Implementation of VLSM in Cisco

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Pre-requisite: Introduction of Variable Length Subnet Mask (VLSM)

VLSM is a Variable Length Subnet Mask in which the subnet design uses more than one mask in the same network which means more than one mask is used for different subnets of a single class A, B, C, or a network. It is used to improve the usability of subnets as they can be of variable size. It is also defined as the process of subnetting a subnet.

Steps:

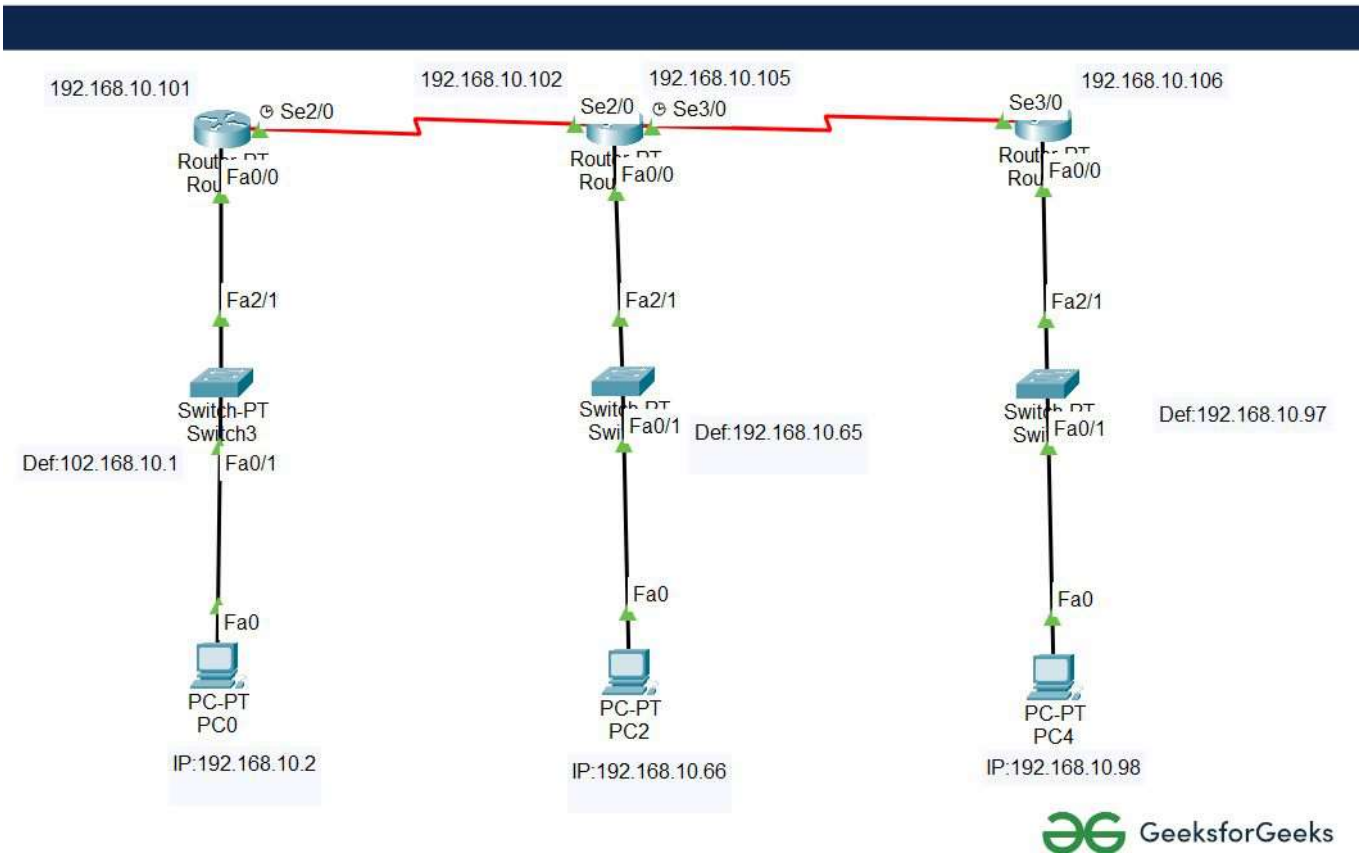
Step 1: First, open the cisco packet tracer desktop and select the devices given below:

S.NO	Device	Model-Name	Qty.
1.	pc	pc	3
2.	switch	PT-Switch	3
3.	router	PT-Router	3

