

## Implementation :-

We configure the above network using the following IP addresses :-

Host	Interface	IP address	Network Address	Default Gateway
Router0	G0/0	10.10.10.1	10.0.0.0	
	S0/1/0	40.40.40.1	40.0.0.0	
Router1	G0/0	20.20.20.1	20.0.0.0	
	S0/1/0	40.40.40.2	40.0.0.0	
	S0/1/1	50.50.50.1	50.0.0.0	
Router2	G0/0	30.30.30.1	30.0.0.0	
	S0/1/0	50.50.50.2	50.0.0.0	
PC0	FastEthernet0	10.10.10.2	10.0.0.0	10.10.10.1
PC1	FastEthernet0	10.10.10.3	10.0.0.0	10.10.10.1
PC2	FastEthernet0	10.10.10.4	10.0.0.0	10.10.10.1
PC3	FastEthernet0	20.20.20.2	20.0.0.0	20.20.20.1
PC4	FastEthernet0	20.20.20.3	20.0.0.0	20.20.20.1
PC5	FastEthernet0	20.20.20.4	20.0.0.0	20.20.20.1
PC6	FastEthernet0	30.30.30.2	30.0.0.0	30.30.30.1
PC7	FastEthernet0	30.30.30.3	30.0.0.0	30.30.30.1
PC8	FastEthernet0	30.30.30.4	30.0.0.0	30.30.30.1

- **Configuring PC0:**

The screenshot shows the configuration window for PC0. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for IP configuration. The fields are filled with the following values:

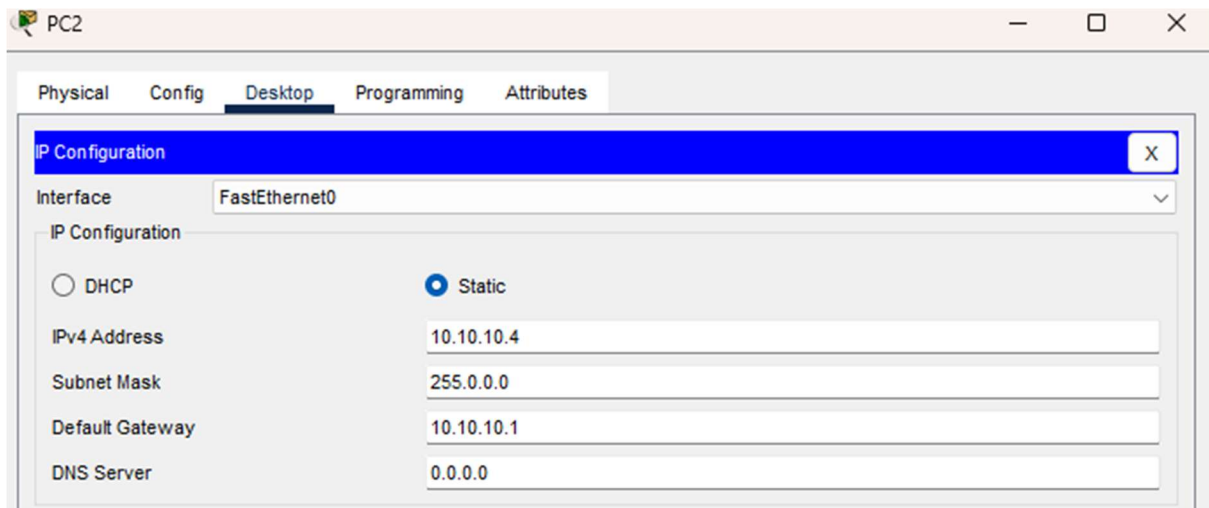
Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.10.10.2
Subnet Mask	255.0.0.0
Default Gateway	10.10.10.1
DNS Server	0.0.0.0

- **Configuring PC1:**

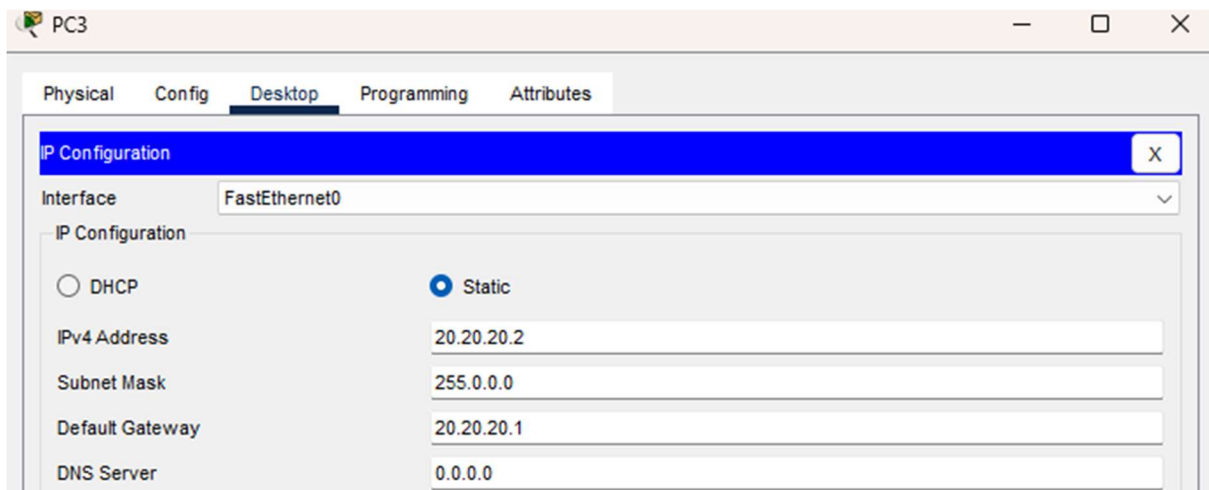
The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for IP configuration. The fields are filled with the following values:

Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.10.10.3
Subnet Mask	255.0.0.0
Default Gateway	10.10.10.1
DNS Server	0.0.0.0

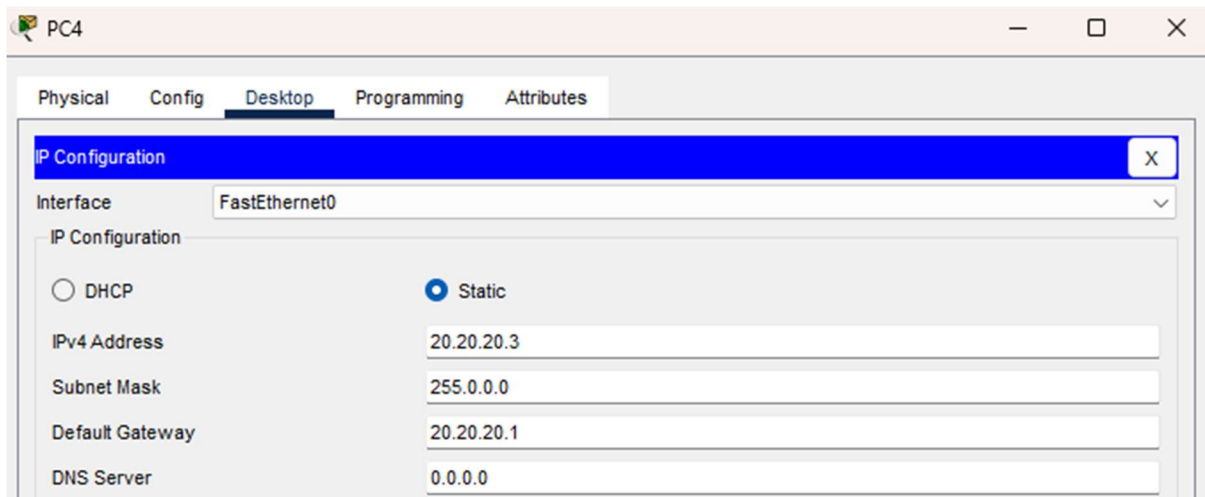
- **Configuring PC2:**



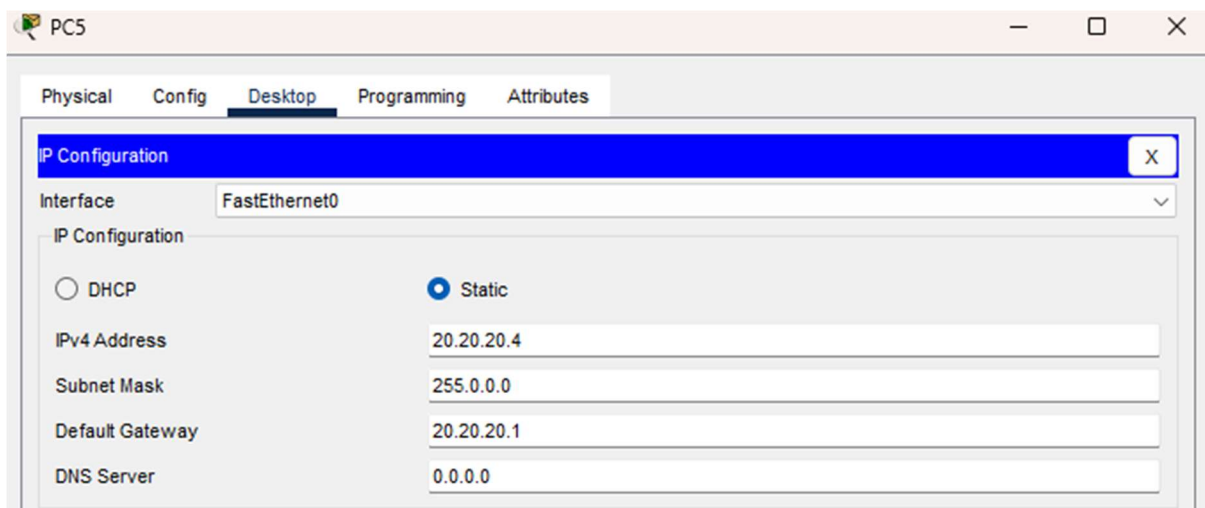
- **Configuring PC3:**



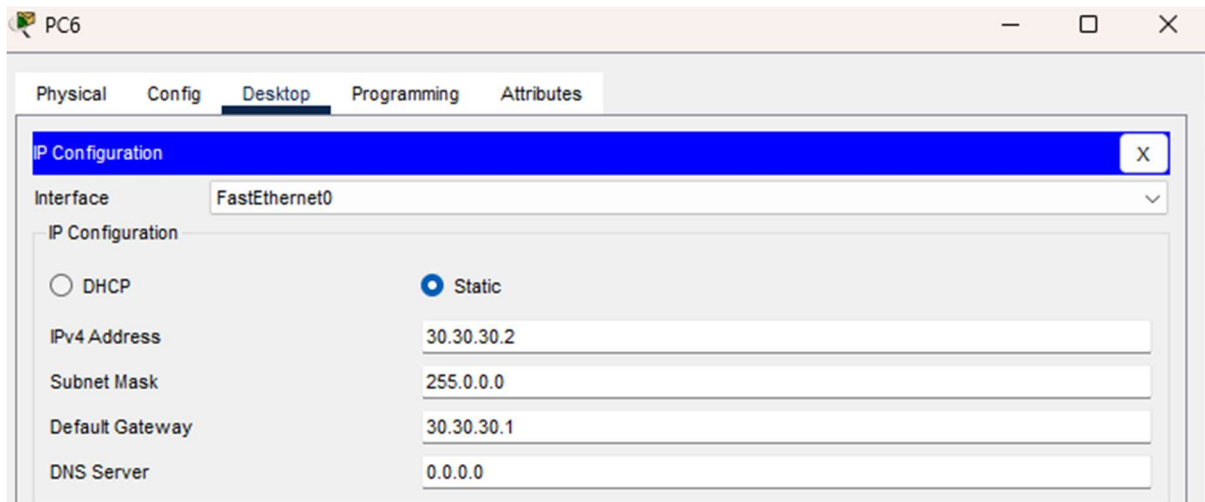
- **Configuring PC4:**



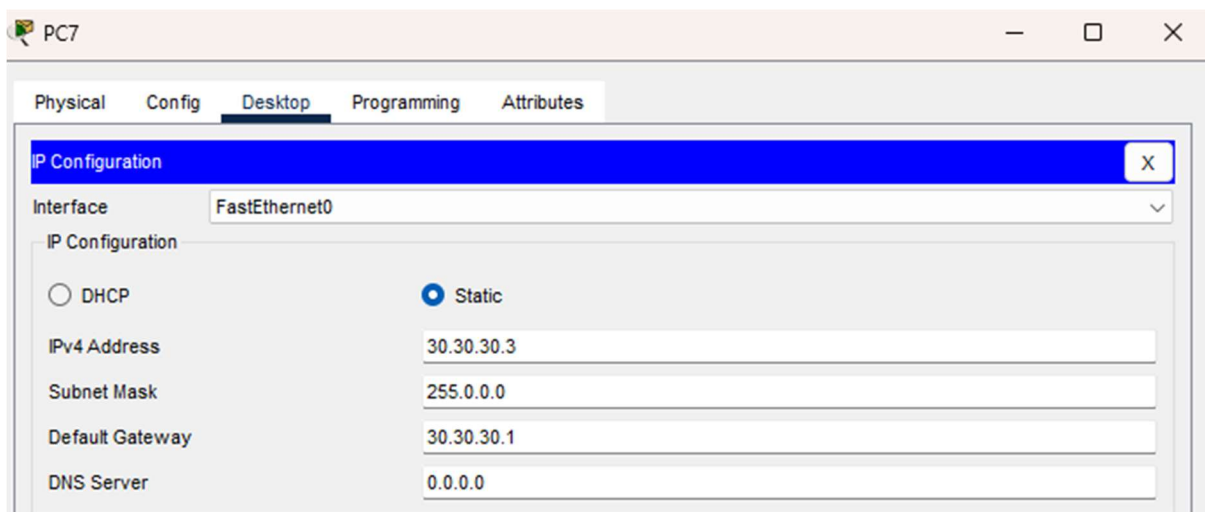
- **Configuring PC5:**



