LAB 7

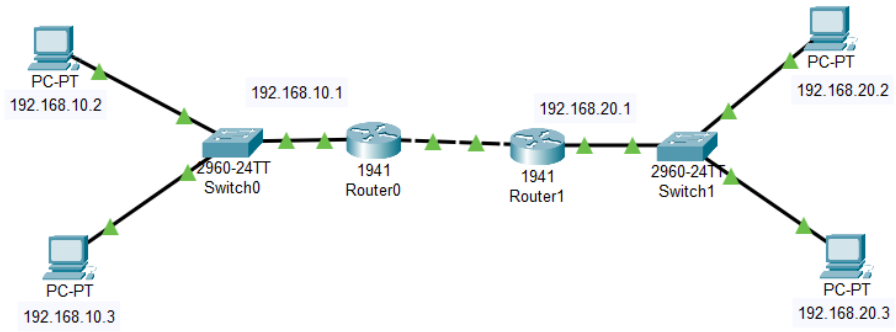
Implementation of Dynamic/Interior/Exterior Routing (RIP, OSPF, BGP)

Objective:

- To understand the basic operations of dynamic interior and exterior routing protocols.

RIP Configuration:

To create a RIP configuration two PCs are connected to a switch and the switch is connected to a Router this router is connected another switch which is connected with two PCs as shown in figure below:



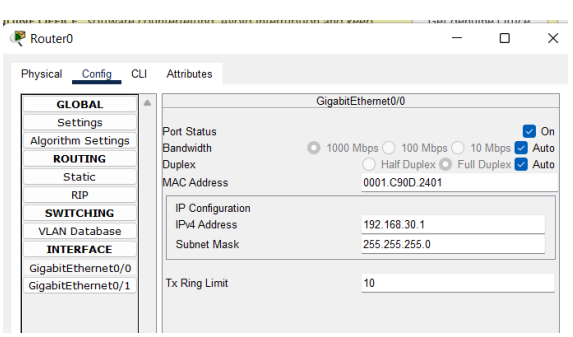
Configuration:

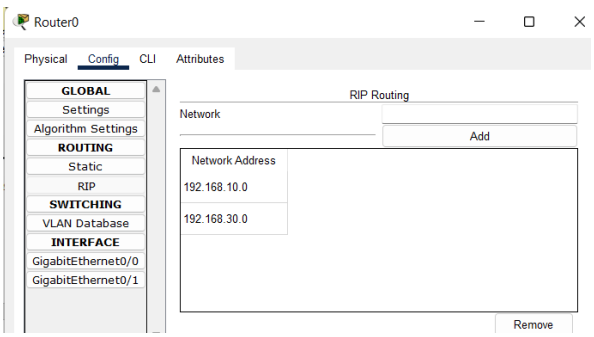
Connect the PCs to the Switch using Fast Ethernet then connect the Switch to a Router then mirror the connection.

For Routers:

In Router 0

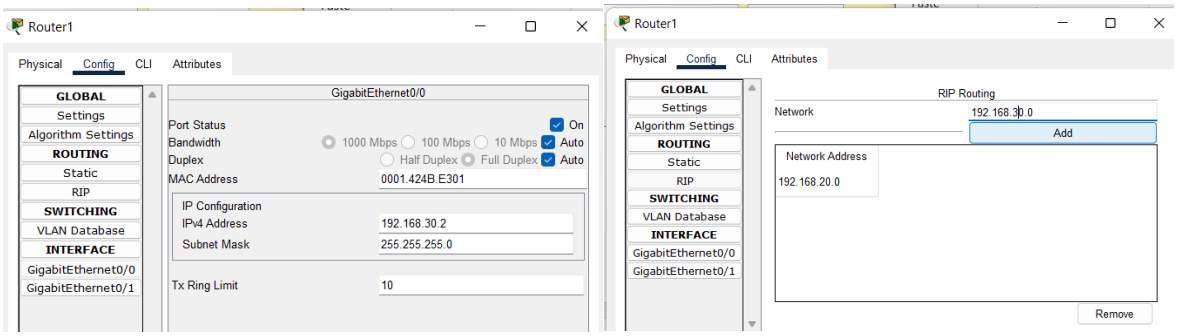
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.30.1.
- In Fast Ethernet 0/1, Set the port status to on and set the IP Address as 192.168.10.1.
- Go to Routing and then to RIP.
- Then add Network Address 192.168.10.0 and 192.168.30.0 to the table.
- Close the window.





