



Faculty of Engineering and Technology

Electrical and Computer Engineering Department

**Computer Networks (ENCS3320)**

**Project No.2 Report**

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# Table of Contents

|                                      |    |
|--------------------------------------|----|
| Part 0.....                          | 1  |
| Part 1.....                          | 2  |
| Part 2.....                          | 9  |
| Part 3.....                          | 12 |
| Part 4.....                          | 13 |
| Applying Ping and Tracert .....      | 13 |
| Access the website from all PCs..... | 19 |
| Sending an email .....               | 24 |

## List of Figures

|  |           |
|--|-----------|
| <b>Figure 1: The assignment of Subnets .....</b>                 | <b>2</b>  |
| <b>Figure 2: The Configuration of Router0.....</b>               | <b>3</b>  |
| <b>Figure 3: The Configuration of Router1.....</b>               | <b>5</b>  |
| <b>Figure 4: The Configuration of Router2.....</b>               | <b>7</b>  |
| <b>Figure 5: The Configuration of HTTP Server.....</b>           | <b>9</b>  |
| <b>Figure 6: The Configuration of DNS Server .....</b>           | <b>10</b> |
| <b>Figure 7: The Configuration of Email Server .....</b>         | <b>11</b> |
| <b>Figure 8: Applying the RIPv2 for Router0-Left Side .....</b>  | <b>12</b> |
| <b>Figure 9: Pinging Pc0 from Pc4.....</b>                       | <b>13</b> |
| <b>Figure 10: Pinging Pc1 from Pc4.....</b>                      | <b>14</b> |
| <b>Figure 11: Applying Tracert to Pc0 and Pc1 from Pc4 .....</b> | <b>15</b> |
| <b>Figure 12: Applying Tracert to Pc2 from Pc4.....</b>          | <b>16</b> |
| <b>Figure 13: Applying Tracert to Pc3 from Pc4.....</b>          | <b>17</b> |
| <b>Figure 14: Applying Tracert to Pc5 from Pc4.....</b>          | <b>18</b> |
| <b>Figure 15: Access the Website from Pc2.....</b>               | <b>19</b> |
| <b>Figure 16: Access the Website from Pc3.....</b>               | <b>20</b> |
| <b>Figure 17: Access the Website from Pc4.....</b>               | <b>21</b> |
| <b>Figure 18: Access the Website from Pc5.....</b>               | <b>22</b> |
| <b>Figure 19: Access the Website from Pc1.....</b>               | <b>23</b> |
| <b>Figure 20: Receiving an Email from Pc0 to Pc1.....</b>        | <b>24</b> |
| <b>Figure 21: Receiving an Email from Pc0 to Pc2.....</b>        | <b>25</b> |
| <b>Figure 22: Receiving an Email from Pc0 to Pc3.....</b>        | <b>26</b> |
| <b>Figure 23: Receiving an Email from Pc0 to Pc4.....</b>        | <b>27</b> |
| <b>Figure 24: Receiving an Email from Pc0 to Pc5.....</b>        | <b>28</b> |

## Part 0

The IP that has been selected: 195.02.0.0/24, where 02 is a part from this id 1200275.

After analysis the topology, four subnets have been found so two bits from added to static bits (24 bit) to be (26 bits).

195.02.0.00000000/24 → 195.02.0.00000000/26

The first subnet when the value of two bits equal to 00. This means that the first subnet is 195.02.0.00000000/26 which equal to 195.02.0.0/26. Then, the second subnet when the value of two bits equal to 01. This means that the second subnet is 195.02.0.01000000/26 which equal to 195.02.0.64/26. While the third subnet when the value of two bits equal to 10. This means that the third subnet is 195.02.0.10000000/26 which equal to 195.02.0.128/26. And the fourth subnet when the value of two bits equal to 11. This means that the fourth subnet is 195.02.0.11000000/26 which equal to 195.02.0.192/26. The subnet mask was found is 255.255.255.192, which means that the subnet size is 64 hosts ( $2^6$ ).

We can then assign subnet ranges as follows:

1<sup>st</sup> Subnet: 195.02.0.0/26 (hosts 1-62)

2<sup>nd</sup> Subnet: 195.02.0.64/26 (hosts 65-126)

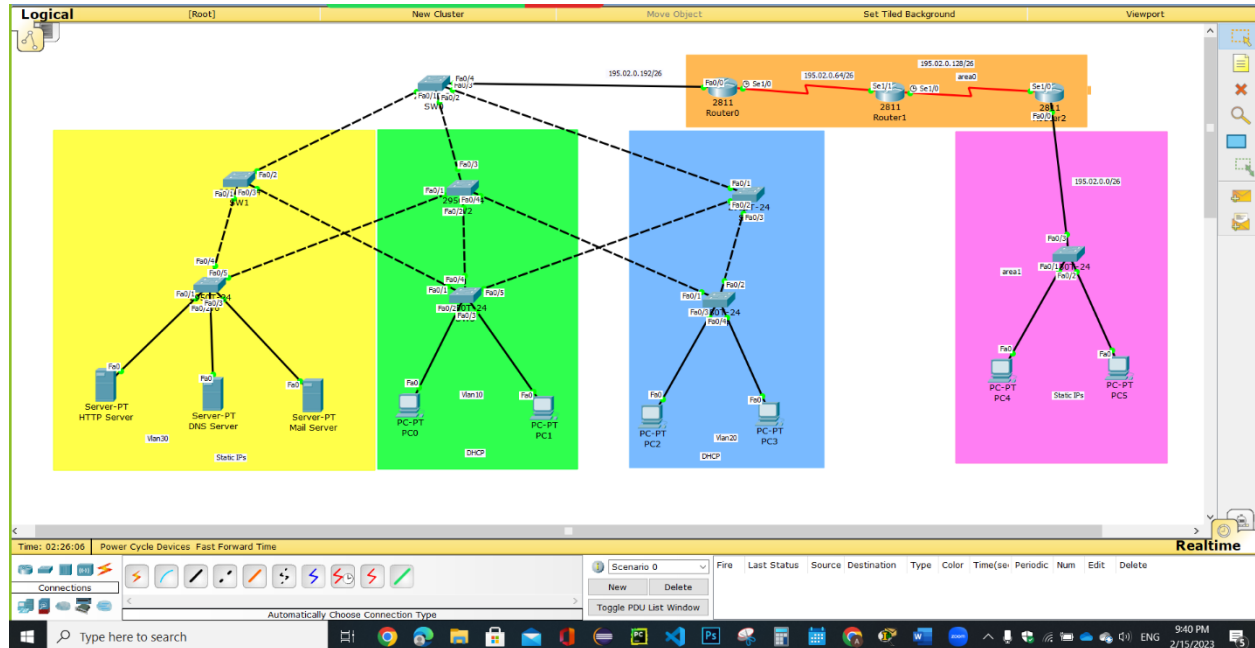
3<sup>rd</sup> Subnet: 195.02.0.128/26 (hosts 129-190)

4<sup>th</sup> Subnet: 195.02.0.192/26 (hosts 193-254)

Subnet mask: 255.255.255.192

## Part 1

Figure 1 shows the topology that was built using Packet Tracer software.



**Figure 1: The assignment of Subnets**

Figure 2 shows that the IP of Vlan10 is 192.02.0.193/28, the IP of Vlan20 is 192.02.0.209/28 and the IP of Vlan30 is 192.02.0.225/28.

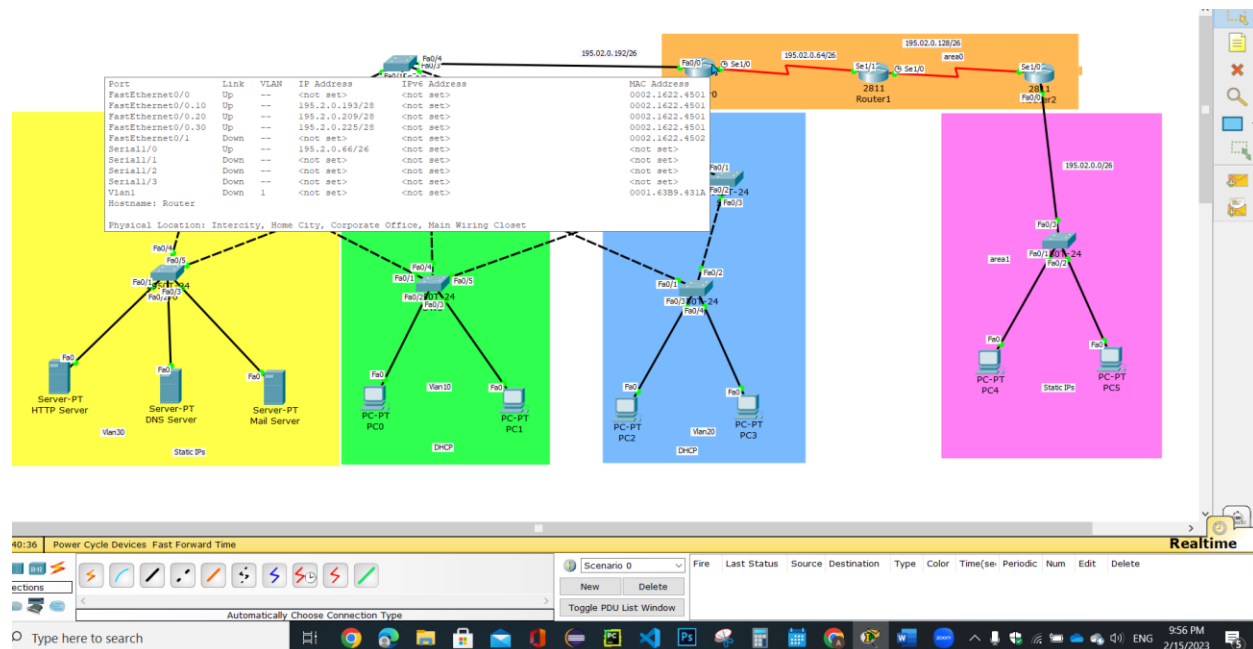


Figure 2: The Configuration of Router0

The commands that used to config router0 (these commands from IOS CLS that displayed by using show running-config command):

