# Lab 1:

## Cable to connect devices:

**Straight** through: **Different** Device (connect hub with pc/laptop)

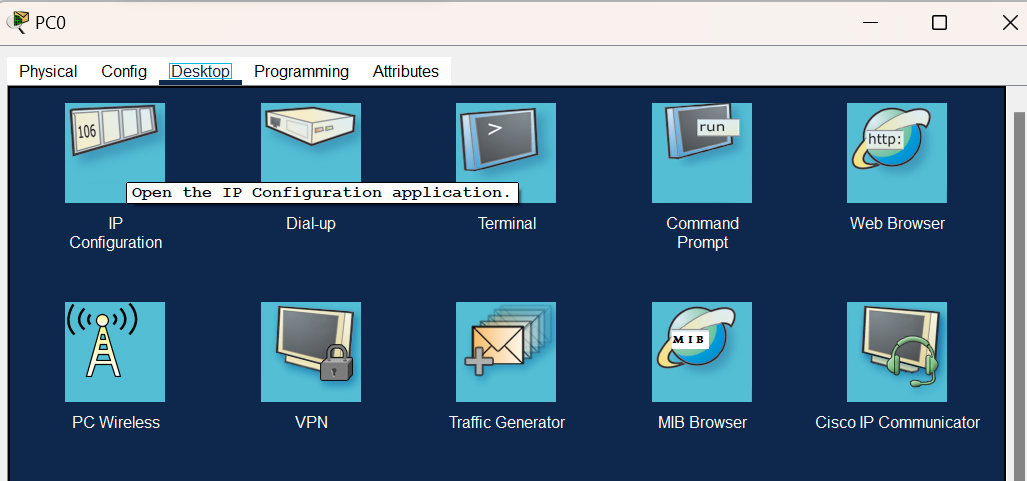
**Cross-over: Same** type device (laptop to laptop)

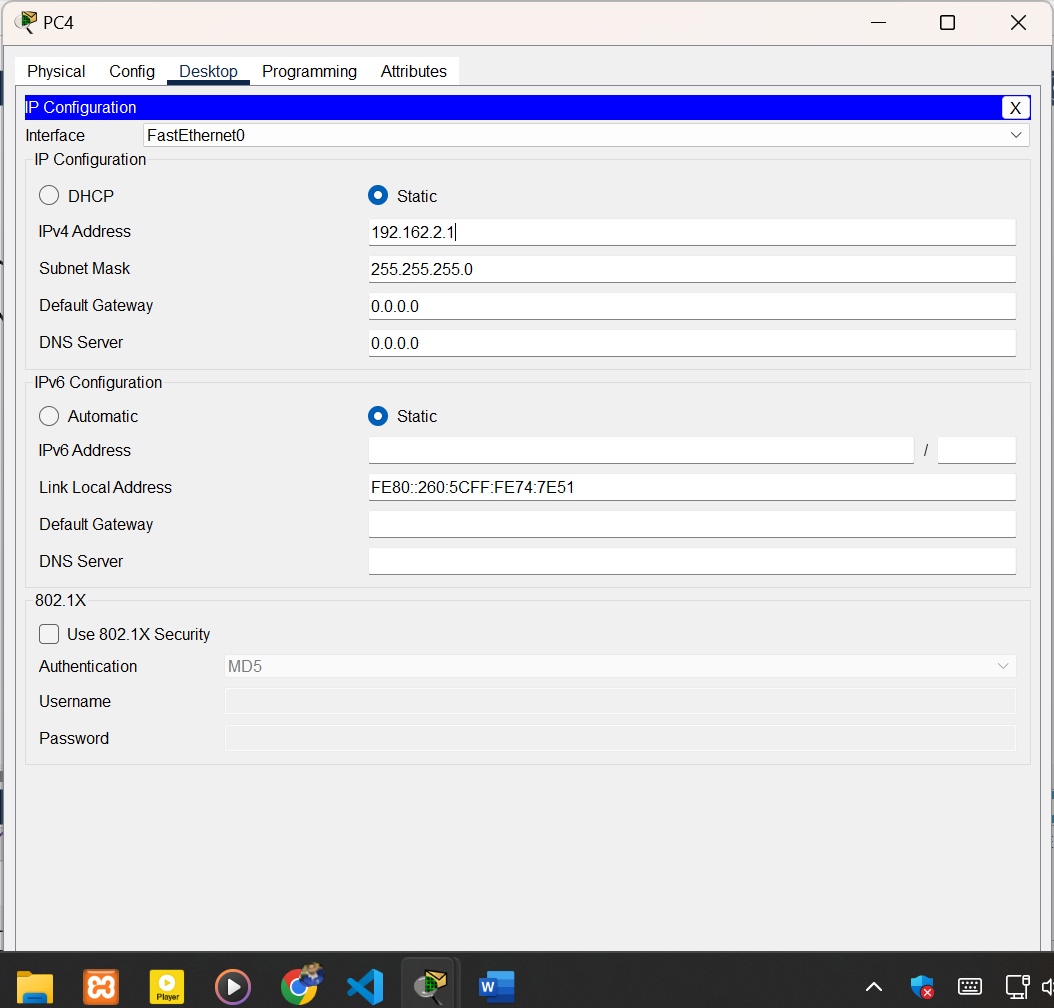
click on pc > desktop > IP configuration > set ipv4 static value 4 octate

