



## CN EXP9 - Computer Network Experiment 9

Computer Network (University of Mumbai)

# **Experiment 9**

**Aim:** Design VPN and Configure RIP/OSPF using Packet tracer.

**Theory:**

## **Routing Information Protocol (RIP):**

RIP stands for Routing Information Protocol in which distance vector routing protocol is used for data/packet transmission. In Routing Information protocol (RIP), the maximum number of Hop is 15, because it prevents routing loops from source to destination. Mechanism like split horizon, route poisoning and holdown are used to prevent from incorrect or wrong routing information. Sally Floyd and Van Jacobson [1994] suggest that, without slight randomization of the timer, the timers are synchronized overtime. Compared to other routing protocol, RIP (Routing Information Protocol) is poor and limit size i.e., small network. The main advantage of using RIP is it uses the UDP (User Datagram Protocol).

## **Open Shortest Path First (OSPF):**

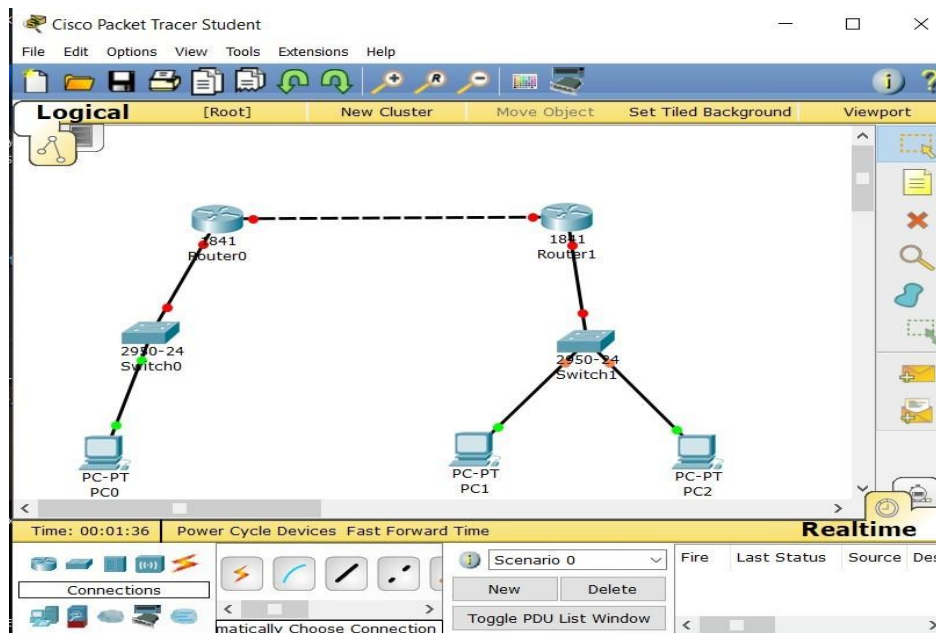
OSPF stands for Open Shortest Path First which uses link-state routing algorithm. Using the link state information, which is available in routers, it constructs the topology in which the topology determines the routing table for routing decisions. It supports both variable-length subnet masking and classless inter-domain routing addressing models. Since it uses Dijkstra's algorithm, it computes the shortest path tree for each route. The main advantages of the OSPF (Open Shortest Path first) are that it handles the error detection by itself and it uses multicast addressing for routing in a broadcast domain.

## **Steps for implementing RIP:**

### **Step 1:**

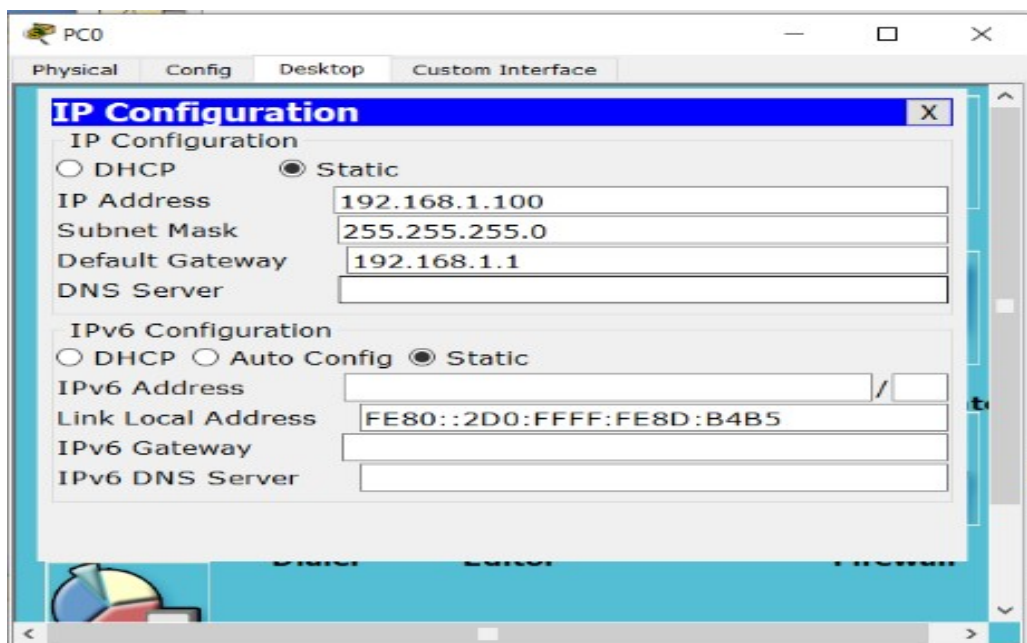
- Select Router – select 1841 router and drag it to the screen (Router0).
- Select another Router – select 1841 and drag it to right of the Router0 (Router1).
- Select Switches – select 2950-24 and drag it below the Router0 (Switch0).
- Select Switches – select 2950-24 and drag it below the Router1 (Switch1).
- Select End Device
- Select End Device

- Select End Device – select Generic and drag it below Switch1 (PC-PT PC2).
- Select Connections – Connect routers, switches, and PCs to each other.



## Step 2:

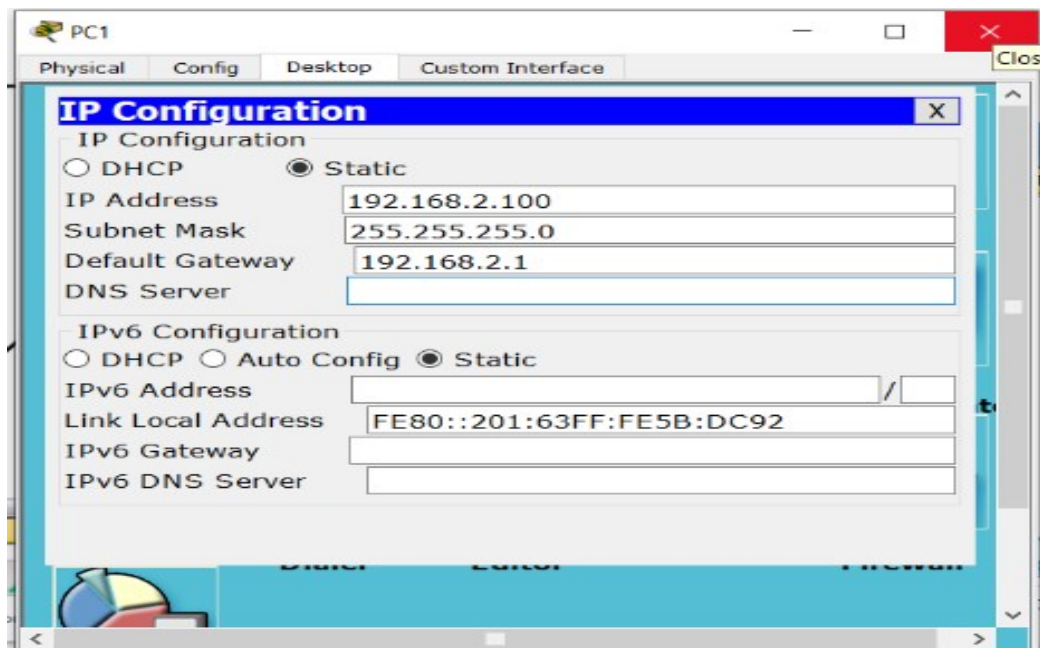
- Click on PC0 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



## Step 3:

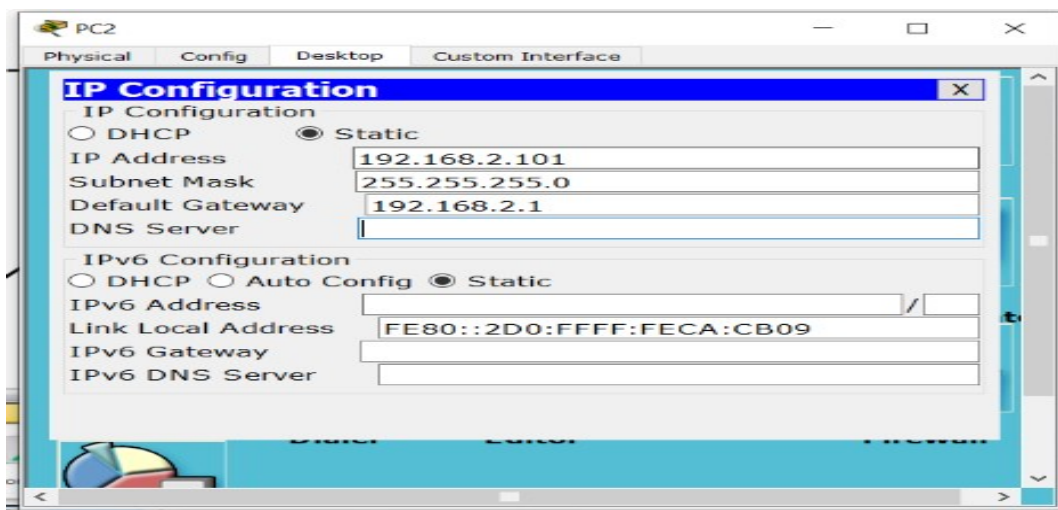
- Click on PC1 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.

- Add Default Gateway and close the window.



