Computer Networks
Lab # 02

20P-0117
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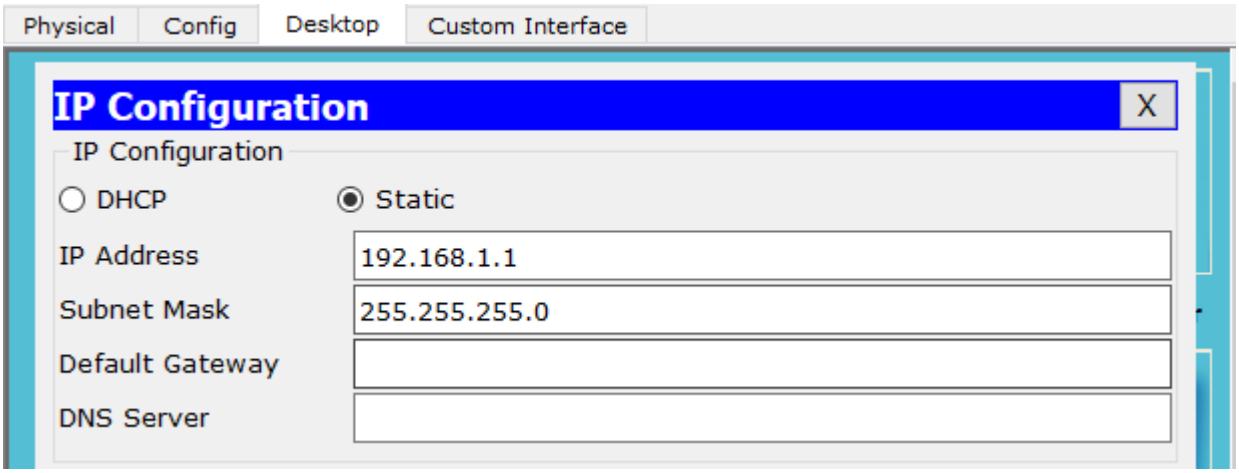
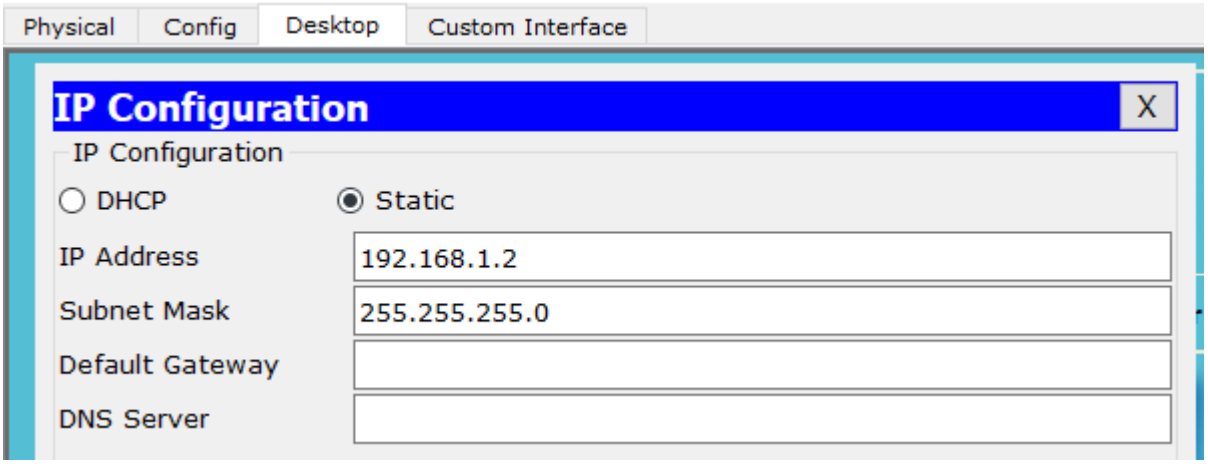
BSSE-5A

Task 1 (i) First Configure the PCs as shown above and verify the connection using ping command.

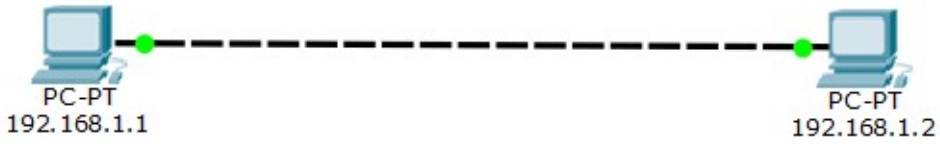
- Drag the PC and assign it IP by clicking on it. Subnet Mask will be assignend automatically.



