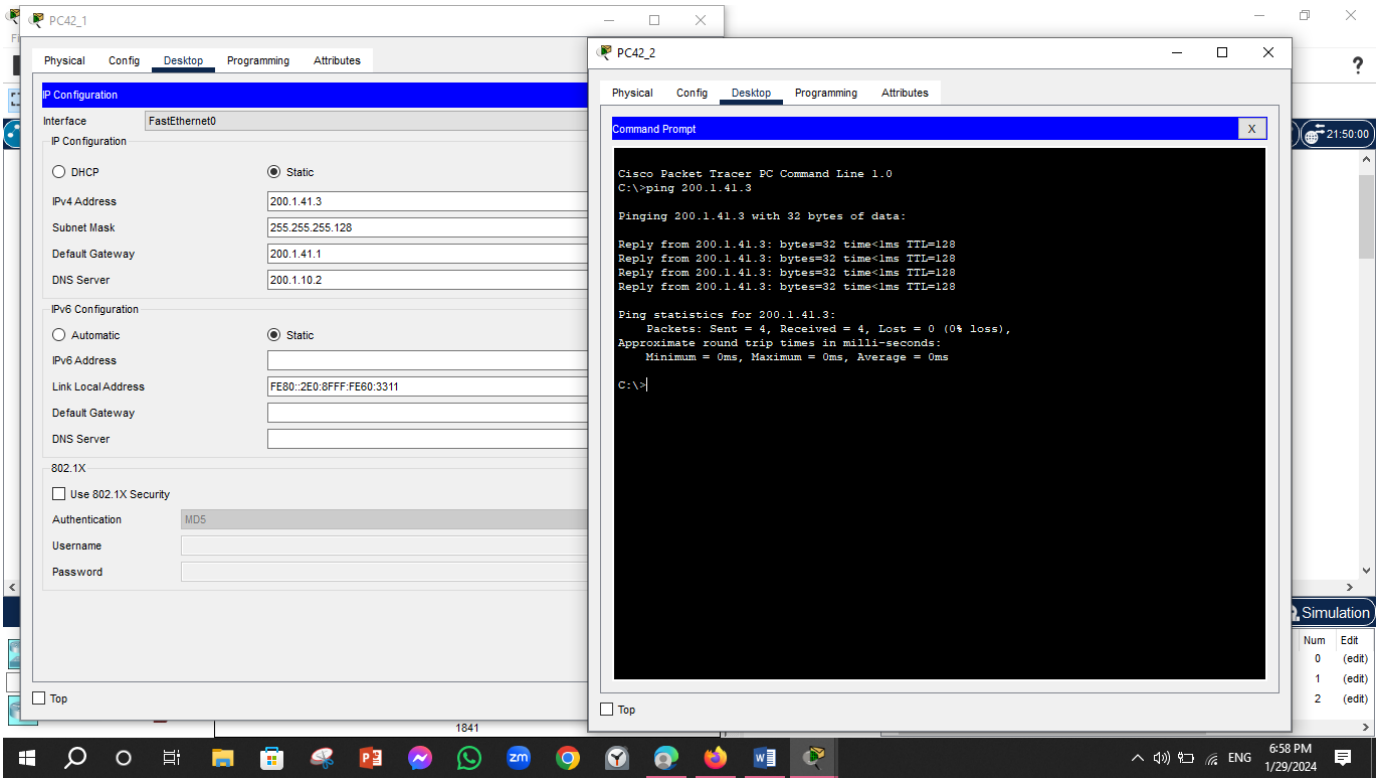

Figure 40 : pc42-2 pinging and tracert to pc42-1

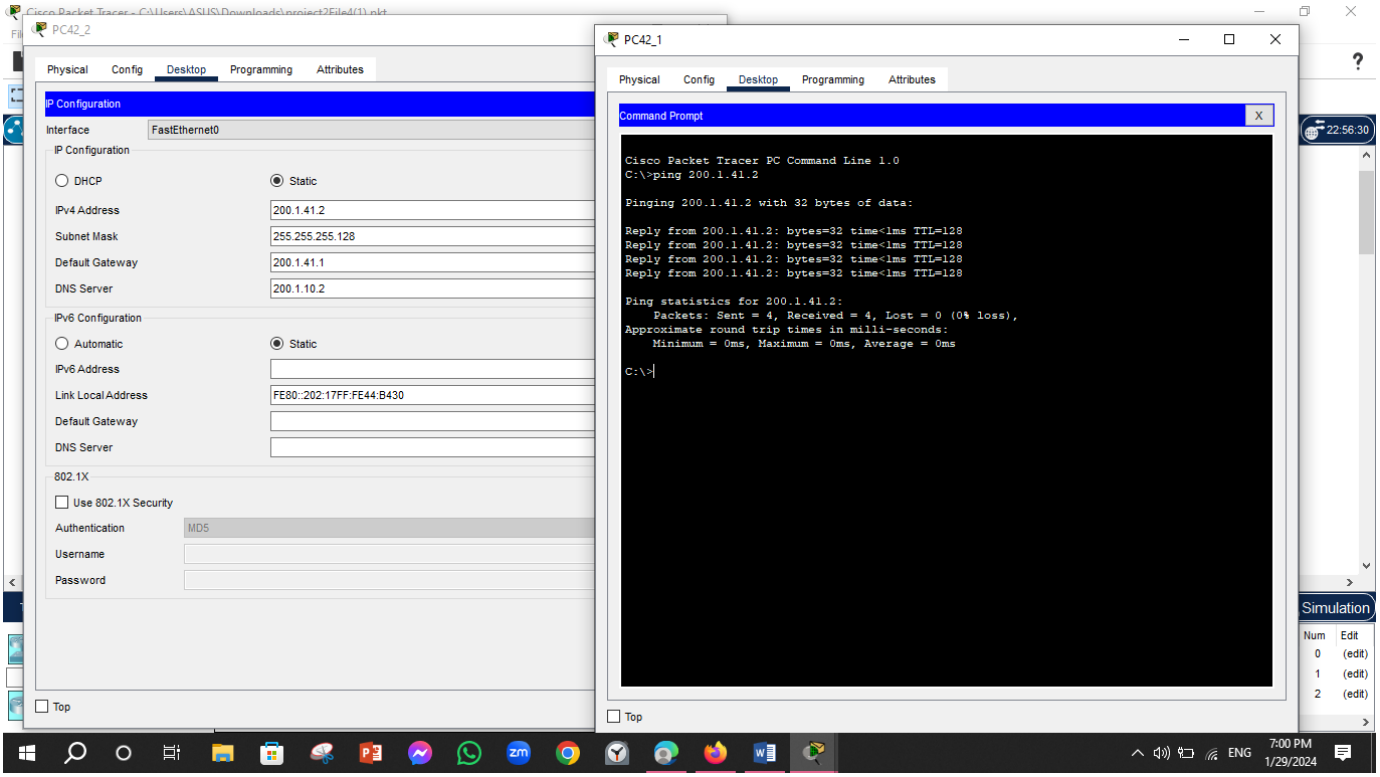

Figure 41: pc42-1 pinging and tracert to pc42-2

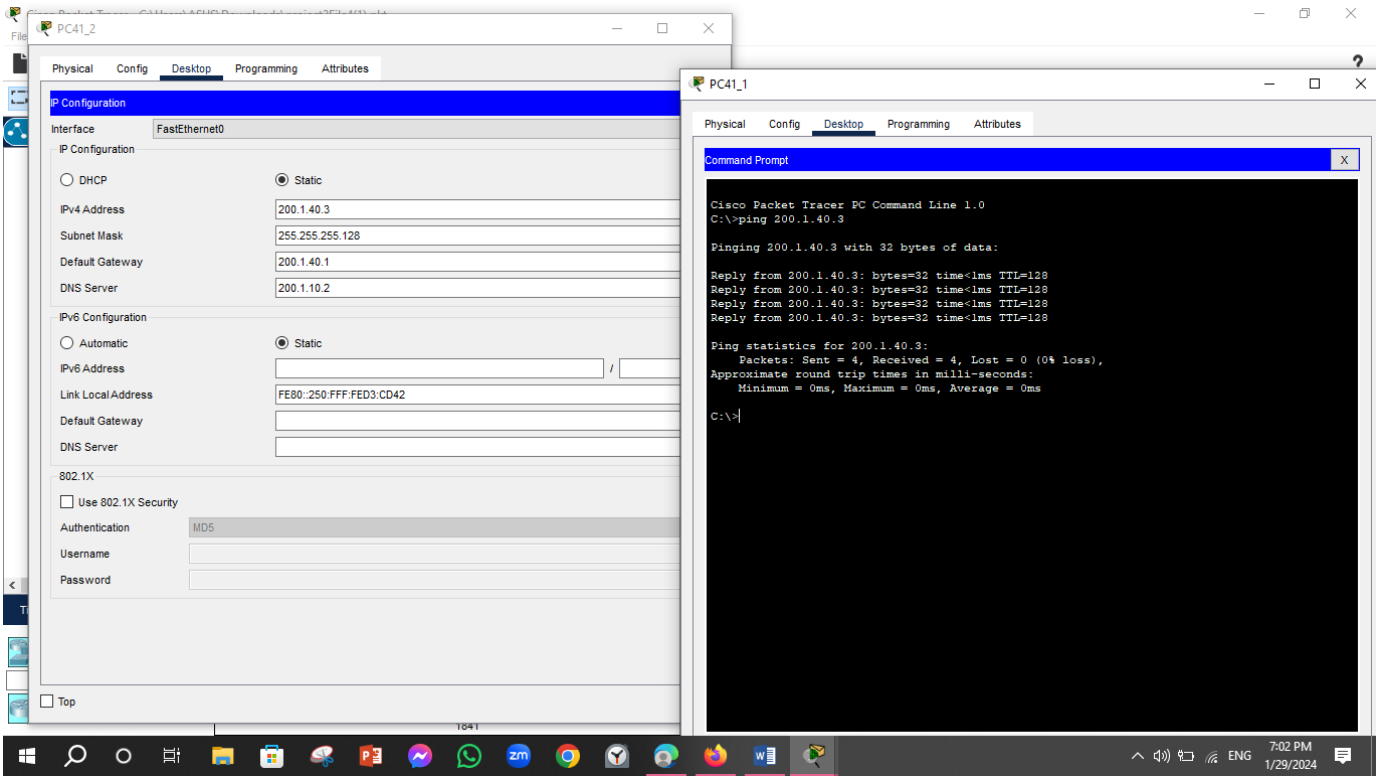

Figure 42 : pc41-1 pinging and tracert to pc41-2