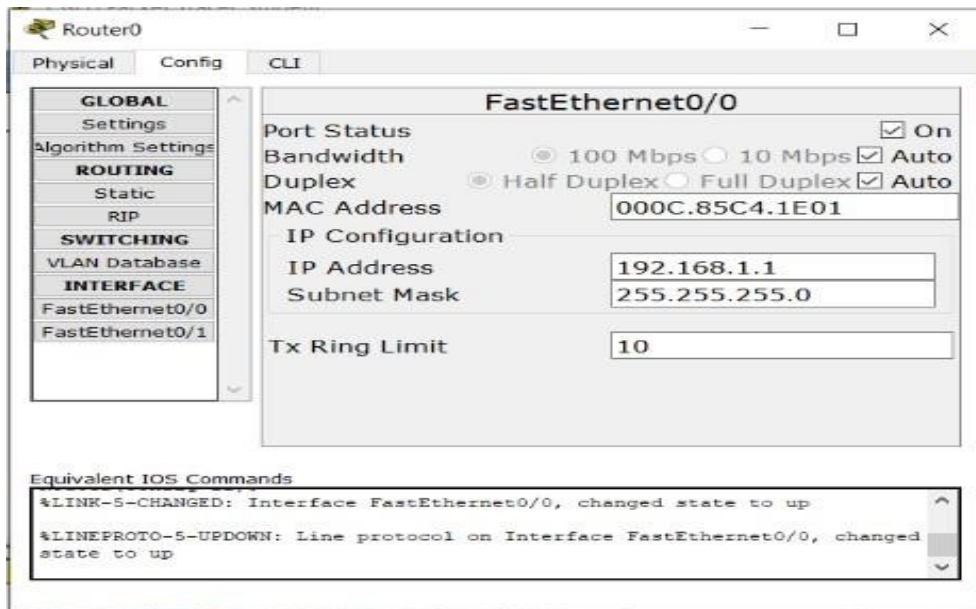
#### Step 4:

- Click on PC2 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



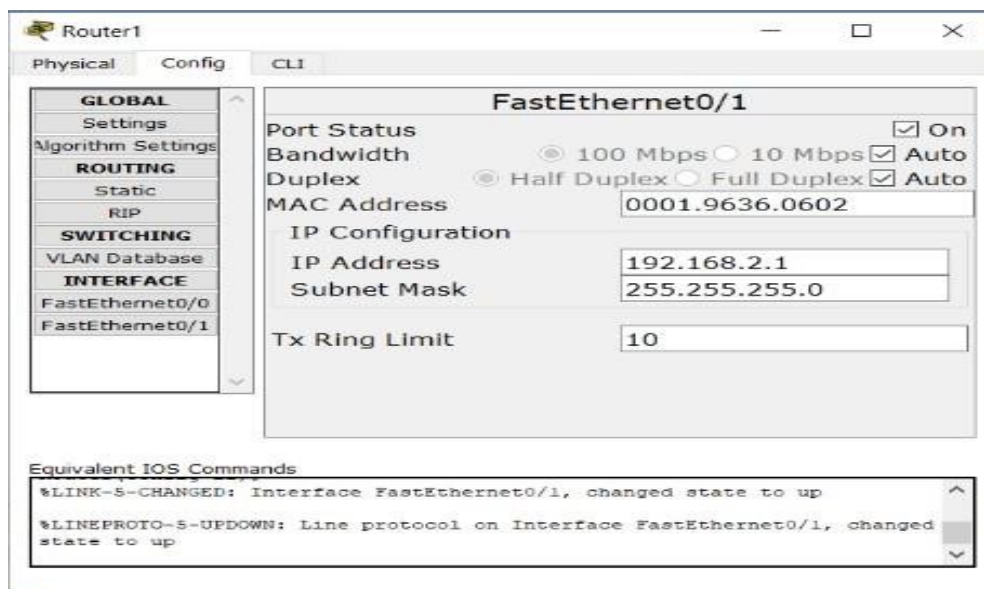
#### Step 5:

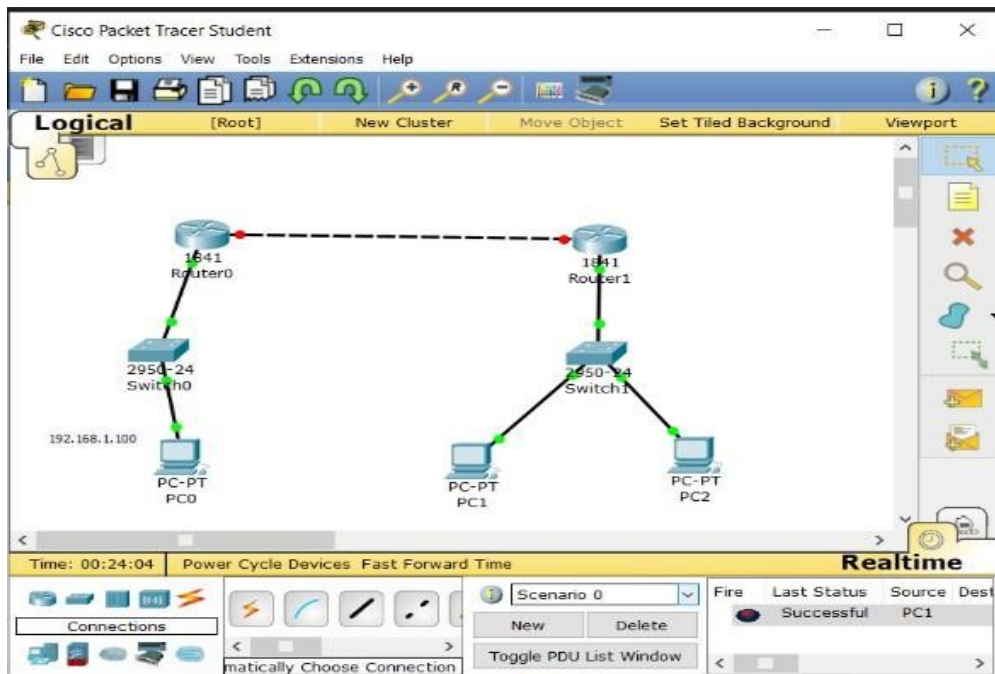
- Click on Router0. Go to Config > FastEthernet0/0. Here, add IP Address and On the Port Status



#### Step 6:

- Click on Router1. Go to Config > FastEthernet0/1. Here, add IP Address and On the Port Status.

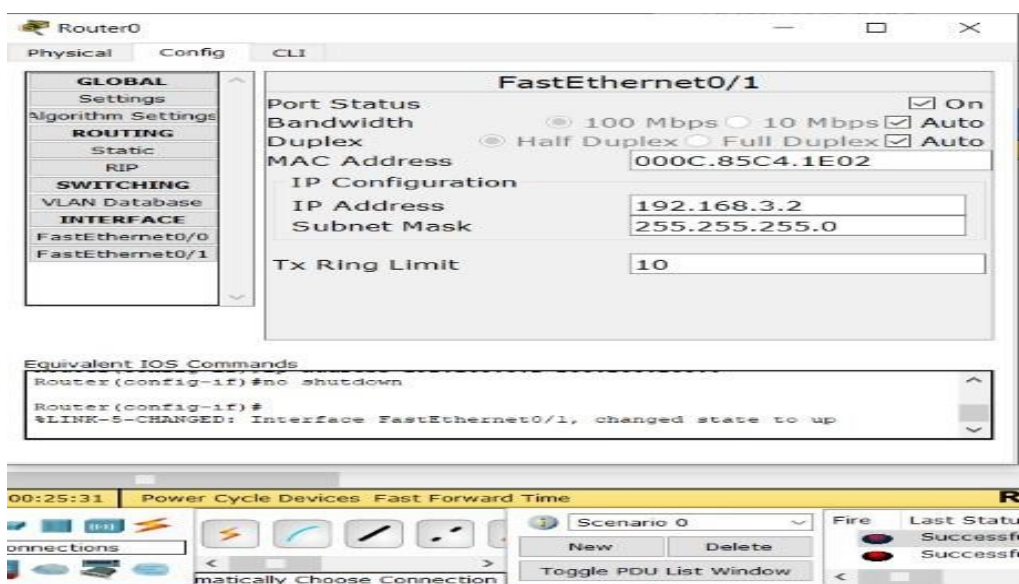




As you will see above, there is green dots which means connections are done successfully between Router, Switches and PCs.

### Step 7:

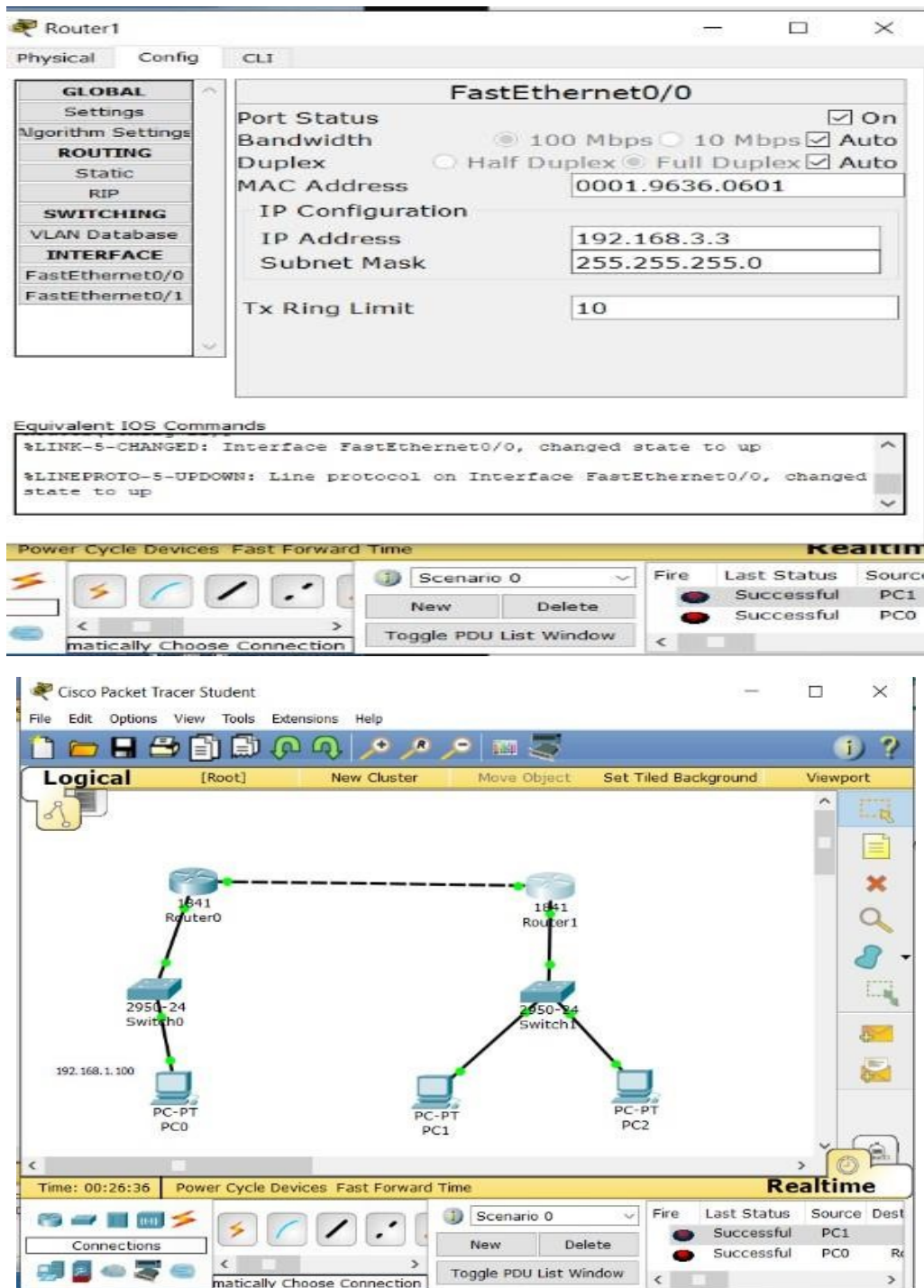
- Click on Router0. Go to Config > FastEthernet0/1. Here, add IP Address and On the Port Status.