1. ip dhcp pool <p10>
2. network 195.2.0.192 255.255.255.240
3. default-router 195.2.0.193
4. dns-server 195.2.0.226
5. ip dhcp pool p20
6. network 195.2.0.208 255.255.255.240
7. default-router 195.2.0.209
8. spanning-tree mode pvst
9. !
10. !
11. !
12. !
13. !
14. !
15. interface FastEthernet0/0

```
16. no ip address
17. duplex auto
18. speed auto
19. !
20. interface FastEthernet0/0.10
21. encapsulation dot1Q 10
22. ip address 195.2.0.193 255.255.255.240
23. !
24. interface FastEthernet0/0.20
25. encapsulation dot1Q 20
26. ip address 195.2.0.209 255.255.255.240
27. !
28. interface FastEthernet0/0.30
29. encapsulation dot1Q 30
30. ip address 195.2.0.225 255.255.255.240
31. !
32. interface FastEthernet0/1
33. no ip address
34. duplex auto
35. speed auto
36. shutdown
37. !
38. interface Serial1/0
39. ip address 195.2.0.66 255.255.255.192
40. clock rate 2000000
41. !
42. interface Serial1/1
43. no ip address
44. clock rate 2000000
45. shutdown
46. !
47. interface Serial1/2
48. no ip address
49. clock rate 2000000
50. shutdown
51. !
52. interface Serial1/3
53. no ip address
54. clock rate 2000000
55. shutdown
56. !
57. interface Vlan1
58. no ip address
59. shutdown
60. !
61. router rip
62. version 2
63. redistribute ospf 1
64. network 195.2.0.0
65. no auto-summary
```

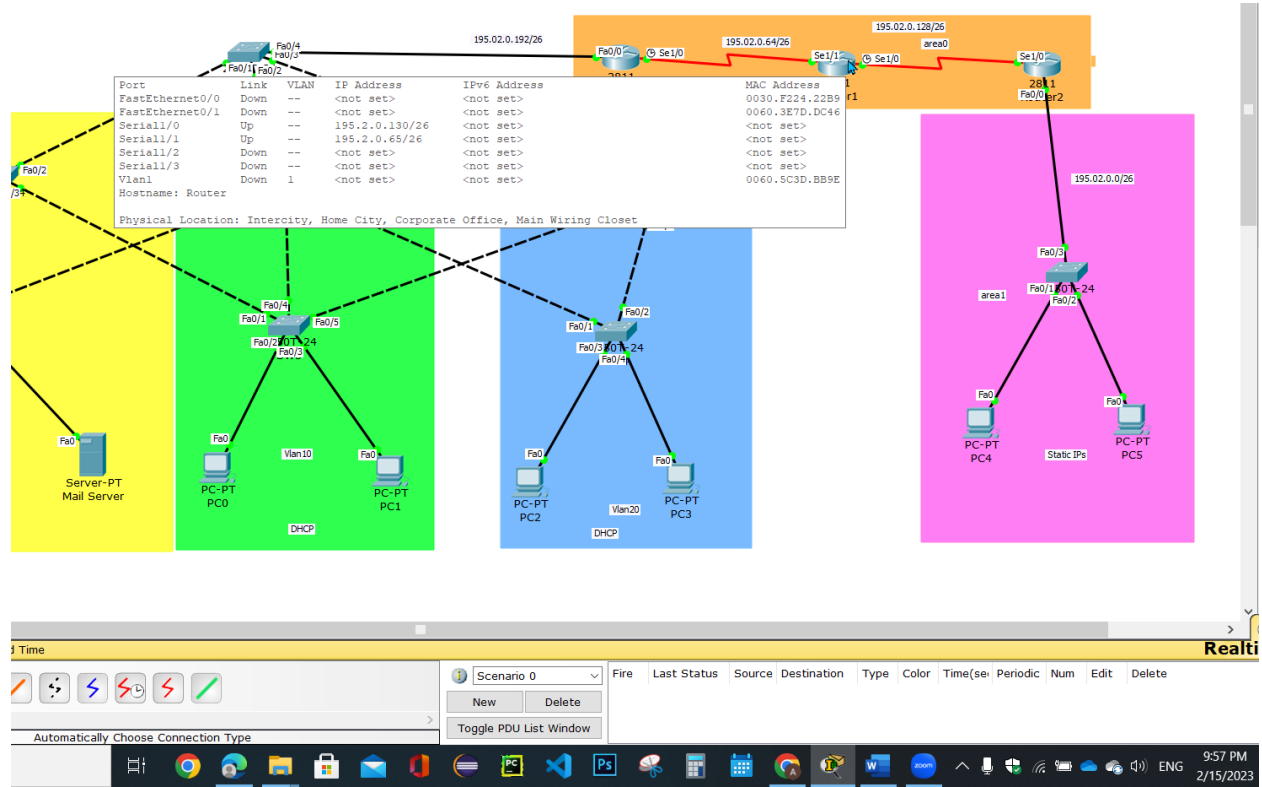


Figure 3: The Configuration of Router1

The commands that used to config router1 (these commands from IOS CLS that displayed by using show running-config command):

1. spanning-tree mode pvst
2. interface FastEthernet0/0
3. no ip address
4. duplex auto
5. speed auto
6. shutdown
7. !
8. interface FastEthernet0/1
9. no ip address
10. duplex auto
11. speed auto
12. shutdown
13. !
14. interface Serial1/0



```
15. ip address 195.2.0.130 255.255.255.192
16. clock rate 2000000
17. !
18. interface Serial1/1
19. ip address 195.2.0.65 255.255.255.192
20. !
21. interface Serial1/2
22. no ip address
23. clock rate 2000000
24. shutdown
25. !
26. interface Serial1/3
27. no ip address
28. clock rate 2000000
29. shutdown
30. !
31. interface Vlan1
32. no ip address
33. shutdown
34. !
35. router ospf 1
36. log-adjacency-changes
37. redistribute rip subnets
38. network 195.2.0.128 0.0.0.63 area 0
39. !
40. router rip
41. version 2
42. redistribute ospf 1 metric 1
43. network 195.2.0.0
44. no auto-summary
```

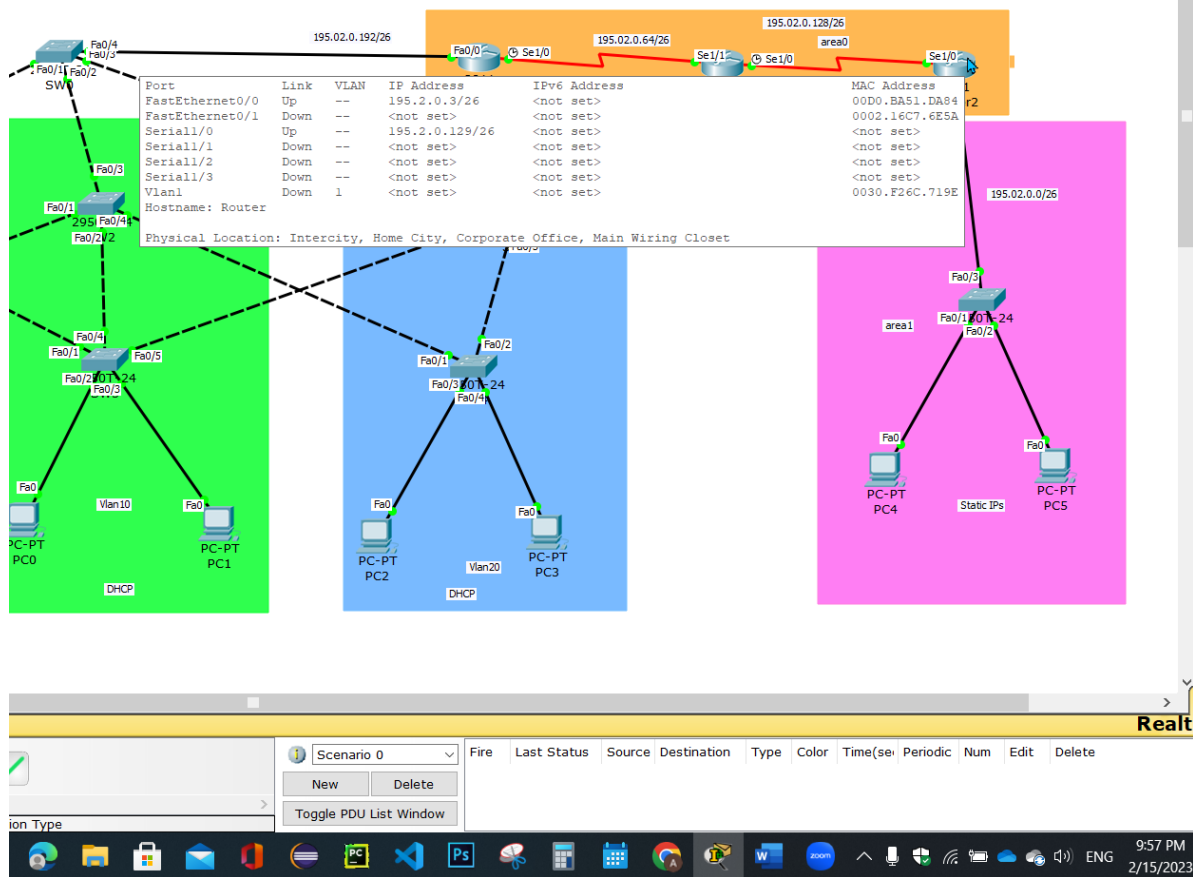


Figure 4: The Configuration of Router2

The commands that used to config router2 (these commands from IOS CLS that displayed by using show running-config command):

1. spanning-tree mode pvst
2. interface FastEthernet0/0
3. ip address 195.2.0.3 255.255.255.192
4. duplex auto
5. speed auto
6. !
7. interface FastEthernet0/1
8. no ip address
9. duplex auto
10. speed auto
11. shutdown

```
12. !
13. interface Serial1/0
14. ip address 195.2.0.129 255.255.255.192
15. !
16. interface Serial1/1
17. no ip address
18. clock rate 2000000
19. shutdown
20. !
21. interface Serial1/2
22. no ip address
23. clock rate 2000000
24. shutdown
25. !
26. interface Serial1/3
27. no ip address
28. clock rate 2000000
29. shutdown
30. !
31. interface Vlan1
32. no ip address
33. shutdown
34. !
35. router ospf 1
36. log-adjacency-changes
37. redistribute rip subnets
38. network 195.2.0.0 0.0.0.63 area 1
39. network 195.2.0.128 0.0.0.63 area 0
40.
```

## Part 2

Figure 5 shows the configuration of HTTP server.

