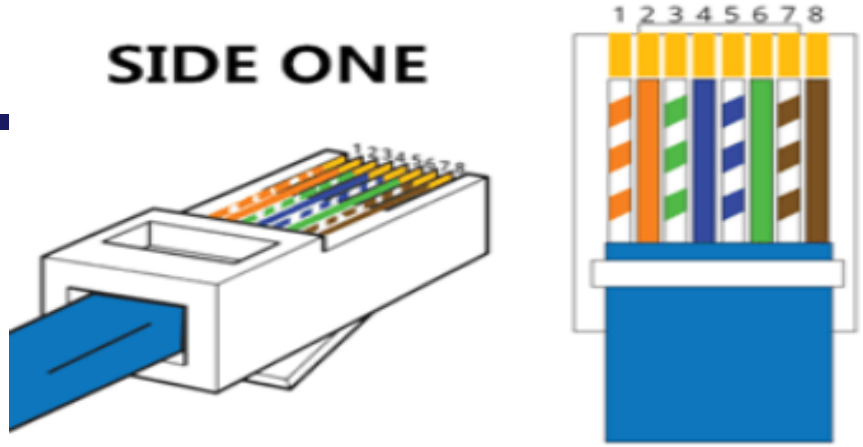
LAB 2 CSE 307

Presented by: Dr. Amandeep Singh

STRAIGHT-THROUGH

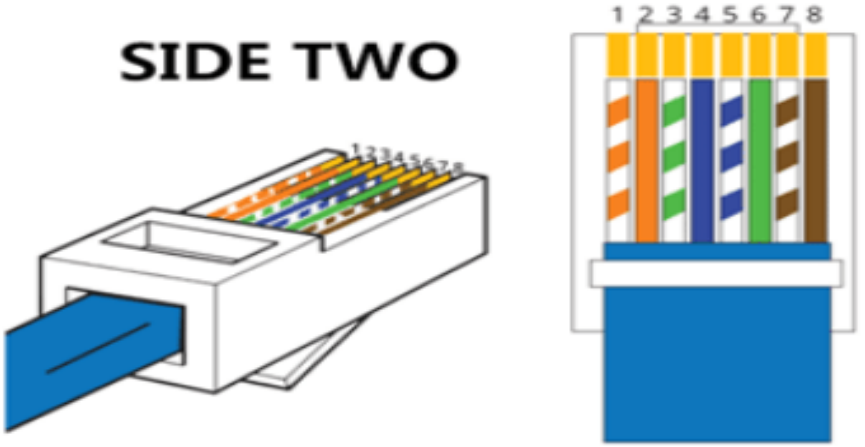
Registered Jack-45

SIDE ONE



1. White Orange	5. White Blue
2. Orange	6. Green
3. White Green	7. White Brown
4. Blue	8. Brown

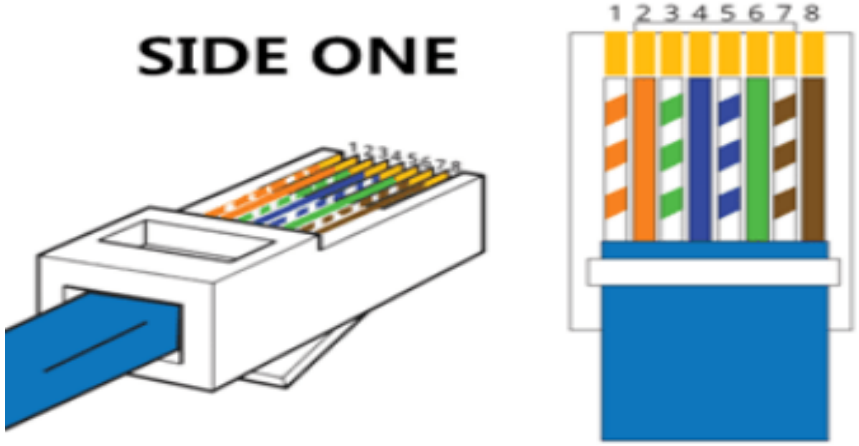
SIDE TWO



1. White Orange	5. White Blue
2. Orange	6. Green
3. White Green	7. White Brown
4. Blue	8. Brown

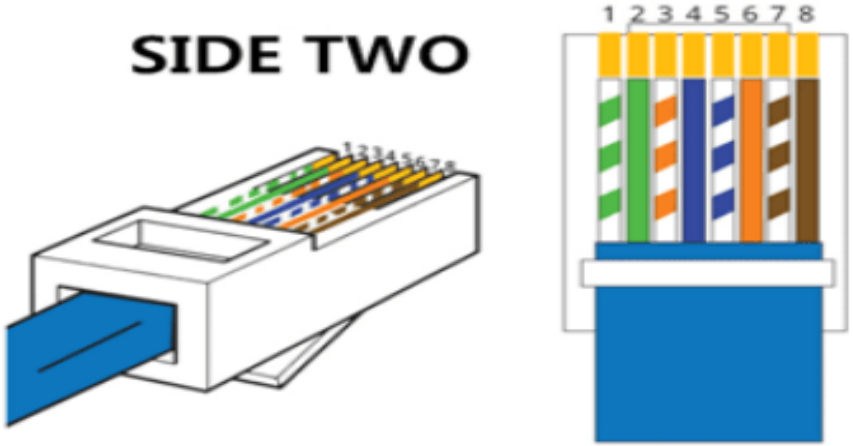
CROSSOVER

SIDE ONE



1. White Orange	5. White Blue
2. Orange	6. Green
3. White Green	7. White Brown
4. Blue	8. Brown

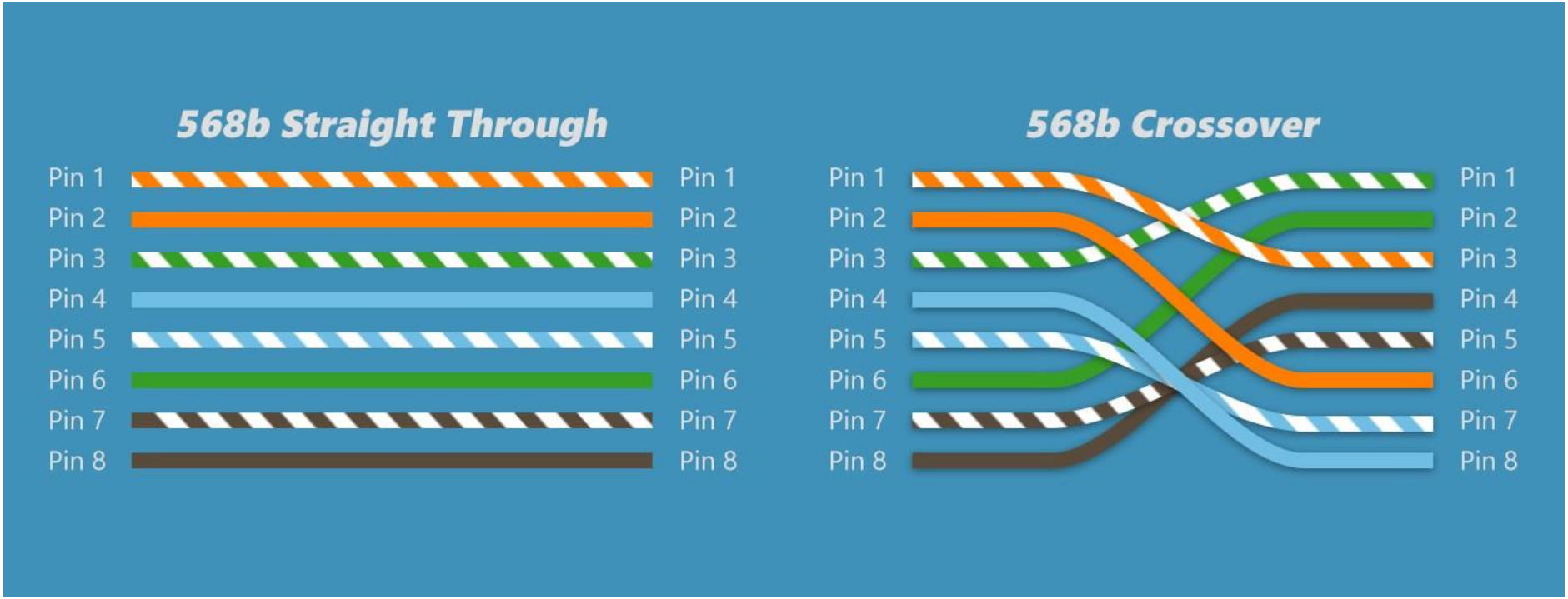
SIDE TWO



1. White Green	5. White Blue
2. Green	6. Orange
3. White Orange	7. White Brown
4. Blue	8. Brown

Uses of cable

	HUB	SWITCH	ROUTER	PC
HUB	Crossover	Crossover	Straight	Straight
SWITCH	Crossover	Crossover	Straight	Straight
ROUTER	Straight	Straight	Crossover	Crossover
PC	Straight	Straight	Crossover	Crossover



Type of IP address

Class	Start range	End range	Use
A	1.0.0.0	127.255.255.255	For Internet Communication
B	128.0.0.0	191.255.255.255	For Internet Communication
C	192.0.0.0	223.255.255.255	For Internet Communication
D	224.0.0.0	239.255.255.255	Reserved for multicasting
E	240.0.0.0	255.255.255.255	Reserved for Research & Experiments

Poll

- D class of internet is used for internet communication

A. True

B. False

Subnet Example

Network address **172.19.0.0 with /16 network mask**

Network	Network	Host	Host
172	19	0	0

Poll

- IP address contain network address along with host address

A. True

B. False

Subnet Example

Network address **172.19.0.0 with /16 network mask**

Network	Network	Host	Host
172	19	0	0