x.x.x.x

each x= 8 bit binary value in decimal 0 to 255 (2^8 combinations) but avoid 0 and 255 as they show problems.

0<x<255





# Lab2:

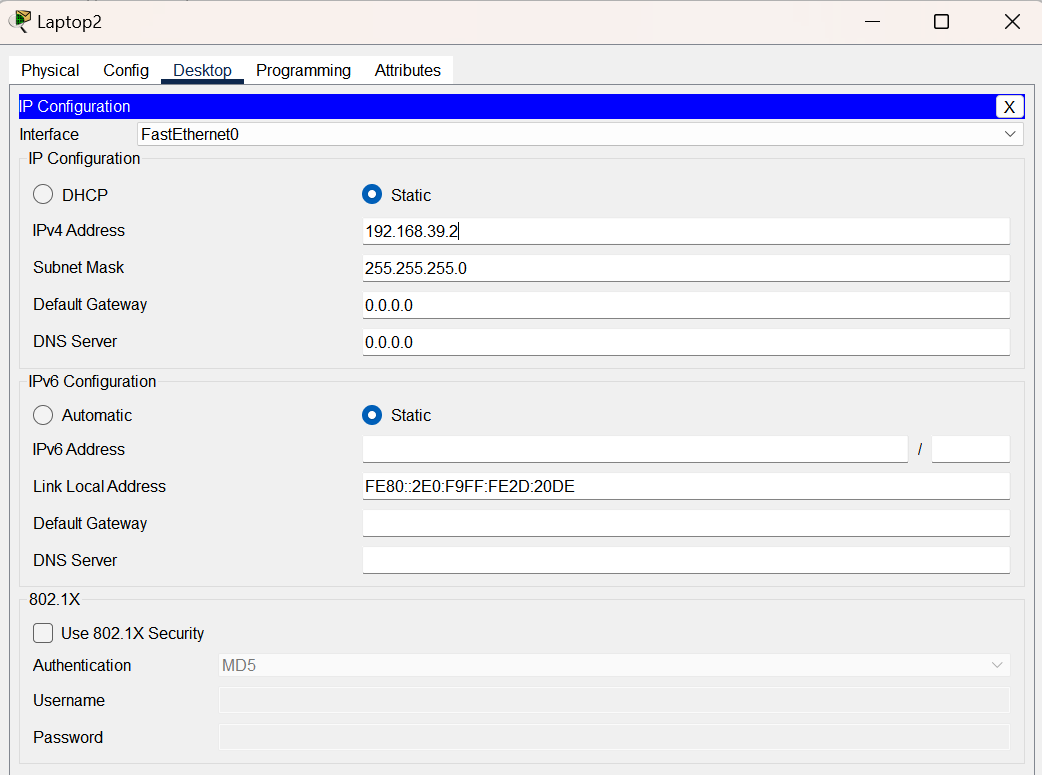
## IP address setting:

subnet mask: 255.255.255.0 for C type N.N.N.H

Ip address of 1st 3 octate of each device should be same 🡪same network

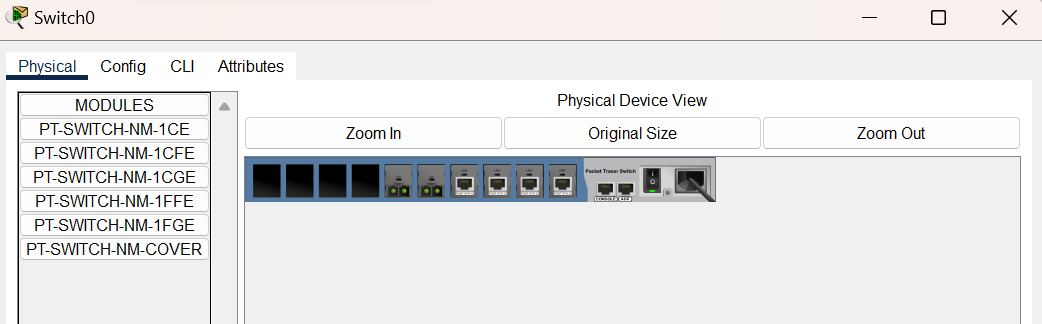
USB don’t support peer to peer connection.