### Step 8:

- Click on Router1. Go to Config > FastEthernet0/0.
- Here, add IP Address and On the Port Status.

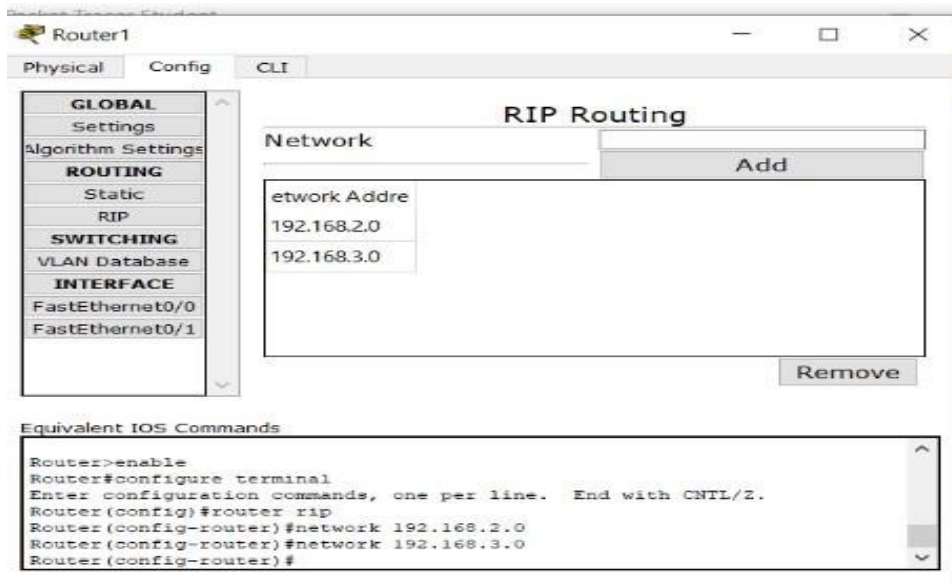




As you can see above, connection is done between both the Routers successfully.

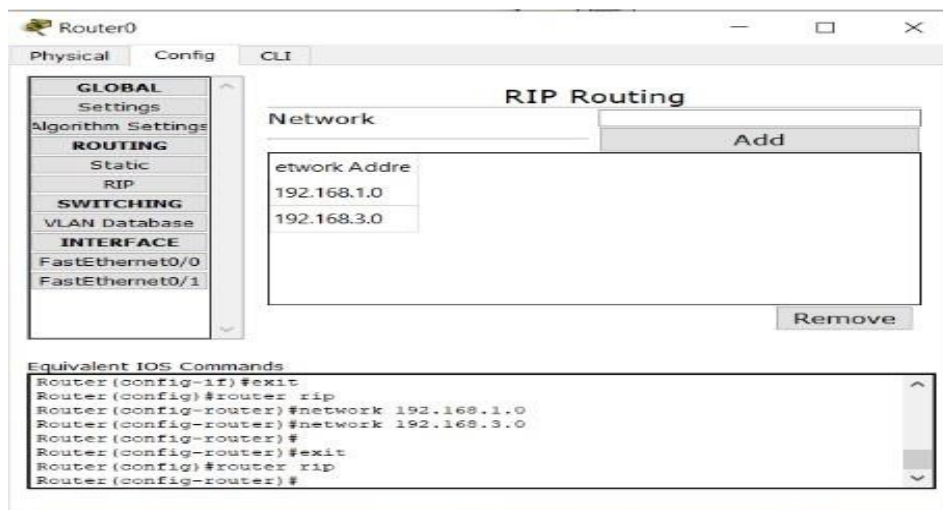
#### Step 9:

- Click on Router1. Go to Config > RIP.
- Here, add the network address to connect router1 with switch1, PC1, PC2 and router0.

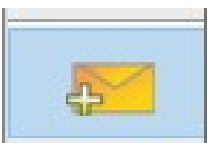


#### Step 10:

- Click on Router0. Go to Config > RIP.
- Here, add the network address to connect router0 with switch0, PC0 and router1.



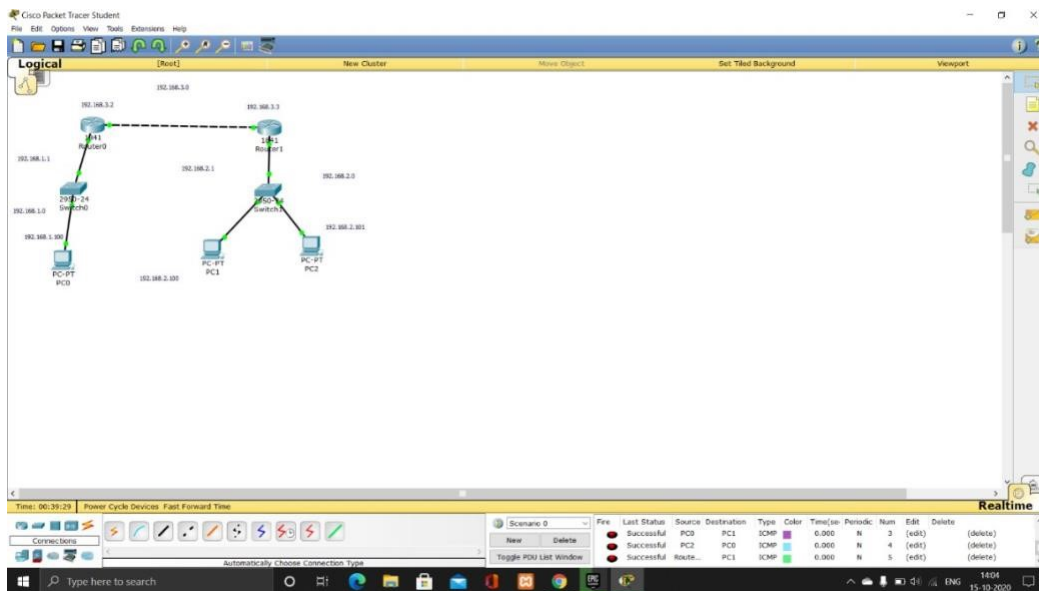
Now, all the connections are done successfully, you can check it by clicking on this symbol.



And then, click on any two PCs, you will get the status as successful.



## Final Output:

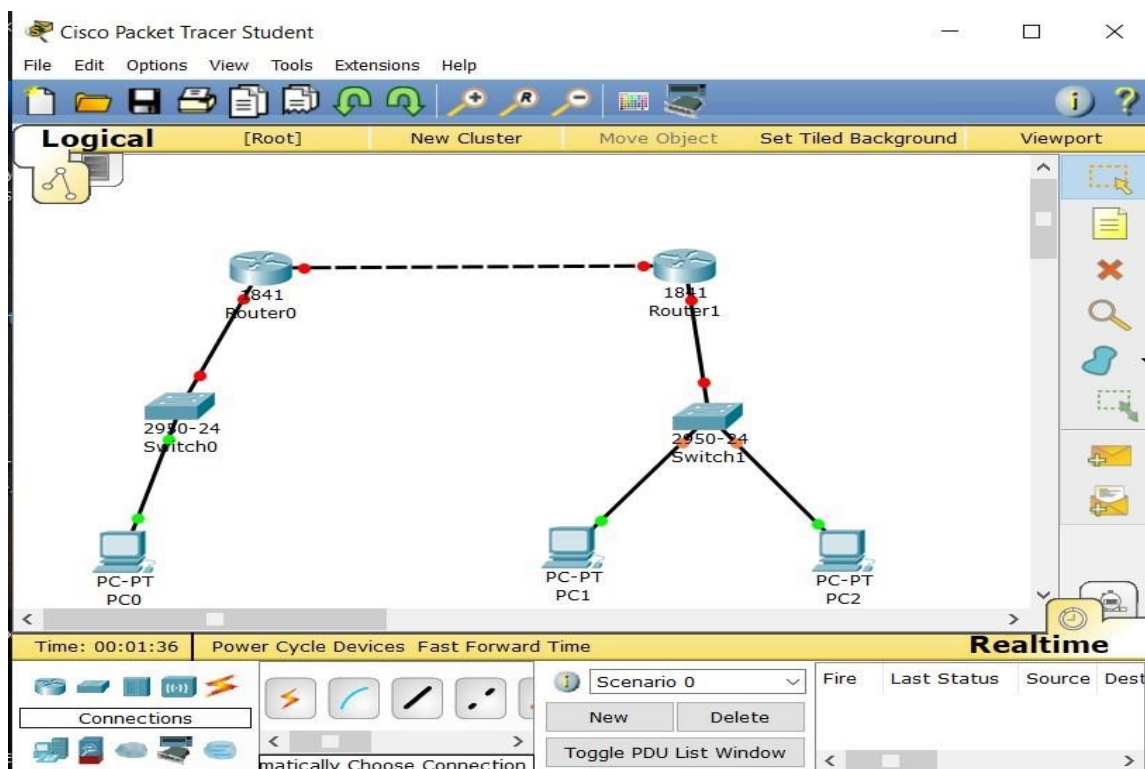


So, Routing Information Protocol is done.

