Lab Exam: Final!

———————————*786*

———————————

Name: Muhammad Sherjeel Akhtar

Roll No: 20p-0101

Subject: Computer Networks Lab

Submitted To Respected

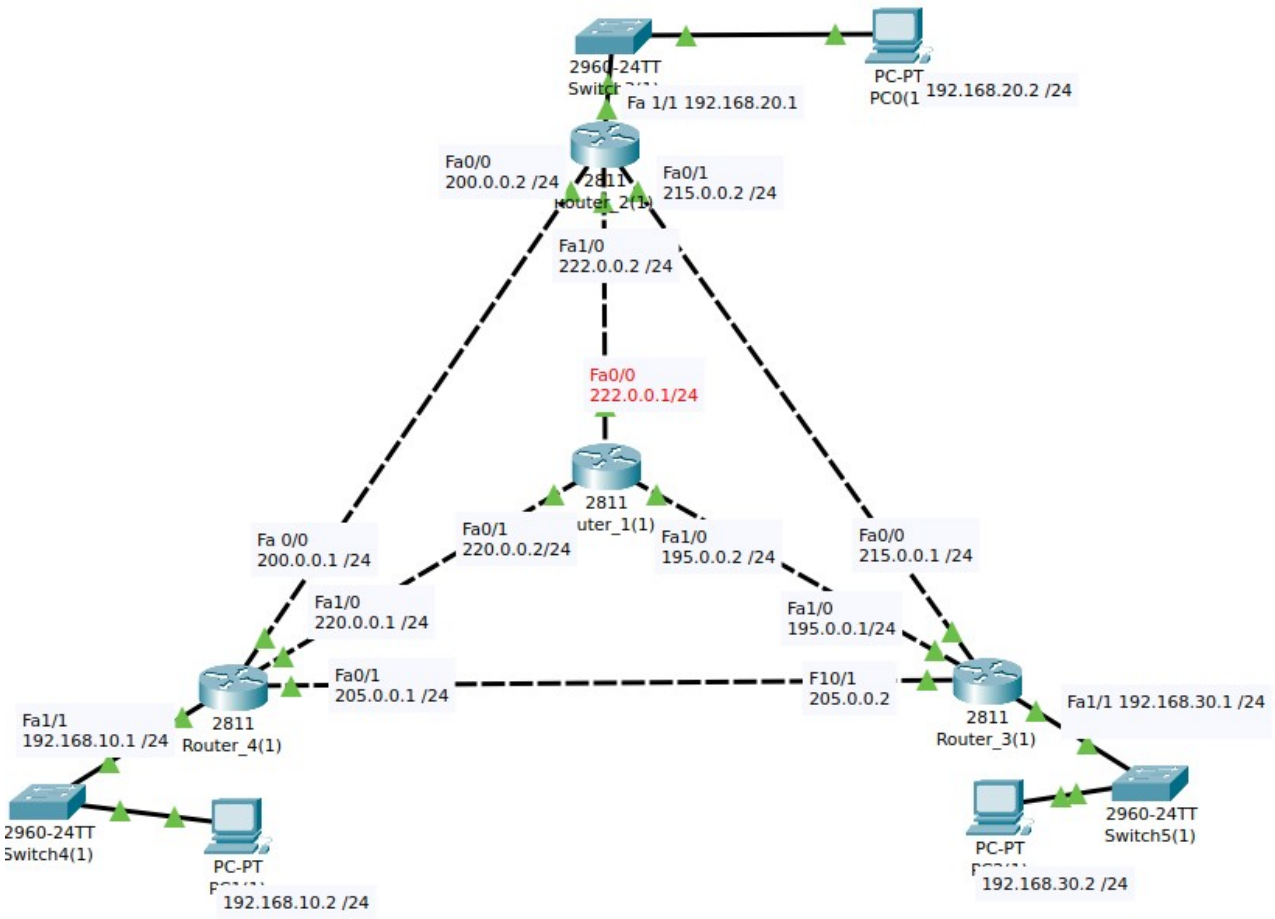
Ma’am: Hurmat Hidayat

Section: BCS-5B

Question: 1

Answer:

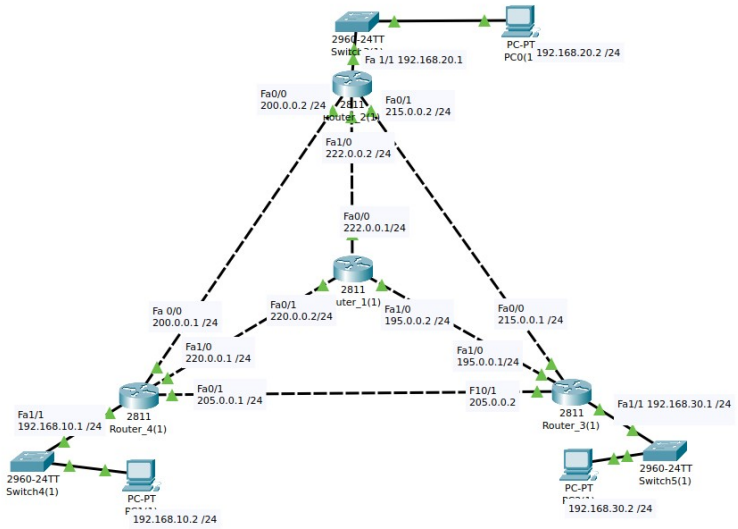
Given Topology:



.

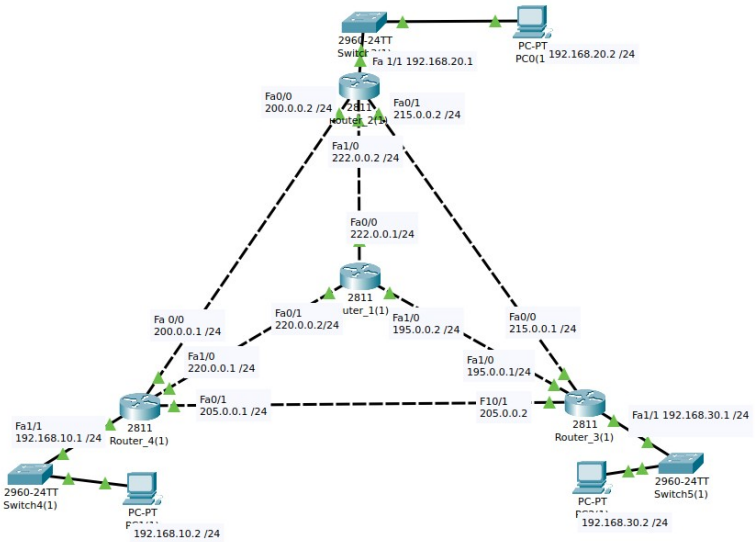
We’ve given above topology for our network.

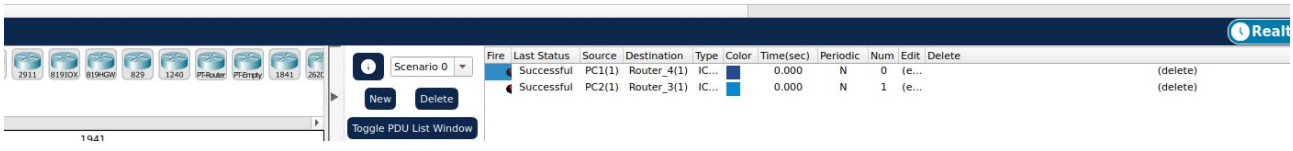
Connection Testing Between PC’s And Routers:


2960-24TT
PC-PT
PC0(1
192.168.20.2 /24
Fa 1/1 192.168.20.1
Fa0/0
200.0.0.2 /24
Fa0/1
215.0.0.2 /24
Fa1/0
222.0.0.2 /24
Fa0/0
222.0.0.1/24
2811
uter_1(1)
Fa0/1
220.0.0.2/24
Fa1/0
195.0.0.2 /24
Fa 0/0
200.0.0.1 /24
Fa0/0
215.0.0.1 /24
Fa1/0
220.0.0.1 /24
Fa1/0
195.0.0.1/24
Fa0/1
205.0.0.1 /24
F10/1
205.0.0.2
Fa1/1 192.168.30.1 /24
Fa1/1
192.168.10.1 /24
2811
Router_4(1)
2811
Router_3(1)
2960-24TT
Switch4(1)
PC-PT
2960-24TT
Switch5(1)
192.168.10.2 /24
192.168.30.2 /24

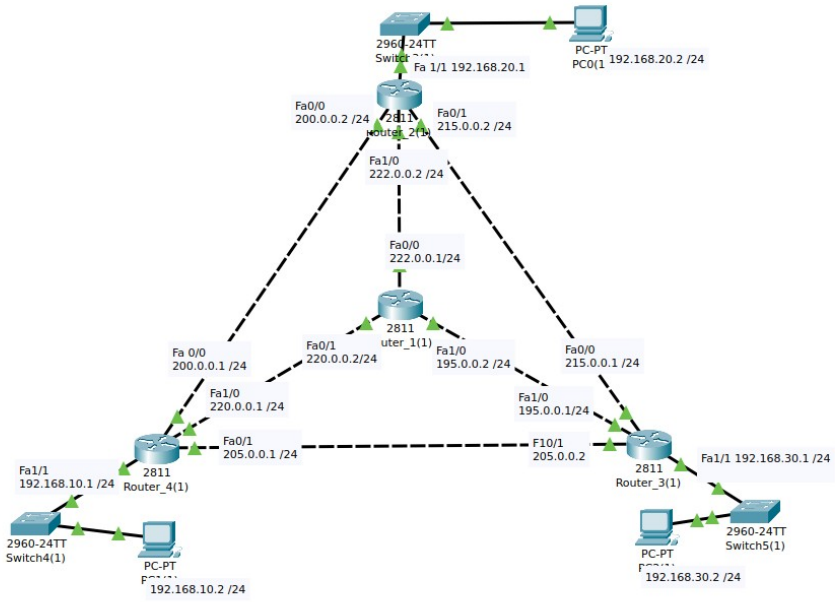

Scenario 0
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC1(1)
Router_4(1)
IC...
0.000
N
0
(e...
(delete)

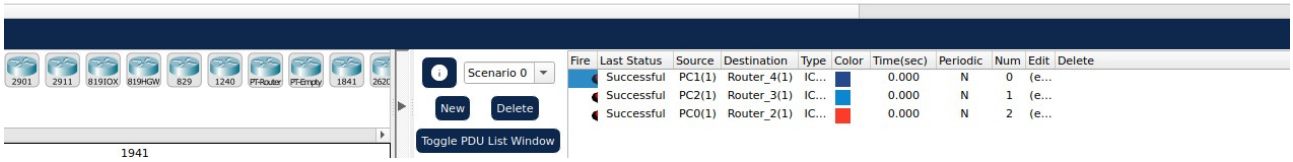
-


2960-24TT
PC-PT
PC0(1
192.168.20.2 /24
Fa 1/1 192.168.20.1
Fa0/0
200.0.0.2 /24
Fa0/1
215.0.0.2 /24
Fa1/0
222.0.0.2 /24
Fa0/0
222.0.0.1/24
2811
uter_1(1)
Fa0/1
220.0.0.2/24
Fa1/0
195.0.0.2 /24
Fa 0/0
200.0.0.1 /24
Fa0/0
215.0.0.1 /24
Fa1/0
220.0.0.1 /24
Fa1/0
195.0.0.1/24
Fa0/1
205.0.0.1 /24
F10/1
205.0.0.2
Fa1/1 192.168.30.1 /24
Fa1/1
192.168.10.1 /24
2811
Router_4(1)
2811
Router_3(1)
2960-24TT
Switch4(1)
PC-PT
2960-24TT
Switch5(1)
192.168.10.2 /24
192.168.30.2 /24


Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC1(1)
Router_4(1)
IC...
0.000
N
0
(e...
(delete)
Successful
PC2(1)
Router_3(1)
IC...
0.000
N
1
(e...
(delete)

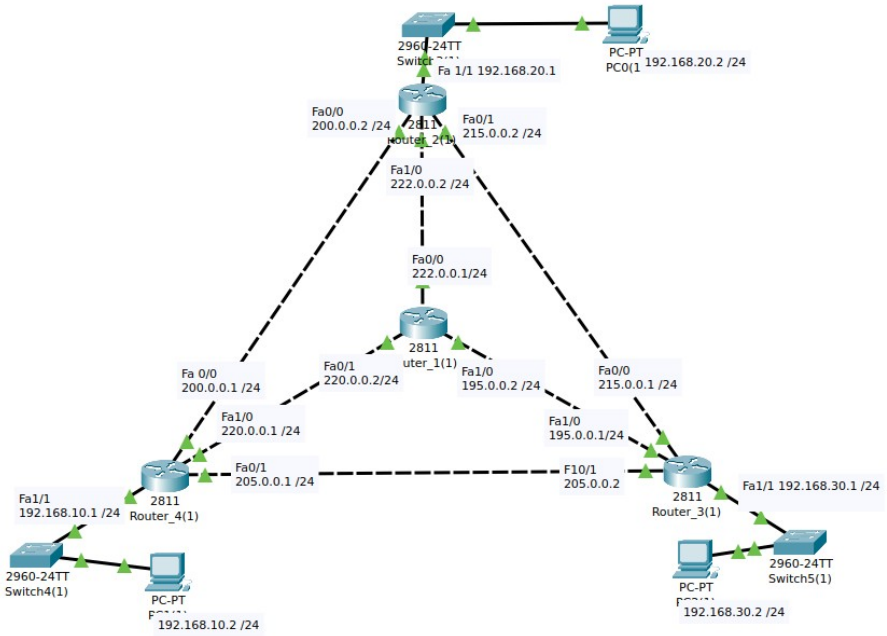
-

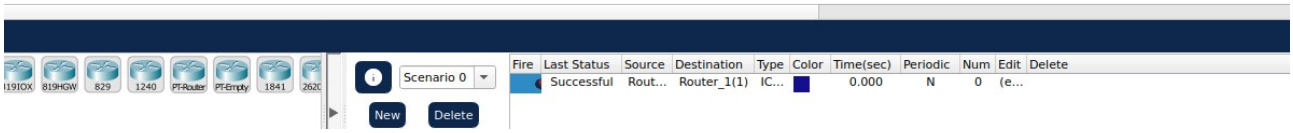




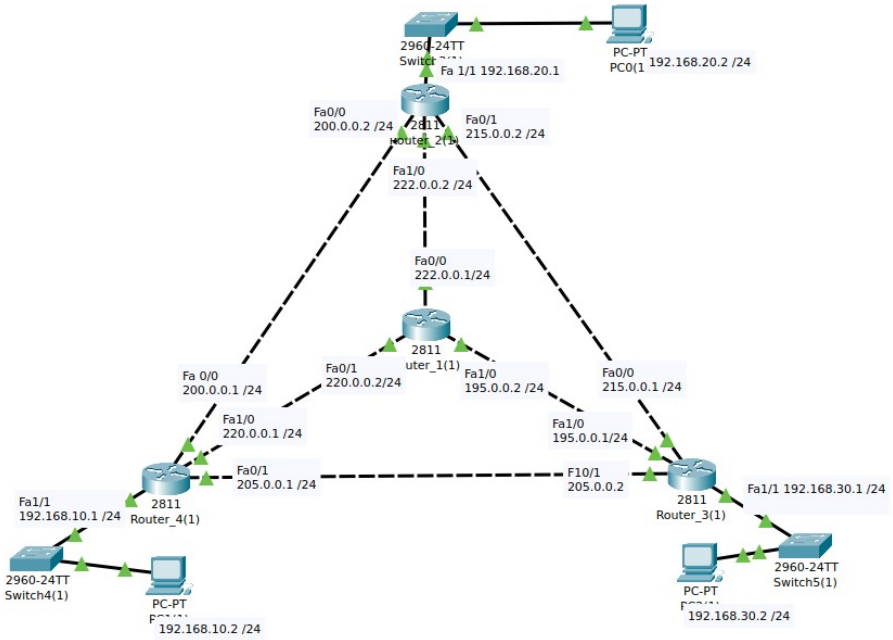
•

Connection Testing Between Routers:


2960-24TT
PC-PT
192.168.20.2 /24
Fa 1/1 192.168.20.1
Fa0/0
200.0.0.2 /24
Fa0/1
215.0.0.2 /24
Fa1/0
222.0.0.2 /24
Fa0/0
222.0.0.1/24
2811
Fa0/1
220.0.0.2/24
Fa1/0
195.0.0.2 /24
Fa0/0
215.0.0.1 /24
Fa 0/0
200.0.0.1 /24
Fa1/0
220.0.0.1 /24
Fa1/0
195.0.0.1/24
Fa0/1
205.0.0.1 /24
F10/1
205.0.0.2
Fa1/1 192.168.30.1 /24
Fa1/1
192.168.10.1 /24
2811
Router_4(1)
2811
Router_3(1)
2960-24TT
Switch4(1)
PC-PT
2960-24TT
Switch5(1)
PC-PT
192.168.10.2 /24
192.168.30.2 /24

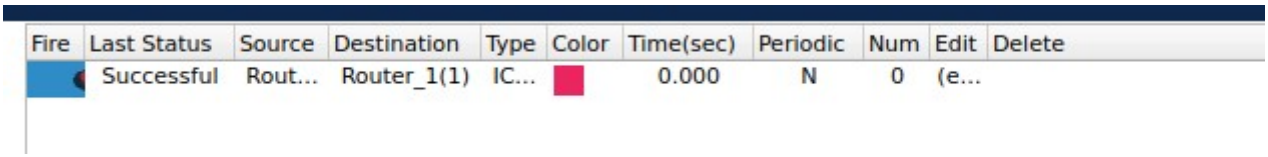

Scenario 0
New
Delete
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Rout...
Router_1(1)
IC...
0.000
N
0
(e...

-

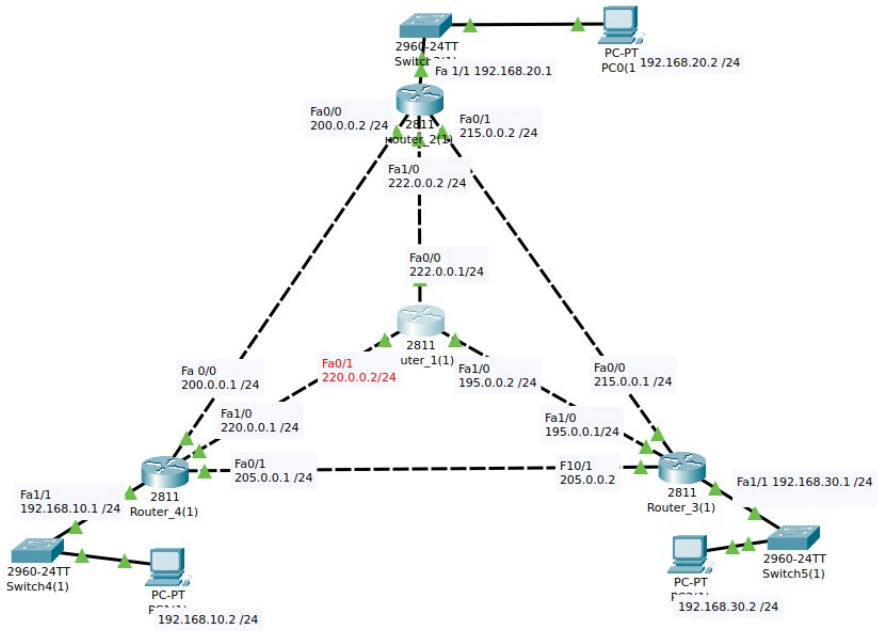

2960-24TT
Switch
PC-PT
PC0(1
192.168.20.2 /24
Fa 1/1 192.168.20.1
Fa0/0
200.0.0.2 /24
Fa0/1
215.0.0.2 /24
Fa1/0
222.0.0.2 /24
Fa0/0
222.0.0.1/24
2811
uter_1(1)
Fa 0/0
200.0.0.1 /24
Fa0/1
220.0.0.2/24
Fa1/0
195.0.0.2 /24
Fa0/0
215.0.0.1 /24
Fa1/0
220.0.0.1 /24
Fa1/0
195.0.0.1/24
Fa0/1
205.0.0.1 /24
F10/1
205.0.0.2
Fa1/1
192.168.10.1 /24
2811
Router_4(1)
2811
Router_3(1)
Fa1/1 192.168.30.1 /24
2960-24TT
Switch4(1)
PC-PT
192.168.10.2 /24
PC-PT
192.168.30.2 /24
2960-24TT
Switch5(1)

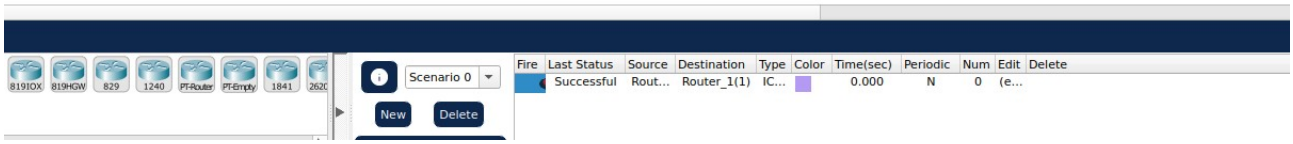

Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Rout...
Router_1(1)
IC...
0.000
N
0
(e...

-

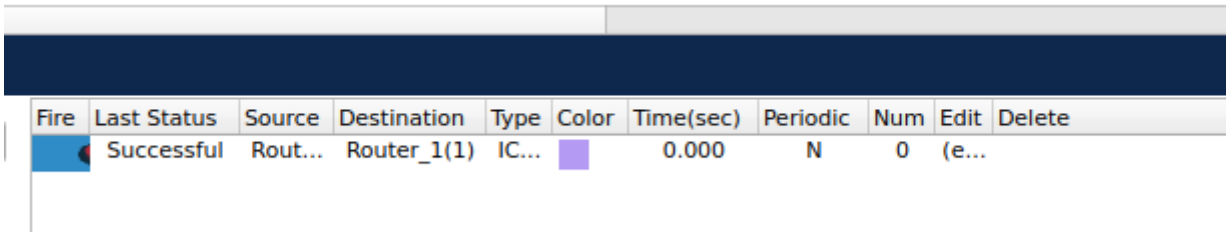

Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Rout...
Router_1(1)
IC...
0.000
N
0
(e...

-





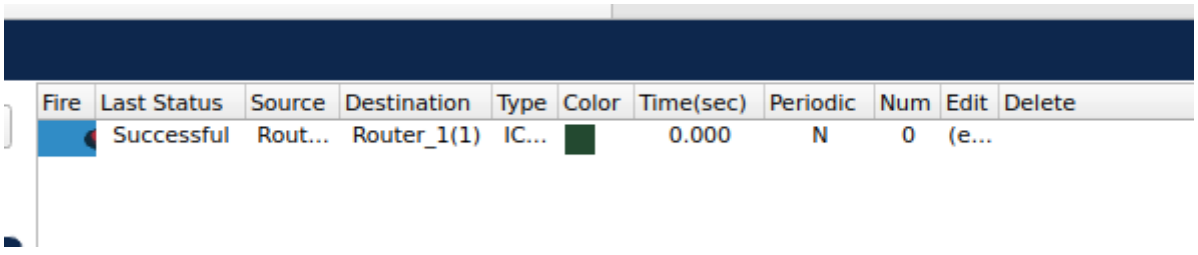
•



•

Successful Connection Testing between Routers.

Testing Router 1 Connection Again with the central Router.