Use crossover ethernet wire to make Peer to Peer connection.



## Add new port in switch:

Click on switch > turn power off > drag and drop ethernet cable port(From Module section-> click on different modules to know their property)



## OSI:

Bridge and Switch: Data Link Layer device 🡪 work in same Network

1. Application Layer
2. Presentation Layer
3. Session
4. Trasportation Layer
5. Network **(Different Network)🡪Router**
6. Datalink **(Same Network)🡪Bridge, Switch**
7. Physical 🡪Hub 🡪 can’t work with Address.

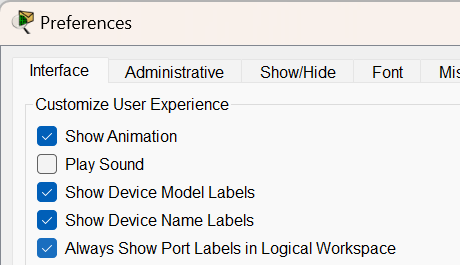
Connect a star topology of Hub with Start topology of Switch with Bridge:

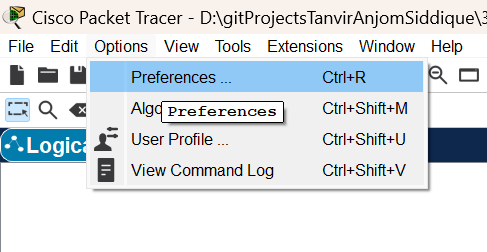
Conditons:

1. Use Same Network (if C type N.N.N.H used 1st 3 octate same for all laptop/desktop)
2. Each device of 2 star topology must have different unique IP address.
3. Connect Laptop with Switch with Straight Through cable
4. Connect Laptop with Hub with Straight Through cable
5. Connect Bridge with Switch with Crossover cable
6. Connect Bridge with Hub with Crossover cable