IP Addressing Table for PCs

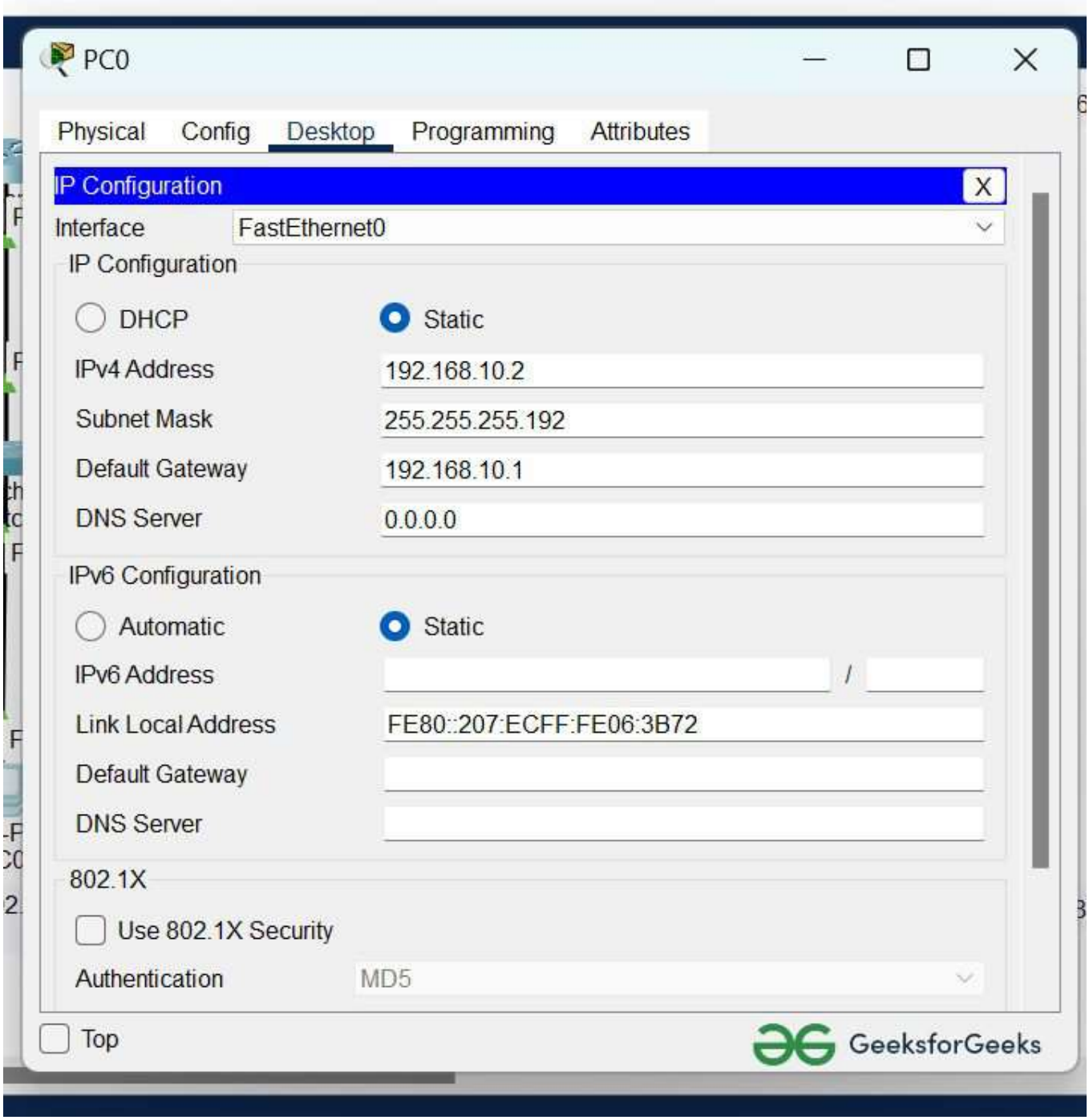
S.NO	Device	IPv4 Address	Subnet-Mask	Default-Gateway
1.	pc0	192.168.10.2	255.255.255.192	192.168.10.1
2.	pc2	192.168.10.66	255.255.255.224	192.168.10.65
3.	pc4	192.168.10.98	255.255.255.252	192.168.10.97

- Then, create a network topology as shown below the image.
- Use an automatic connecting cable to connect the devices with others.