Using Subnets: subnet mask **255.255.255.0** or /24

Network	Network	Subnet	Host
Network Mask: 255.255.0.0 or /16	11111111	11111111	00000000	00000000
Subnet Mask: 255.255.255.0 or /24	11111111	11111111	11111111	00000000

- Applying a mask which is larger than the default subnet mask, will divide your network into subnets.
- Subnet mask used here is 255.255.255.0 or /24

Subnet Example

Class B address **172.19.0.0 with /16 network mask**

Using Subnets: **subnet mask** 255.255.255.0 or /24

Network	Network	Subnet	Hosts		Hosts Addresses
172	19	0	1	→	254
172	19	1	1	→	254
172	19	2	1	→	254
172	19	3	1	→	254
172	19	etc.	1	→	254
172	19	254	1	→	254

172	19	255	Host

Each subnet has 254 hosts, $2^8 - 2$

Subnet Example

Network address **172.19.0.0 with /16 network mask**

Using Subnets: **subnet mask** 255.255.255.0 or /24

Network	Network	Subnet	Host
172	19	0	255
172	19	1	255
172	19	2	255
172	19	3	255
172	19	etc.	255
172	19	254	255
172	19	255	255

Broadcast Addresses

255 Subnets

$2^8 - 1$

Cannot use last subnet as it contains broadcast address

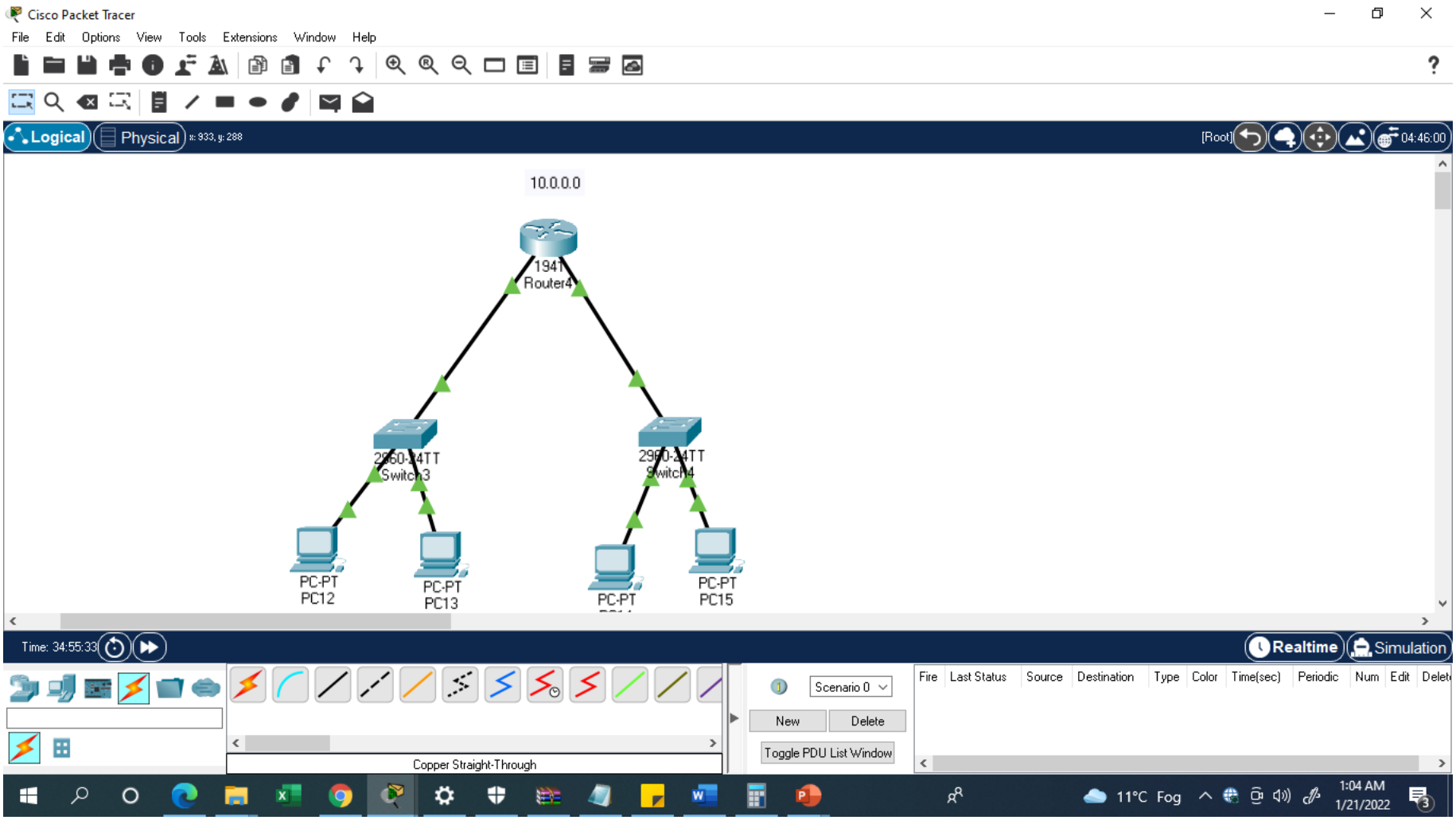
Poll

- **last subnet Cannot be used as it contains broadcast address**

A. **True**

B. **False**

Single router network



CLI Router (command line interface)

- --- System Configuration Dialog ---
- Would you like to enter the initial configuration dialog? [yes/no]: no
- Press RETURN to get started!
- Router>en
- Router#config terminal (privilege mode)
- Enter configuration commands, one per line. End with CNTL/Z.
- Router(config)#interface GigabitEthernet0/1 (or Router(config)#interface g0/1)
- Router(config-if)#ip add 20.0.0.1 255.0.0.0
- Router(config-if)#no shutdown

