

Practical No 1

Aim: Using, linux-terminal or Windows-cmd, execute following networking commands and note the output: ping, traceroute, netstat, arp, ipconfig, Getmac, hostname, NSLookUp, pathping, SystemInfo

1. ping

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=4ms TTL=117
Reply from 8.8.8.8: bytes=32 time=5ms TTL=117
Reply from 8.8.8.8: bytes=32 time=17ms TTL=117
Reply from 8.8.8.8: bytes=32 time=3ms TTL=117

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 17ms, Average = 7ms

C:\Users\Static>
```

2. traceroute

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>tracert www.google.com

Tracing route to www.google.com [142.250.192.36]
over a maximum of 30 hops:

  0  1 ms  1 ms  1 ms  192.168.1.1
  1  3 ms  2 ms  2 ms  103.170.201.166
  2  2 ms  2 ms  2 ms  103.170.201.165
  3  *      *      3 ms  10.157.186.129
  4 18 ms  7 ms  7 ms  as15169.bom.extreme-ix.net [103.77.108.82]
  5  7 ms  5 ms  6 ms  74.125.37.7
  6  5 ms  5 ms  4 ms  142.250.210.183
  7  4 ms  3 ms  5 ms  bom12s15-in-f4.1e100.net [142.250.192.36]

Trace complete.

C:\Users\Static>
```

3. netstat

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP    192.168.1.104:49690      20.7.2.167:https        ESTABLISHED
TCP    192.168.1.104:49713      server-108-159-80-99:https CLOSE_WAIT
TCP    192.168.1.104:49729      104.18.41.183:https      CLOSE_WAIT
TCP    192.168.1.104:49732      104.18.41.183:https      CLOSE_WAIT
TCP    192.168.1.104:49765      ec2-18-211-21-156:https  ESTABLISHED
TCP    192.168.1.104:50017      whatsapp-cdn-shv-01-pnq1:https ESTABLISHED
TCP    192.168.1.104:50050      104.16.102.112:https     ESTABLISHED
TCP    192.168.1.104:50071      104.16.102.112:https     ESTABLISHED
TCP    192.168.1.104:50084      dns:https                CLOSE_WAIT
TCP    192.168.1.104:50148      52.111.252.6:https       ESTABLISHED
TCP    192.168.1.104:50149      52.111.252.6:https       ESTABLISHED
TCP    192.168.1.104:50191      ec2-34-213-149-83:https  CLOSE_WAIT
TCP    192.168.1.104:50193      a23-212-254-11:https     CLOSE_WAIT
TCP    192.168.1.104:50194      52.98.57.162:https       ESTABLISHED
TCP    192.168.1.104:50197      20.140.151.75:https      CLOSE_WAIT
TCP    192.168.1.104:50199      52.111.194.24:https      TIME_WAIT
TCP    192.168.1.104:50201      52.109.56.129:https      TIME_WAIT
TCP    192.168.1.104:50202      52.109.56.129:https      TIME_WAIT
TCP    192.168.1.104:50203      52.111.194.24:https      ESTABLISHED
TCP    192.168.1.104:50204      104.16.103.112:https     ESTABLISHED
TCP    [::1]:5426              Static-PC:49766           ESTABLISHED
TCP    [::1]:5426              Static-PC:49768           ESTABLISHED
TCP    [::1]:5426              Static-PC:49772           ESTABLISHED
TCP    [::1]:5426              Static-PC:49775           ESTABLISHED
TCP    [::1]:5426              Static-PC:49778           ESTABLISHED
TCP    [::1]:5426              Static-PC:49787           ESTABLISHED
TCP    [::1]:5426              Static-PC:49799           ESTABLISHED
TCP    [::1]:5426              Static-PC:49803           ESTABLISHED
```

4. arp

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>arp -a

Interface: 192.168.1.104 --- 0x7
Internet Address      Physical Address      Type
192.168.1.1           38-6b-1c-ae-0a-1a    dynamic
192.168.1.101         94-be-46-56-1e-85    dynamic
192.168.1.255         ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.251           01-00-5e-00-00-fb    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static
255.255.255.255       ff-ff-ff-ff-ff-ff    static

C:\Users\Static>
```

5. ipconfig

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-Local IPv6 Address . . . . . : fe80::c859:3da7:9a30:9658%7
    IPv4 Address. . . . . : 192.168.1.104
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

C:\Users\Static>
```

6. getmac

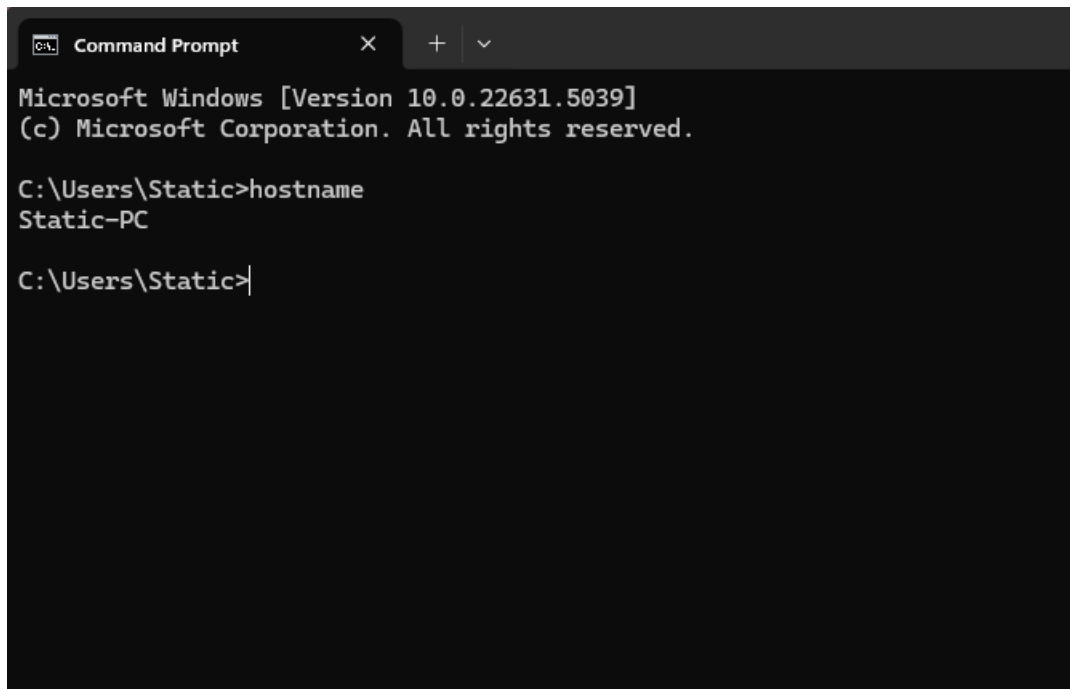
```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>getmac

Physical Address      Transport Name
=====
80-2B-F9-5C-9A-DF     \Device\Tcpip_{3569BFFB-079A-429B-A2CE-95449A7A5EB8}
54-48-10-EC-23-50     Media disconnected

C:\Users\Static>
```

7. hostname

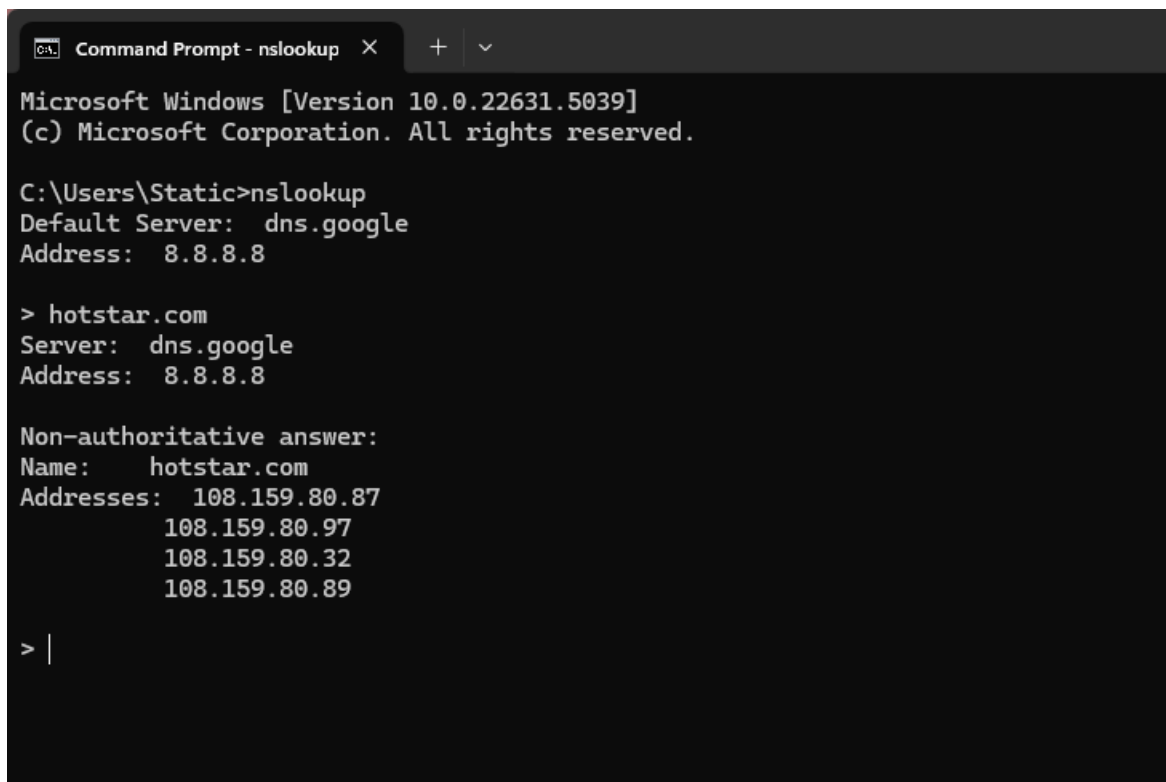


```
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>hostname
Static-PC

C:\Users\Static>
```

8. NSLookUp



```
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>nslookup
Default Server:  dns.google
Address:  8.8.8.8