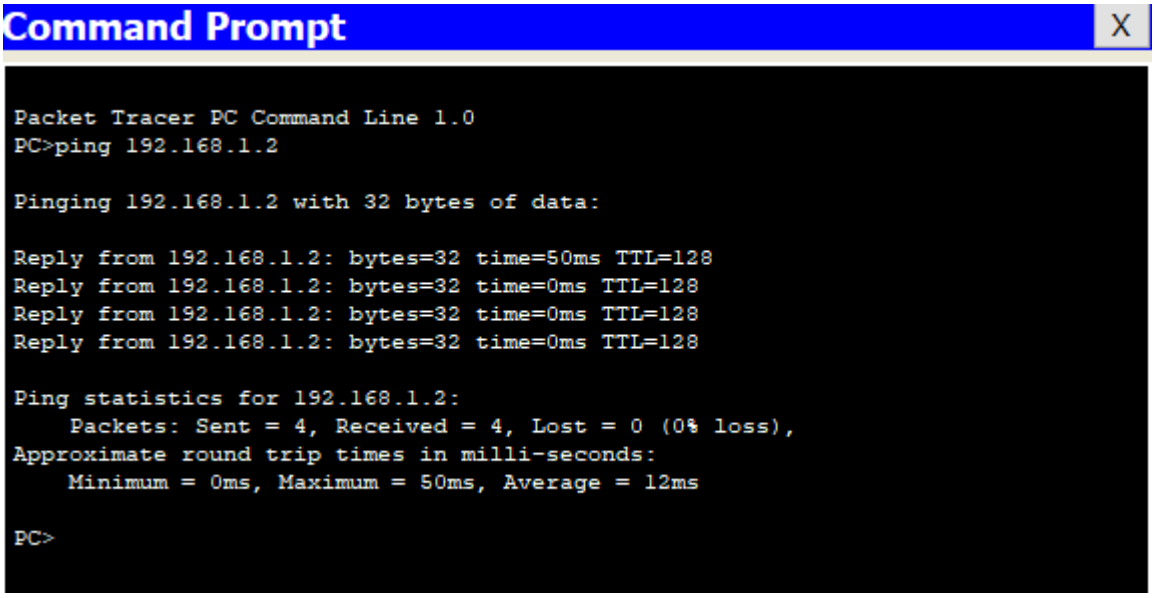
- Drag the second PC and assign it IP by clicking on it. Subnet Mask will be assignend automatically.



- Rename both PCs same as their IP and connect both PCs with crossover wire as we are connecting same machines.



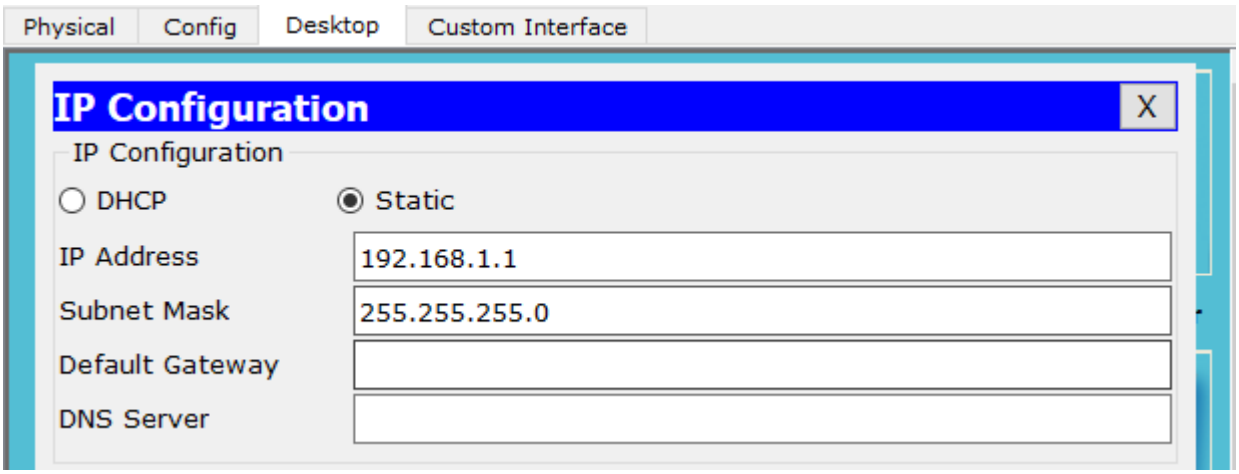
- Click on PC and open command prompt by clicking on dialogue box. And write “pinng” command with the other connected PC’s IP.



