Network Project

Team

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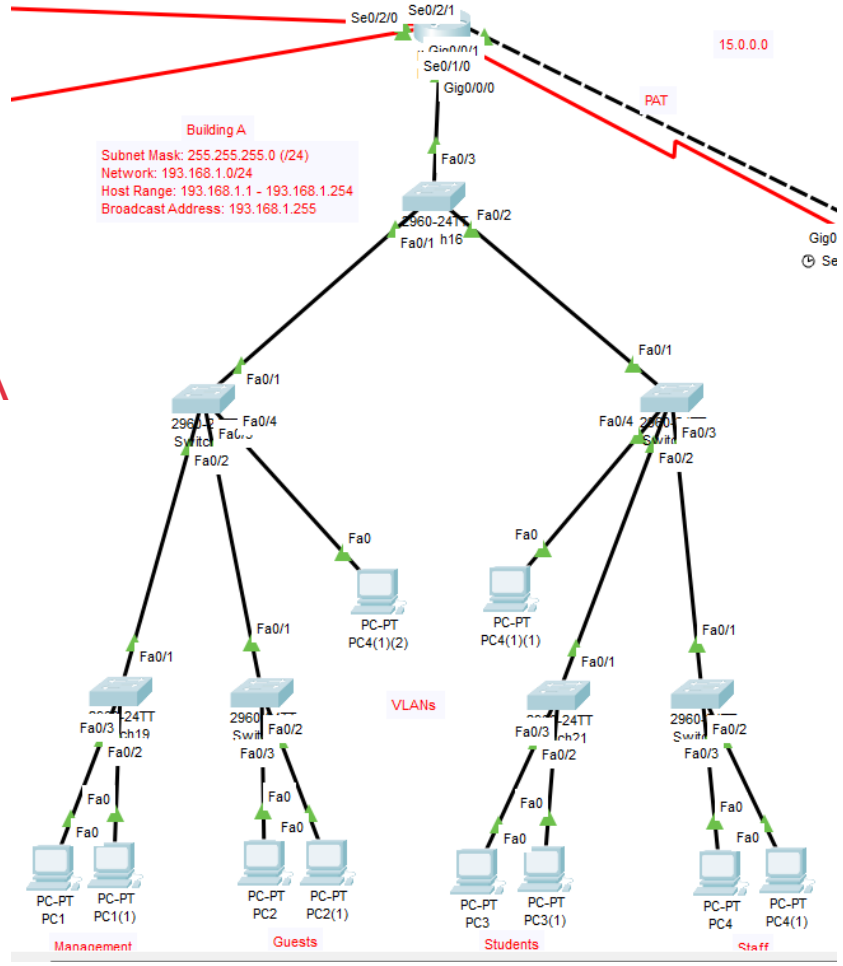
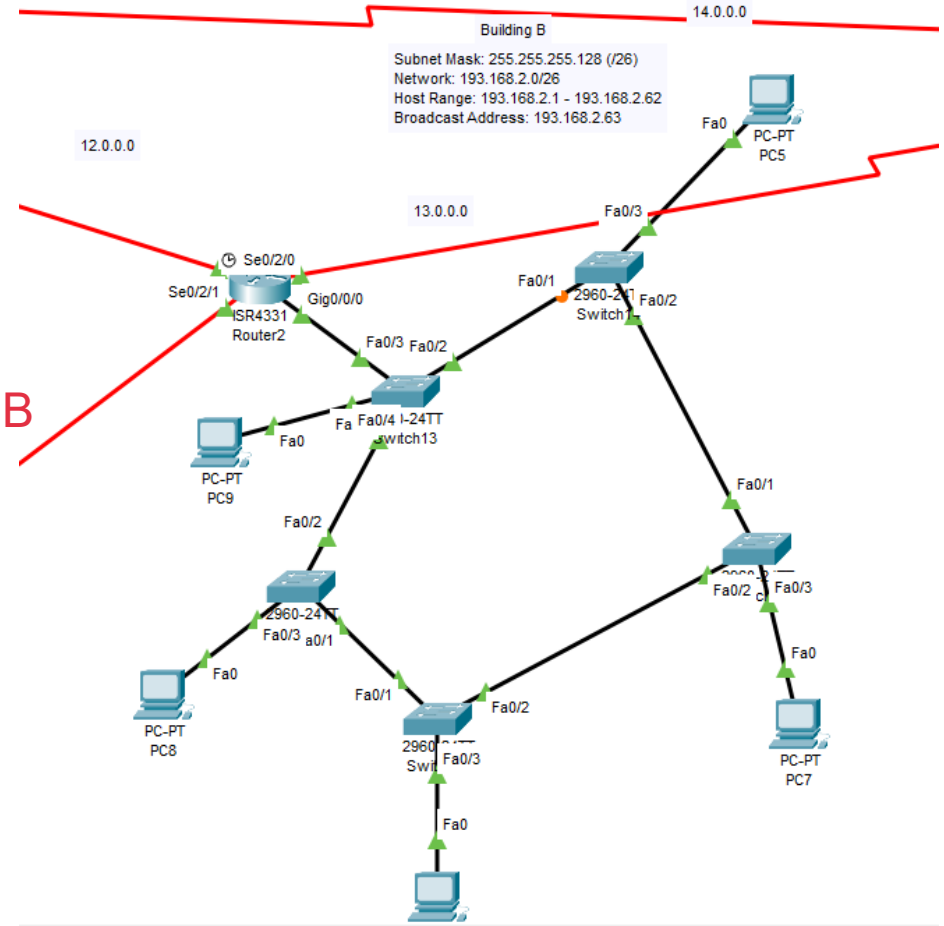
Tree

Building A



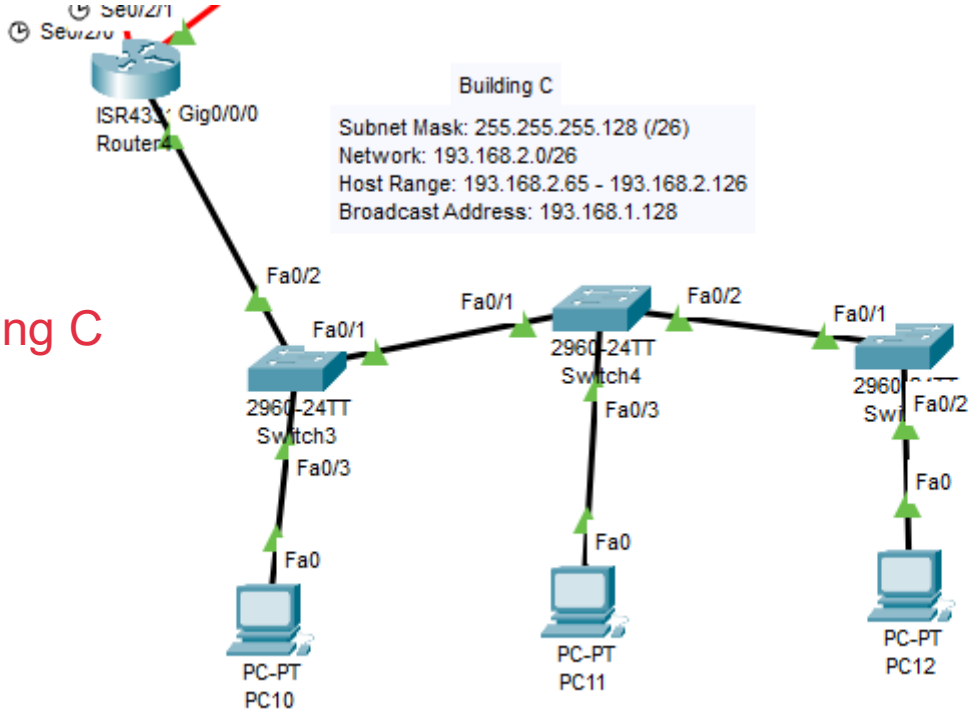
Ring

Building B

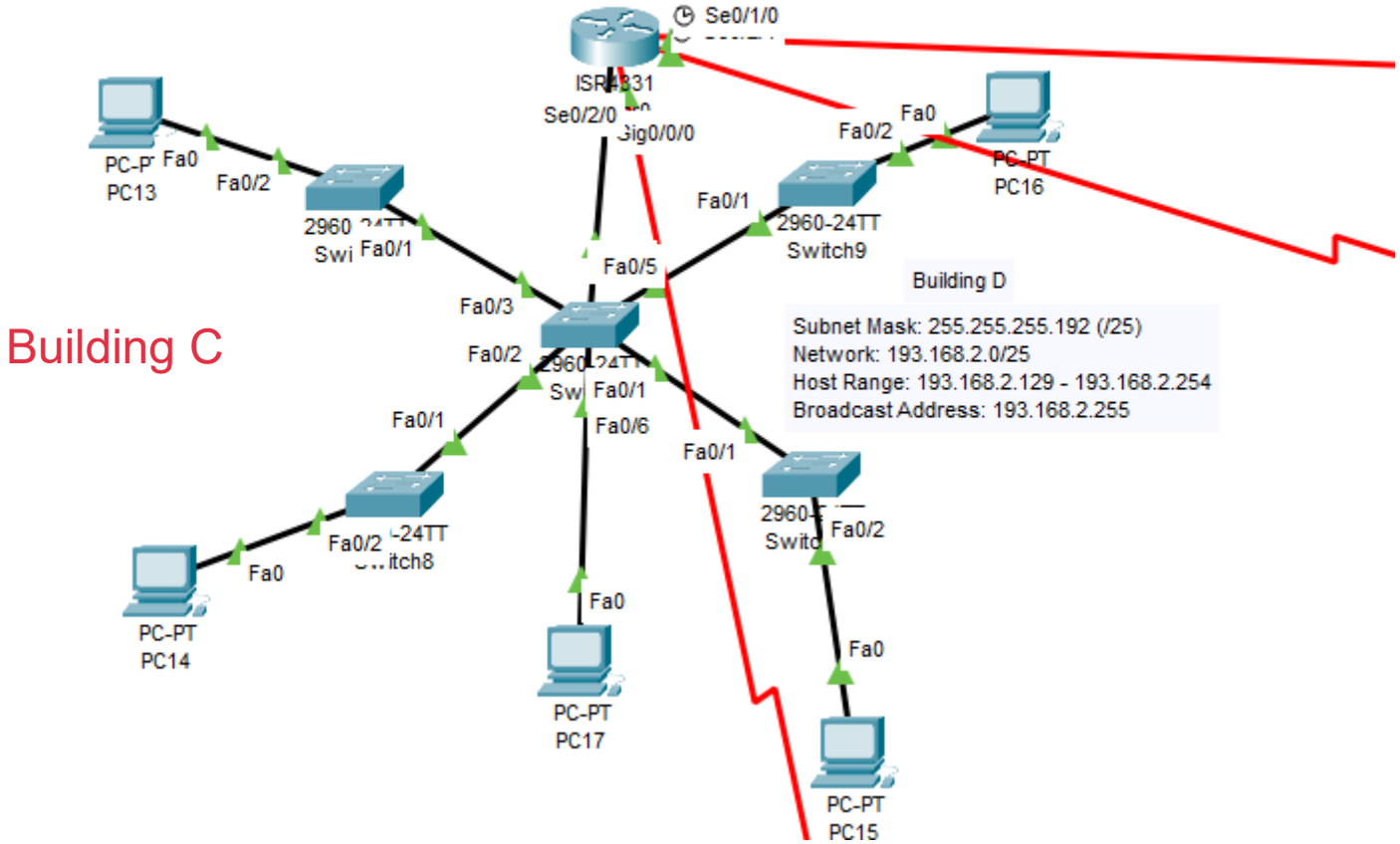


Bus

Building C



Star



Subnetting Table

These are the 4 buildings IPs:

Building	Network IP	Subnet Mask	Host IP range	Usable Hosts	Broadcast IP
A	193.168.1.0	255.255.255.0	193.168.1.1-193.168.1.254	254	193.168.1.255
B	193.168.2.0	255.255.255.128	193.168.2.1-193.168.2.62	62	193.168.2.63
C	193.168.2.0	255.255.255.128	193.168.2.65-193.168.2.126	62	193.168.2.128
D	193.168.2.0	255.255.255.192	193.168.2.129-193.168.2.254	126	193.168.2.255

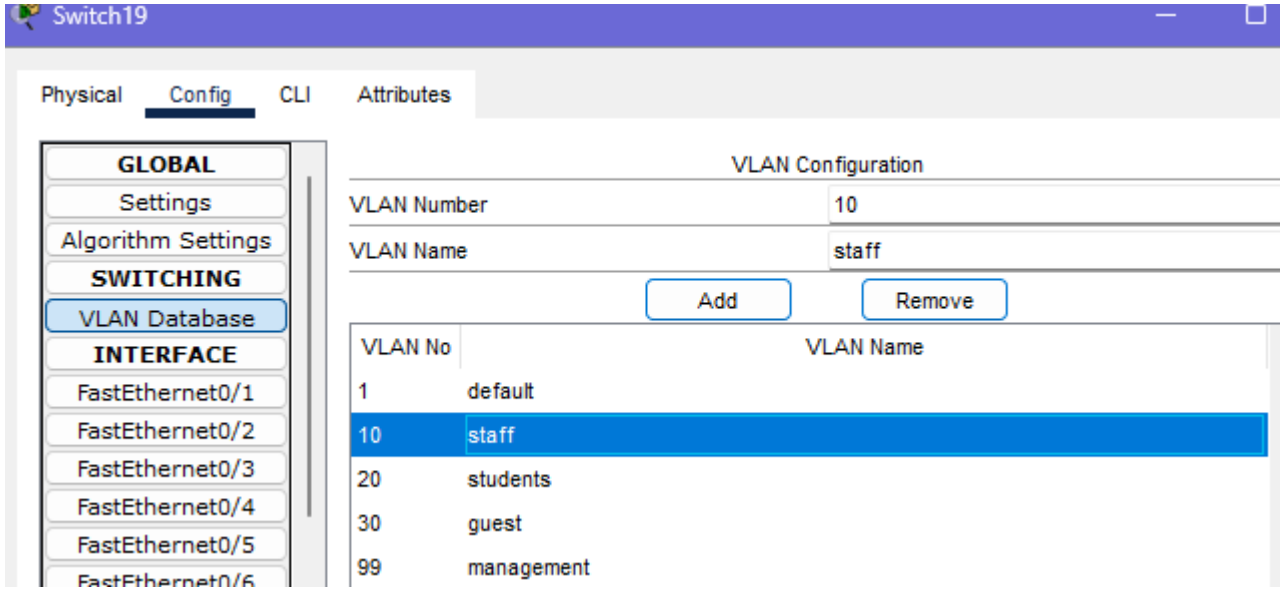
Subnetting Table

Data center Building:

Building	Network IP	Subnet Mask	Host IP range	Usable hosts	Broadcast IP
Data center	172.125.0.0	255.255.0.0	No range	____	____

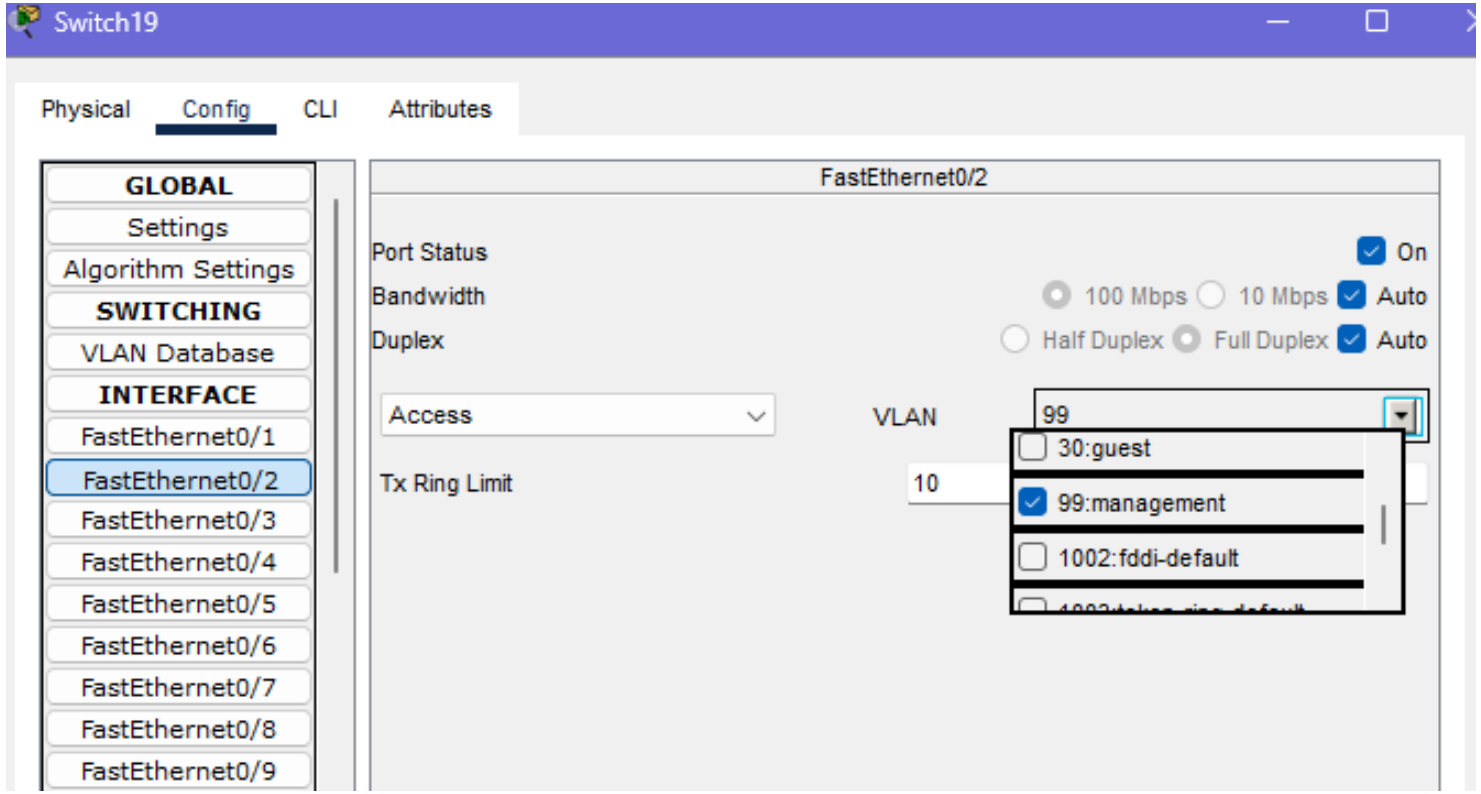
Virtual LANs (VLANs)

We assign any unused number and name:



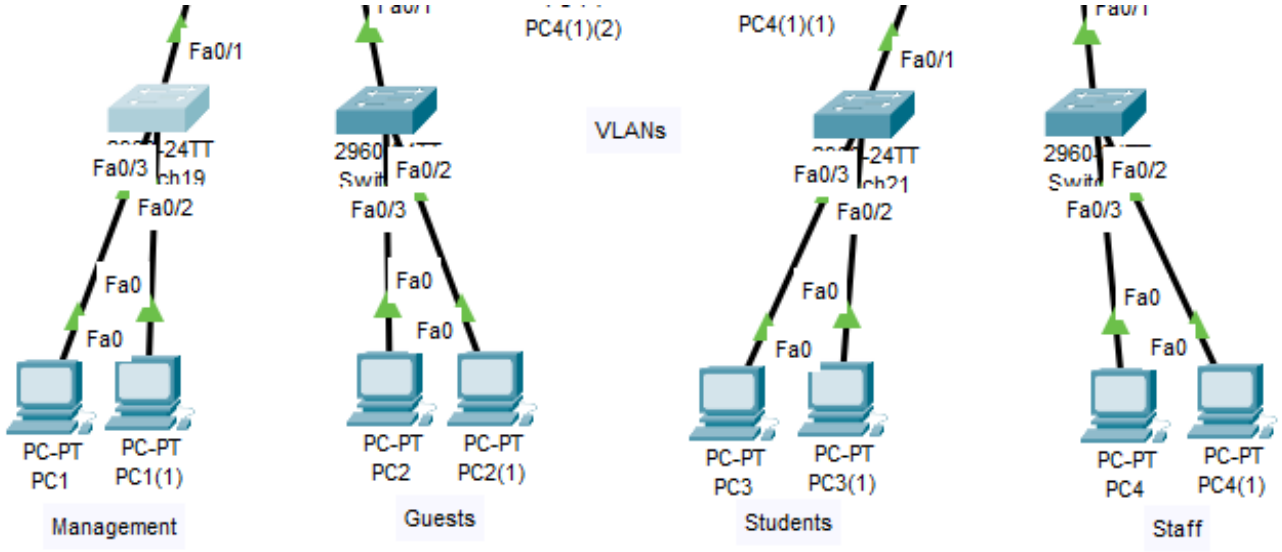
Virtual LANs (VLANs)

We choose which VLAN we need for every interface:



Virtual LANs (VLANs)

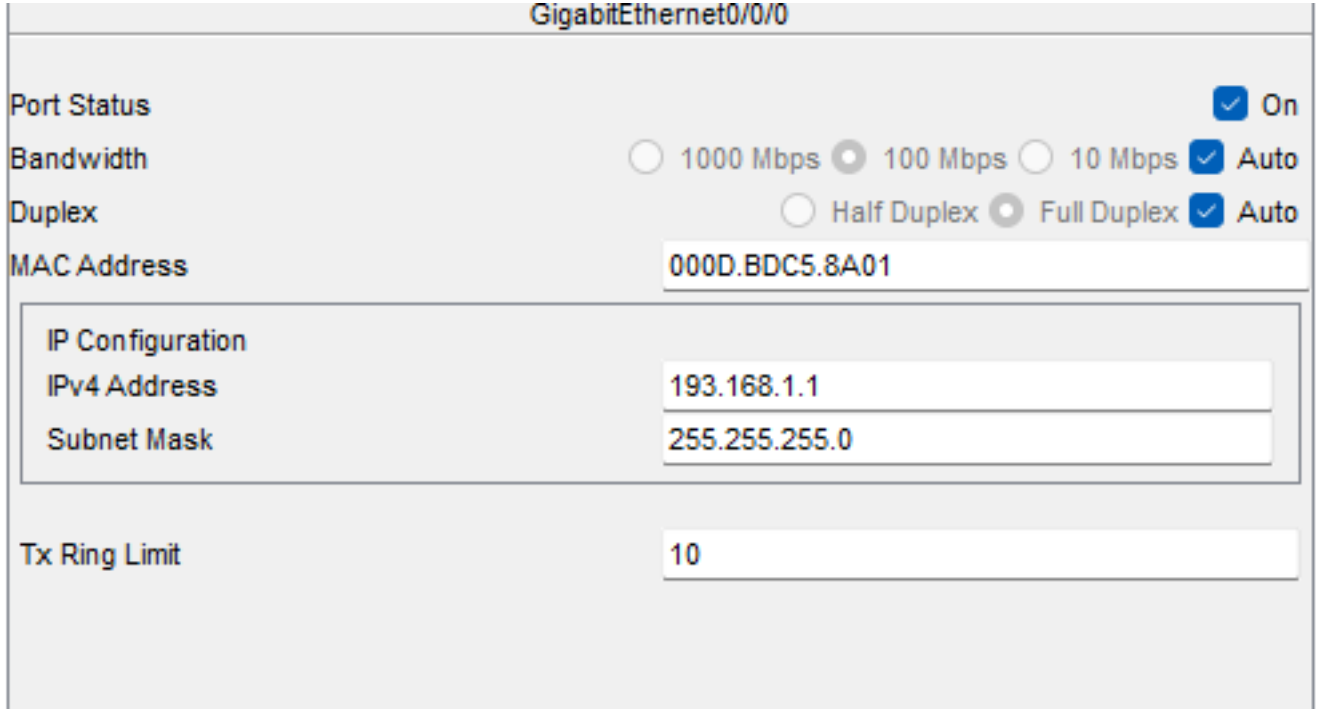
Do the same for all switches:



Routers

Routers has their internal interface to connect with their building with IPv4 address and Subnet Mask in via Gbit:

Building A

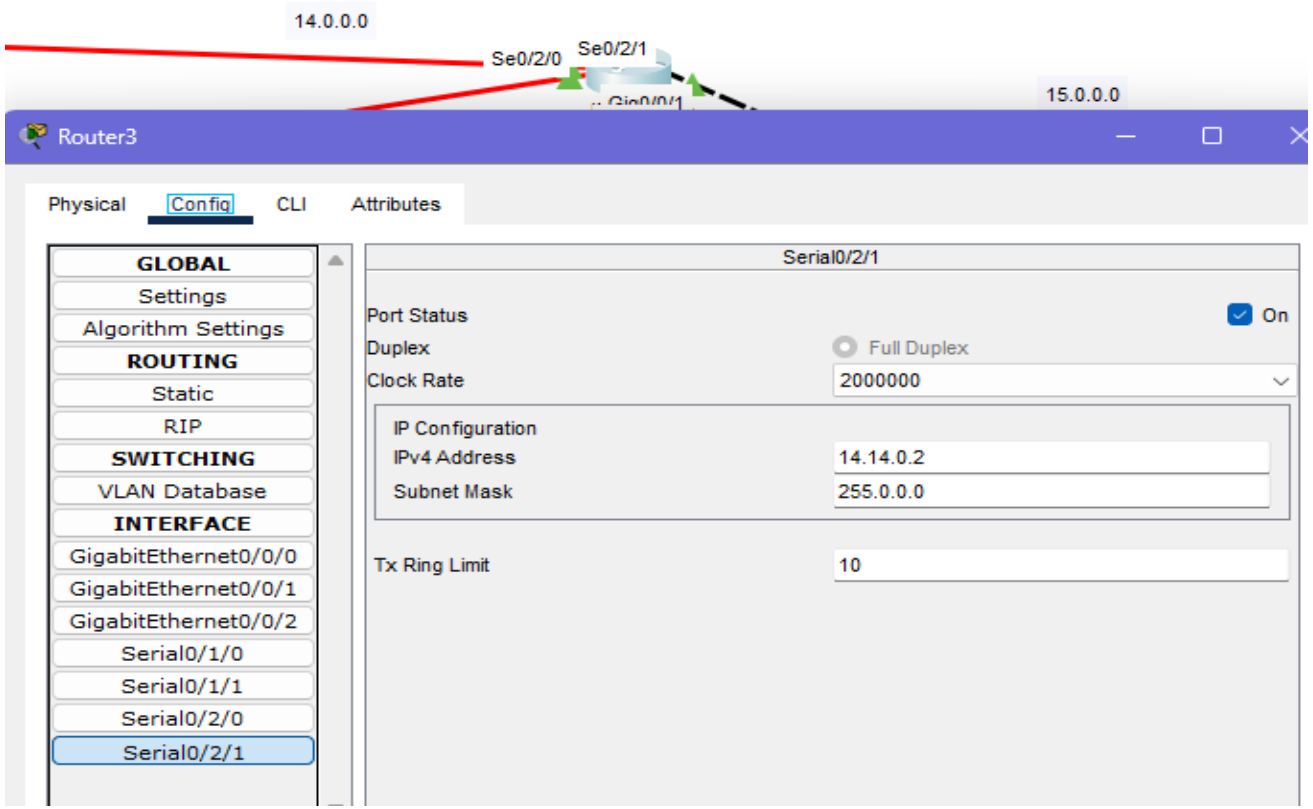


Routers

Routers also has their external interface to connect with other routers in other buildings with IPv4 address and Subnet Mask via serial:

Used for routing like OSPF

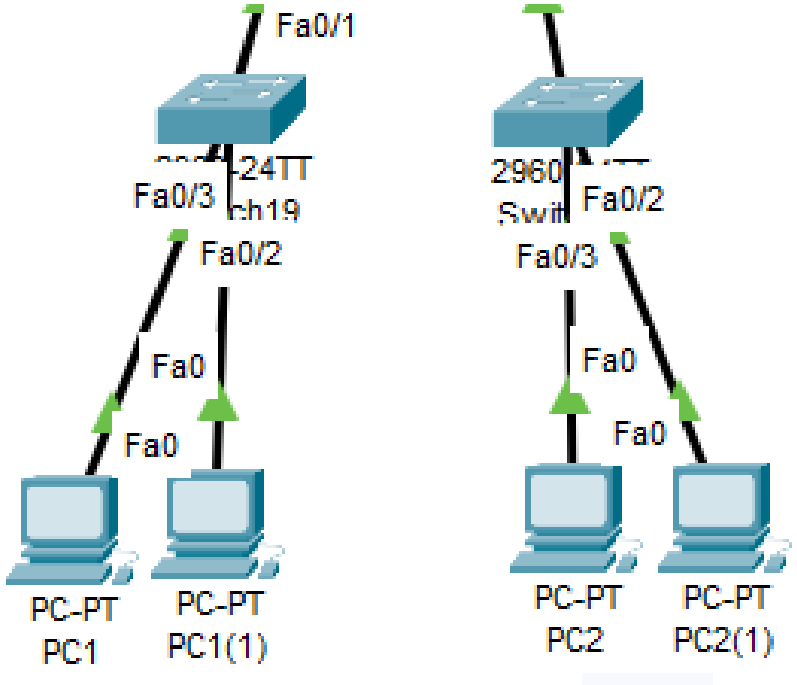
Building A



Switches

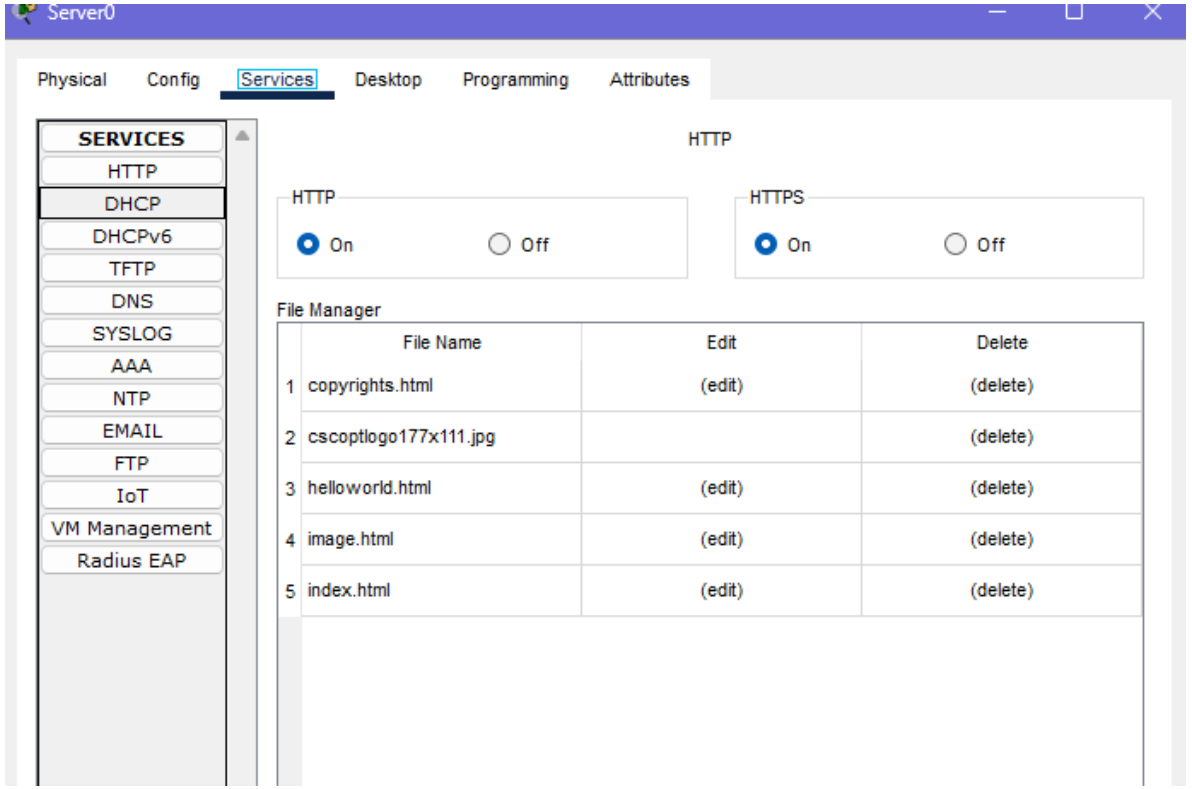
Switches is used to connect multiple devices with each other:

Building A



Servers

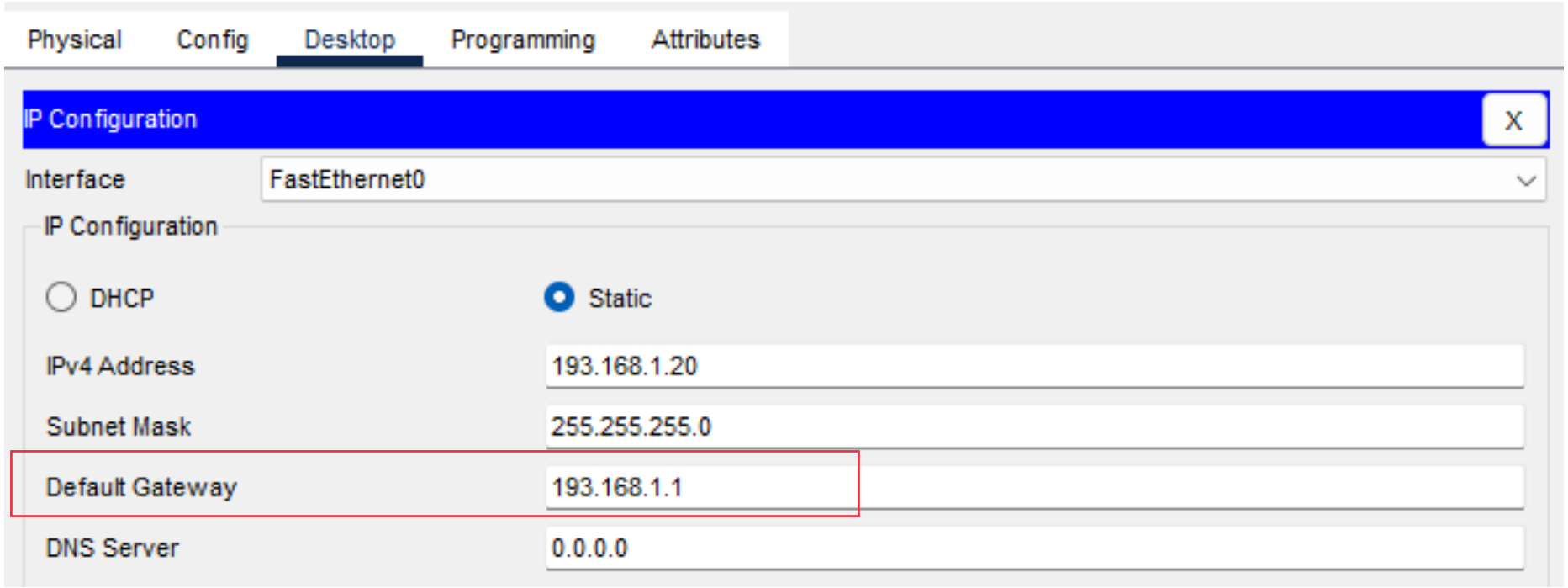
Servers offer a list of services to assign to any network:



Internal interface

To connect a pc to a router we must set the gateway of the pc = the IPv4 of the router:

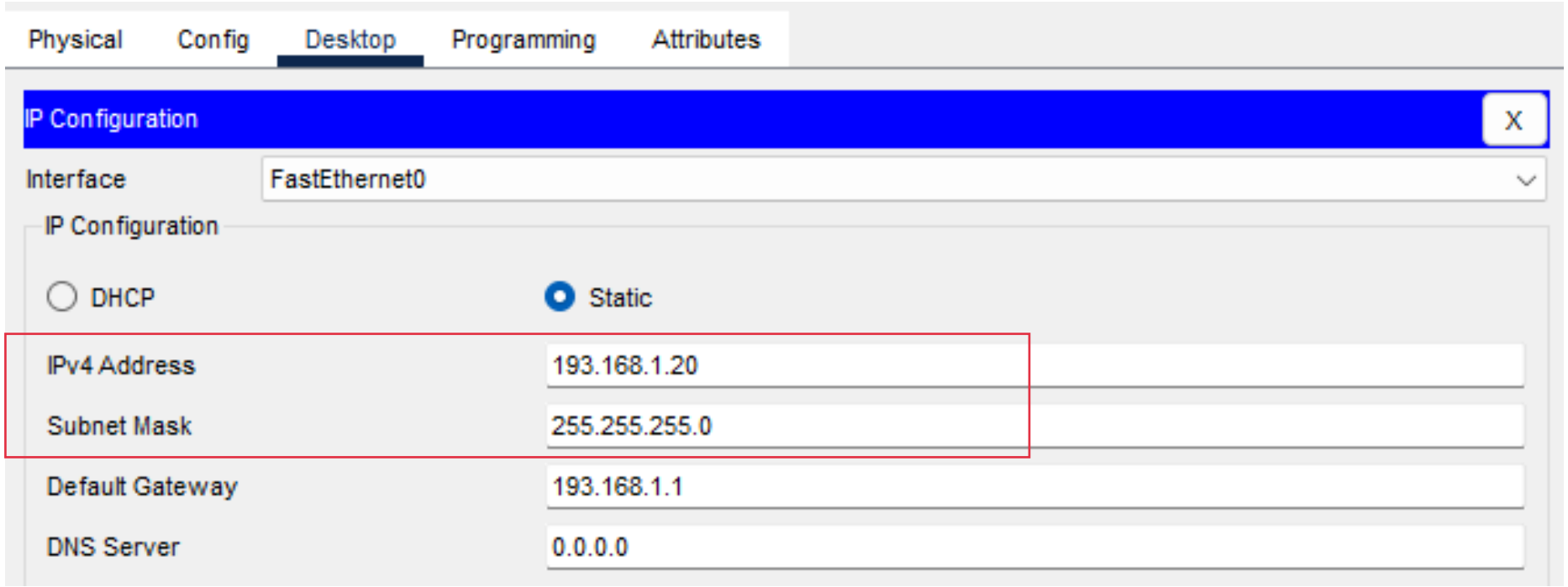
Building A



Internal interface

Set IP from the available hosts range and set its Subnet Mask:

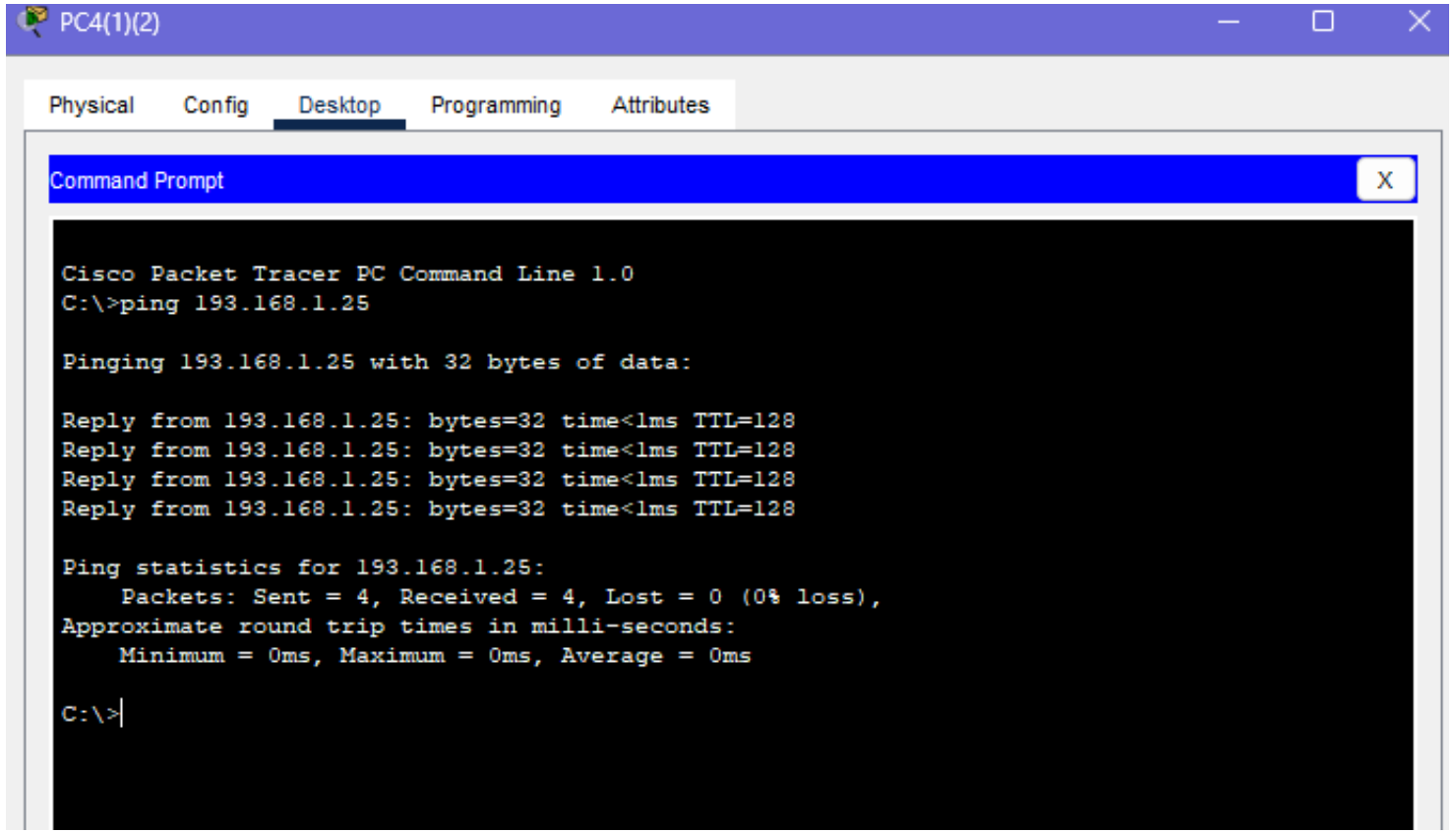
Building A



Internal interface

Testing connection using ping:

Building A

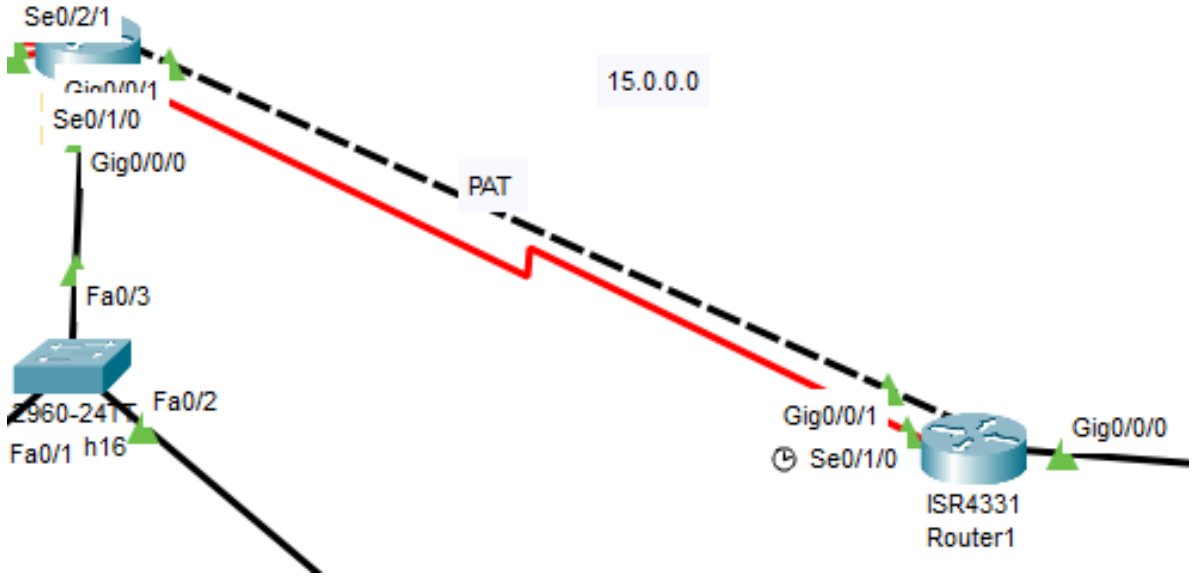


External interface

Connection with a device from external network can not be established without PAT

To apply pat we need to connect the 2 routers via Gig:

Building A



External interface

Connection with a device from external network can not be established without PAT

To apply pat we need to connect the 2 routers via Gig then write this command:

Building A

```
RouterA(config)# access-list 1 permit 193.168.1.0 0.0.0.255
RouterA(config)# ip nat inside source list 1 interface GigabitEthernet0/1
overload
RouterA(config)# interface GigabitEthernet0/0
RouterA(config-if)# ip nat inside
RouterA(config-if)# exit
RouterA(config)# interface GigabitEthernet0/1
RouterA(config-if)# ip nat outside
RouterA(config-if)# exit
```

External interface

Now connection is on and PAT is applied we can test with ping connection between 2 pcs the cmd from pc in building A and the IP is a pc from the Data Center building:

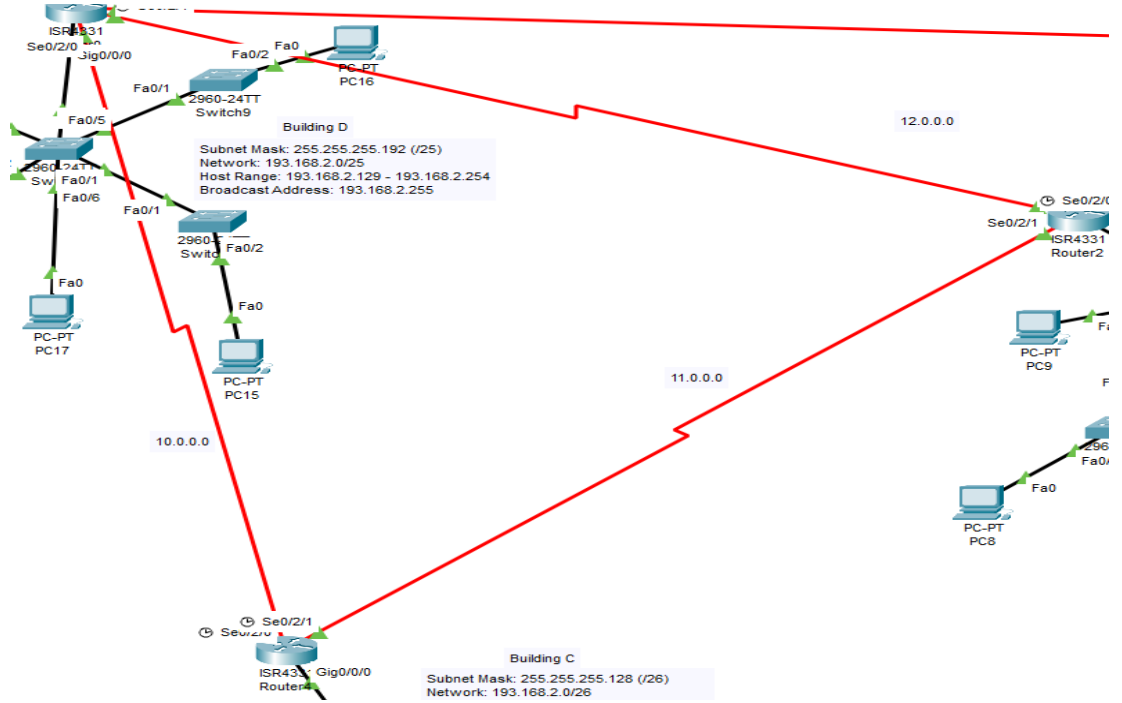
Building A

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.125.12.10

Pinging 172.125.12.10 with 32 bytes of data:

Request timed out.
Reply from 172.125.12.10: bytes=32 time=1ms TTL=126
Reply from 172.125.12.10: bytes=32 time=13ms TTL=126
Reply from 172.125.12.10: bytes=32 time=1ms TTL=126

Ping statistics for 172.125.12.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 13ms, Average = 5ms

C:\>
```

Routing

Routing is essential for connecting all network with each other via routers to choose the best path via OSPF

We need to connect routers via serials and set IPs for every serial:



Routing

To apply OSPF we must write this commands for every router:

Enable
Configure terminal
Router ospf 1
Network (internal network IP) (Subnet mask) area (number)
Network (1st external network IP) (Subnet mask) area (same number)
Network (2nd internal network IP) (Subnet mask) area (same number)
Then save

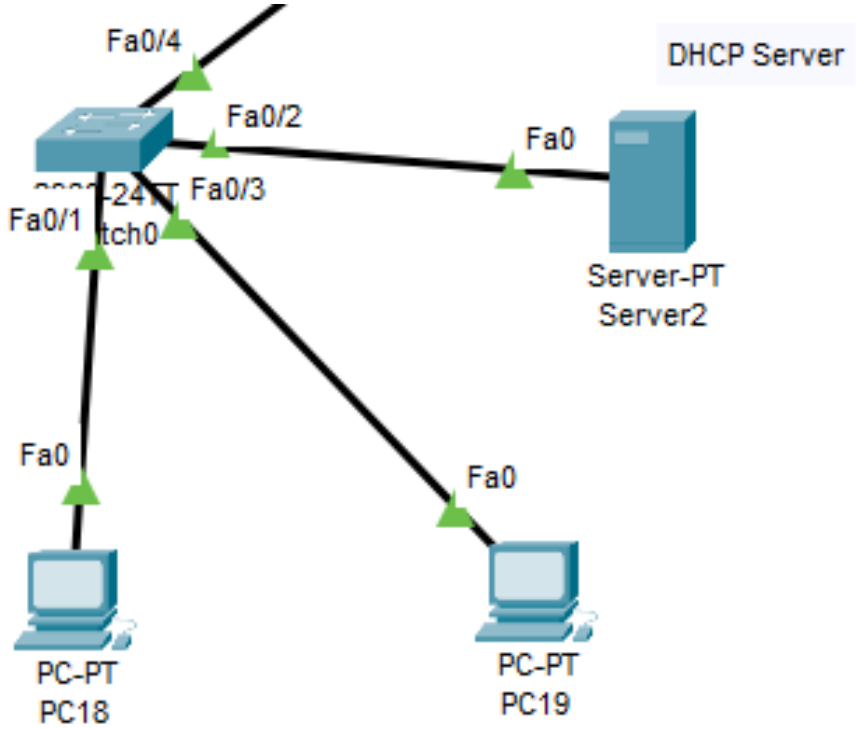
Routing

Now to test by sending message from a pc to other network router:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC10	Router0	ICMP		0.000	N	0	(edit)	

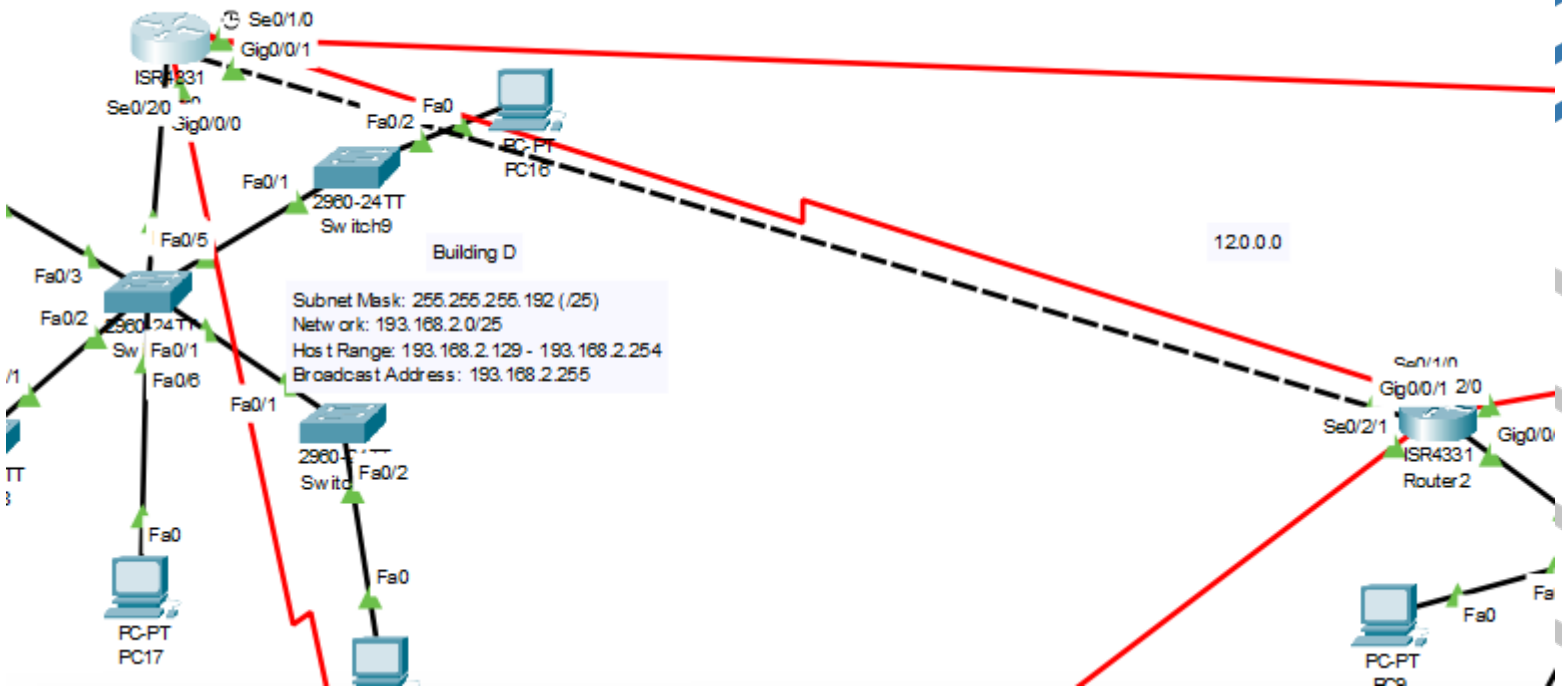
DHCP Server (Bonus)

Made a small with a server to test DHCP for automati addressing:



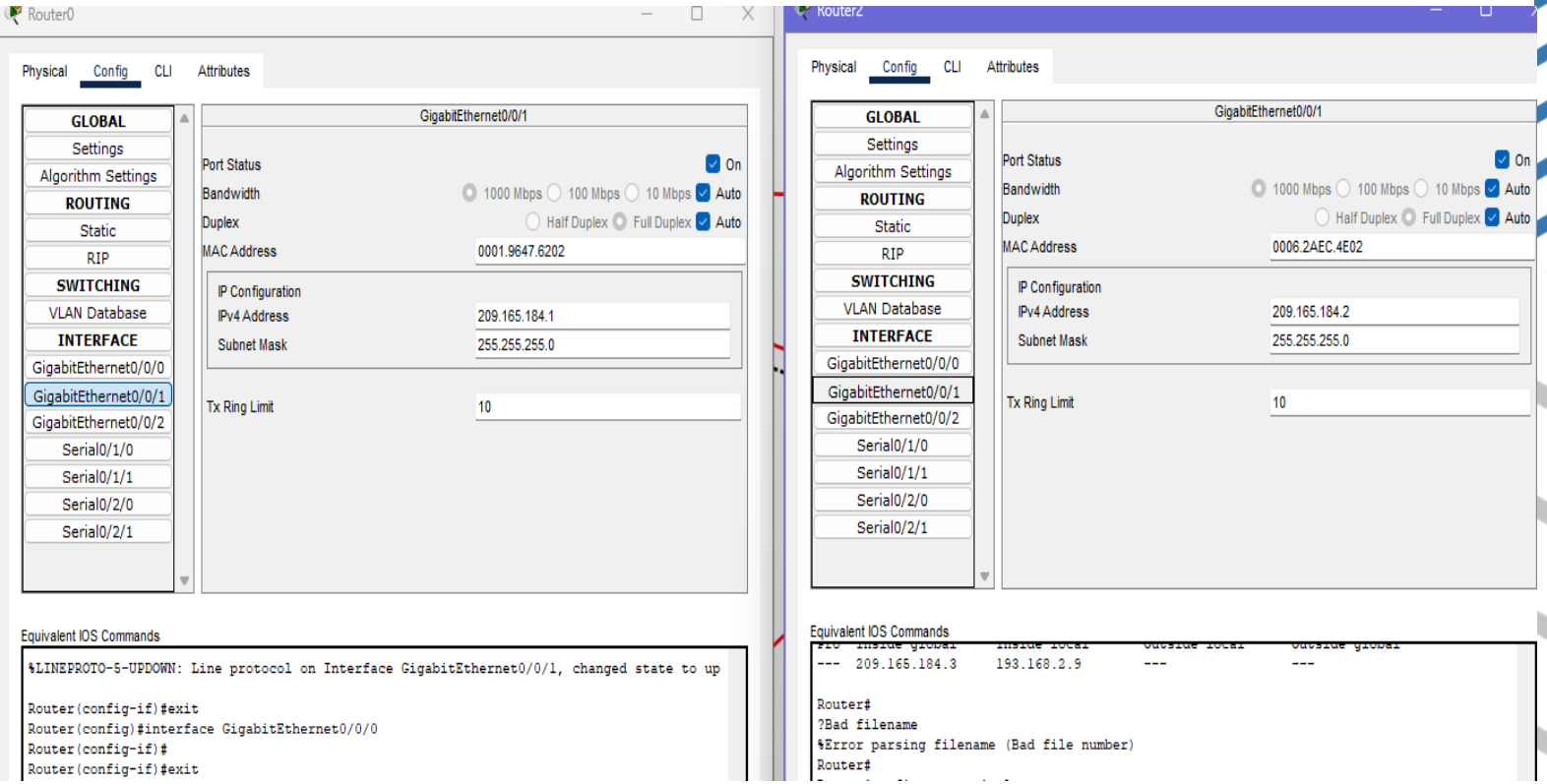
Static NAT(Bonus)

Connecting a static IP of a pc to another network:



Static NAT(Bonus)

The 2 routers are connected via Gig:



Static NAT(Bonus)

We write this command in the router of the desired static IP pc:

```
Interface G0/0/0
Ip nat inside
Int G0/0/1
Ip nat ouside
Exit
Ip nat inside source static 193.168.2.9 209.165.184.3
ex
```

Static NAT(Bonus)

We check nat:

```
Router#sh ip nat trans
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.184.3     193.168.2.9        ---                ---
```

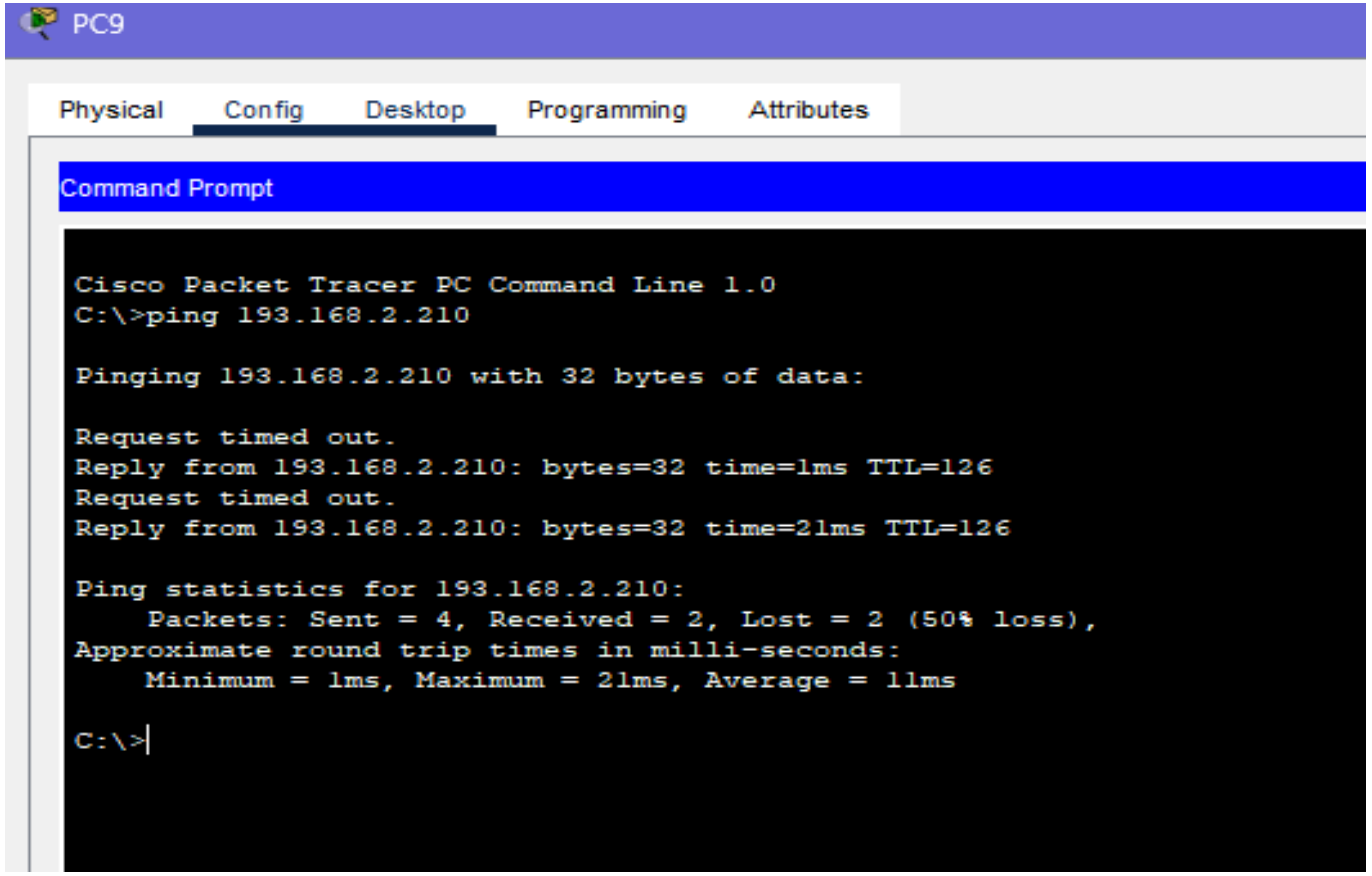
Static NAT(Bonus)

We check nat:

```
Router#sh ip nat trans
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.184.3     193.168.2.9        ---                ---
```

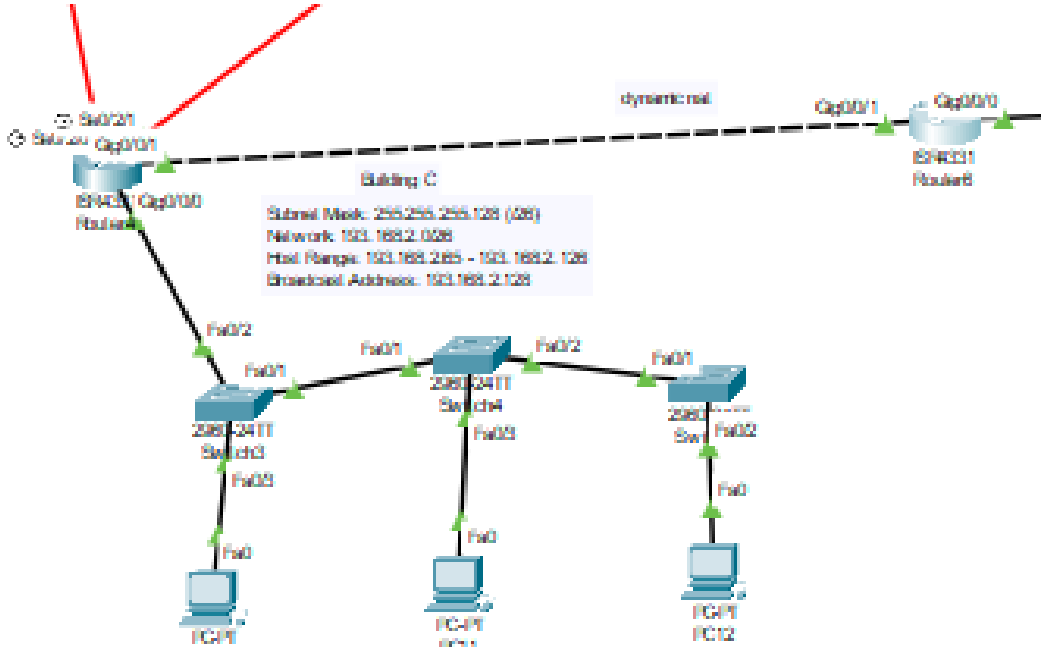
Static NAT(Bonus)

Ping the pc with other in the second network:



Dynamic NAT(Bonus)

Connecting a pool of IPs to another network:



Dynamic NAT(Bonus)

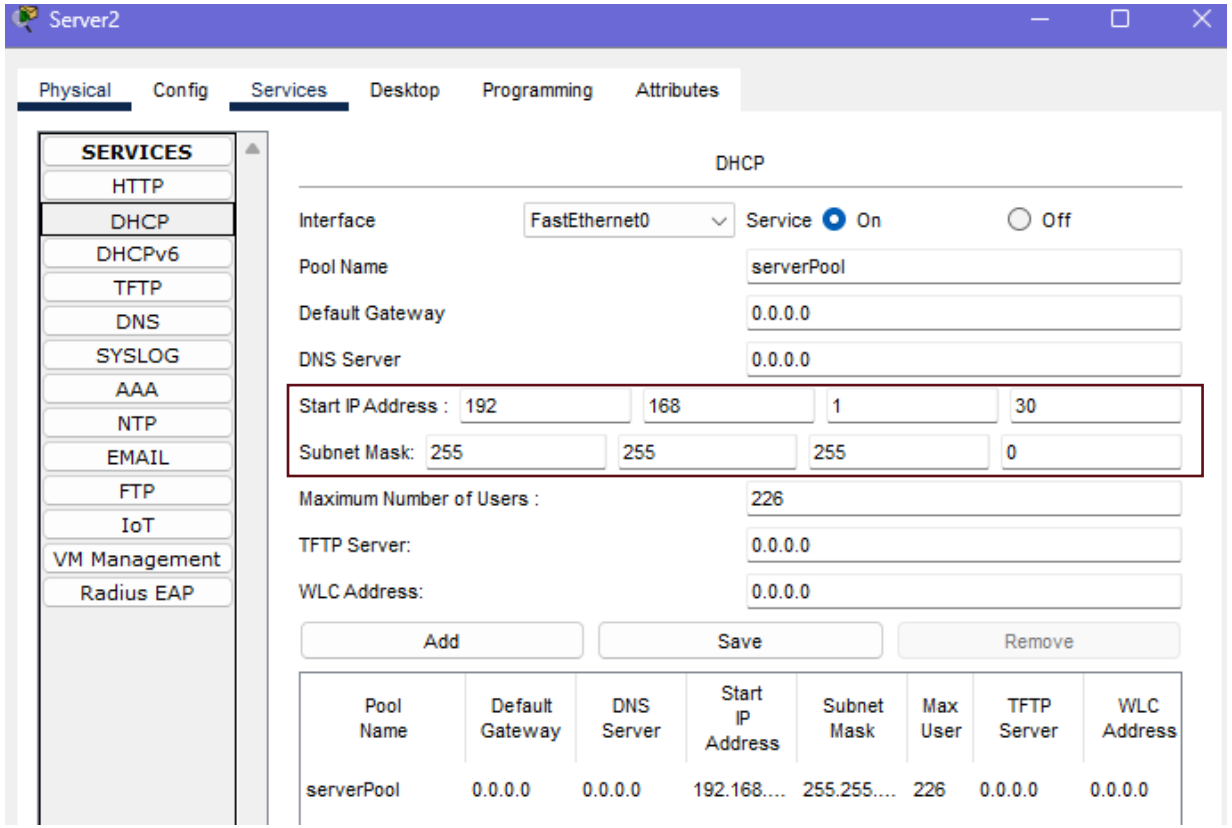
We set IPs for both routers and type this command:

```
Router(config)#ip nat pool ACCESS 209.165.184.4 209.165.184.9
netmask 255.255.255.0
Router(config)#access-list 1 permit 193.168.2.0 0.0.0.255
Router(config)#ip nat inside source list 1 pool ACCESS
Router(config)#ex
```

DHCP Server (Bonus)

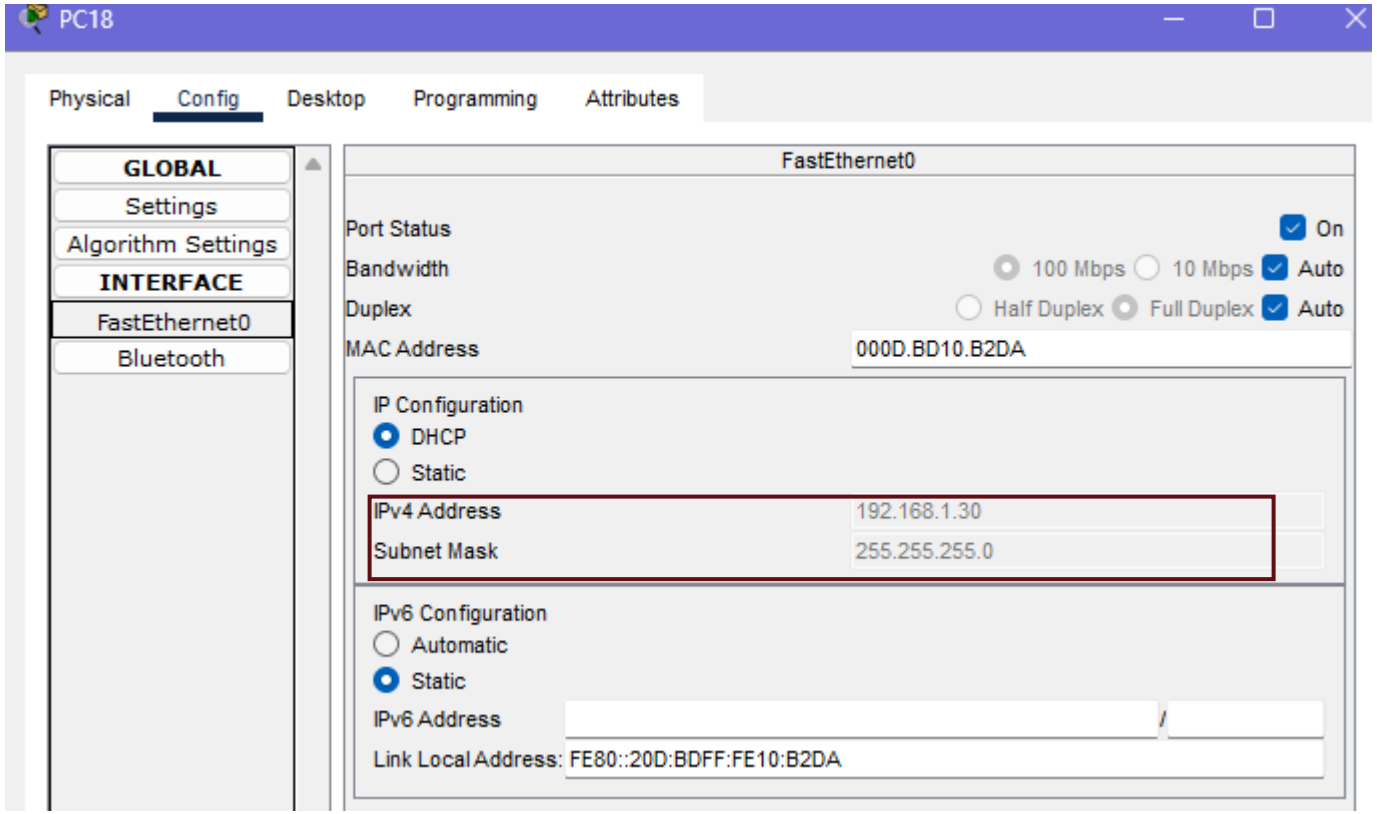
Made a small with a server to test DHCP for automatic addressing

Start IP from 192.168.1.30 and number of users and save:



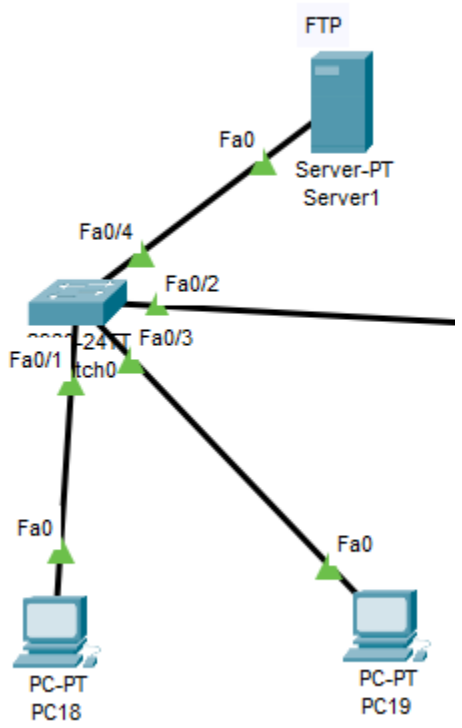
DHCP Server (Bonus)

Check the DHCP box and the IP address is automated to193.168.1.30 :



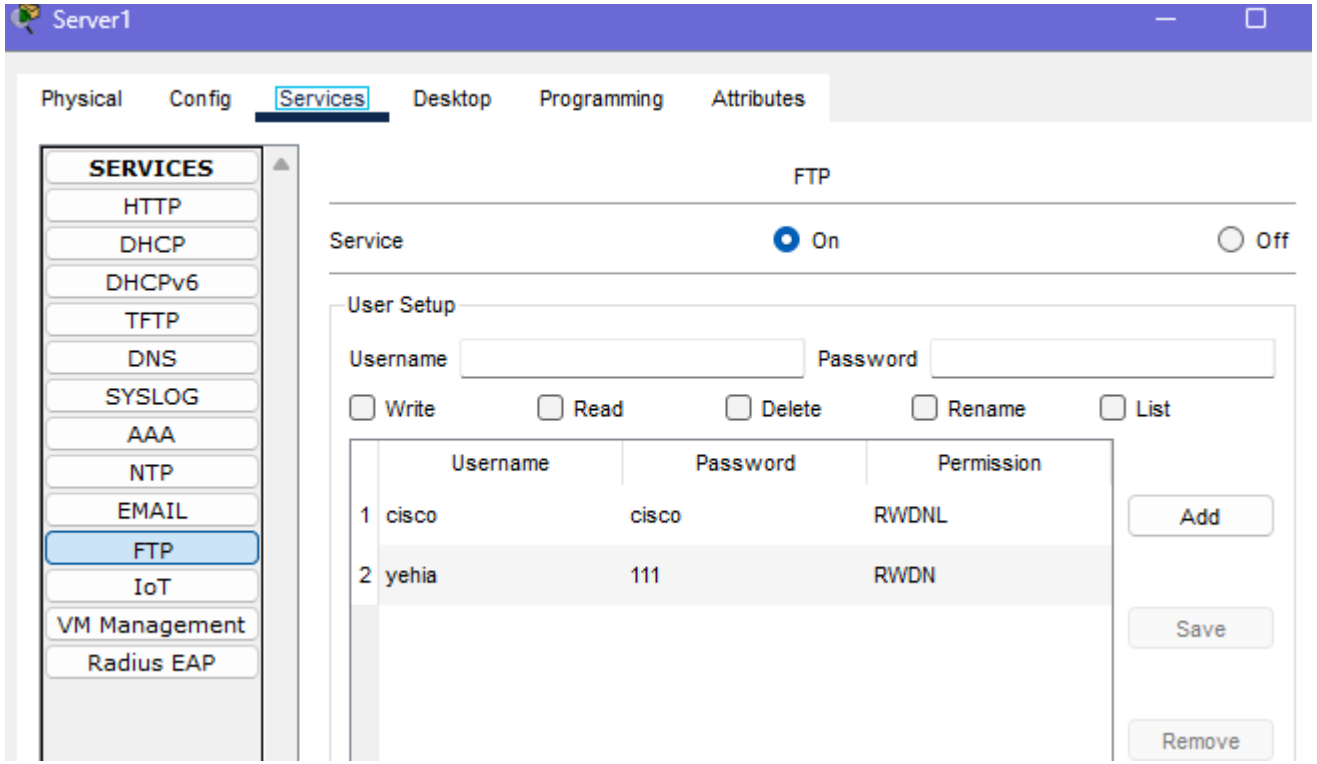
FTP Server (Bonus)

Added a FTP Server to transfer files:



FTP Server (Bonus)

Type username , password and choose permissions:



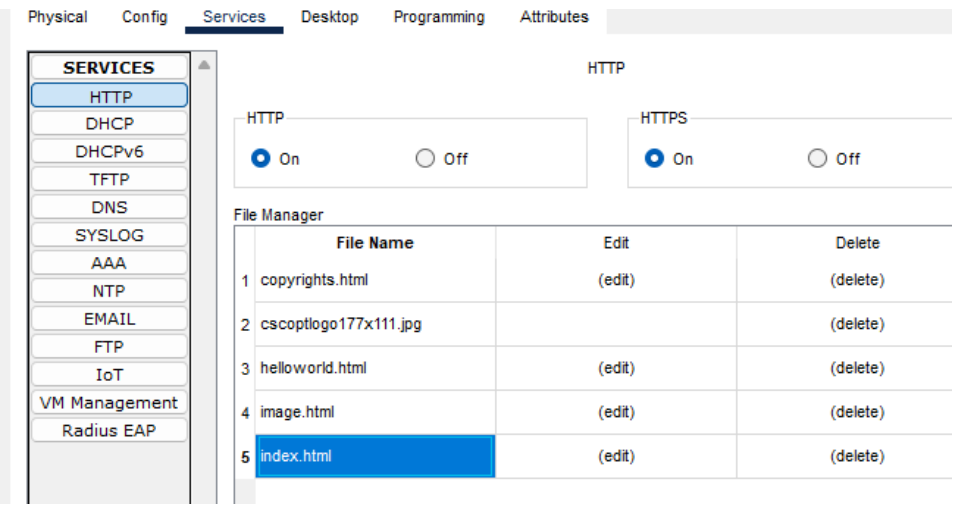
FTP Server (Bonus)

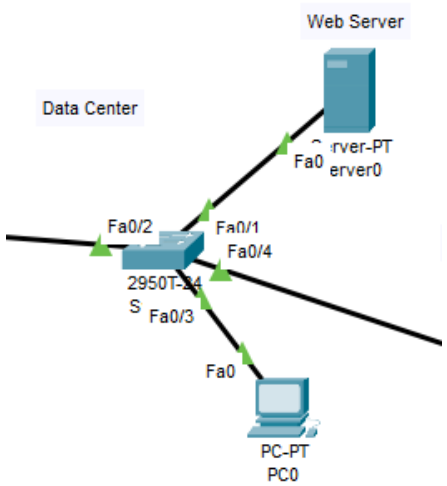
Connect :