In Router 1

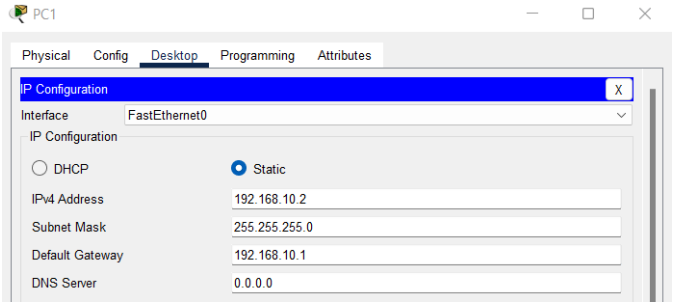
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.30.2.
- In Fast Ethernet 0/1, Set the port status to on and set the IP Address as 192.168.20.1.
- Go to Routing and then to RIP.
- Then add Network Address 192.168.20.0 and 192.168.30.0 to the table.
- Close the window.



For PCs:

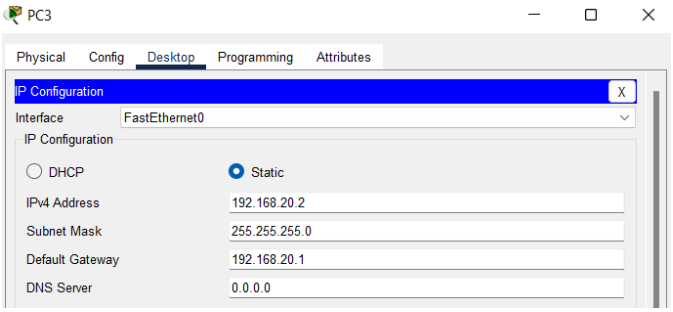
PCs connected to Router 0

- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.10.2 and The Default Gateway as 192.168.10.1.
- Close the window.
- Repeat the same step for the next PC and Set the IP Address as 192.168.10.3 and Gateway as 192.168.10.1.



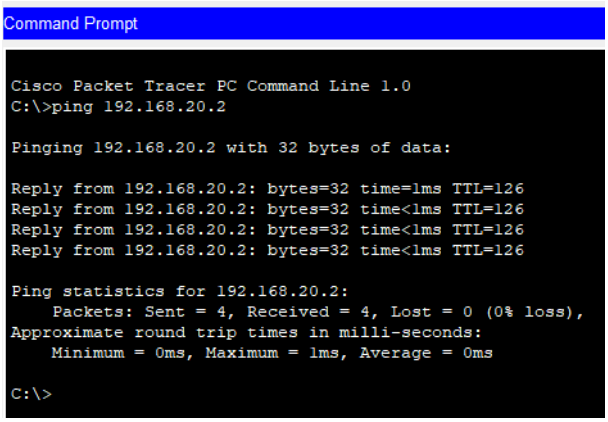
PCs connected to Router 1

- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.20.2 and The Default Gateway as 192.168.20.1.
- Close the window.
- Repeat the same step for the next PC and Set the IP Address as 192.168.20.3 and Gateway as 192.168.20.1.