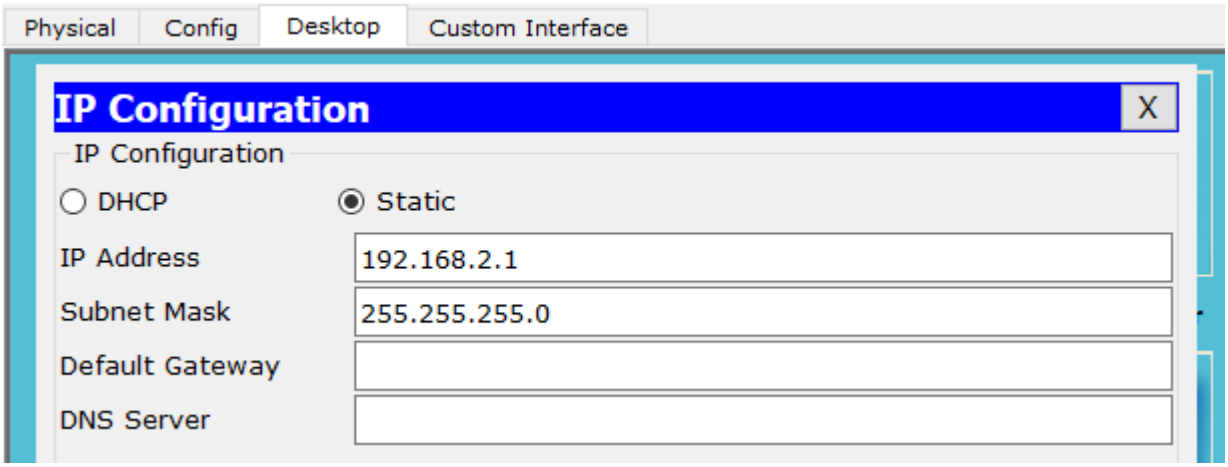
Hence, as we can see the network is connected successfully.

(ii) Configure PC1 as follow: IPv4: 192.168.1.1 Subnet mask: 255.255.255.0
And PC2 as: IPv4: 192.168.2.1 Subnet mask: 255.255.255.0

- Drag the PC and assign it IP by clicking on it. Subnet Mask will be assignend automatically.



- Drag the second PC and assign it IP according to requirement by clicking on it. Subnet Mask will be assignend automatically.



- Click on PC and open command prompt by clicking on dialogue box. And write “pinng” command with the other connected PC’s IP.

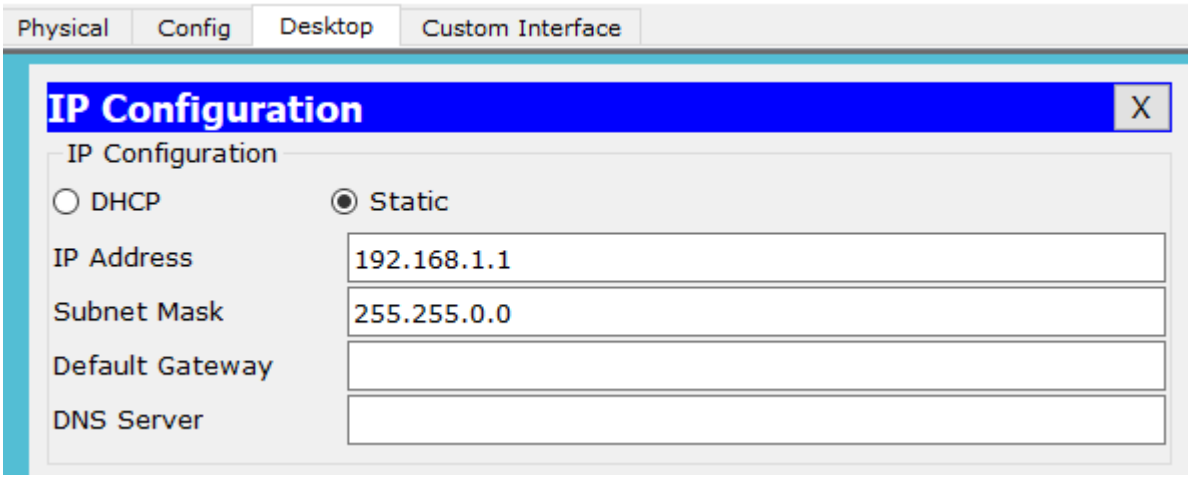
```
PC>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Reason:

Subnet mask separates the IP address into the network and host addresses. The “255” address is always assigned to a broadcast address, and the “0” address is always assigned to a network address.
Since 255 states the network, there is a difference between these two IPs: 192.168.1.1 and 192.168.2.1.
192.168.1 is not the same as the network, so it is showing a timeout.

(iii) Configure PC1 as follow: IPv4: 192.168.1.1 Subnet mask: 255.255.0.0
And PC2 as: IPv4: 192.168.2.1 Subnet mask: 255.255.0.0

- Drag the PC and assign it IP by clicking on it. Subnet Mask will be assignend automatically. Now, change the “Subnet Mask“ according to required.



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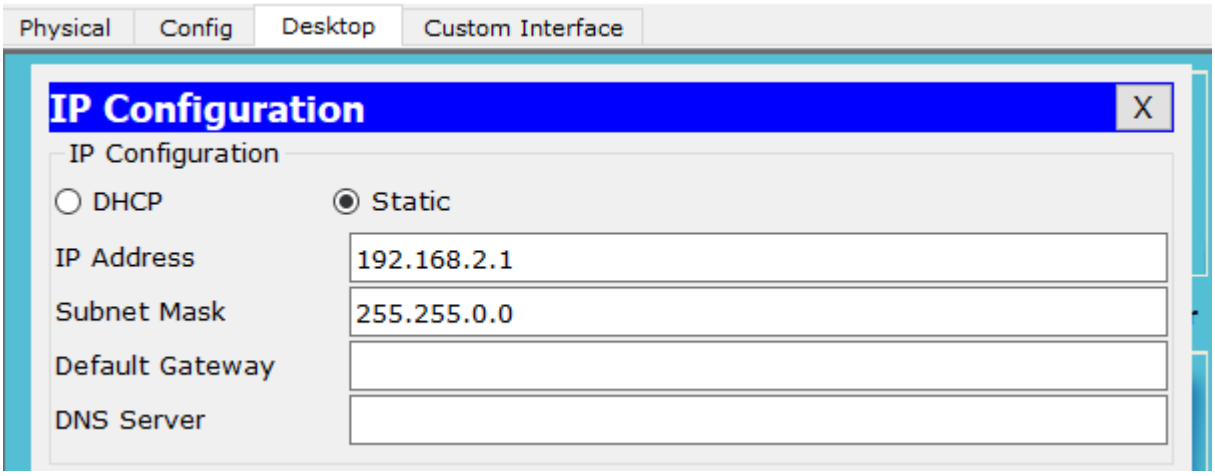
- Drag the second PC and assign it IP according to requirement by clicking on it. Subnet Mask will be assignend automatically. Now, change the “Subnet Mask“ according to required.



- Click on PC and open command prompt by clicking on dialogue box. And write “pinng” command with the other connected PC’s IP.