- Router#config terminal
- Enter configuration commands, one per line. End with CNTL/Z.
- Router(config)#interface g0/0
- Router(config-if)#ip add 10.0.0.1 255.0.0.0
- Router(config-if)#no shutdown

FLSM subnetting (fixed length subnet mask)

- Step 1:decide total number of sub net required , lets say 2
- Step 2: calculate required subnet bits for example in assumed case

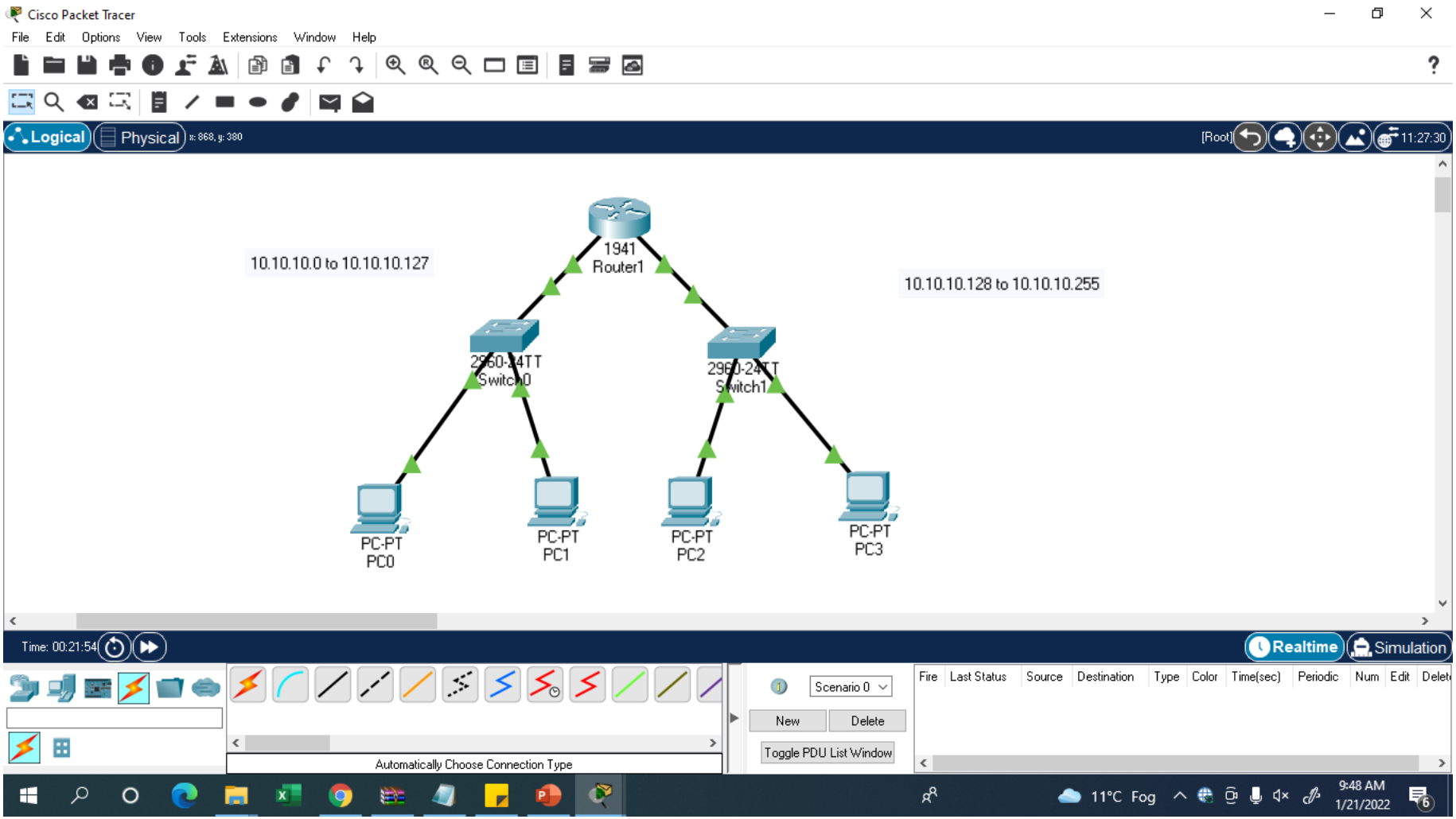
  255.255.255.10000000 (2^n formula used)
- Step 3: calculate subnet mask by converting this binary number to decimal for eg.

  10000000 =128 hence mask will be: 255.255.255.128
- Step 4: Find range by subtracting calculated mask from maximum possible number 255.255.255.255