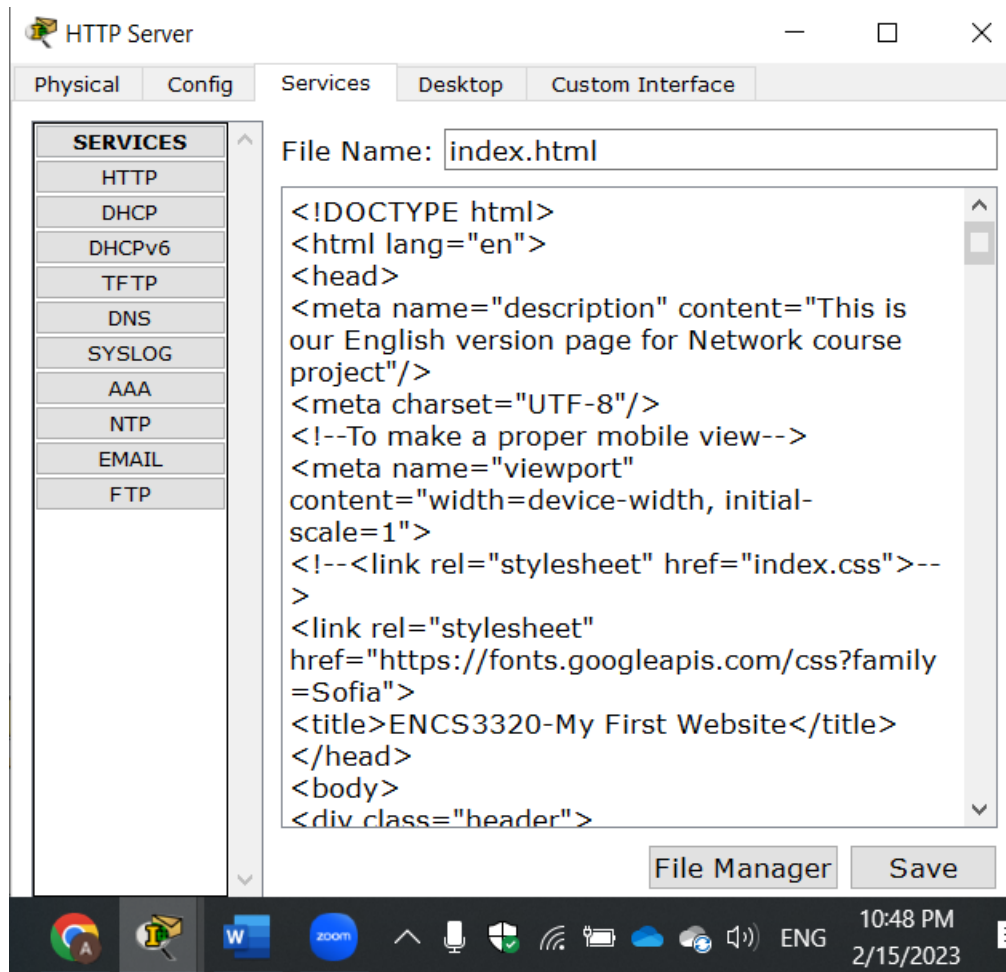


Figure 5: The Configuration of HTTP Server

Figure 6 shows the configuration of DNS server.

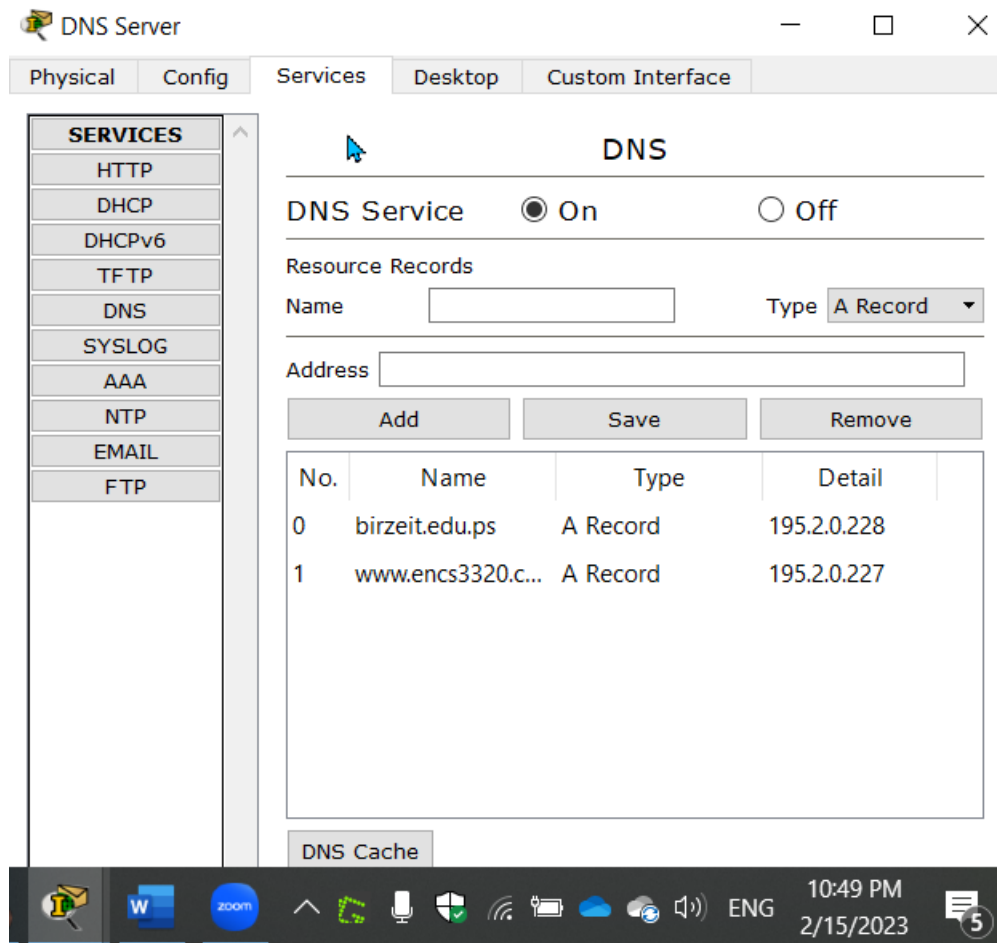


Figure 6: The Configuration of DNS Server

Figure 7 shows the configuration of email server.

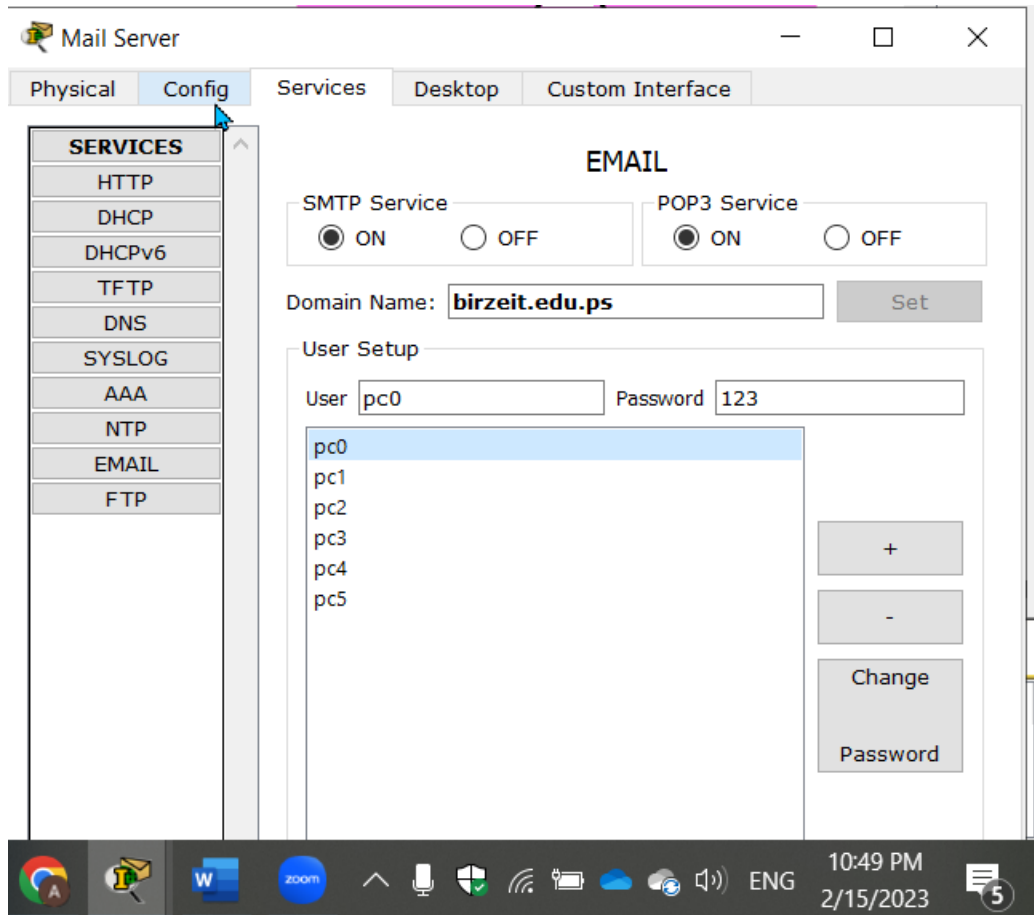


Figure 7: The Configuration of Email Server

The mode between two switches was set as trunk, the mode between switch and router was set as trunk, the mode between switch and pc was set as access and the proper vlan was set and the mode between switch and the server was set as access.