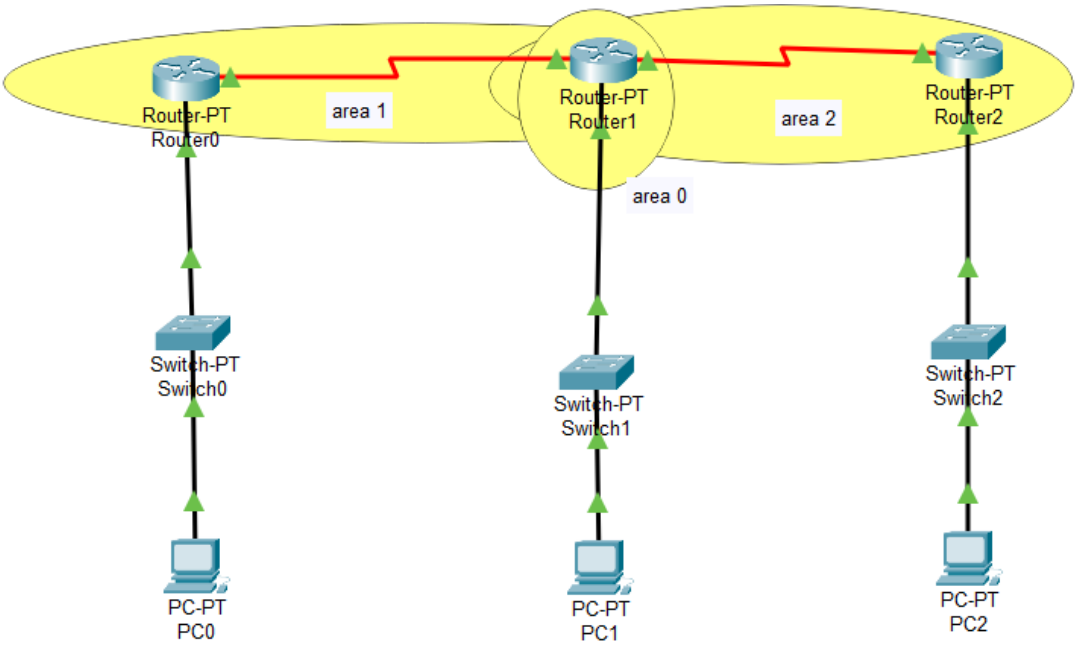
To test for proper configuration:

- Double click on any of the PC and go to desktop.
- Open Command prompt.
- Ping any other PC in the Network. If the configuration is successful reply will be received else the request will be timed out.



OSPF Configuration:

To create a OSPF configuration a PC is connected to a switch and the switch is connected to a Router. This router is then connected to another router that has the same layout as the first. Then this router is further connected to another router having the same layout as the first two routers. Then the area between router 0 and router 1 is assigned area 1, area for router 1 is assigned area 0 and area between router 1 and 2 is assigned area 2 as shown in figure below:



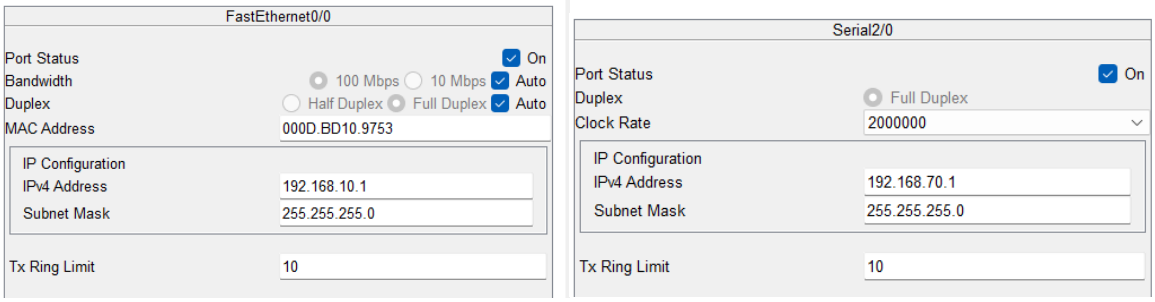
Configuration:

Connect the PC to the Switch using Fast Ethernet then connect the Switch to a Router. Create such 3 networks and connect the router 0 with router 1 and router 1 with router 2.

For Routers:

In Router 0

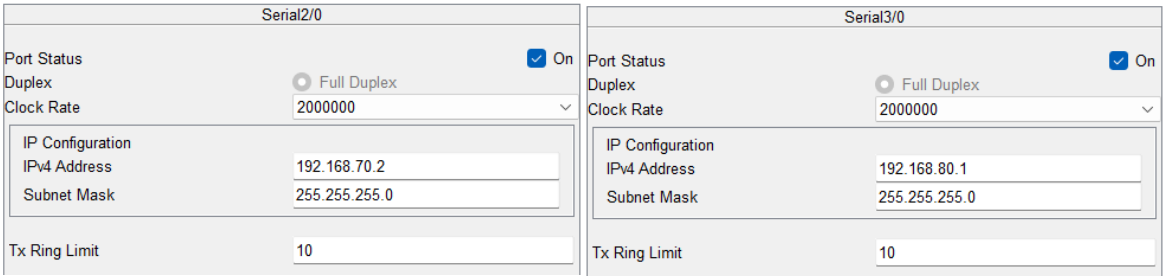
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.10.1.
- In Serial 2/0, Set the port status to on and set the IP Address as 192.168.70.1.
- Then go to CLI and type the following.
    1. Router ospf 1
    2. Network 192.168.10.0 0.0.0.255 area 1.
    3. Network 192.168.70.0 0.0.0.255 area 1.
    4. Exit.
- Close the window.




```
Router(config-router)#
Router(config-router)#router ospf 1
Router(config-router)#network 192.168.10.0 0.0.0.255 area 1
Router(config-router)#network 192.168.70.0 0.0.0.255 area 1
Router(config-router)#exit
```

In Router 1

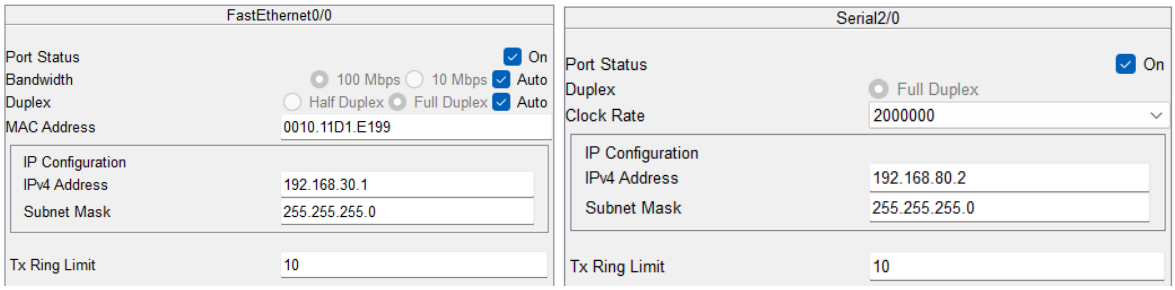
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.20.1.
- In Serial 2/0, Set the port status to on and set the IP Address as 192.168.70.2.
- In Serial 3/0, Set the port status to on and set the IP Address as 192.168.80.1.
- Then go to CLI and type the following.
    1. Router ospf 2
    2. Network 192.168.20.0 0.0.0.255 area 0.
    3. Network 192.168.70.0 0.0.0.255 area 1.
    4. Network 192.168.80.0 0.0.0.255 area 2.
    5. Exit.
- Close the window.




```
Router(config)#router ospf 2
Router(config-router)#network 192.168.20.0 0.0.0.255 area 0
Router(config-router)#network 192.168.70.0 0.0.0.255 area 1
Router(config-router)#network 192.168.80.0 0.0.0.255 area 2
Router(config-router)#exit
Router(config)#
```

In Router 2

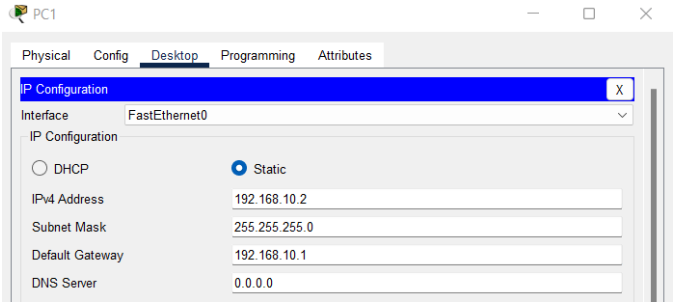
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.30.1.
- In Serial 2/0, Set the port status to on and set the IP Address as 192.168.80.2.
- Then go to CLI and type the following.
    1. Router ospf 1
    2. Network 192.168.30.0 0.0.0.255 area 2.
    3. Network 192.168.80.0 0.0.0.255 area 1.
    4. Exit.
- Close the window.




```
Router(config)#router ospf 1
Router(config-router)#network 192.168.30.0 0.0.0.255 area 2
Router(config-router)#network 192.168.80.0 0.0.0.255 area 2
Router(config-router)#exit
```