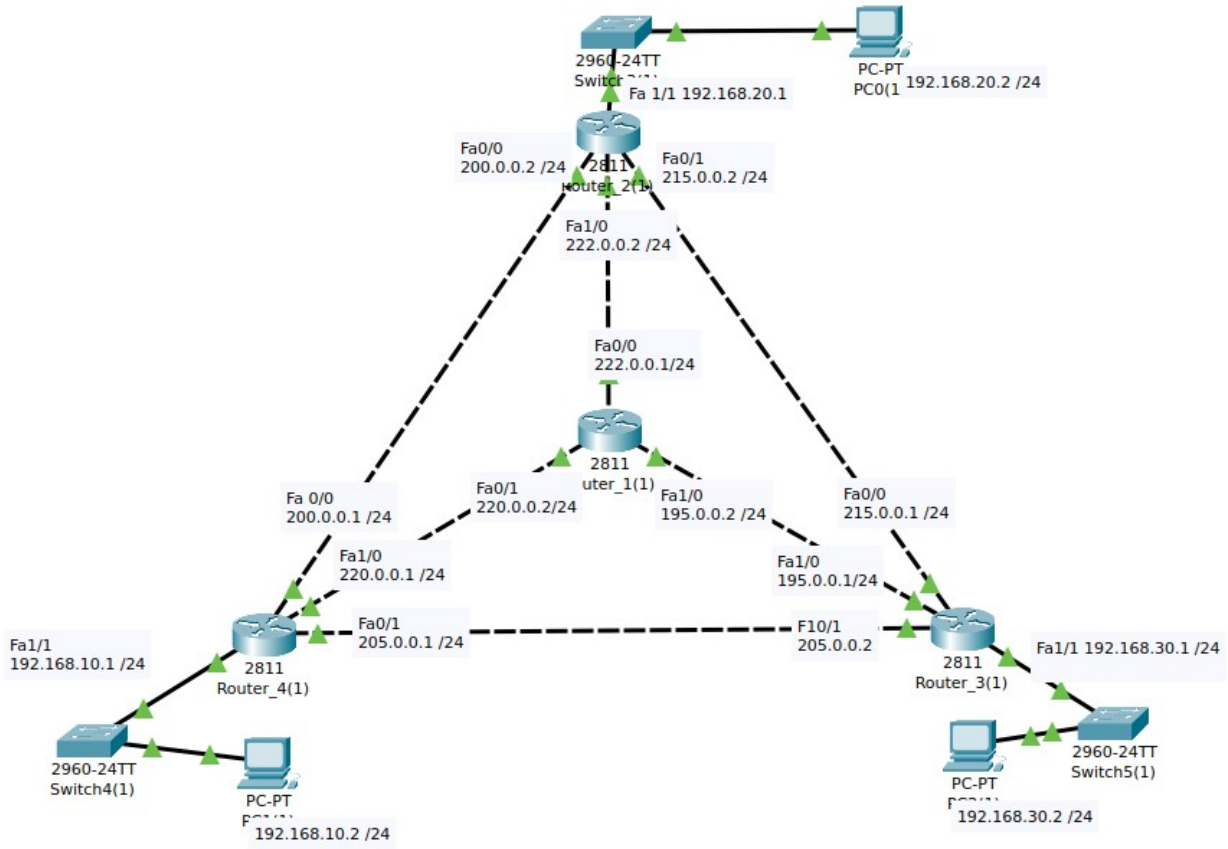
•

All The Router Configurations are Working.

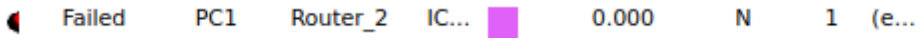
Next Step:

Now, we will check if we can transfer data from ***One Network To The Other.*** For this purpose, we will send a packet between the PC's of the different Networks.

Testing b/w Router 4 and Router 2:

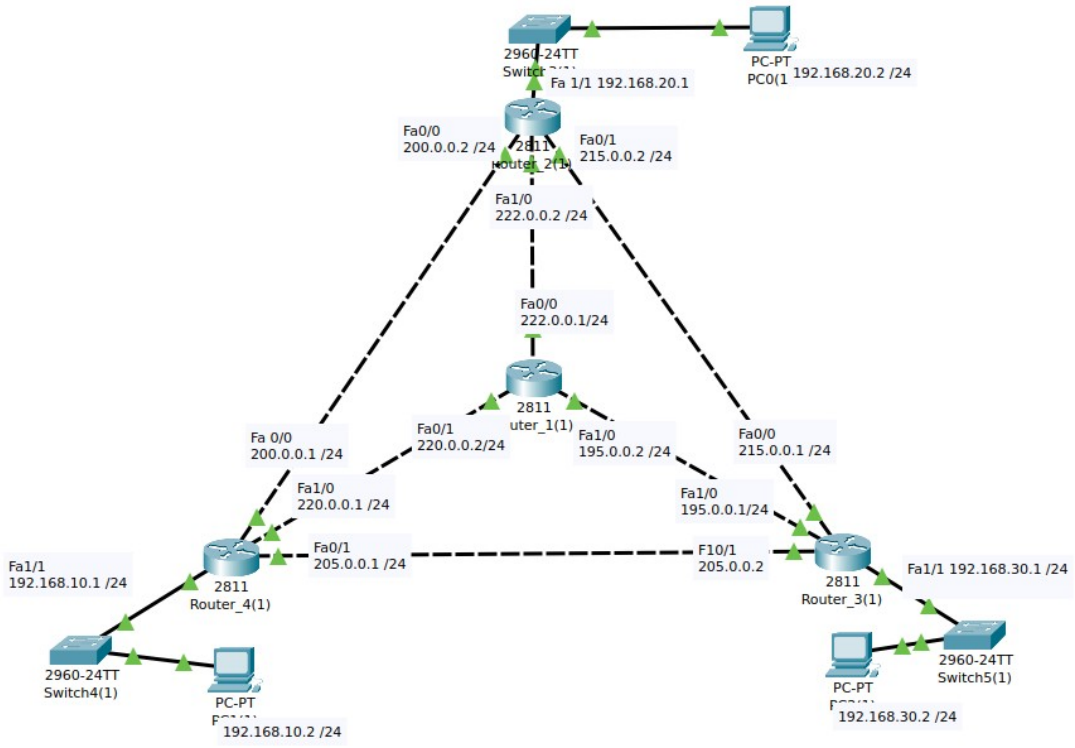


•



•

Testing b/w Router 3 And Router 2:

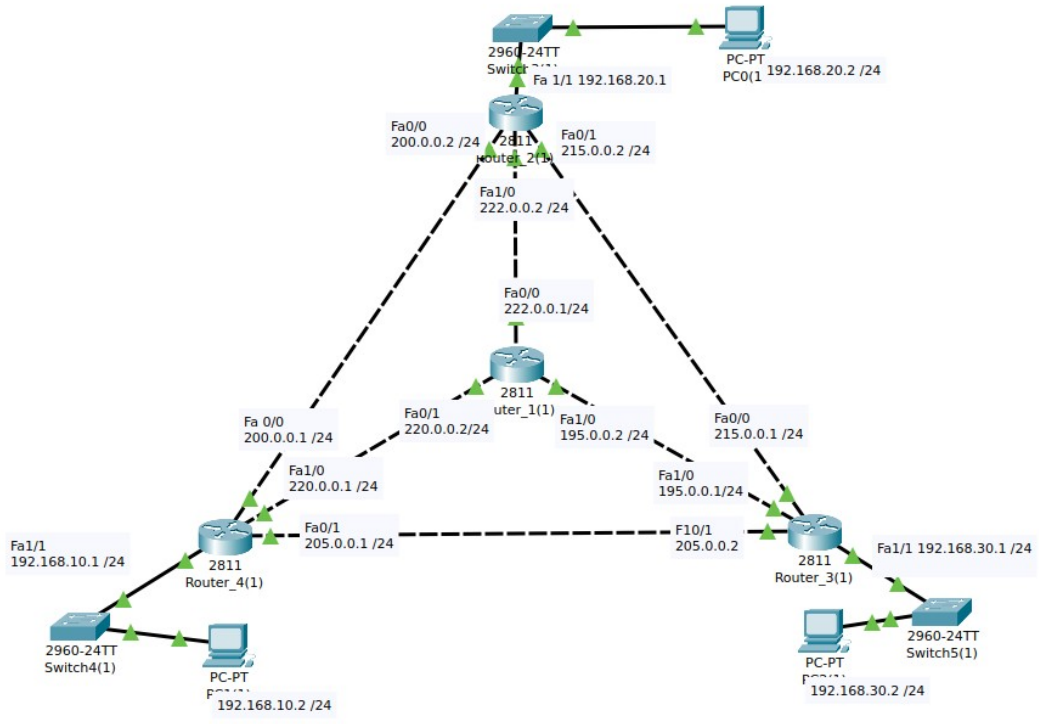


-

	Failed	Rout...	PC0(1)	IC...		0.000	N	8	(e...	(delete)

-

Testing b/w Router 3 And Router 4:



•

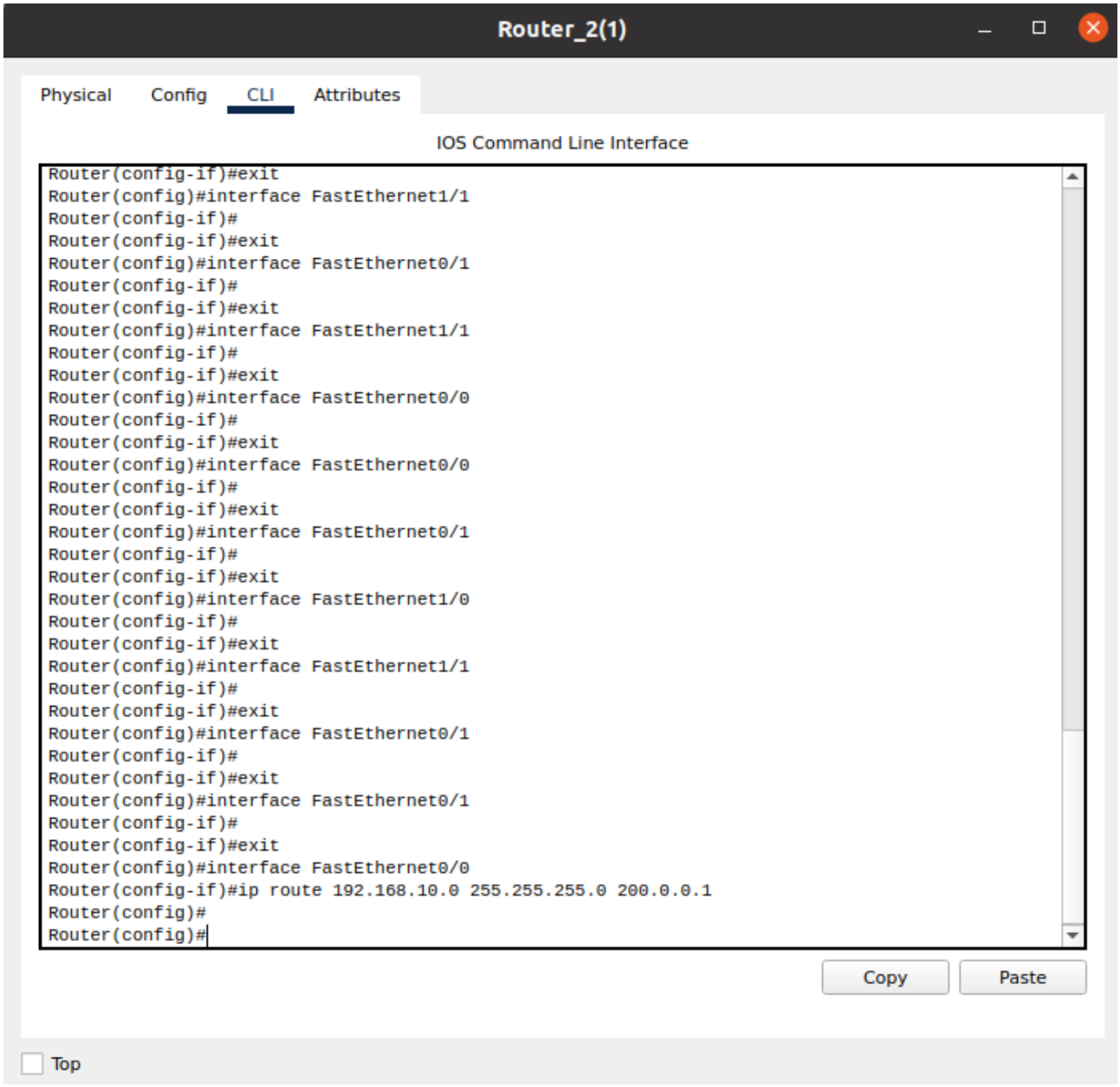
	Failed	PC1(1)	PC2(1)	IC...		0.000	N	9	(e...	(delete)

•

Conclusion: *We can see, we cannot transfer files between different Networks. For this purpose, we will do* ***STATIC ROUTING*** *between the Networks.*

Static Routing between Router 4 And Router 2:

Router 2:

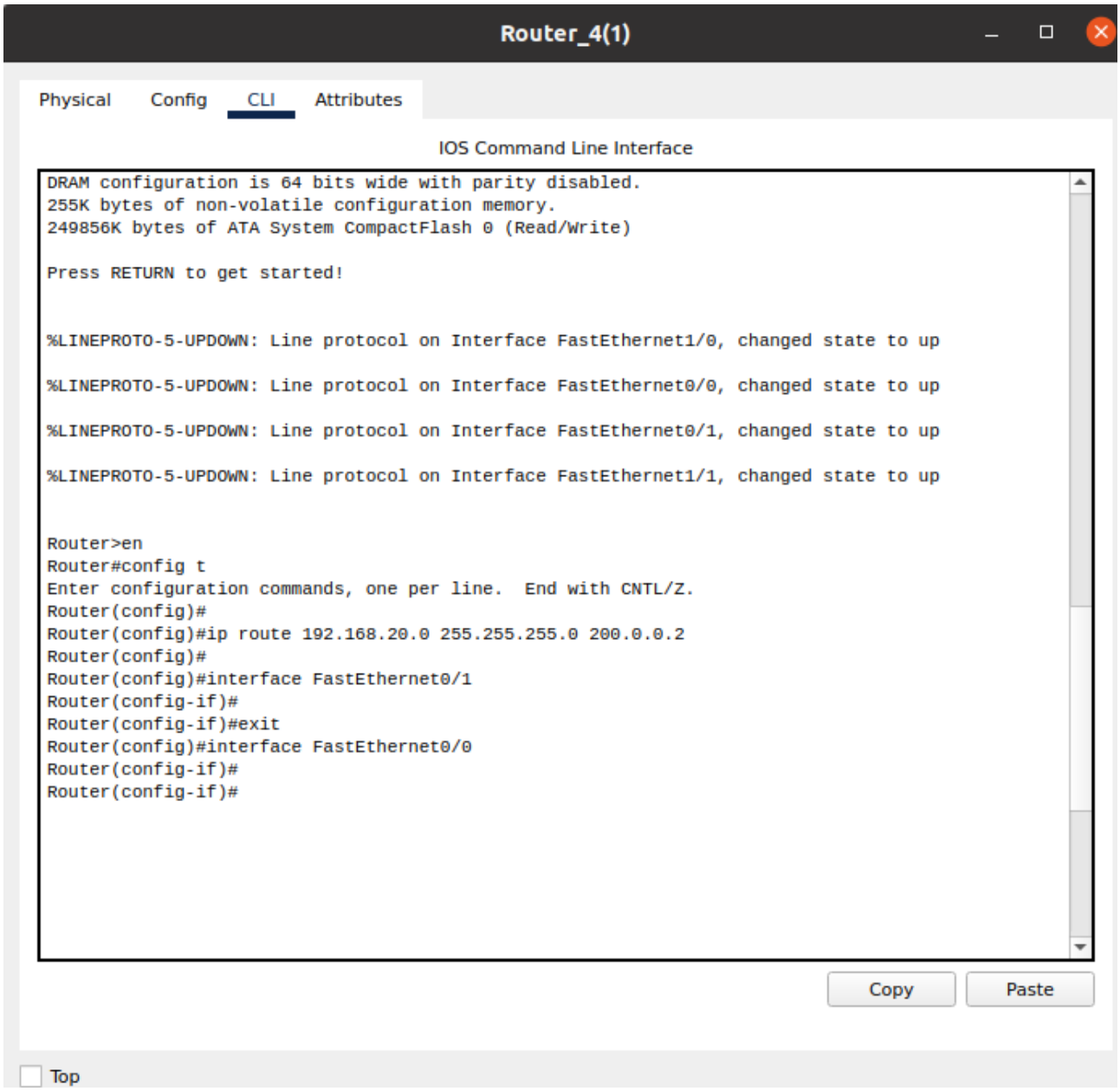


.

Here is the Router 2 CLI Configuration.

Router 4:

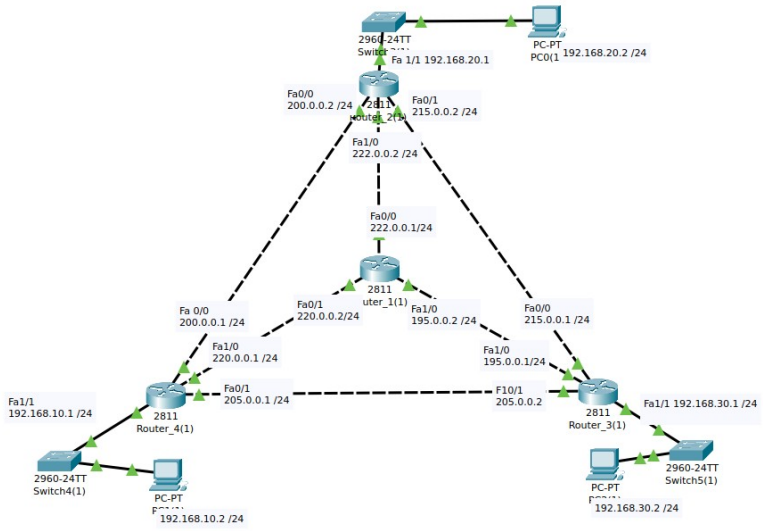
Below is the Router 4 Configuration.



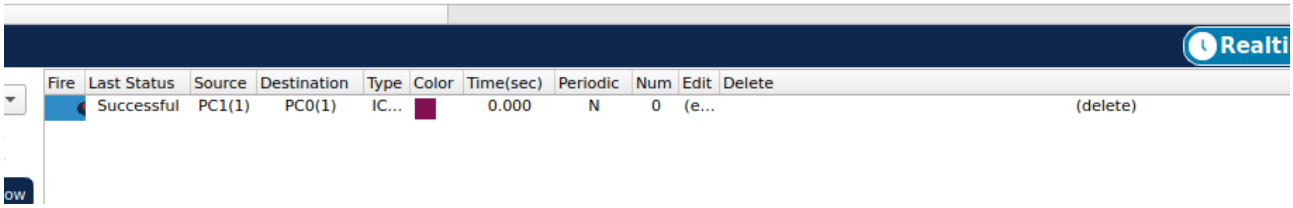
.

Testing:

Packet Send successfully after the Static Routing between the Routers.



.

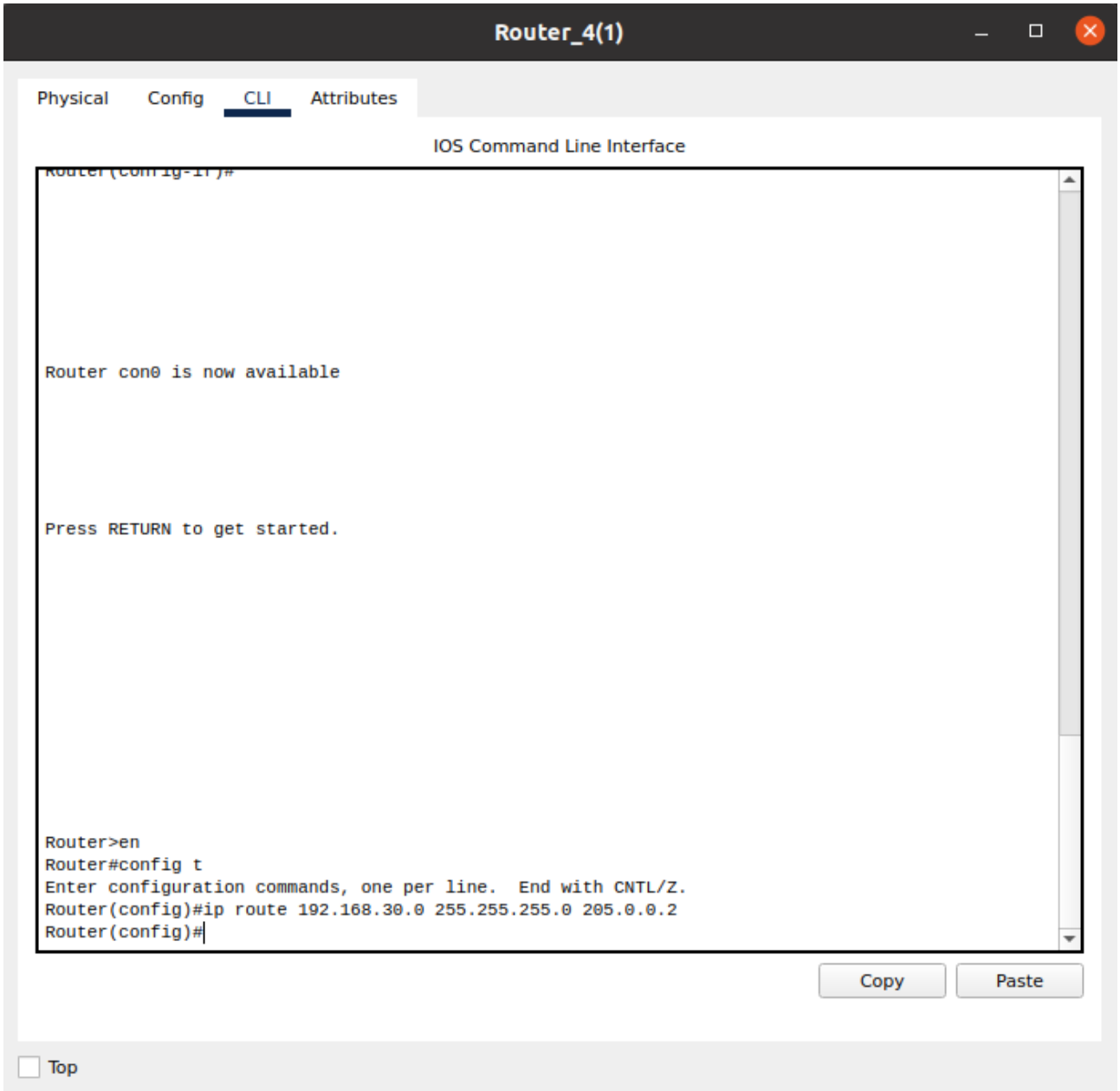


.