> hotstar.com
Server:  dns.google
Address:  8.8.8.8

Non-authoritative answer:
Name:    hotstar.com
Addresses:  108.159.80.87
            108.159.80.97
            108.159.80.32
            108.159.80.89

> |
```

9. Pathping

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>pathping www.netflix.com

Tracing route to apiproxy-website-nlb-prod-1-5675d5ecda6efdd8.elb.eu-west-1.amazonaws.com [54.246.79.9]
over a maximum of 30 hops:
  0  Static-PC [192.168.1.104]
  1  192.168.1.1
  2  103.170.201.166
  3  103.170.201.165
  4  * * 10.157.186.129
  5  * * static-45-113-136-233.ctrls.in [45.113.136.233]
  6  * * *
Computing statistics for 125 seconds...
Hop  RTT      Source to Here   This Node/Link   Address
     Lost/Sent = Pct  Lost/Sent = Pct  Lost/Sent = Pct
  0                                     Static-PC [192.168.1.104]
  1    2ms      0/ 100 = 0%      0/ 100 = 0%      192.168.1.1
  2    4ms      0/ 100 = 0%      0/ 100 = 0%      103.170.201.166
  3    3ms      0/ 100 = 0%      0/ 100 = 0%      103.170.201.165
  4    3ms      0/ 100 = 0%      0/ 100 = 0%      10.157.186.129
  5    3ms      0/ 100 = 0%      0/ 100 = 0%      static-45-113-136-233.ctrls.in [45.113.136.233]

Trace complete.

C:\Users\Static>
```

10. Systeminfo

```
Command Prompt
Microsoft Windows [Version 10.0.22631.5039]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Static>systeminfo

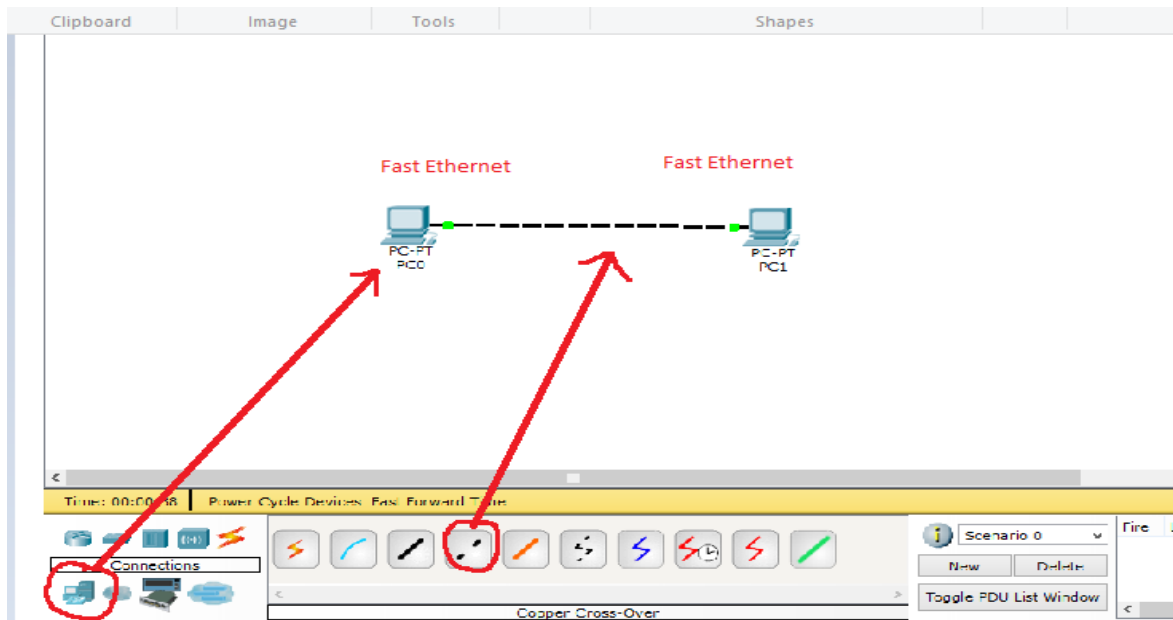
Host Name:                STATIC-PC
OS Name:                  Microsoft Windows 11 Pro
OS Version:               10.0.22631 N/A Build 22631
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         N/A
Registered Organization:  N/A
Product ID:               00330-81486-16324-AA640
Original Install Date:    13-10-2024, 19:23:13
System Boot Time:         17-03-2025, 14:09:14
System Manufacturer:      Dell Inc.
System Model:              Inspiron 3576
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 142 Stepping 10 GenuineIntel ~1600 Mhz
BIOS Version:              Dell Inc. 1.16.0, 16-12-2021
Windows Directory:        C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:              en-us;English (United States)
Input Locale:              00004009
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:     16,249 MB
```

Practical No 2

Aim: Using Packet Tracer, create a basic network of two computers using appropriate network wire through Static IP address allocation and verify connectivity

Theory:

We use the following network to verify the connectivity using Cisco packet tracer



Now we set the ip address of the devices as follows

Host name	ip Address	Default Gateway
PC0	192.168.1.2	192.168.1.1
PC1	192.168.1.3	192.168.1.1

PC1

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.3

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::206:2AFF:FE01:EEDE

Default Gateway:

DNS Server:

802.1X

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

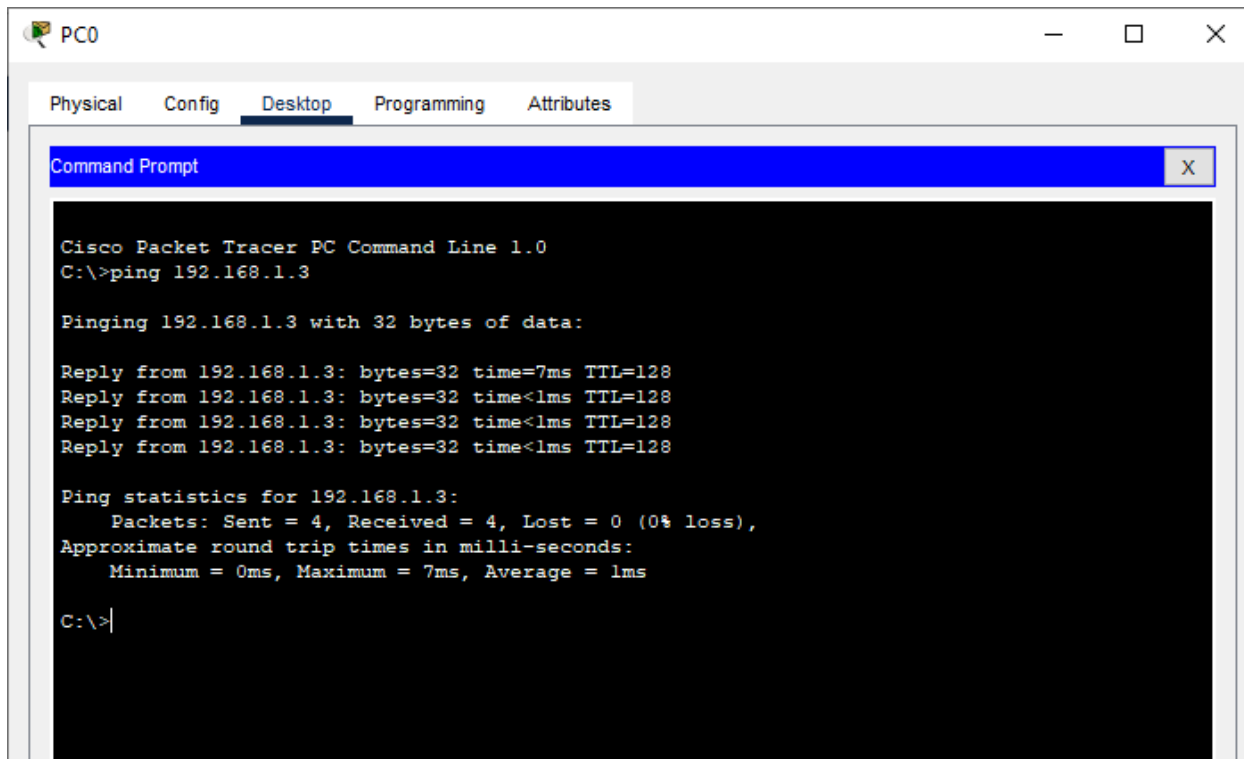
IPv6 Address: /

Link Local Address: FE80::202:16FF:FEA6:BA6D

Default Gateway:

DNS Server:

In order to check the connectivity we send a ping command from PC0 to PC1 as follows



```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=7ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 7ms, Average = 1ms

C:\>|
```

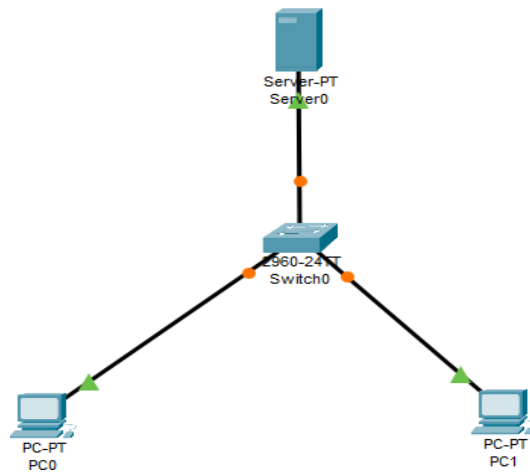
Result:

Hence the Connectivity between the PCs has been verified.