## Part 3

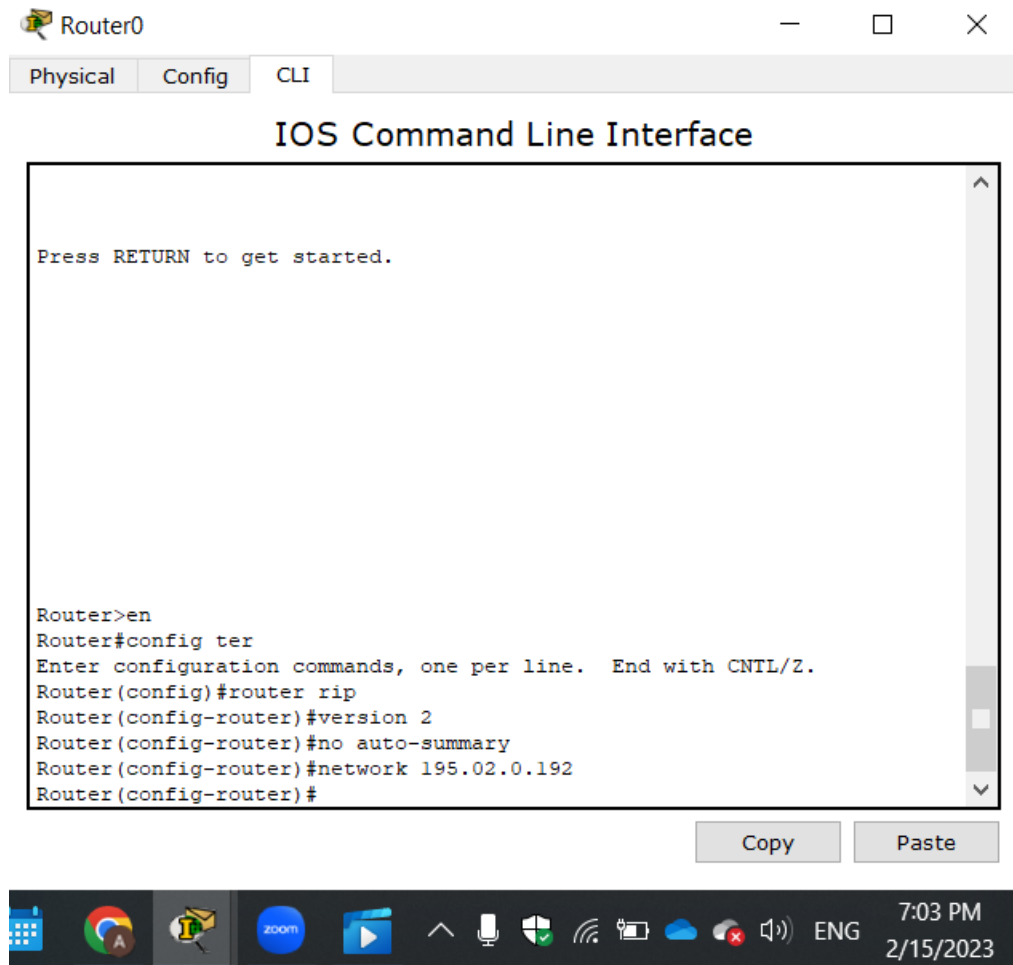


Figure 8: Applying the RIPv2 for Router0-Left Side

## Part 4

### Applying Ping and Tracert

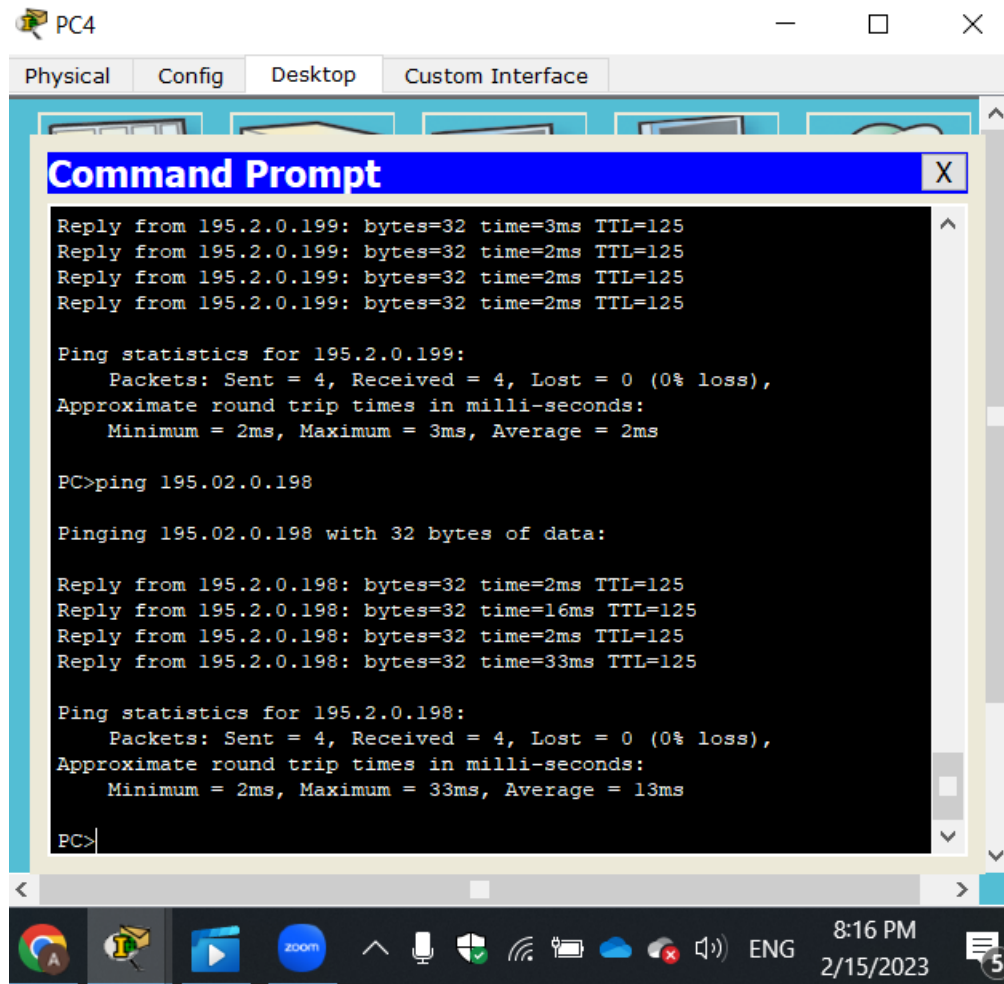


Figure 9: Pinging Pc0 from Pc4



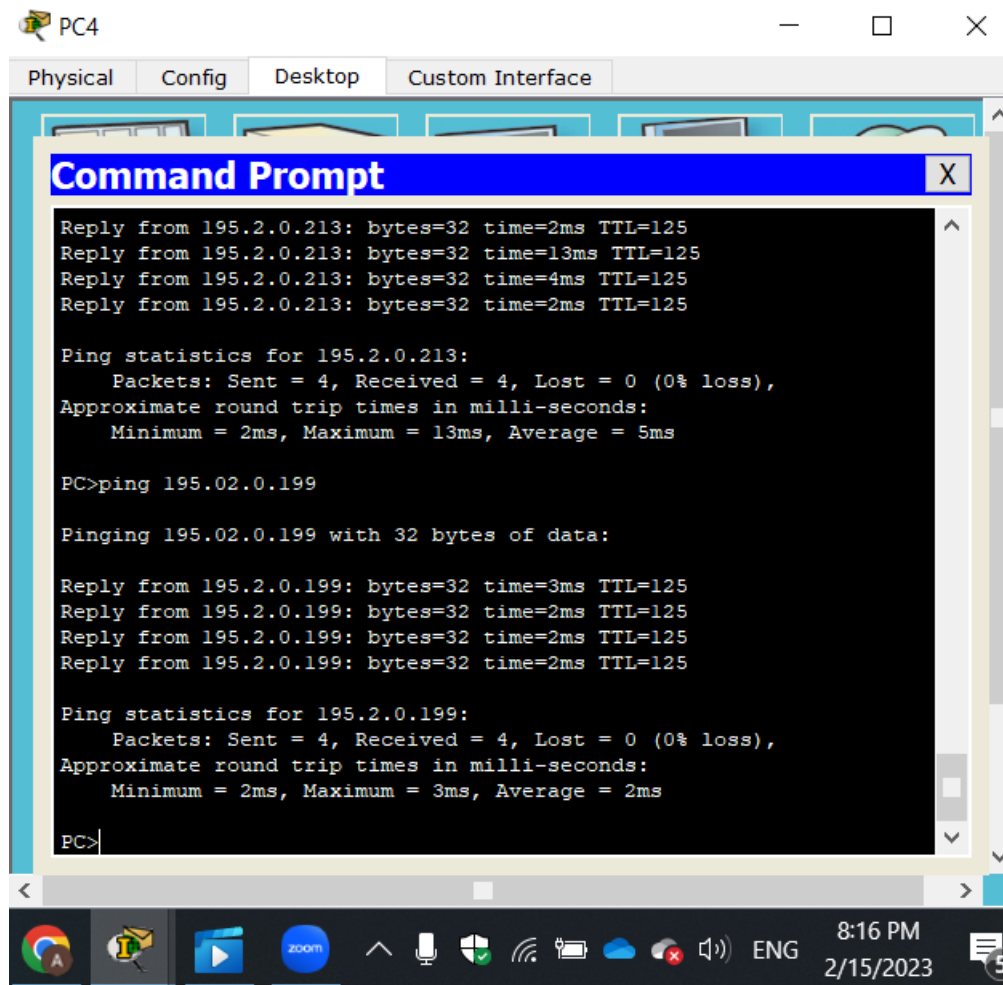


Figure 10: Pinging Pc1 from Pc4