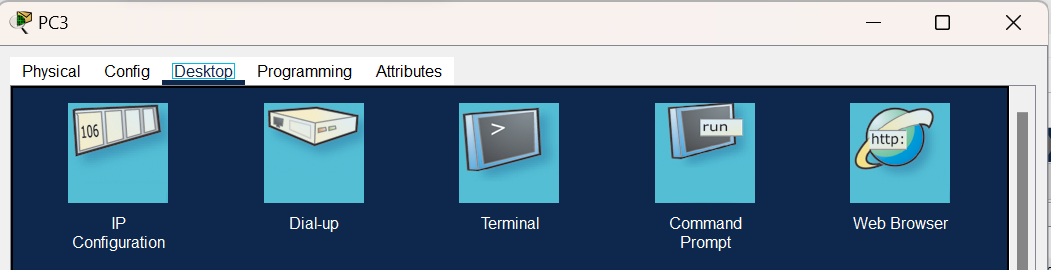
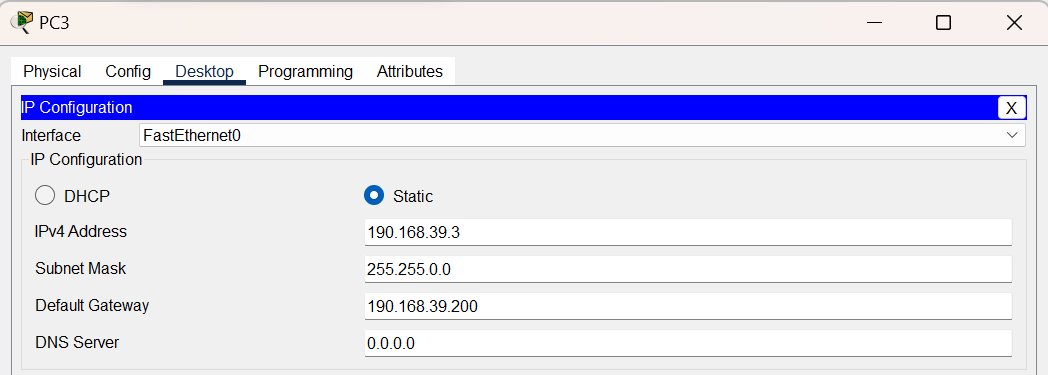
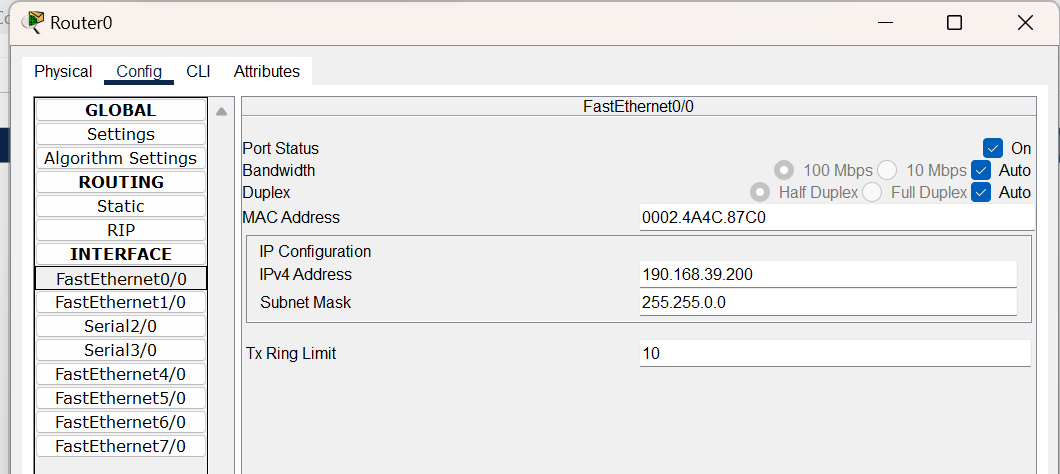
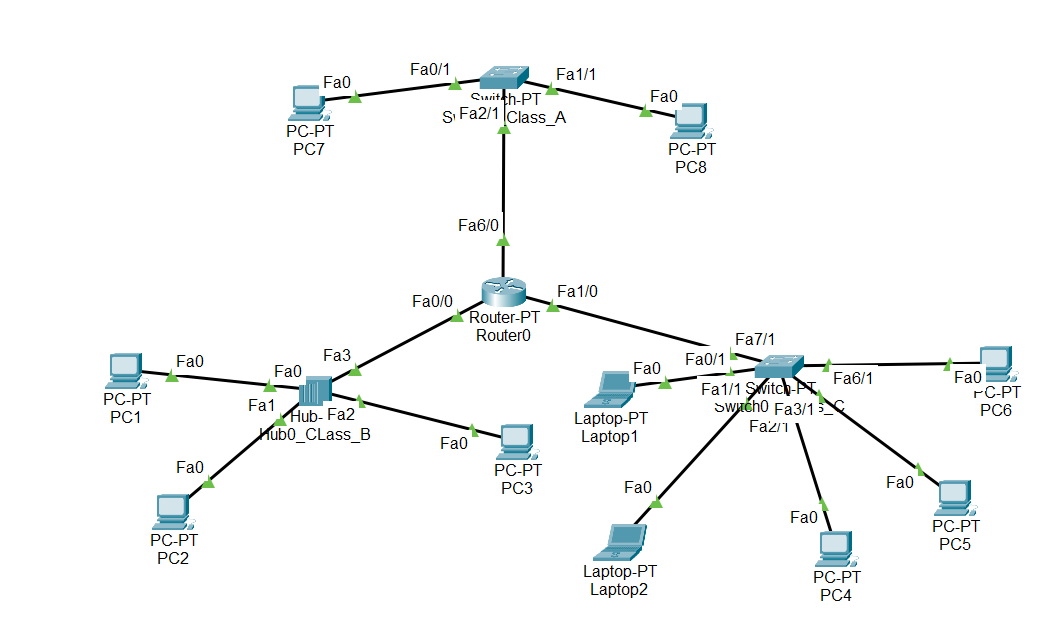
# Lab3:

Preferences> always show port logical address

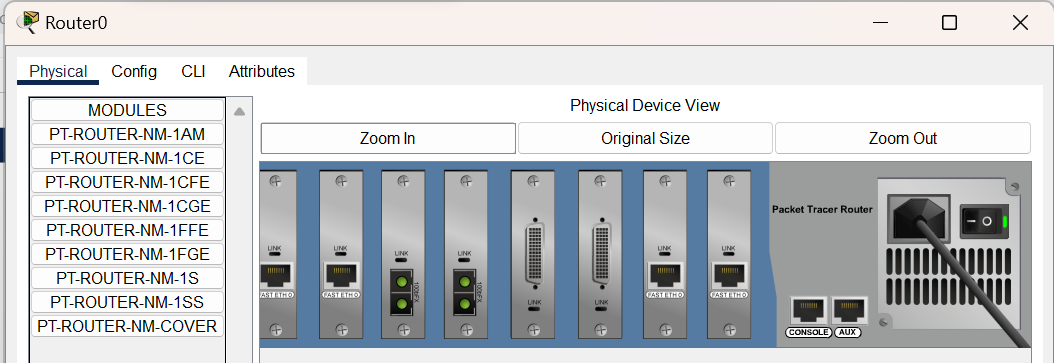
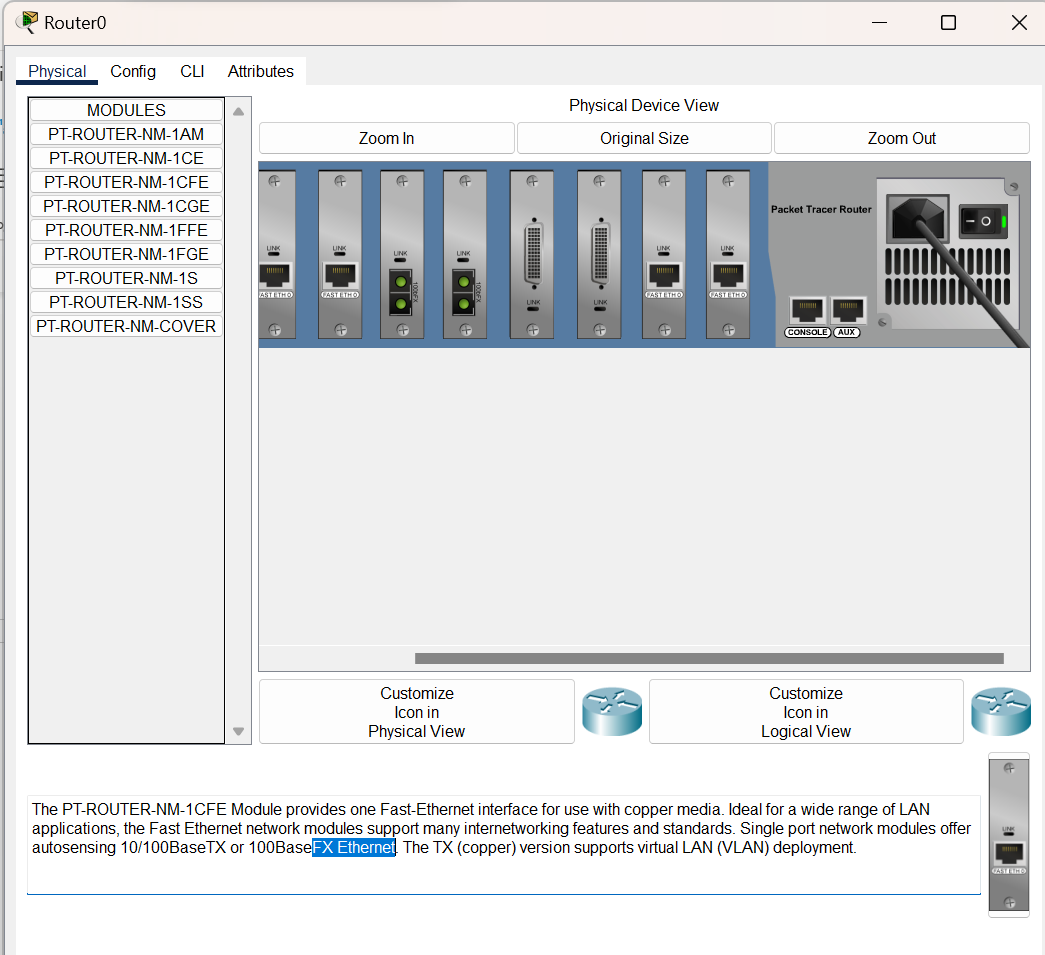




## Set default gateway:

1. Click on Laptop/desktop > IP Configuration
2. Set IP address(unique for **each PC** of same network) & Default gateway(Unique for 1 hub/switch of same network= all pc under it will have same Default Gateway) 
3. Click on Router > Config > Fast Ethernet0 (with which port the Hub is connected to router) > turn **Port Status on** >Set **IPv4 Address = Default gatway** address of each PC of the Connected Hub > Enter (Subnet Mask will be automatically set.)
4. 
5. Follow this procedure for each Hub/Switch connected to Router.