```
C:\>ftp 192.168.1.2
Trying to connect...192.168.1.2
Connected to 192.168.1.2
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
```

Web page (Bonus)

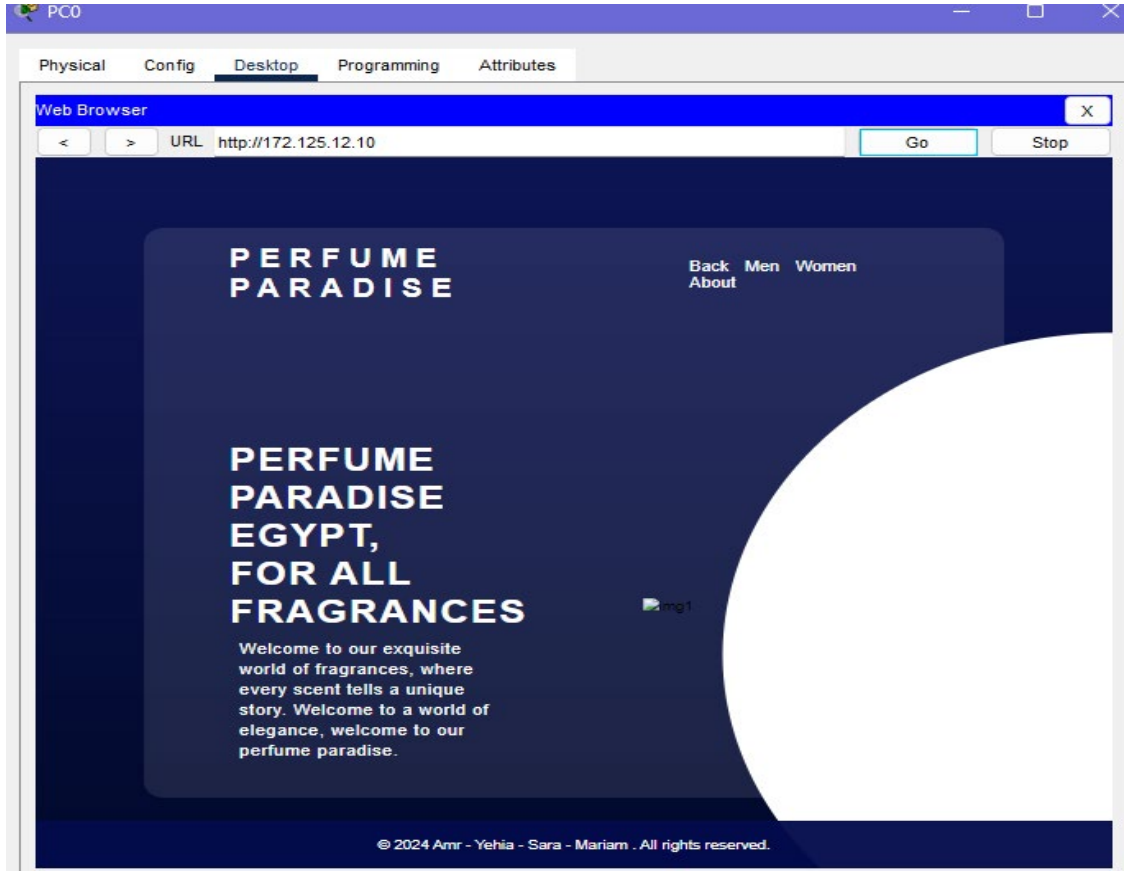
Adding a server for a web page:





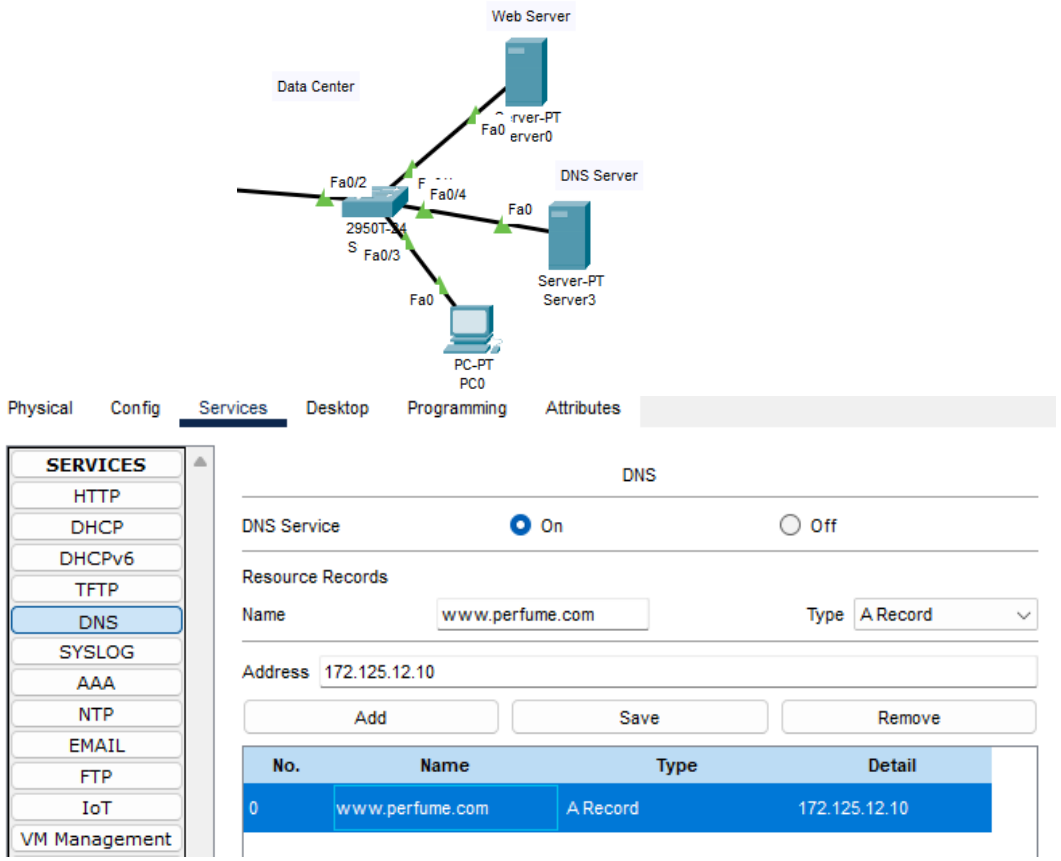
Web page (Bonus)

Navigating to the page using the server IP address:



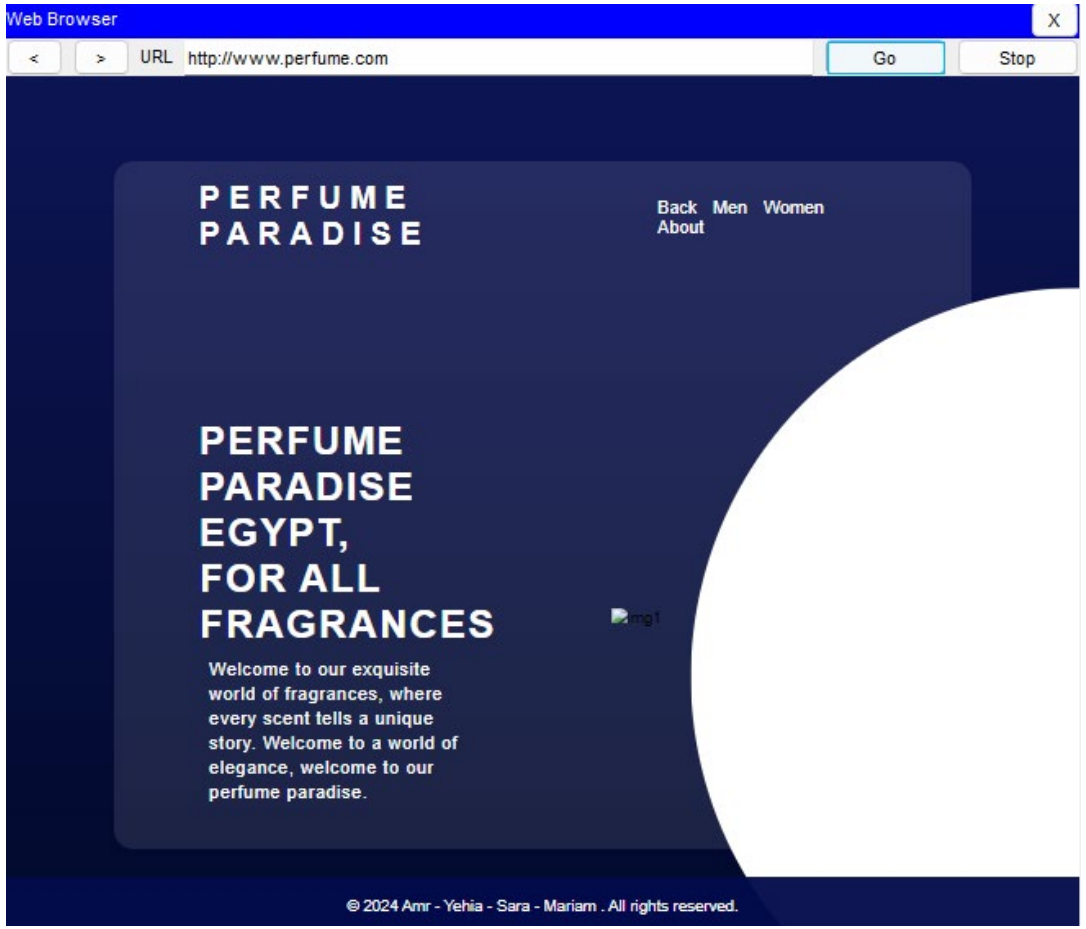
DNS Server (Bonus)

Translating the previous web page IP address to its name:



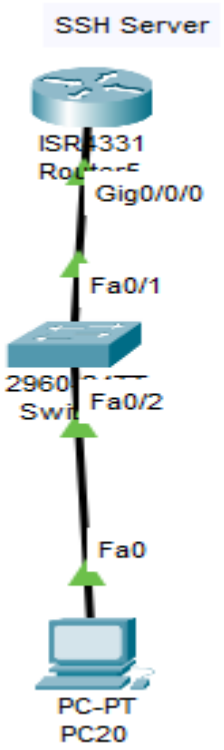
DNS Server (Bonus)

Navigating by the domain name:



SSH Server (Bonus)

Made a LAN for SSH server:



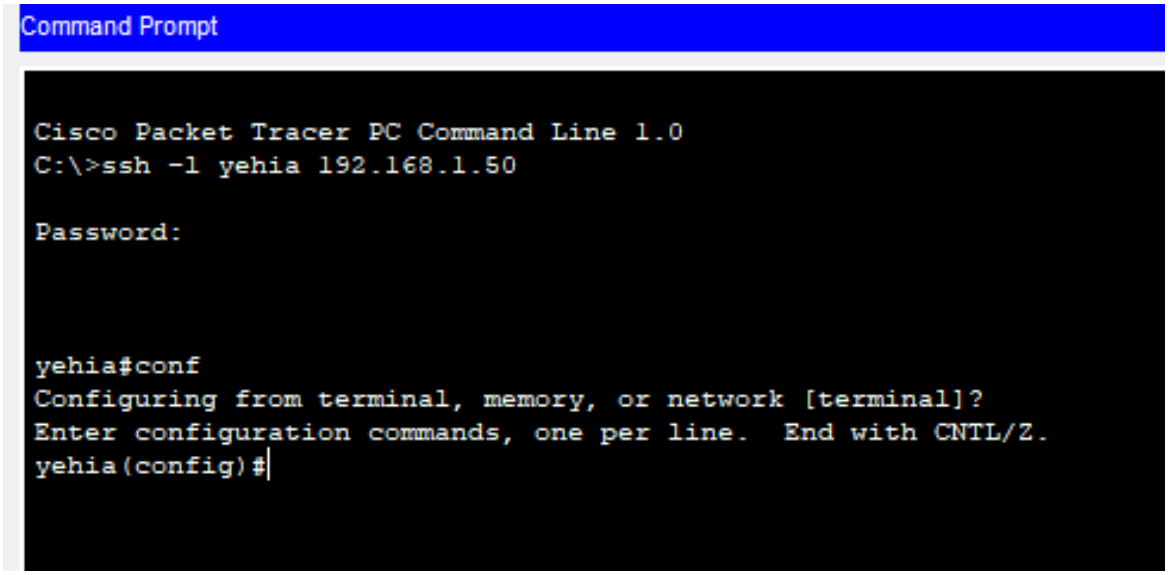
SSH Server (Bonus)

Command in the router cli:

Ip domain-name SSH1
Crypto key generate rsa
Line vty 0 15
Transport input ssh
Login local
Ip ssh ver 2
Username yehia privilege 15 [assword 111
Do wr

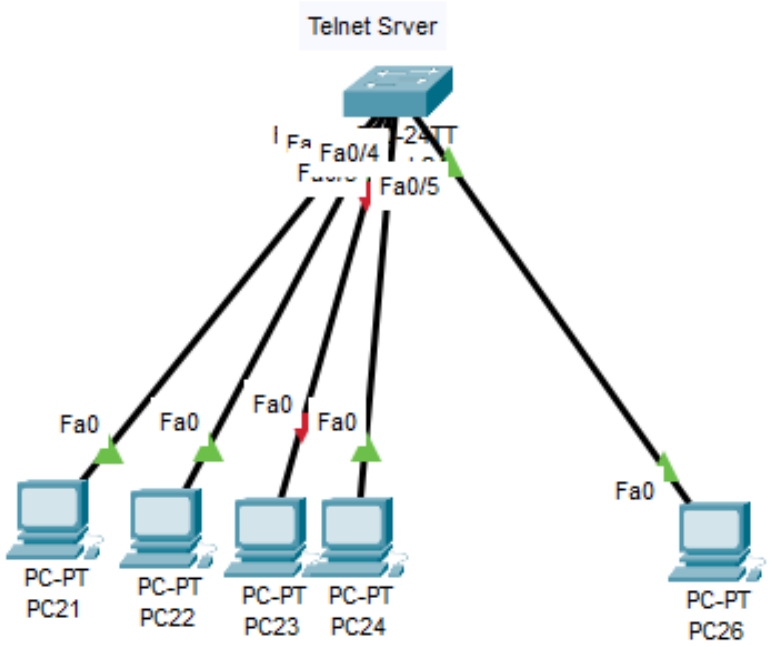
SSH Server (Bonus)

Now we can control the router from the pc cmd:



Telnet Server (Bonus)

Made a LAN for the Telnet server:



Telnet Server (Bonus)

Use this command in the switch cli:

Interface clan 1
Ip address 192.168.10.100 255.255.255.0
No shutdown
Exit
Line vty 0 15
Password yehia@111
Login
Exit
Exit
Then save

Telnet Server (Bonus)

From the cmd from any pc we can access the switch:

```
C:\>telnet 192.168.10.100
Trying 192.168.10.100 ...Open


User Access Verification

Password:
Switch>\
```

Team

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End..