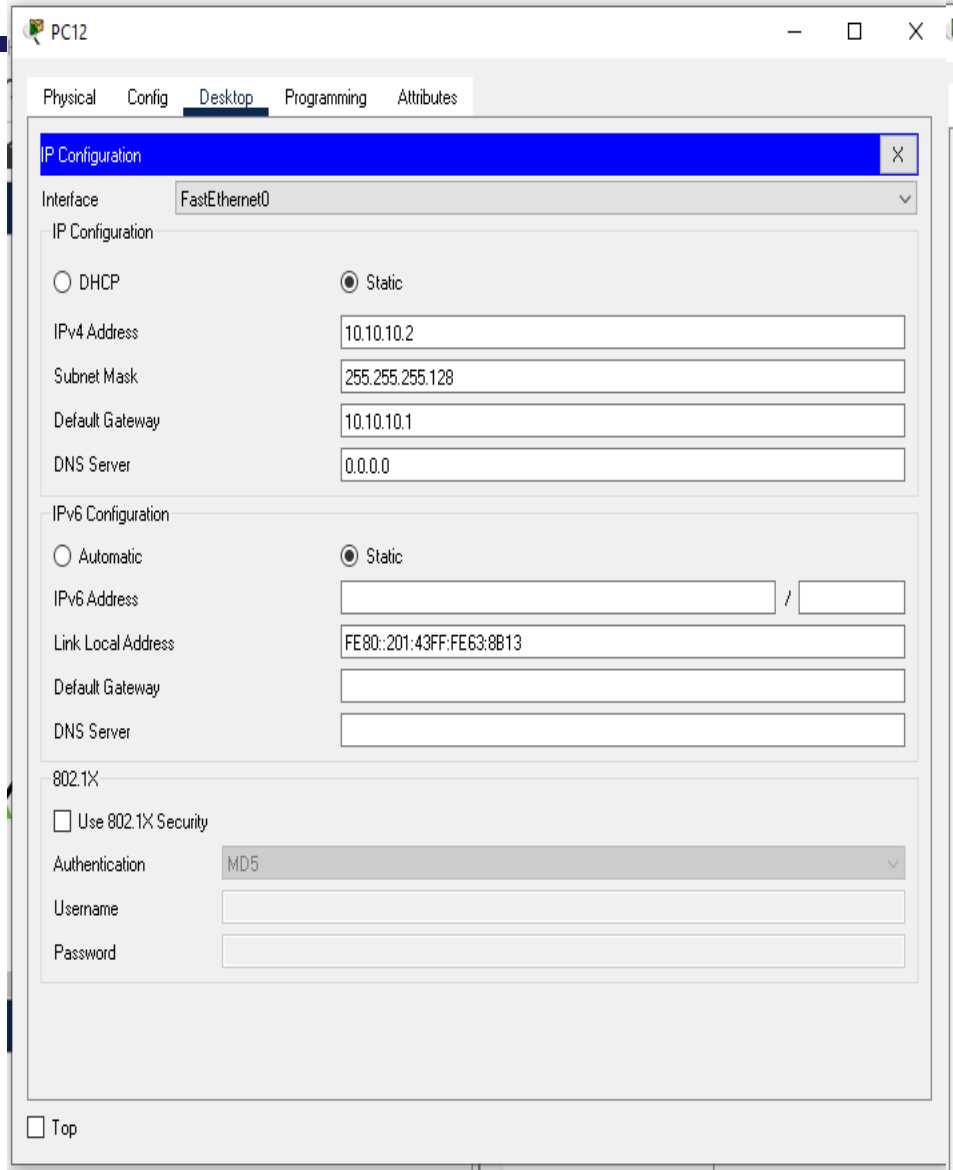
255.255.255.255
255.255.255.128

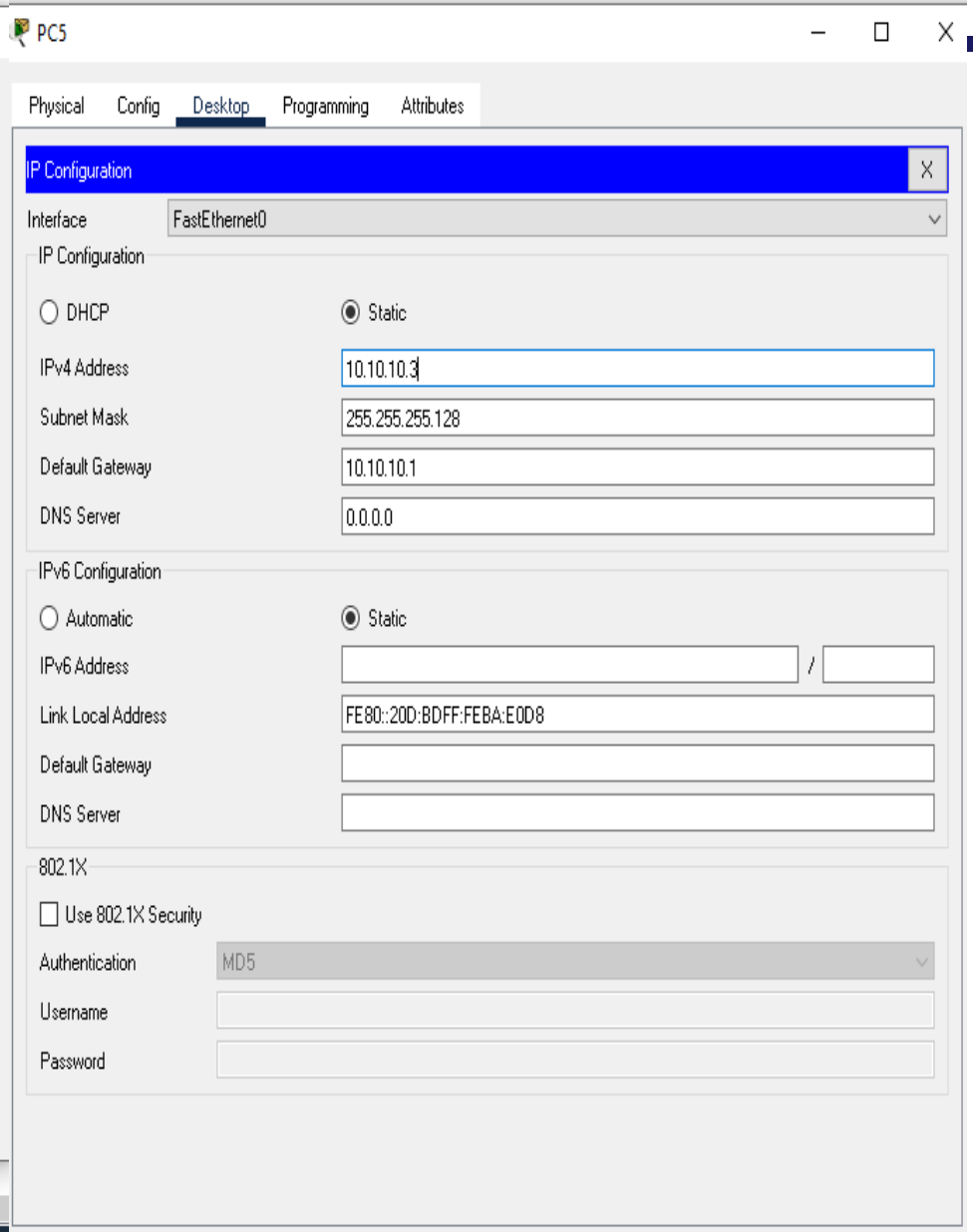
0.0.0.127

Range will be
10.10.10.0 to 10.10.0.127
And
10.10.10.128 to 10.10.10.255

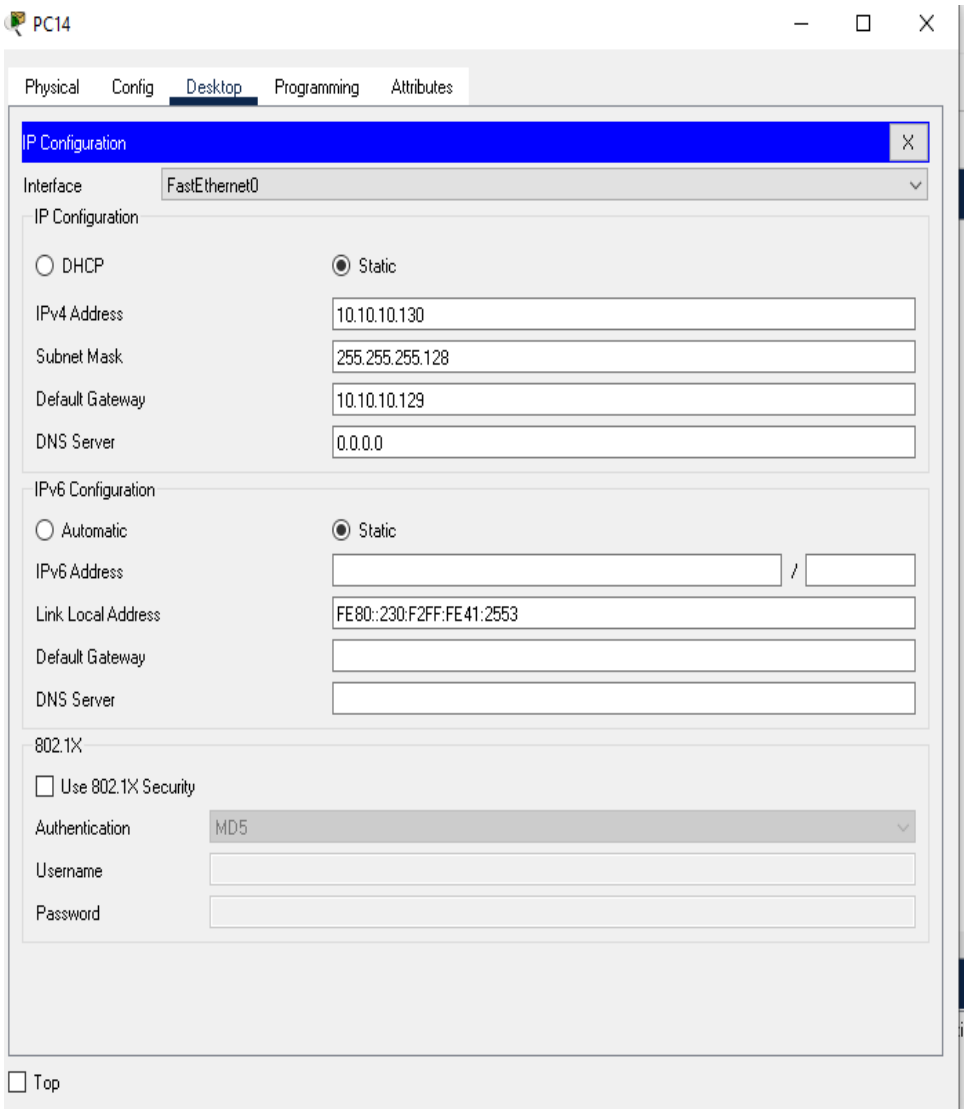

Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
11:27:30
10.10.10.0 to 10.10.10.127
10.10.10.128 to 10.10.10.255
1941
Router1
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Time: 00:21:54
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Automatically Choose Connection Type
11°C Fog
9:48 AM
1/21/2022