## Steps for implementing VLAN:

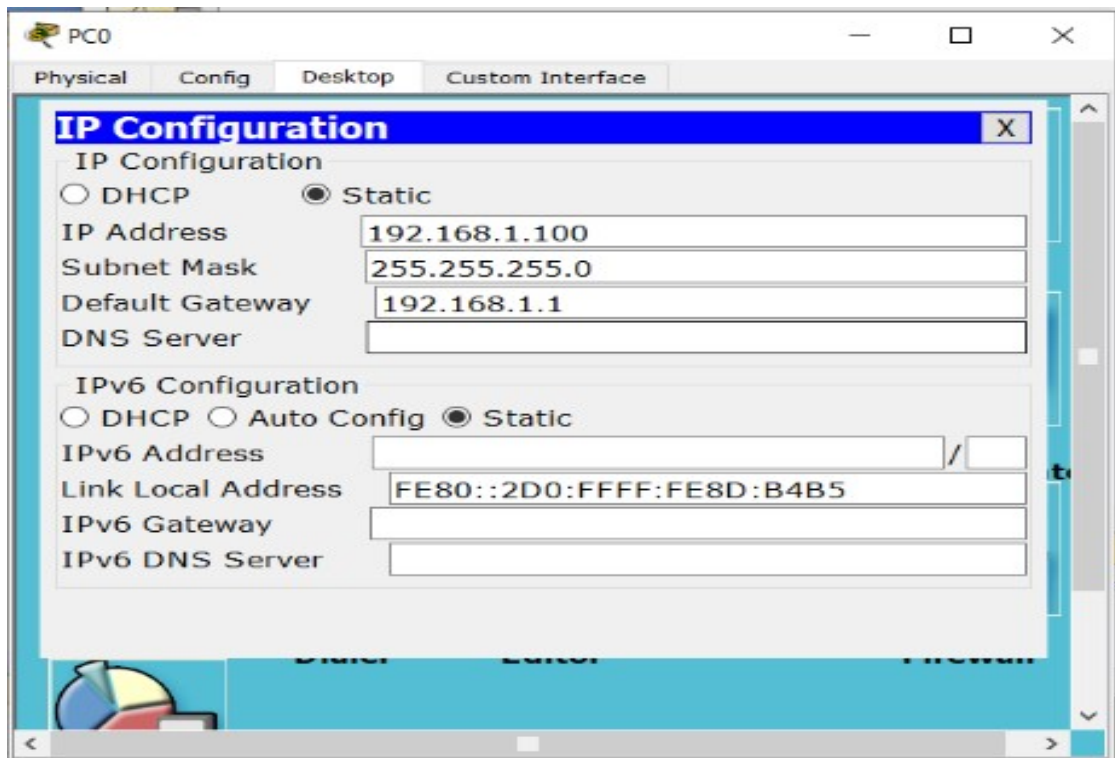
### Step1:

- Select Router – select 1841 router and drag it to the screen (Router0).
- Select another Router – select 1841 and drag it to right of the Router0 (Router1).
- Select Switches – select 2950-24 and drag it below the Router0 (Switch0).
- Select Switches – select 2950-24 and drag it below the Router1 (Switch1).
- Select End Device – select Generic and drag it below Switch0 (PC-PT PC0).
- Select End Device – select Generic and drag it below Switch1 (PC-PT PC1). Select End Device – select Generic and drag it below Switch1 (PC-PT PC2).
- Select Connections – Connect routers, switches, and PCs to each other.



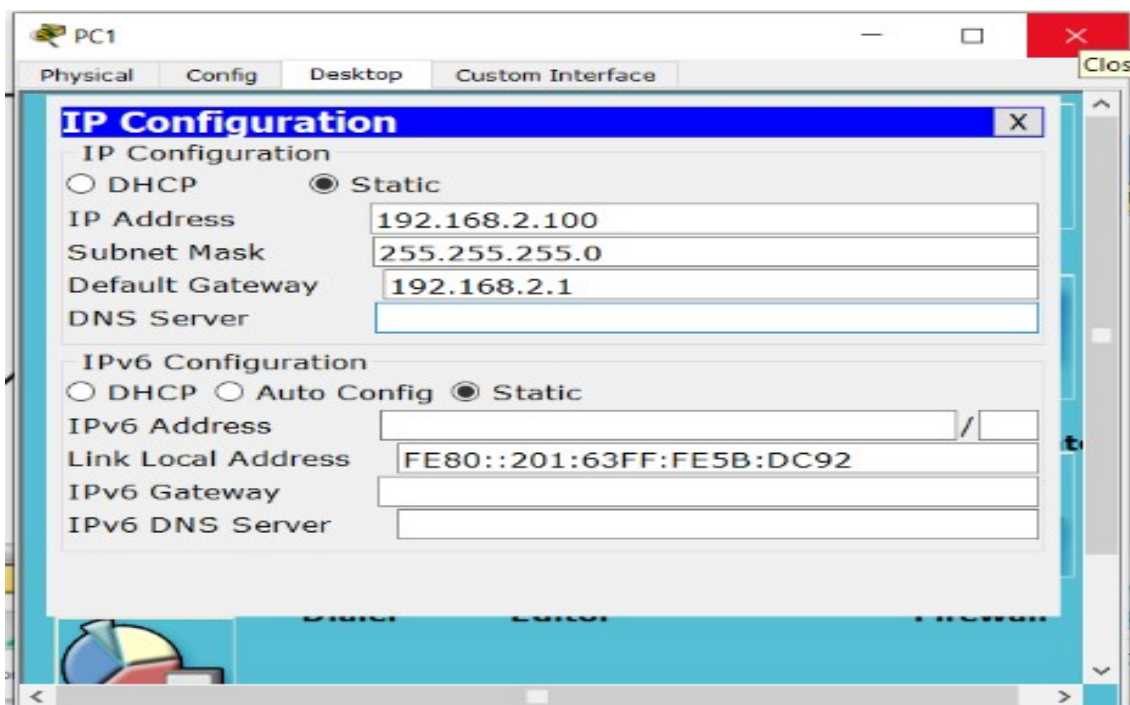
### Step 2:

- Click on PC0 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



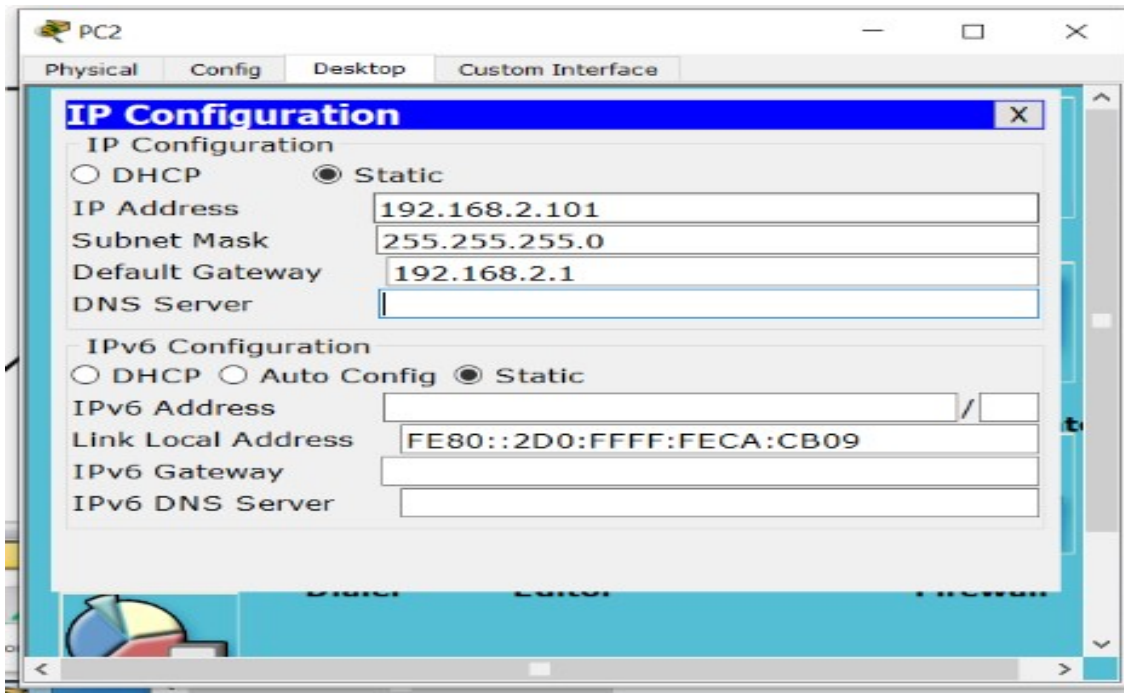
### Step 3:

- Click on PC1 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



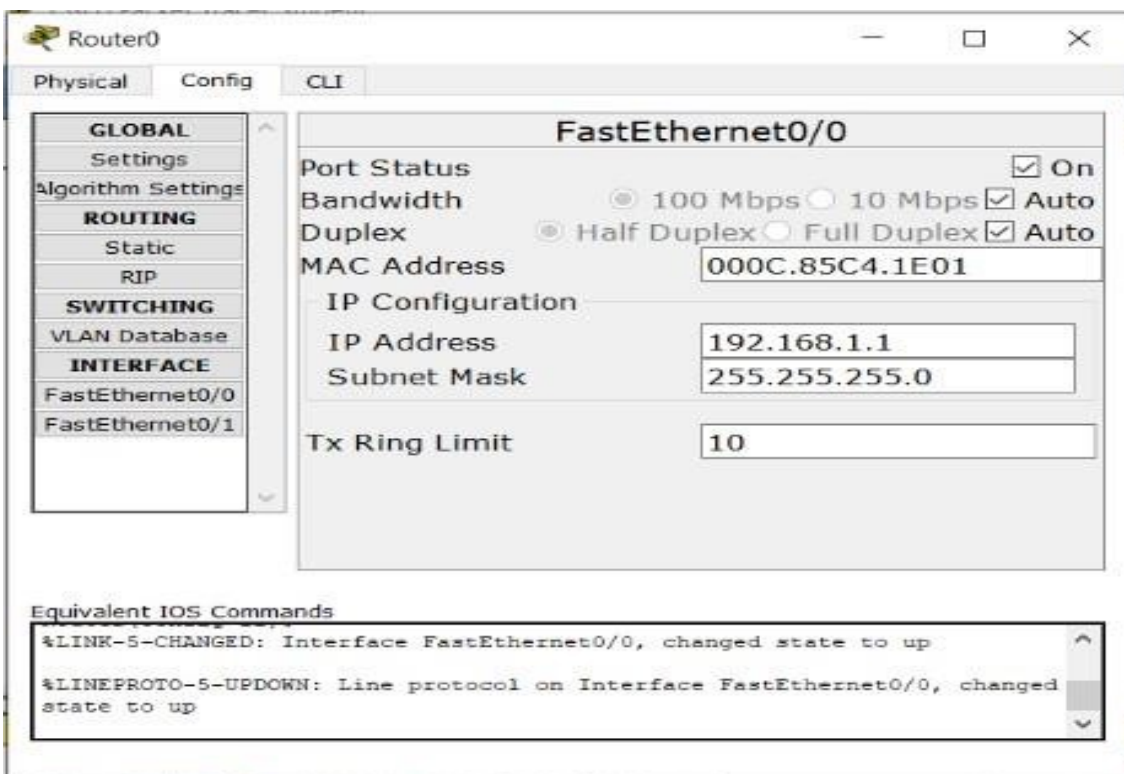
#### Step 4:

- Click on PC2 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



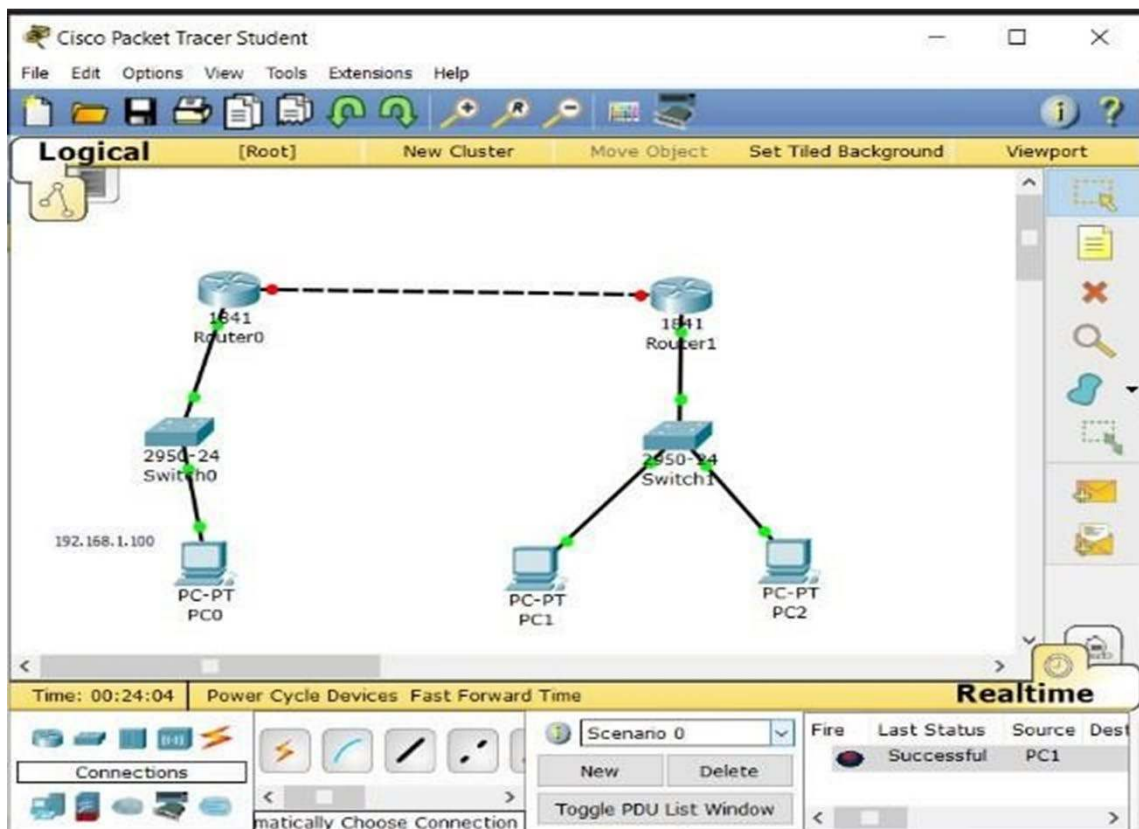
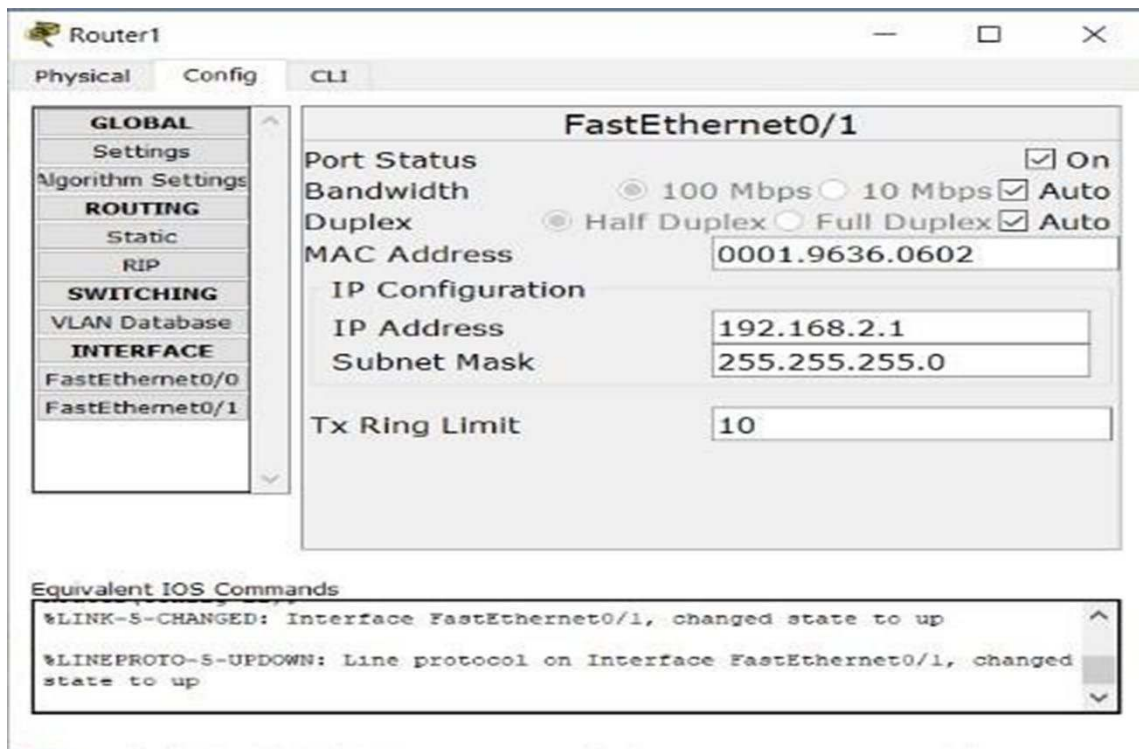
#### Step 5:

- Click on Router0. Go to Config > FastEthernet0/0. Here, add IP Address and On the Port Status.



### Step 6:

- Click on Router1. Go to Config > FastEthernet0/1.
- Here, add IP Address and On the Port Status.

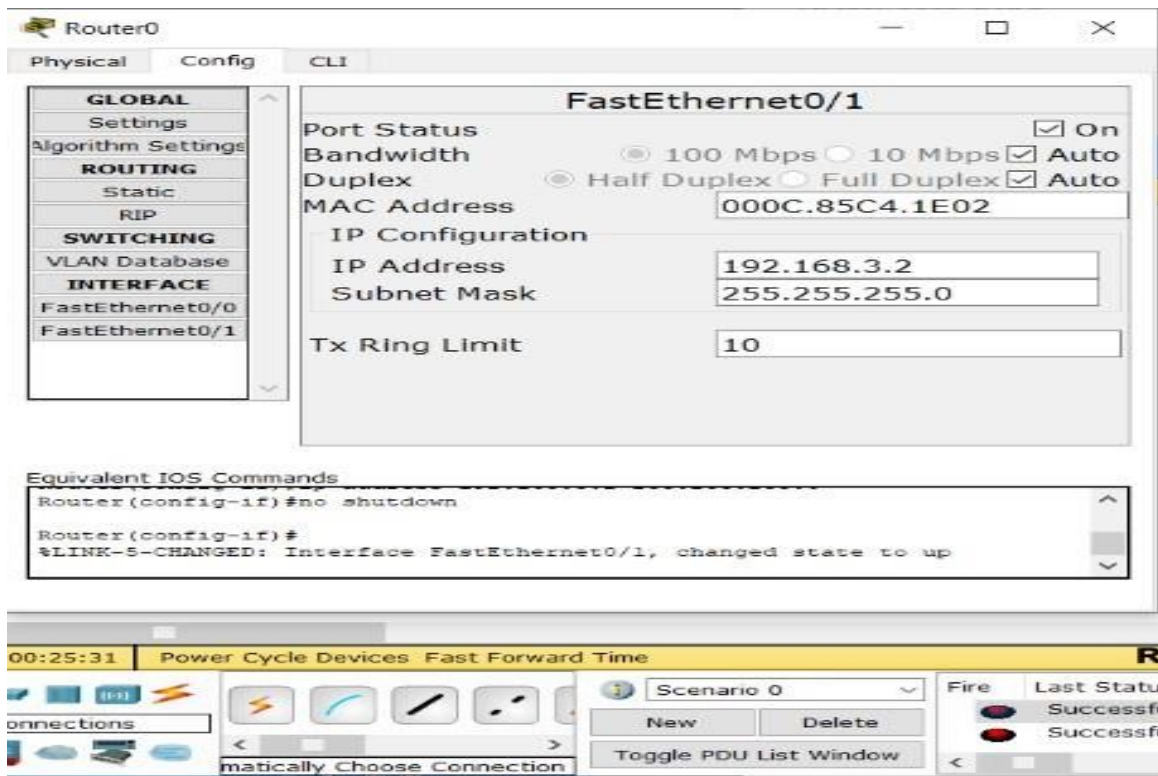


As you will see above, there is green dots which means connections are done successfully between Router, Switches and PCs.



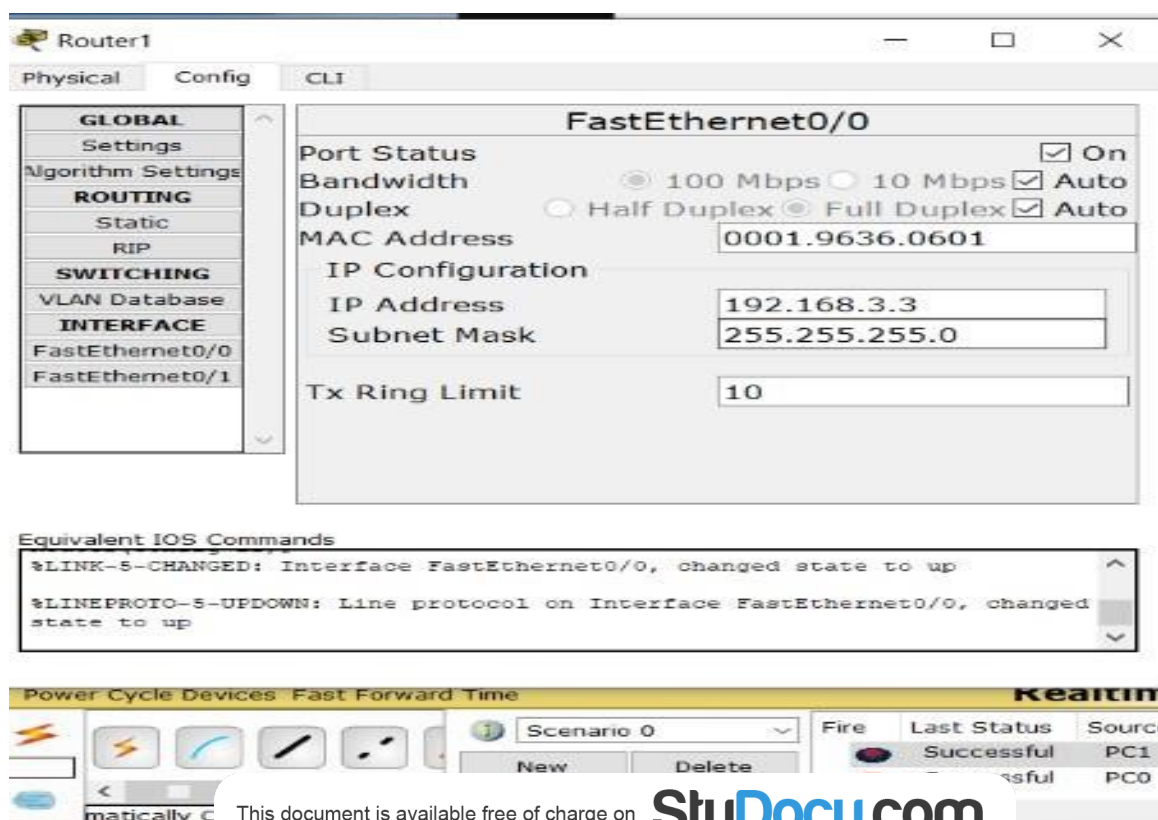
### Step 7:

- Click on Router0. Go to Config > FastEthernet0/1.
- Here, add IP Address and On the Port Status.