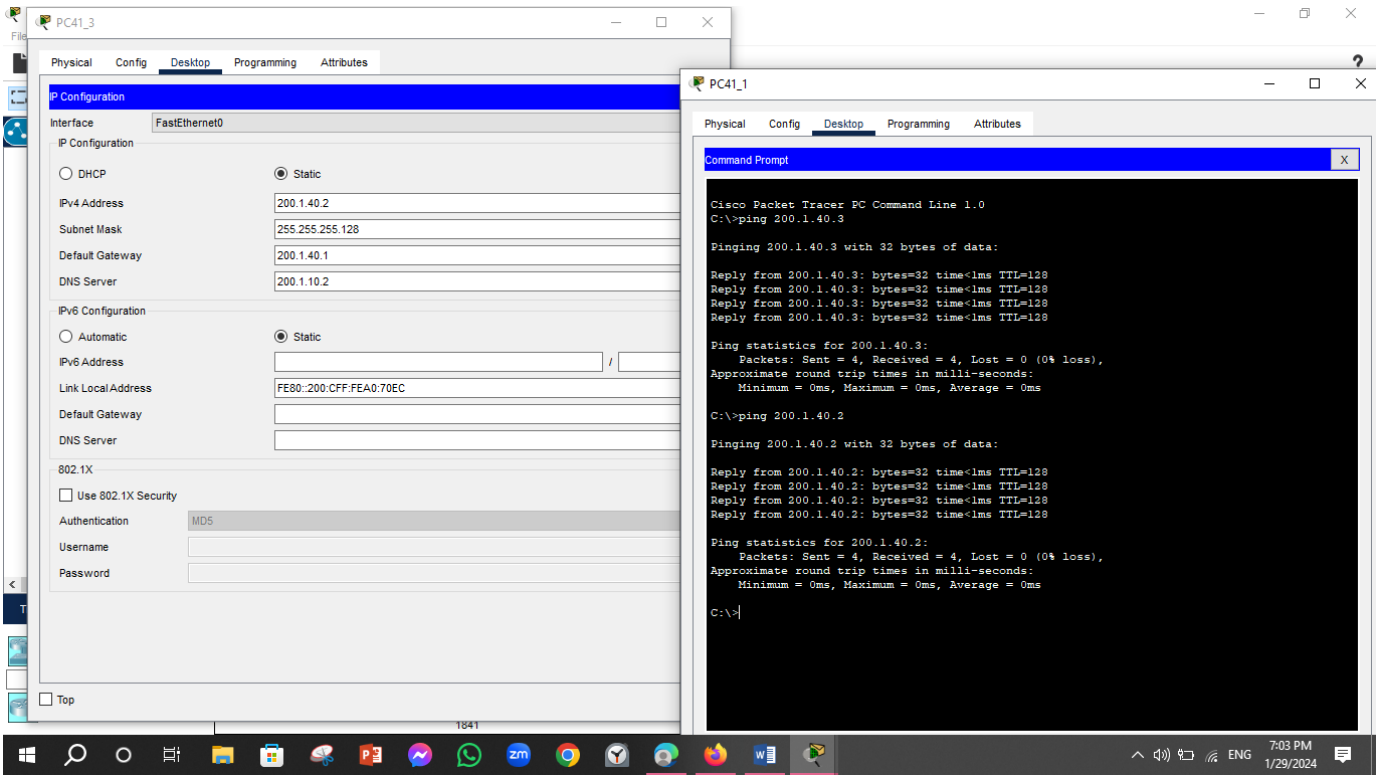

Figure 43 : pc41-1 pinging and tracert to pc41-3

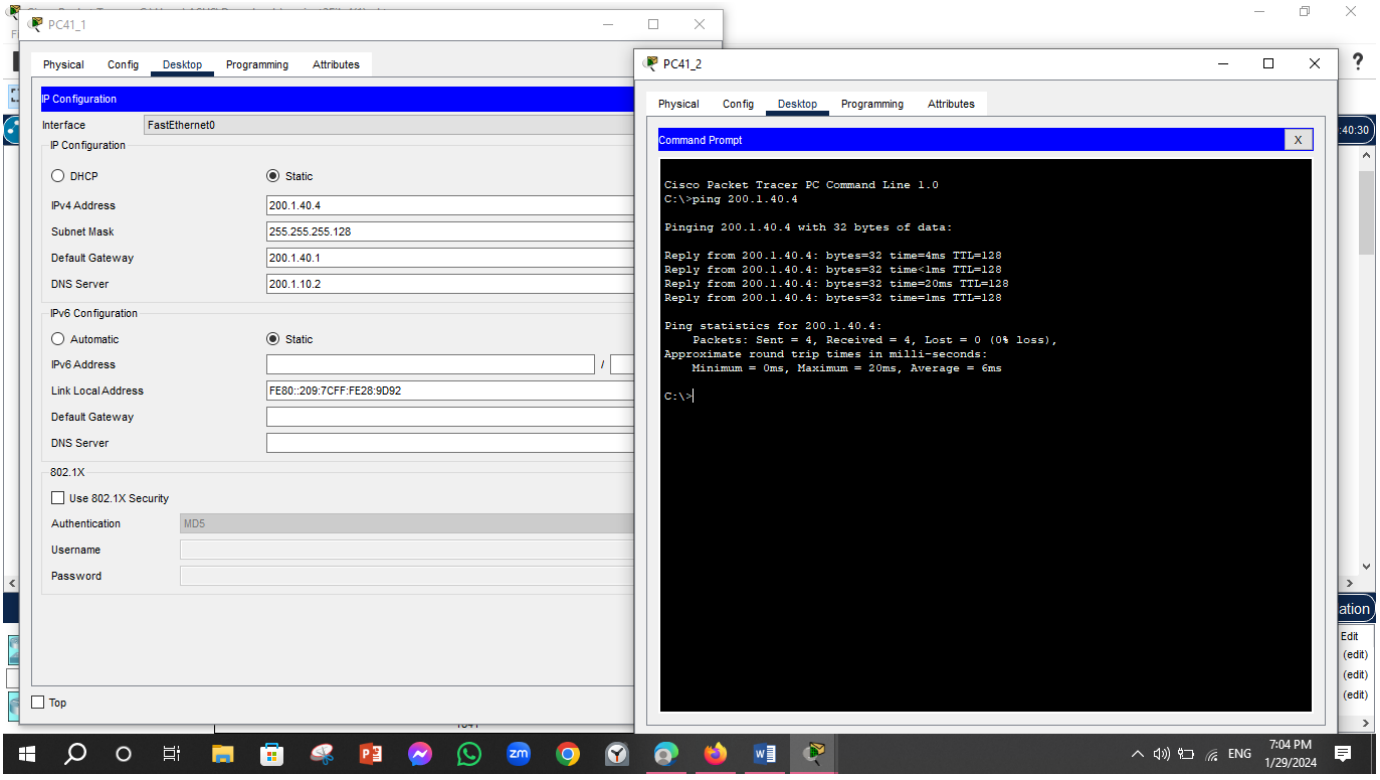

Figure 44: pc41-2 pinging and tracert to pc41-1

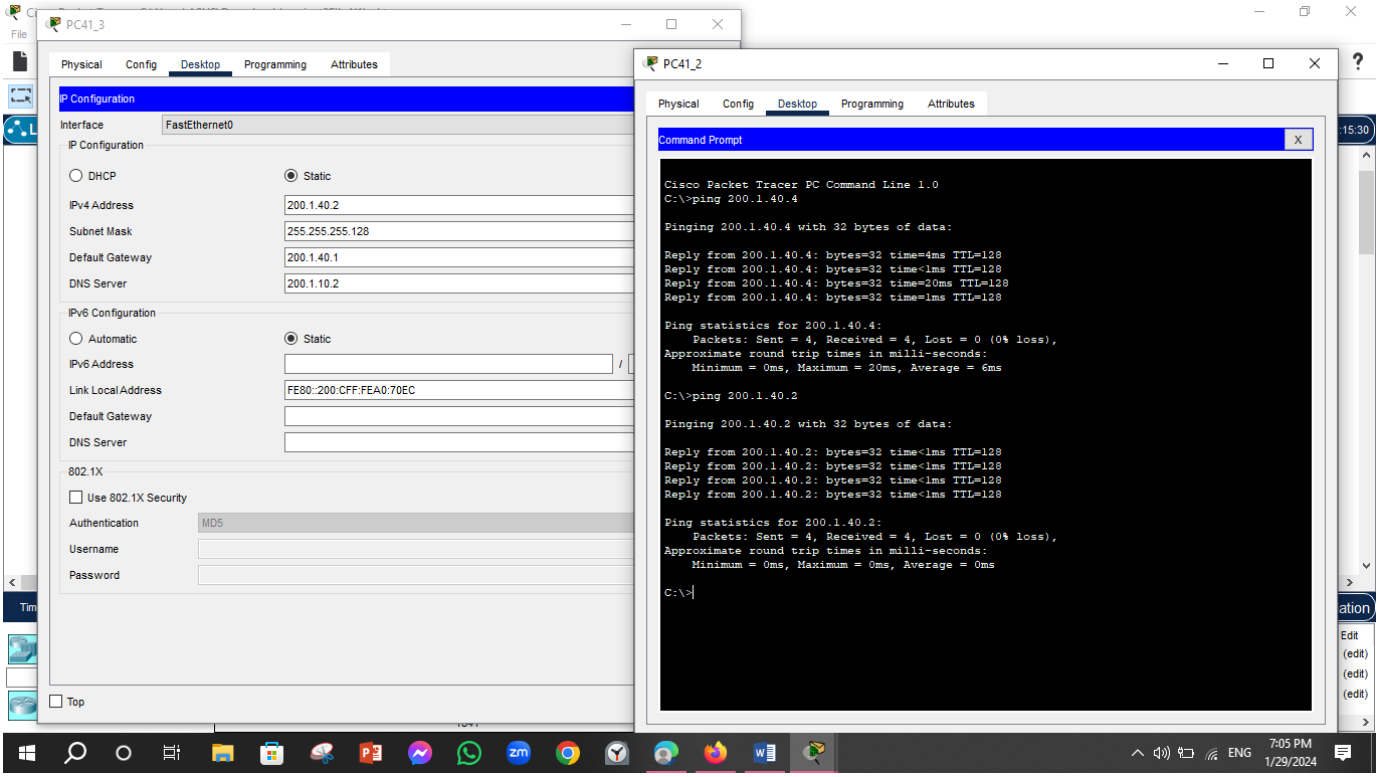

Figure 45 : pc41-2 pinging and tracert to pc41-3

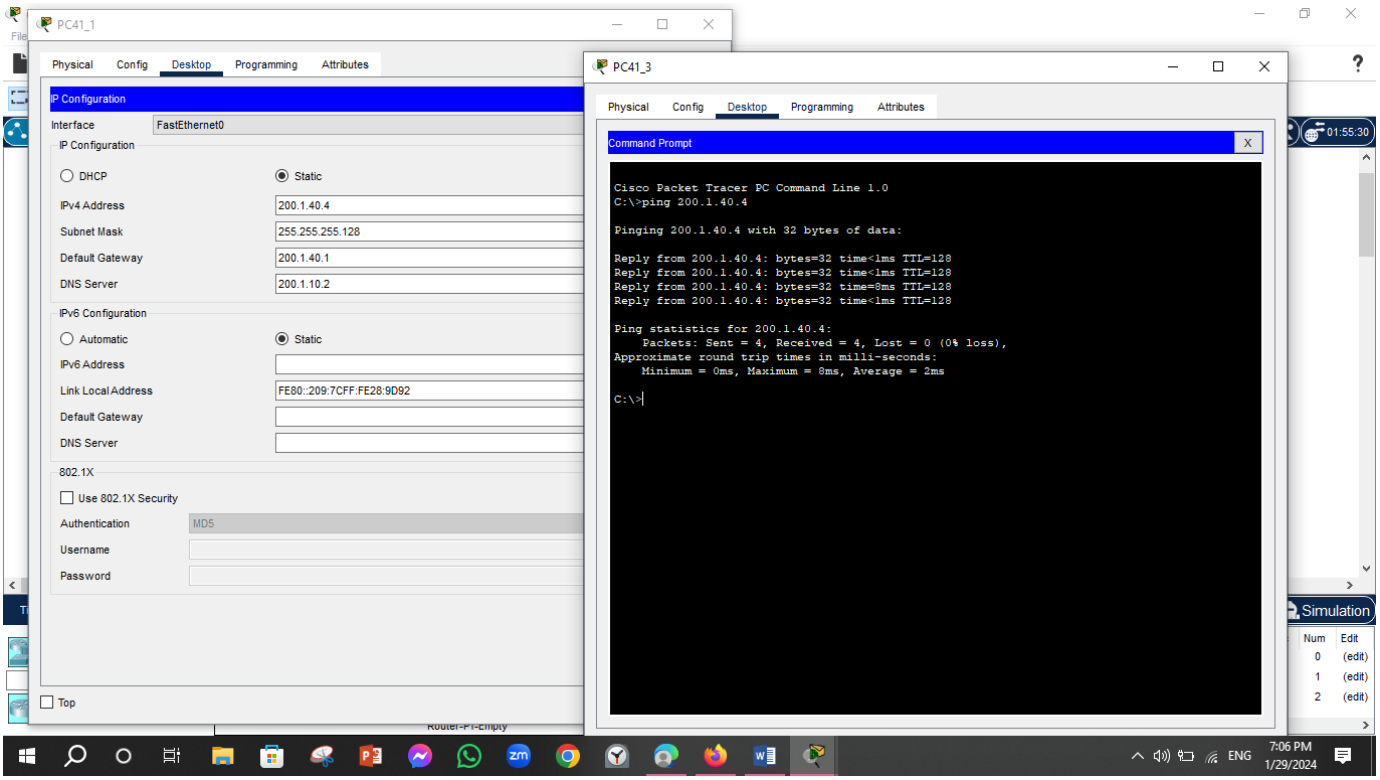