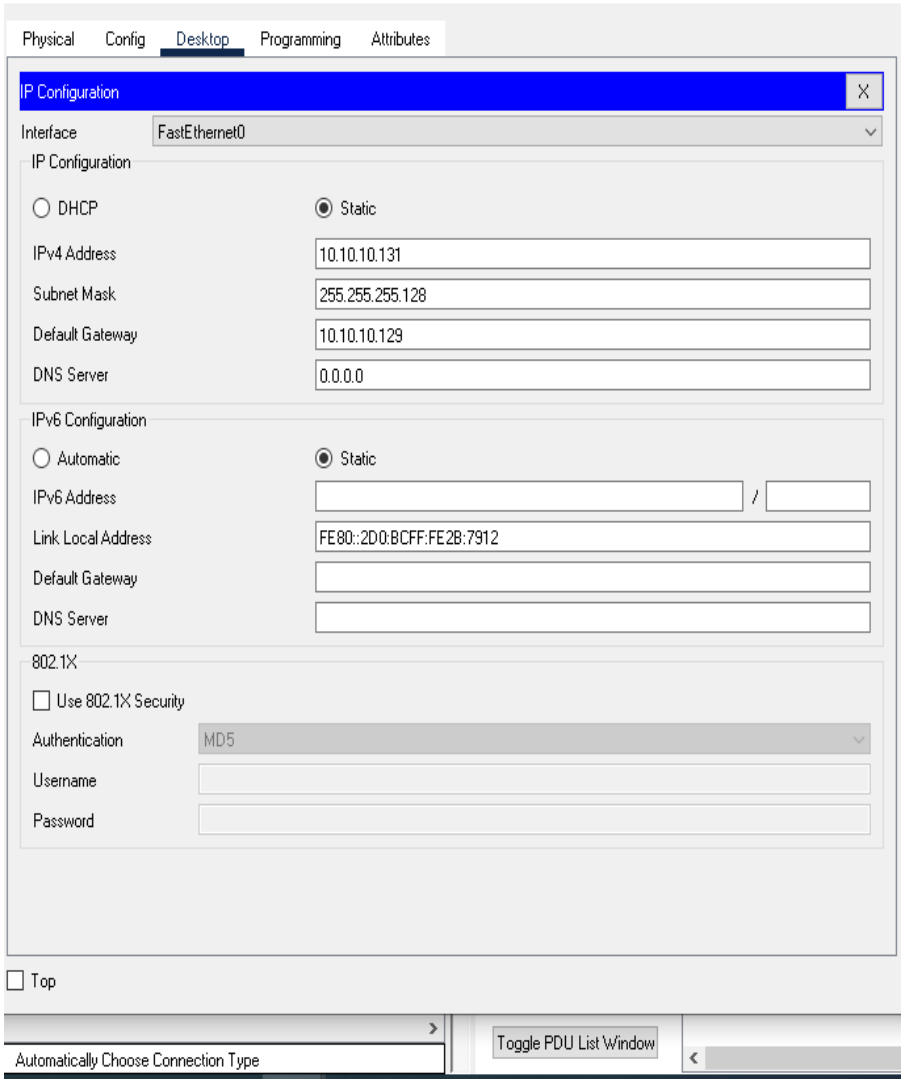
Sample of pc setting



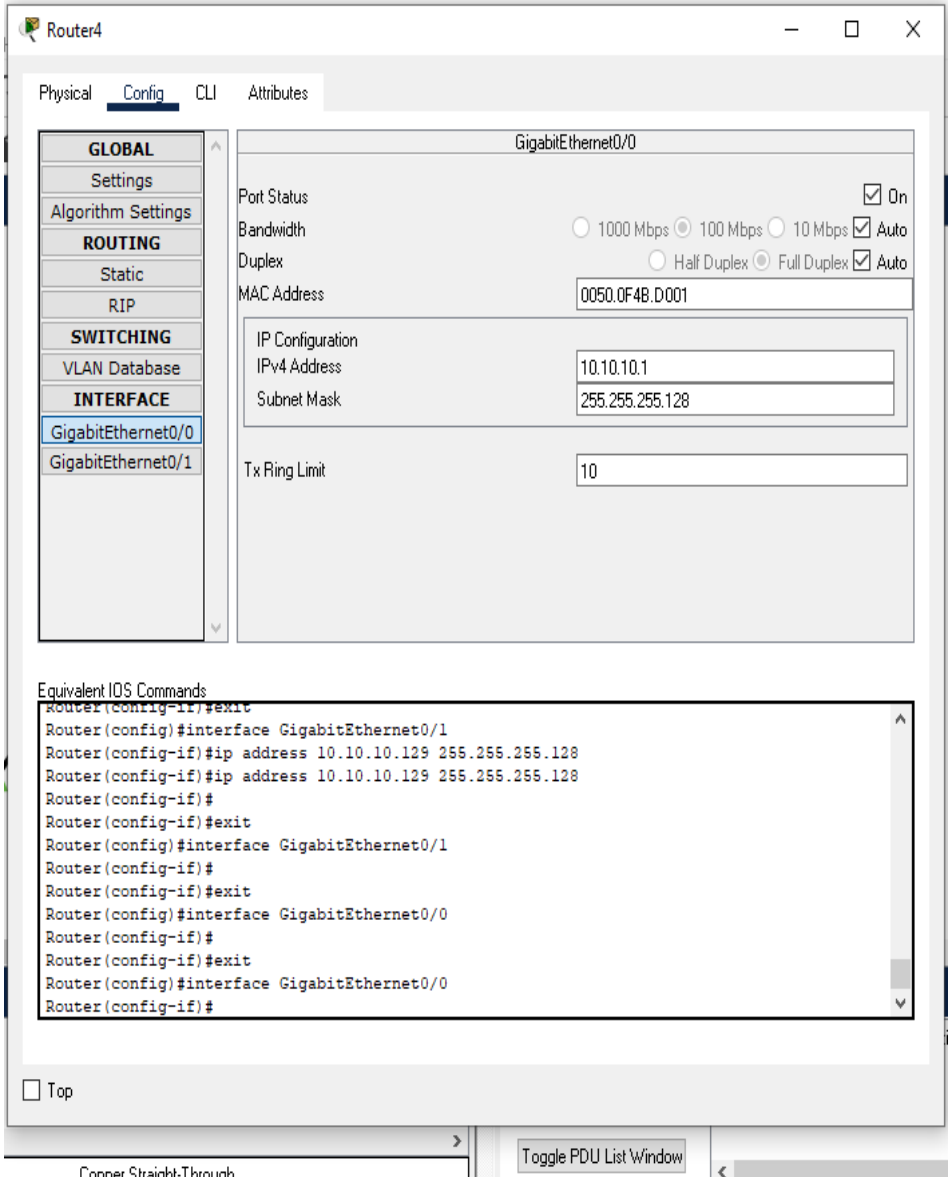


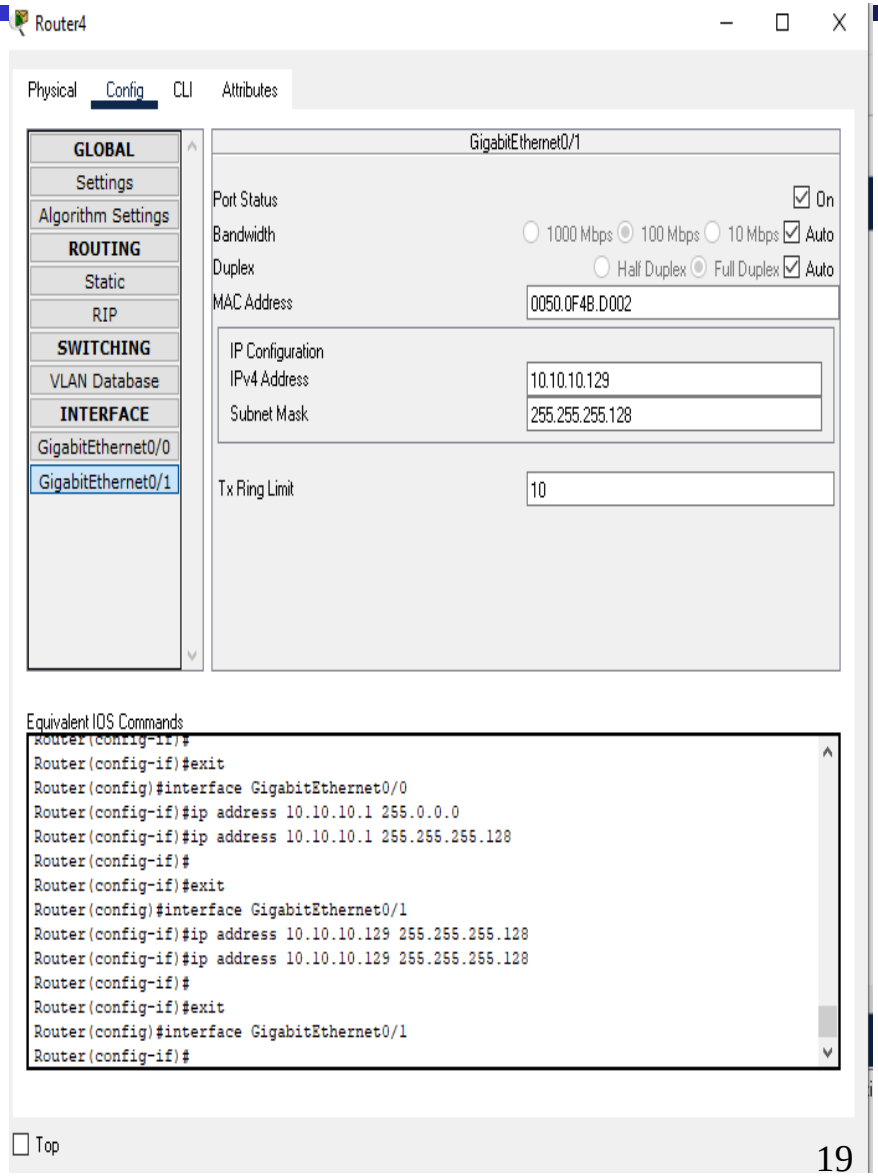
Sample of pc setting





Router setting





VLSM subnetting (variable length subnet mask)

- Step 1:decide total number of sub net required , lets say 2
- Step 2: calculate required network bits for example in assumed case network one need 64 IP's and rest IP's belong to network two

  32-6=26 bits

(2^n formula used and 32 is (8.8.8.8 total no of bits))

- Step 3: calculate subnet mask by converting this binary number to decimal for eg.

  11000000 =192 hence mask will be: 255.255.255.192