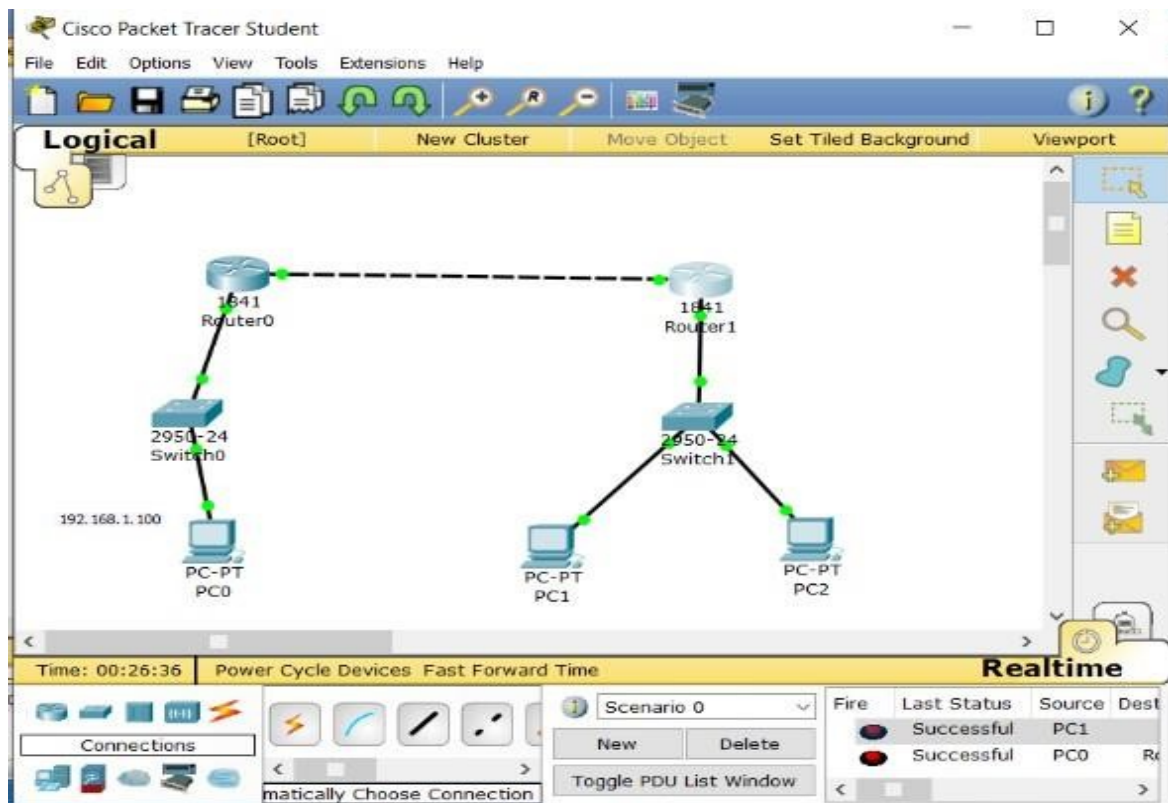


### Step 8:

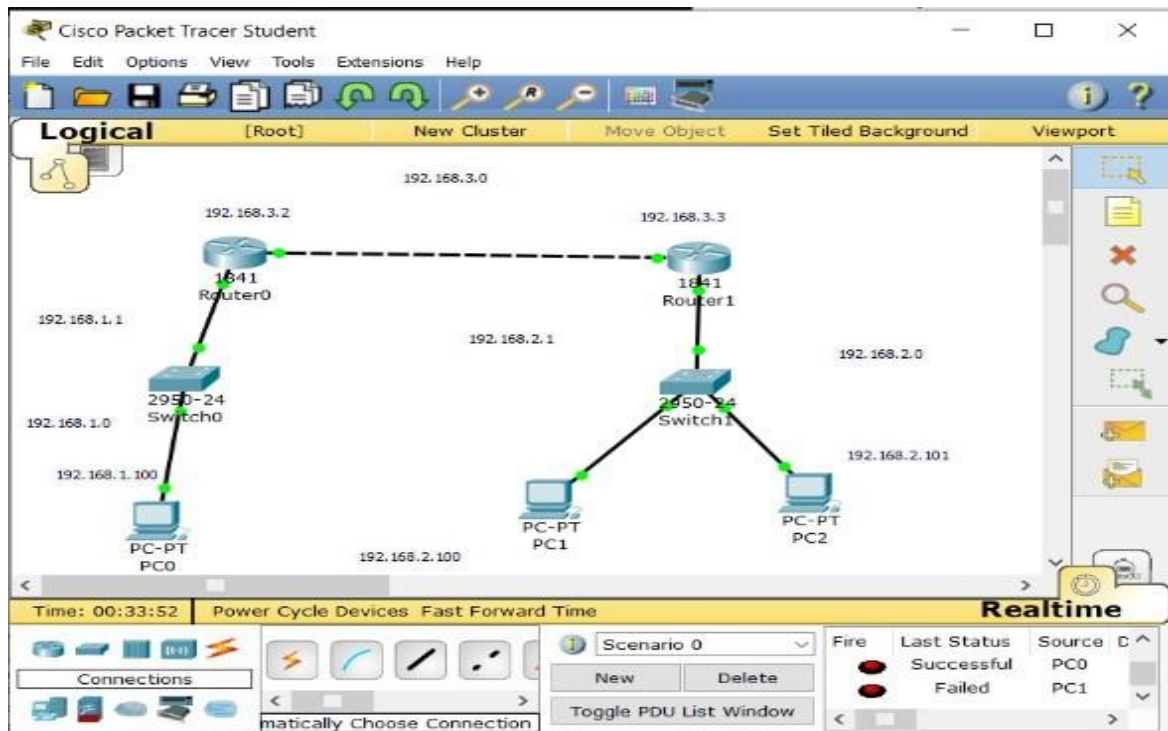
- Click on Router1. Go to Config > FastEthernet0/0. Here, add IP Address and On the Port Status.





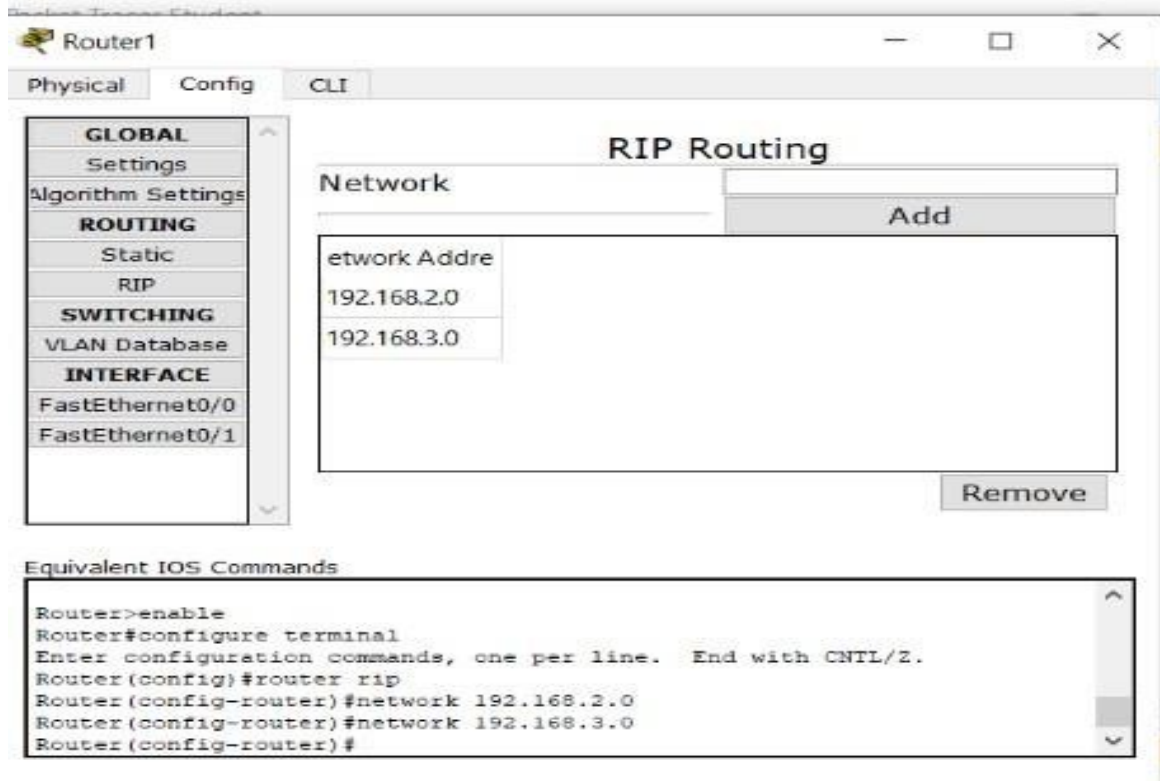


As you can see above, connection is done between both the Routers successfully.