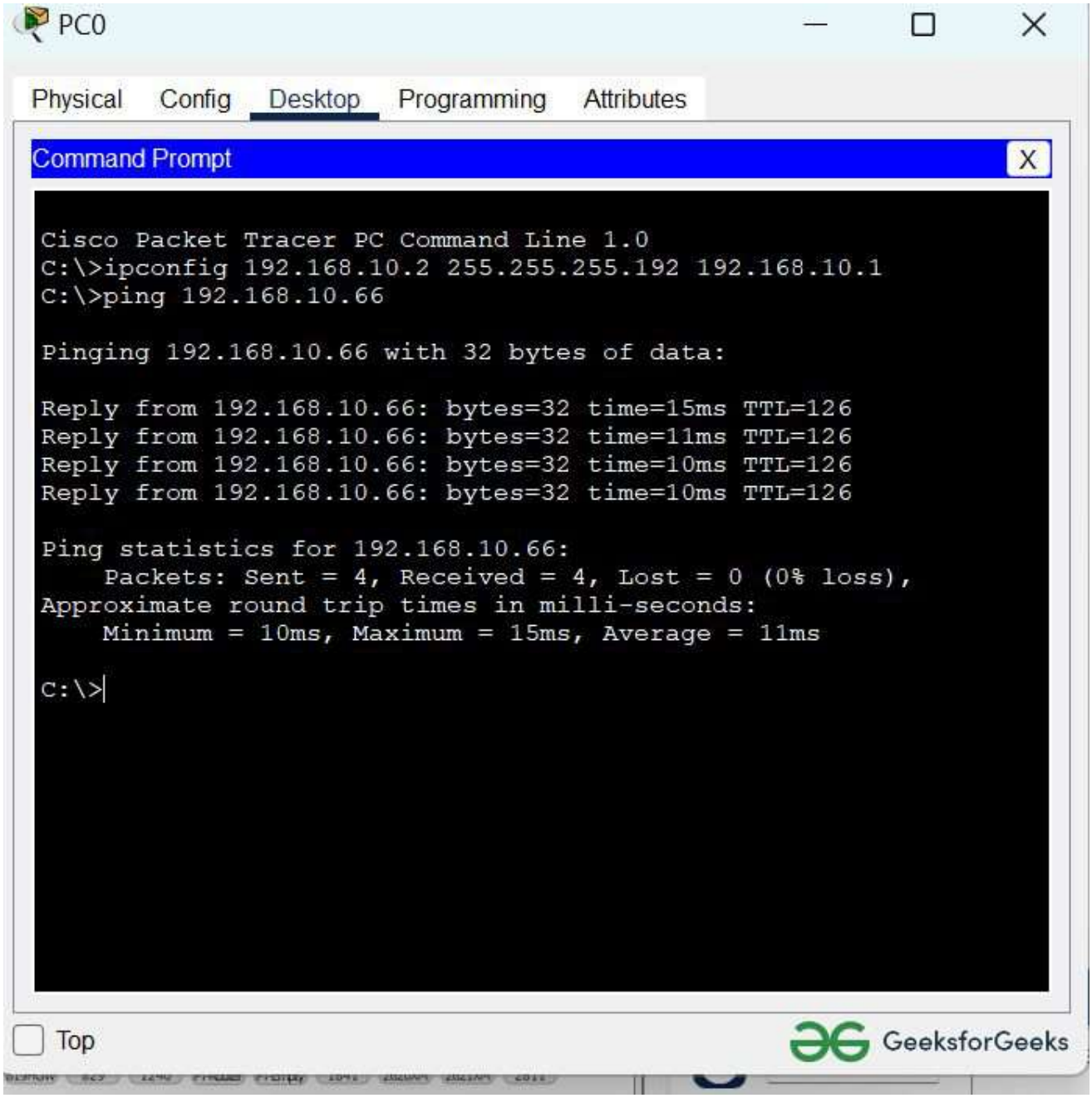
Step 2: Configure the PCs (hosts) with IPv4 address and Subnet Mask according to the IP addressing table given above.

- To assign an IP address in PC0, click on PC0.
- Then, go to desktop and then IP configuration and there you will IPv4 configuration.
- Fill IPv4 address and subnet mask.