- Step 4: Find range by subtracting calculated mask from maximum possible number 255.255.255.255

255.255.255.255
255.255.255.192

0.0.0.63

Range will be
10.10.10.0 to 10.10.0.63

VLSM subnetting

- Step 1:decide total number of sub net required , lets say 2
- Step 2: calculate required network bits for example is assumed case network one need 30 IP's and rest IP's belong to network two

  32-5=27 bits

(2^n formula used and 32 is (8.8.8.8 total no of bits))

- Step 3: calculate subnet mask by converting this binary number to decimal for eg.

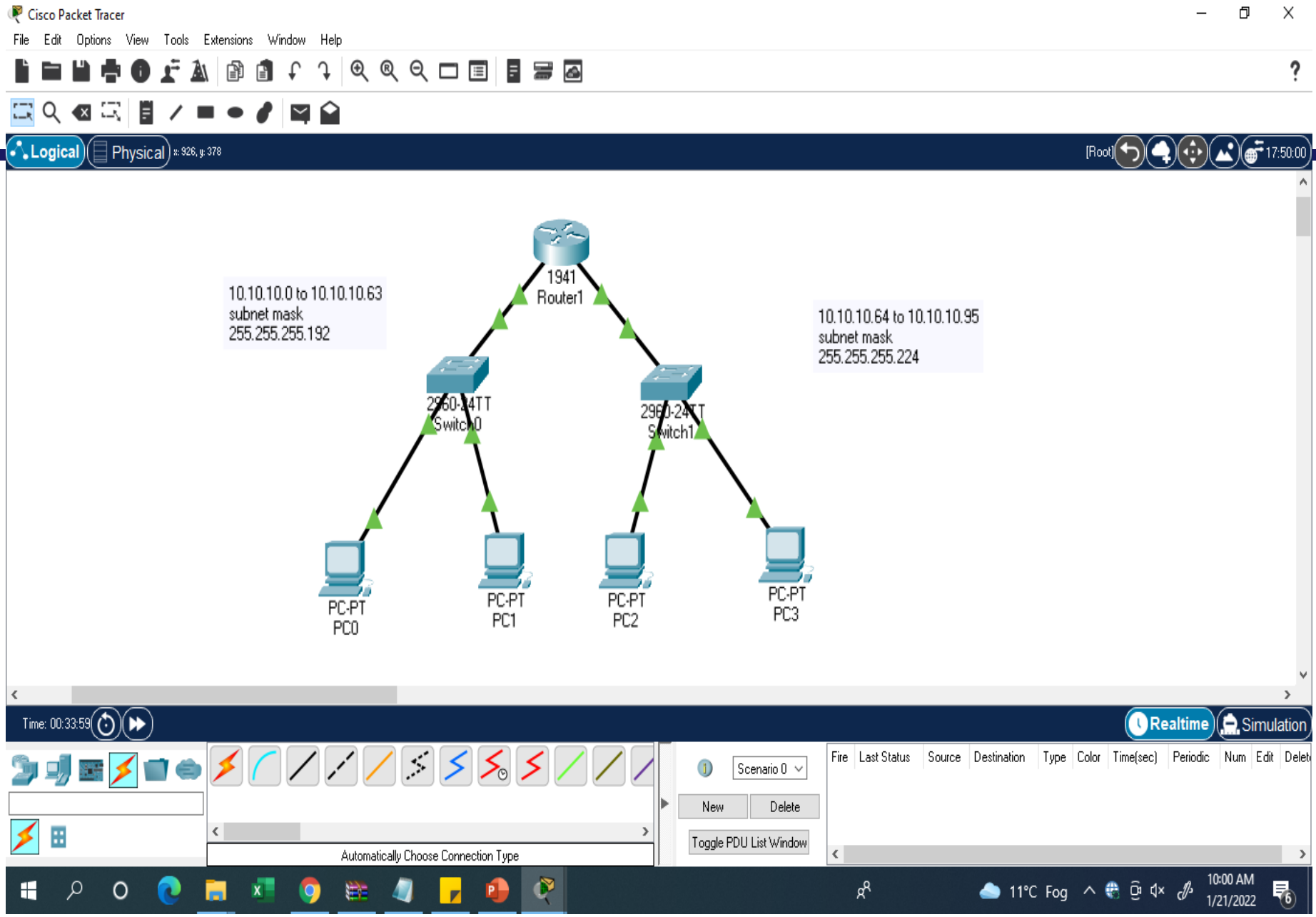
  1110000 =224 hence mask will be: 255.255.255.224