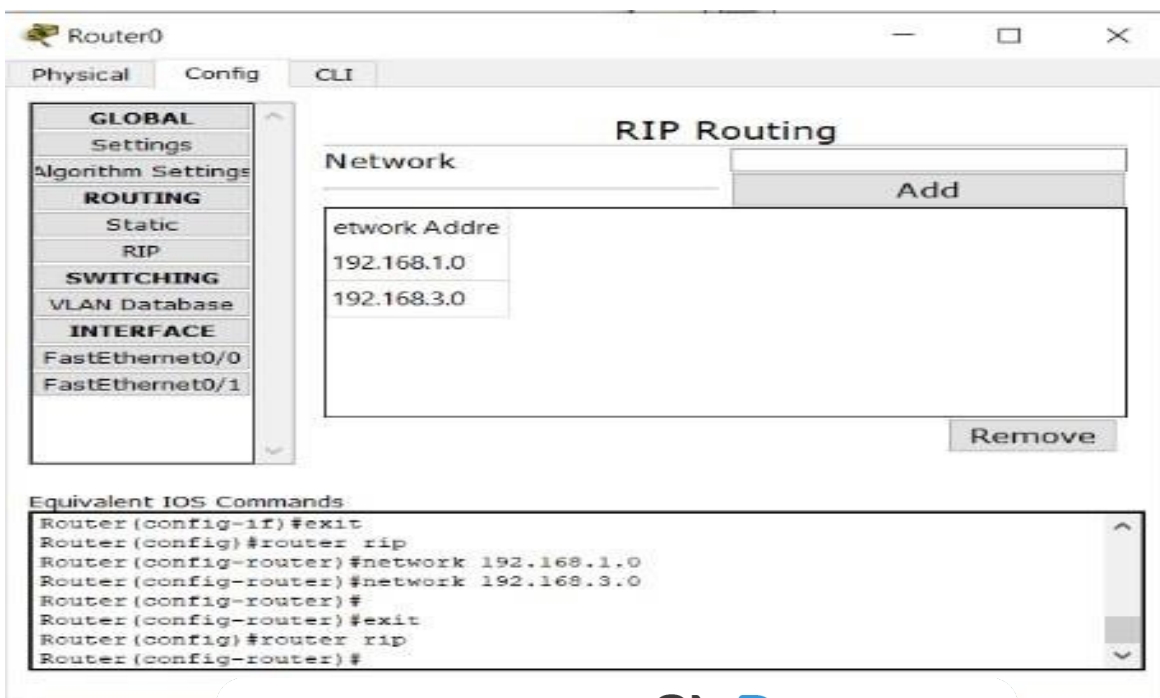
### Step 9:

- Click on Router1. Go to Config > RIP.
- Here, add the network address to connect router1 with switch1, PC1, PC2 and router0.



### Step 10:

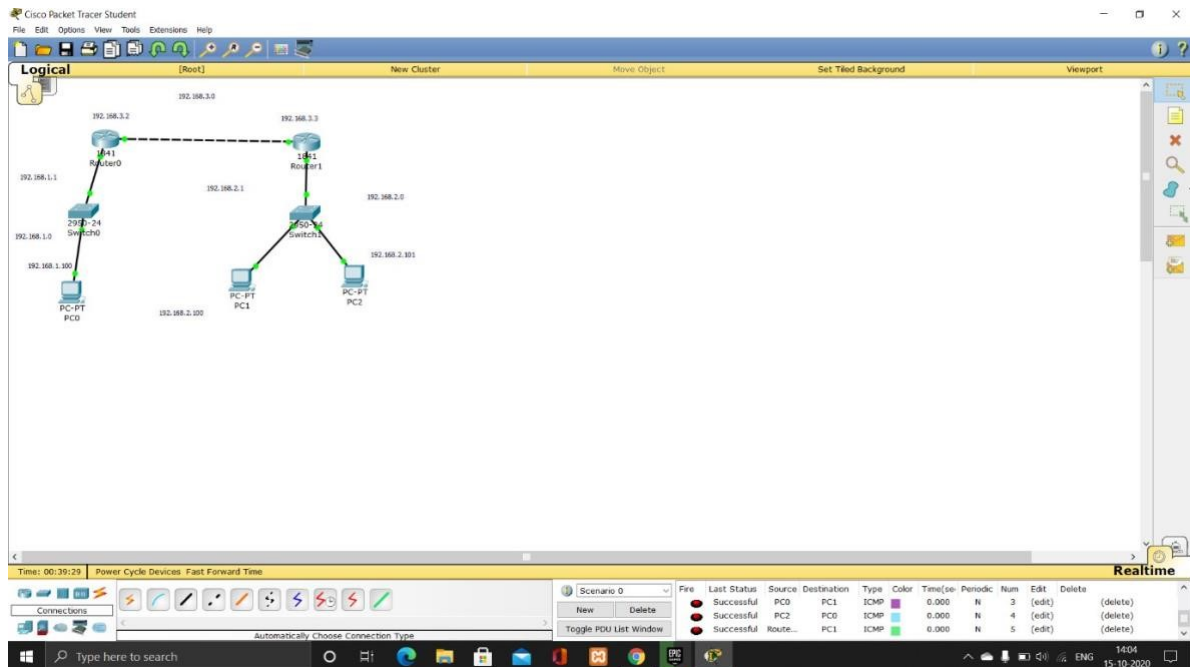
- Click on Router0. Go to Config > RIP.
- Here, add the network address to connect router0 with switch0, PC0 and router1.



Now, all the connections are done successfully, you can check it by clicking on this symbol



And then, click on any two PCs, you will get the status as successful.

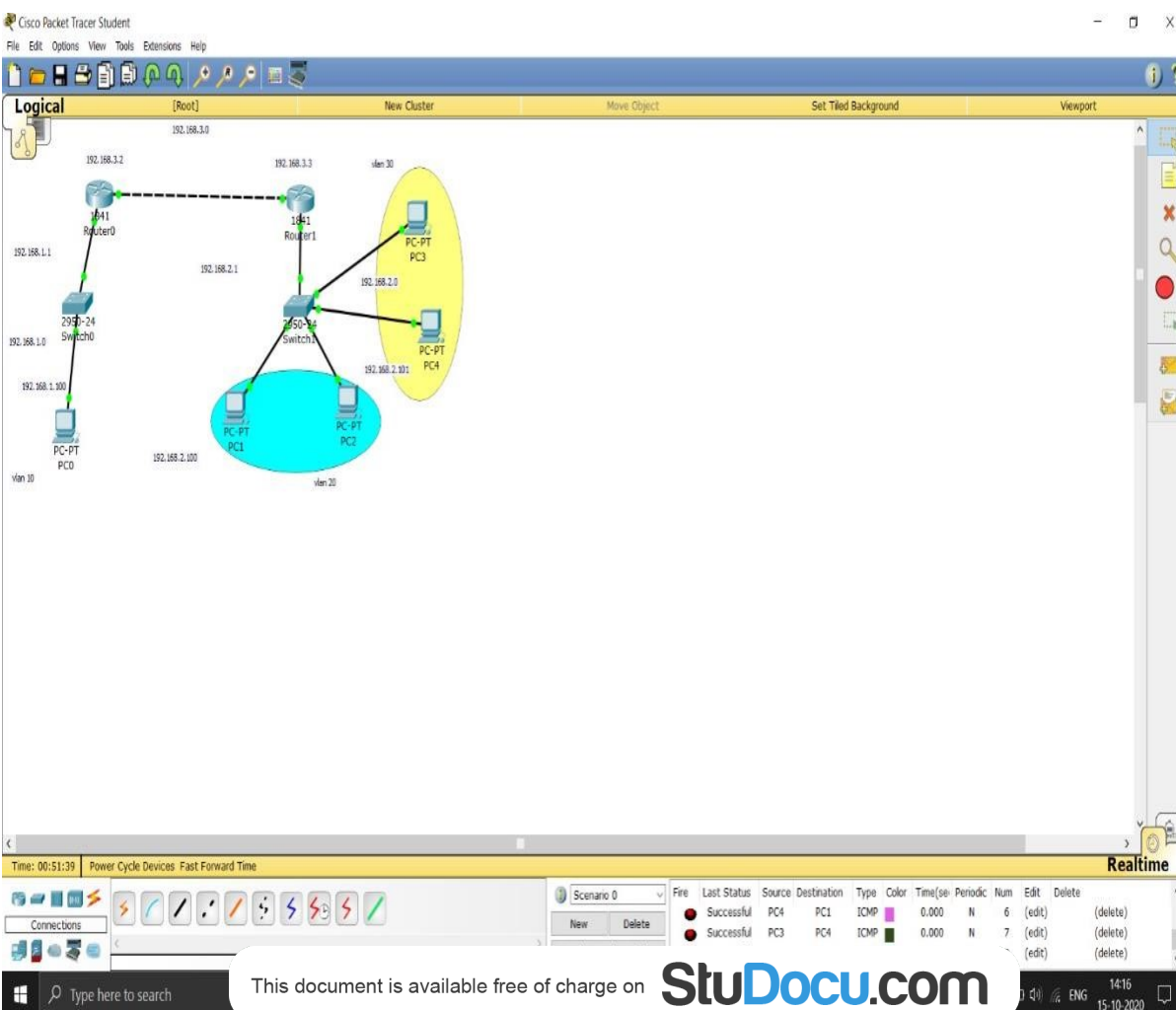
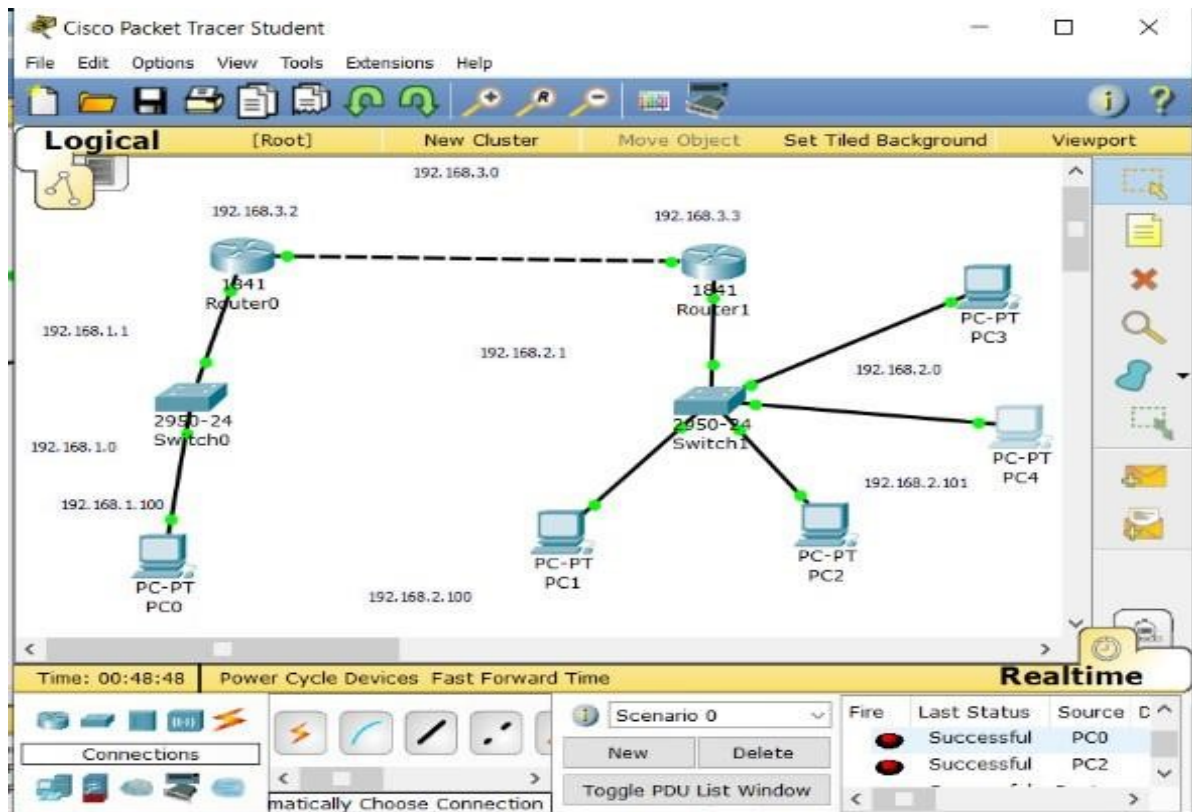


So, till now, Routing Information Protocol is done.