Figure 46 : pc41-3 pinging and tracert to pc41-1

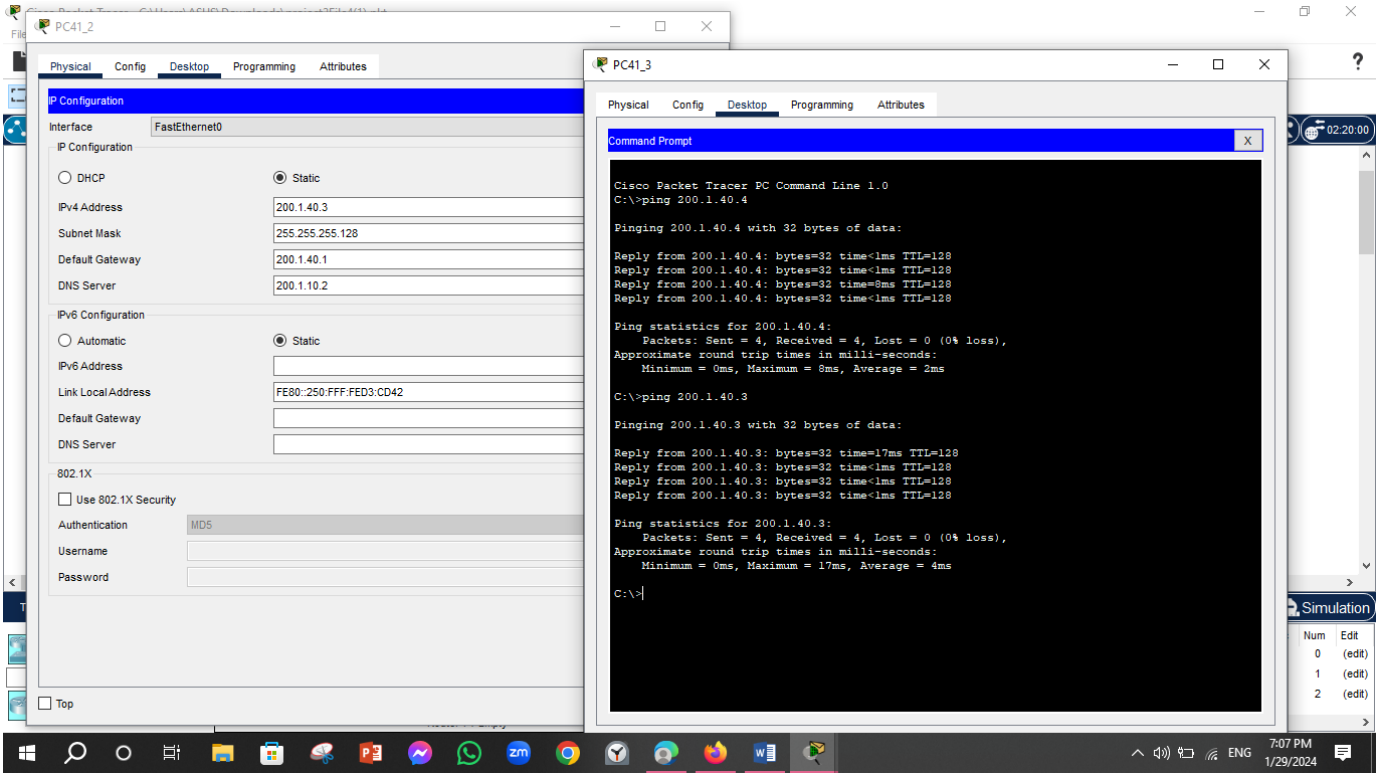

Figure 47 :pc41-3 pinging and tracert to pc41-2

2. Access www. FirstSem2024.com from all PCs

We went to each pc and typed the URL of the www. FirstSem2024.com and this the html we got in all pcs:

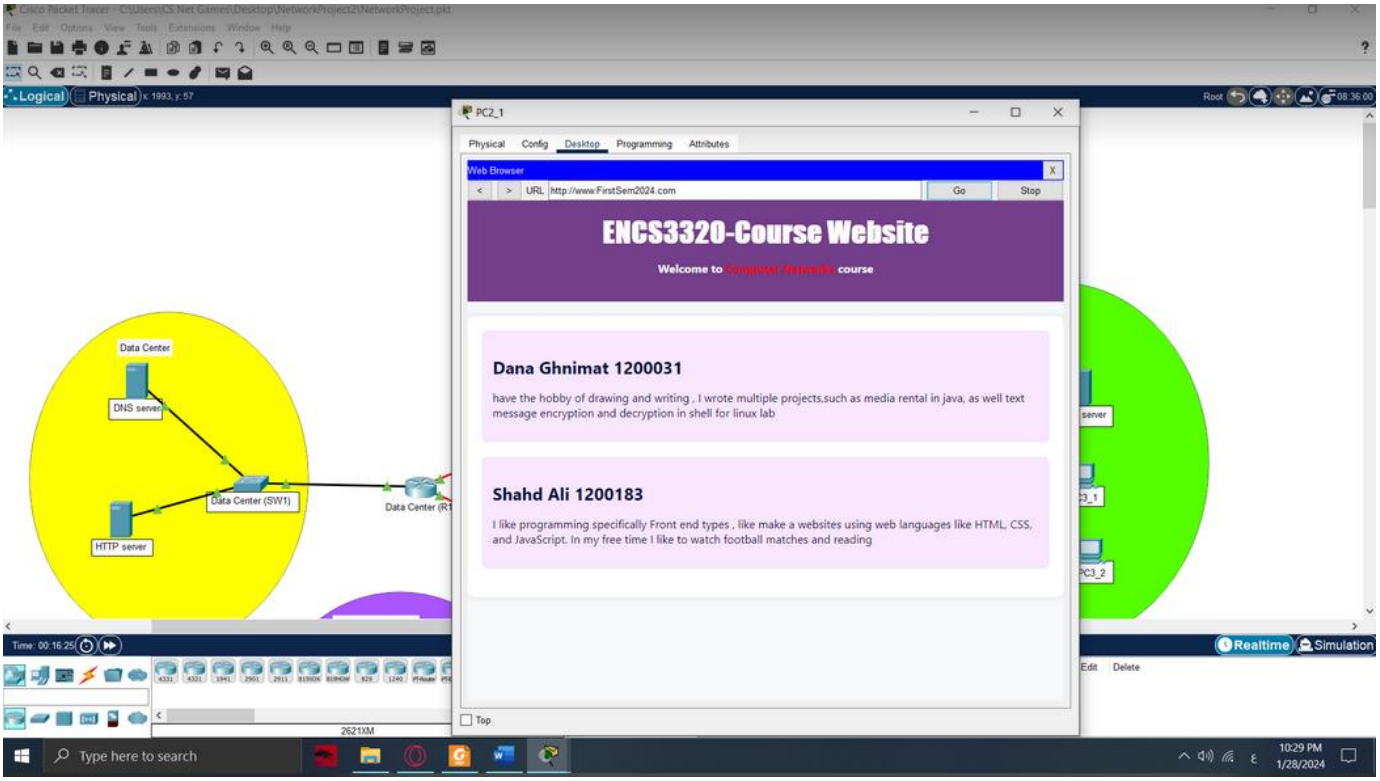

Figure 48 : PC2-1

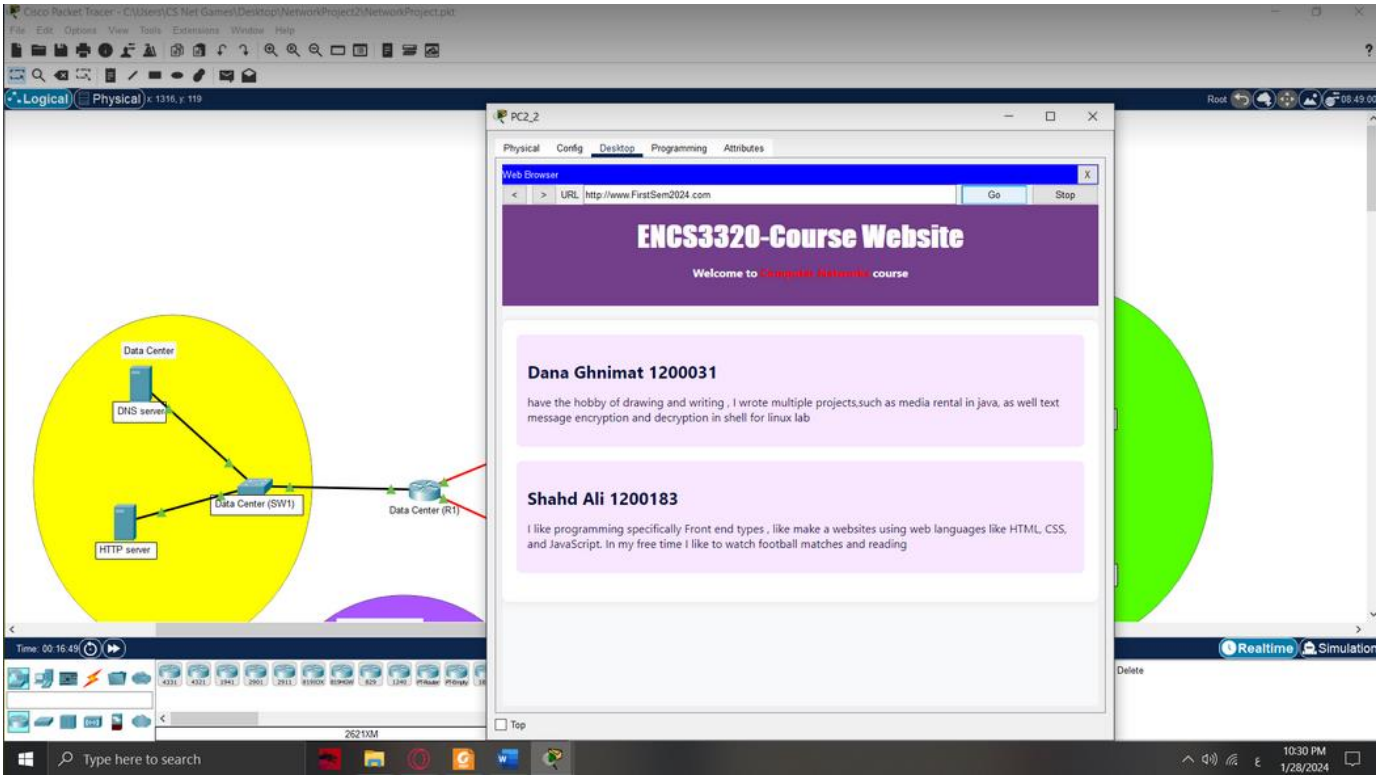

Figure 49 PC2-2

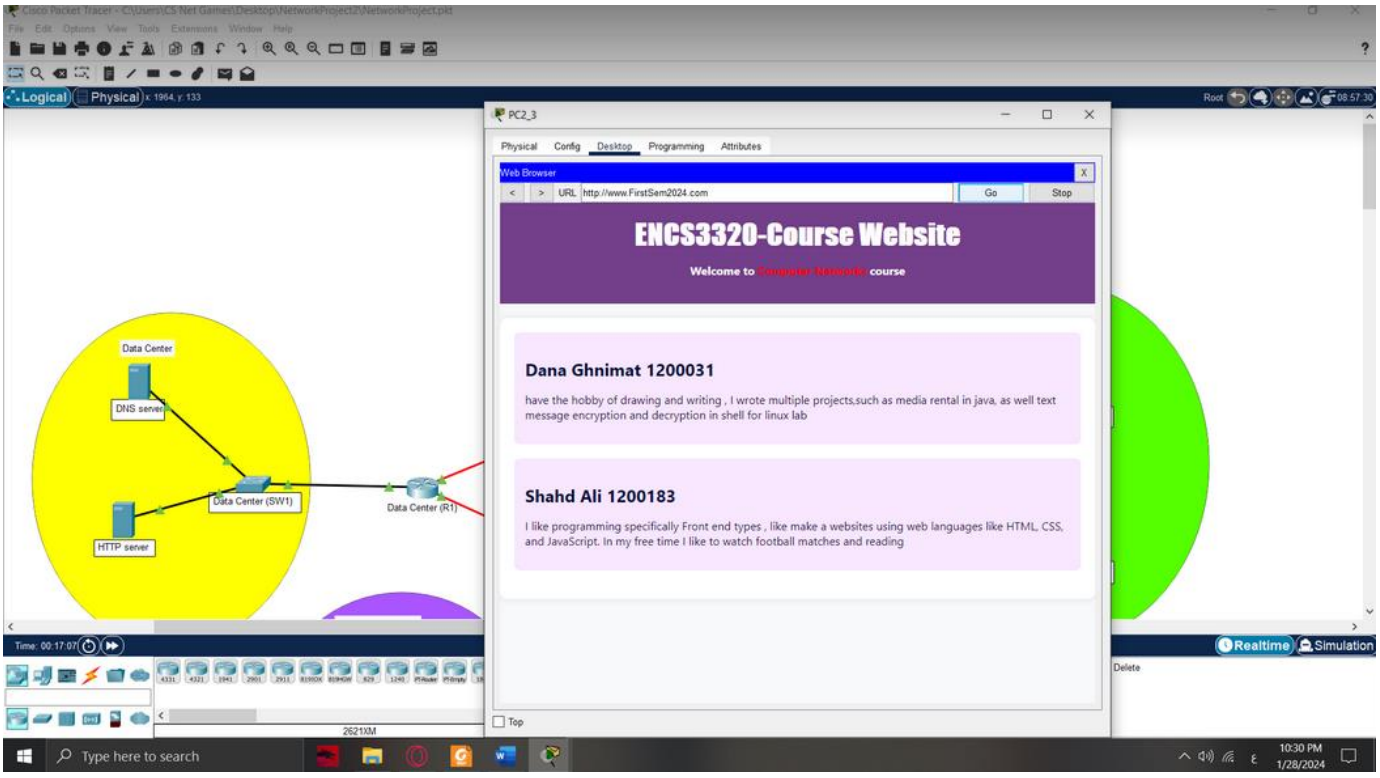