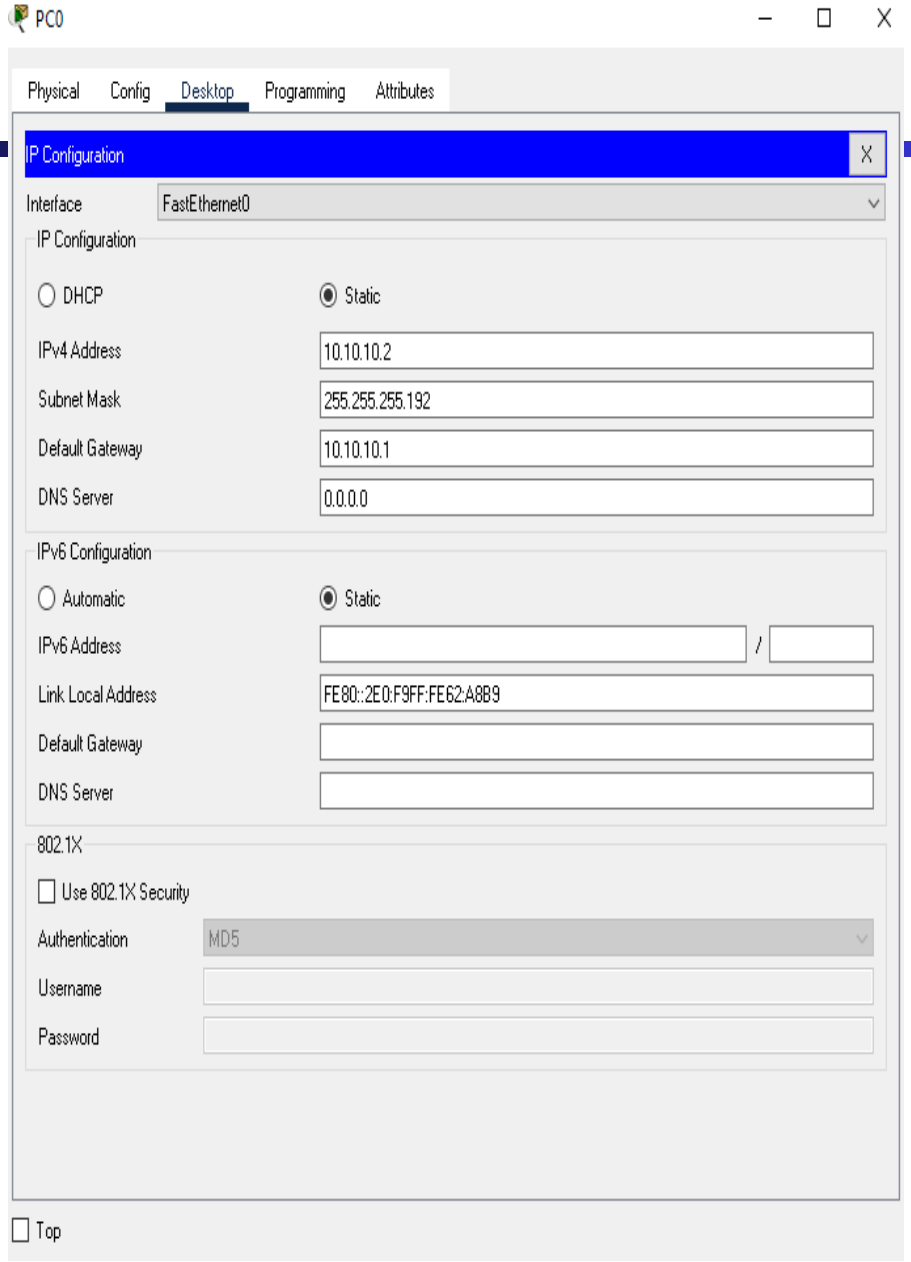
- Step 4: Find range by subtracting calculated mask from maximum possible number 255.255.255.255