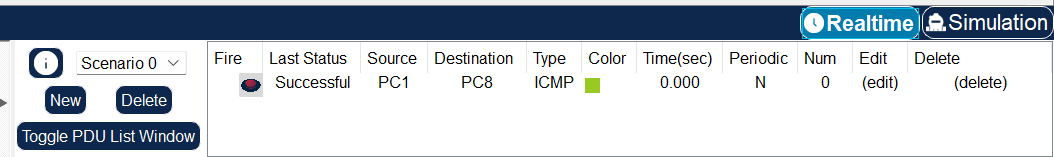
## Increase Fast Ethernet Port in Router:

1. Click on Router >Turn Router Off > click & Drag PT-ROUTER-NM-1CFE to Router emtyp space for port > Turn Router on
2. If you turn off & then on Router > all ports will be turned off > hence you need to turn ports of Router connected to Hub/Switches on.
3. If you click on a Module : Details information about the Module will be shown below.
4. 
5. 

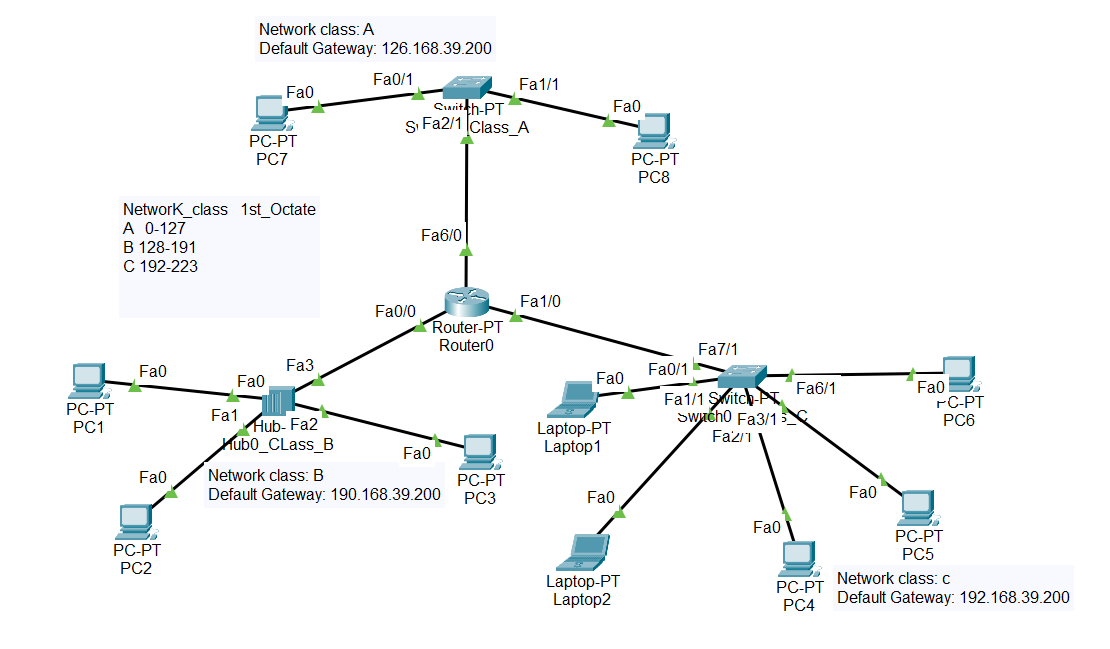
## Connection wire:

1. Laptop + Switch/Hub = Straight Through (Fast Ethernet port)
2. Switch/Hub + Router = Straight Through (Fast Ethernet port)
3. Hub+Switch = Cross Over
4. Laptop/Destop + Laptop/Desktop = Cross Over

## Delete a message: click on a message > Delete



## Full Network Figure : 3 star topology of different netwok connected by Router



# Lab4:

Suppose a company is given IP address 192.168.100.0/24

Now the company wants to divide into two subdepartment

1. Marketing (4hosts)
2. Production (5hosts)

Design the network:

MarketingSite—Router0—Router1—ProductionSite

## Production site:

We need 2 different network (fixed length subnetting)