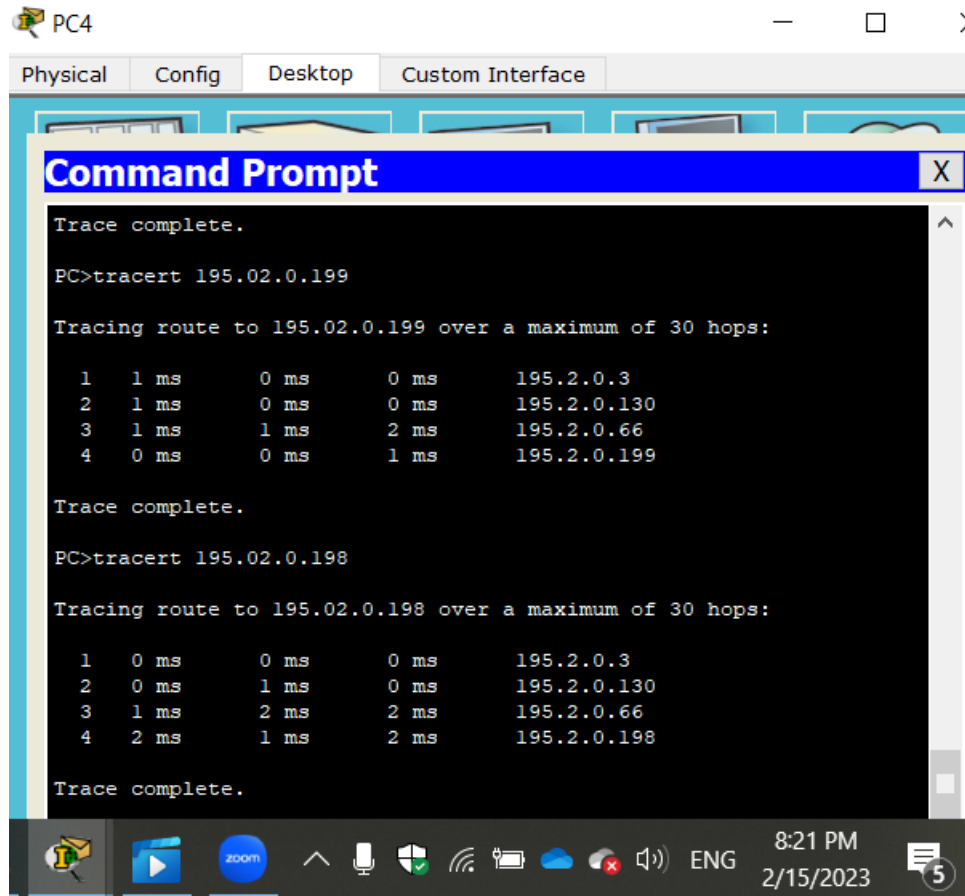


Figure 11: Applying Tracert to Pc0 and Pc1 from Pc4

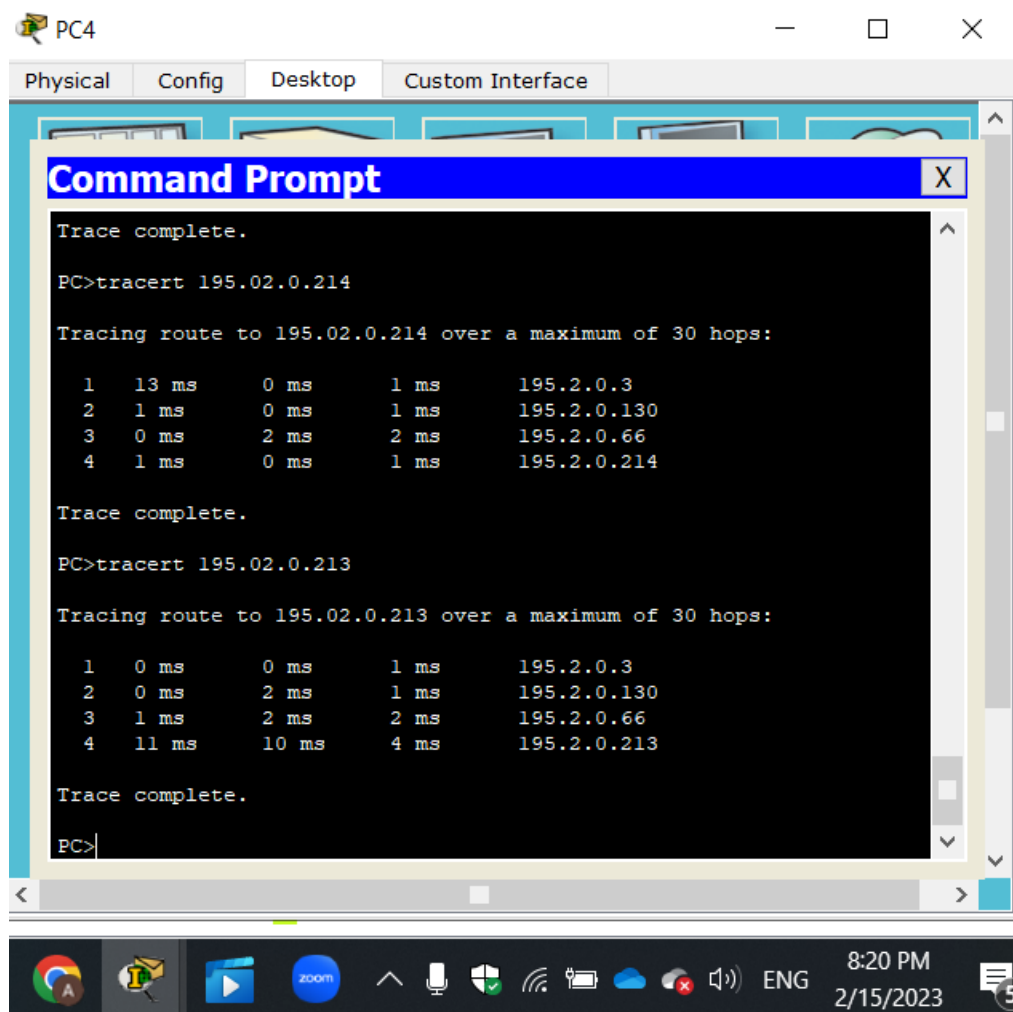


Figure 12: Applying Tracert to Pc2 from Pc4

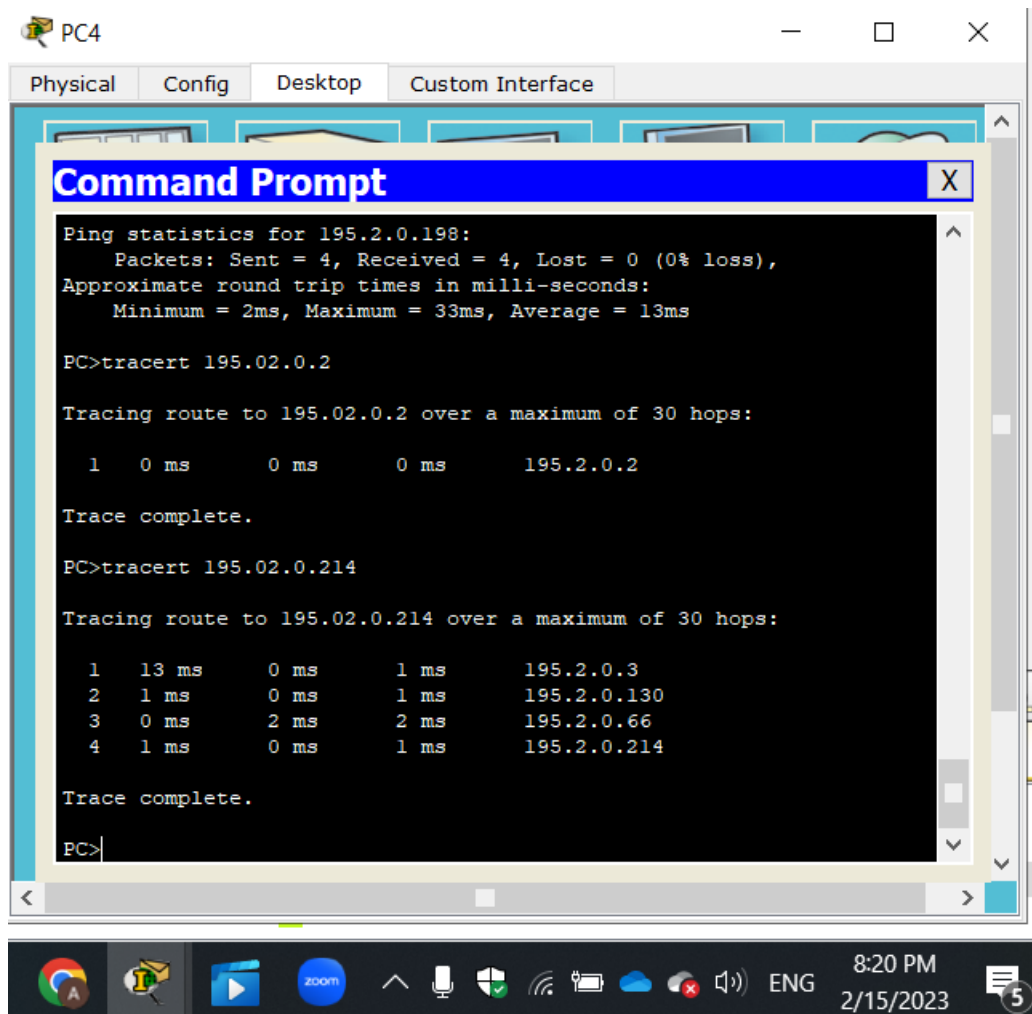


Figure 13: Applying Tracert to Pc3 from Pc4

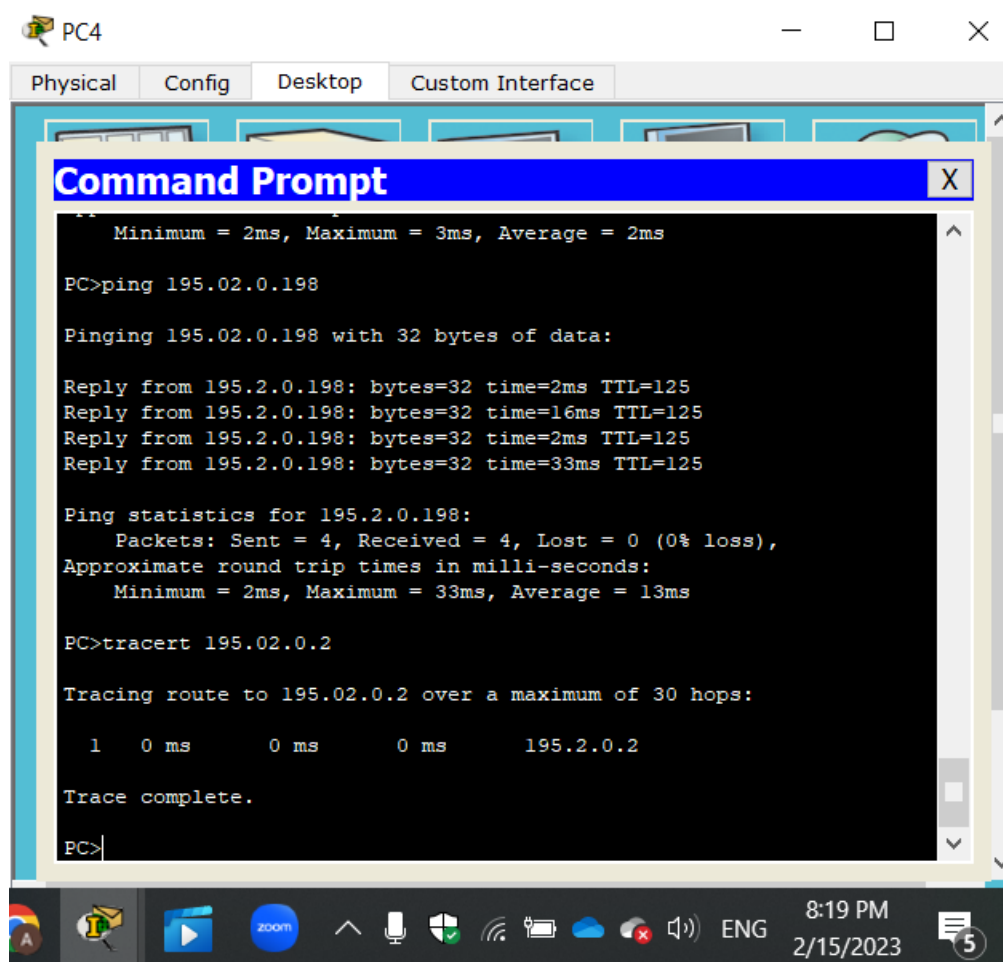