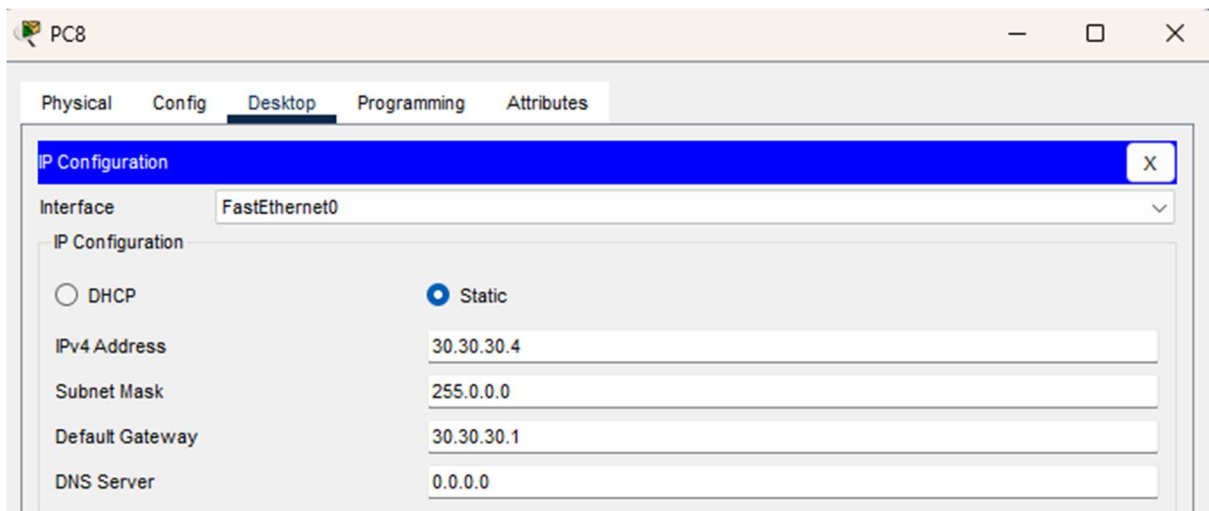
- **Configuring PC6:**



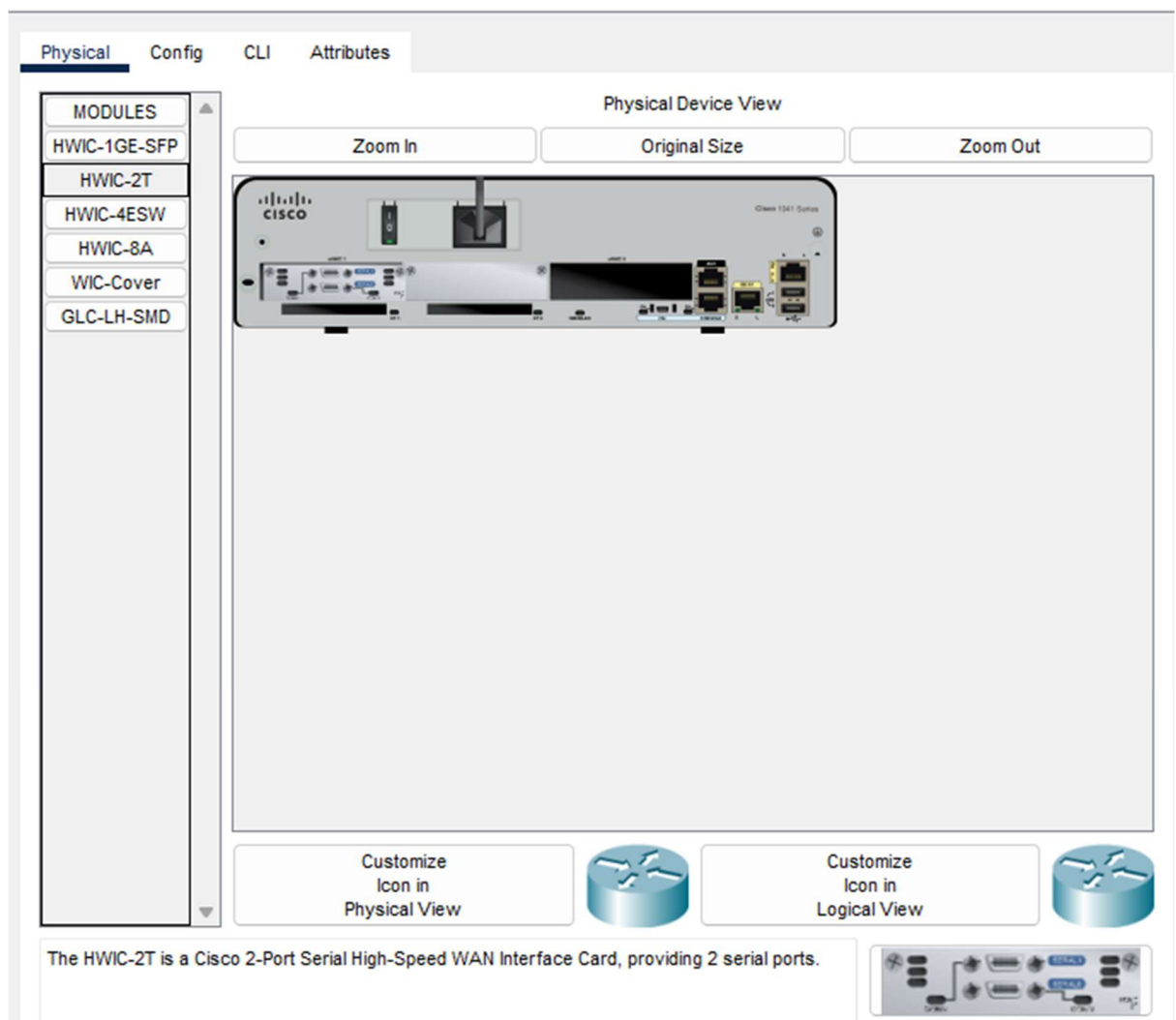
- **Configuring PC7:**



- **Configuring PC8:**



- Set Serial Interface (HWIC-2T Port) For All Routers:-



- Router0 Configuration With PC0,PC1,PC2:

The screenshot shows the configuration window for Router0. The 'Config' tab is selected. In the left sidebar, the 'INTERFACE' section is expanded, and 'GigabitEthernet0/0' is selected. The main area displays the configuration for this interface. The 'Port Status' is 'On'. 'Bandwidth' is set to '100 Mbps'. 'Duplex' is set to 'Full Duplex'. 'MAC Address' is '0030.F21C.0801'. Under 'IP Configuration', the 'IPv4 Address' is '10.10.10.1' and the 'Subnet Mask' is '255.0.0.0'. The 'Tx Ring Limit' is set to '10'.