1 bit🡪 address 2 subnet

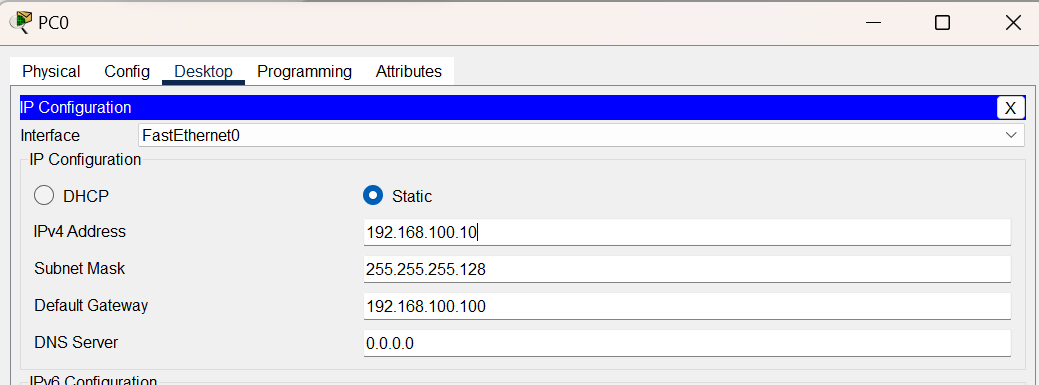
IP: 192.168.100.0/24

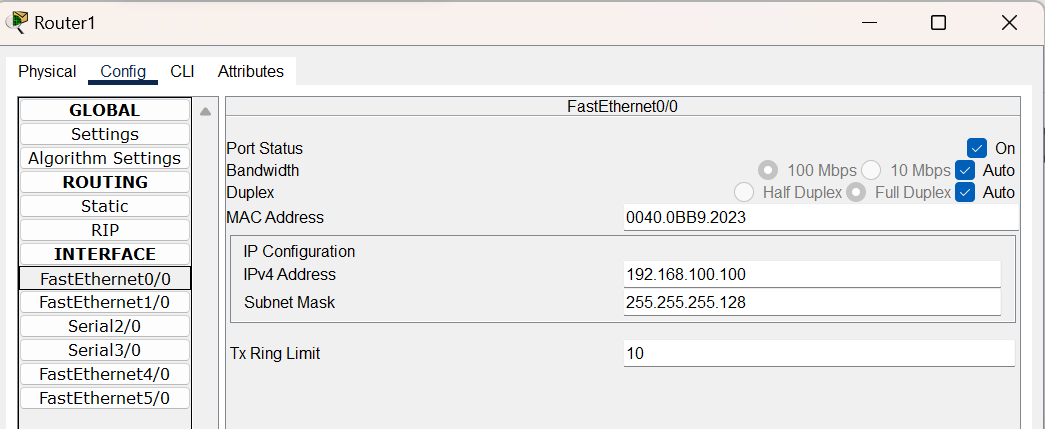
Given Subnet Mask: 255.255.255.0 🡪 24 consecutive 1

Our subnet Mask for each subnet:

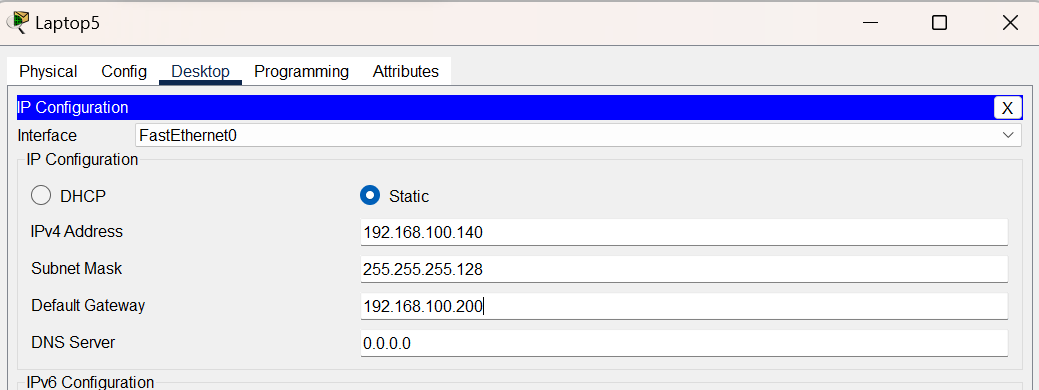
255.255.255.10000000 🡪 255.255.255.128 🡪 25 consecutive 1 for network