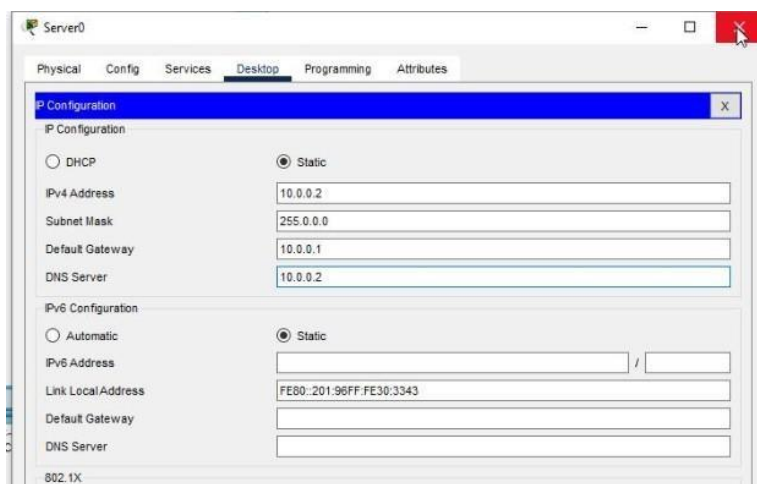
Practical No 3

Aim: Using Packet Tracer, create a basic network of one server and two computers using appropriate network wire. Use Dynamic IP address allocation and show connectivity

We use the following topology for the present case



Configuring the Server:



Enabling and setting the DHCP Service on the Server:

The screenshot shows the 'Server0' configuration window with the 'Services' tab selected. The 'DHCP' service is enabled (radio button selected). The configuration fields are as follows:

- Interface: FastEthernet0
- Service: On
- Pool Name: serverPool
- Default Gateway: 10.0.0.1
- DNS Server: 10.0.0.2
- Start IP Address: 10.0.0.3
- Subnet Mask: 255.0.0.0
- Maximum Number of Users: 512
- TFTP Server: 0.0.0.0
- WLC Address: 0.0.0.0

Buttons: Add, Save, Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	10.0.0.1	10.0.0.2	10.0.0.3	255.0.0.0	512	0.0.0.0	0.0.0.0

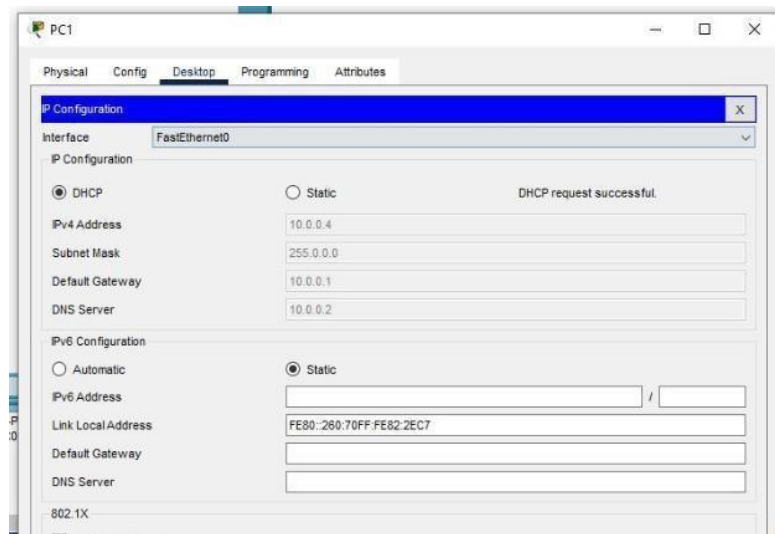
Verifying the Dynamic Addressing on both the PCs:

The screenshot shows the 'PC0' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing the following settings:

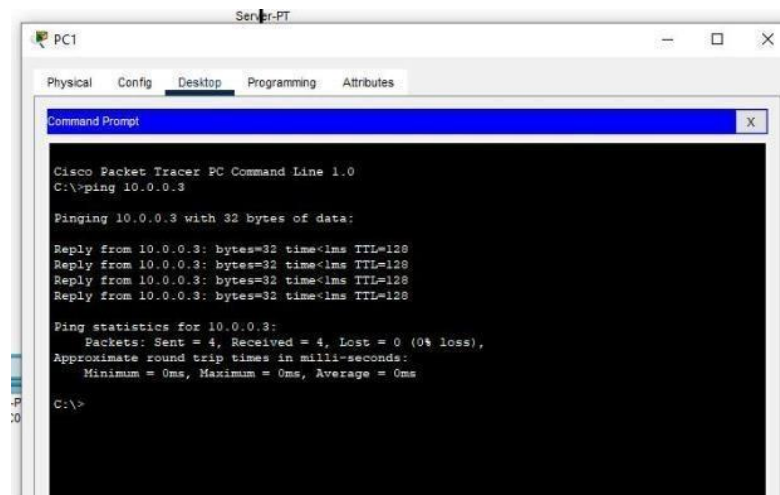
- Interface: FastEthernet0
- IP Configuration: DHCP (radio button selected)
- Static: (radio button unselected)
- DHCP request successful: (checkbox checked)
- IPv4 Address: 10.0.0.3
- Subnet Mask: 255.0.0.0
- Default Gateway: 10.0.0.1
- DNS Server: 10.0.0.2

IPv6 Configuration:

- Automatic: (radio button unselected)
- Static: (radio button selected)
- IPv6 Address: (empty field)
- Link Local Address: FE80::260:5CFF:FE65:CD24
- Default Gateway: (empty field)
- DNS Server: (empty field)



Checking the connectivity:



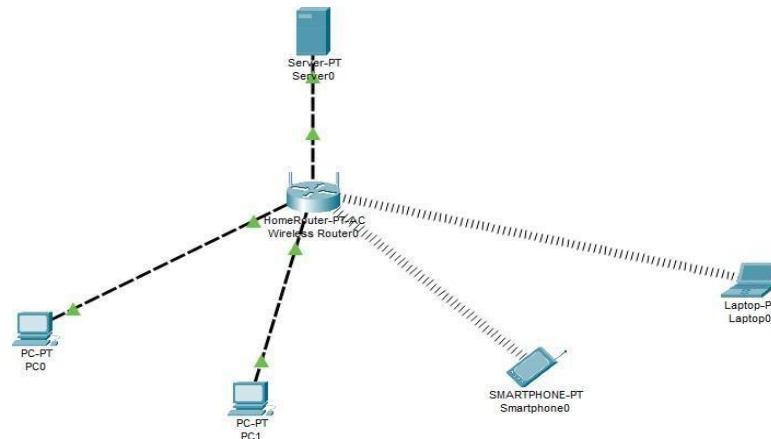
Result:

Hence the Connectivity between the PCs has been verified.

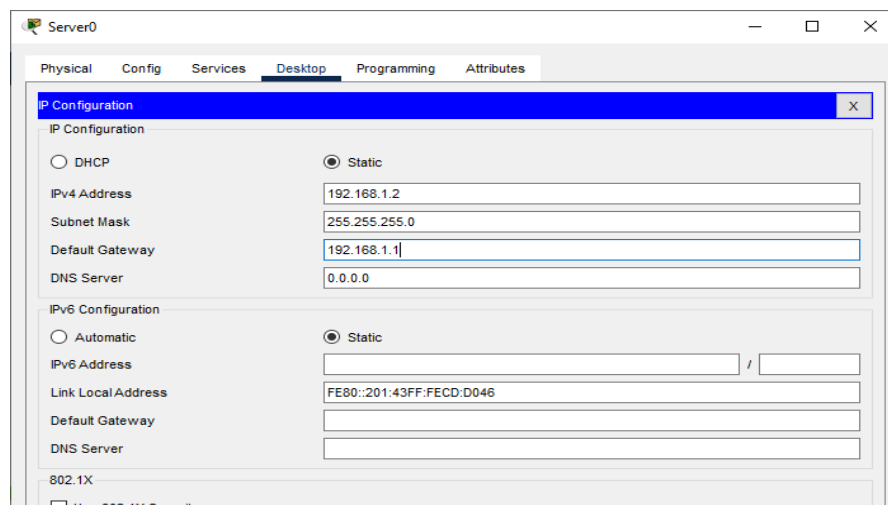
Practical No 4

Aim: Using Packet Tracer, create a basic network of one server and two computers and two mobile / movable devices using appropriate network wire. And verify the connectivity

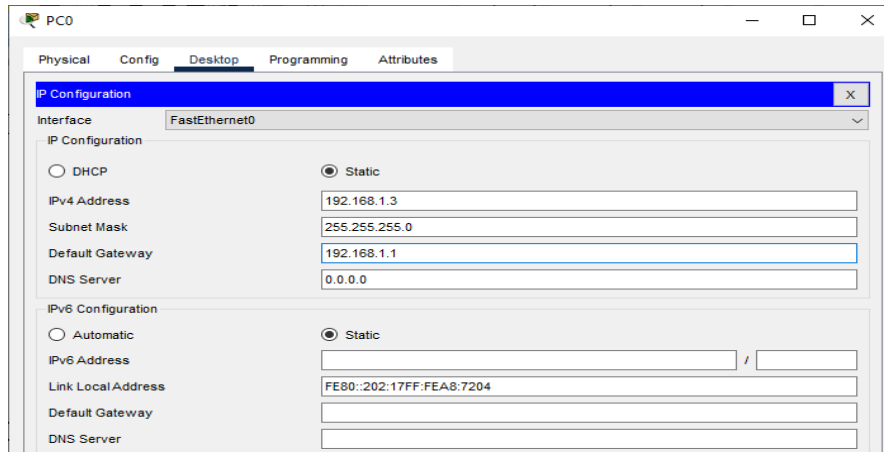
For the present case we use the following topology



