

ĐẠI HỌC KHOA HỌC TỰ NHIÊN - ĐH QG TP.HCM
KHOA CÔNG NGHỆ THÔNG TIN

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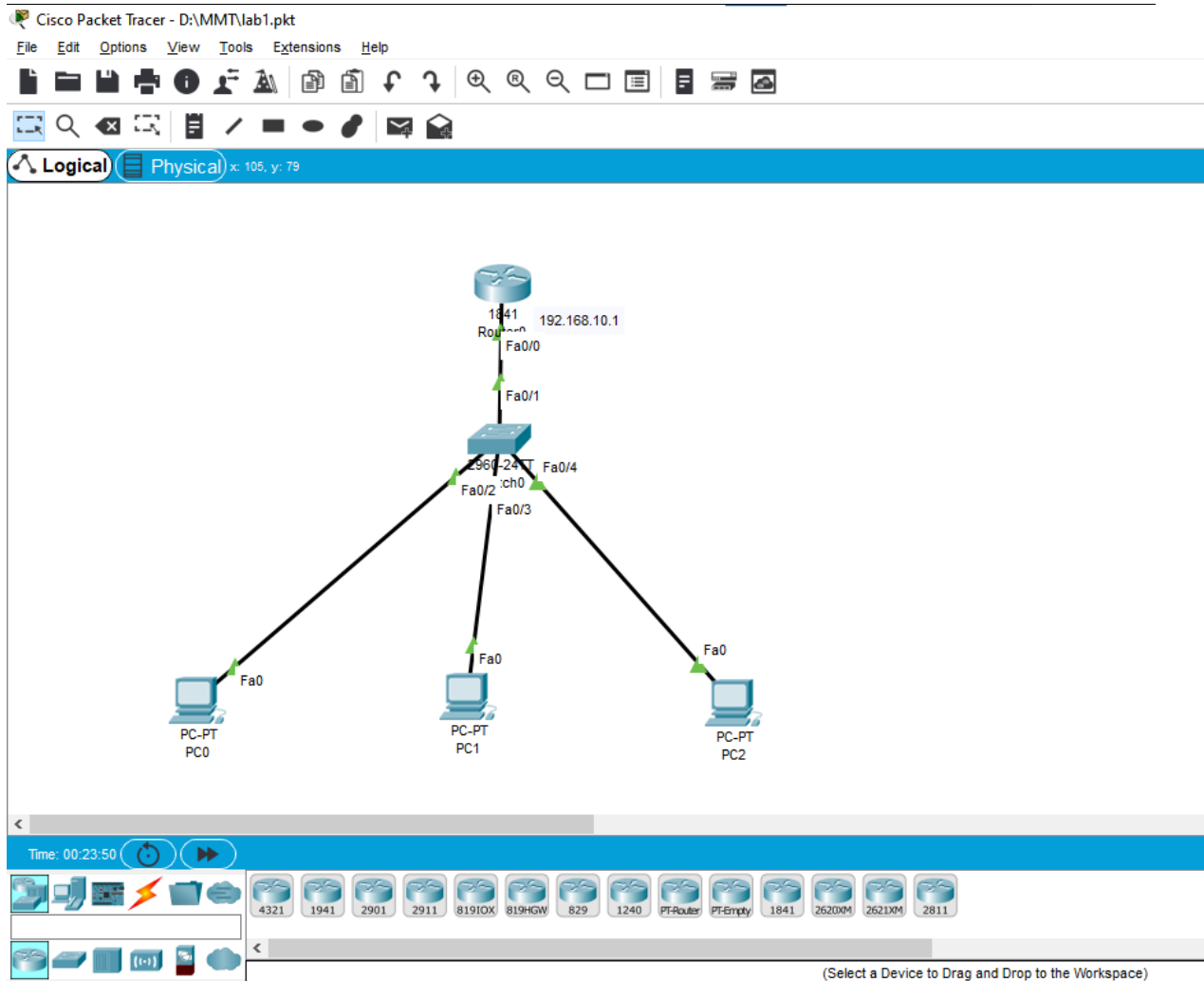
ĐỒ ÁN 3: PACKET TRACER
MÔN: MẠNG MÁY TÍNH

THÔNG TIN THÀNH VIÊN NHÓM

STT	HỌ VÀ TÊN	MSSV
1	NGUYỄN TRẦN NGỌC VINH	19120720
2	TRẦN NGỌC VỸ	19120731

TRẢ LỜI CÂU HỎI

Lab 1: DHCP configuration on CISCO router



- Trước tiên ta cần cài địa chỉ ip tĩnh cho các cổng của router:
 - + Mở tag CLI của router, vào gõ đoạn code sau vào để bắt đầu cài đặt cấu hình ip và dhcp cho router.

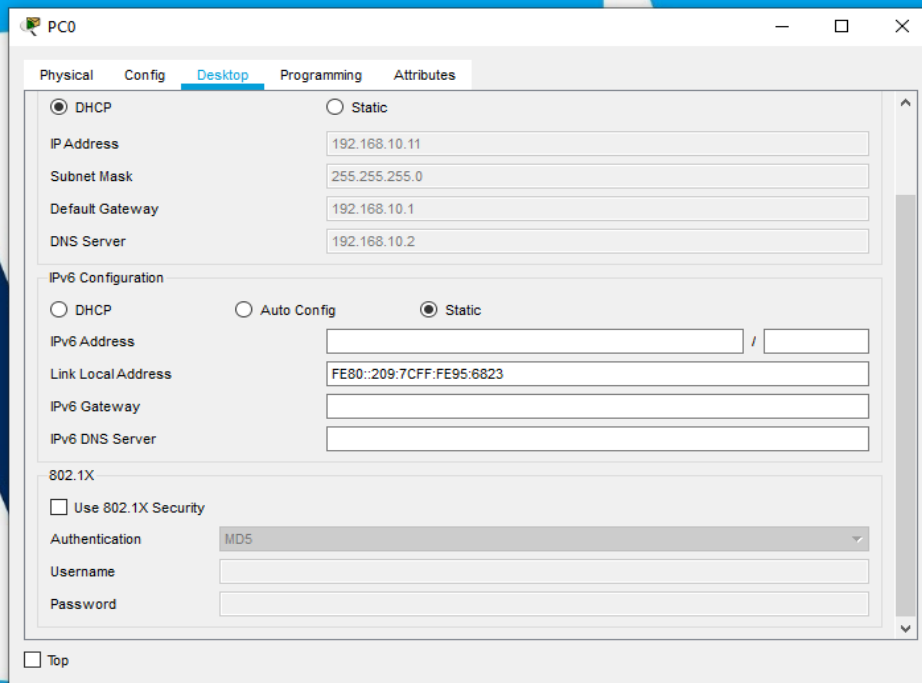
```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 192.168.10.1 255.255.255.0
Router(config-if)#exit
Router(config)#ip dhcp pool dhclab
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#dns-server 192.168.10.2
Router(dhcp-config)#exit
Router(config)#ip dhcp excluded-address 192.168.10.1 192.168.10.10
Router(config)#ip dhcp excluded-address 192.168.10.248 192.168.10.254
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#configure terminal
```

- + Sau khi thực hiện đoạn code trên xong thì ta chọn tag config, trong phần interface ➡ fastEthernet0/0 ➡ On.

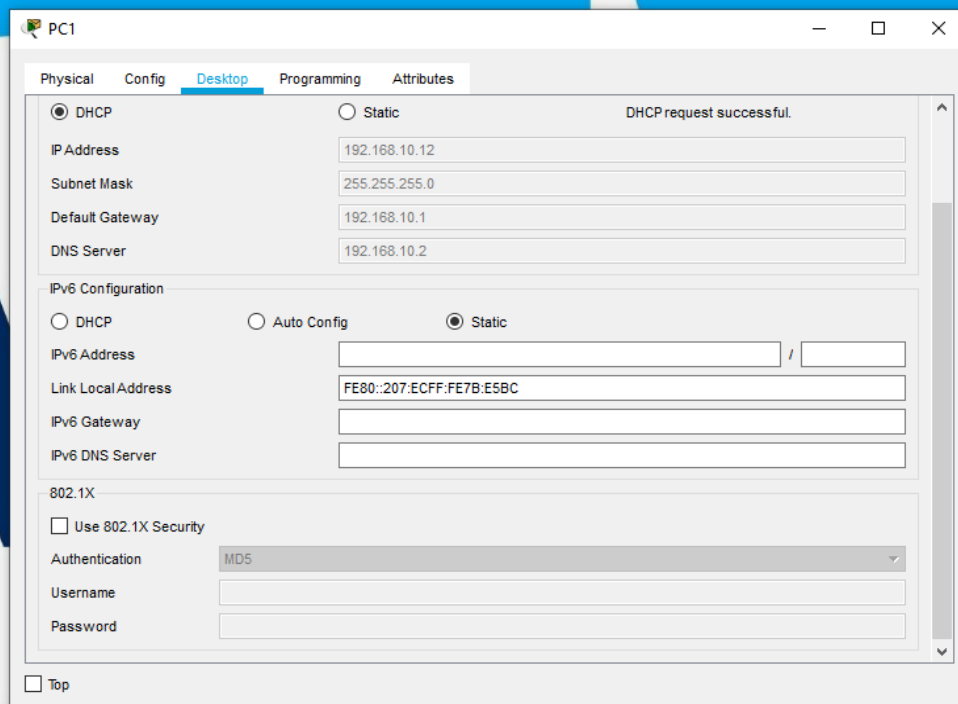
1. What is the IP addresses of PC0, PC1, PC2 which were acquired from DHCP?