Figure 50 PC2-3

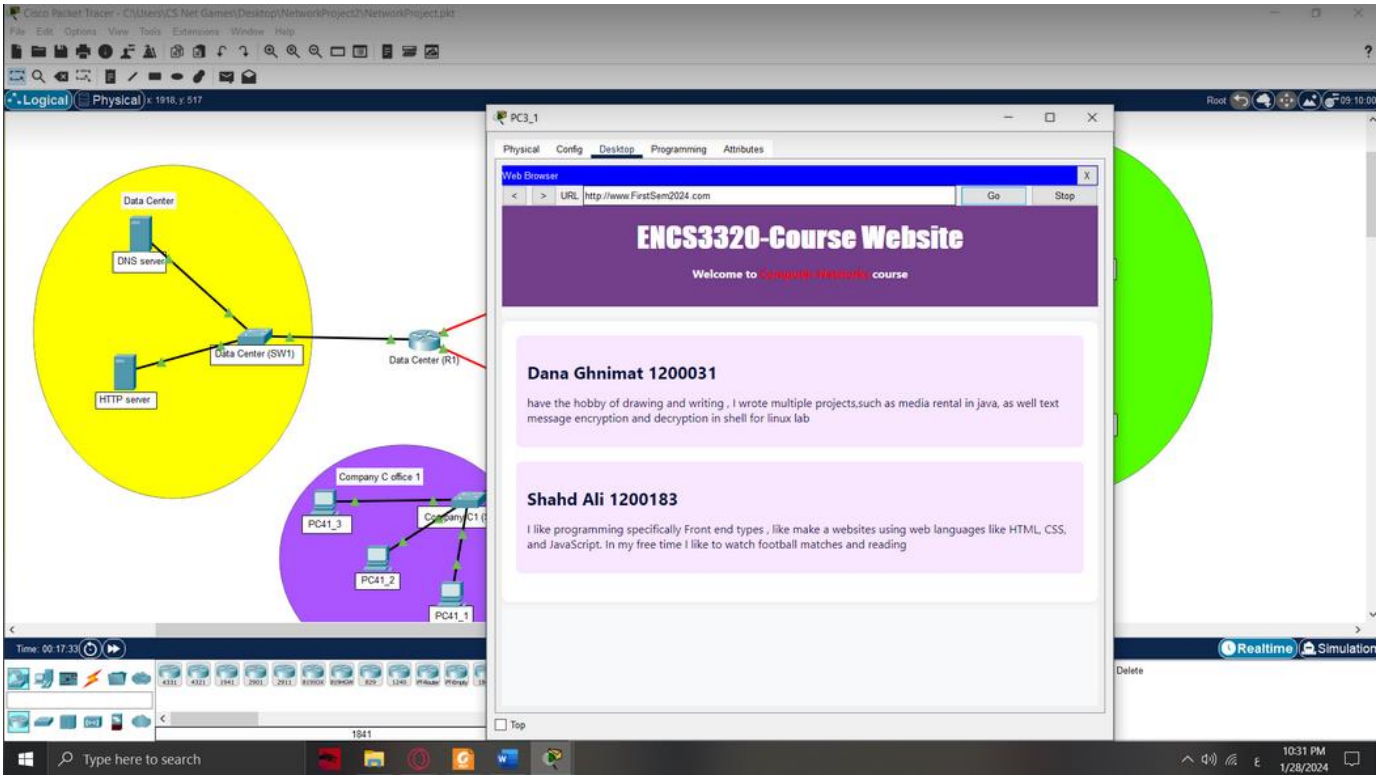

Figure 51 PC3-1

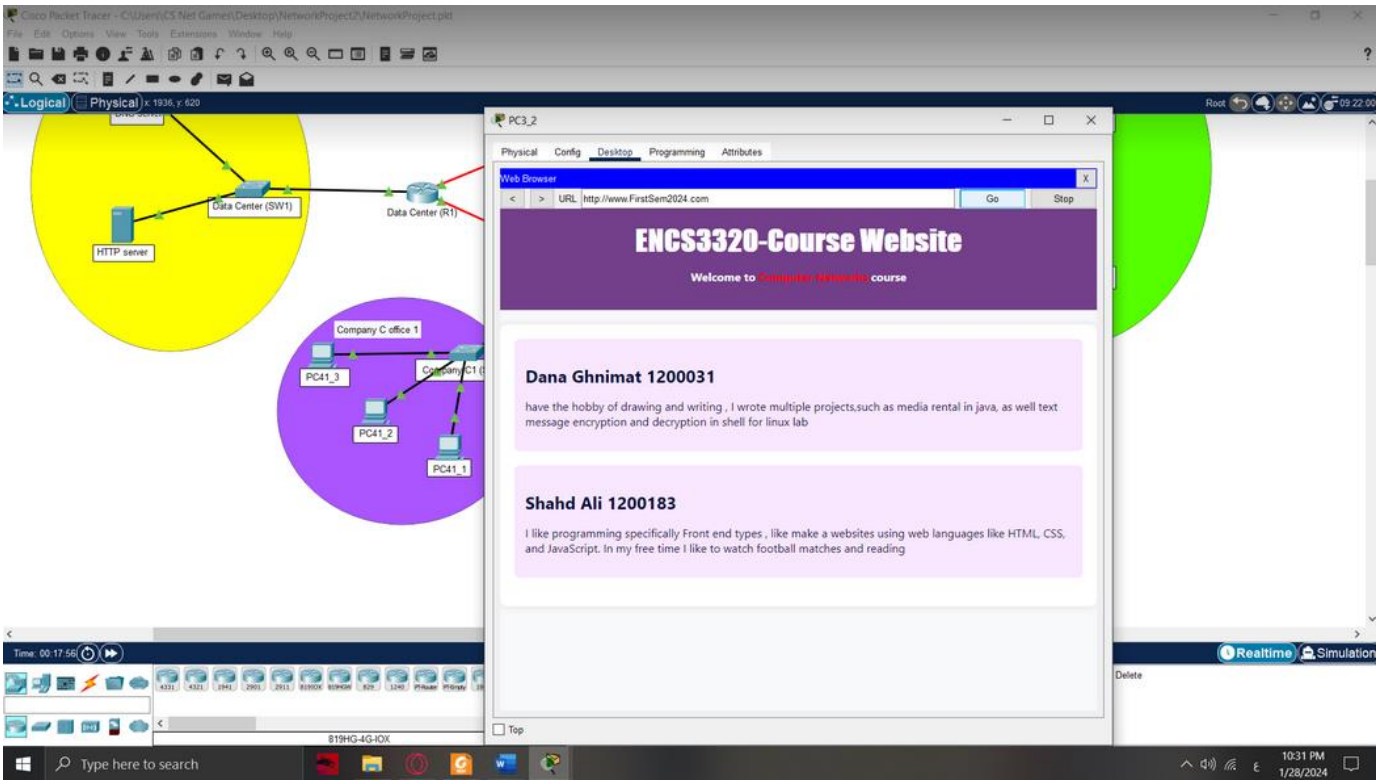

Figure 52 PC 3-2

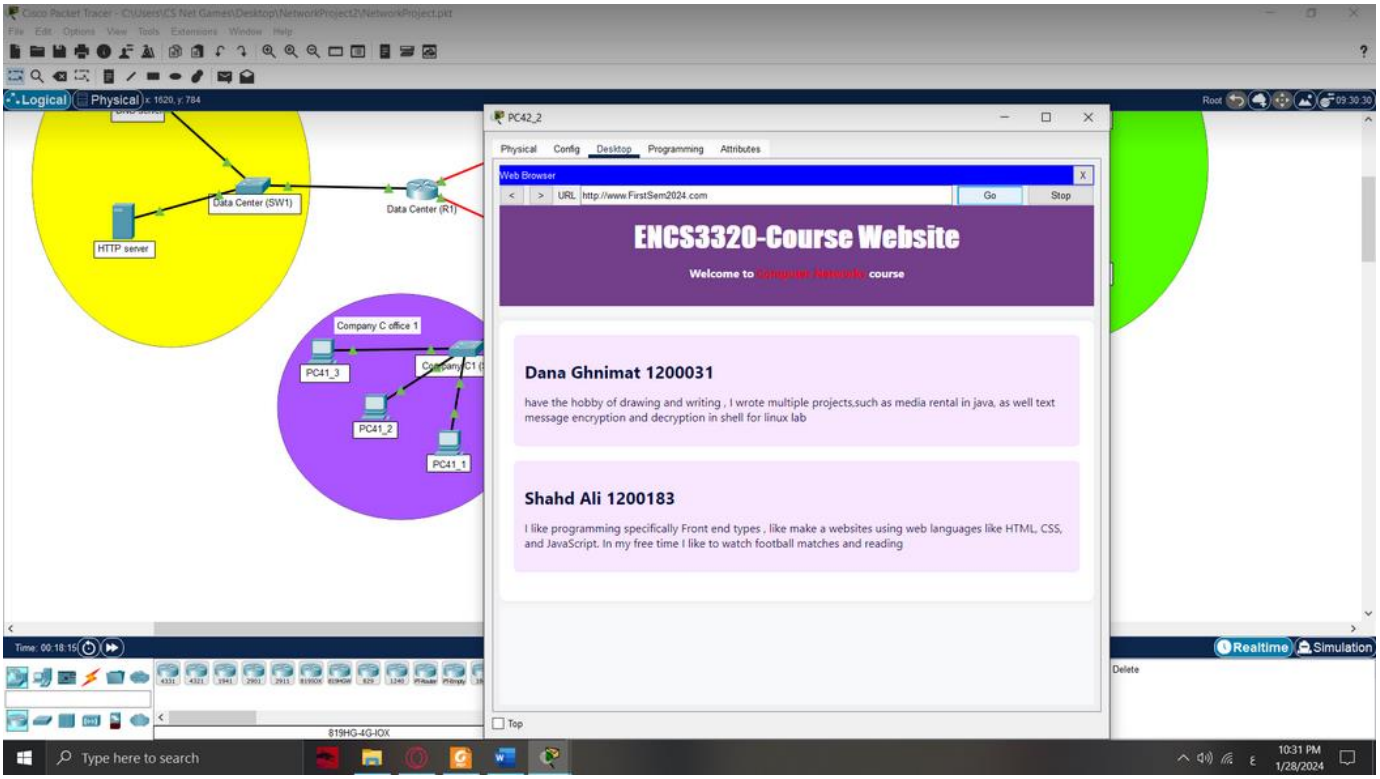