Configure the Server:



Configure PC0:



PC0

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.3

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

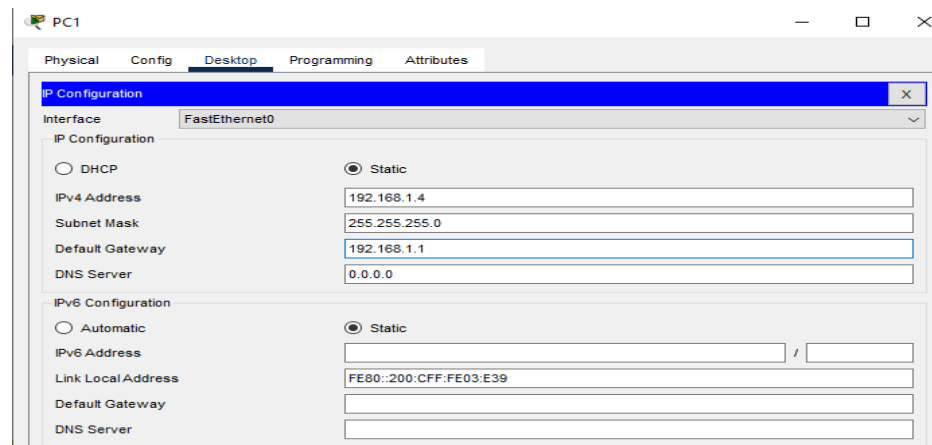
IPv6 Address: /

Link Local Address: FE80::202:17FF:FEA8:7204

Default Gateway:

DNS Server:

Configure PC1:



PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.4

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

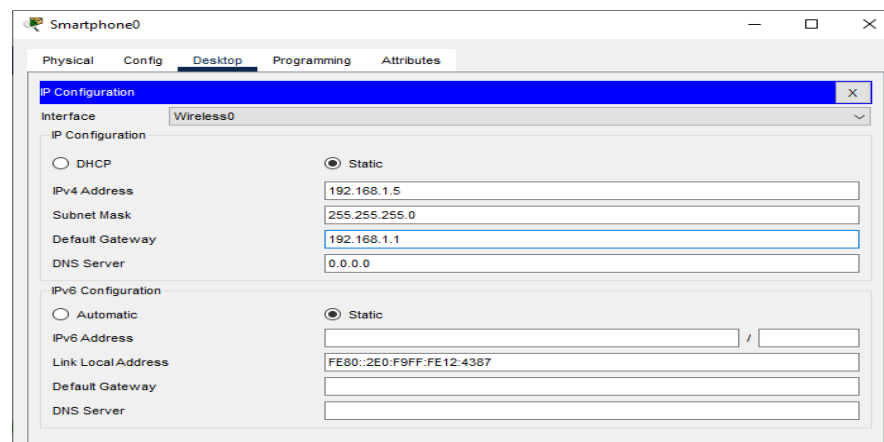
IPv6 Address: /

Link Local Address: FE80::200:CFF:FE03:E39

Default Gateway:

DNS Server:

Configure Smartphone0:



Smartphone0

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: Wireless0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 192.168.1.5

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

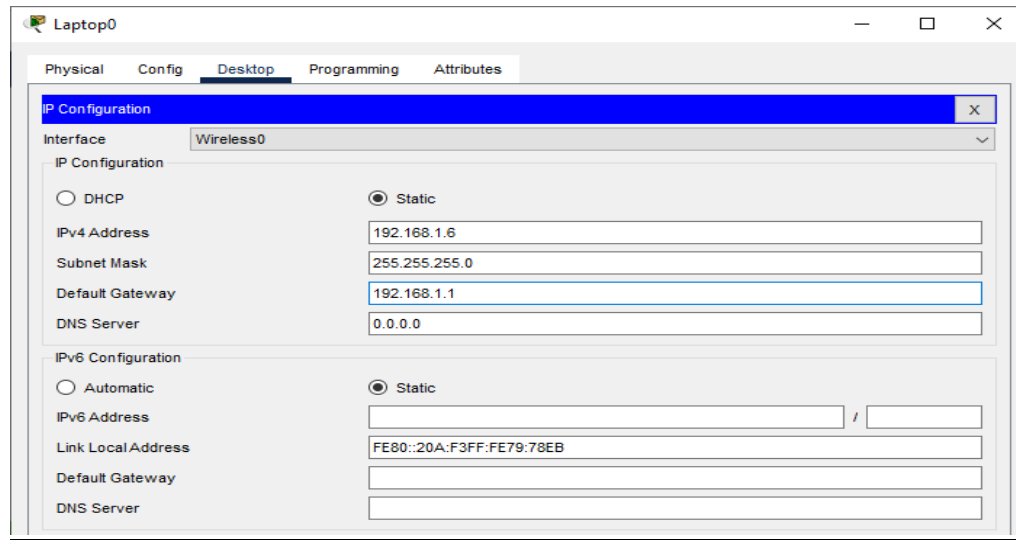
IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE12:4387

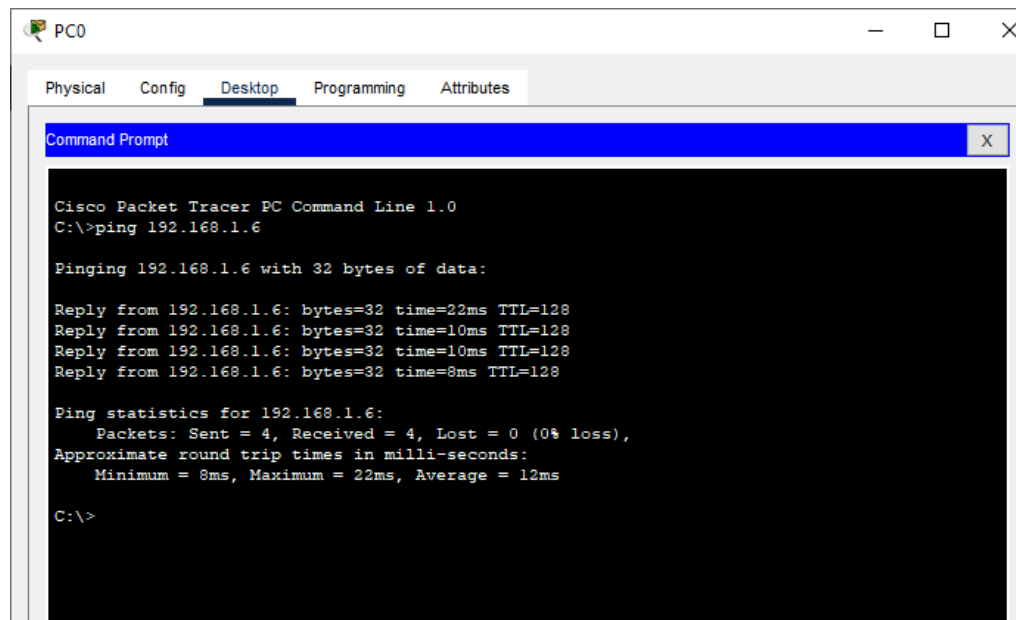
Default Gateway:

DNS Server:

Configure Laptop0:



Checking the connectivity (pinging laptop0 from PC0):



Similarly the ping message can be checked for all the devices

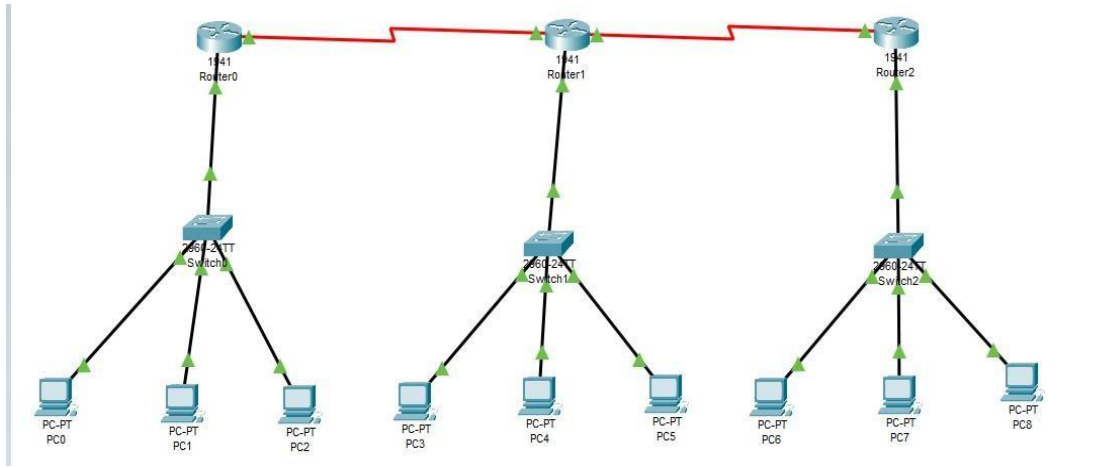
Result:

Hence the Connectivity of the network has been verified.