Figure 14: Applying Tracert to Pc5 from Pc4

## Access the website from all PCs

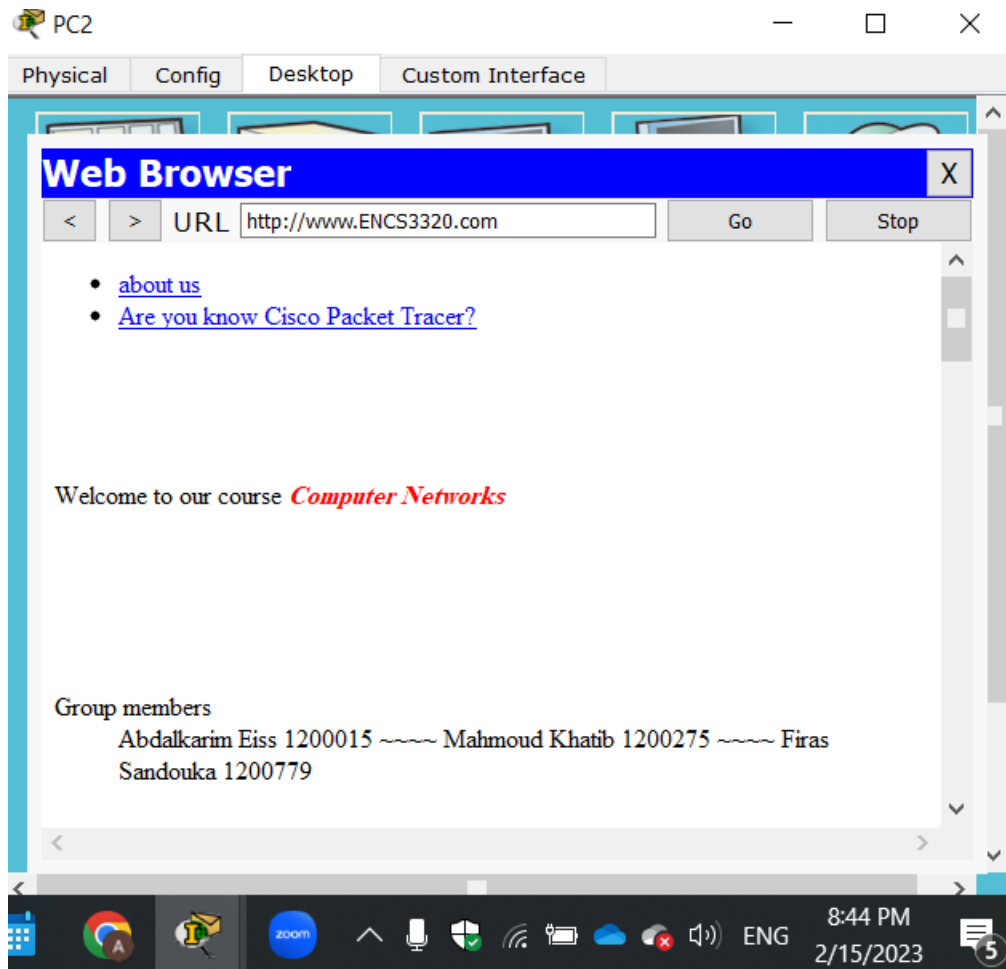


Figure 15: Access the Website from Pc2

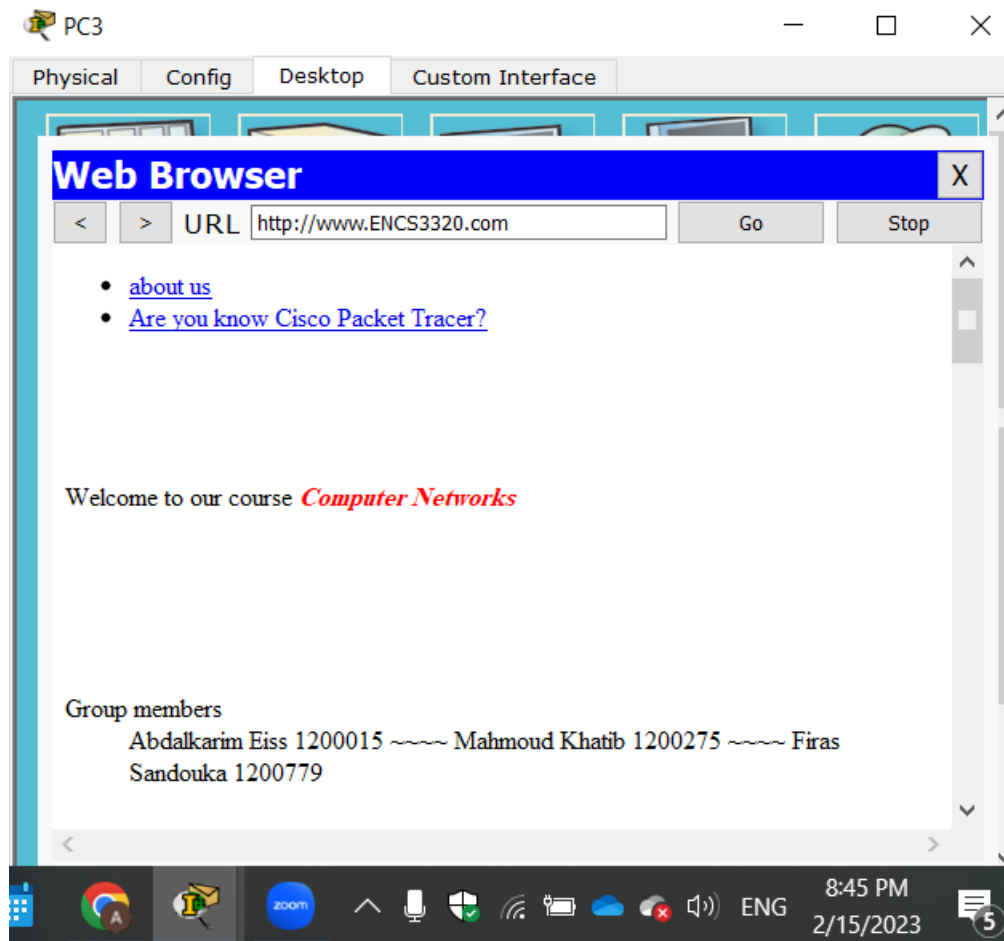


Figure 16: Access the Website from Pc3

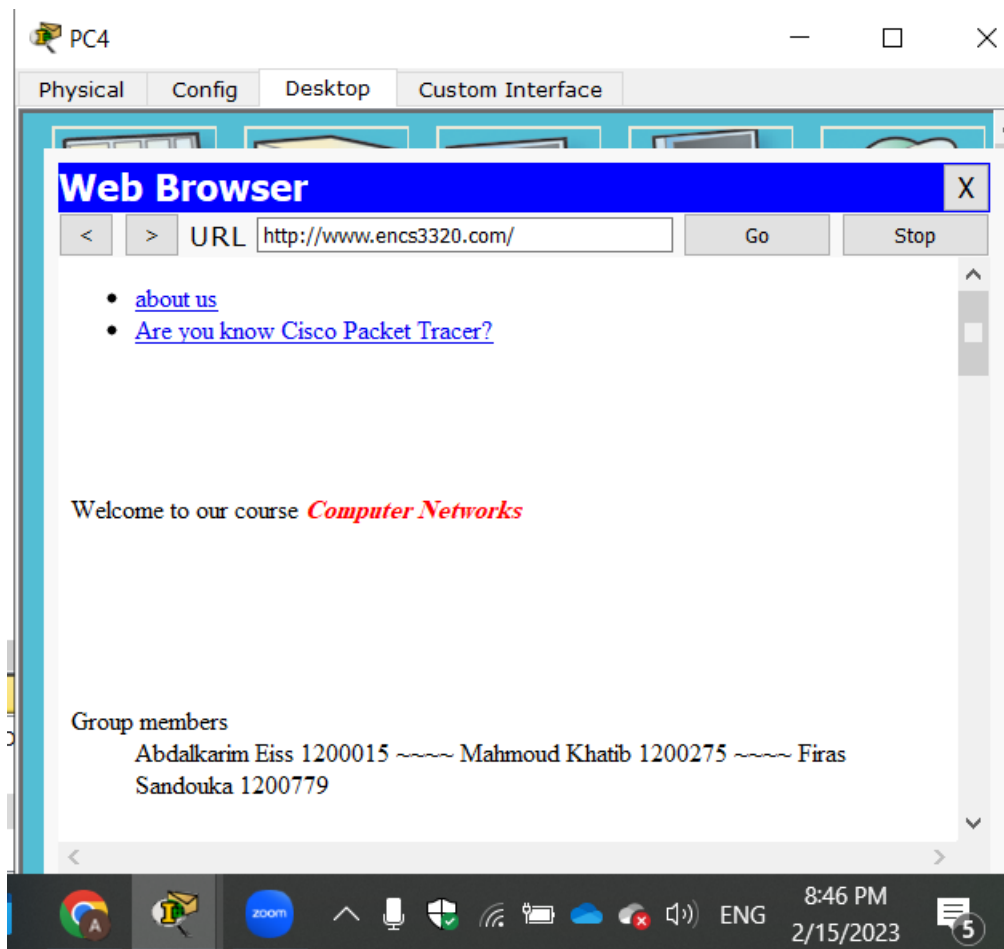


Figure 17: Access the Website from Pc4