Static Routing between Router 4 And Router 3:

Router 4:

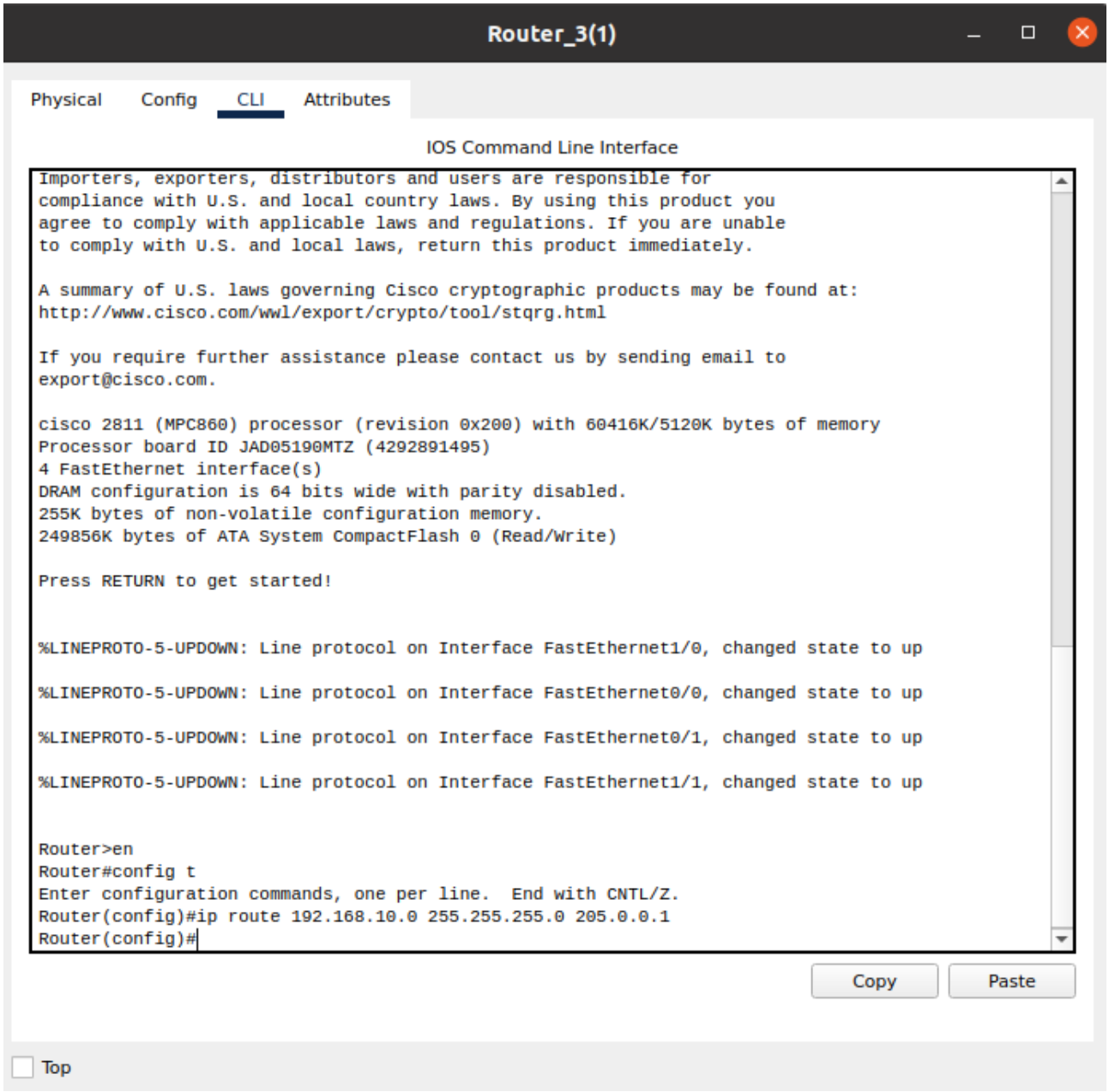
Below is the Router 4 Configuration.



.

Router 3:

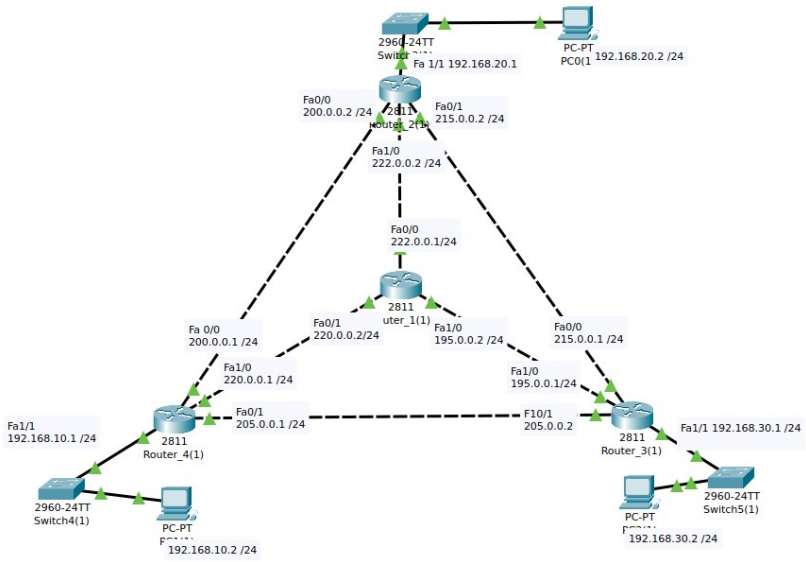
Below is the Router 3 Configuration.

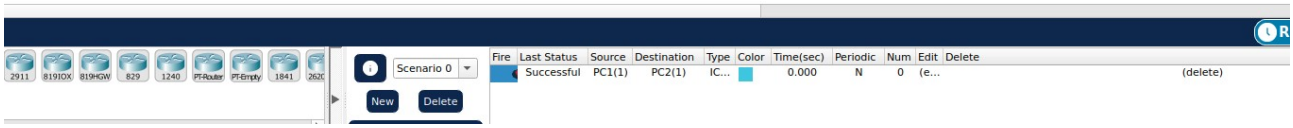


.

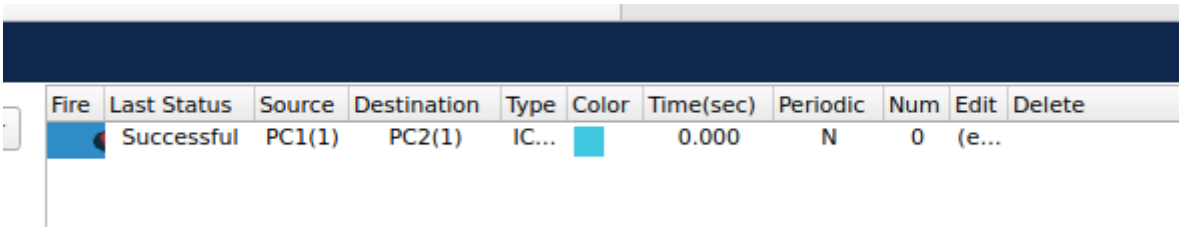
Testing:

Packet Send successfully after the Static Routing between the Routers.





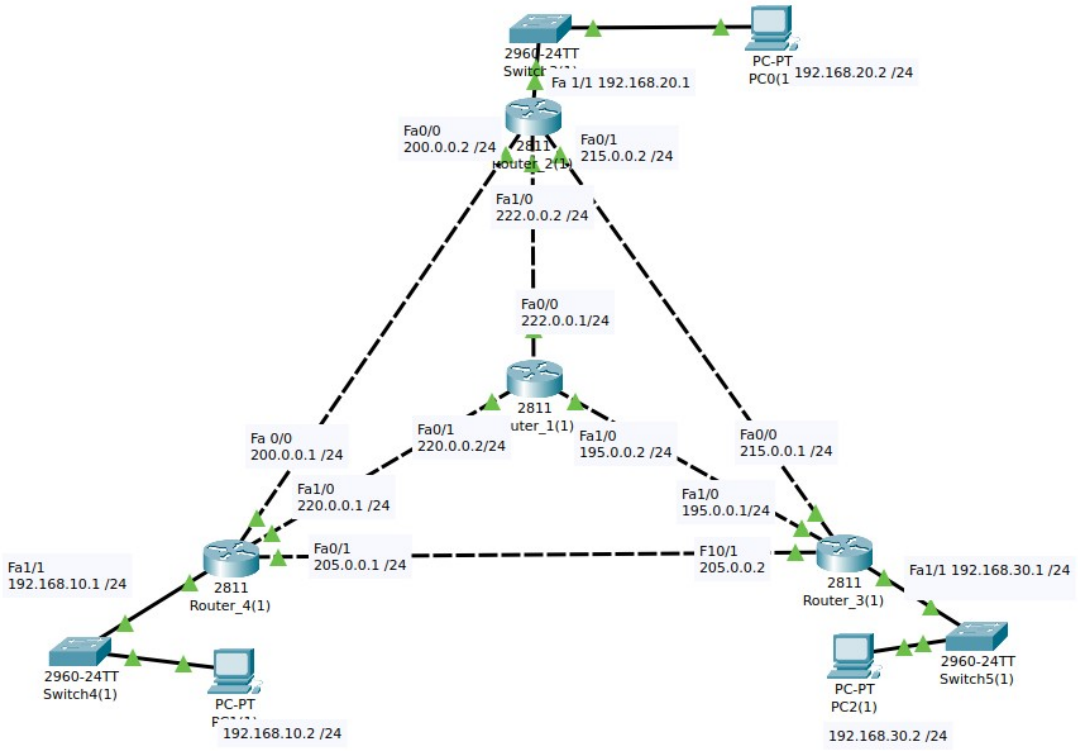
.



.

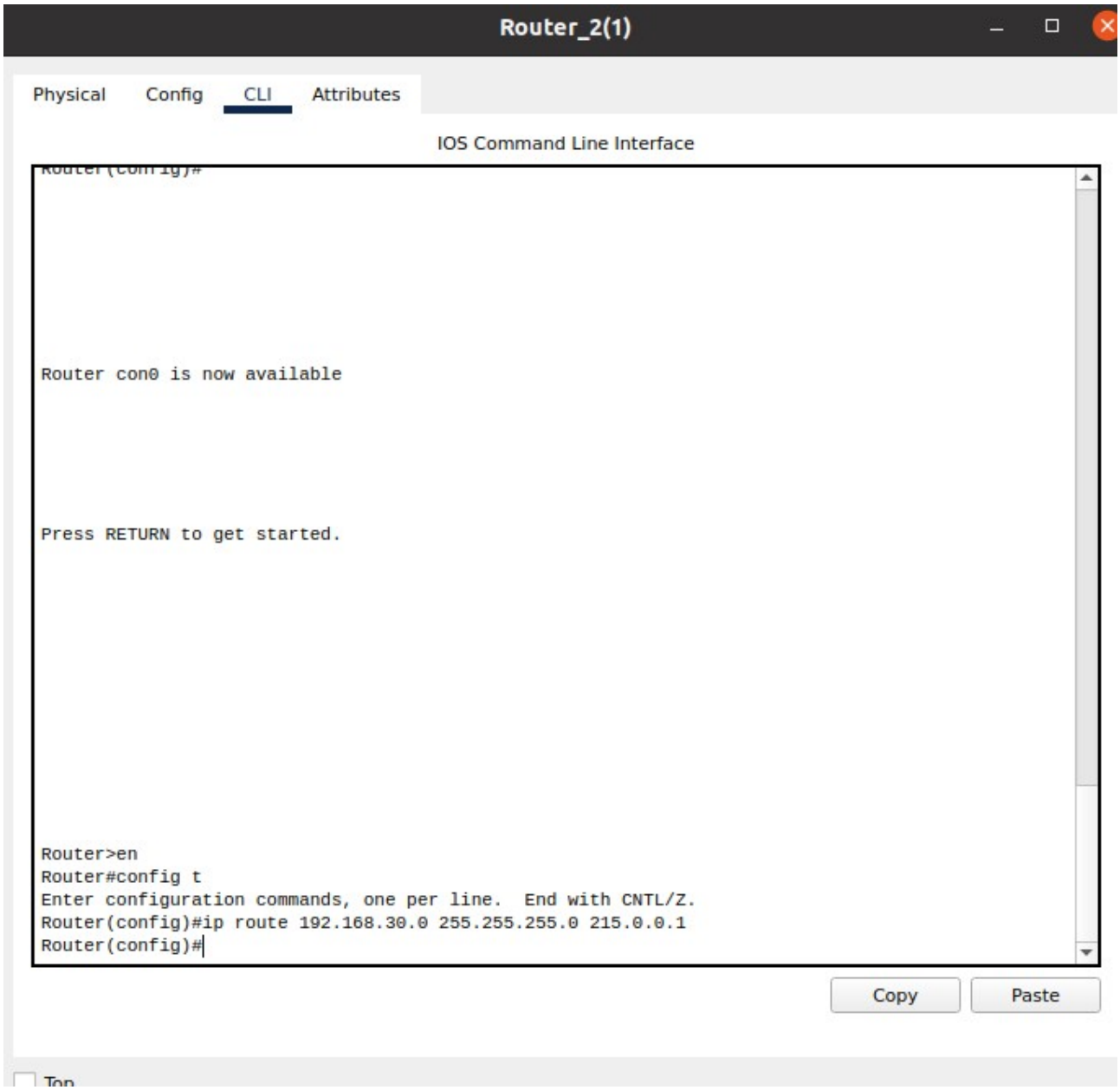
Static Routing between Router 2 And Router 3:

Router 2:



.

Below is the Router 2 Configuration.



.

Router-3:

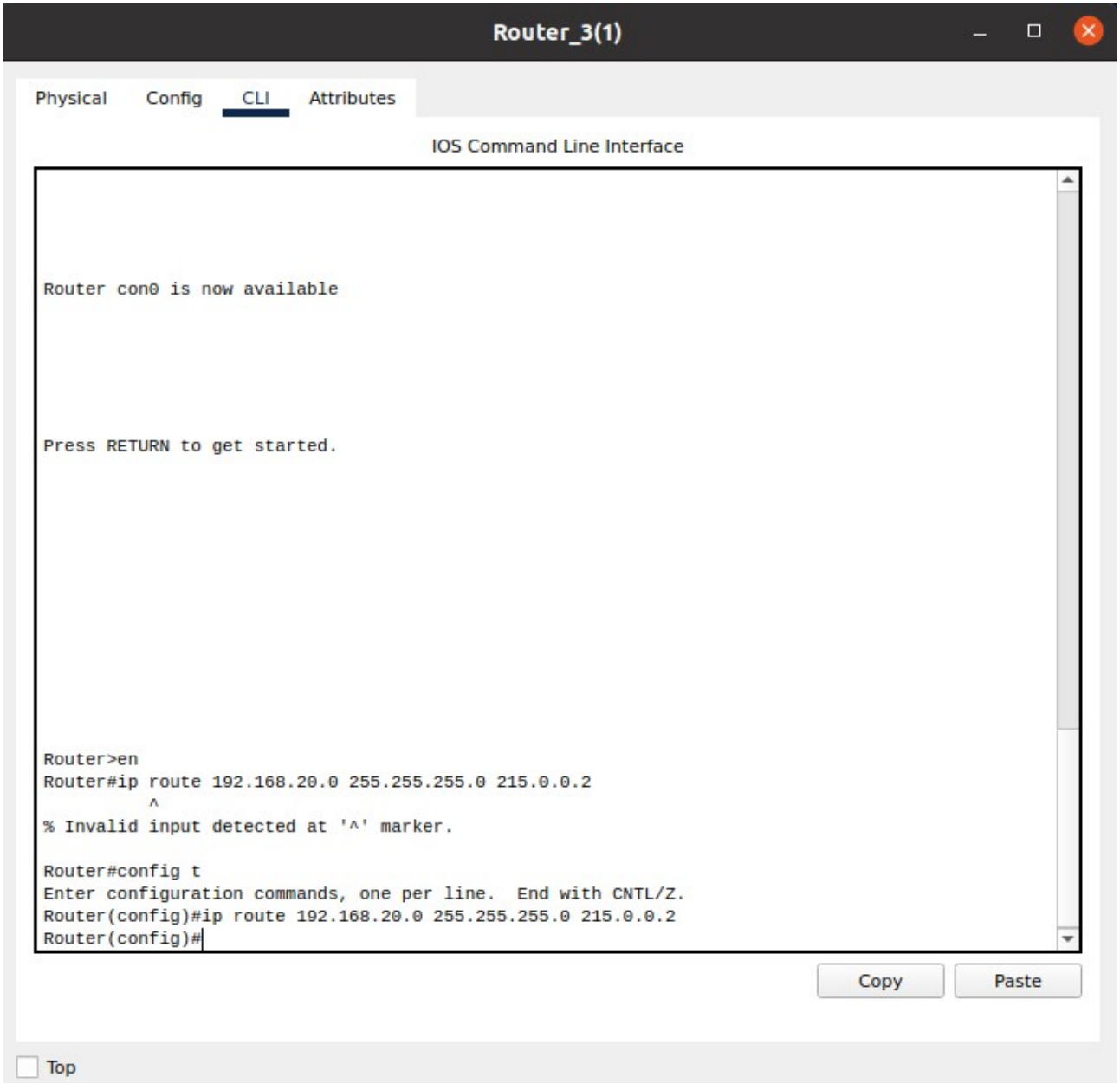
Below is the Router-3 Configuration.

..

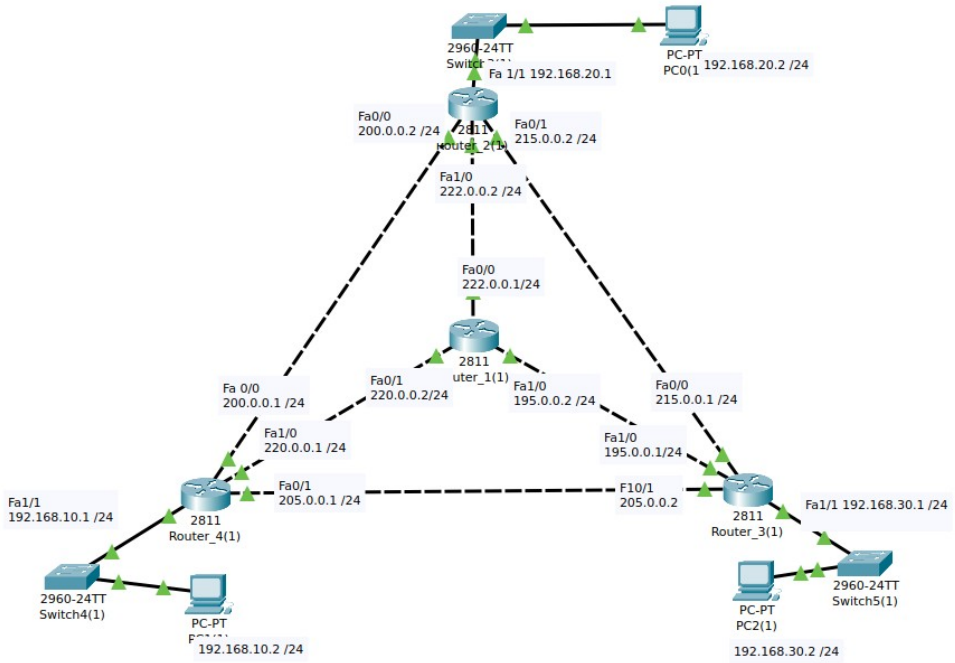
.

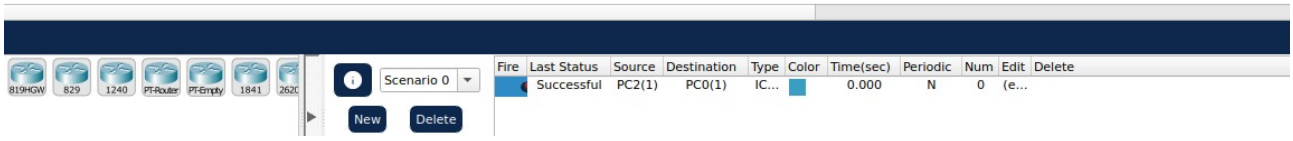
.

.

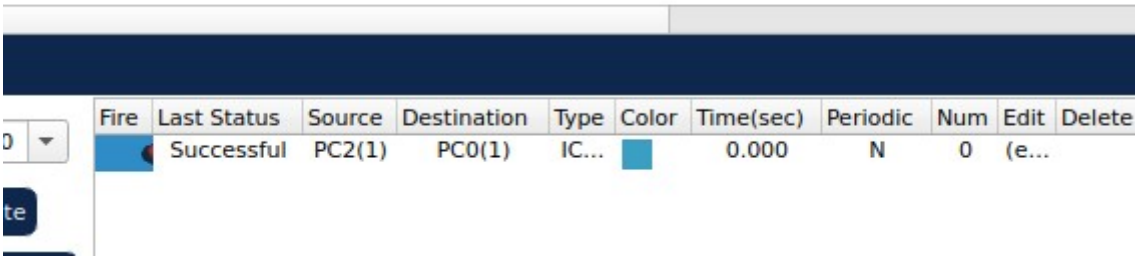

Router_3(1)
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router con0 is now available
Press RETURN to get started.
Router>en
Router#ip route 192.168.20.0 255.255.255.0 215.0.0.2
^
% Invalid input detected at '^' marker.
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.20.0 255.255.255.0 215.0.0.2
Router(config)#
Copy
Paste
Top

Testing:





.



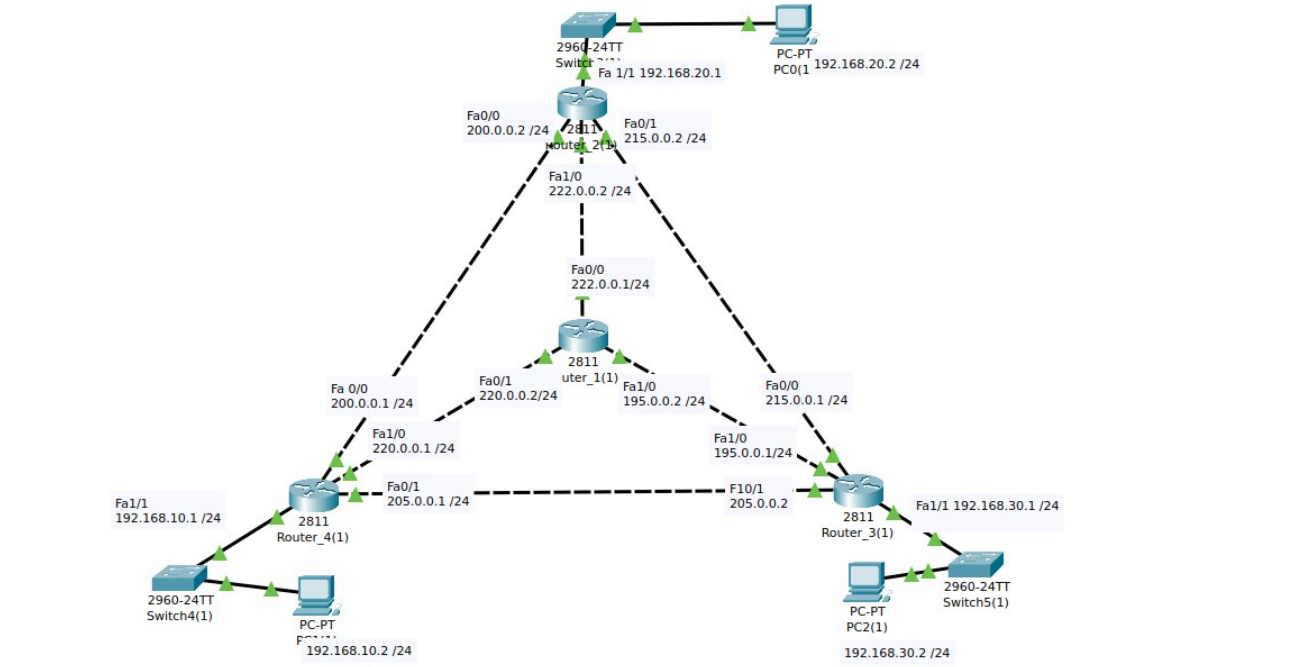
.

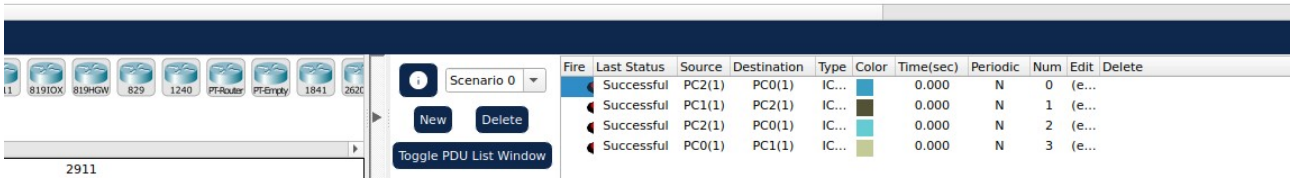
Successfully all router configured via Static Routing.