Practical No 5

Aim: Using Packet Tracer to create a network with three routers with RIPv1 and each router associated network will have minimum three PC and show the connectivity

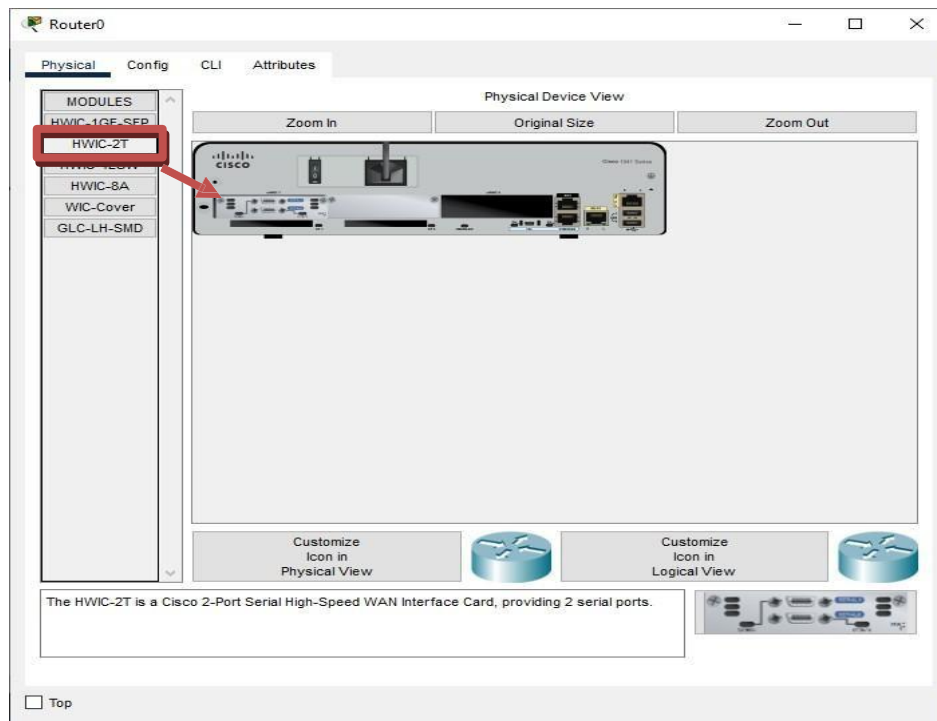
We use the following topology for the present case



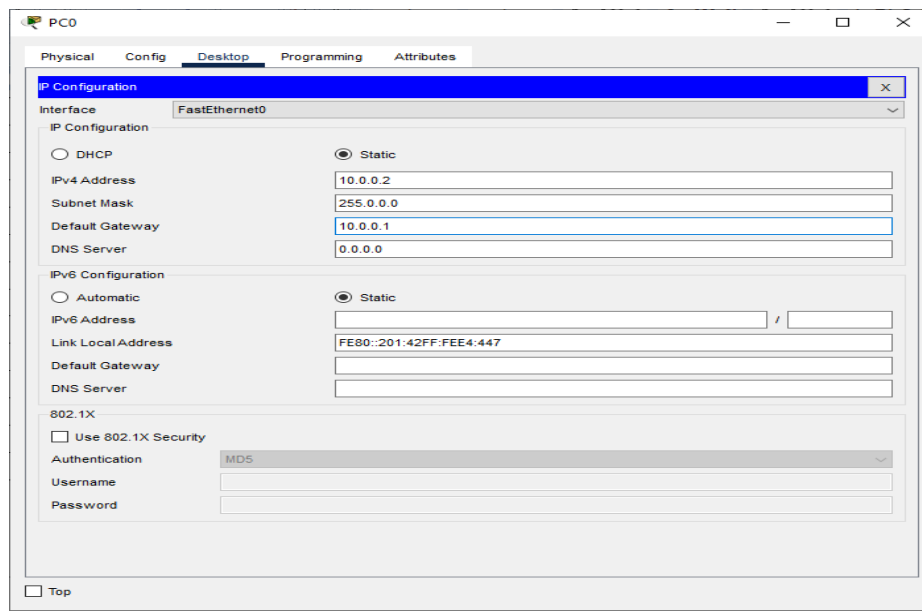
We configure the above network using the following IP addresses

Host	Interface	IP address	Network Address	Default Gateway
Router 0	G0/0	10.0.0.1	10.0.0.0	
	S0/1/0	192.168.0.1	192.168.0.0	
Router 1	G0/0	20.0.0.1	20.0.0.0	
	S0/1/0	192.168.0.2	192.168.0.0	
	S0/1/1	192.168.1.1	192.168.1.0	
Router 2	G0/0	30.0.0.1	30.0.0.0	
	S0/1/1	192.168.1.2	192.168.1.0	
PC0	FastEthernet0	10.0.0.2	10.0.0.0	
PC1	FastEthernet0	10.0.0.3	10.0.0.0	
PC2	FastEthernet0	10.0.0.4	10.0.0.0	
PC3	FastEthernet0	20.0.0.2	20.0.0.0	
PC4	FastEthernet0	20.0.0.3	20.0.0.0	
PC5	FastEthernet0	20.0.0.4	20.0.0.0	
PC6	FastEthernet0	30.0.0.2	30.0.0.0	
PC7	FastEthernet0	30.0.0.3	30.0.0.0	
PC8	FastEthernet0	30.0.0.4	30.0.0.0	

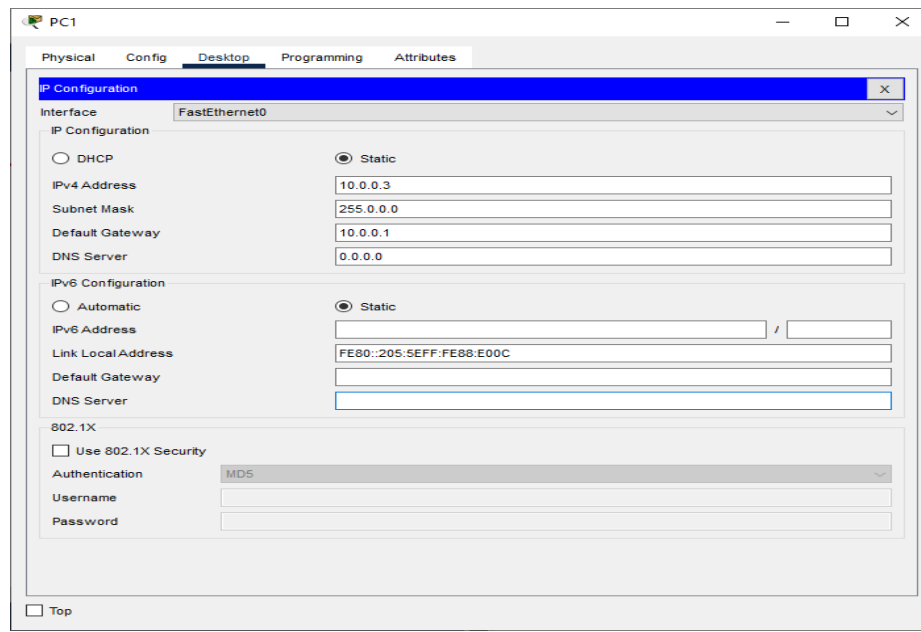
Adding Serial Interface in each Router



Configuring PC0:



Configuring PC1:



The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below these are fields for 'IPv4 Address' (10.0.0.3), 'Subnet Mask' (255.0.0.0), 'Default Gateway' (10.0.0.1), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below these are fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::205:5EFF:FE88:E00C), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox 'Use 802.1X Security' (unchecked), a dropdown 'Authentication' (MD5), and fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.3

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::205:5EFF:FE88:E00C

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

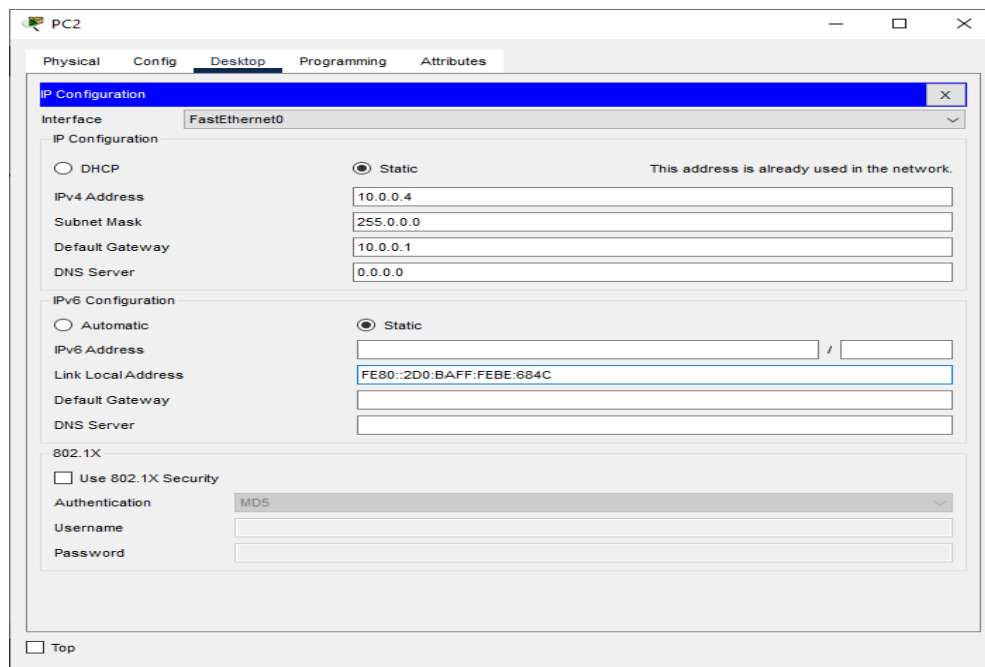
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC2:



The screenshot shows the 'PC2' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below these are fields for 'IPv4 Address' (10.0.0.4), 'Subnet Mask' (255.0.0.0), 'Default Gateway' (10.0.0.1), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below these are fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::2D0:BAFF:FE8E:684C), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox 'Use 802.1X Security' (unchecked), a dropdown 'Authentication' (MD5), and fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left. A red error message 'This address is already used in the network.' is displayed next to the 'Static' radio button.