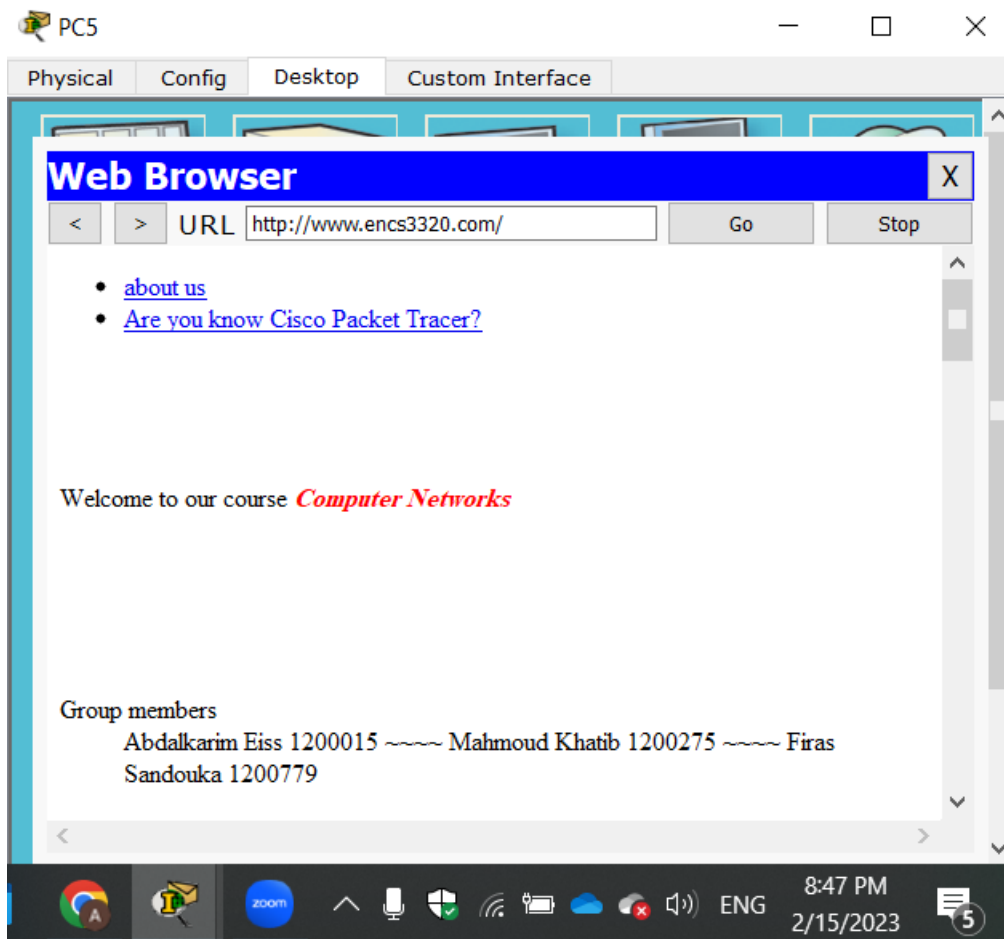


Figure 18: Access the Website from Pc5

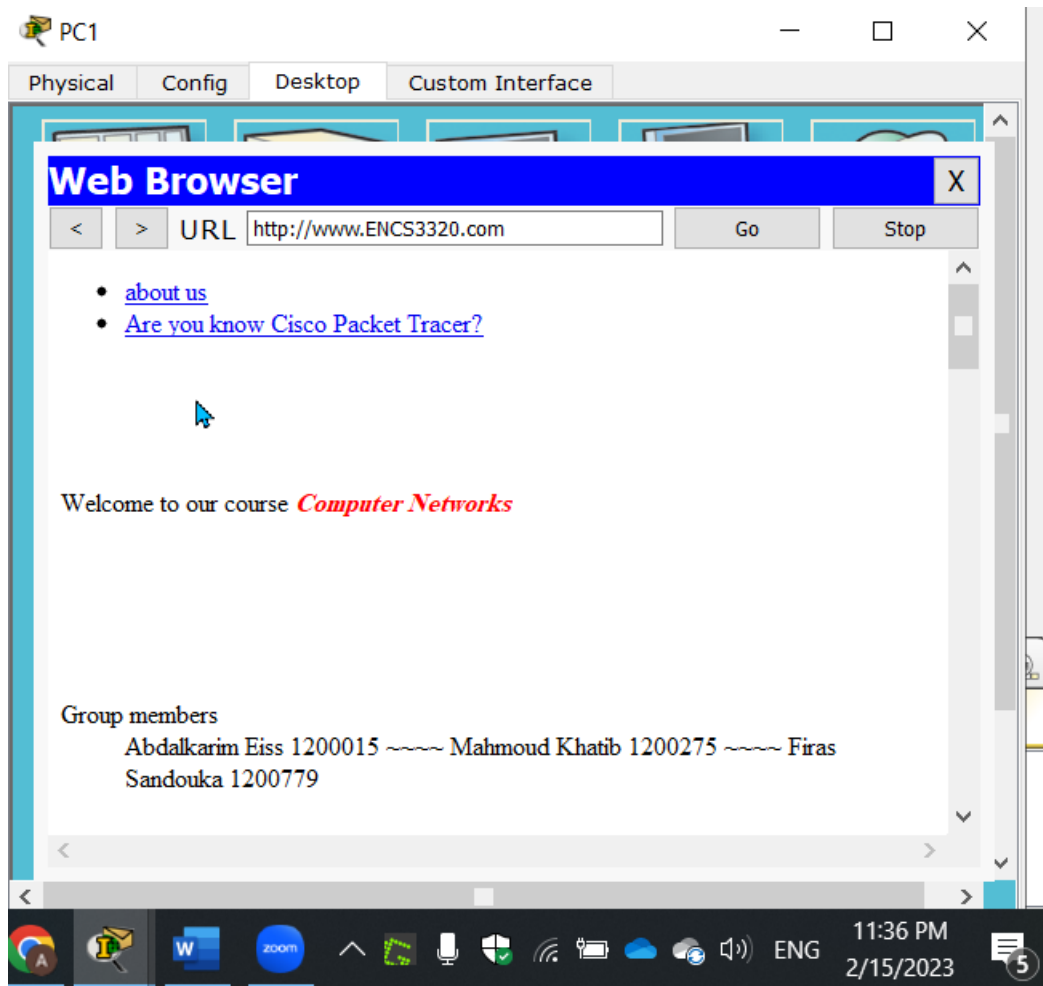


Figure 19: Access the Website from Pc1

## Sending an email

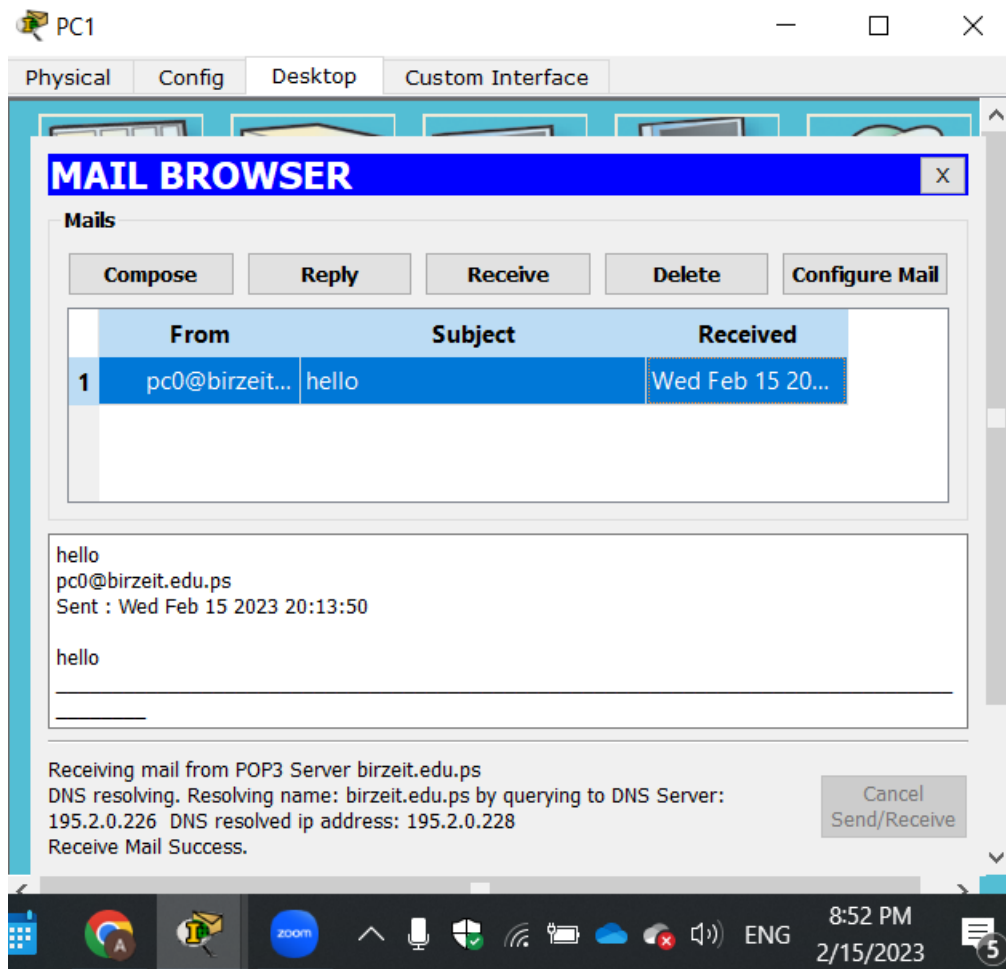


Figure 20: Receiving an Email from Pc0 to Pc1

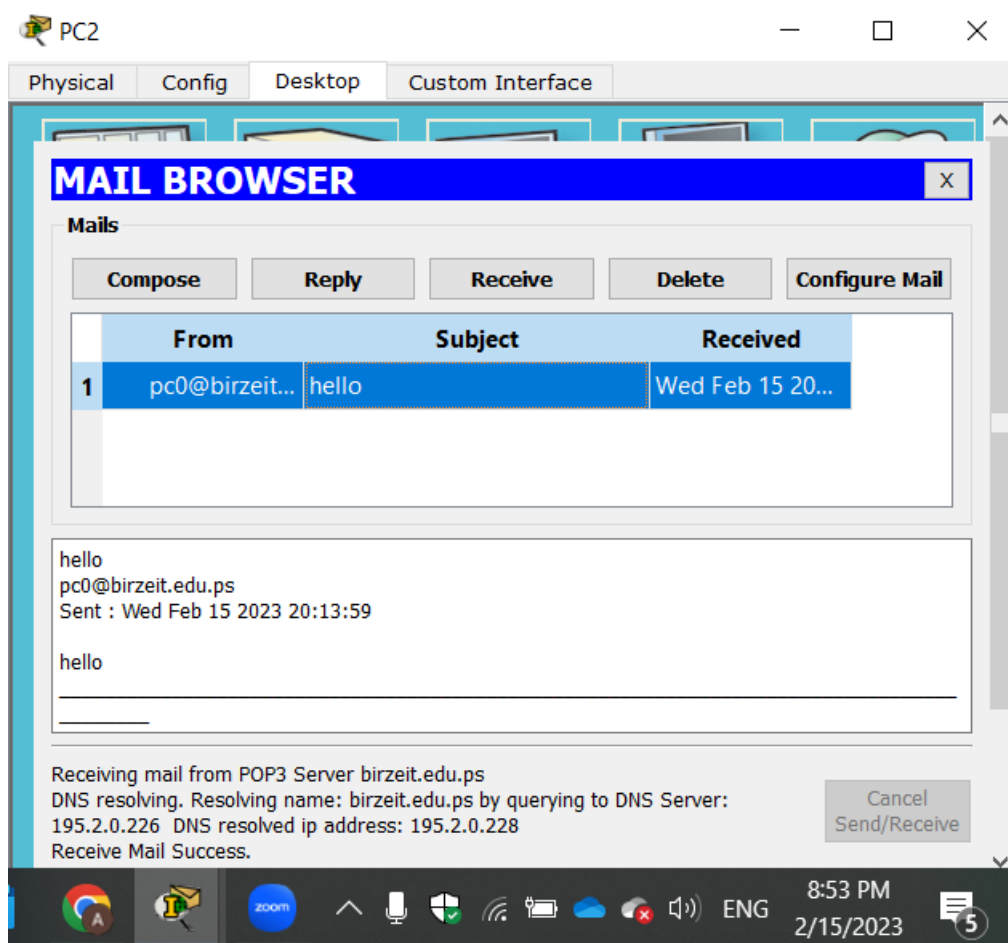