Figure 53 PC42-2

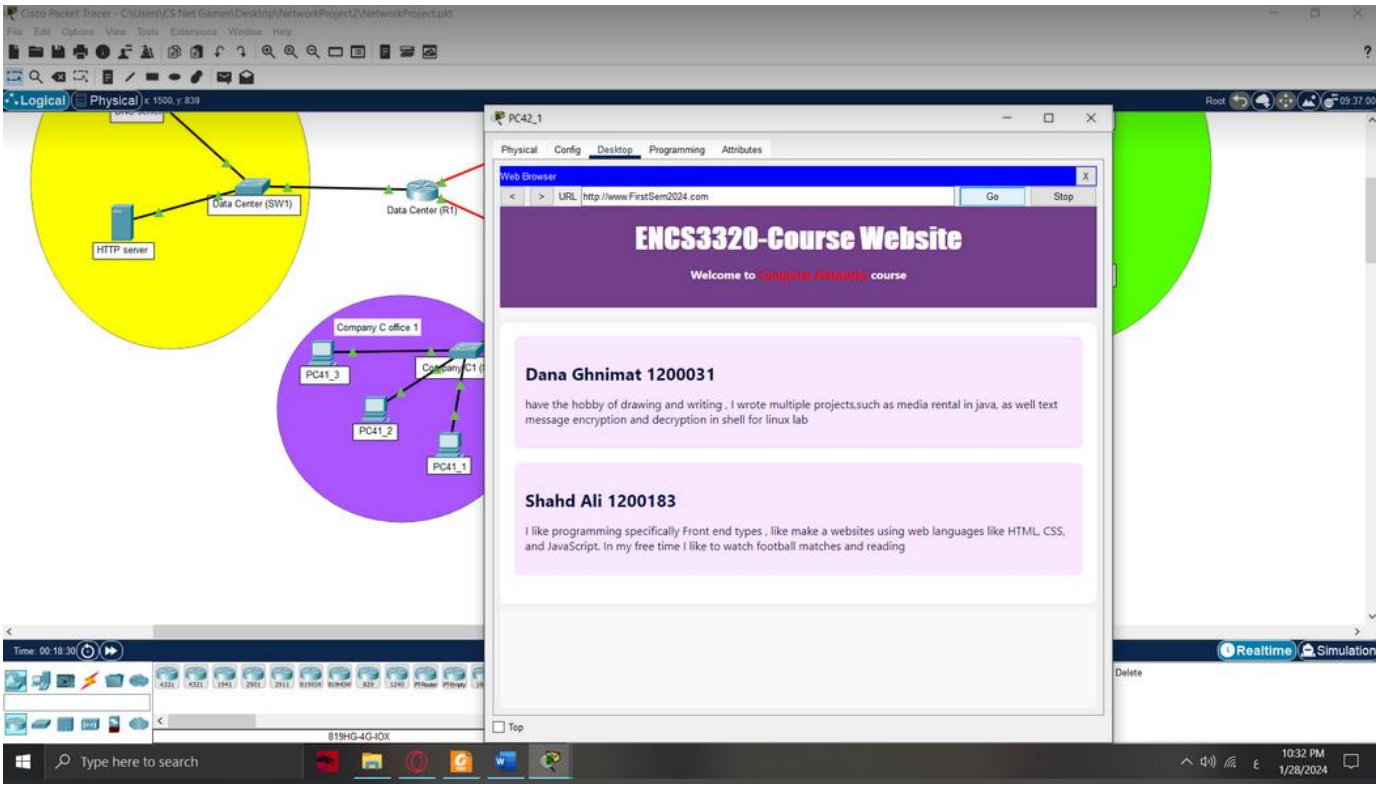

Figure 54 PC42-1

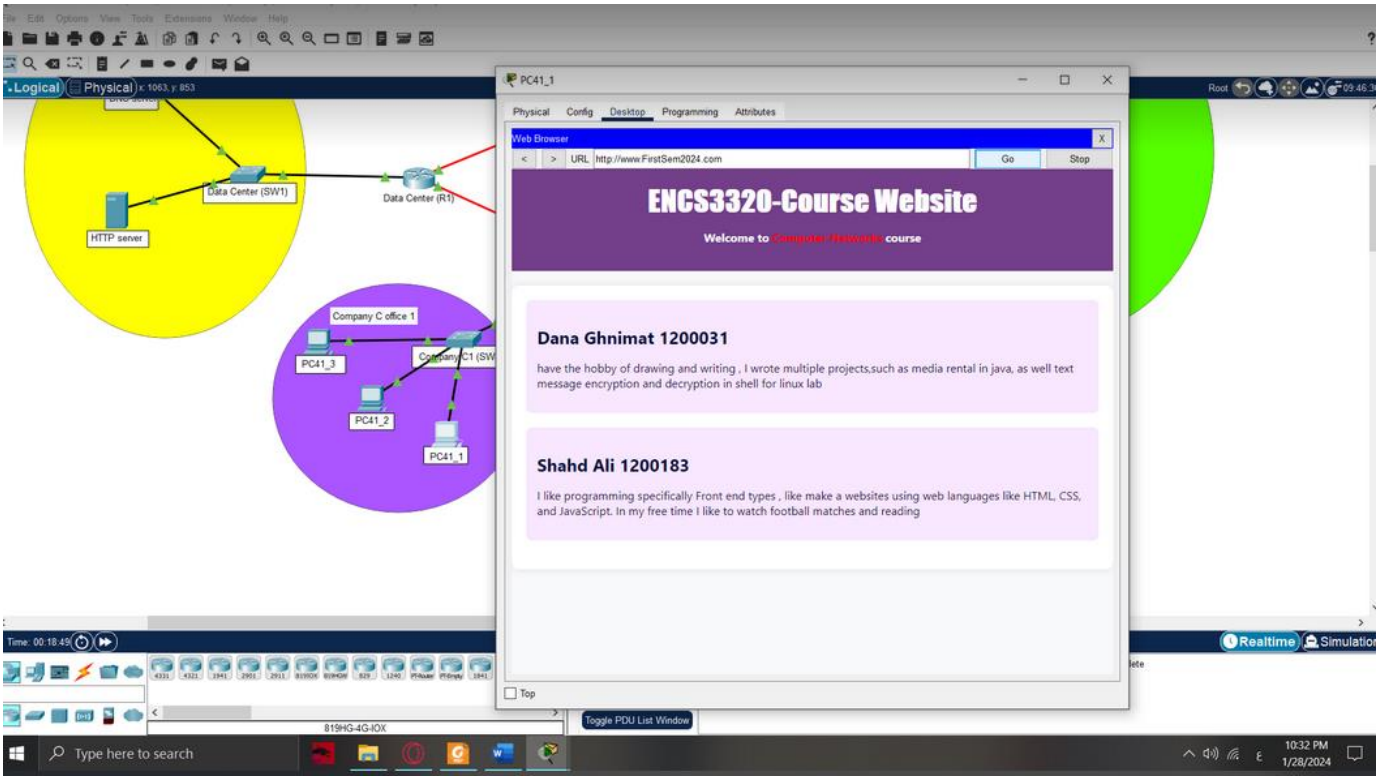

Figure 55 PC41-1