PC0: 192.168.10.11



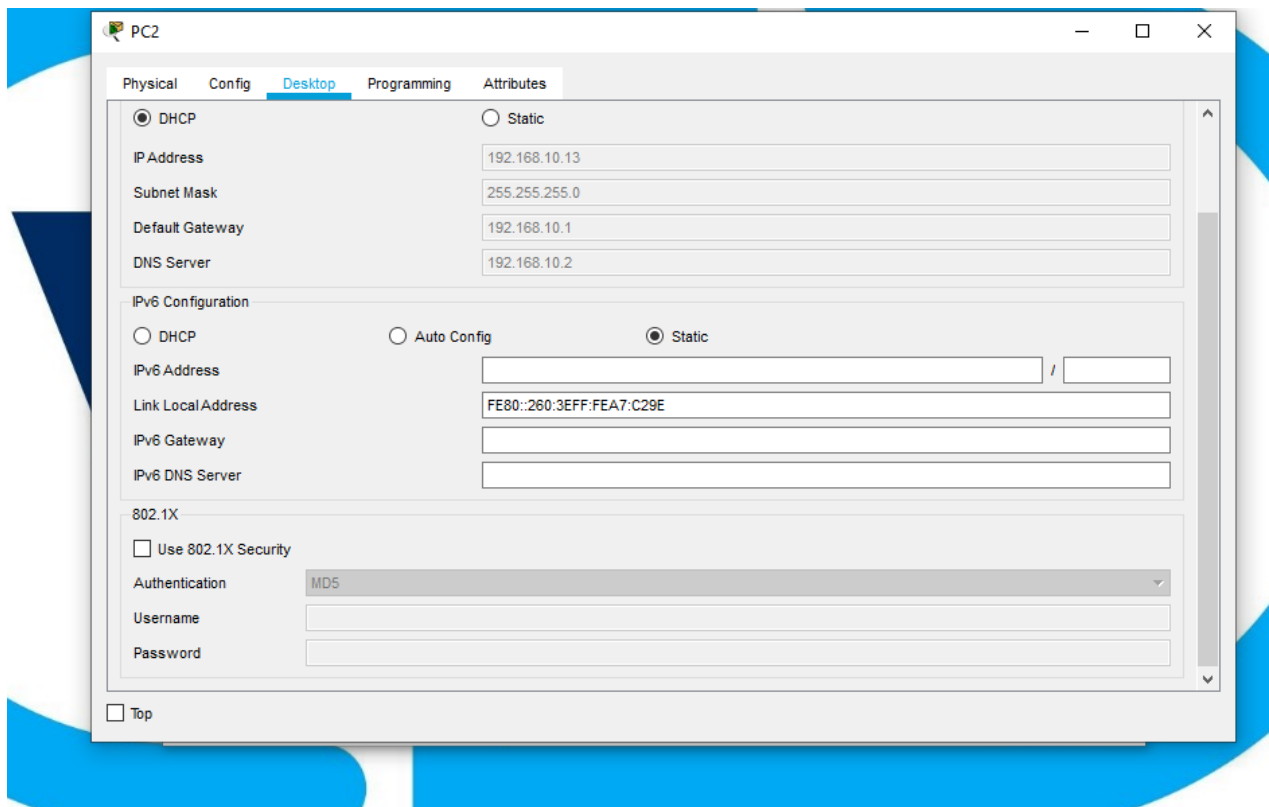
The screenshot shows the 'PC0' configuration window with the 'Desktop' tab selected. The 'DHCP' radio button is selected under the IP configuration section. The IP Address is 192.168.10.11, Subnet Mask is 255.255.255.0, Default Gateway is 192.168.10.1, and DNS Server is 192.168.10.2. The IPv6 Configuration section shows 'Static' selected, with IPv6 Address, Link Local Address (FE80::209:7CFF:FE95:6823), IPv6 Gateway, and IPv6 DNS Server fields. The 802.1X section shows 'Use 802.1X Security' unchecked, Authentication set to MD5, and empty Username and Password fields. A 'Top' button is at the bottom left.

PC1:192.168.10.12



The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'DHCP' radio button is selected under the IP configuration section. The IP Address is 192.168.10.12, Subnet Mask is 255.255.255.0, Default Gateway is 192.168.10.1, and DNS Server is 192.168.10.2. The IPv6 Configuration section shows 'Static' selected, with IPv6 Address, Link Local Address (FE80::207:ECFF:FE7B:E5BC), IPv6 Gateway, and IPv6 DNS Server fields. The 802.1X section shows 'Use 802.1X Security' unchecked, Authentication set to MD5, and empty Username and Password fields. A 'Top' button is at the bottom left. A status message 'DHCP request successful.' is displayed in the top right corner.

PC2:192.168.10.13



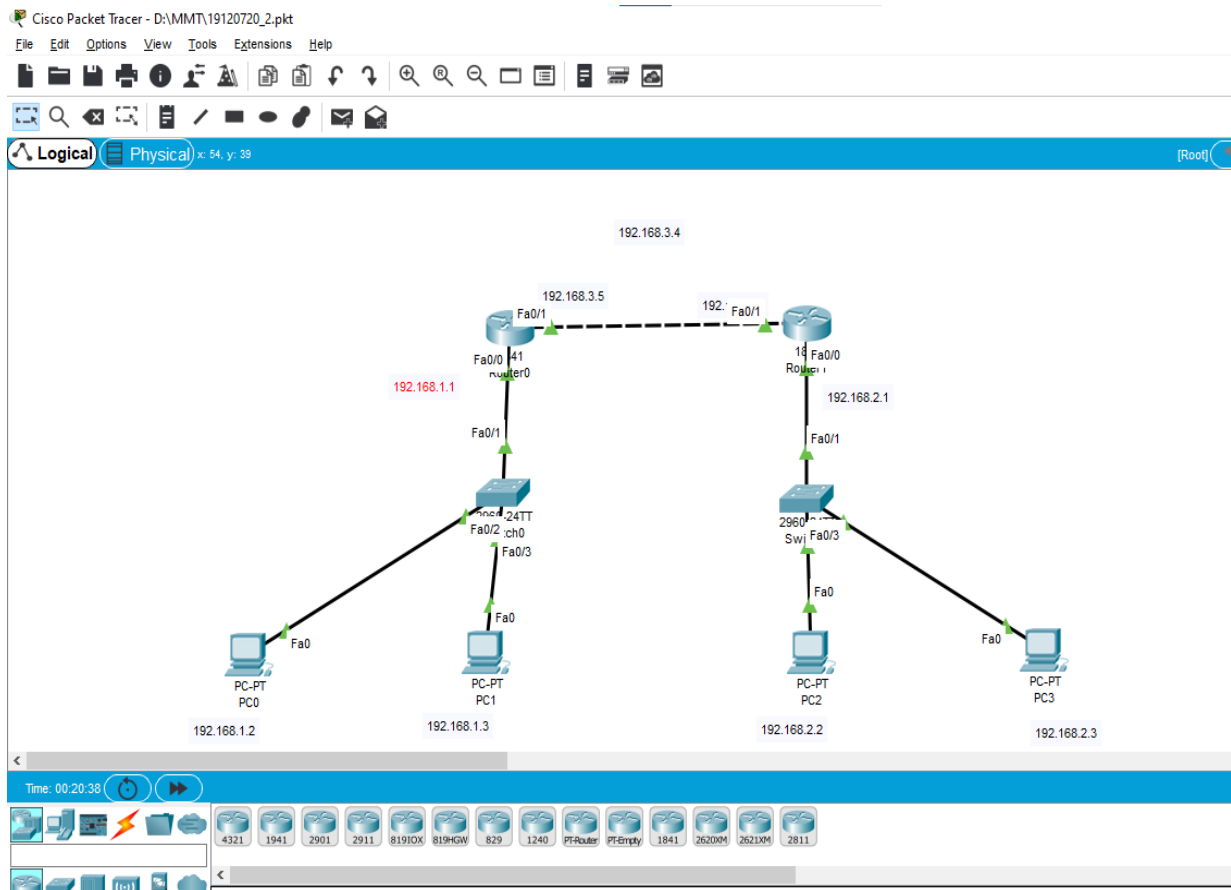
2. What is the gateway addresses of PC0, PC1, PC2?

Gateway address của PC0,PC1,PC2 giống là: 192.168.10.1 (hình trên)

3. Which server is the DNS server for PC0, PC1, PC2?

DNS server của PC0,PC1,PC2: có địa chỉ IP là 192.168.10.2 (hình trên).

Lab 2: Static routing implementation



Trước tiên, ta cần cấu hình địa chỉ IP tĩnh cho các router (mô tả cấu hình cho router R0, R1 tương tự). Vào tag Config ➡ interface, cấu hình tĩnh cho từng interface như hình bên dưới.