- Assigning an IP address using the ipconfig command, or we can also assign an IP address with the help of a command.
- Go to the command terminal of the PC.
- Then, type ipconfig <IPv4 address><subnet mask><default gateway>(if needed)

```
Example: ipconfig 192.168.10.2  255.255.255.192 192.168.10.1
```



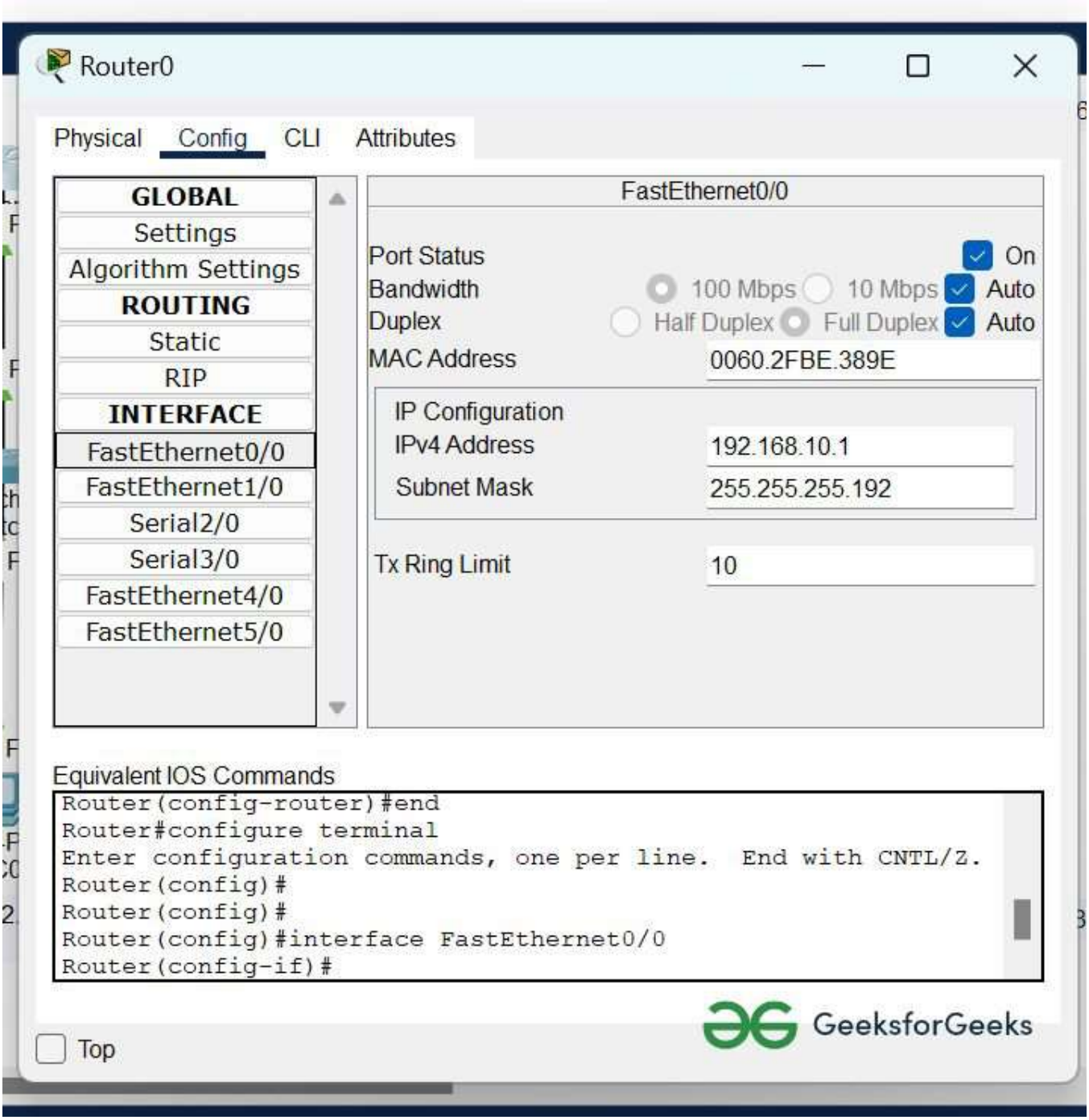
- Repeat the same procedure with other PCs to configure them thoroughly.

Step 3: Configure router with IP address and subnet mask.

S.NO	Device	Interface	IPv4 Address	Subnet mask
1.	router0	FastEthernet0/0	192.168.10.1	255.255.255.192

S.NO	Device	Interface	IPv4 Address	Subnet mask
2.	router2	FastEthernet0/0	192.168.10.65	255.255.255.224
		Serial2/0	192.168.10.102	255.255.255.252
		Serial3/0	192.168.10.105	255.255.255.252
3.	router3	FastEthernet0/0	192.168.10.97	255.255.255.252
		Serial2/0	192.168.10.106	255.255.255.252

- To assign an IP address in router0, click on router0.
- Then, go to config and then Interfaces.
- Now, configure the IP address in FastEthernet and serial ports according to IP addressing Table.
- Fill IPv4 address and subnet mask.