Conclusion:

Now you can transfer any packet between any networks of the given Topology.

Demonstration:





-
-
-
-
-
-
-
-
-
-

PART B.

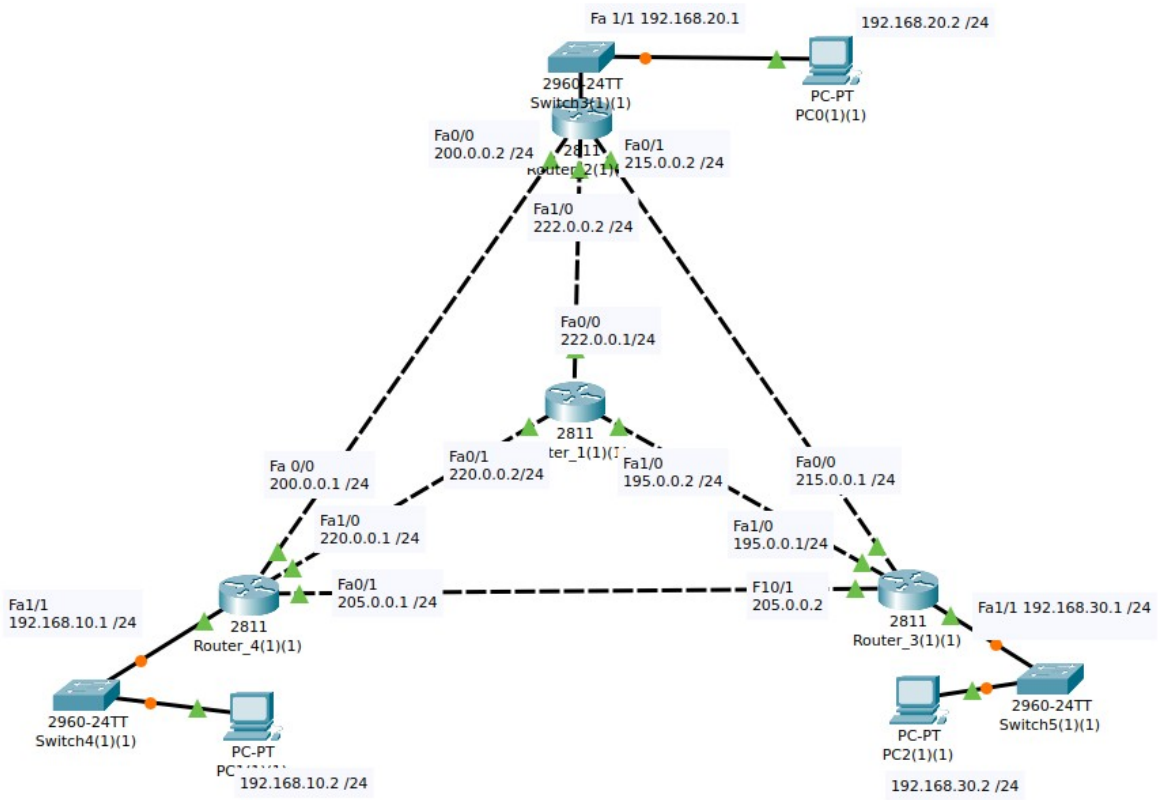
Answer:

We’re required create a server that will assign the IP’s to all the devices of the Network.

Initial Step:

For this purpose, we are going to add a DHCP Server to the Topology.

Topology:



.

Adding Server:

The initial step is of,

- Adding of the Server to our Topology.

Demonstration:

.

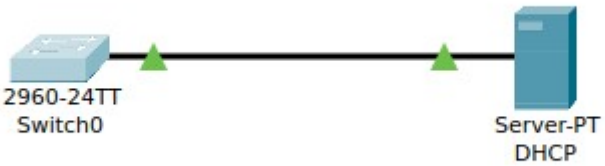
.

Connection:

Now we are going to connect it to Router Using **Copper-Straight-Through** wire.

.

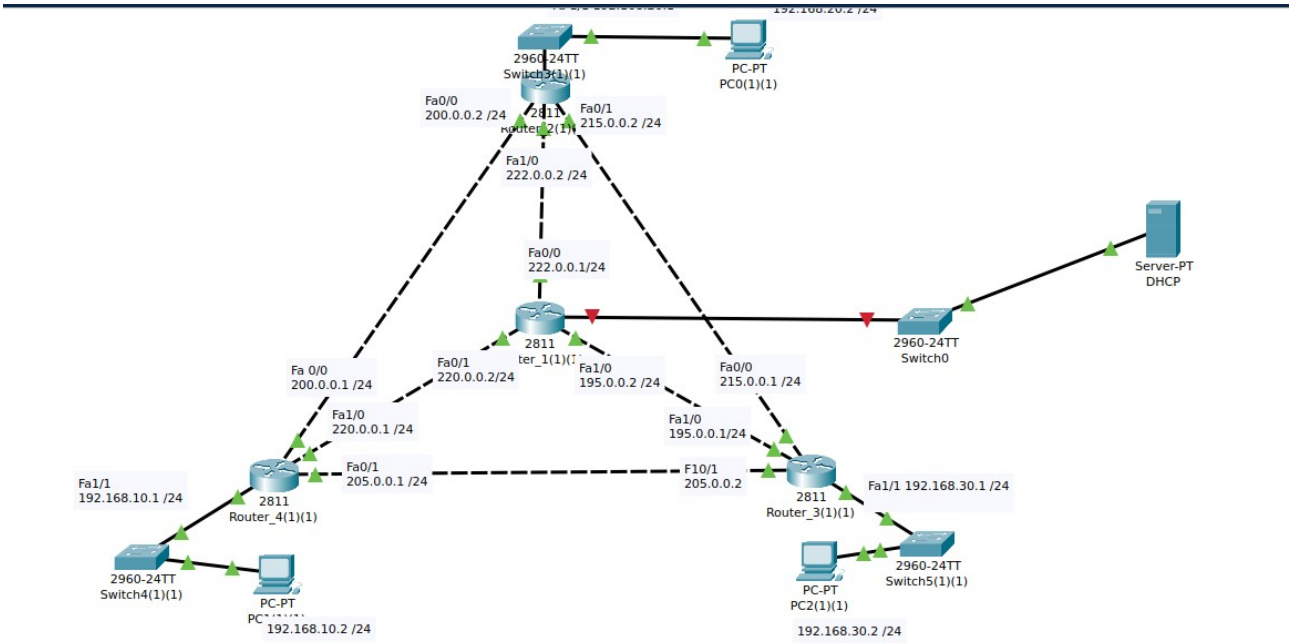
.



.

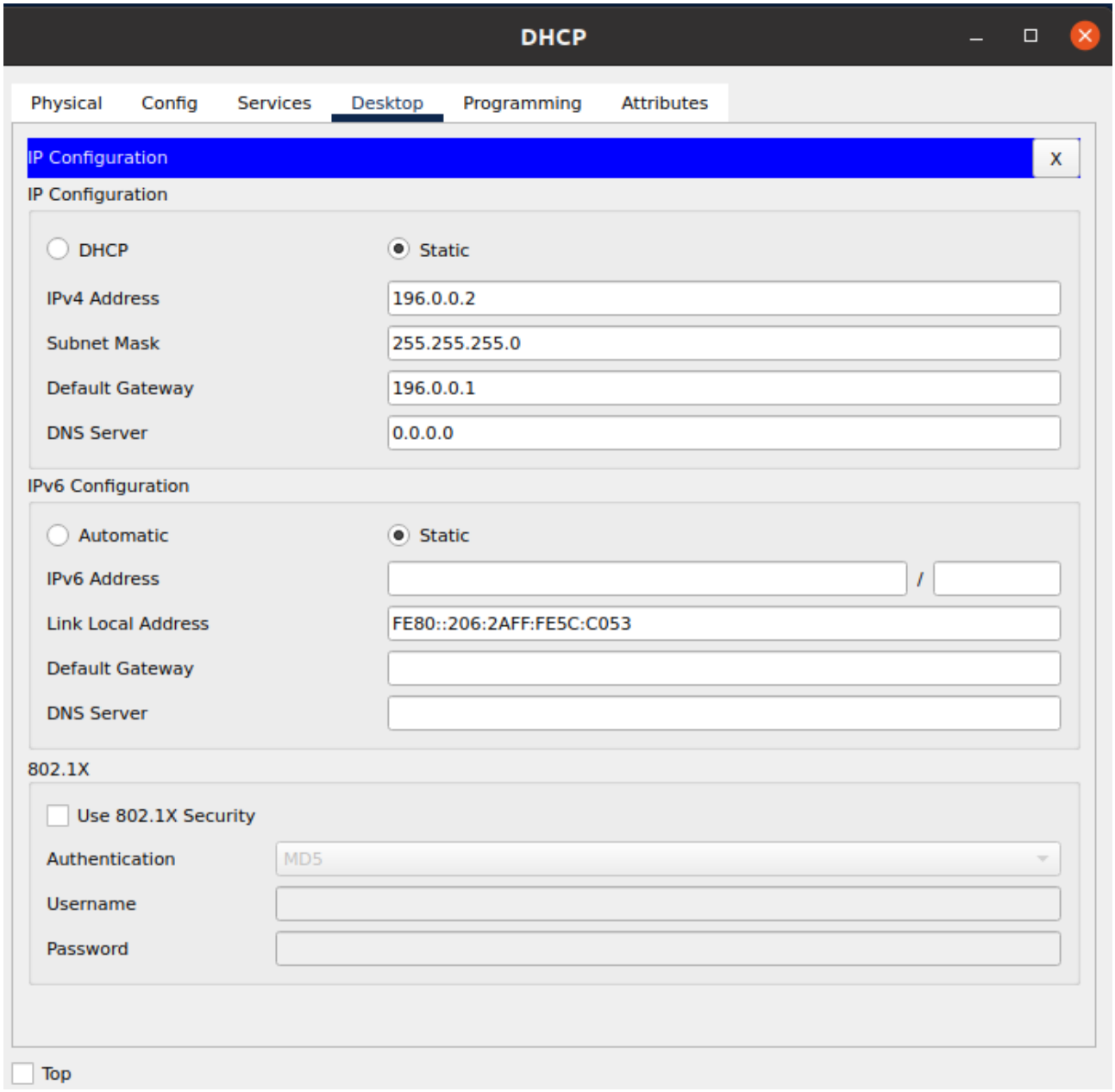
Next Step:

Now connect this, server to the Centralized Router via the Wire.



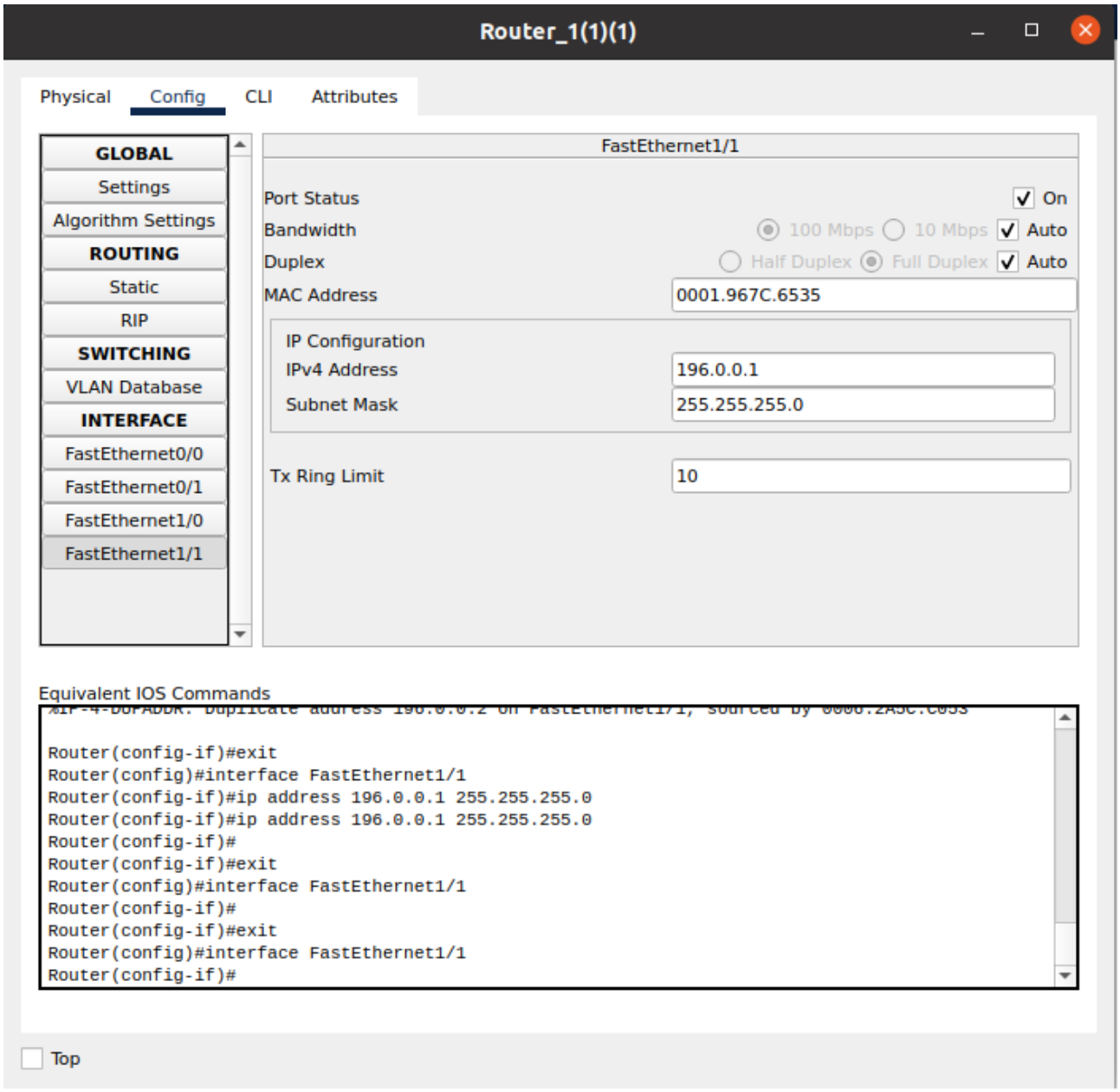
.

Assigning IP To The Server:



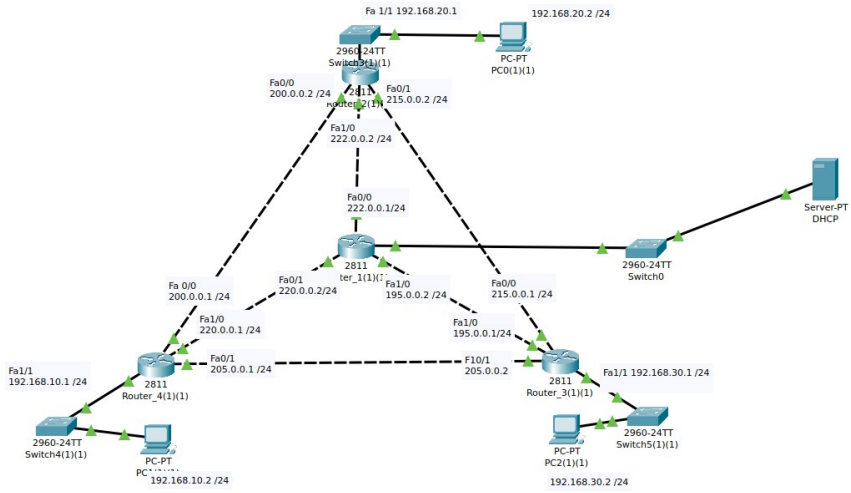
•

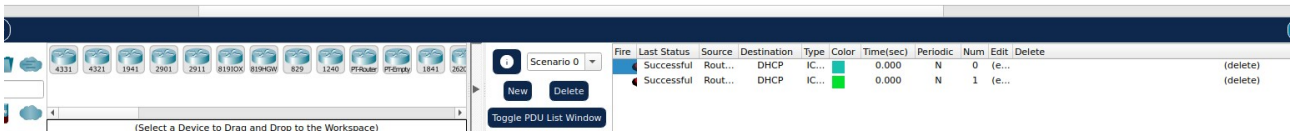
Router Configuration For The Server:



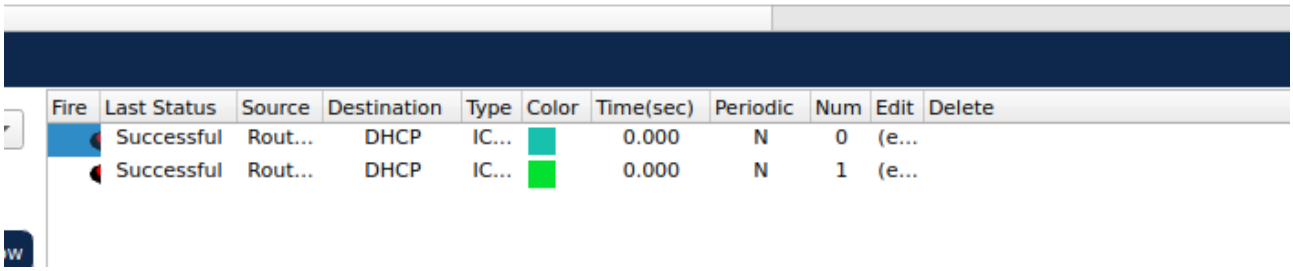
•

Connection Testing:





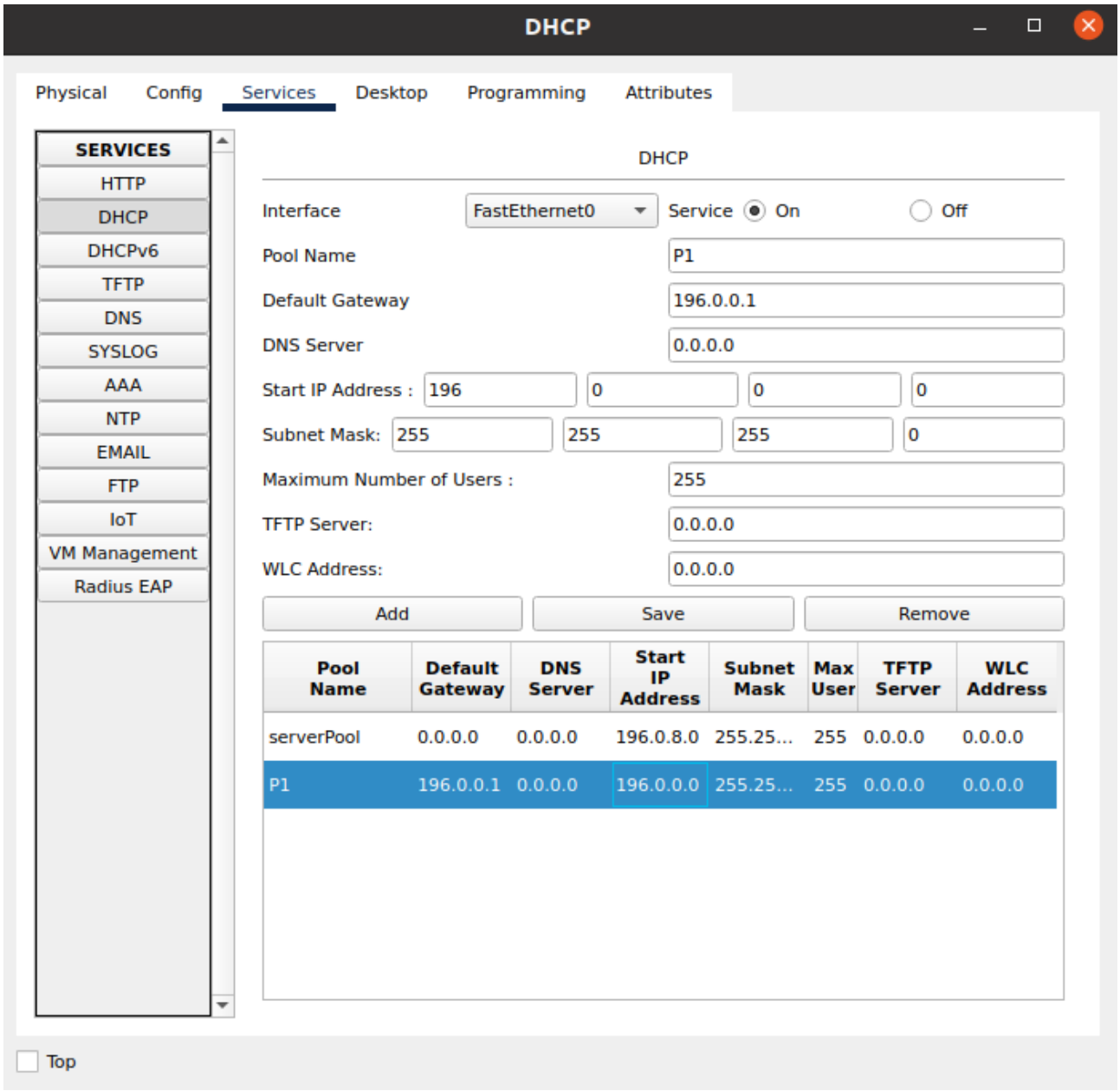
-



-

DHCP Server Configuration Of DHCP Services:

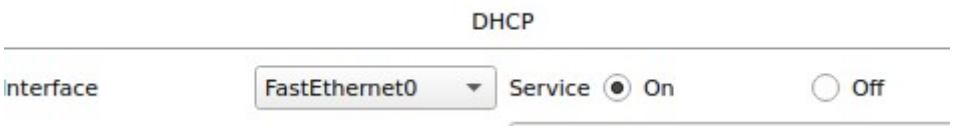
Adding Pool.



.

Switching On DHCP Services:

.

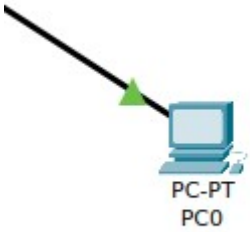


.

.