- Router R0

The screenshot shows the configuration window for Router0. The 'Config' tab is active, and the 'INTERFACE' section is selected. The 'FastEthernet0/0' interface is highlighted. The configuration fields are as follows:

Field	Value
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.6334.3101
IP Configuration	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Equivalent IOS Commands:

```
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

- Router R1

The screenshot shows the configuration window for Router1. The 'Config' tab is active, and the 'INTERFACE' section is selected. The 'FastEthernet0/0' interface is highlighted. The configuration fields are as follows:

Field	Value
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00D0.FF44.9A01
IP Configuration	
IP Address	192.168.2.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

Equivalent IOS Commands:

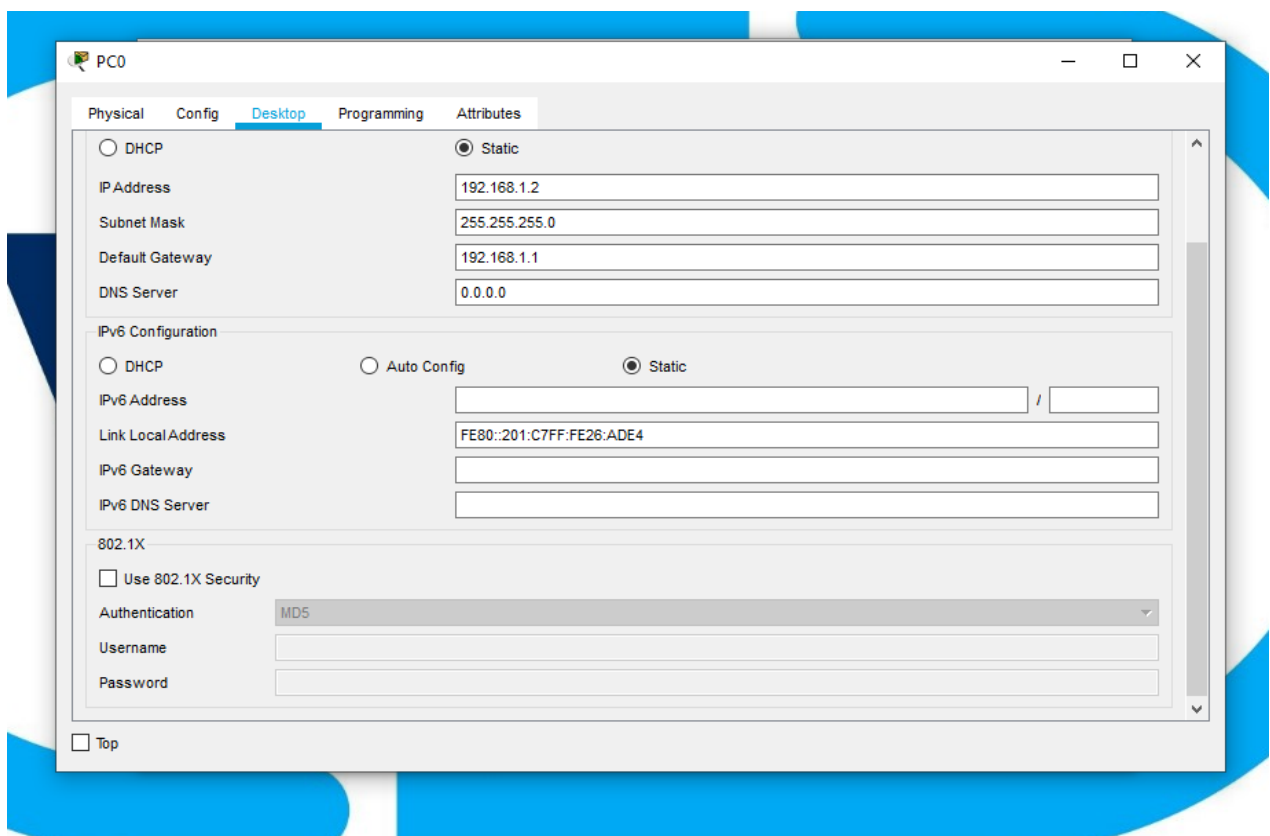
```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
```


Sau khi cài đặt xong cấu hình cho các router, tiếp tục cài đặt IP tĩnh cho các máy tính:

- Chọn máy tính cần cài IP, vào tab Desktop IP configuration Static điền lần lượt tương ứng với bảng bên dưới:

STT	IP address	Subnet mask	Default Gateway
PC0	192.168.1.2	255.255.255.0	192.168.1.1
PC1	192.168.1.3	255.255.255.0	192.168.1.1
PC2	192.168.2.2	255.255.255.0	192.168.2.1
PC3	192.168.2.3	255.255.255.0	192.168.2.1

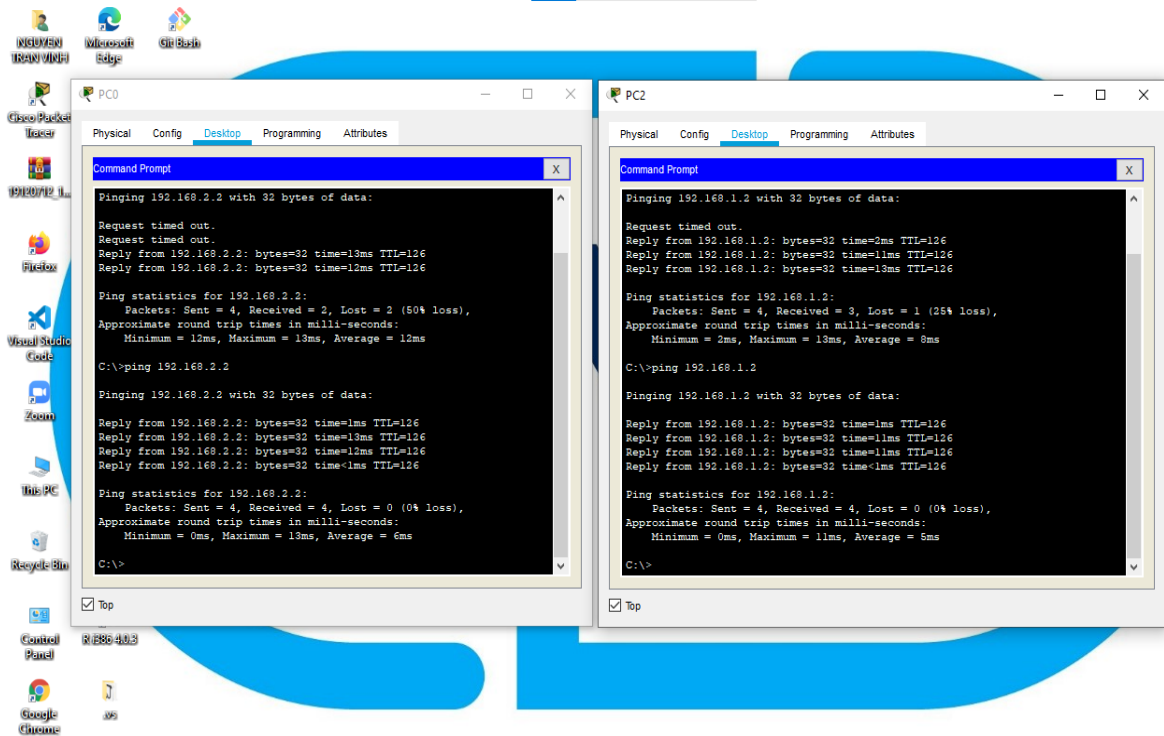
- Ví dụ PC0 (Các PC1,2,3 tương tự)



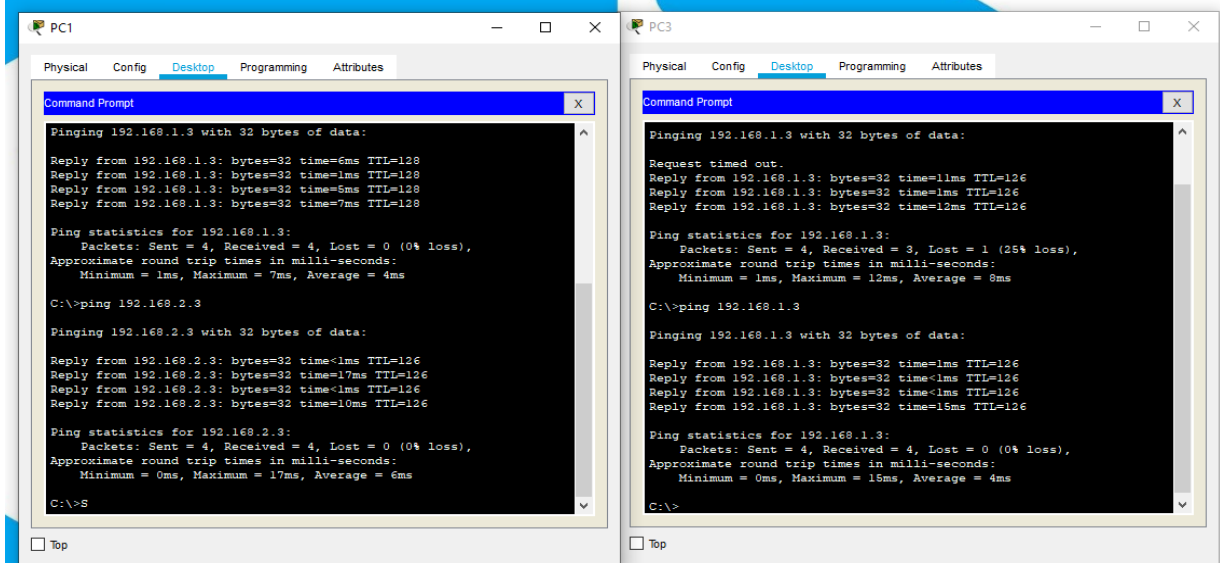