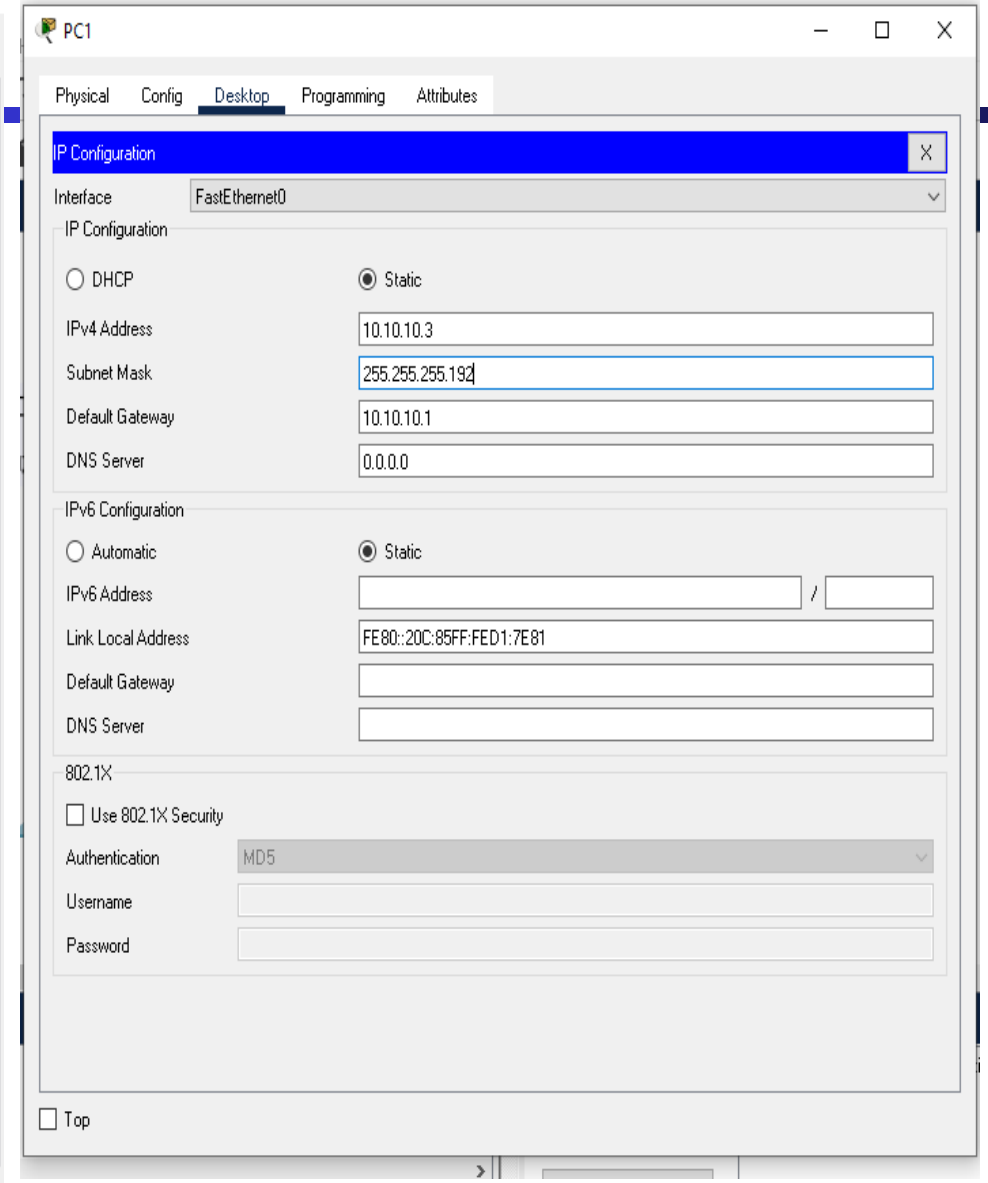
255.255.255.255
255.255.255.224

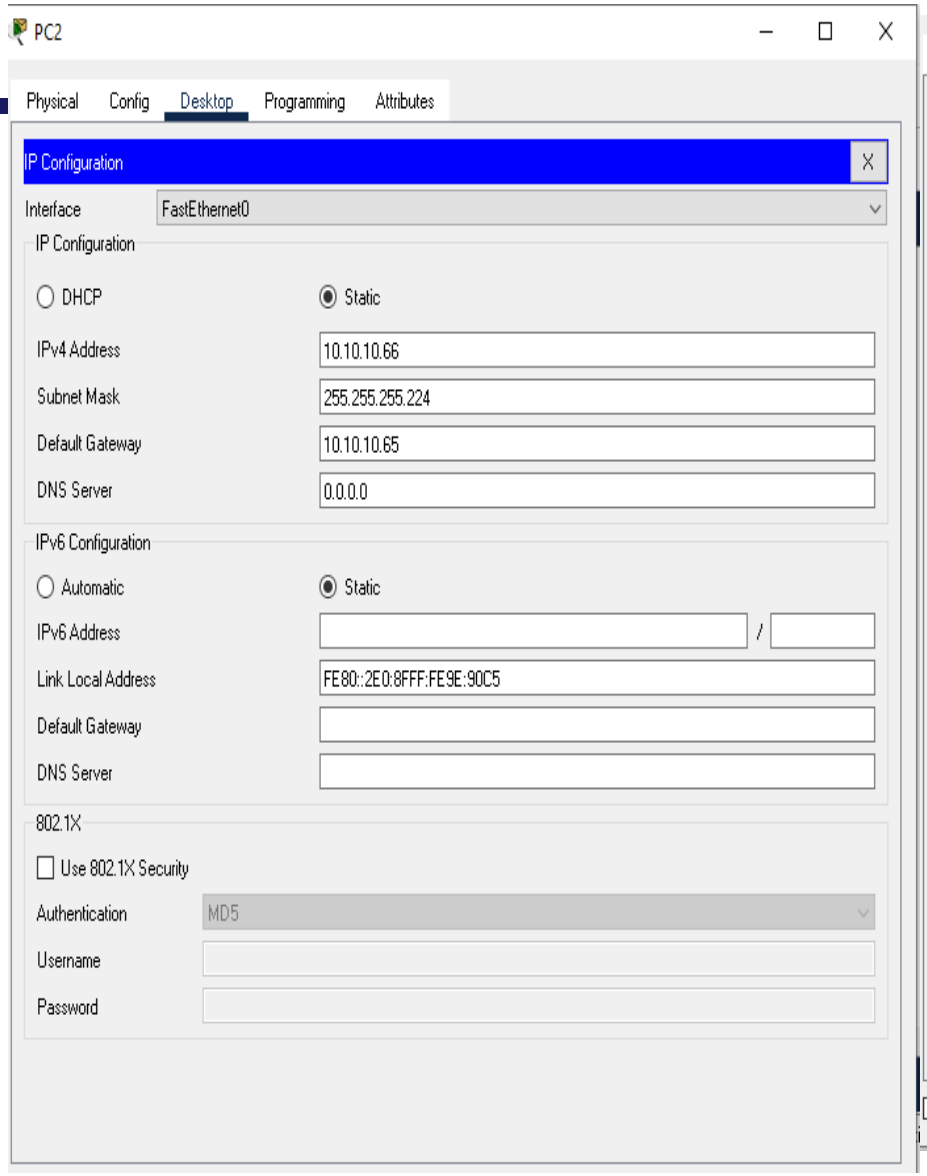
0.0.0.31

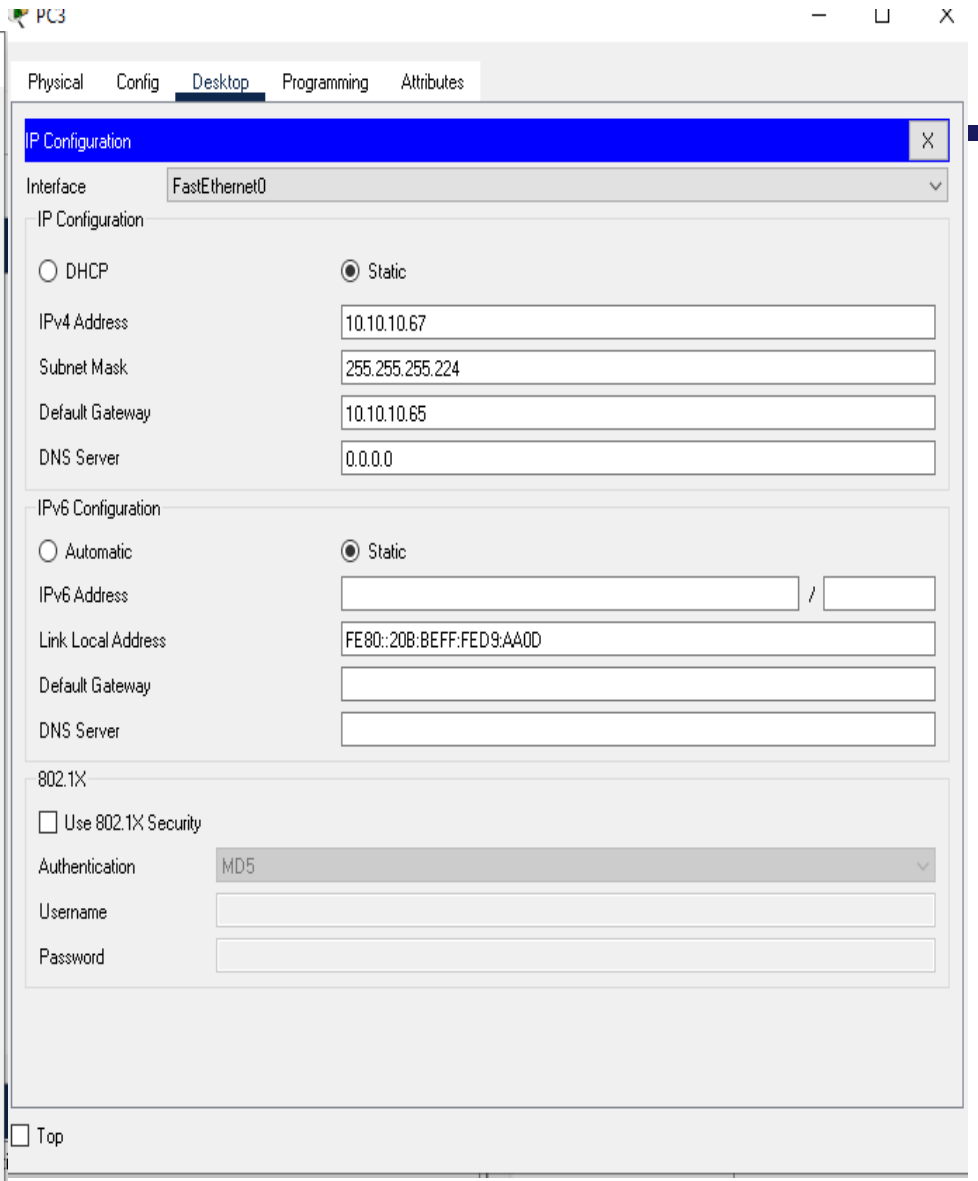
Range will be
10.10.10.64 to 10.10.0.95


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
[Root]
17:50:00
10.10.10.0 to 10.10.10.63
subnet mask
255.255.255.192
10.10.10.64 to 10.10.10.95
subnet mask
255.255.255.224
1941
Router1
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
PC0
PC-PT
PC1
PC-PT
PC2
PC-PT
PC3
Time: 00:33:59
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Automatically Choose Connection Type
11°C Fog
10:00 AM
1/21/2022


PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.10.10.2
Subnet Mask
255.255.255.192
Default Gateway
10.10.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:F9FF:FE62:A8B9
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.10.10.3
Subnet Mask
255.255.255.192
Default Gateway
10.10.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20C:85FF:FED1:7E81
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.10.10.66
Subnet Mask
255.255.255.224
Default Gateway
10.10.10.65
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:8FFF:FE9E:90C5
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password


PC3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.10.10.67
Subnet Mask
255.255.255.224
Default Gateway
10.10.10.65
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20B:BEFF:FED9:AA0D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top