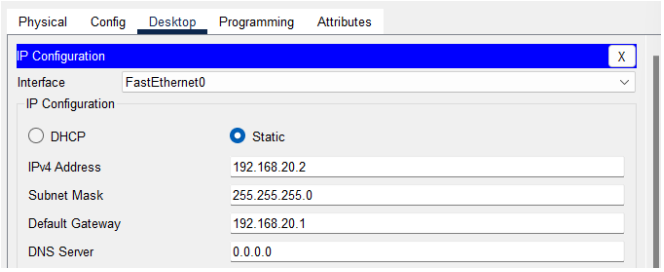
For PCs:

PCs connected to Router 0



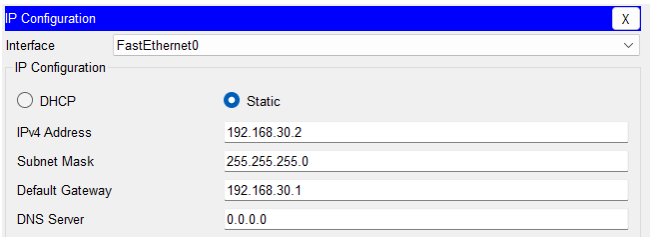
- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.10.2 and The Default Gateway as 192.168.10.1.
- Close the window.

PCs connected to Router 1



- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.20.2 and The Default Gateway as 192.168.20.1.
- Close the window.

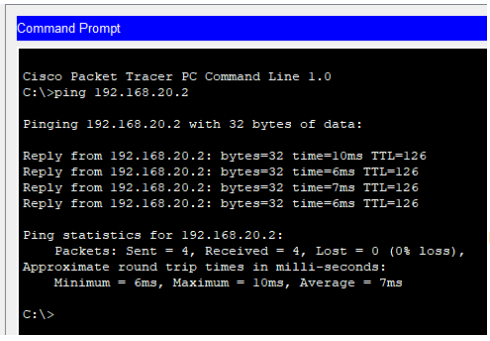
PCs connected to Router 2



- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.30.2 and The Default Gateway as 192.168.30.1.
- Close the window.

To test for proper configuration:

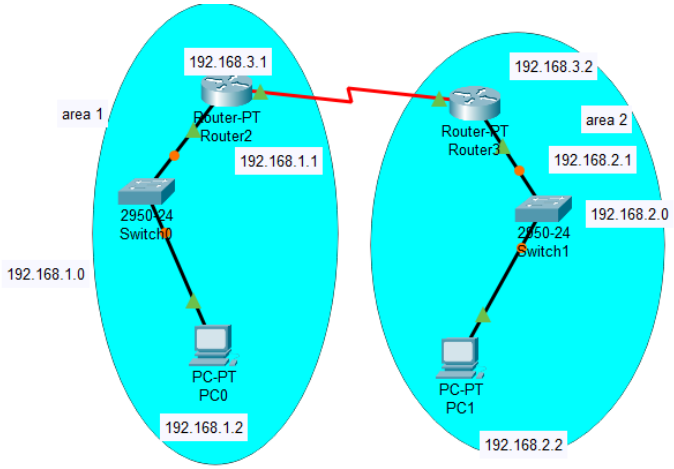
- Double click on any of the PC and go to desktop.
- Open Command prompt.
- Ping any other PC in the Network. If the configuration is successful reply will be received else the request will be timed out



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	PC0	PC2	ICMP		0.000	N	0	(edit)
	Successful	PC1	PC2	ICMP		0.000	N	1	(edit)
	Successful	PC0	PC1	ICMP		0.000	N	2	(edit)

BGP Configuration:

To create a BGP configuration a PC is connected to a switch and the switch is connected to a Router. This router is then connected to another router that has the same layout as the first. as shown in figure below:



Configuration:

Connect the PC to the Switch using Fast Ethernet then connect the Switch to a Router. Create such 2 networks and connect the two routers.