Hình ảnh 1. Cấu hình ip tĩnh cho PC0

1. Execute ping commands and take screenshots the ping result between PC0 and PC2, PC3 and PC1

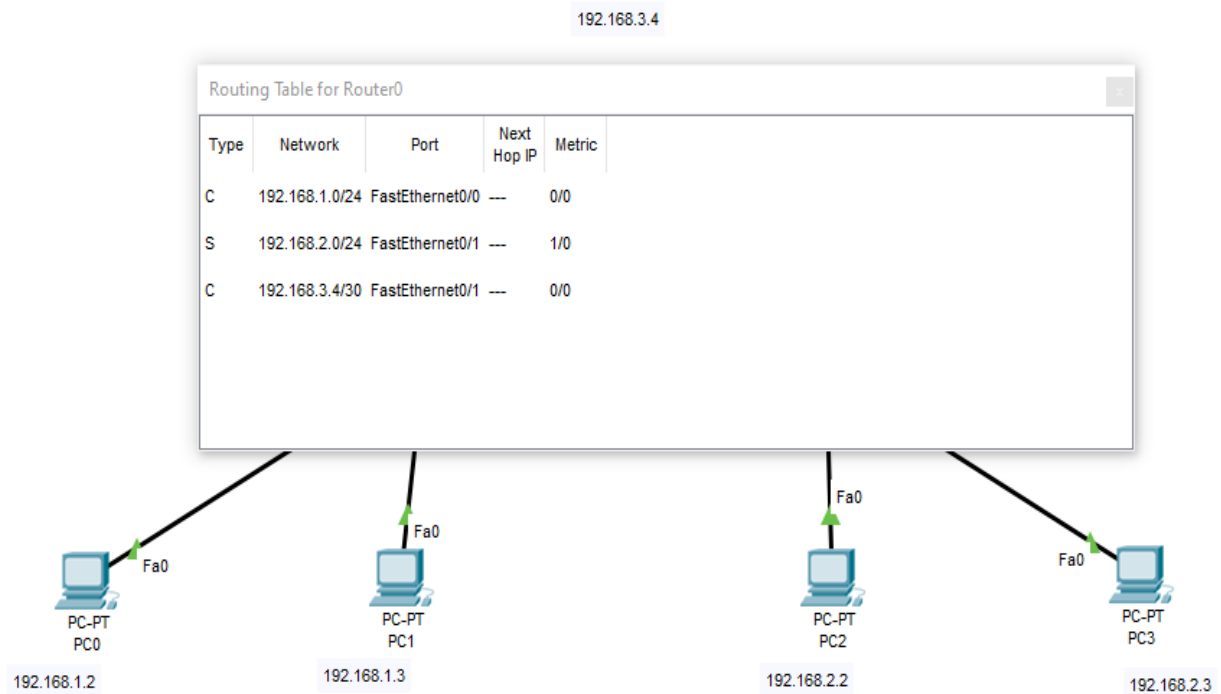
- Ping from PC0 & PC2



- Ping PC3 & PC1:



2. Show the routing table of the router R0 (can use command or GUI to get the routing table).



3. Which line in the routing table is configured by static route? What is the administrative distance (AD) and the metric of the static route?

The line in the routing table is configured by static route:

S 192.168.2.0/24 FastEthernet0/1.

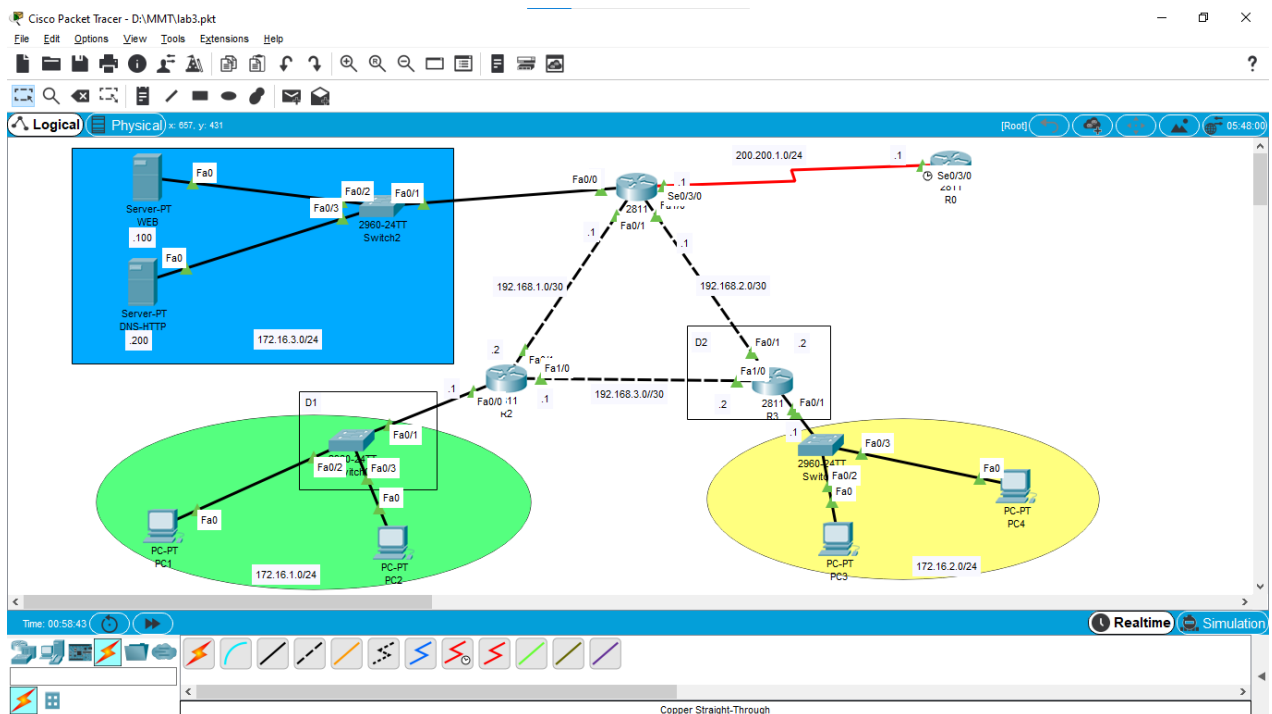
- The administrative distance (AD) of the static route: 1.

- The metric of the static route: 1.

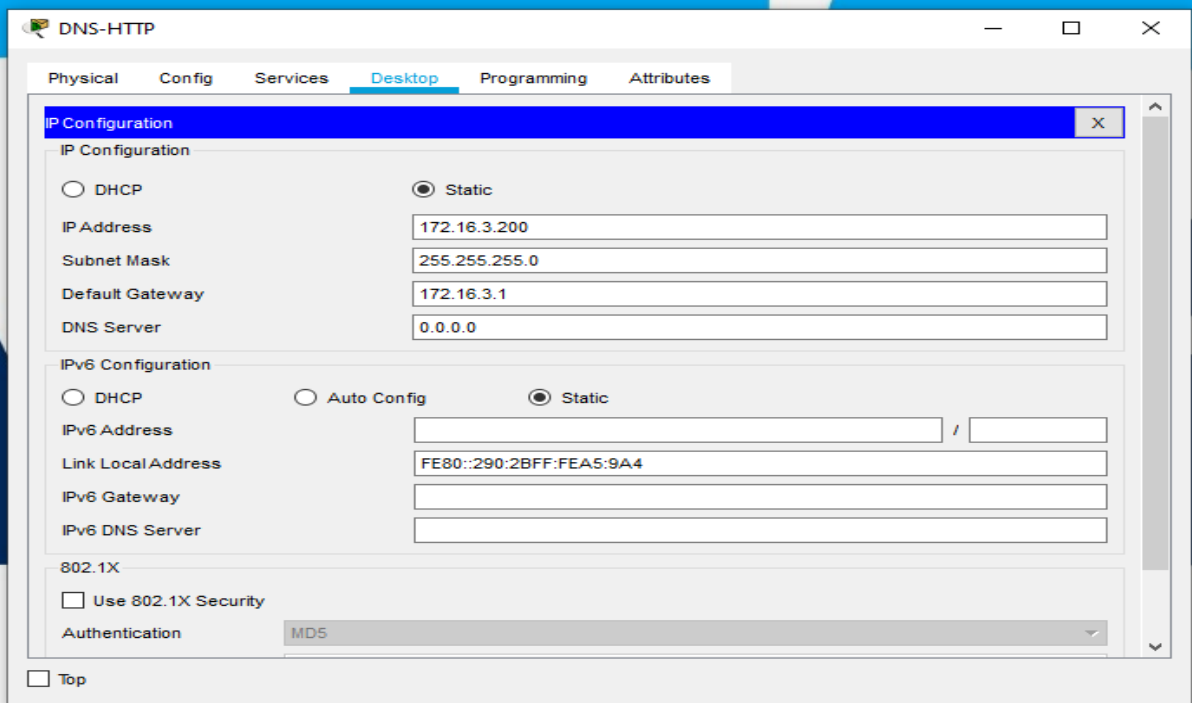
Routing Table for Router0				
Type	Network	Port	Next Hop IP	Metric
C	192.168.1.0/24	FastEthernet0/0	---	0/0
S	192.168.2.0/24	FastEthernet0/1	---	1/0
C	192.168.3.4/30	FastEthernet0/1	---	0/0

Lab 3: Implement the basic building network topology

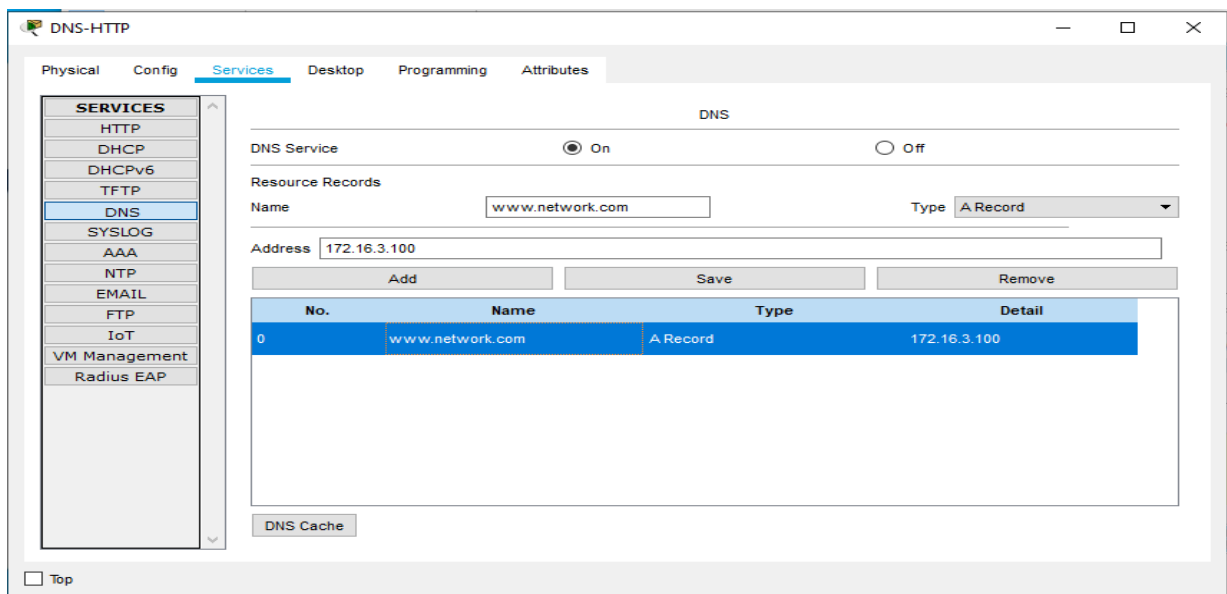
1. Determine the “Device Type” of devices D1 and D2 in the “Device Table” and in the diagram to finish the network topology.
 - D1: Switch
 - D2: Router



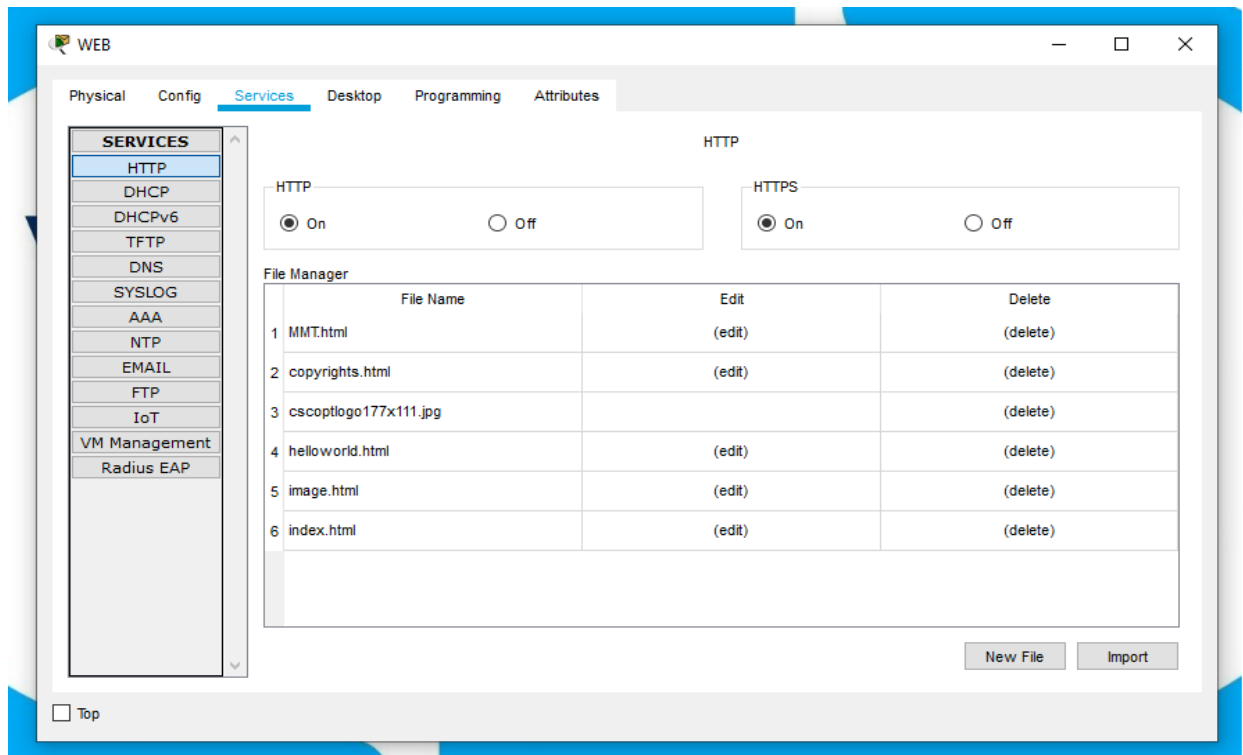
2. Configure the DNS server and Web server for `www.network.com` and test to access it via a browser.
 - Trước tiên ta cần cài đặt IP tĩnh cho DNS server như hình bên dưới.
 - + IP address: 172.16.3.200
 - + Subnet mask: 255.255.255.0
 - + Default gateway: 172.16.3.1



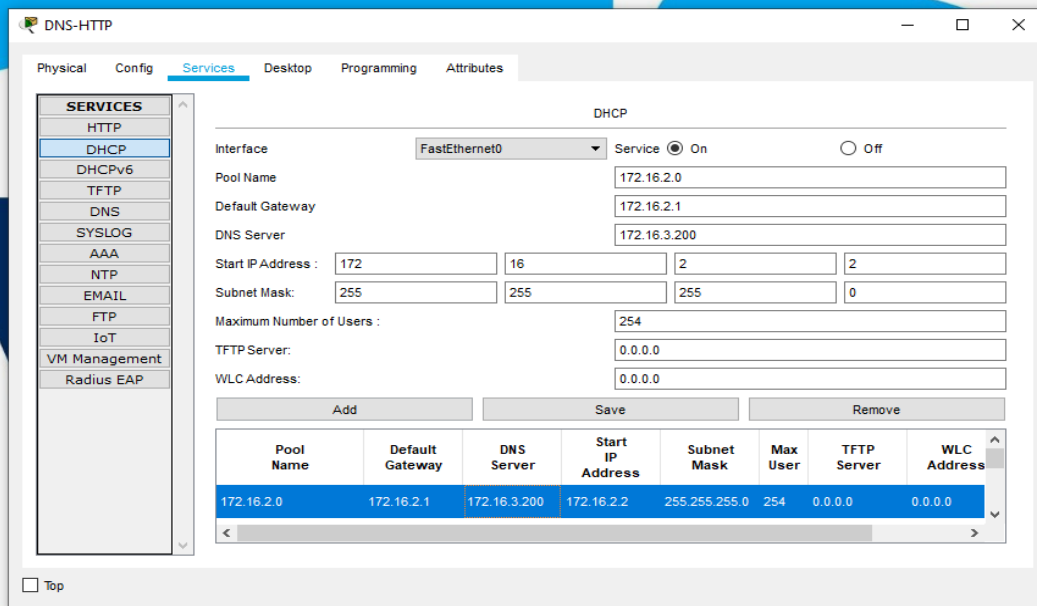