Figure 21: Receiving an Email from Pc0 to Pc2

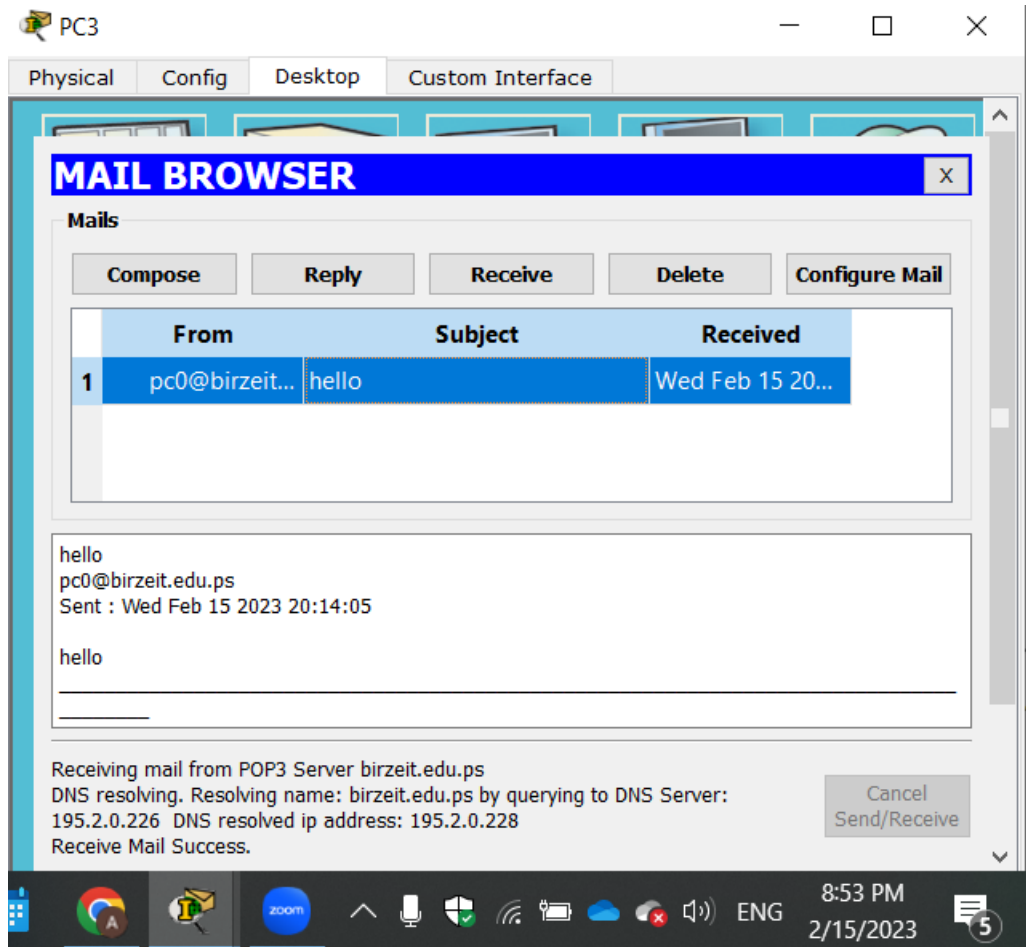


Figure 22: Receiving an Email from Pc0 to Pc3

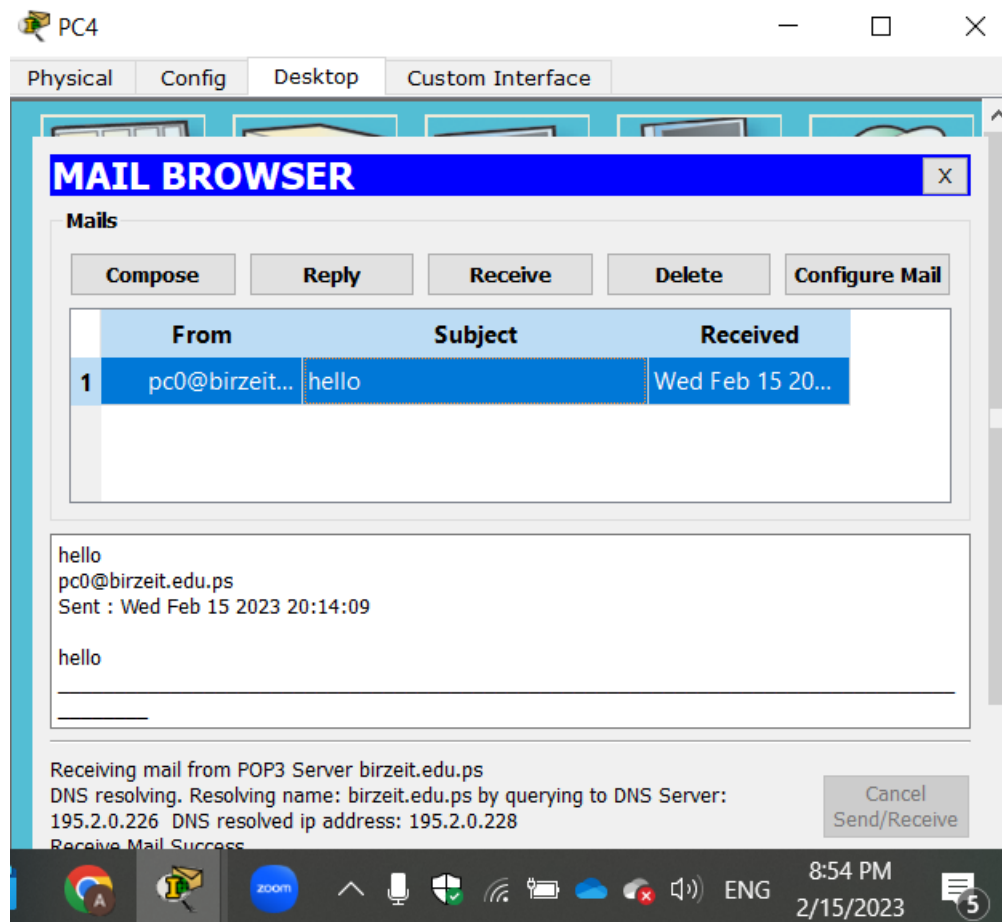


Figure 23: Receiving an Email from Pc0 to Pc4

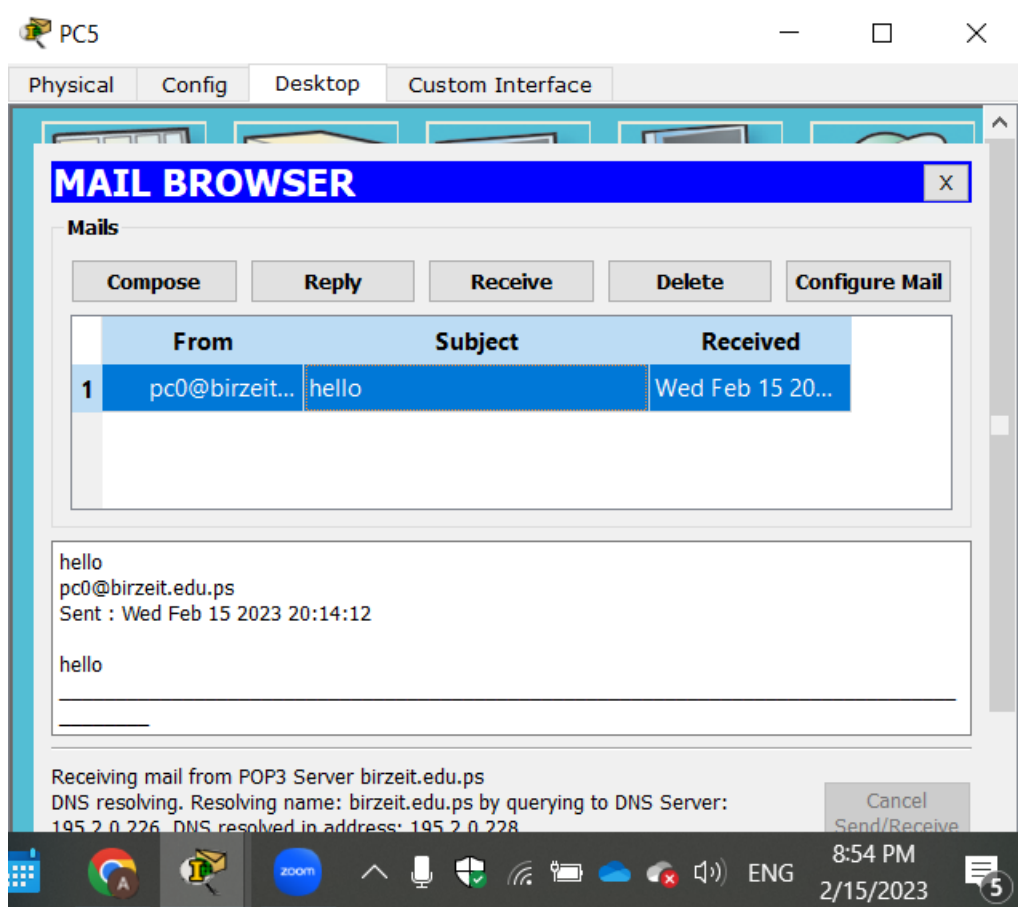


Figure 24: Receiving an Email from Pc0 to Pc5