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static This address is already used in the network.

IPv4 Address: 10.0.0.4

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:BAFF:FE8E:684C

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

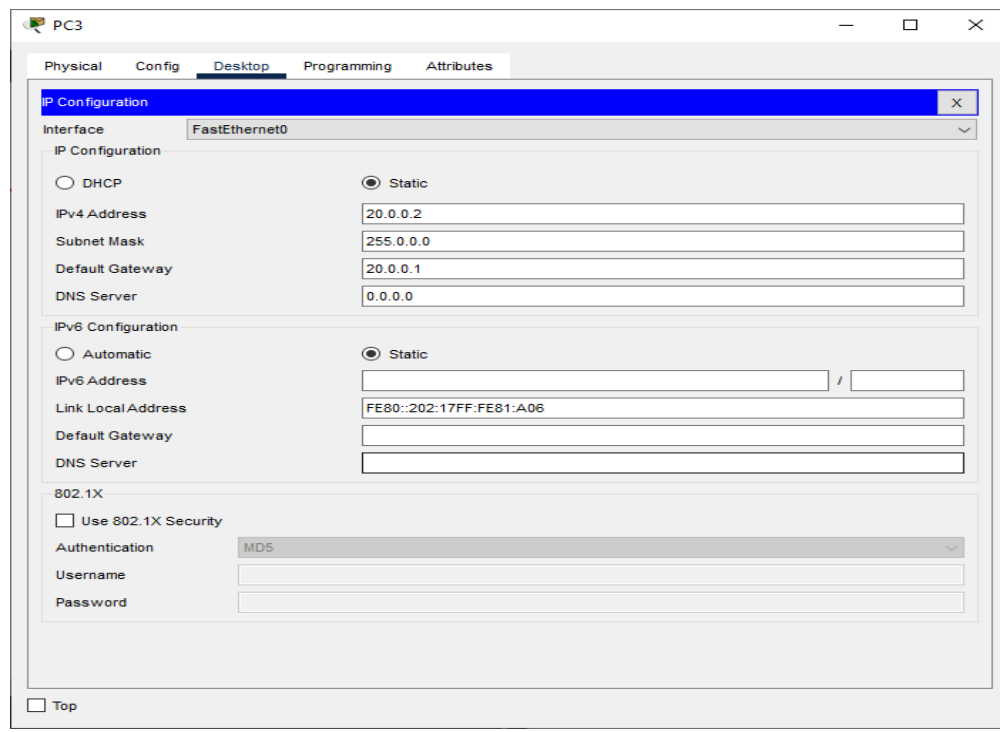
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC3:

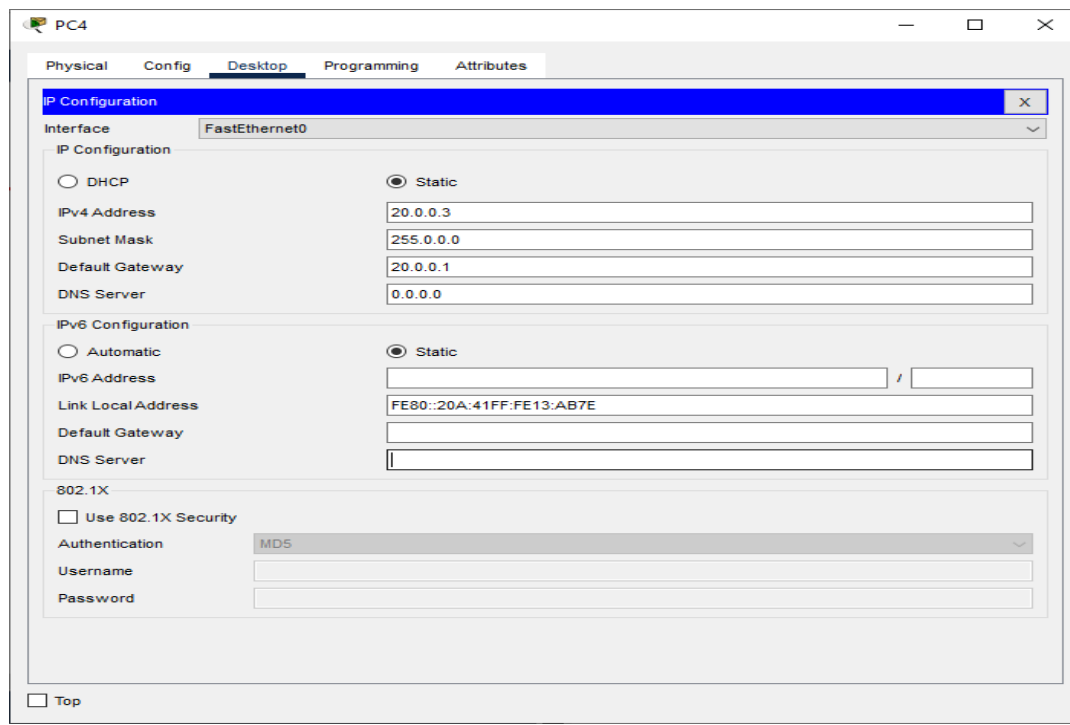


The screenshot shows the 'PC3' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IP Address 20.0.0.2, Subnet Mask 255.0.0.0, Default Gateway 20.0.0.1, and DNS Server 0.0.0.0. The IPv6 settings are: Static selected, Link Local Address FE80::202:17FF:FE81:A06, and Default Gateway and DNS Server fields are empty. The '802.1X' section is collapsed, showing 'Use 802.1X Security' as unchecked, 'Authentication' as MD5, and 'Username' and 'Password' fields as empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	20.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::202:17FF:FE81:A06
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC4:



The screenshot shows the 'PC4' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IP Address 20.0.0.3, Subnet Mask 255.0.0.0, Default Gateway 20.0.0.1, and DNS Server 0.0.0.0. The IPv6 settings are: Static selected, Link Local Address FE80::20A:41FF:FE13:AB7E, and Default Gateway and DNS Server fields are empty. The '802.1X' section is collapsed, showing 'Use 802.1X Security' as unchecked, 'Authentication' as MD5, and 'Username' and 'Password' fields as empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	20.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::20A:41FF:FE13:AB7E
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC5:

The screenshot shows the configuration window for PC5. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 address is set to 20.0.0.4, subnet mask to 255.0.0.0, default gateway to 20.0.0.1, and DNS server to 0.0.0.0. The IPv6 address is set to FE80::2E0:F9FF:FE0D:3AA, and the link local address is FE80::2E0:F9FF:FE0D:3AA. The '802.1X' section is collapsed, and the 'Use 802.1X Security' checkbox is unchecked. The 'Authentication' dropdown is set to 'MD5', and the 'Username' and 'Password' fields are empty. A 'Top' button is located at the bottom left.

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 20.0.0.4

Subnet Mask: 255.0.0.0

Default Gateway: 20.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE0D:3AA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Configuring PC6:

The screenshot shows the configuration window for PC6. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 address is set to 30.0.0.2, subnet mask to 255.0.0.0, default gateway to 30.0.0.1, and DNS server to 0.0.0.0. The IPv6 address is set to FE80::2E0:F9FF:FE9A:D3AA, and the link local address is FE80::2E0:F9FF:FE9A:D3AA. The '802.1X' section is collapsed, and the 'Use 802.1X Security' checkbox is unchecked. The 'Authentication' dropdown is set to 'MD5', and the 'Username' and 'Password' fields are empty. A 'Top' button is located at the bottom left.

PC6

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 30.0.0.2

Subnet Mask: 255.0.0.0

Default Gateway: 30.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE9A:D3AA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

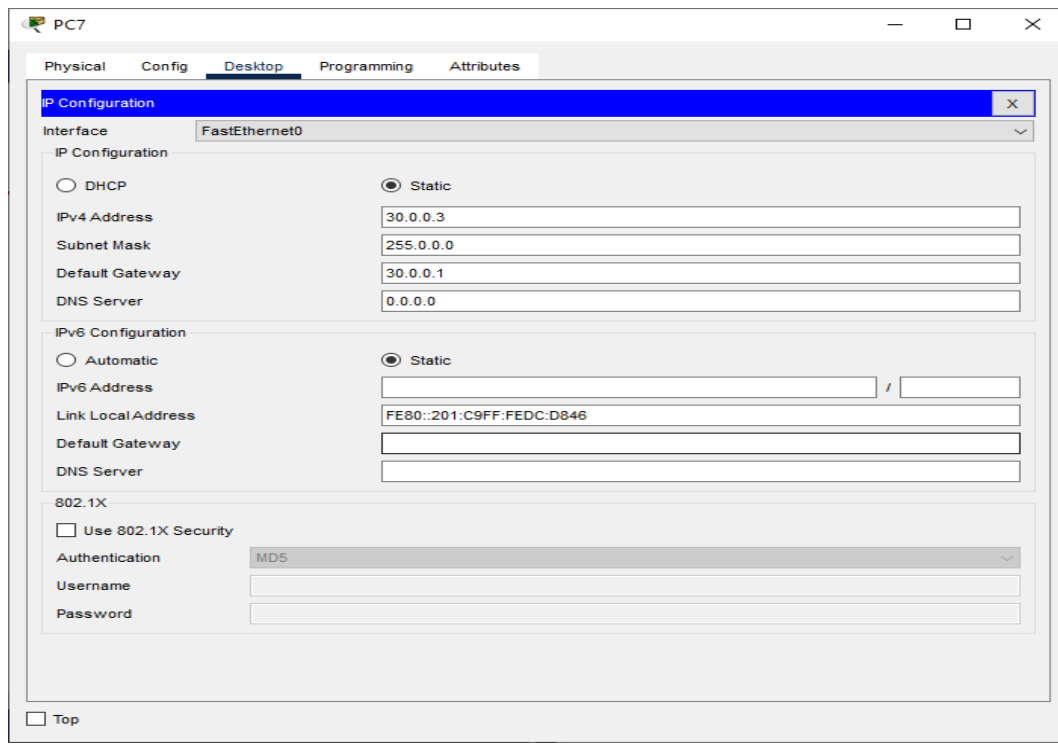
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC7:

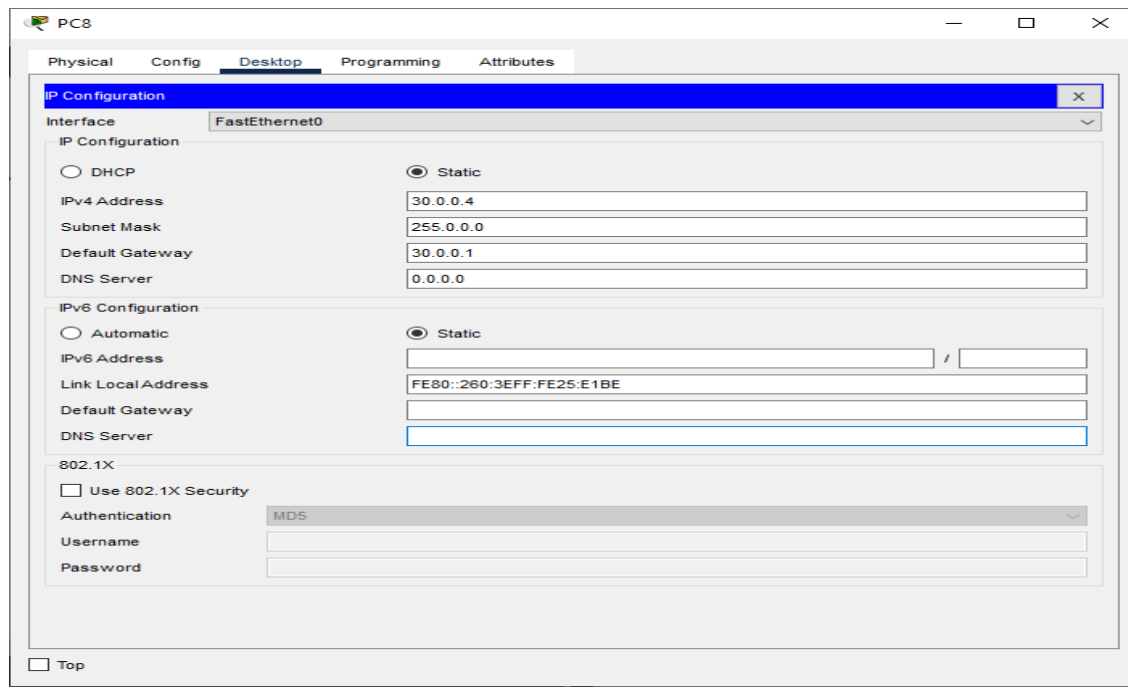


The screenshot shows the configuration window for PC7. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.3, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected. The IPv6 Address field is empty, and the Link Local Address is set to FE80::201:C9FF:FEDC:D846. The '802.1X' section is collapsed. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::201:C9FF:FEDC:D846
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC8:



The screenshot shows the configuration window for PC8. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.4, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected. The IPv6 Address field is empty, and the Link Local Address is set to FE80::260:3EFF:FE25:E1BE. The '802.1X' section is collapsed. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::260:3EFF:FE25:E1BE
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring Router 0 (using the CLI mode)

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 10.0.0.1
255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/0
Router(config-if)#ip address 192.168.0.1
255.255.255.0 Router(config-if)#no shutdown
Router(config-
if)#exit Router(config)#
Router#
```

Configuring Router 1 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#interface
gigabitEthernet 0/0 Router(config-if)#ip
address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/0
Router(config-if)#ip address 192.168.0.2
255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/1
Router(config-if)#ip address 192.168.1.1
255.255.255.0
Router(config-if)#no shutdown
```

Configuring Router 2 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#interface
gigabitEthernet 0/0
Router(config-if)#ip address 30.0.0.1
255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/1
Router(config-if)#ip address 192.168.1.2
255.255.255.0
Router(config-if)#no shutdown
```

Setting the RIPv1 on Router 0

```
Router>enable
Router#configure
terminal
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#exit
```

Setting the RIPv1 on Router 1

```
Router>enable
Router#configure
terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 192.168.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#
```

Router#

Setting the RIPv1 on Router 2

Router>enable

Router#configure

terminal

Router(config)#router rip

Router(config-router)#network 192.168.1.0

Router(config-router)#network

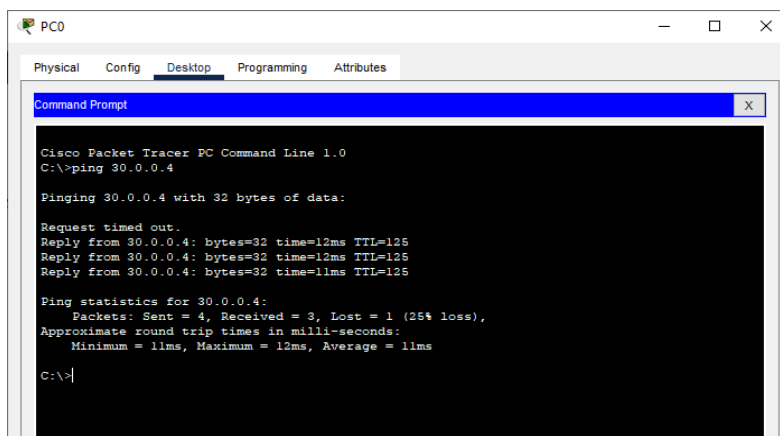
30.0.0.0

Router(config-router)#exit

Router(config)#

Checking the connectivity by using the ping command

Pinging PC8 (ip address 30.0.0.4) from PC0



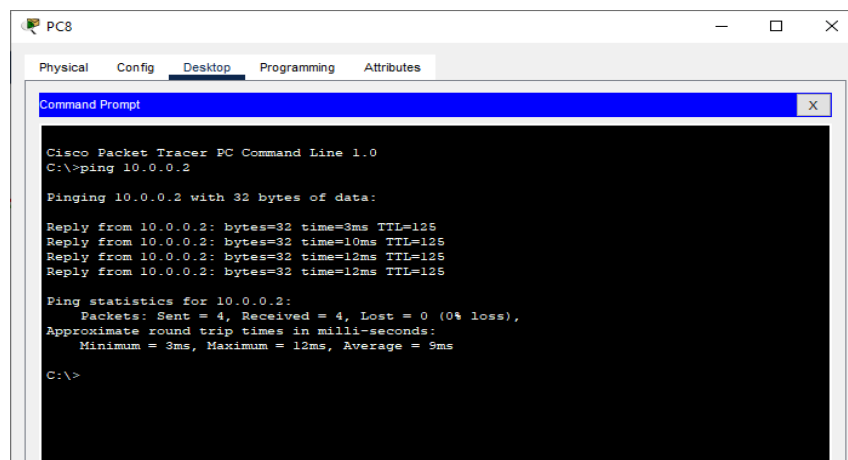
```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 30.0.0.4

Pinging 30.0.0.4 with 32 bytes of data:

Request timed out.
Reply from 30.0.0.4: bytes=32 time=12ms TTL=125
Reply from 30.0.0.4: bytes=32 time=12ms TTL=125
Reply from 30.0.0.4: bytes=32 time=11ms TTL=125

Ping statistics for 30.0.0.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 12ms, Average = 11ms
C:\>
```

Pinging PC0 (ip address 10.0.0.2) from PC8



```
PC8
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=3ms TTL=125
Reply from 10.0.0.2: bytes=32 time=10ms TTL=125
Reply from 10.0.0.2: bytes=32 time=12ms TTL=125
Reply from 10.0.0.2: bytes=32 time=12ms TTL=125