For Routers:

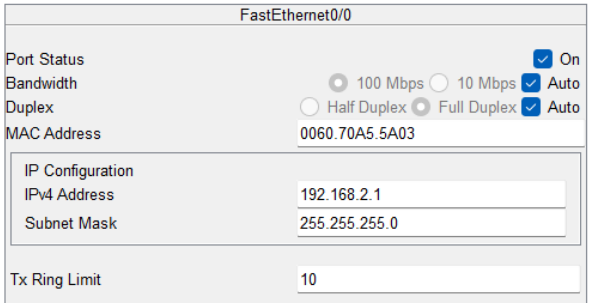
In Router 0

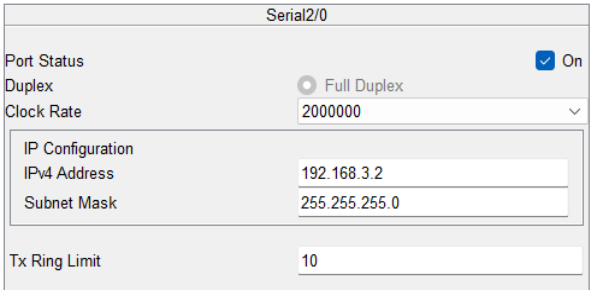
- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.1.1.
- In Serial 2/0, Set the port status to on and set the IP Address as 192.168.3.1.
- Then go to CLI and type the following.
    1. Router bgp 1
    2. Network 192.168.1.0.
    3. Network 192.168.3.0.
    4. Network 192.168.2.0.
    5. Neighbor 192.168.3.2 remote-as 2.
    6. Neighbor 192.168.2.2 remote-as 2.
    7. Exit.
- Close the window.

```
Router(config)#router bgp 1
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.3.0
Router(config-router)#network 192.168.2.0
Router(config-router)#neighbor 192.168.3.2 remote-as 2
Router(config-router)#neighbor 192.168.2.2 remote-as 2
Router(config-router)#exit
Router(config)#
```

In Router 1

- Double click on the router and go to config and then interface.
- In Fast Ethernet 0/0, Set the port status to on and set the IP Address as 192.168.2.1.
- In Serial 2/0, Set the port status to on and set the IP Address as 192.168.3.2.
- Then go to CLI and type the following.
    1. Router bgp 2
    2. Network 192.168.2.0.
    3. Network 192.168.3.0.
    4. Network 192.168.1.0.
    5. Neighbor 192.168.3.1 remote-as 1.
    6. Neighbor 192.168.1.2 remote-as 1.
    7. Exit.
- Close the window.

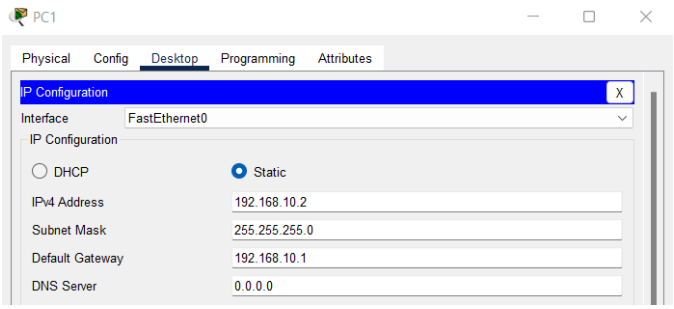




For PCs:

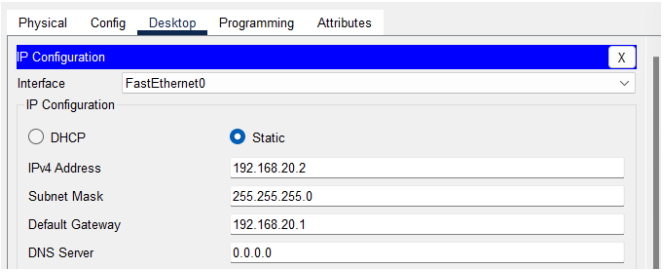
PCs connected to Router 0

- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.10.2 and The Default Gateway as 192.168.10.1.
- Close the window.



PCs connected to Router 1

- Double click on the PC and go to desktop and then IP Configuration.
- Set the IP Address as 192.168.20.2 and The Default Gateway as 192.168.20.1.
- Close the window.



To test for proper configuration:

- Double click on any of the PC and go to desktop.
- Open Command prompt.
- Ping any other PC in the Network. If the configuration is successful reply will be received else the request will be timed out