- Ta làm tương tự cho Web server với địa chỉ ip 172.16.3.100/24.
- **Cấu hình DNS server**
 - Vào tab **Services** của **DNS server** ➔ **DNS**.
 - Ta chọn **A-Record**(Phân giải tên sang địa chỉ), **Name** là www.network.com, **Address** trở đến là địa chỉ IP của **Web server**



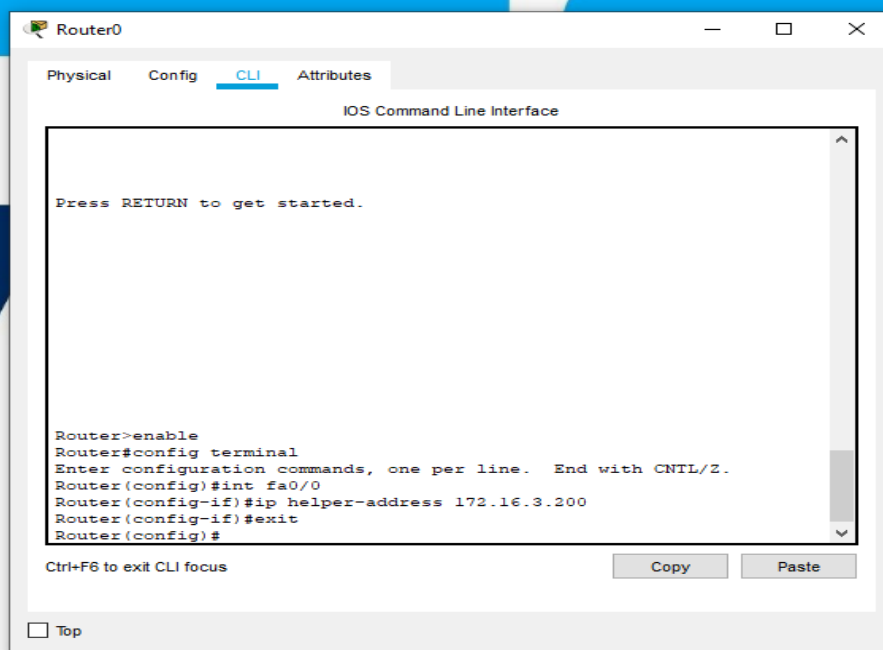
- Cấu hình **Web server**:
 - Vào tab Service của **Web server** → **HTTP** → **ON**



- Kiểm tra DNS server và Web server sẽ được thực hiện sau khi cấp địa chỉ IP cho các máy.
3. Configure the DHCP server to assign the IP addresses to PC1, PC2, PC3, PC4.
- Cài đặt cấu hình DHCP như sau:
 - Vào tag **Services** chọn **DHCP**. Tiếp đó ta điền các thông tin phù hợp với từng mạng vào.
 - Cấu hình DHCP cho mạng 172.16.2.0/24 (gồm PC3,PC4. Mạng 172.16.1.0/24 tương tự) như hình dưới.

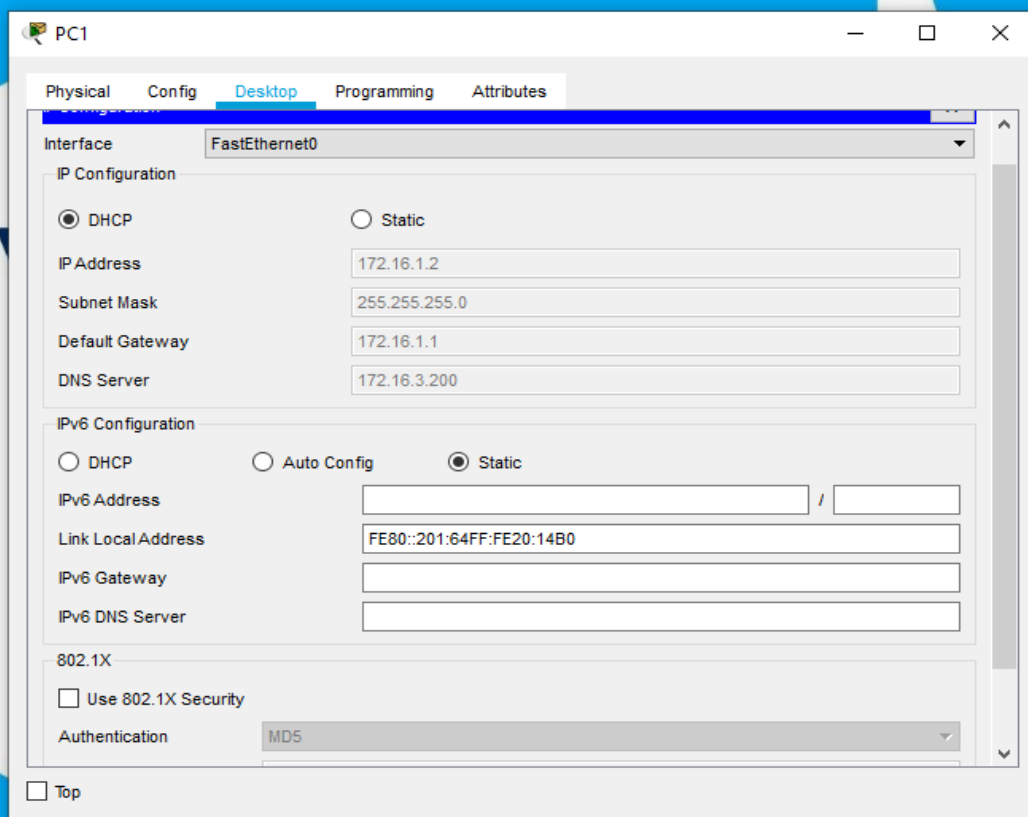


- Sau khi ta cấu hình xong trong DHCP server, tiếp tục vào router gắn với mạng cần cấp IP tự động(ở đây là router R2)
- + Ta vào tag CLI của router R2: Thực hiện liên sau:



STT	IP address	Subnet Mask	Default Gateway	DNS server
PC1	172.16.1.x	255.255.255.0	172.16.1.1	172.16.3.200
PC2	172.16.1.y	255.255.255.0	172.16.1.1	172.16.3.200
PC3	172.16.2.z	255.255.255.0	172.16.2.1	172.16.3.200
PC3	172.16.2.t	255.255.255.0	172.16.2.1	172.16.3.200

- Kiểm tra DHCP cài thành công hay chưa bằng cách:
 - Mở tab Desktop của từng PC ➡ IP Configuration ➡ DHCP.
 - Lưu ý: Các router đã được kết nối với nhau.
- PC1



- PC2

PC2

Physical Config **Desktop** Programming Attributes

☒ DHCP ☐ Static