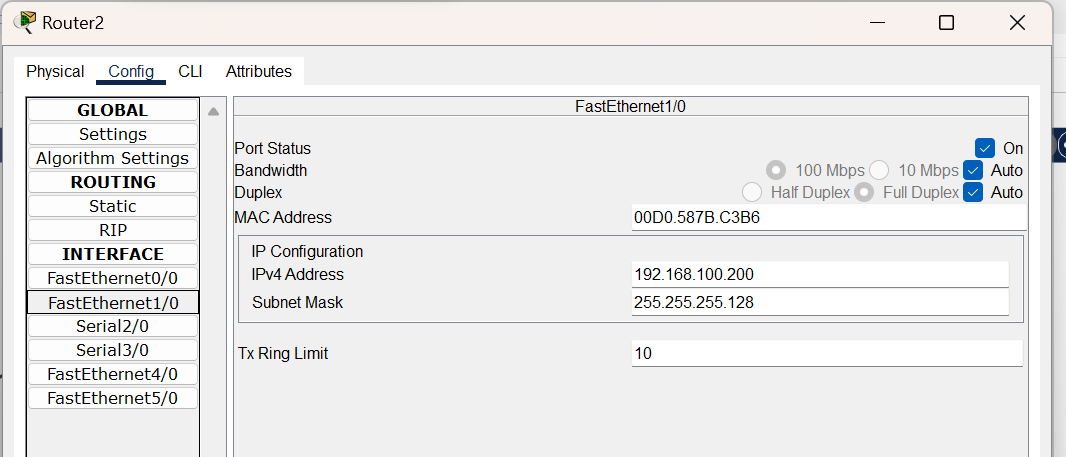
Rest 7 lower bits 🡪 for host





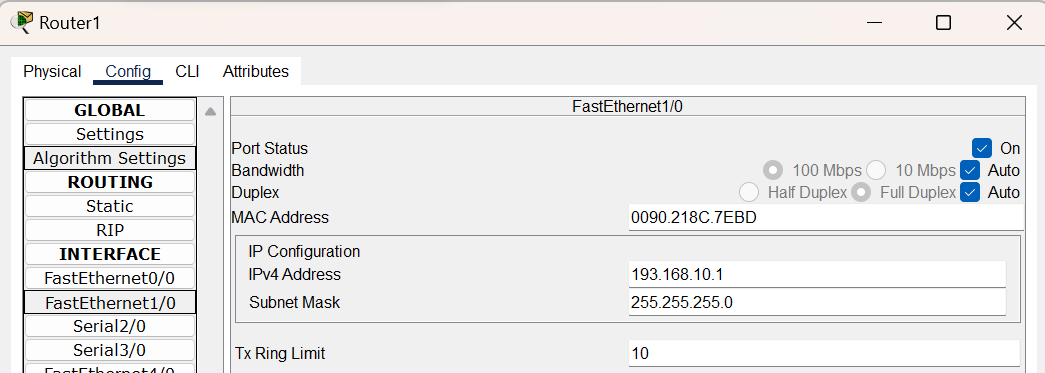
## Production:

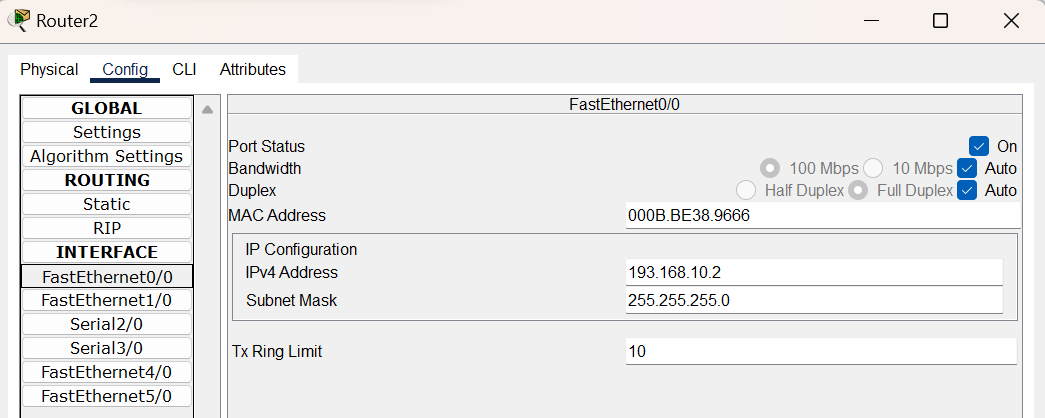




## Router to Router connection:

2 routers are connected as a other network.Set their ip address.





## Select Destination PC’s Network address & subnet mask

## & Network hop: IP of the destination routers Port