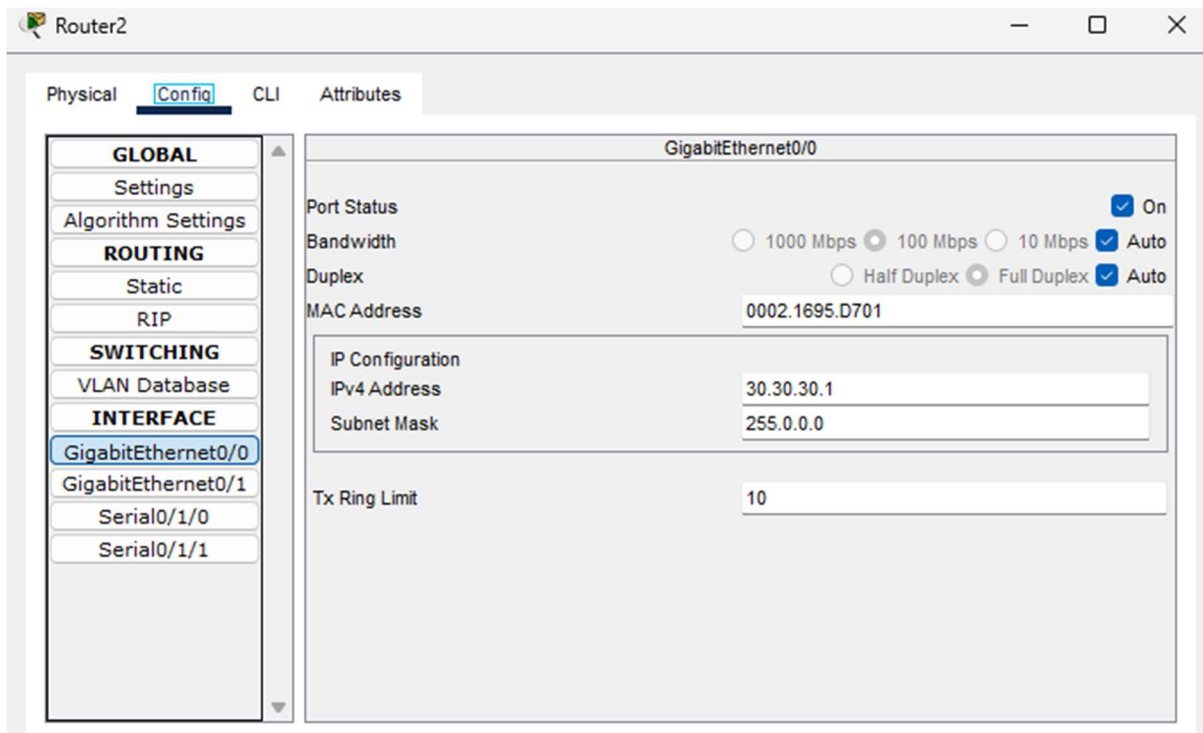
GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0030.F21C.0801
IP Configuration	
IPv4 Address	10.10.10.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

- Router1 Configuration With PC3,PC4,PC5:

The screenshot shows the configuration window for Router1. The 'Config' tab is selected. In the left sidebar, the 'INTERFACE' section is expanded, and 'GigabitEthernet0/0' is selected. The main area displays the configuration for this interface. The 'Port Status' is 'On'. 'Bandwidth' is set to '100 Mbps'. 'Duplex' is set to 'Full Duplex'. 'MAC Address' is '0090.2176.C901'. Under 'IP Configuration', the 'IPv4 Address' is '20.20.20.1' and the 'Subnet Mask' is '255.0.0.0'. The 'Tx Ring Limit' is set to '10'.

GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0090.2176.C901
IP Configuration	
IPv4 Address	20.20.20.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

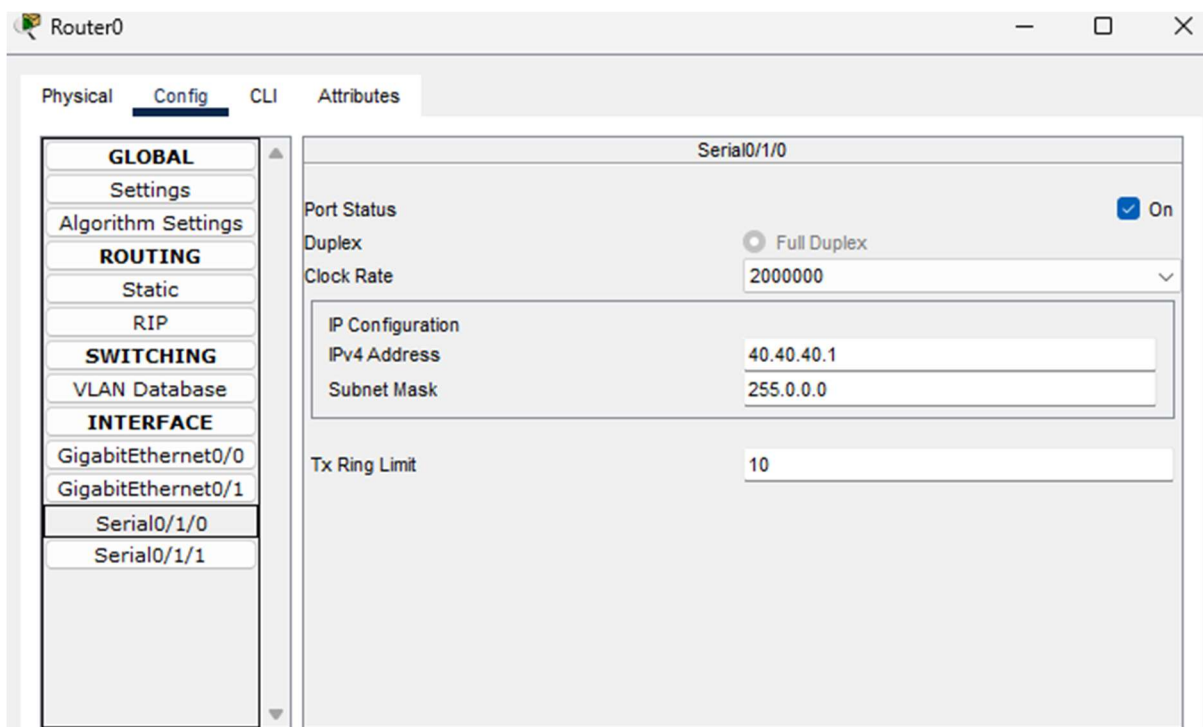
- Router2 Configuration With PC6,PC7,PC8:



The image shows the configuration window for Router2. The 'Config' tab is selected. On the left, the 'INTERFACE' section is expanded, and 'GigabitEthernet0/0' is selected. The main area displays the configuration for this interface. The 'Port Status' is 'On'. The 'Bandwidth' is set to '100 Mbps'. The 'Duplex' is set to 'Full Duplex'. The 'MAC Address' is '0002.1695.D701'. The 'IP Configuration' section shows the 'IPv4 Address' as '30.30.30.1' and the 'Subnet Mask' as '255.0.0.0'. The 'Tx Ring Limit' is set to '10'.

GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0002.1695.D701
IP Configuration	
IPv4 Address	30.30.30.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

- Router0 Configuration With Router1:



The image shows the configuration window for Router0. The 'Config' tab is selected. On the left, the 'INTERFACE' section is expanded, and 'Serial0/1/0' is selected. The main area displays the configuration for this interface. The 'Port Status' is 'On'. The 'Duplex' is set to 'Full Duplex'. The 'Clock Rate' is '2000000'. The 'IP Configuration' section shows the 'IPv4 Address' as '40.40.40.1' and the 'Subnet Mask' as '255.0.0.0'. The 'Tx Ring Limit' is set to '10'.

Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input checked="" type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	40.40.40.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10



- Router1 Configuration With Router0:

The screenshot shows the configuration window for Router1, specifically for the Serial0/1/0 interface. The window has tabs for Physical, Config, CLI, and Attributes. The Config tab is active. On the left, there is a sidebar with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under the INTERFACE category, the Serial0/1/0 interface is selected. The main area displays the configuration for Serial0/1/0. The Port Status is On. Duplex is set to Full Duplex. Clock Rate is 1200. IP Configuration shows IPv4 Address 40.40.40.2 and Subnet Mask 255.0.0.0. Tx Ring Limit is 10.

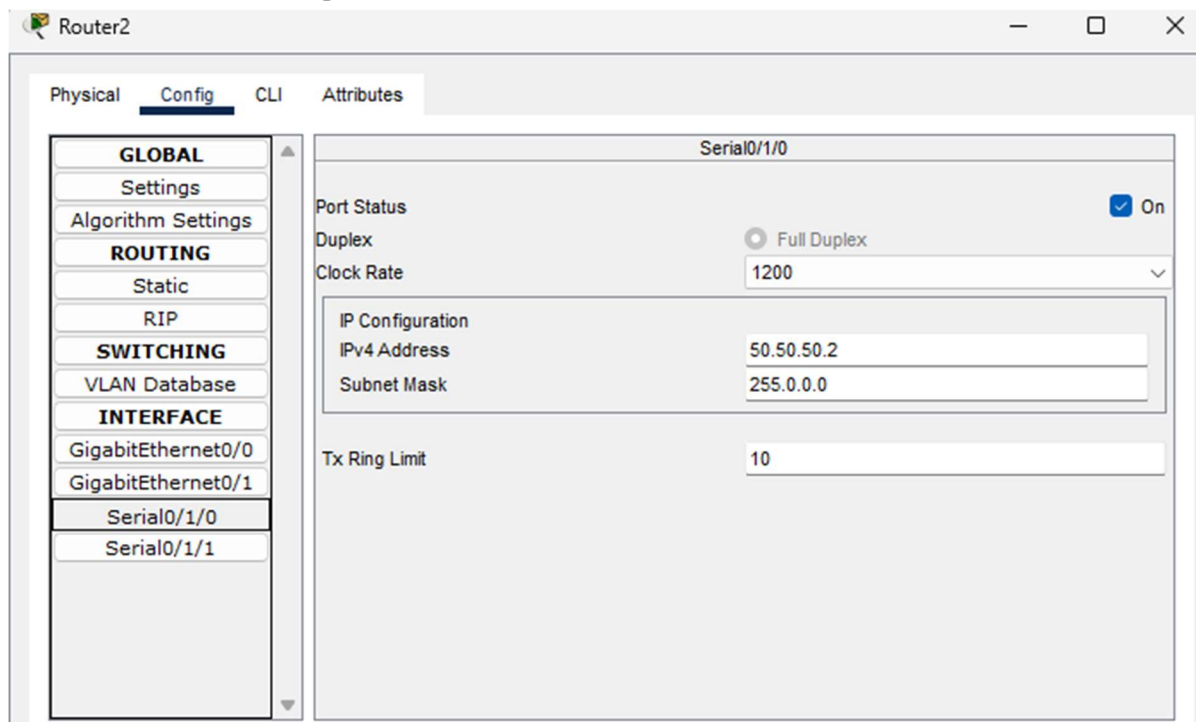
Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	1200
IP Configuration	
IPv4 Address	40.40.40.2
Subnet Mask	255.0.0.0
Tx Ring Limit	10