- Repeat the same procedure with other routers to configure them thoroughly.

Step 4: After configuring all of the devices we need to assign the routes to the routers.

To assign static routes to the particular router:

- First, click on router0 then Go to CLI.
- then type the commands and IP information given below.

```
CLI command : ip route <network id> <subnet mask><next hop>
```

Static Routes for Router0 are given below:

```
Router(config)#ip route 192.168.10.64 255.255.255.224 192.168.10.102
Router(config)#ip route 192.168.10.104 255.255.255.252 192.168.10.102
Router(config)#ip route 192.168.10.96 255.255.255.252 192.168.10.102
```

Static Routes for Router1 are given below:

```
Router(config)#ip route 192.168.10.0 255.255.255.192 192.168.10.101
Router(config)#ip route 192.168.10.96 255.255.255.252 192.168.10.106
```

Static Routes for Router2 are given below:

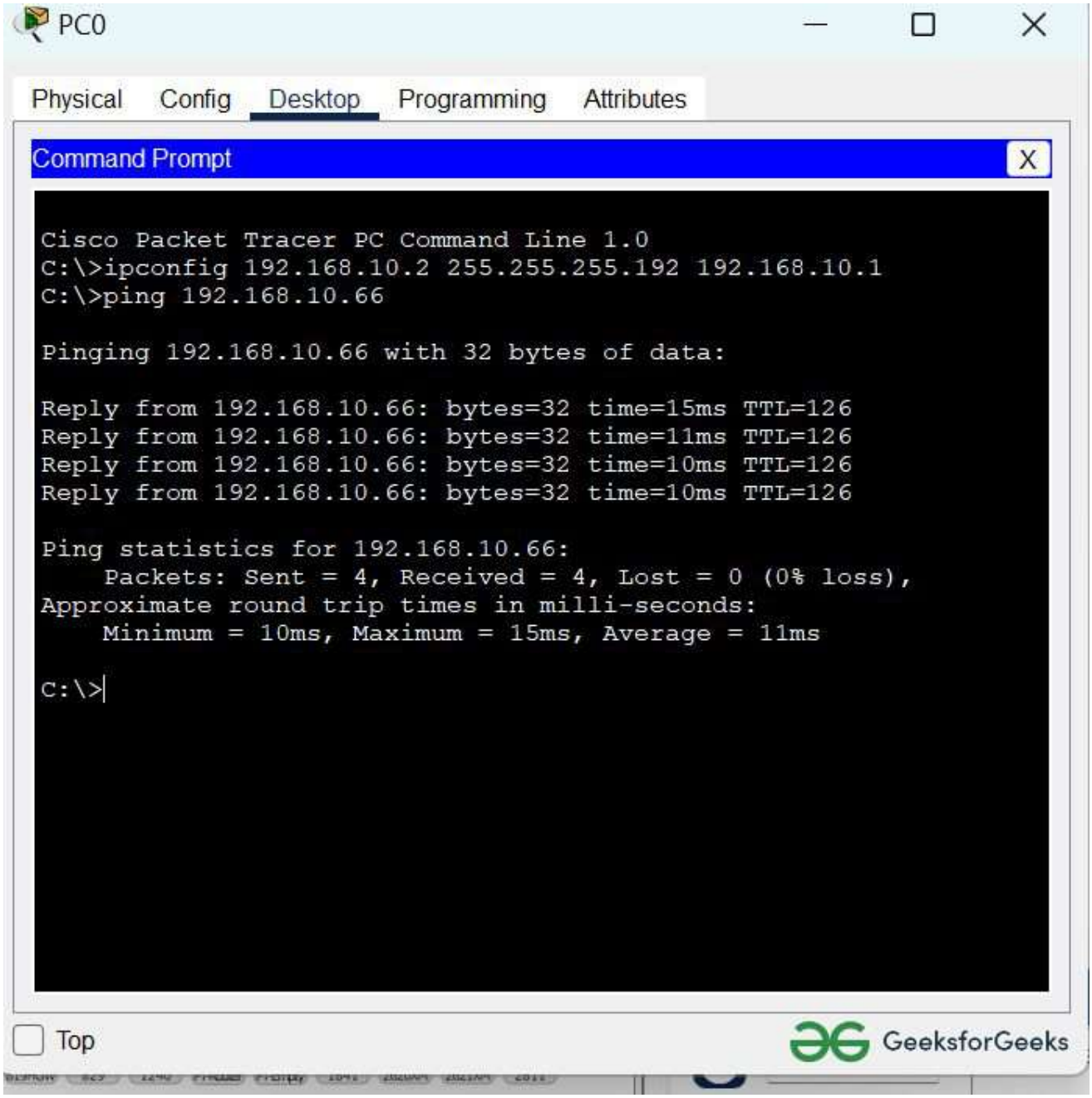
```
Router(config)#ip route 192.168.10.64 255.255.255.224 192.168.10.105
Router(config)#ip route 192.168.10.100 255.255.255.252 192.168.10.105
Router(config)#ip route 192.168.10.0 255.255.255.192 192.168.10.105
```