IP Address 172.16.1.3

Subnet Mask 255.255.255.0

Default Gateway 172.16.1.1

DNS Server 172.16.3.200

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::2D0:D3FF:FE06:1B16

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MDS

Username

Password

☐ Top

- PC3

PC3

Physical Config **Desktop** Programming Attributes

☒ DHCP ☐ Static

IP Address 172.16.2.2

Subnet Mask 255.255.255.0

Default Gateway 172.16.2.1

DNS Server 172.16.3.200

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::201:43FF:FE20:6369

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

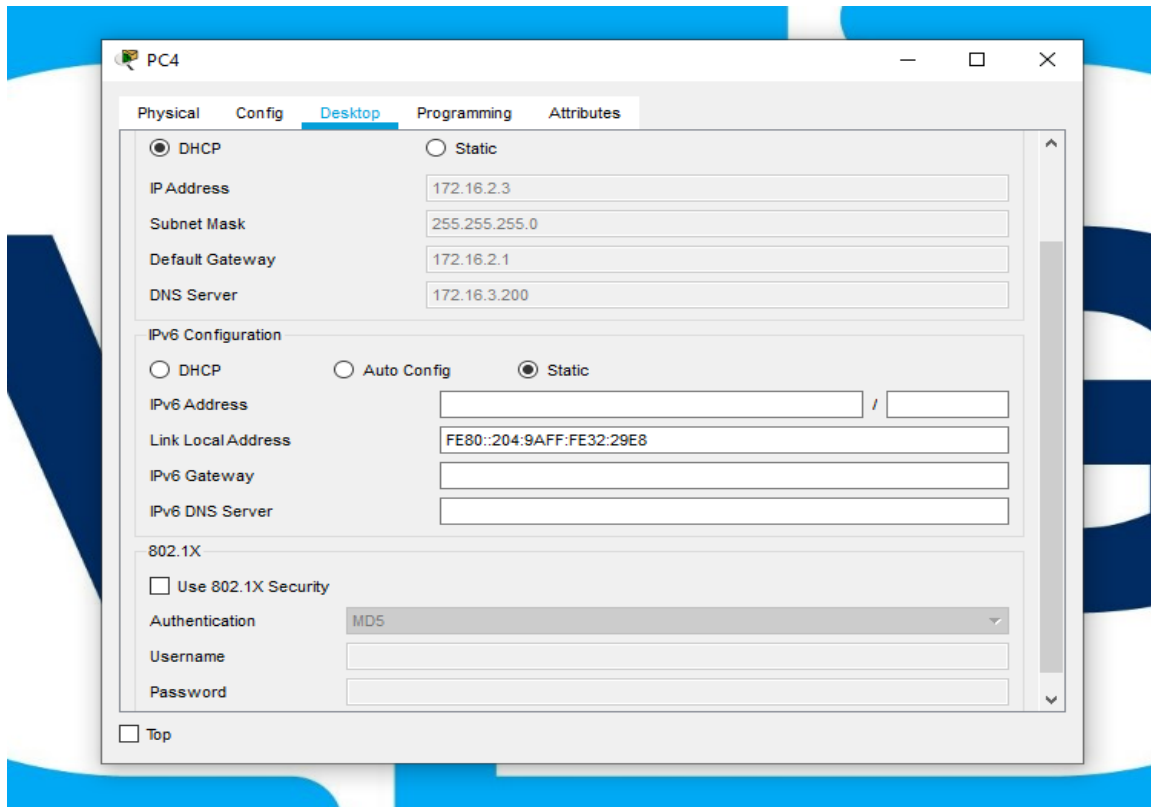
Authentication MDS

Username

Password

☐ Top

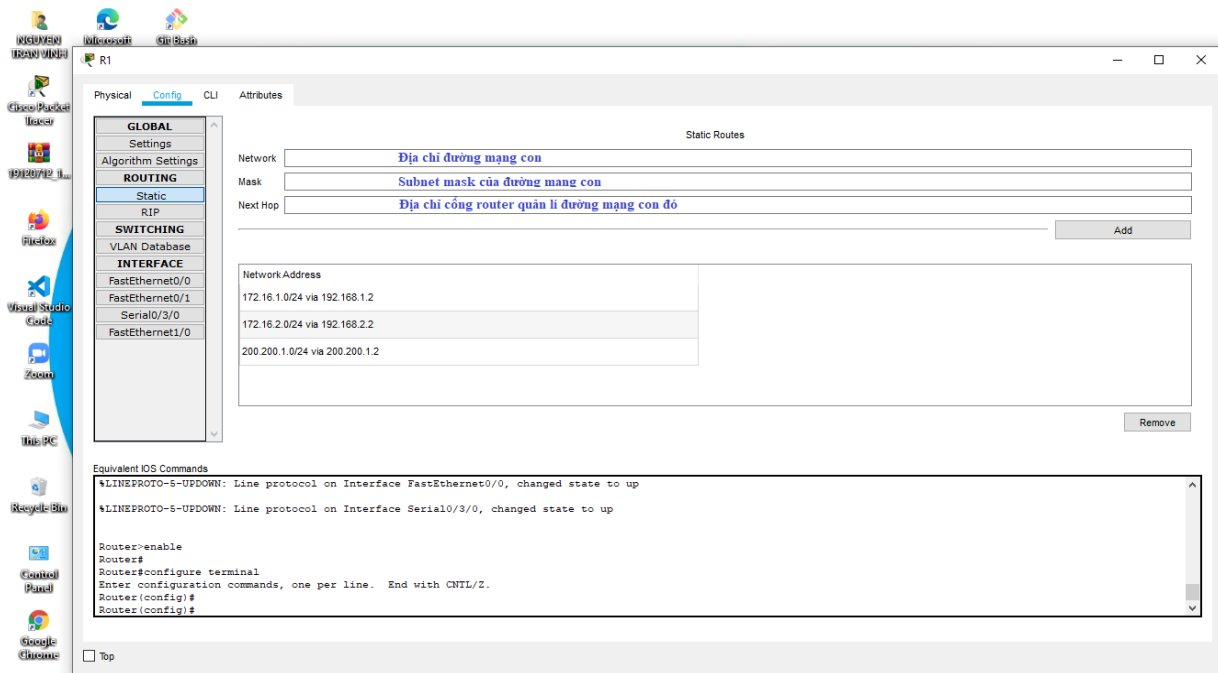
- PC4



4. Configure static routing for all routers so that all subnets can talk to each other.

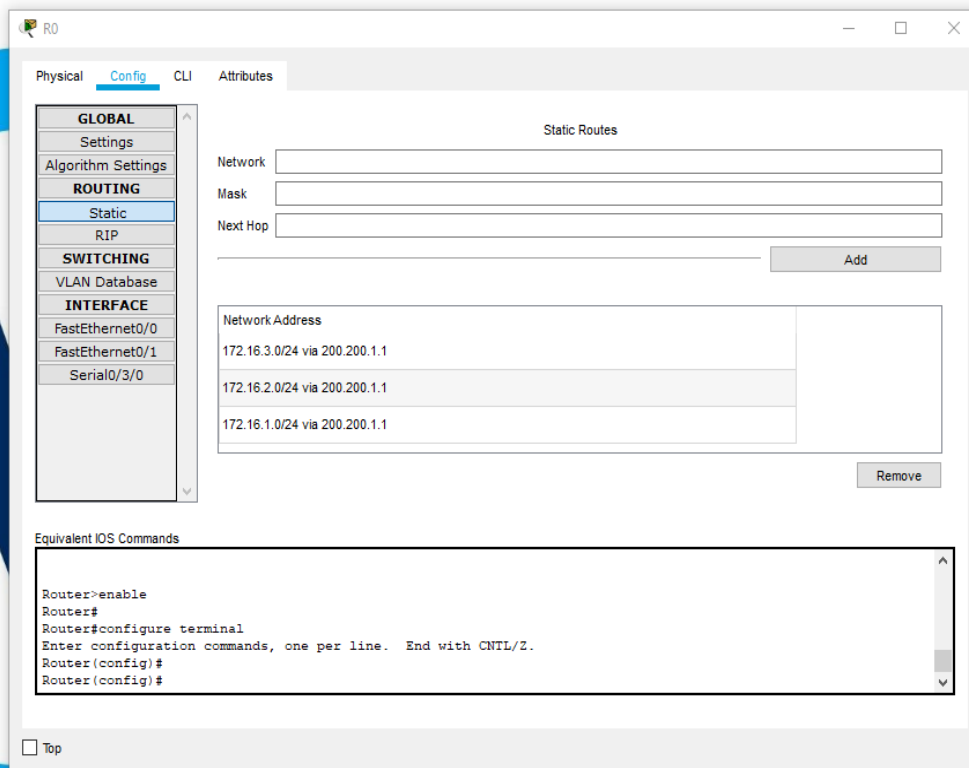
- Cách cấu hình:

- Vào tab **Config** của router, phần **routing** chọn **static** rồi thêm các thông số vào bảng định tuyến.



Hình ảnh 2. Hướng dẫn cấu hình cho router

- R0



- R1

The screenshot shows the configuration window for router R1. The 'Config' tab is active, and the 'ROUTING' section is expanded, with 'Static' selected. The 'Static Routes' section contains three entries in the 'Network Address' list:

Network Address
172.16.1.0/24 via 192.168.1.2
172.16.2.0/24 via 192.168.2.2
200.200.1.0/24 via 200.200.1.2

Below the list is a 'Remove' button. The 'Equivalent IOS Commands' section shows the following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
```