- Router1 Configuration With Router2:

The screenshot shows the configuration window for Router1, specifically for the Serial0/1/1 interface. The window has tabs for Physical, Config, CLI, and Attributes. The Config tab is active. On the left, there is a sidebar with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under the INTERFACE category, the Serial0/1/1 interface is selected. The main area displays the configuration for Serial0/1/1. The Port Status is On. Duplex is set to Full Duplex. Clock Rate is 2000000. IP Configuration shows IPv4 Address 50.50.50.1 and Subnet Mask 255.0.0.0. Tx Ring Limit is 10.

Serial0/1/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	50.50.50.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

- **Router2 Configuration With Router1:**



- **Configuring Router0 for BGP (using the CLI mode)**

```
Router>enable
Router#configure terminal
Router(config)#
Router(config-if)#router bgp 1
Router(config-router)#network 10.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#neighbor 40.40.40.2 remote-as 2
```

- **Configuring Router1 for BGP (using the CLI mode)**

```
Router>enable
Router#configure terminal
```

```
Router(config)#  
Router(config)#router bgp 2  
Router(config-router)#network 20.0.0.0  
Router(config-router)#network 40.0.0.0  
Router(config-router)#network 50.0.0.0  
Router(config-router)#neighbor 40.40.40.1 remote-as 1
```

**Router(config-router)#%BGP-5-ADJCHANGE: neighbor 40.40.40.1 Up**

```
Router(config-router)#neighbor 50.50.50.2 remote-as 3
```

**Router(config)#%BGP-5-ADJCHANGE: neighbor 50.50.50.2 Up**

```
Router(config-router)#exit
```

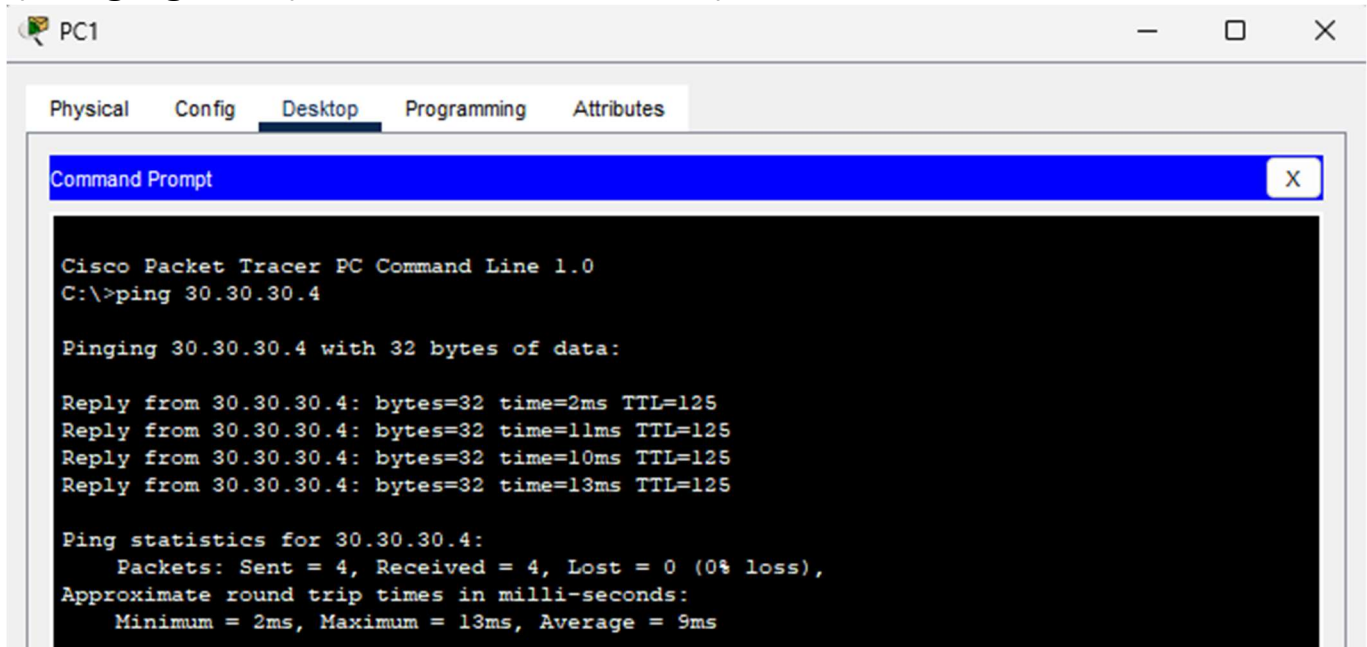
- **Configuring Router2 for BGP (using the CLI mode)**

```
Router>enable  
Router#configure terminal  
Router(config)#router bgp 3  
Router(config-router)#network 30.0.0.0  
Router(config-router)#network 50.0.0.0  
Router(config-router)#neighbor 50.50.50.1 remote-as 2
```