Now, we will start with implementing VLAN.

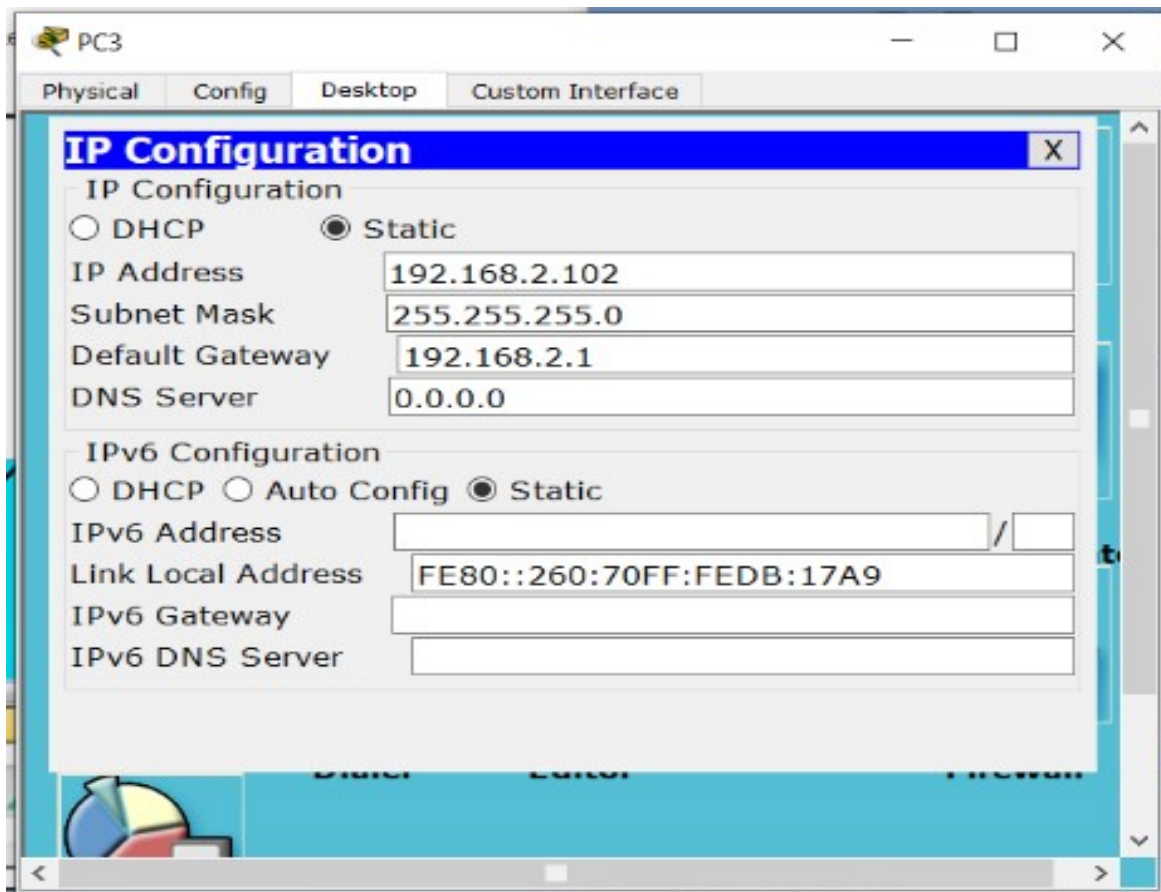
### Step 11:

- Add two PC (PC 3 and PC4) and connect it with switch.



**Step 12:**

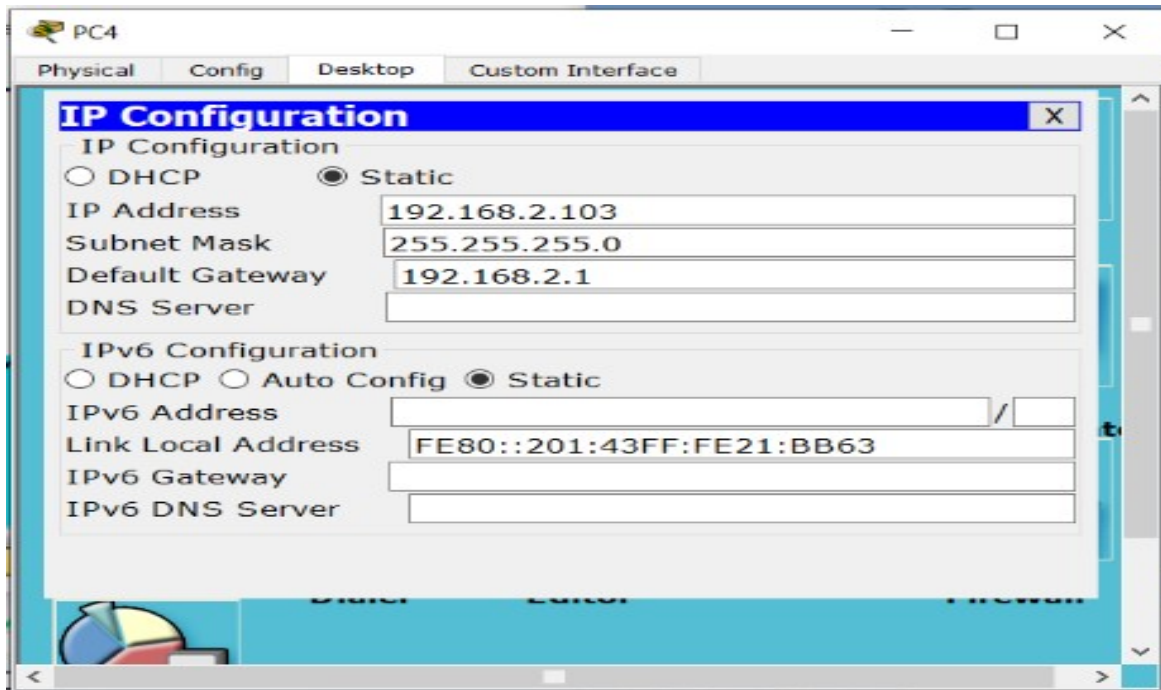
- Click on PC3 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.





### Step 13:

- Click on PC3 and go to Desktop > IP Configuration
- Add IP Address, as you will add the IP Address, Subnet Mask will be automatically added and displayed.
- Add Default Gateway and close the window.



### Step 14:

- Click on Switch1 and go to CLI
- Add type the VLAN code –

VLAN

```
enable
config t
vlan 20 name purchase
exit
vlan 30 name sales
exit
```

```
int fa0/2
switchport access vlan 20
exit
```

```
int fa0/3
switchport access vlan 20
exit
```

```
int fa0/4
switchport access vlan 30
exit
```

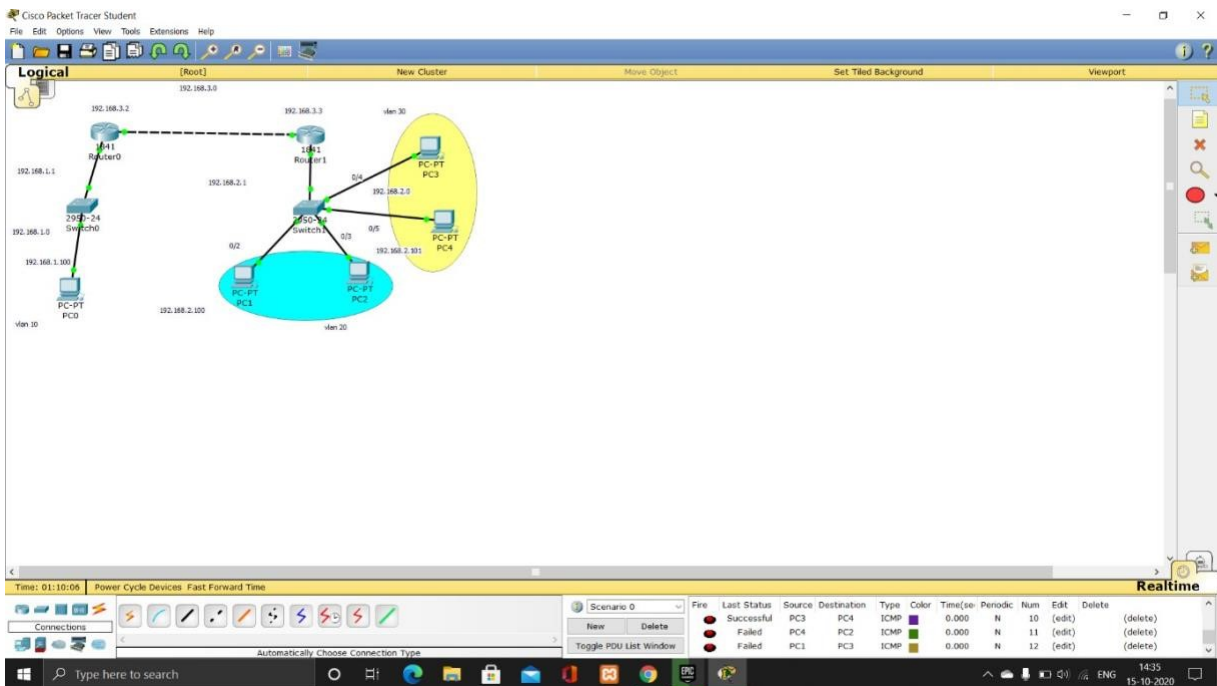
```
int fa0/5
switchport access vlan 30
exit
```





## Final Output:

- Now, PC1, PC2 are not connected to PC3 and PC4.



**Conclusion:** Thus, we successfully implemented VPN and configured RIP/OSPF using Packet tracer