Step 5: Verifying the network by pinging the IP address of any PC.

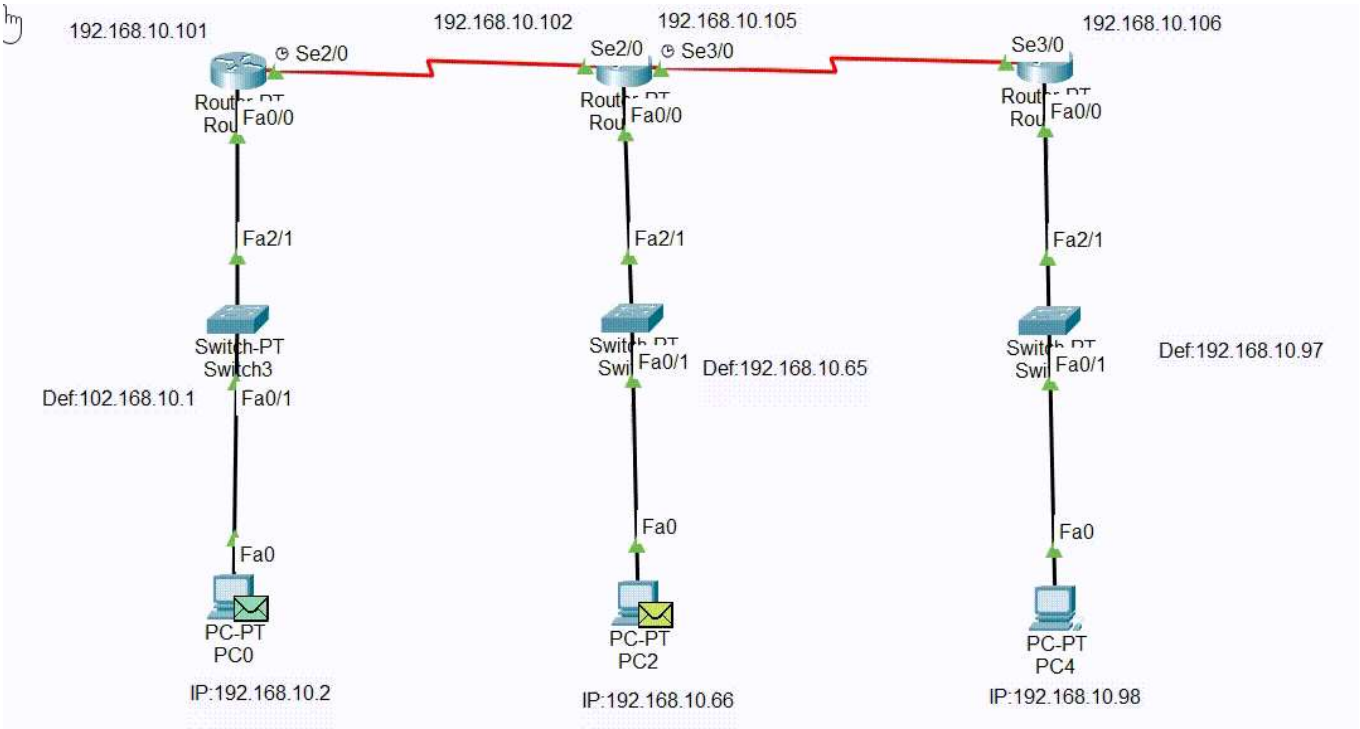
we will use the ping command to do so.

- First, click on PC0 then Go to the command prompt.
- Then type ping <IP address of targeted node>.
- As we can see in the below image we are getting replies which means the connection is working.

```
Example : ping 192.168.10.66
```



- A simulation of the experiment is given below we are sending PDU from PC0 to PC2 and PC2 to PC4:



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