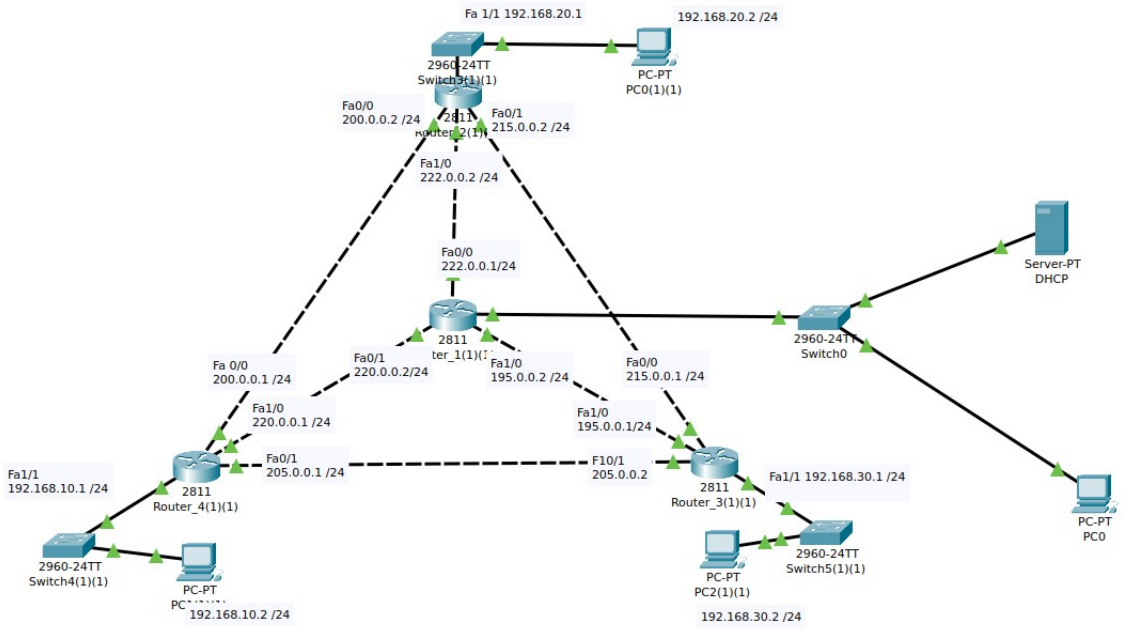
Tesing DHCP Server Working:

Adding A PC:

-
- 

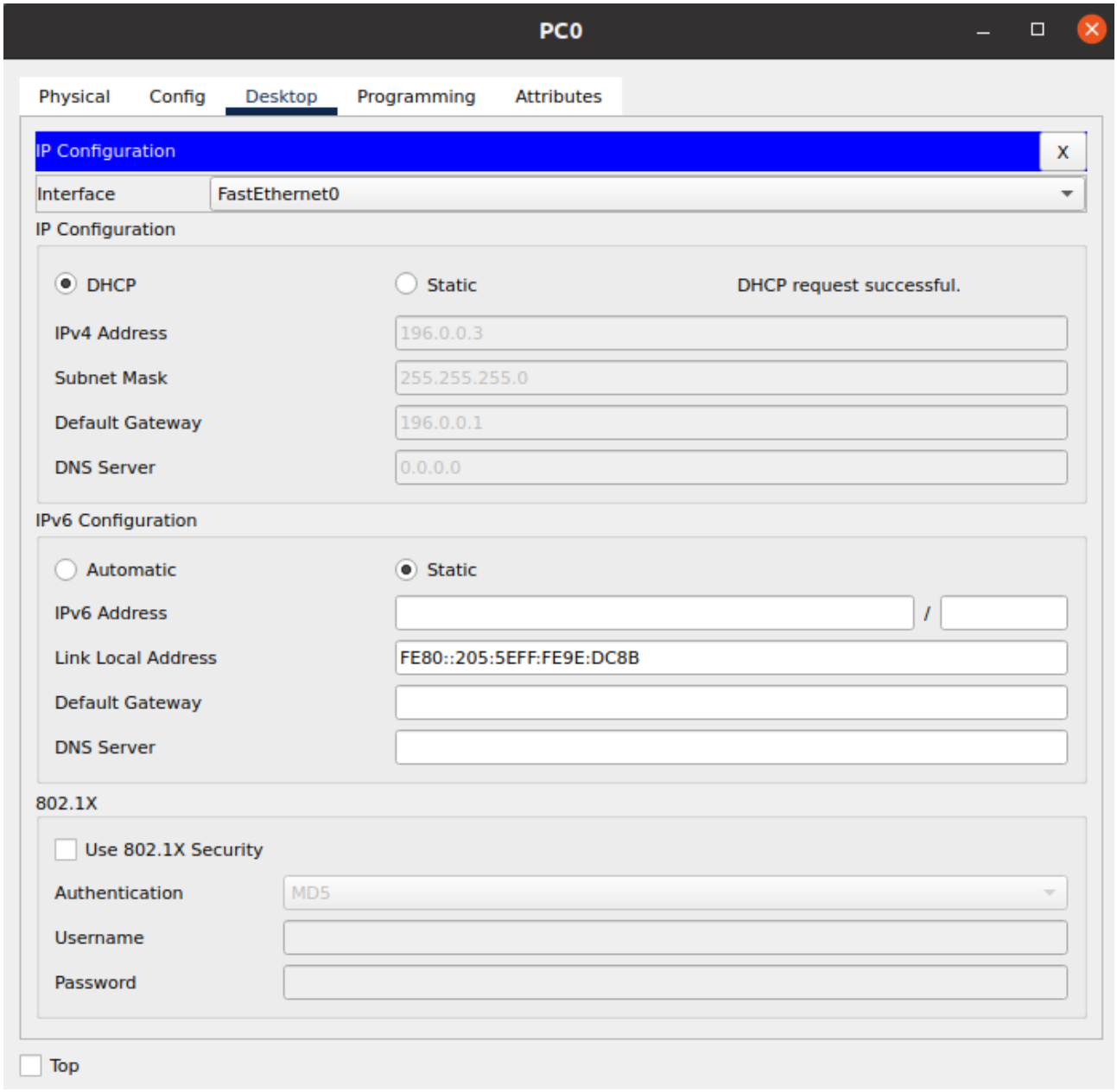
-
-

Connecting It To Server:



-

Testing DHCP IP Addressing:



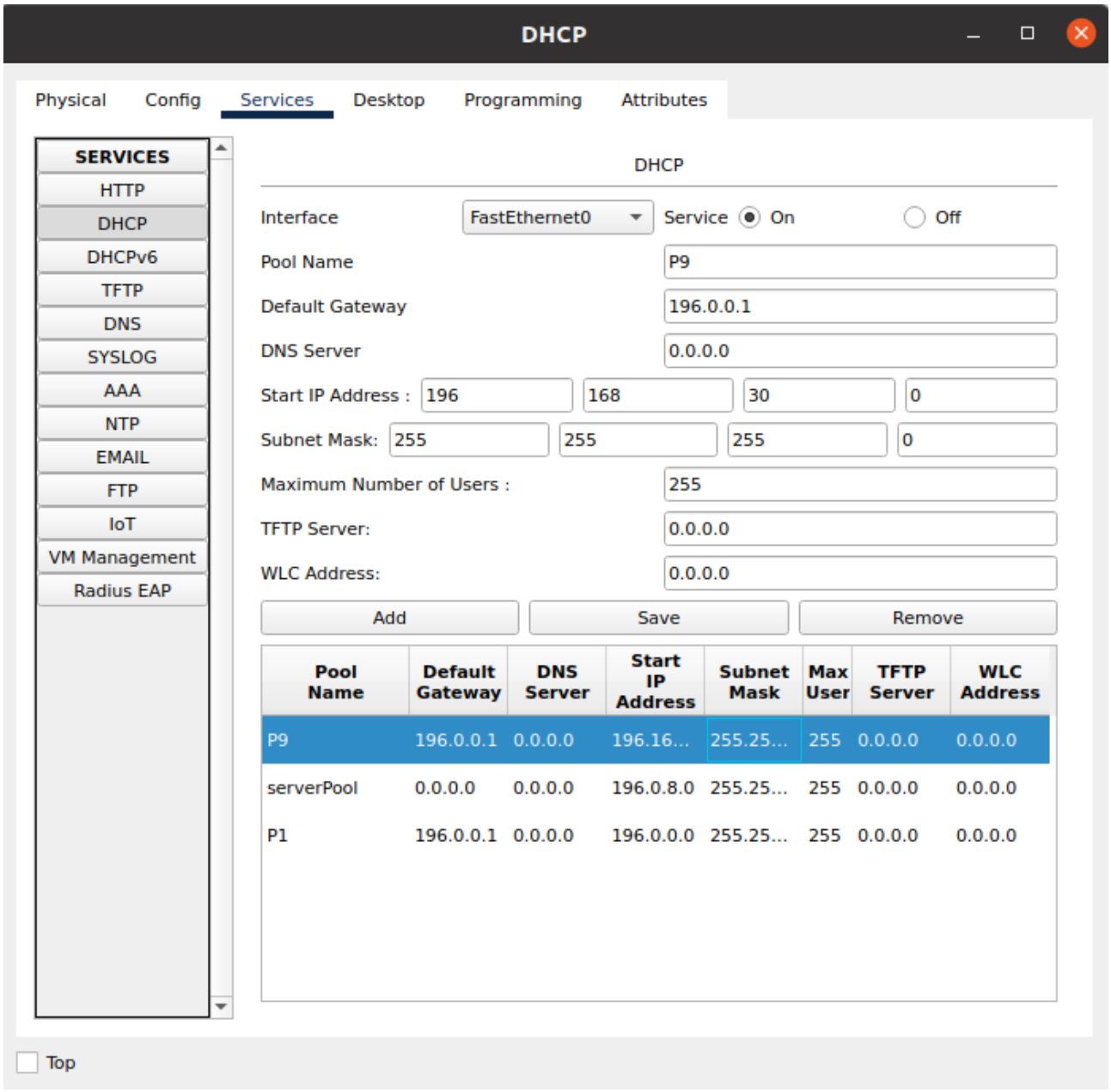
.

Adding Pools For The Whole Network:

For Router 3:

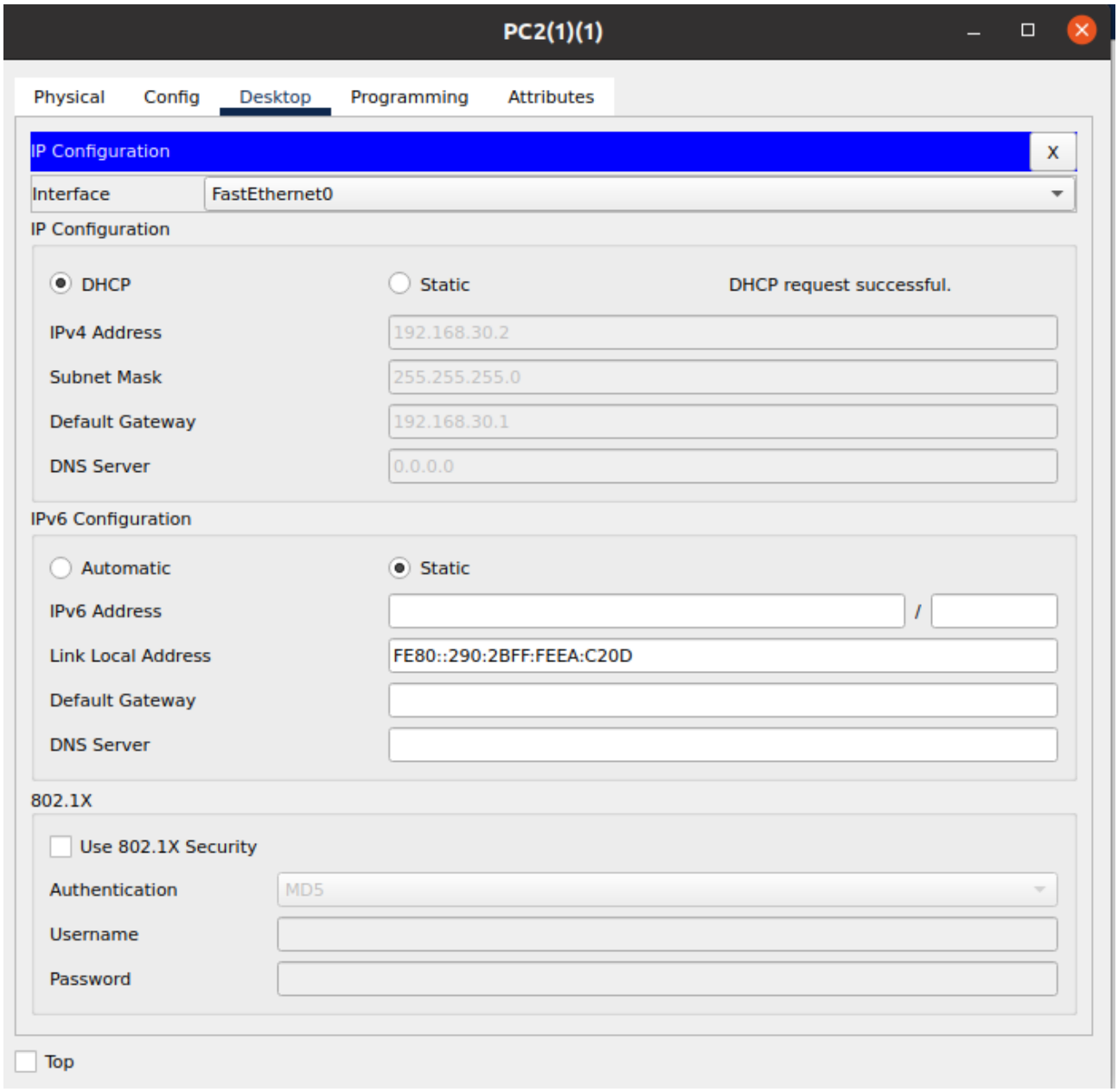
We are adding Pool P9 for router 3.

Demonstration:



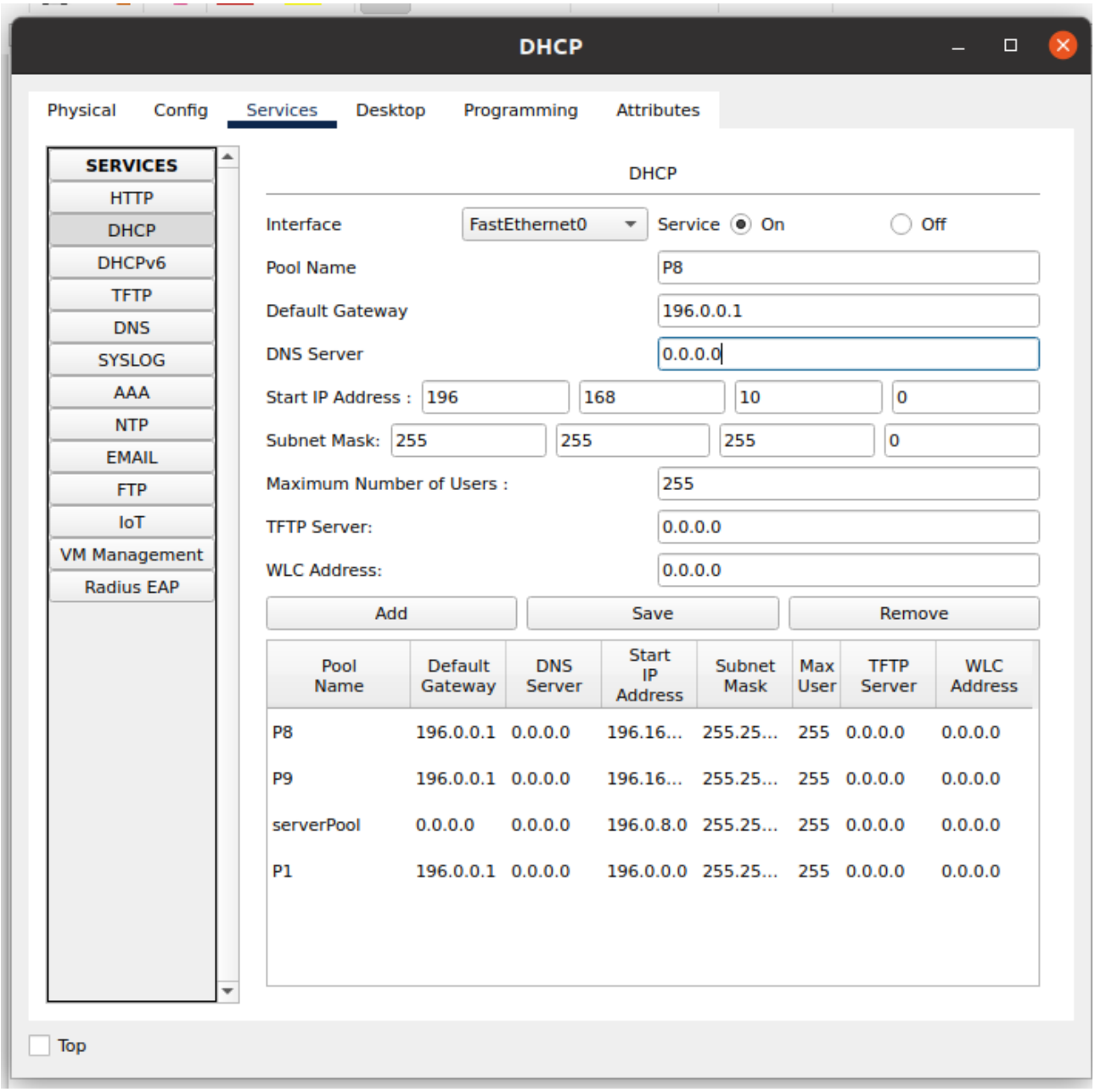
•

Testing DHCP IP Assignment For Router 3:



•

Adding Pool P8 For Router 4:



•

Testing DHCP Auto IP Assigning On Router 4:

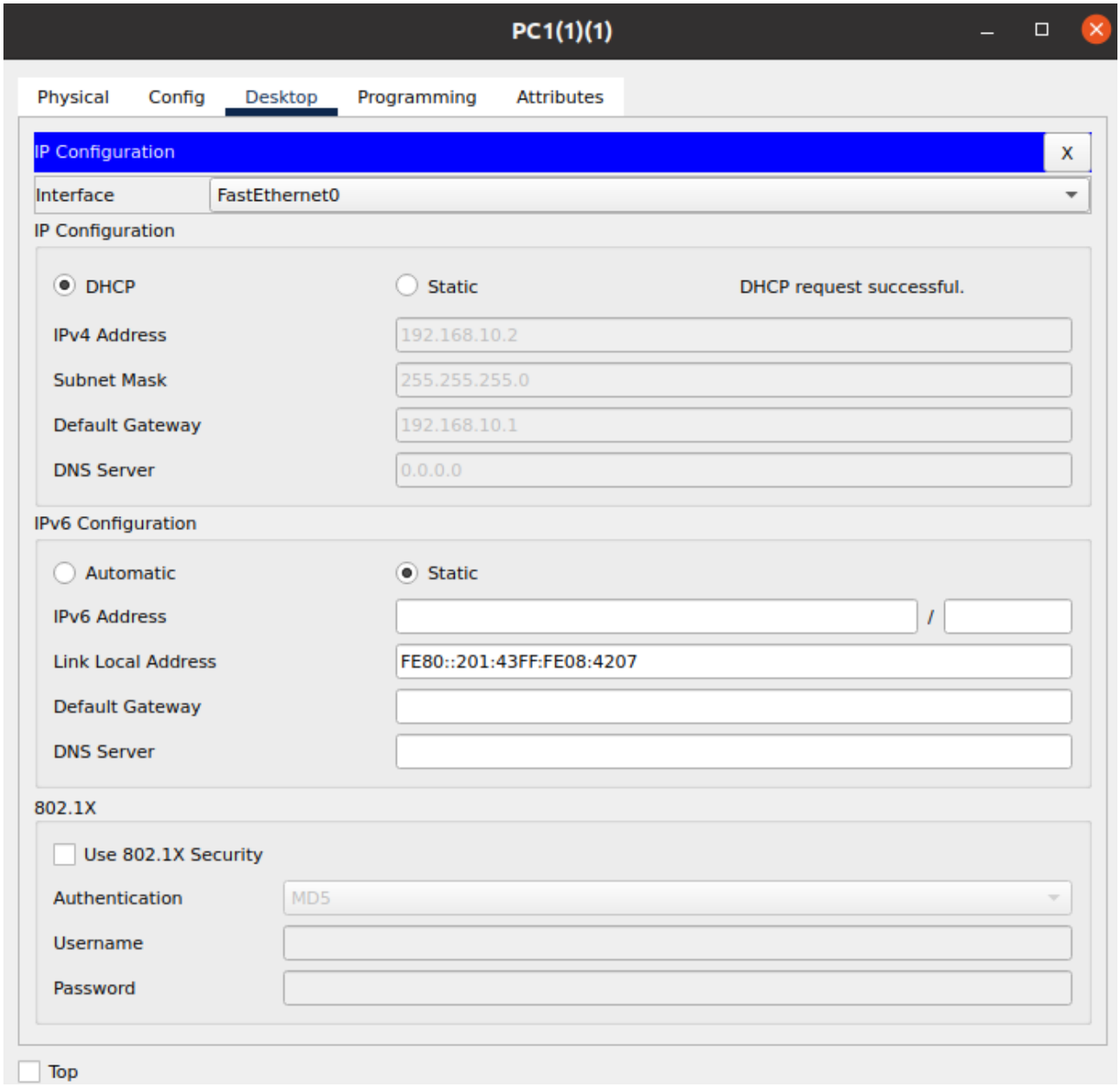
•

•

•

•

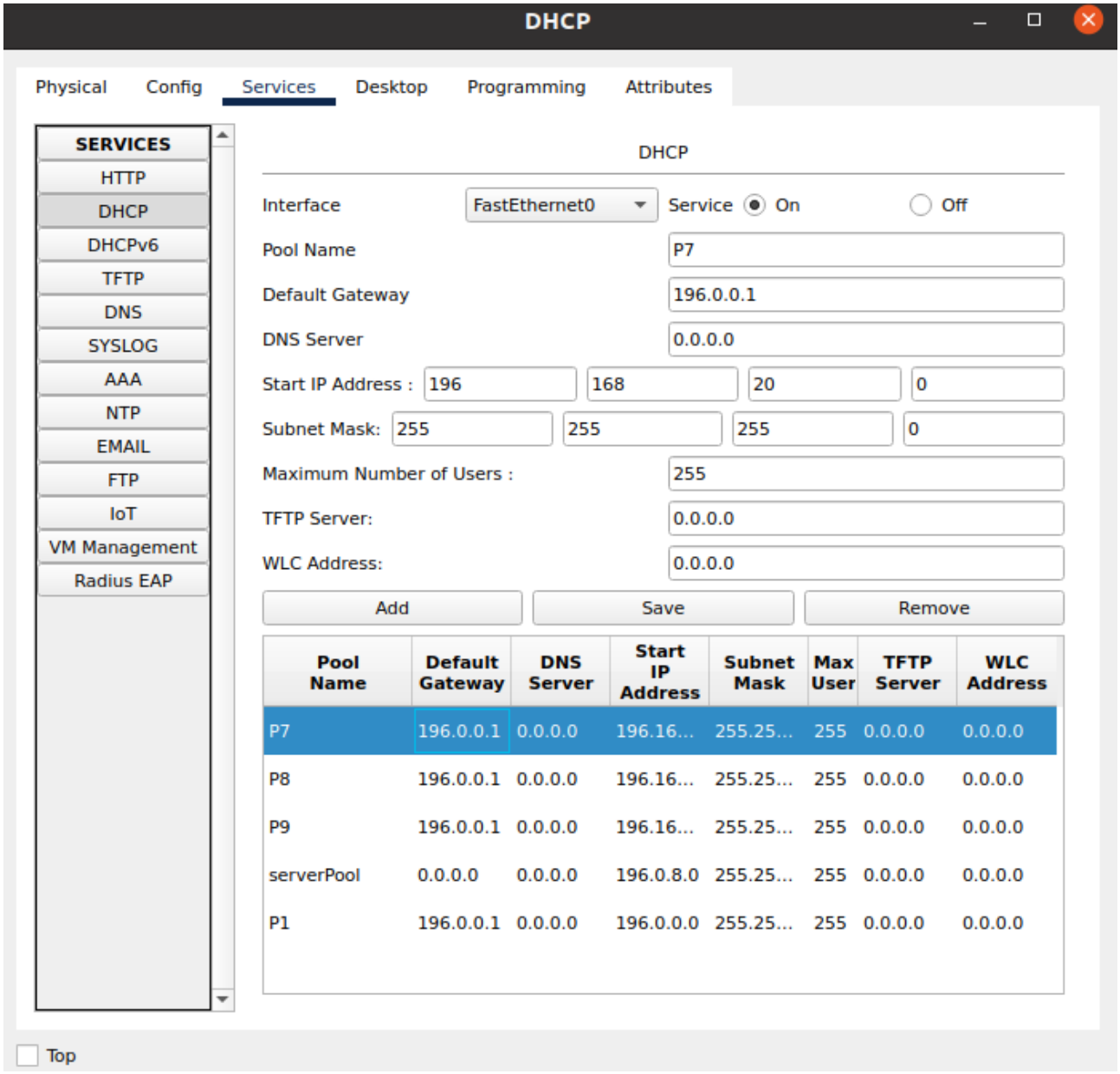
•


PC1(1)(1)
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.10.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::201:43FF:FE08:4207
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