At the bottom left, there is a 'Top' button.

- R2

The screenshot shows the configuration window for router R2. The 'Config' tab is active, and the 'ROUTING' section is expanded, with 'Static' selected. The 'Static Routes' section contains three entries in the 'Network Address' list:

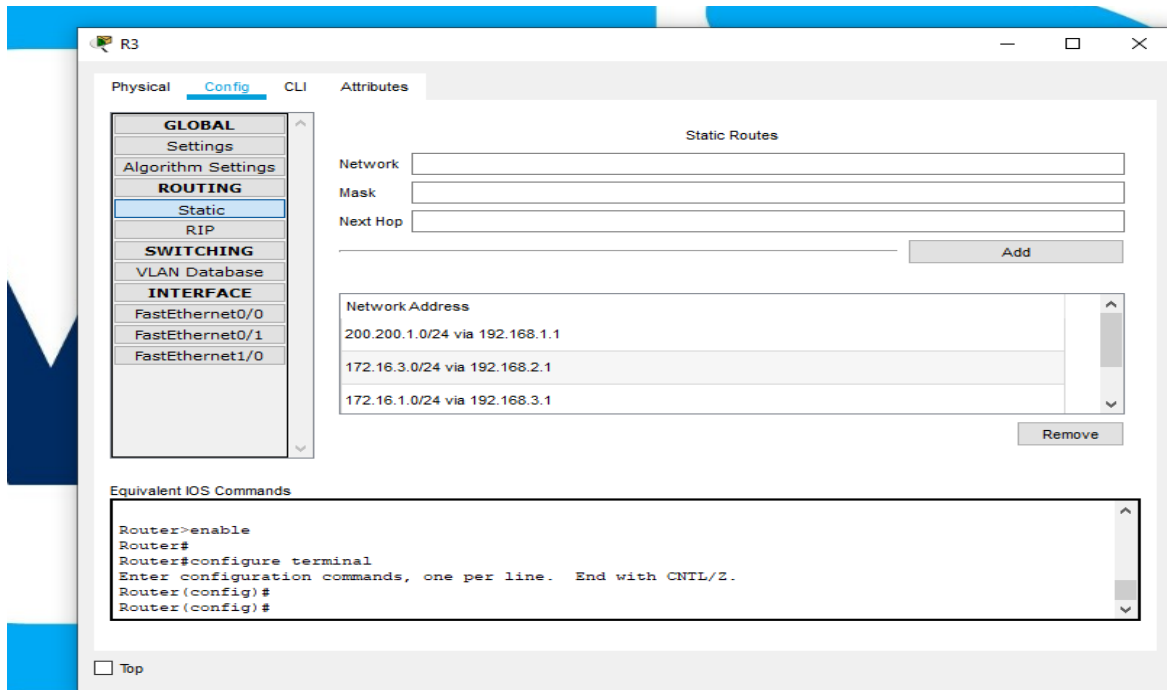
Network Address
172.16.3.0/24 via 192.168.1.1
172.16.2.0/24 via 192.168.3.2
200.200.1.0/24 via 192.168.1.1

Below the list is a 'Remove' button. The 'Equivalent IOS Commands' section shows the following commands:

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#
```

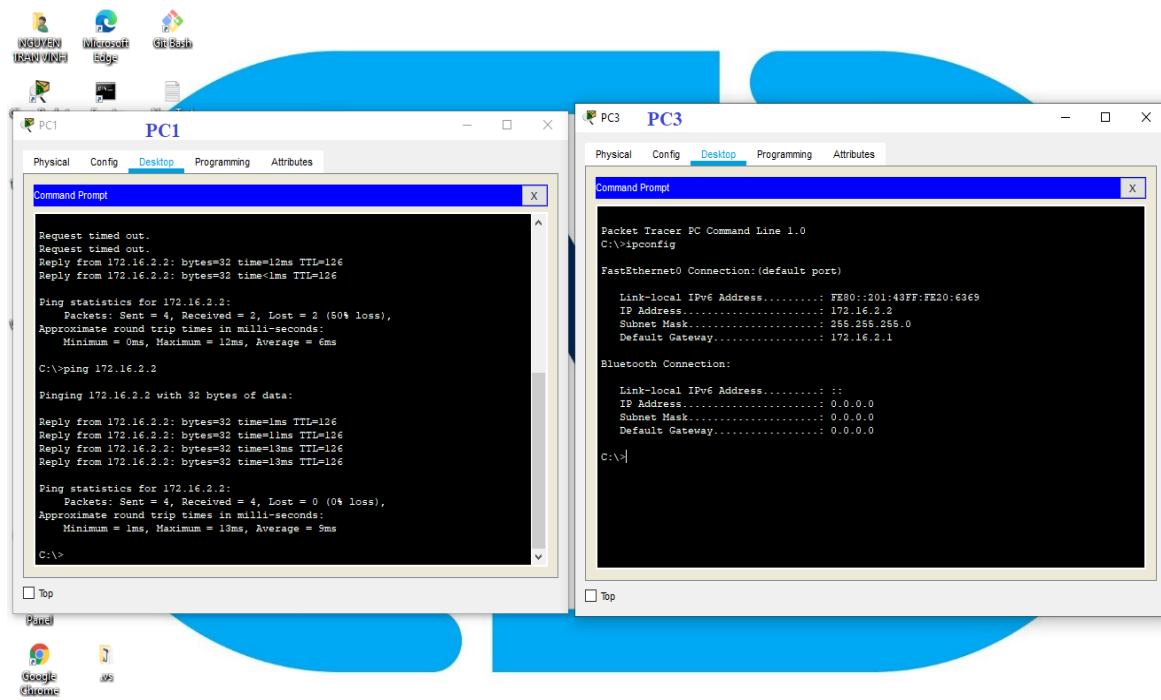
At the bottom left, there is a 'Top' button.

- R3

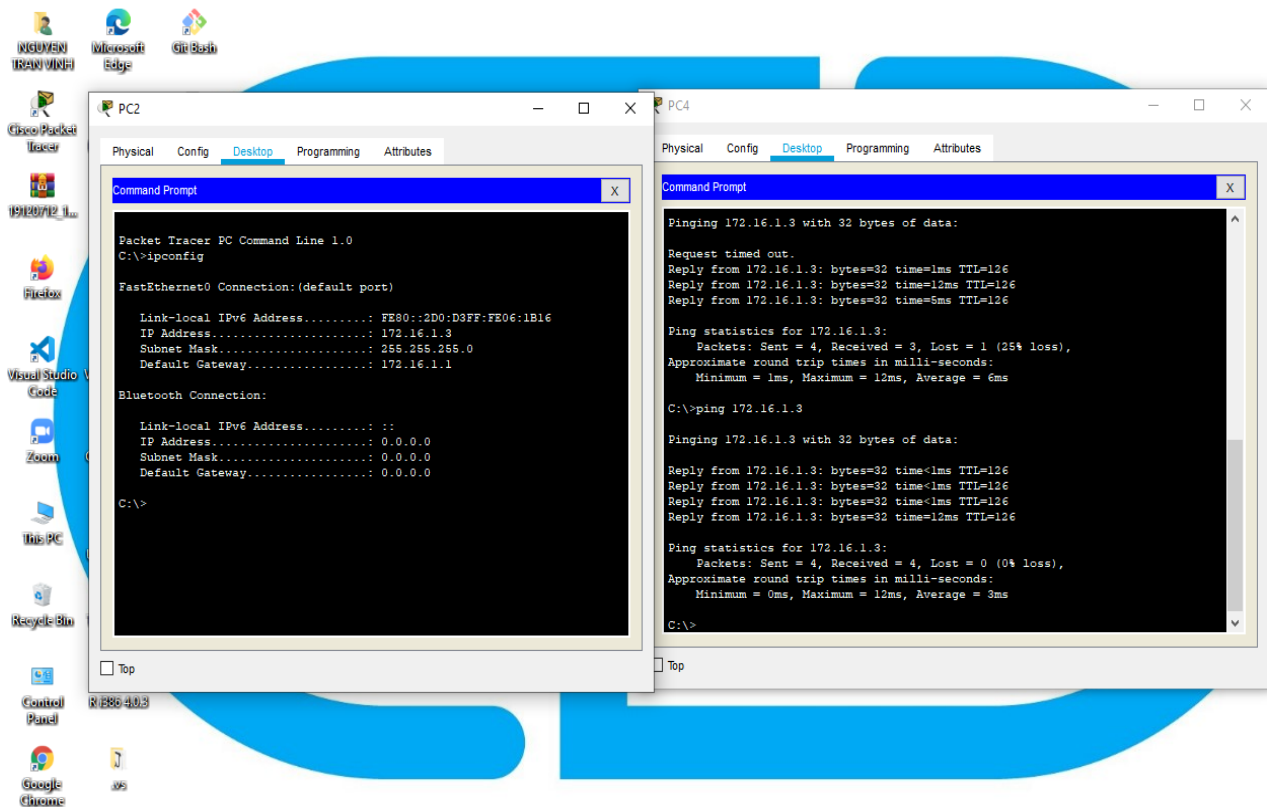


5. Execute ping command and take screenshots about the ping result from PC1 to PC3, PC4 to PC2.

- Ping from PC1 to PC3:



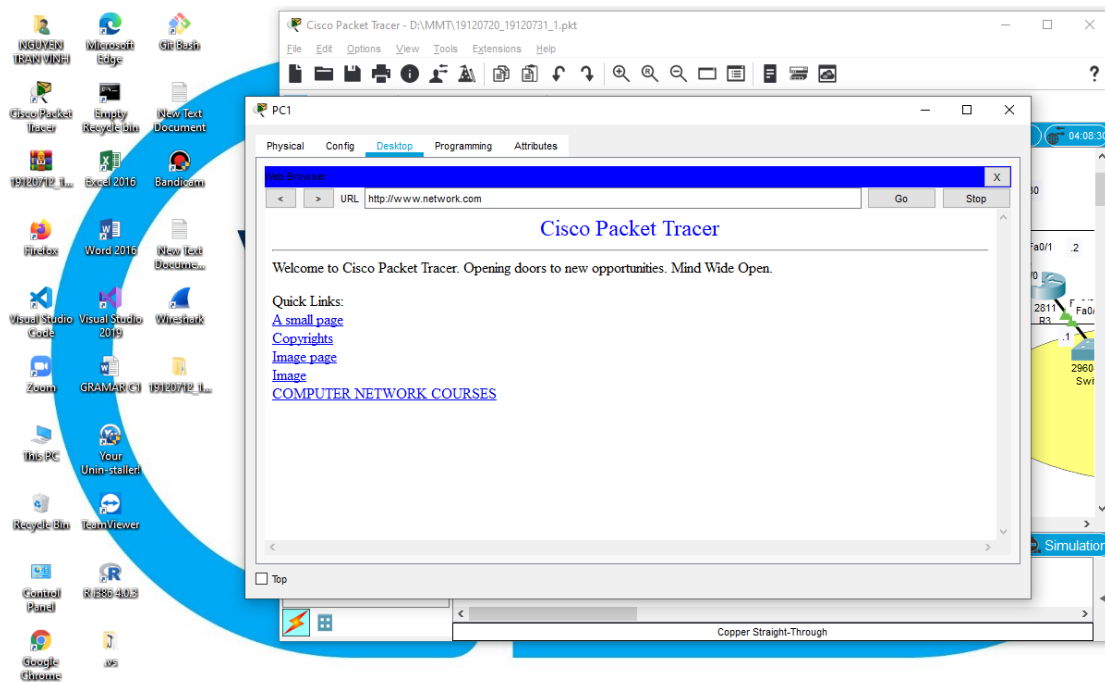
- Ping from PC4 to PC2



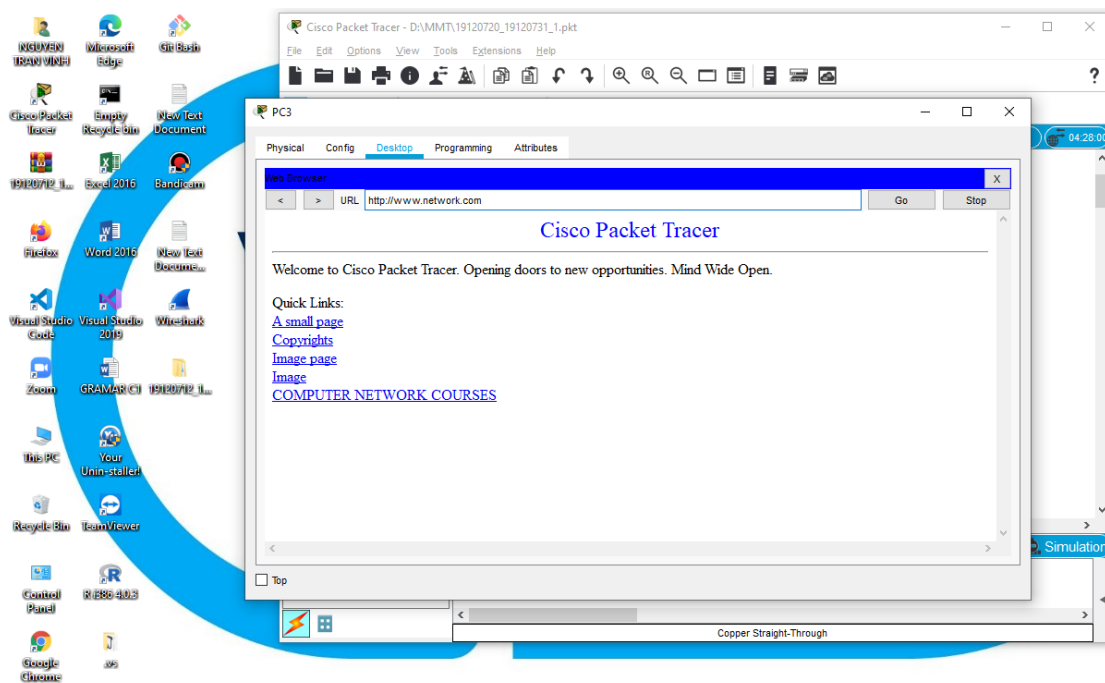
6. Access the web pages at <http://www.network.com> address via web browser of PC1, PC3.

- Nếu ta thấy được trang web như hình bên dưới thì ta đã truy cập thành vào trang web <http://www.network.com> và chứng tỏ ta đã cài thành công DNS server và Web server.

- PC1



- PC3



TÀI LIỆU THAM KHẢO

1. https://www.cisco.com/E-Learning/bulk/public/tac/cim/cib/using_cisco_ios_software/cmdrefs/show_ip_route.htm
2. https://www.youtube.com/watch?v=wRG3l_5dkjU&list=LL&index=1&ab_channel=AvinashBhagat