```
PC>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=1ms TTL=128
Reply from 192.168.2.1: bytes=32 time=0ms TTL=128
Reply from 192.168.2.1: bytes=32 time=0ms TTL=128
Reply from 192.168.2.1: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Reason:

Subnet mask separates the IP address into the network and host addresses. The “255” address is always assigned to a broadcast address, and the “0” address is always assigned to a network address.
In this case, subnet mask states 255 upto 2 portions so, 192.168 should be the same in both cases.
Hence the network is valid.

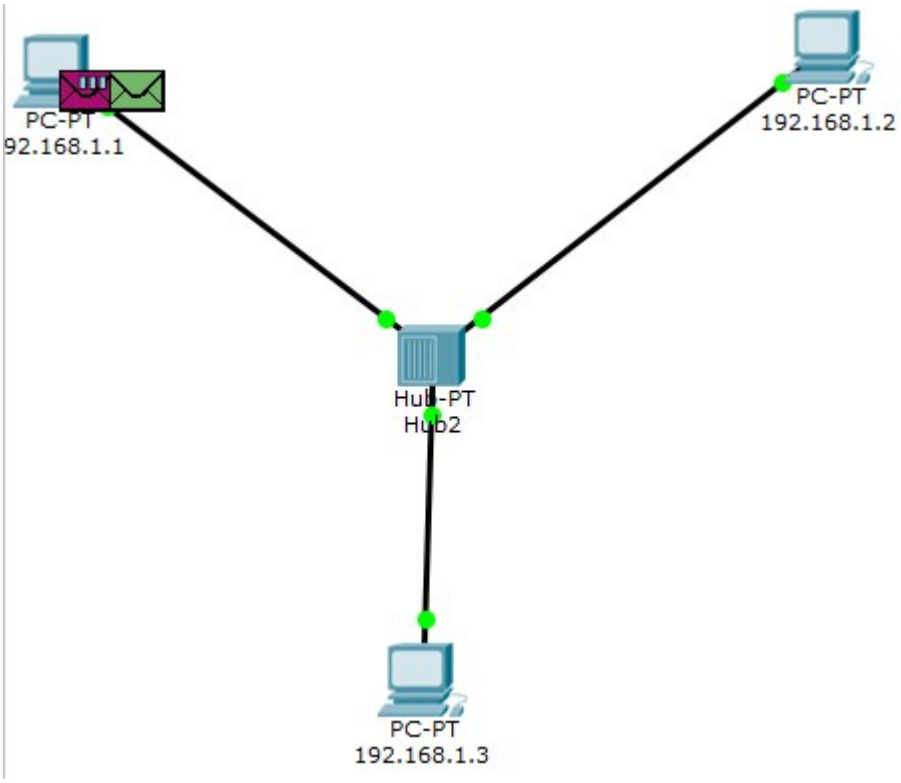
Task 1: Topology using Hub

Using “Hub”, it sends messages to all systems / PCs. So, it has security issues as the file can be important.