**Router(config-router)#%BGP-5-ADJCHANGE: neighbor 50.50.50.1 Up**

- **Checking the connectivity by using the ping command:-**

i) Pinging PC8 (IP address 30.30.30.4) from PC1



The screenshot shows a Cisco Packet Tracer window for PC1. The 'Desktop' tab is selected, and a 'Command Prompt' window is open. The command prompt shows the command 'C:\>ping 30.30.30.4' being executed. The output indicates that the ping was successful, with 4 packets sent and 4 received, resulting in 0% loss. The approximate round trip times in milliseconds are: Minimum = 2ms, Maximum = 13ms, Average = 9ms.

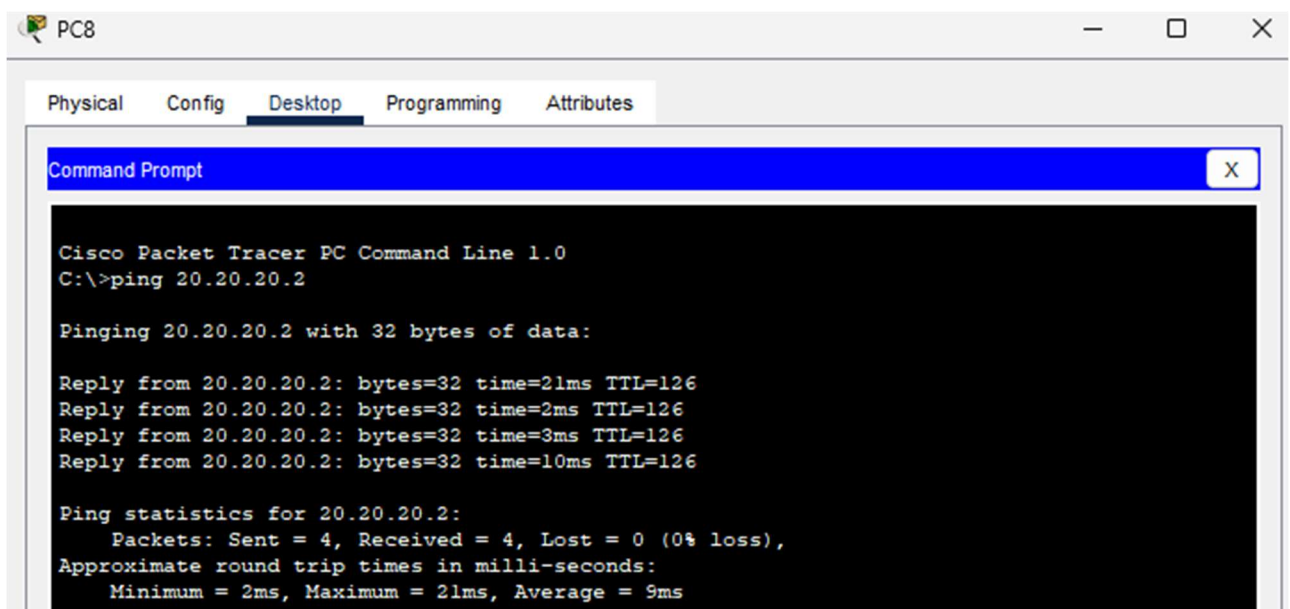
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 30.30.30.4

Pinging 30.30.30.4 with 32 bytes of data:

Reply from 30.30.30.4: bytes=32 time=2ms TTL=125
Reply from 30.30.30.4: bytes=32 time=11ms TTL=125
Reply from 30.30.30.4: bytes=32 time=10ms TTL=125
Reply from 30.30.30.4: bytes=32 time=13ms TTL=125

Ping statistics for 30.30.30.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 13ms, Average = 9ms
```

ii) Pinging PC3 (IP address 20.20.20.2) from PC8



The screenshot shows a Cisco Packet Tracer window for PC8. The 'Desktop' tab is selected, and a 'Command Prompt' window is open. The command prompt shows the command 'C:\>ping 20.20.20.2' being executed. The output indicates that the ping was successful, with 4 packets sent and 4 received, resulting in 0% loss. The approximate round trip times in milliseconds are: Minimum = 2ms, Maximum = 21ms, Average = 9ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 20.20.20.2

Pinging 20.20.20.2 with 32 bytes of data:

Reply from 20.20.20.2: bytes=32 time=21ms TTL=126
Reply from 20.20.20.2: bytes=32 time=2ms TTL=126
Reply from 20.20.20.2: bytes=32 time=3ms TTL=126
Reply from 20.20.20.2: bytes=32 time=10ms TTL=126

Ping statistics for 20.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 21ms, Average = 9ms
```

- **Result:**

Hence the BGP has been studied and verified through the given network