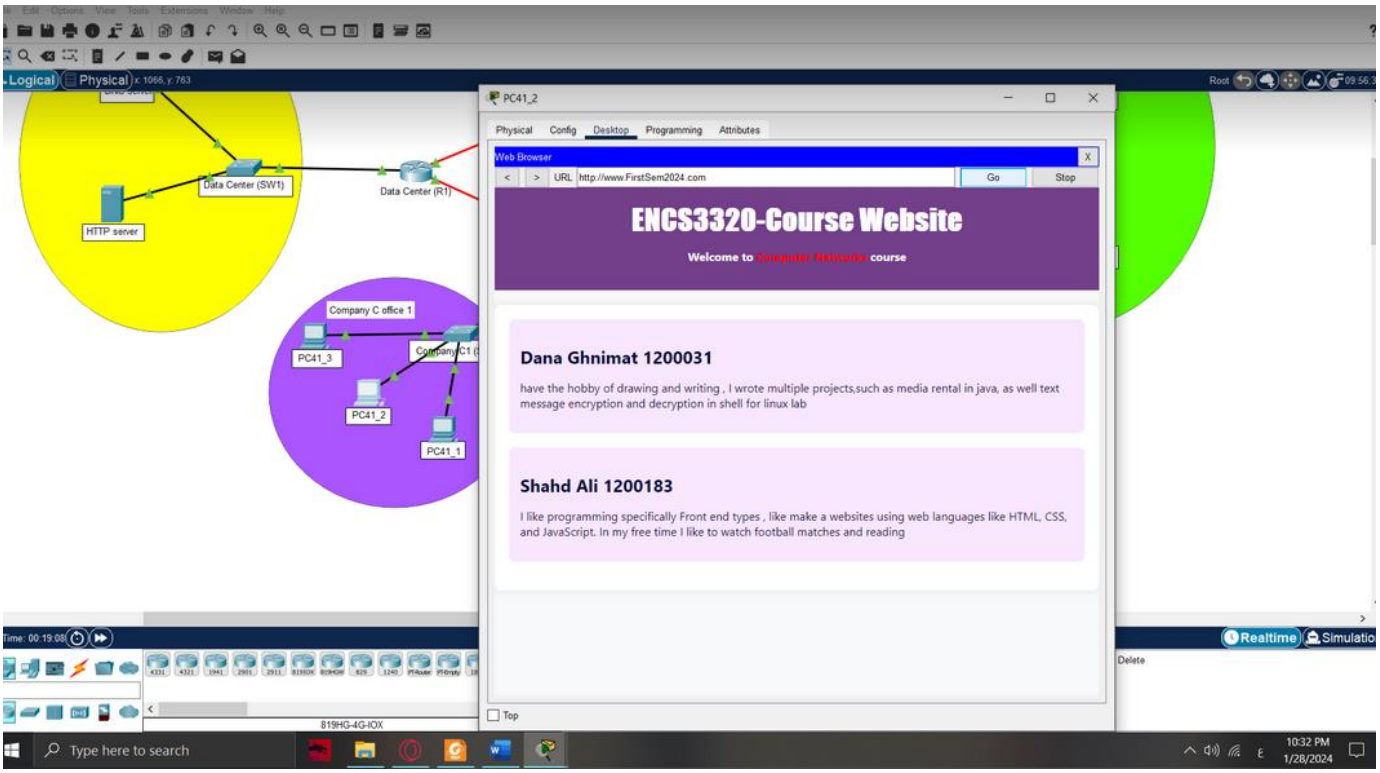

Figure 56 PC41-2

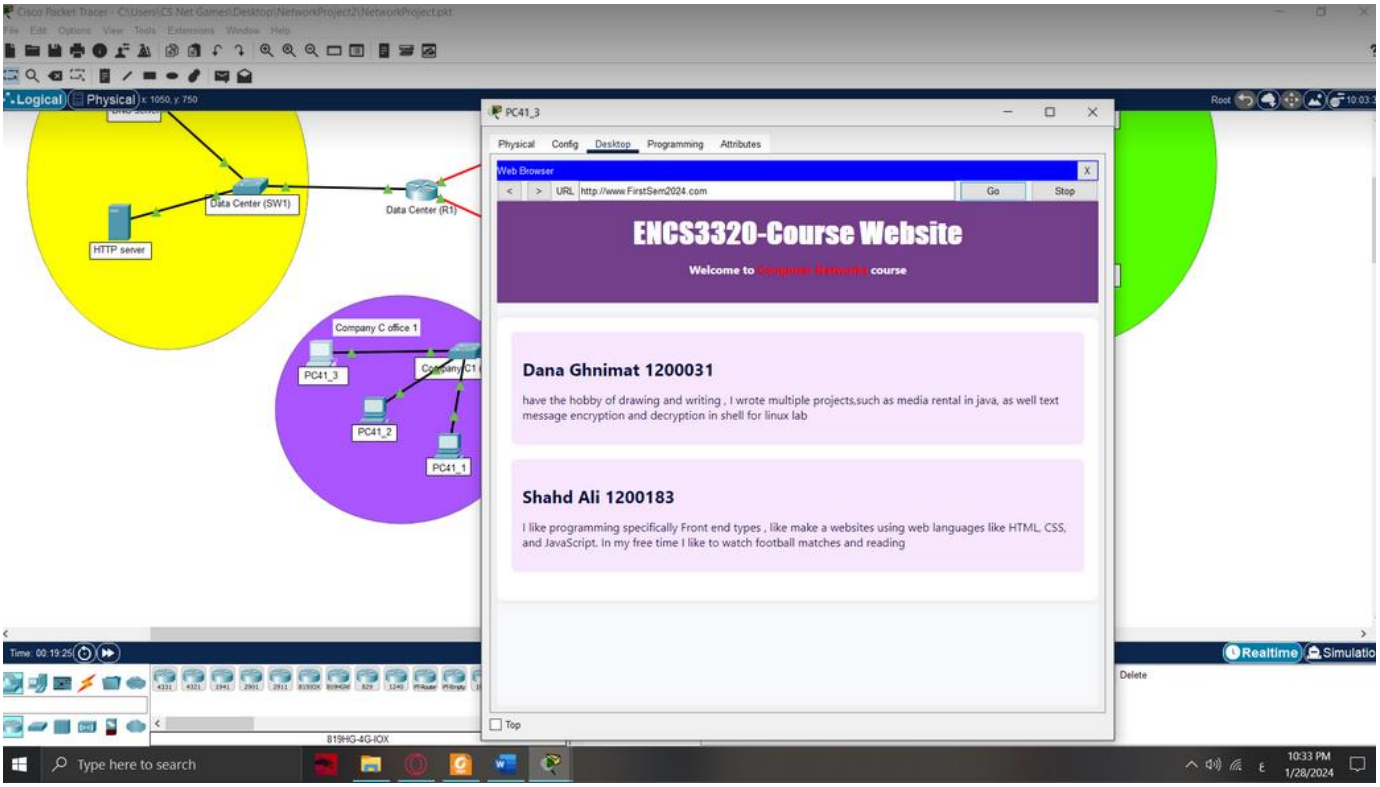

Figure 57 PC42-3

3. The outputs of sending Email from 2 PCs

PC41_3 to PC2_2:

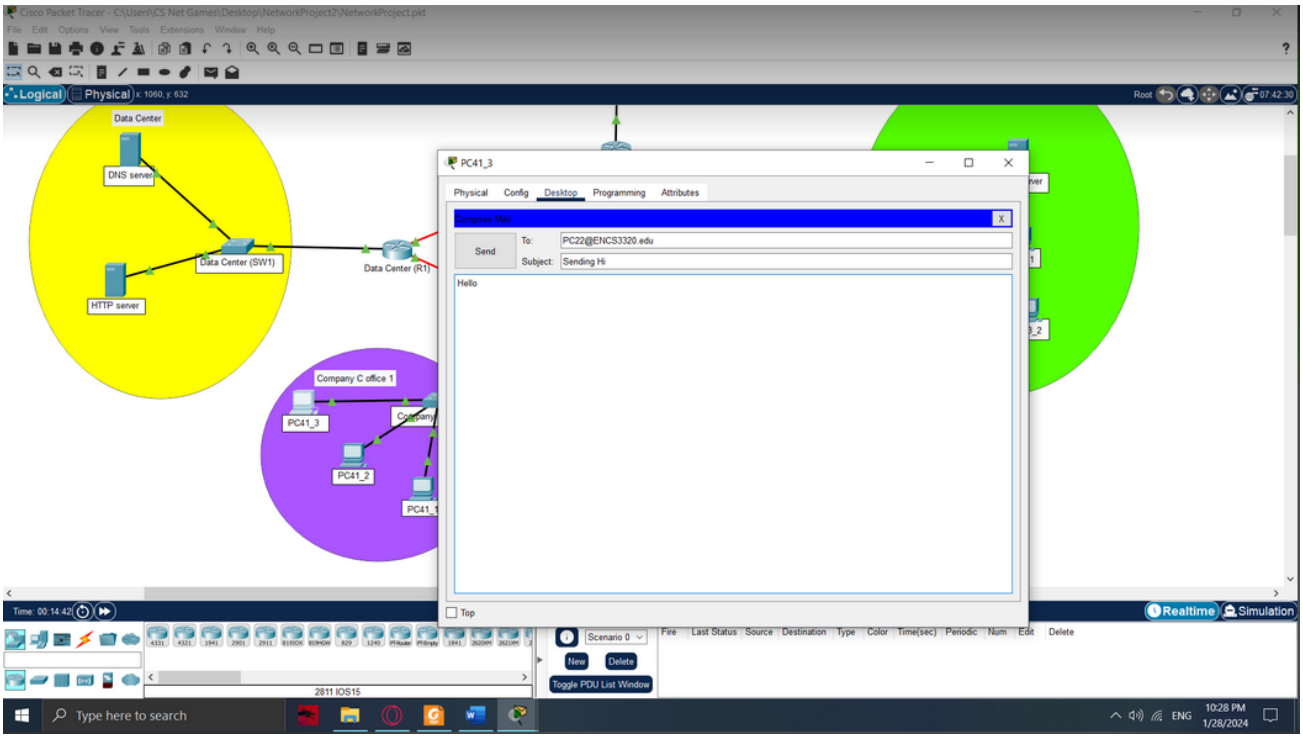

Figure 58 : PC41_3 sending

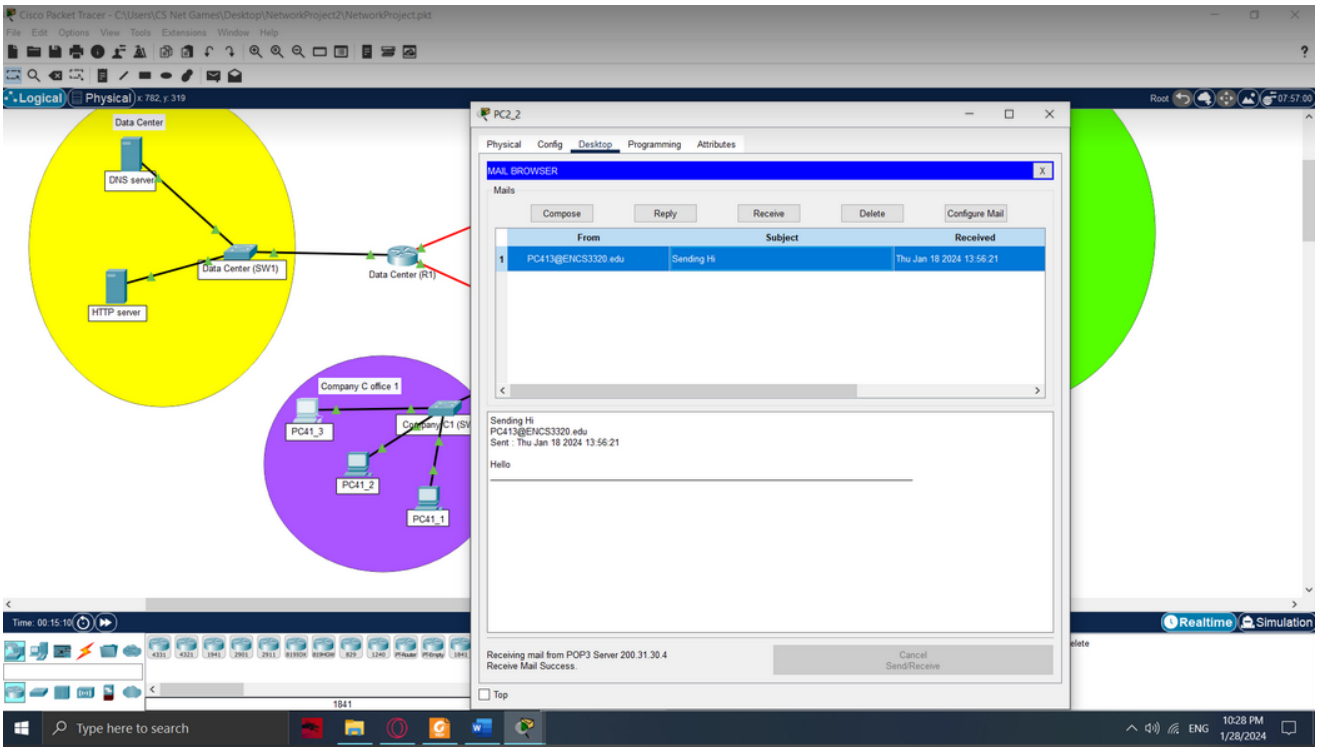

Figure 59 : PC2-2 received

PC3-1 to PC42-1:

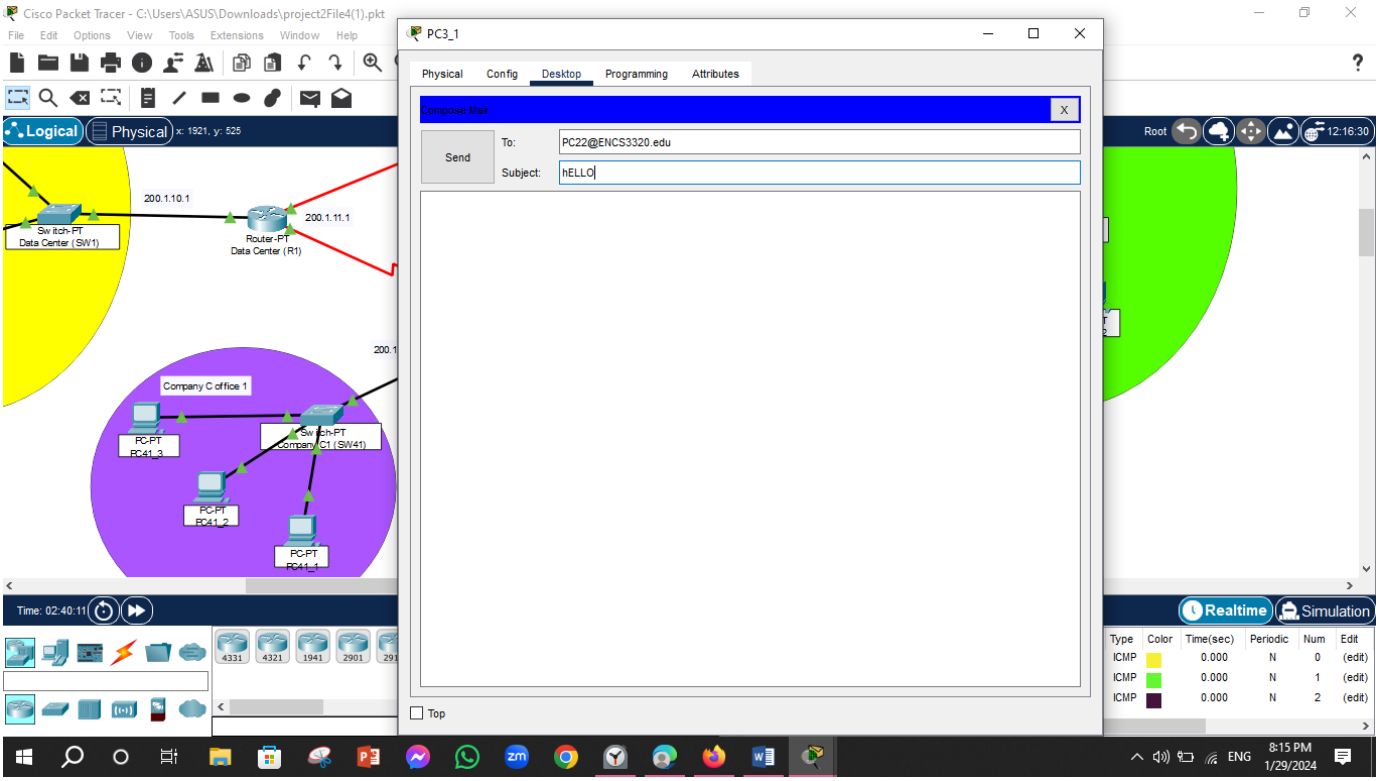

Figure 60 : PC3-1 sensing

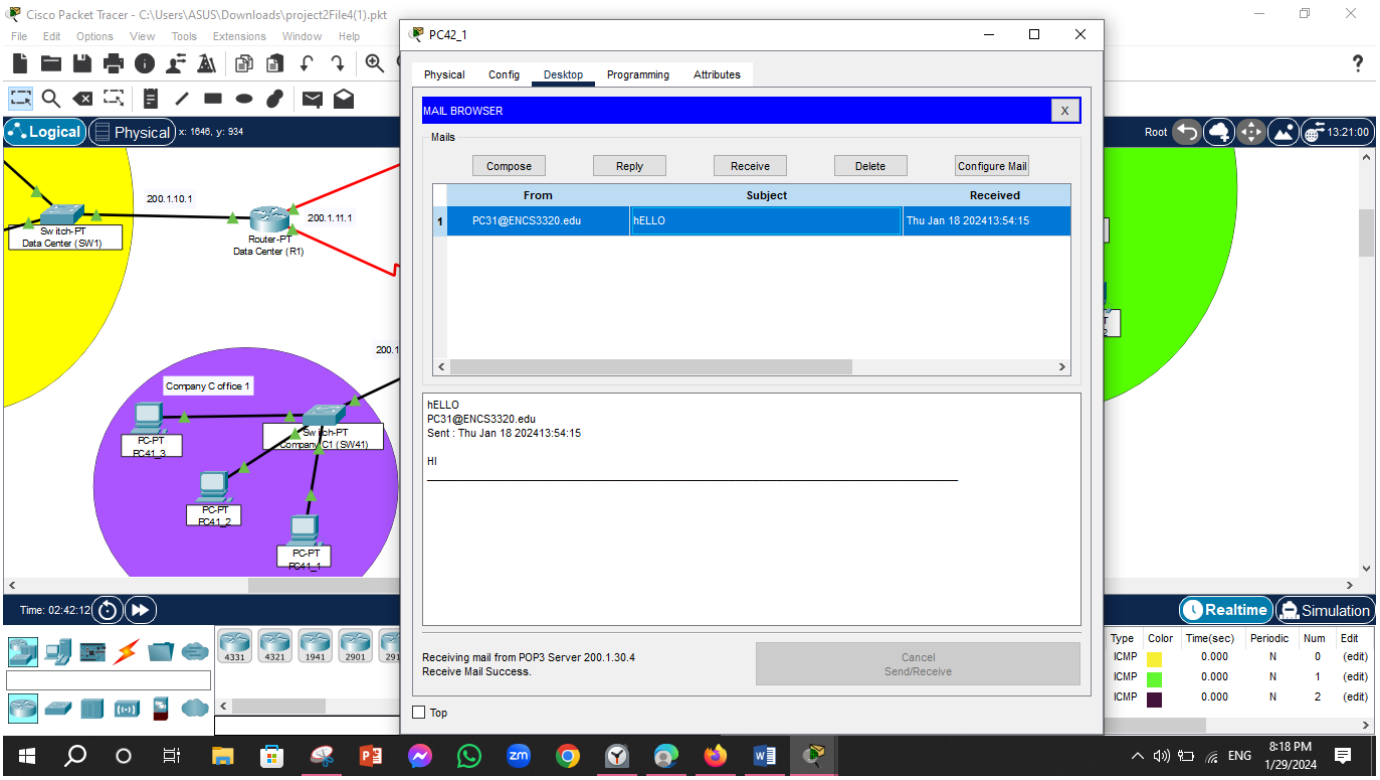

Figure 61 : PC42-1 received

Conclusion

In the end, we learn a lot of things and facts from this project. We learn how to use packet tracer which will help us on the lab, now we know how to do the IP subnetting and assignment, configure end devices like PCs and servers, and how to setup the routing algorithms on the routers.

References

[1] http://www.cisco.com/c/en/us/td/docs/ios/12_2/security/configuration/guide/fsecur_c/scfacls. html. Accessed on 27-04-2017 at 7:36PM.

[2] http://searchenterprisewan.techtarget.com/definition/IPv6.
Accessed on 27-04-2017 at 8:14PM.