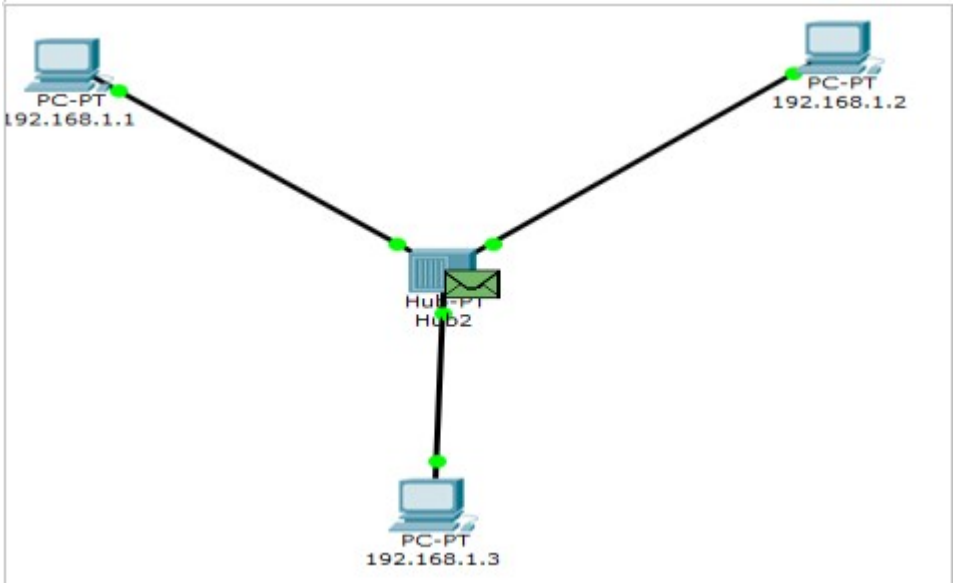
Procedure:

- First place three PCs.
- Then assign the IP addresses to them.
- Place the **Hub** and connect systems to Hub using **Straight Through Cables**. Because we are connecting different machines.
- Then drag message from one system (sender) to other system (receiver)

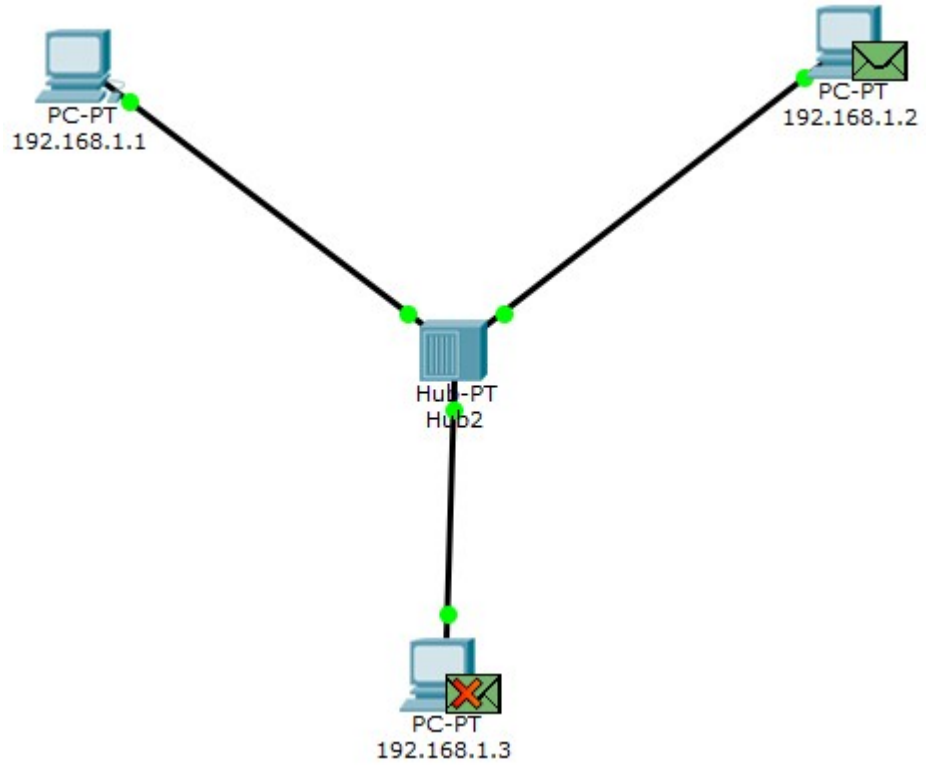
- At first the message will be at sender’s system.