-

-

Adding Pool P7 For Router 2:



•

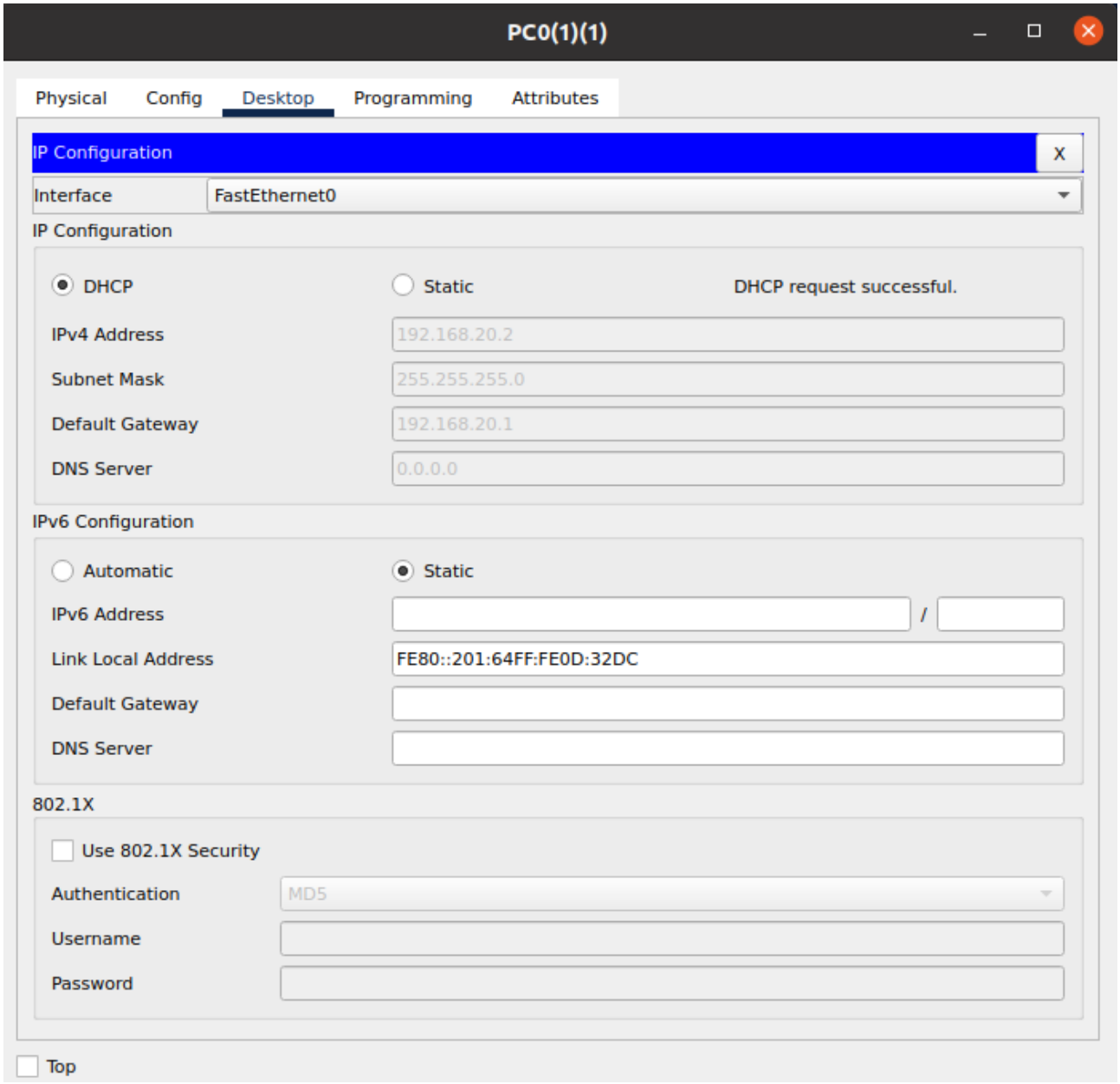
Testing DHCP Auto IP Assigning On Router 2:

•

•

•

•



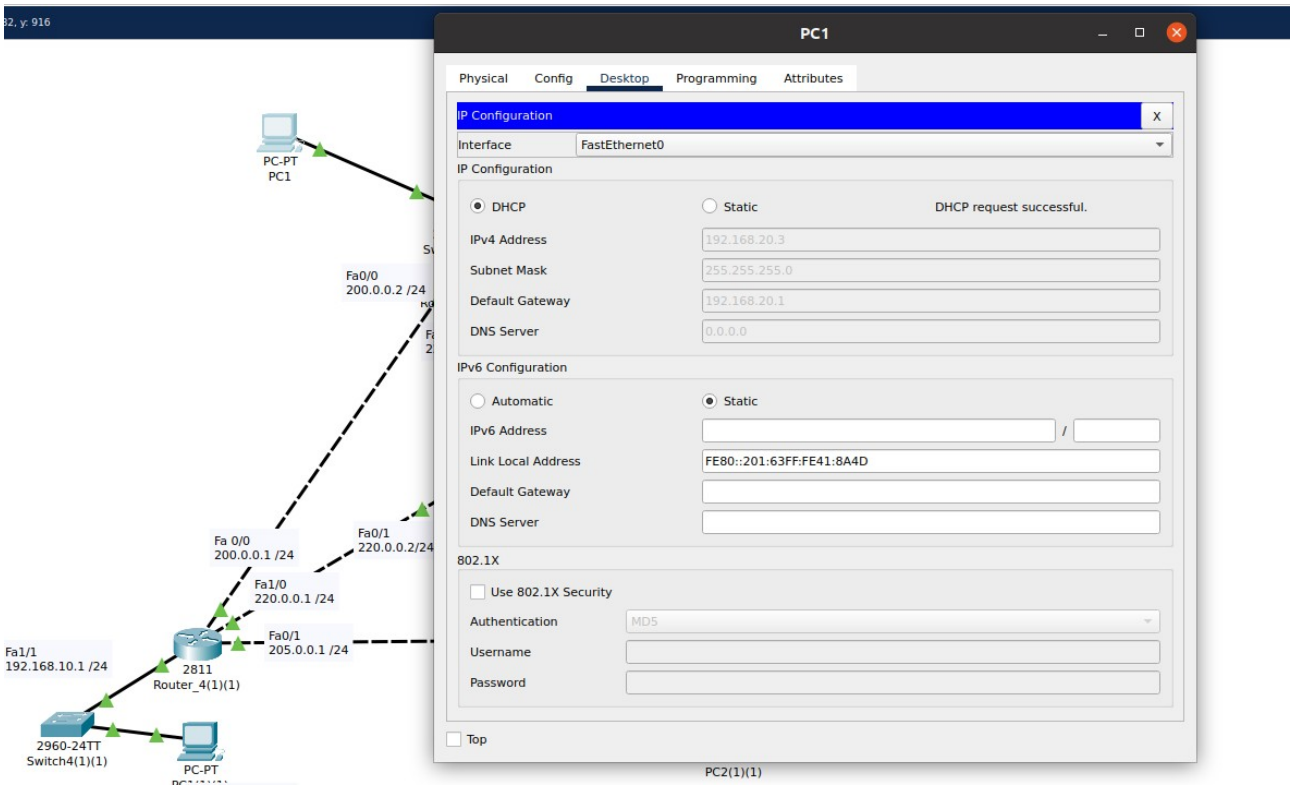
.

.

Testing DHCP IP Assignment By Adding A New Device On Each Network:

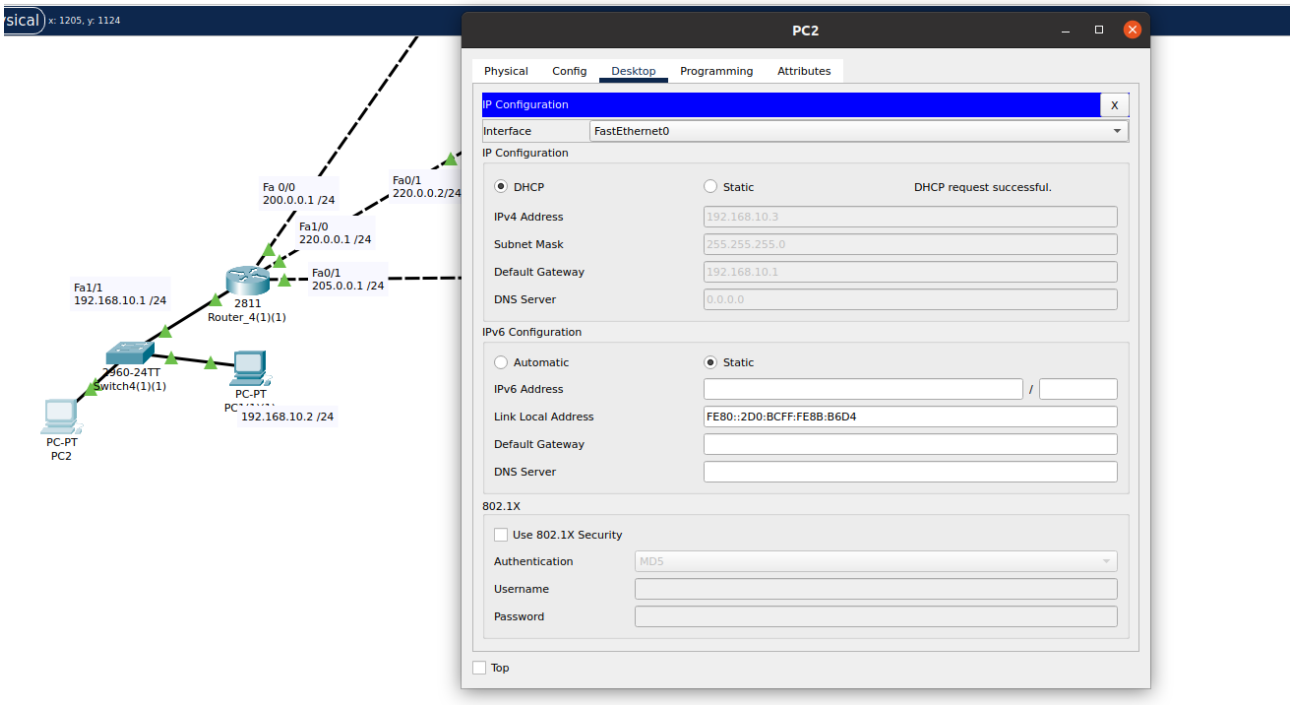
.

1st:


PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.20.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::201:63FF:FE41:8A4D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
PC-PT
PC1
Fa0/0
200.0.0.2 /24
Fa 0/0
200.0.0.1 /24
Fa0/1
220.0.0.2/24
Fa1/0
220.0.0.1 /24
Fa0/1
205.0.0.1 /24
Fa1/1
192.168.10.1 /24
2811
Router_4(1)(1)
2960-24TT
Switch4(1)(1)
PC-PT
PC2(1)(1)

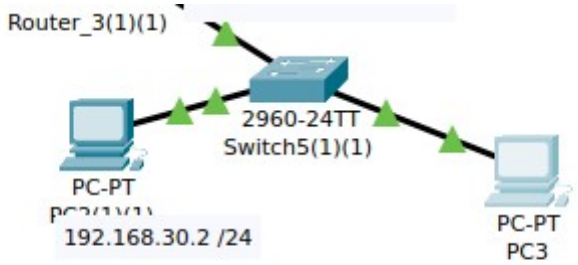
•

2nd:


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.10.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2D0:BCFF:FE8B:B6D4
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top
Fa 0/0
200.0.0.1 /24
Fa0/1
220.0.0.2/24
Fa1/0
220.0.0.1 /24
Fa0/1
205.0.0.1 /24
Fa1/1
192.168.10.1 /24
2811
Router_4(1)(1)
2960-24TT
Switch4(1)(1)
PC-PT
192.168.10.2 /24
PC-PT
PC2

•

3rd:



PC3

Physical | Config | Desktop | Programming | Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

- DHCP
- Static

DHCP request successful.

IPv4 Address	192.168.30.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	0.0.0.0

IPv6 Configuration

- Automatic
- Static

IPv6 Address	/
Link Local Address	FE80::240:BFF:FEDC:E118
Default Gateway	
DNS Server	

802.1X

- Use 802.1X Security

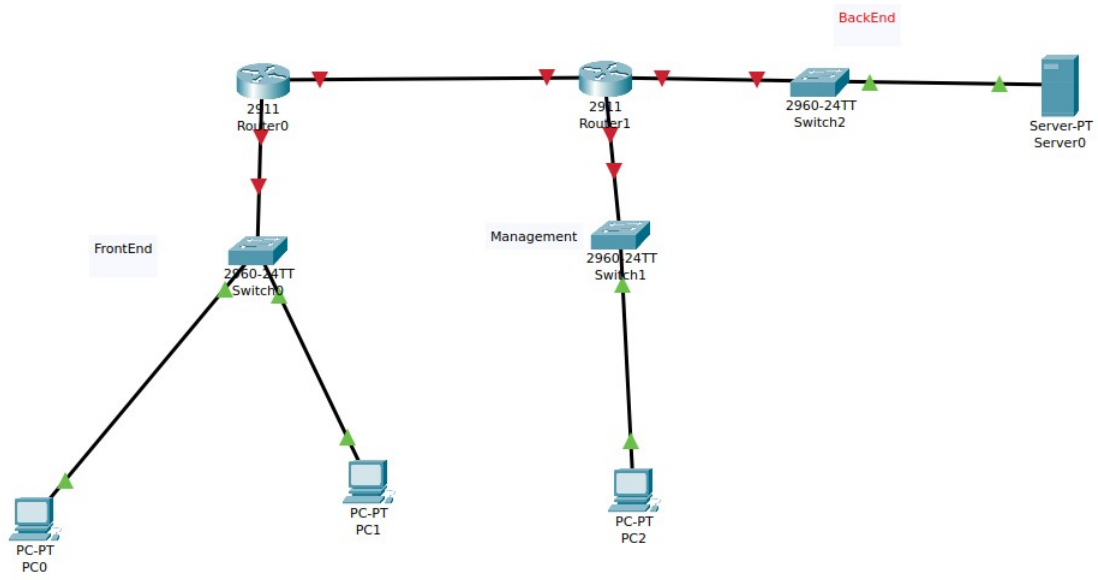
Authentication	MD5
Username	
Password	

Top

Here Our B For The Centralized DHCP Server is Also Completed.

Q3:

Answer:



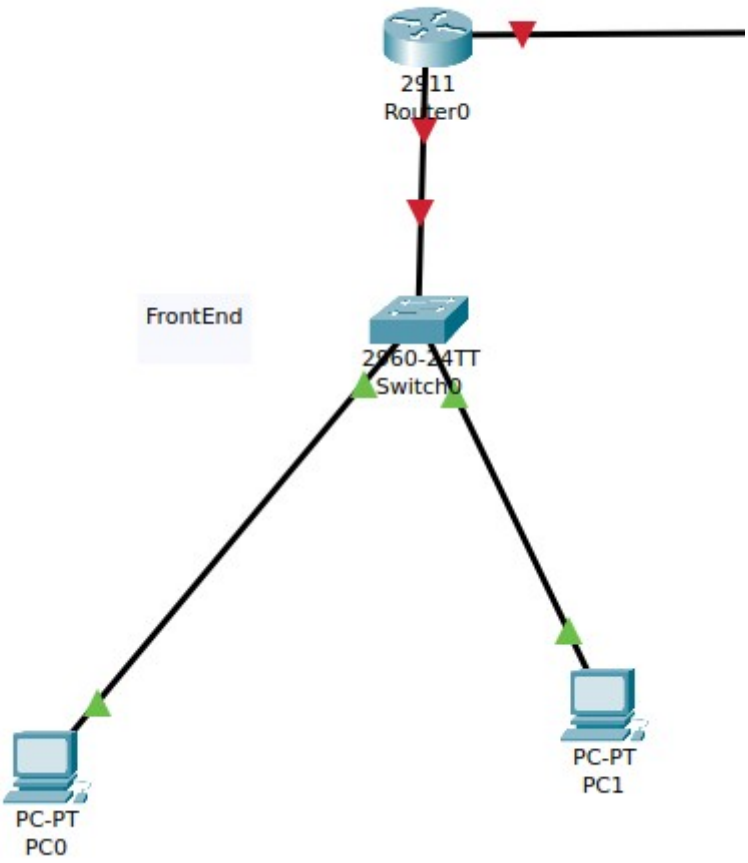
.

This is our. Topology,

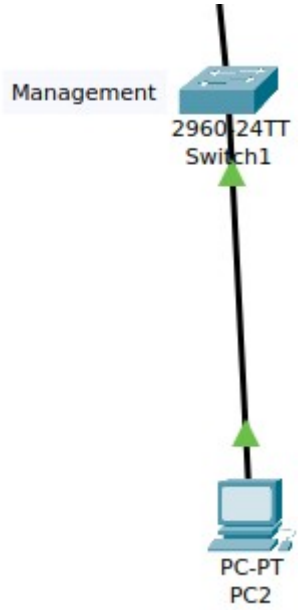
We’ve,

FrontEnd:.

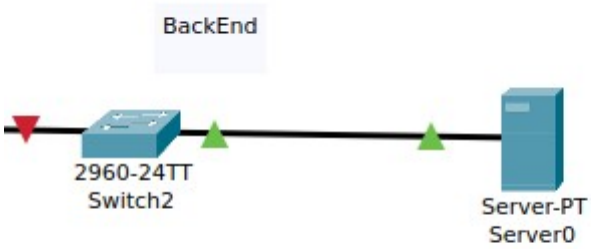
.


2911
Router0
FrontEnd
2960-24TT
Switch0
PC-PT
PC0
PC-PT
PC1

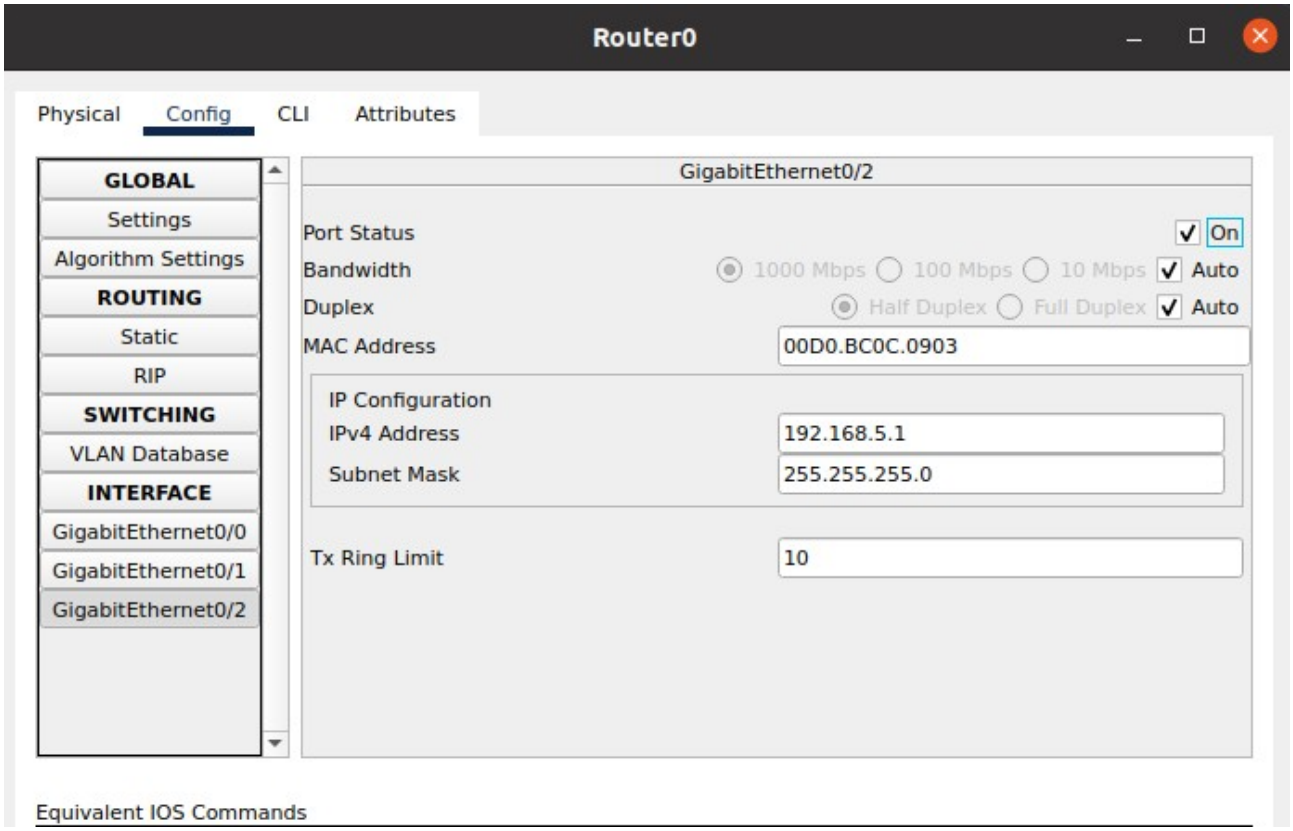
.Management:


Management
2960-24TT
Switch1
PC-PT
PC2

BackEnd(Server):

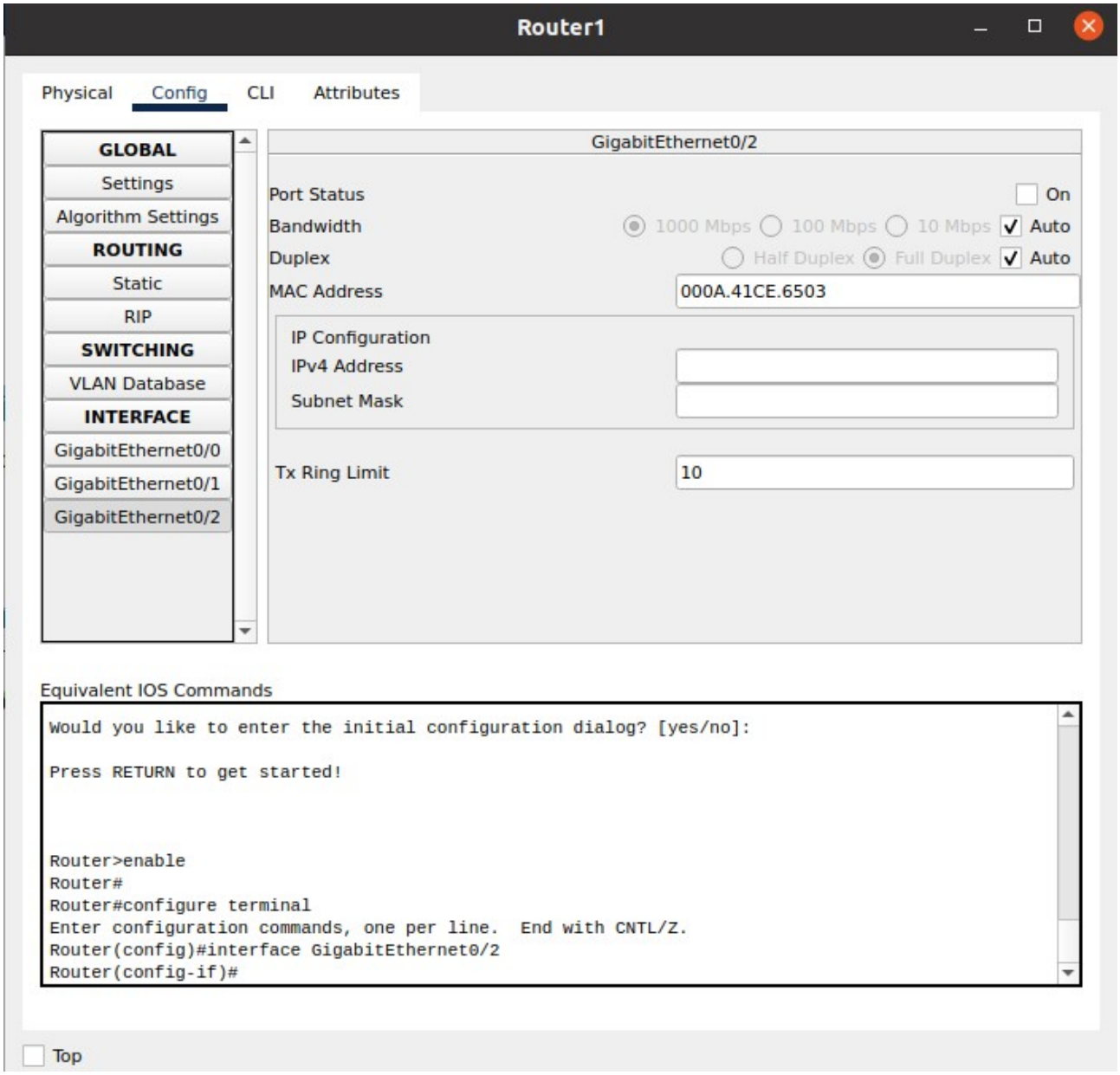


Router Configuration:



••

2nd Router Configuration:



•

•

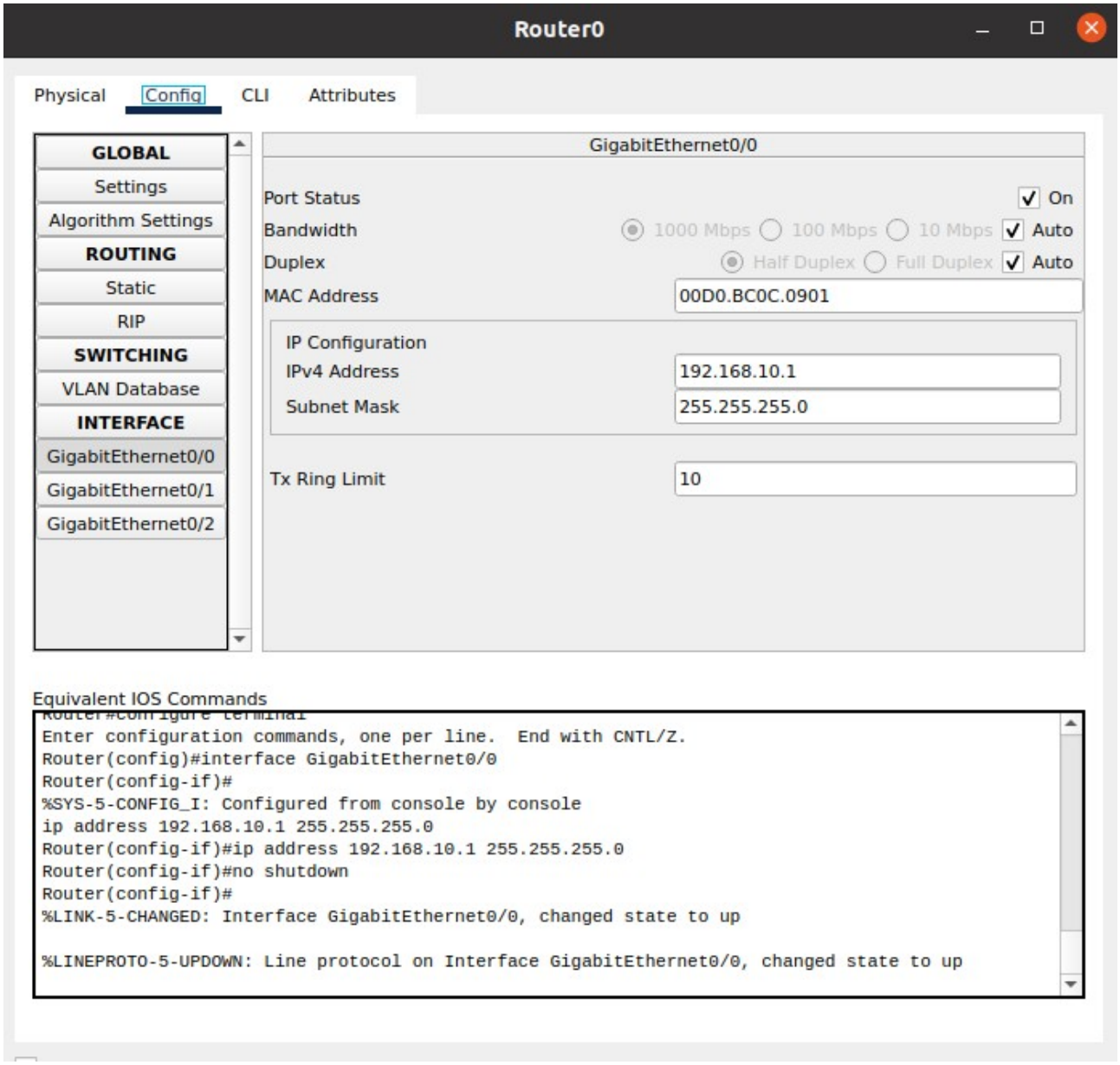
•

•

•

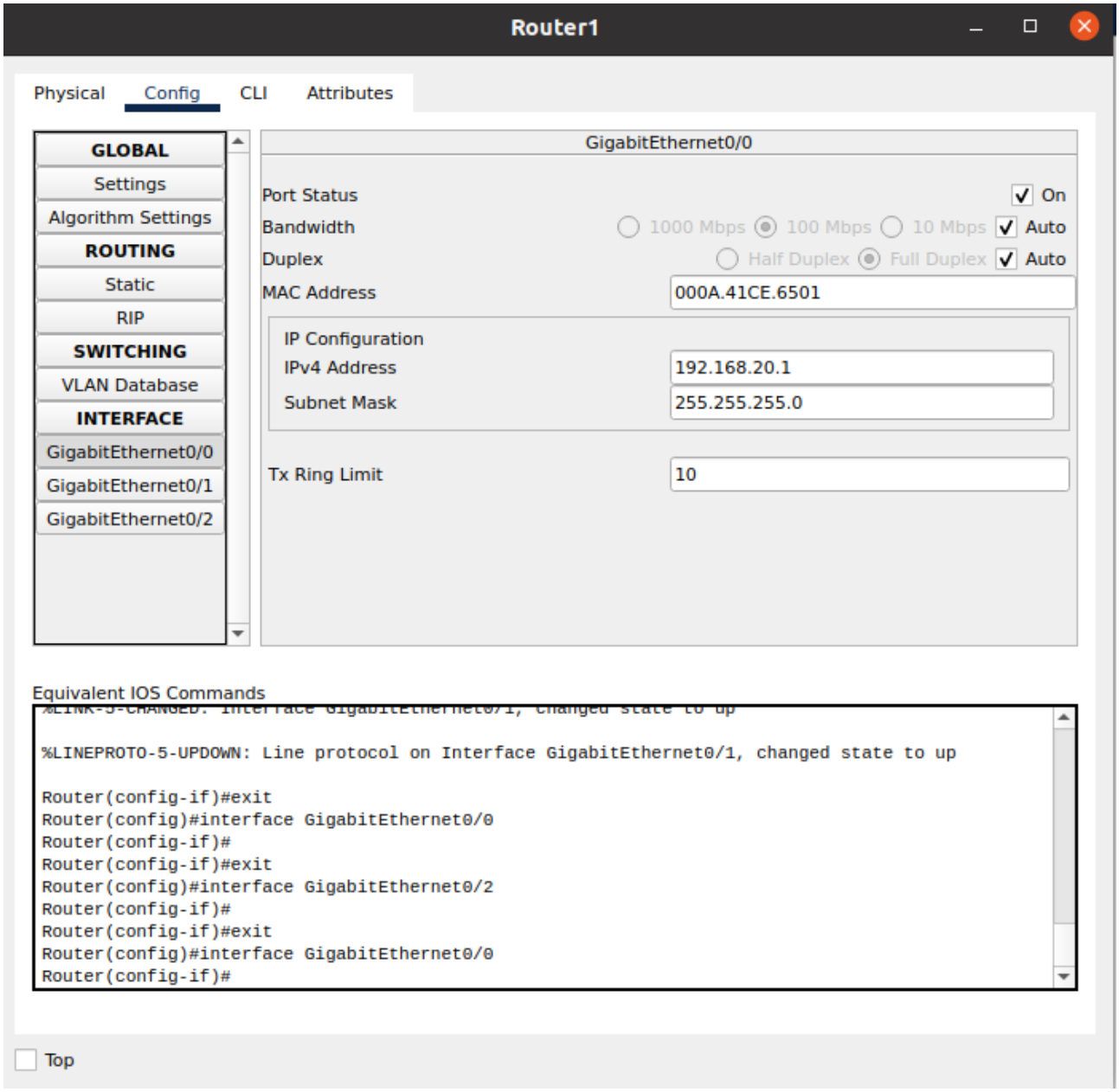
.

Front End Dept Config:



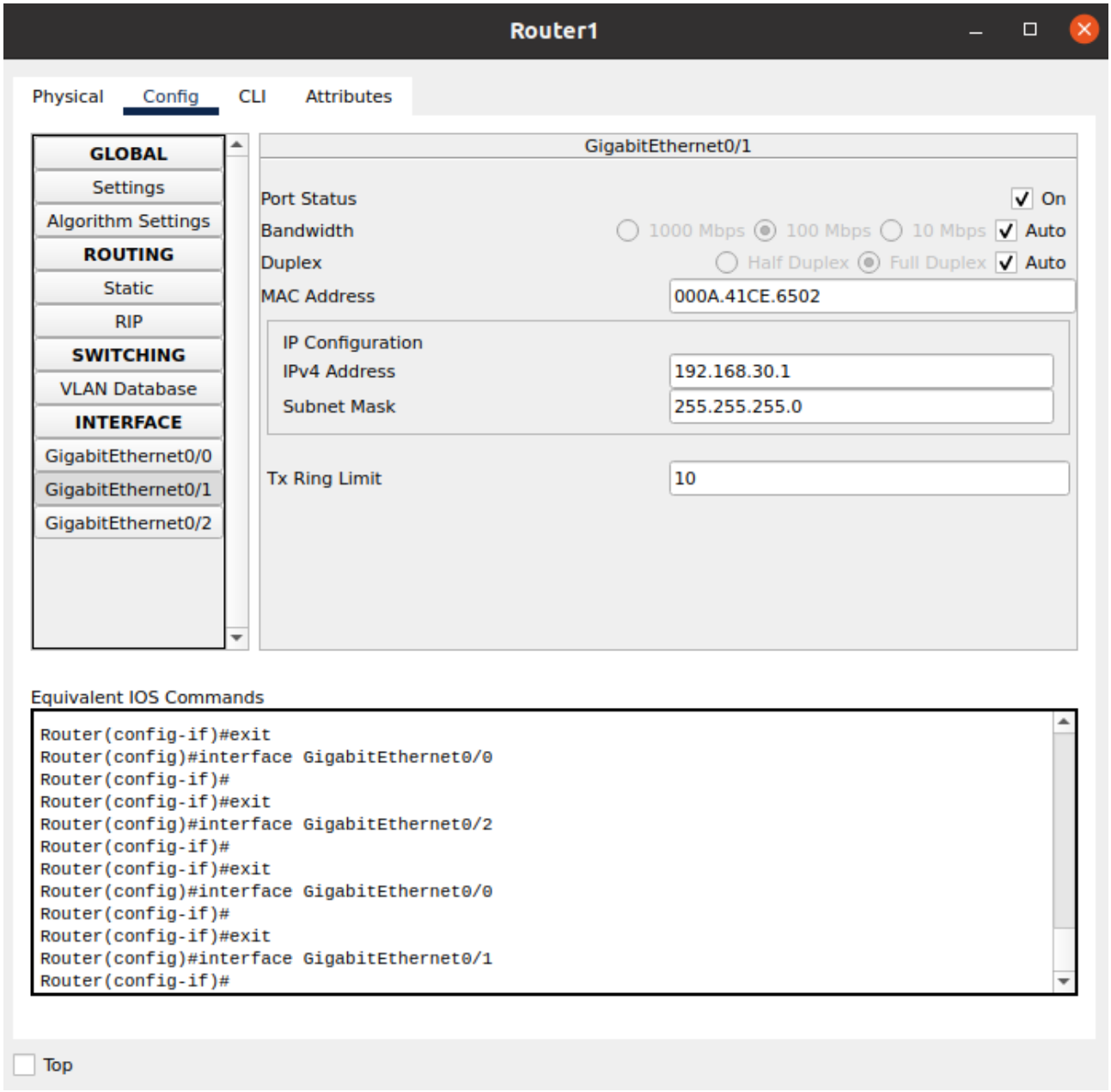
.

Management Dept Config:


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
GigabitEthernet0/2
GigabitEthernet0/0
Port Status
On
Bandwidth
1000 Mbps
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
000A.41CE.6501
IP Configuration
IPv4 Address
192.168.20.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/2
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Top

-
-
-
-
-
-
-

Back End Dept Configuration:

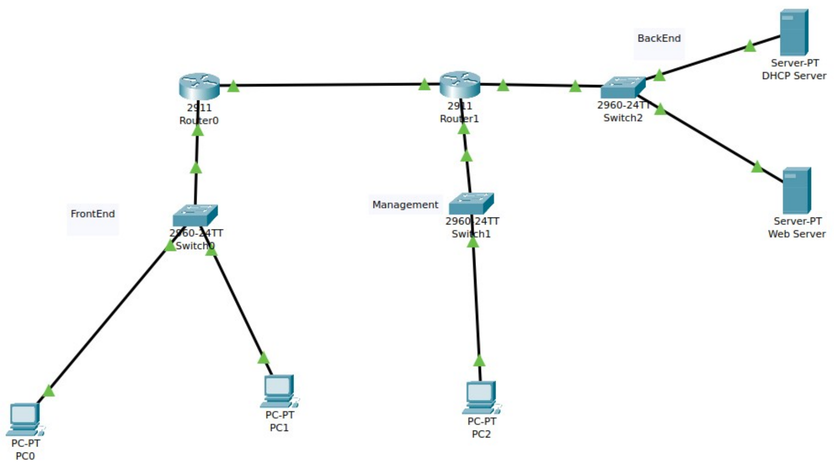


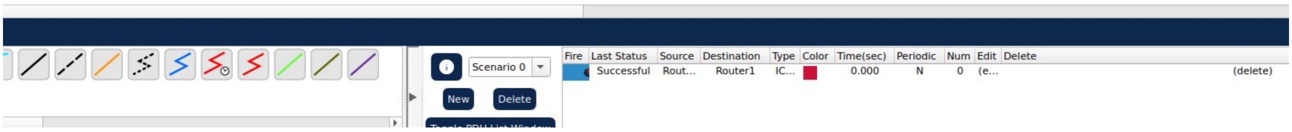
.

.

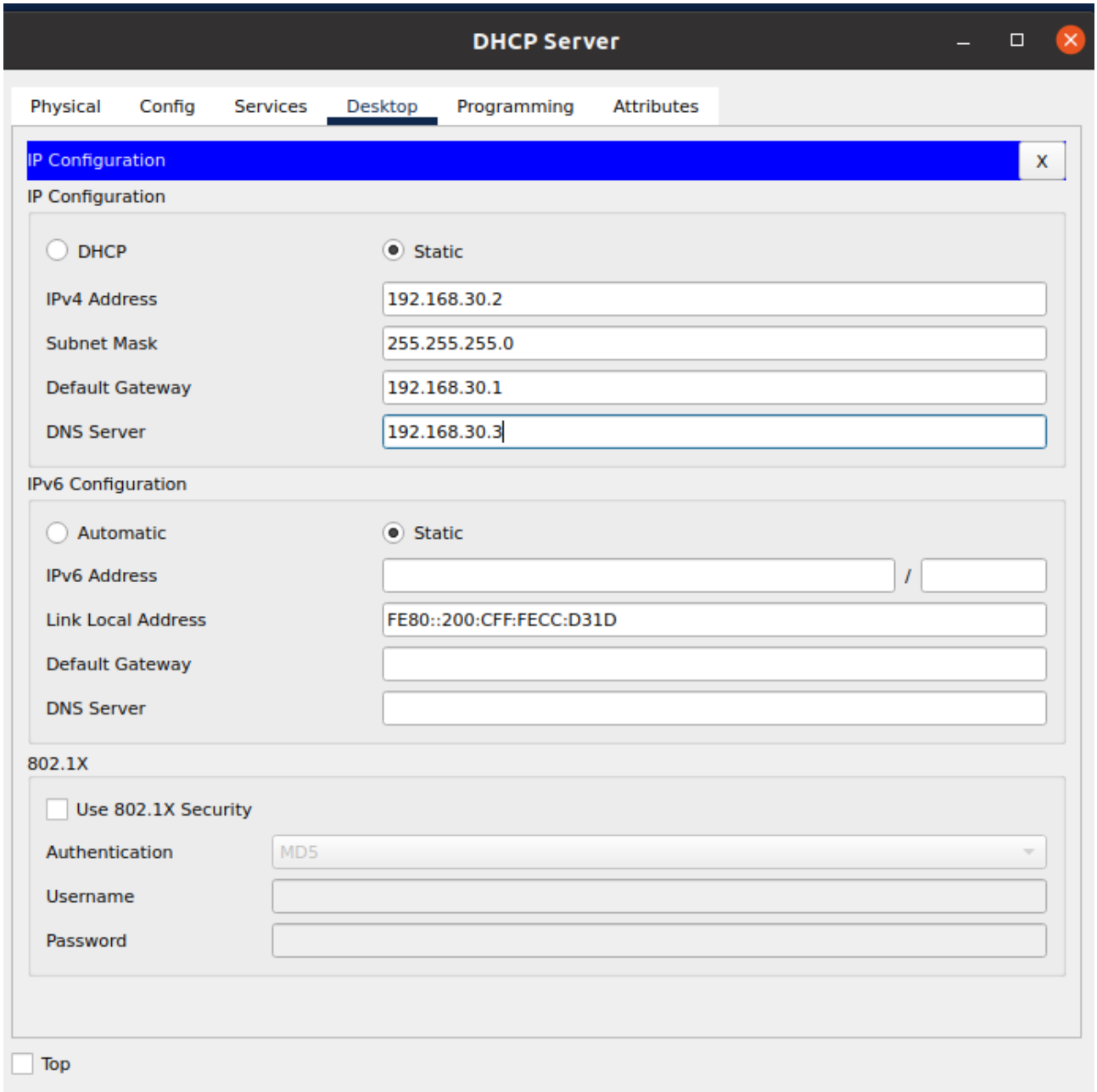
.

.Connection Test B/w Routers:


BackEnd
Server-PT
DHCP Server
2911
Router0
2911
Router1
2960-24TT
Switch2
FrontEnd
Management
2960-24TT
Switch0
2960-24TT
Switch1
Server-PT
Web Server
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2

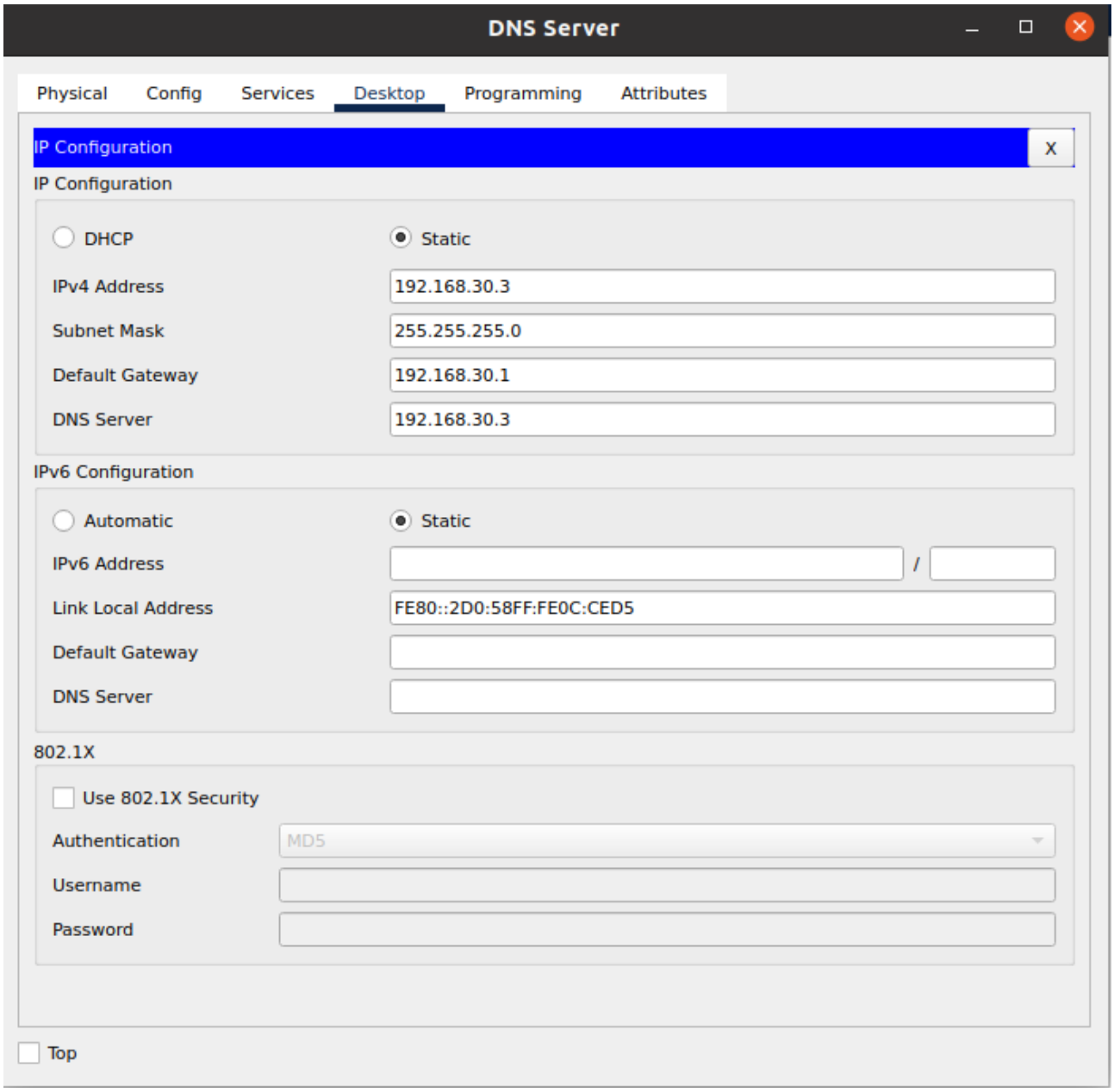

Scenario 0
New
Delete
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Rout...
Router1
IC...
0.000
N
0
(e...
(delete)

DHCP Server Config:



•

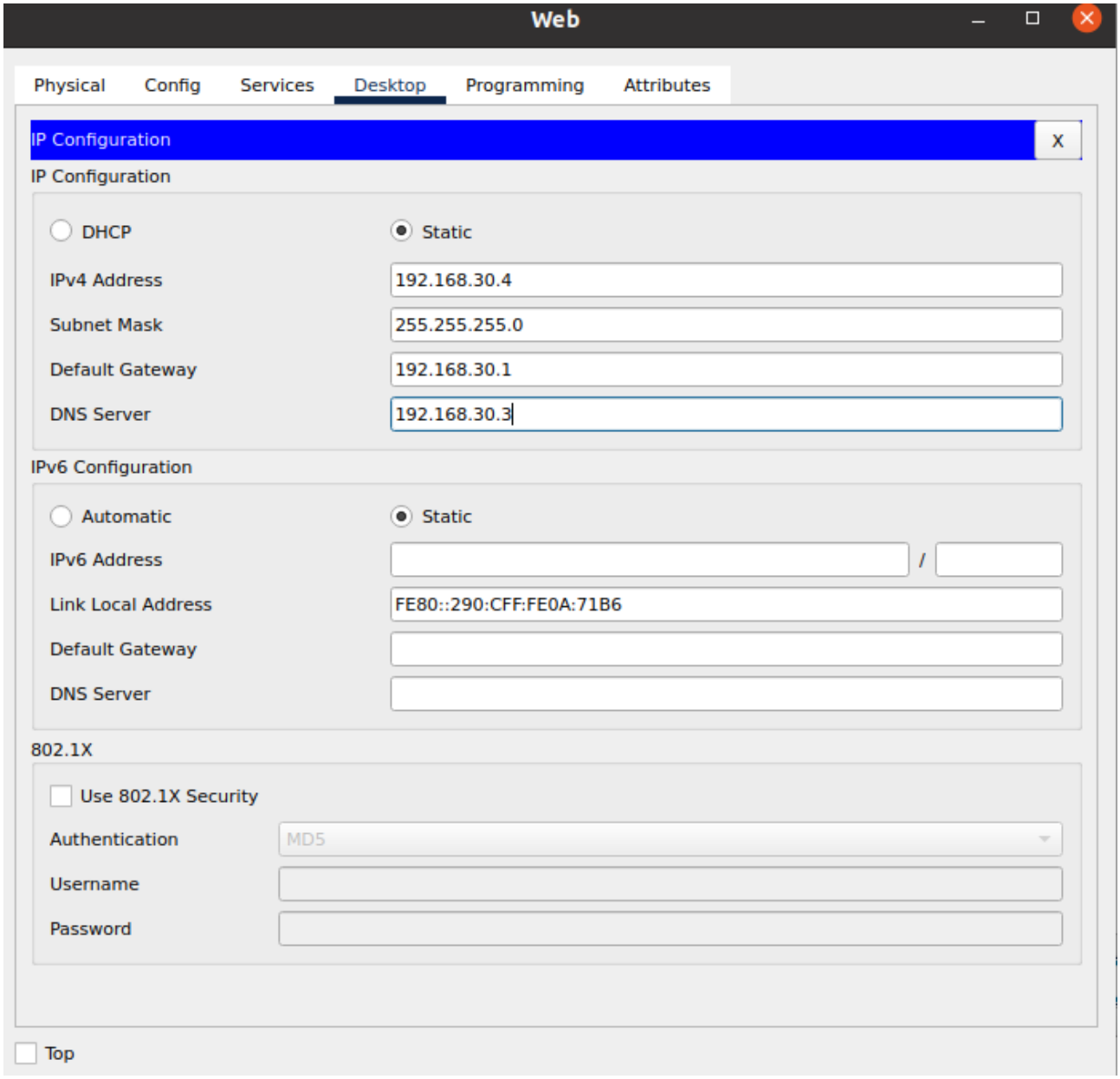
DNS:


DNS Server
Physical
Config
Services
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IPv4 Address
192.168.30.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
192.168.30.3
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::2D0:58FF:FE0C:CED5
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

-
-
-
-
-
-
-

•

Web Server Config:

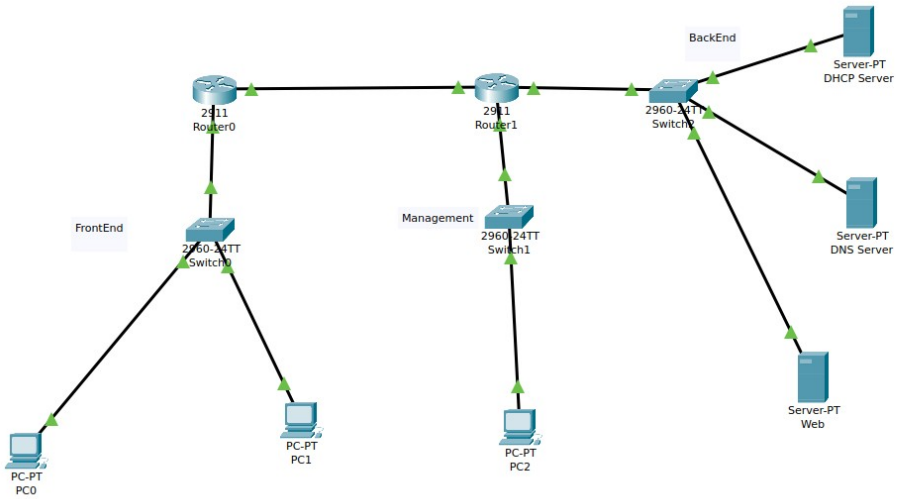


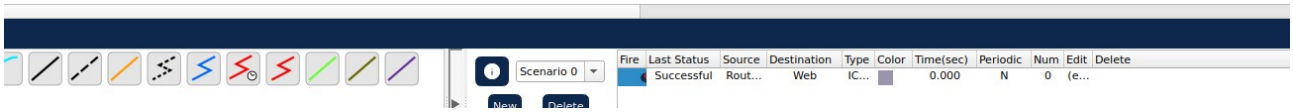
•

•

•

Whole Topology:

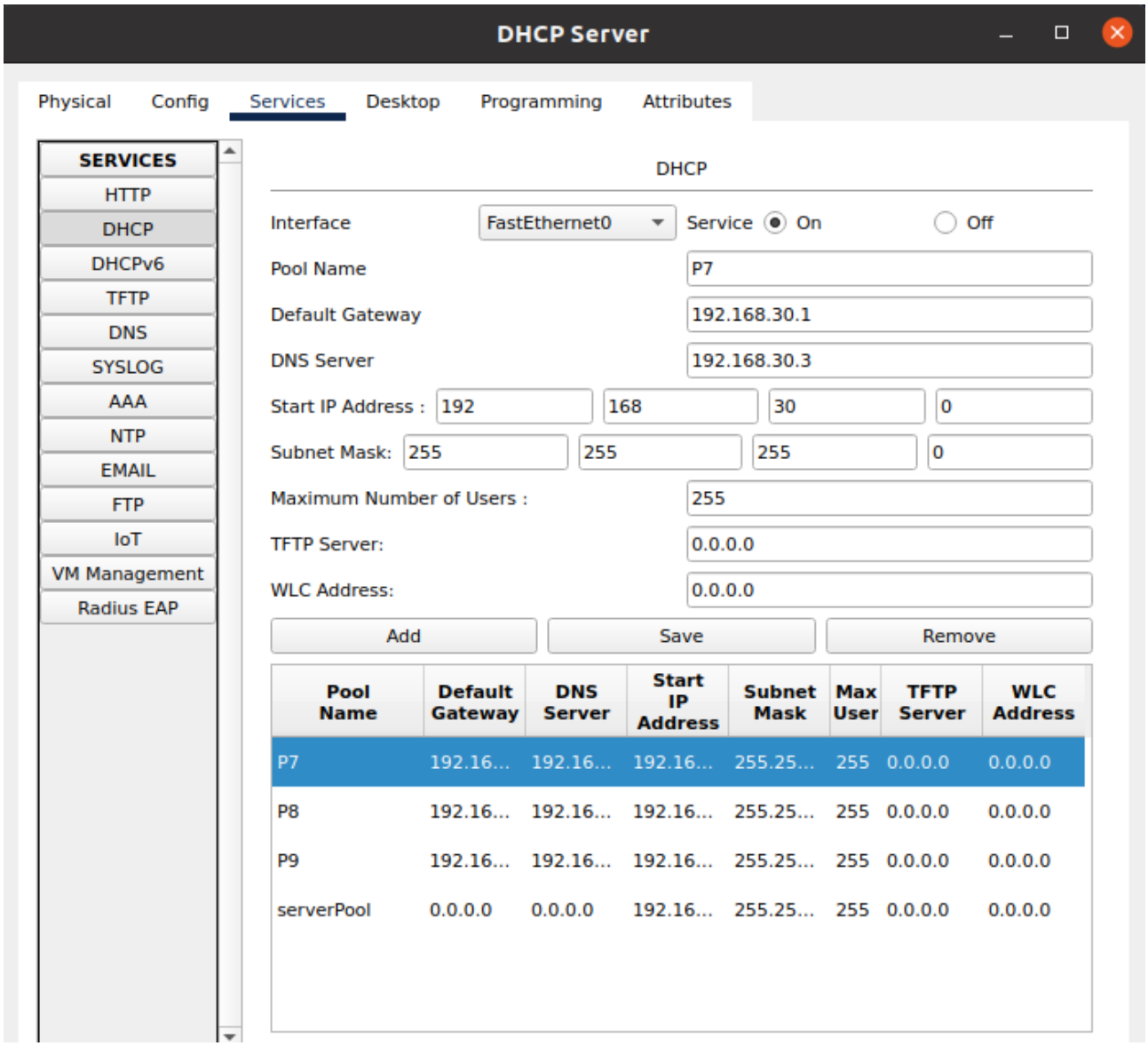




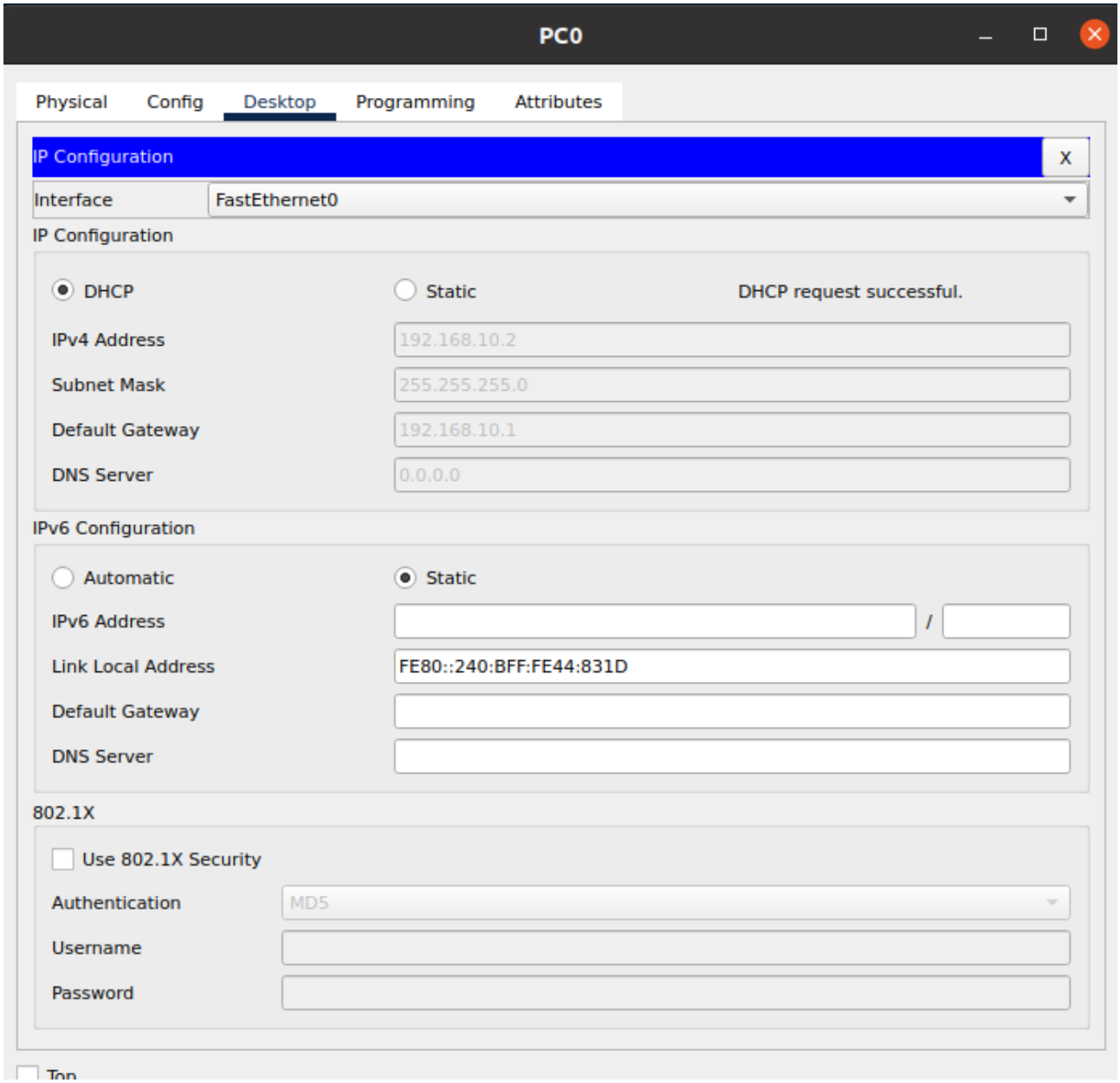
.

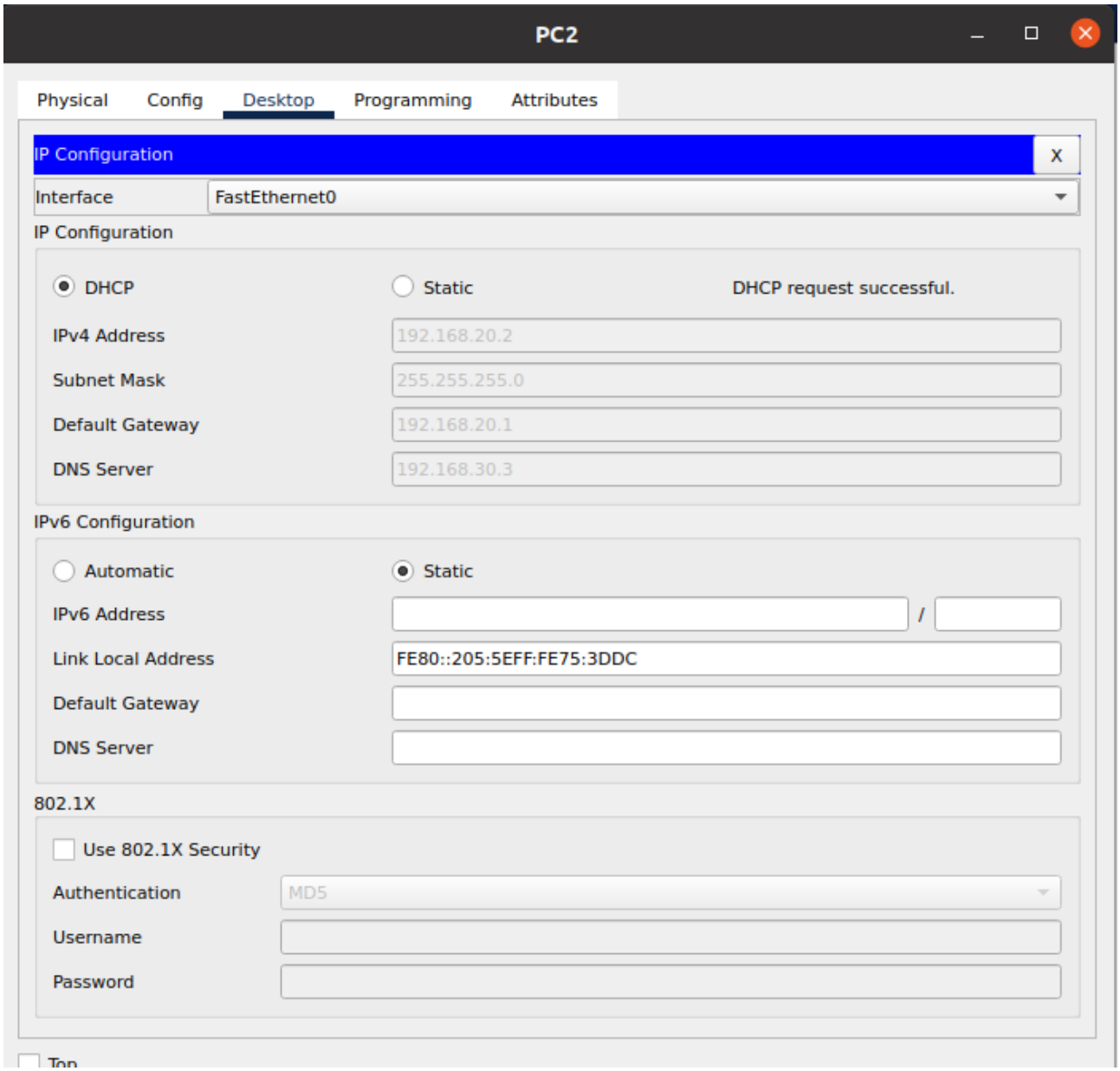
Connection Is Successful With Testing.

DHCP Config:


DHCP Server
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
P7
Default Gateway
192.168.30.1
DNS Server
192.168.30.3
Start IP Address :
192
168
30
0
Subnet Mask:
255
255
255
0
Maximum Number of Users :
255
TFTP Server:
0.0.0.0
WLC Address:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gateway
DNS Server
Start IP Address
Subnet Mask
Max User
TFTP Server
WLC Address
P7
192.16...
192.16...
192.16...
255.25...
255
0.0.0.0
0.0.0.0
P8
192.16...
192.16...
192.16...
255.25...
255
0.0.0.0
0.0.0.0
P9
192.16...
192.16...
192.16...
255.25...
255
0.0.0.0
0.0.0.0
serverPool
0.0.0.0
0.0.0.0
192.16...
255.25...
255
0.0.0.0
0.0.0.0

-
-
-
-
-
-
-
-

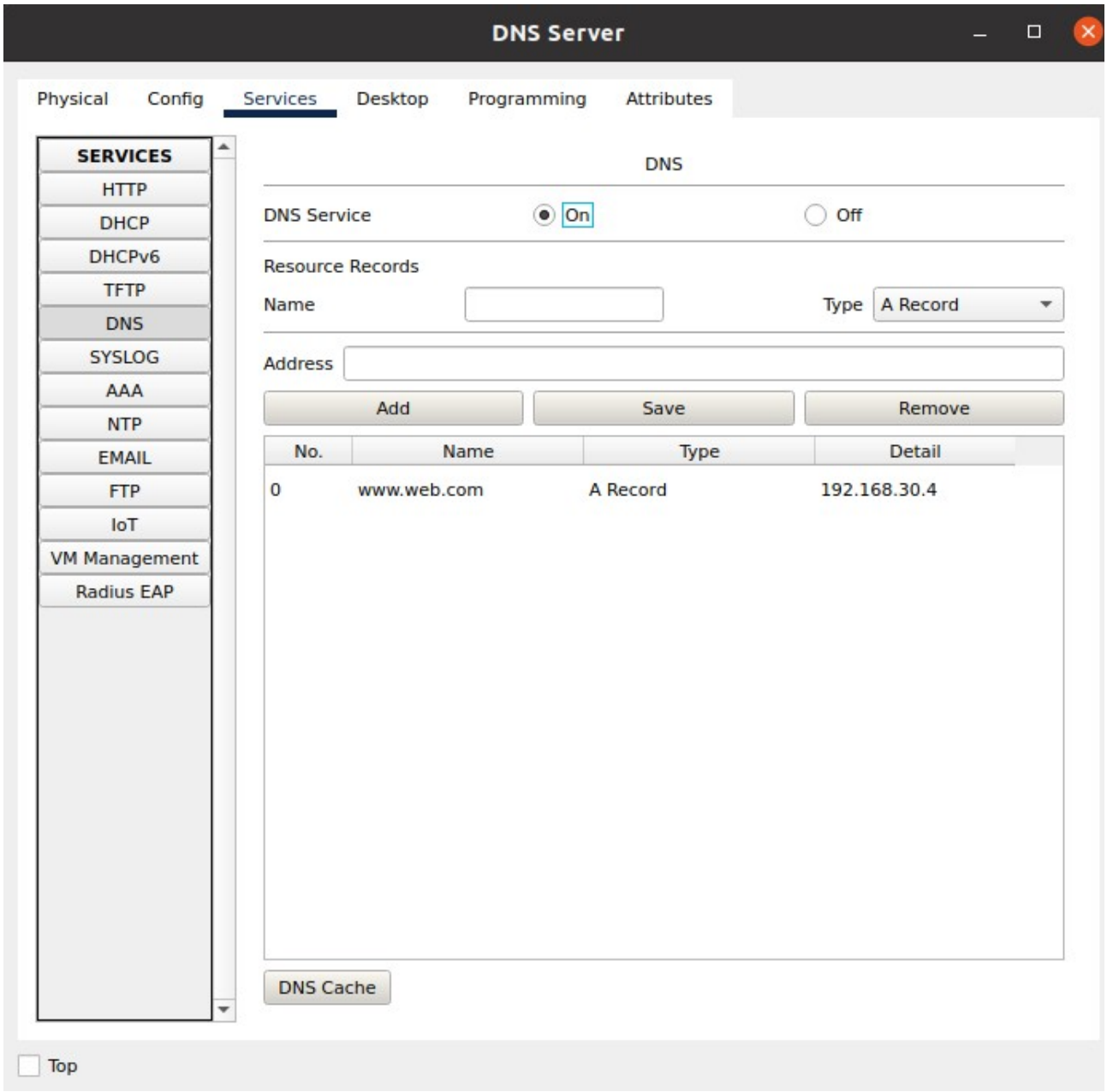

PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.10.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::240:BFF:FE44:831D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
DHCP request successful.
IPv4 Address
192.168.20.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
192.168.30.3
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::205:5EFF:FE75:3DDC
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

-
-
-
-
-
-
-
-

•

DNS Services:



•

•

•

•

.Q:

a.

How many subnet?

Answer: 4

b.

2

c.

4

d.

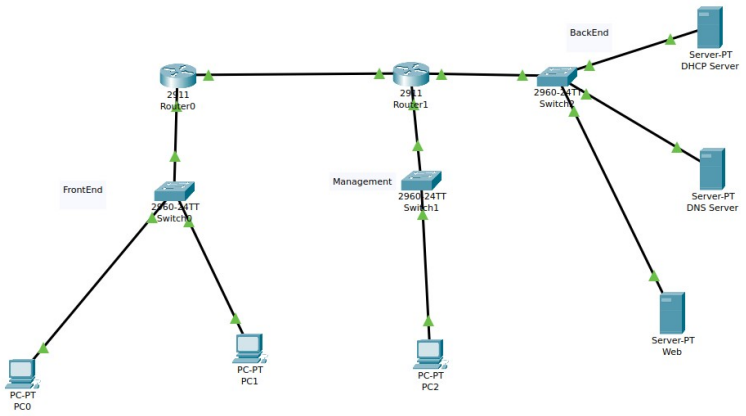
62

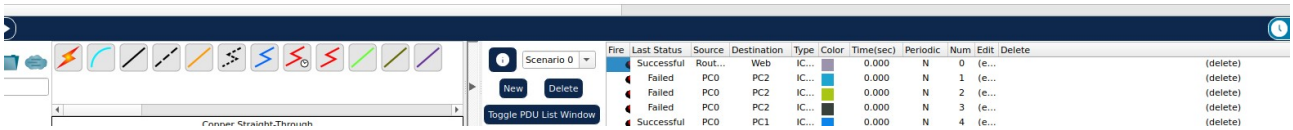
e.

220.10.10.192

f.

220.10.10.192





•

Successful Connection.

Maam Im sorry I forget the IP is given, so I've used Another IP. Really Sry for inconvience

Same procedure will be followed by the IP given in the Paper.

Part g due to time shortage.Sry