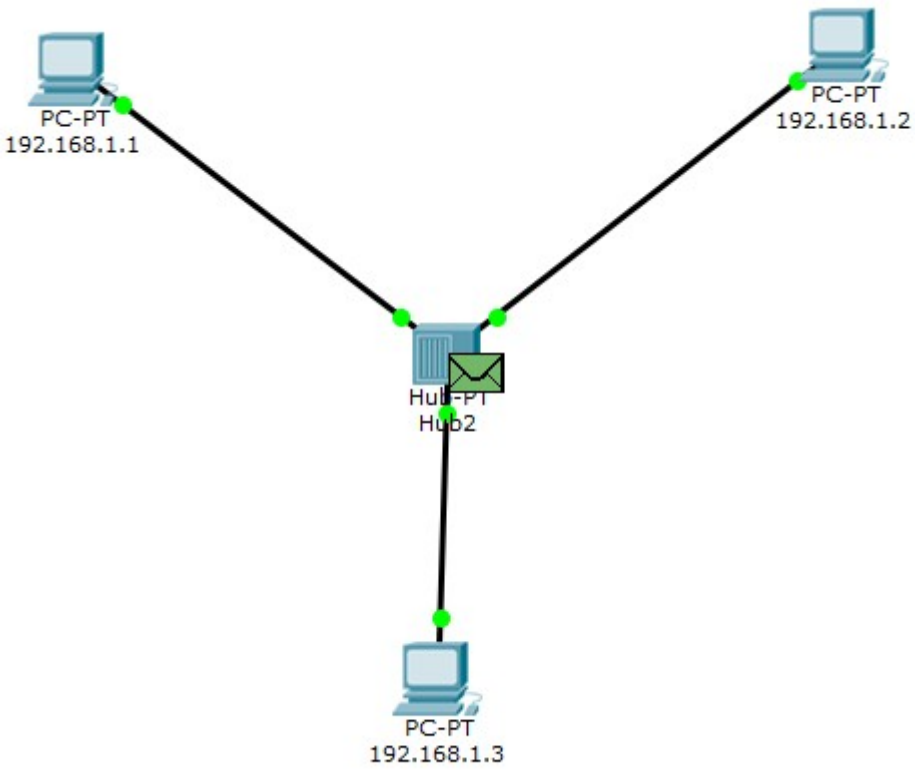
- Then it will go to “Hub”.



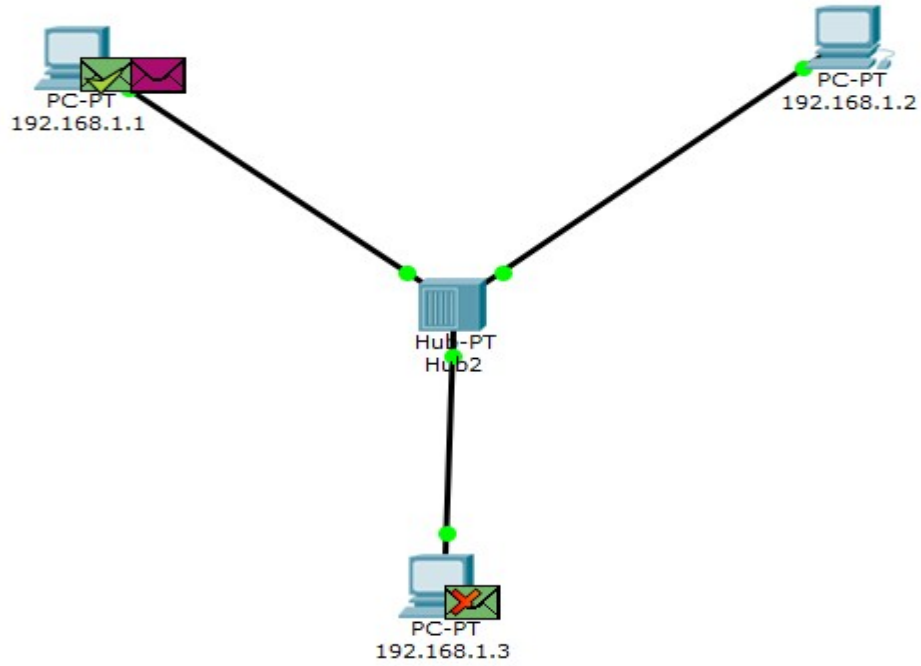
- The “Hub” will then send message to all connected systems.



- Then the message will move back to “Hub”.



- And then will come back to sender. But it should not sent to third party.



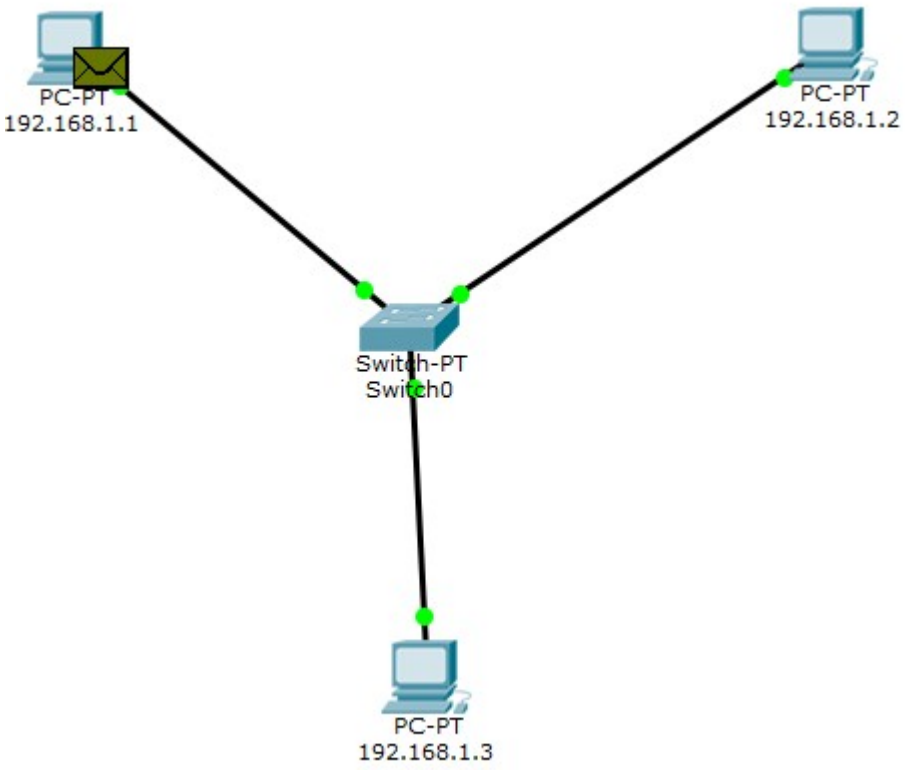
Task 2: Topology using Switch

Using “Hub”, it sends messages to all systems / PCs. Then he came back to switch having MAC addresses of all systems. Then he knows whom to send message and then sends so.

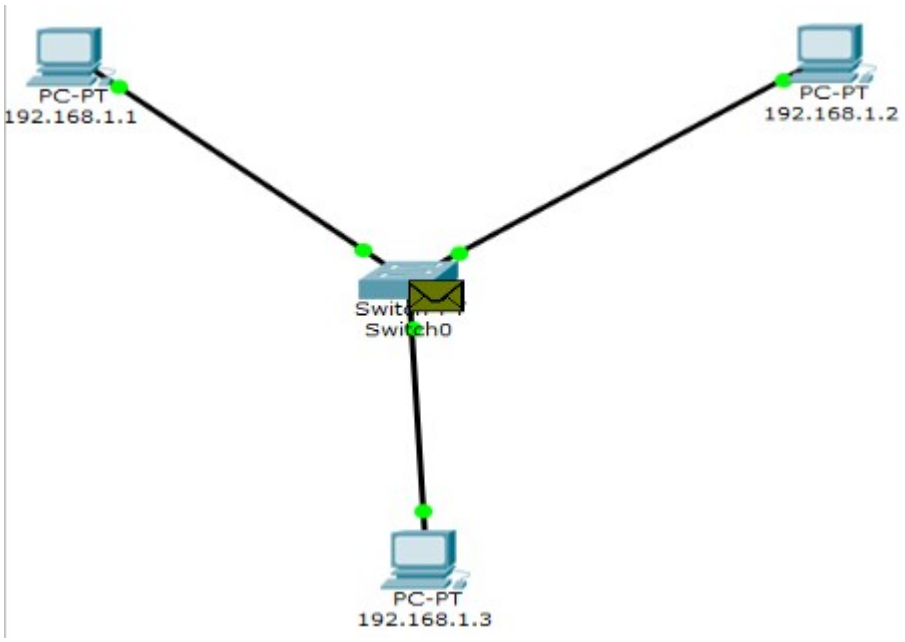
Procedure:

- First place three PCs.
- Then assign the IP addresses to them.
- Place the Switch and connect systems to Switch using **Straight Through Cables**. Because we are connecting different machines.
- Then drag message from one system (sender) to other system (receiver)

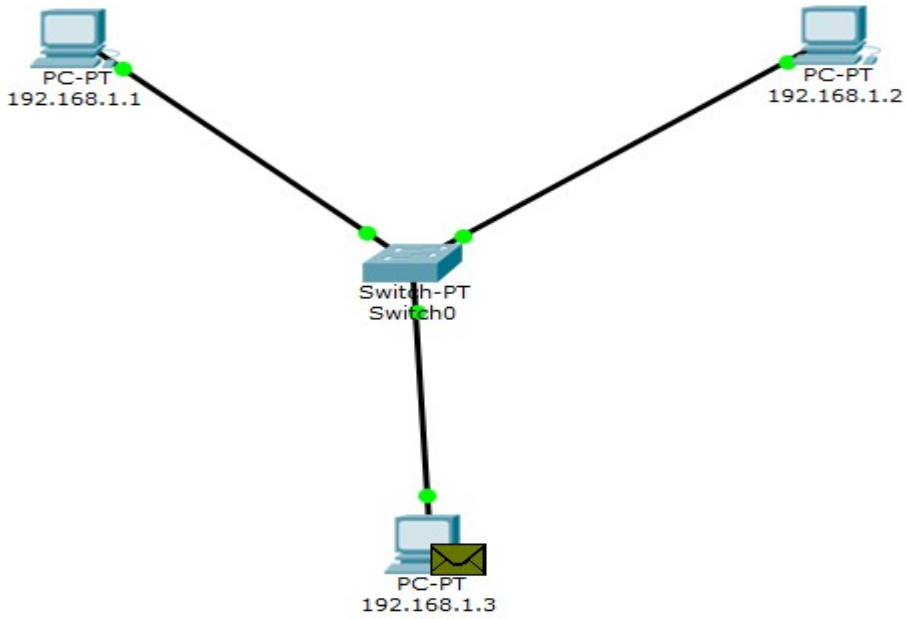
- At first, the sender will send message.



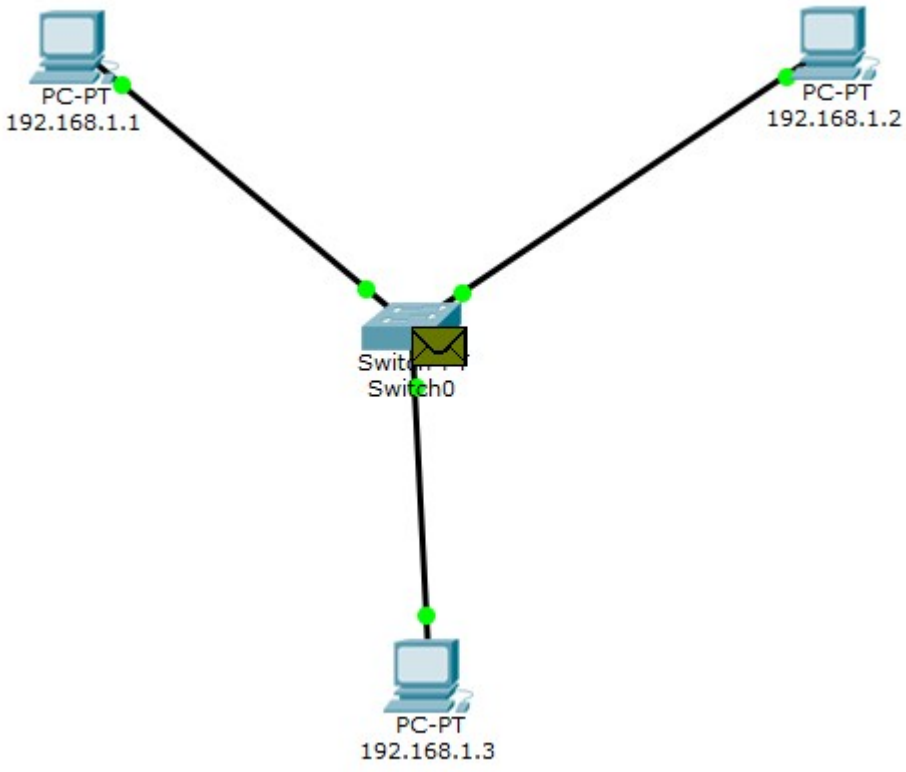
- Then it will be sent to Switch, the switch will sent to all systems and then assign MAC address to systems.



- Then the switch will sent it to receiver only after analyzing the receiver by MAC address.



- Then it will move to “Switch”.



- And then to sender. Hence it is safer then “Hub”.