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 12ms, Average = 9ms
C:\>
```

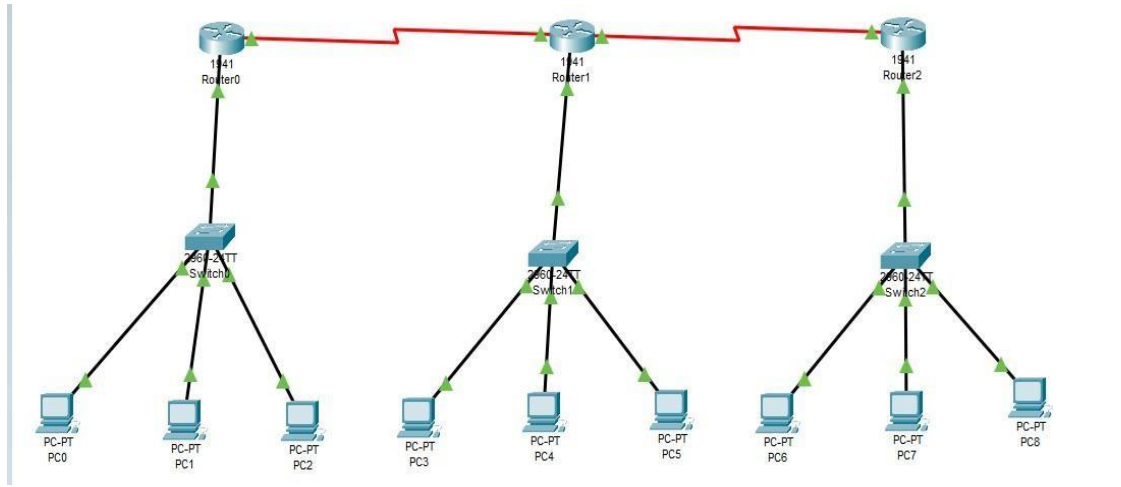
Result:

Hence the RIPv1 has been studied and verified through the given network

Practical No 6

Aim: Using Packet Tracer to create a network with three routers with RIPv2 and each router associated network will have minimum three PC and show the connectivity

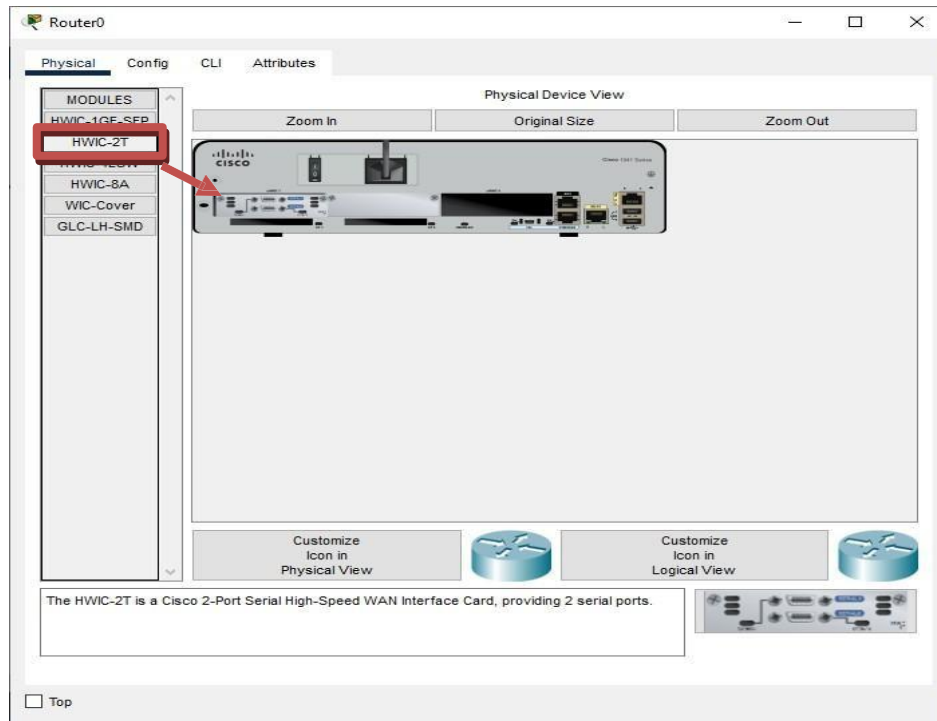
We use the following topology for the present case



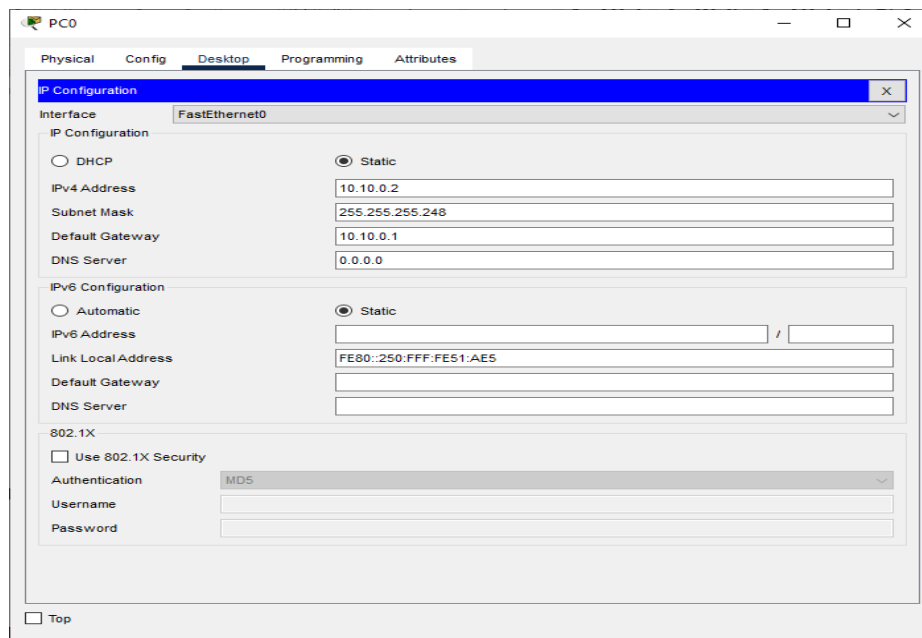
We configure the above network using the following IP addresses

Host	Interface	IP address	Subnet Mask	Network Address	Default Gateway
Router 0	G0/0	10.10.0.1	255.255.255.248	10.10.0.0	
	S0/1/0	192.168.0.1	255.255.255.252	192.168.0.0	
Router 1	G0/0	10.20.0.1	255.255.255.248	10.20.0.0	
	S0/1/0	192.168.0.2	255.255.255.252	192.168.0.0	
	S0/1/1	192.168.1.1	255.255.255.252	192.168.1.0	
Router 2	G0/0	10.30.0.1	255.255.255.248	10.30.0.0	
	S0/1/1	192.168.1.2	255.255.255.252	192.168.1.0	
PC0	FastEthernet0	10.10.0.2	255.255.255.248	10.10.0.0	10.10.0.1
PC1	FastEthernet0	10.10.0.3	255.255.255.248	10.10.0.0	10.10.0.1
PC2	FastEthernet0	10.10.0.4	255.255.255.248	10.10.0.0	10.10.0.1
PC3	FastEthernet0	10.20.0.2	255.255.255.248	10.20.0.0	10.20.0.1
PC4	FastEthernet0	10.20.0.3	255.255.255.248	10.20.0.0	10.20.0.1
PC5	FastEthernet0	10.20.0.4	255.255.255.248	10.20.0.0	10.20.0.1
PC6	FastEthernet0	10.30.0.2	255.255.255.248	10.30.0.0	10.30.0.1
PC7	FastEthernet0	10.30.0.3	255.255.255.248	10.30.0.0	10.30.0.1
PC8	FastEthernet0	10.30.0.4	255.255.255.248	10.30.0.0	10.30.0.1

Adding Serial Interface in each Router



Configuring PC0:



Configuring PC1:

The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two sub-sections: 'IP Configuration' and 'IPv6 Configuration'. The 'IP Configuration' sub-section has radio buttons for 'DHCP' and 'Static', with 'Static' selected. Below these are text fields for 'IPv4 Address' (10.10.0.3), 'Subnet Mask' (255.255.255.248), 'Default Gateway' (10.10.0.1), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' sub-section has radio buttons for 'Automatic' and 'Static', with 'Static' selected. Below these are text fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::2D0:BAFF:FEA4:5B72), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' (MDS), and text fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

PC1

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.10.0.3

Subnet Mask: 255.255.255.248

Default Gateway: 10.10.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:BAFF:FEA4:5B72

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MDS

Username:

Password:

☐ Top

Configuring PC2:

The screenshot shows the 'PC2' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two sub-sections: 'IP Configuration' and 'IPv6 Configuration'. The 'IP Configuration' sub-section has radio buttons for 'DHCP' and 'Static', with 'Static' selected. Below these are text fields for 'IPv4 Address' (10.10.0.4), 'Subnet Mask' (255.255.255.248), 'Default Gateway' (10.10.0.1), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' sub-section has radio buttons for 'Automatic' and 'Static', with 'Static' selected. Below these are text fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::2D0:BCFF:FE33:A758), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' (MDS), and text fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

PC2

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.10.0.4

Subnet Mask: 255.255.255.248

Default Gateway: 10.10.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:BCFF:FE33:A758

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MDS

Username:

Password:

☐ Top

Configuring PC3:

The screenshot shows the configuration window for PC3. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration includes an IP address of 10.20.0.2, a subnet mask of 255.255.255.248, a default gateway of 10.20.0.1, and a DNS server of 0.0.0.0. The IPv6 configuration includes a static IPv6 address, a link local address of FE80::2E0:8FFF:FE7E:6379, and empty fields for default gateway and DNS server. The 802.1X section shows 'Use 802.1X Security' is unchecked, and 'Authentication' is set to 'MD5'.

PC3

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.20.0.2

Subnet Mask: 255.255.255.248

Default Gateway: 10.20.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:8FFF:FE7E:6379

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Configuring PC4:

The screenshot shows the configuration window for PC4. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration includes an IP address of 10.20.0.3, a subnet mask of 255.255.255.248, a default gateway of 10.20.0.1, and a DNS server of 0.0.0.0. The IPv6 configuration includes a static IPv6 address, a link local address of FE80::2D0:FFFF:FE8B:2C17, and empty fields for default gateway and DNS server. The 802.1X section shows 'Use 802.1X Security' is unchecked, and 'Authentication' is set to 'MD5'.

PC4

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.20.0.3

Subnet Mask: 255.255.255.248

Default Gateway: 10.20.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:FFFF:FE8B:2C17

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Configuring PC5:

The screenshot shows the configuration window for PC5. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 address is 10.20.0.4, subnet mask is 255.0.0.0, default gateway is 10.20.0.1, and DNS server is 0.0.0.0. The IPv6 address is empty, link local address is FE80::230:F2FF:FE77:CBE7, and default gateway and DNS server are empty. The '802.1X' section is collapsed, and the 'Use 802.1X Security' checkbox is unchecked. The 'Authentication' dropdown is set to 'MD5', and the 'Username' and 'Password' fields are empty. A 'Top' button is located at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	10.20.0.4
Subnet Mask	255.0.0.0
Default Gateway	10.20.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::230:F2FF:FE77:CBE7
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

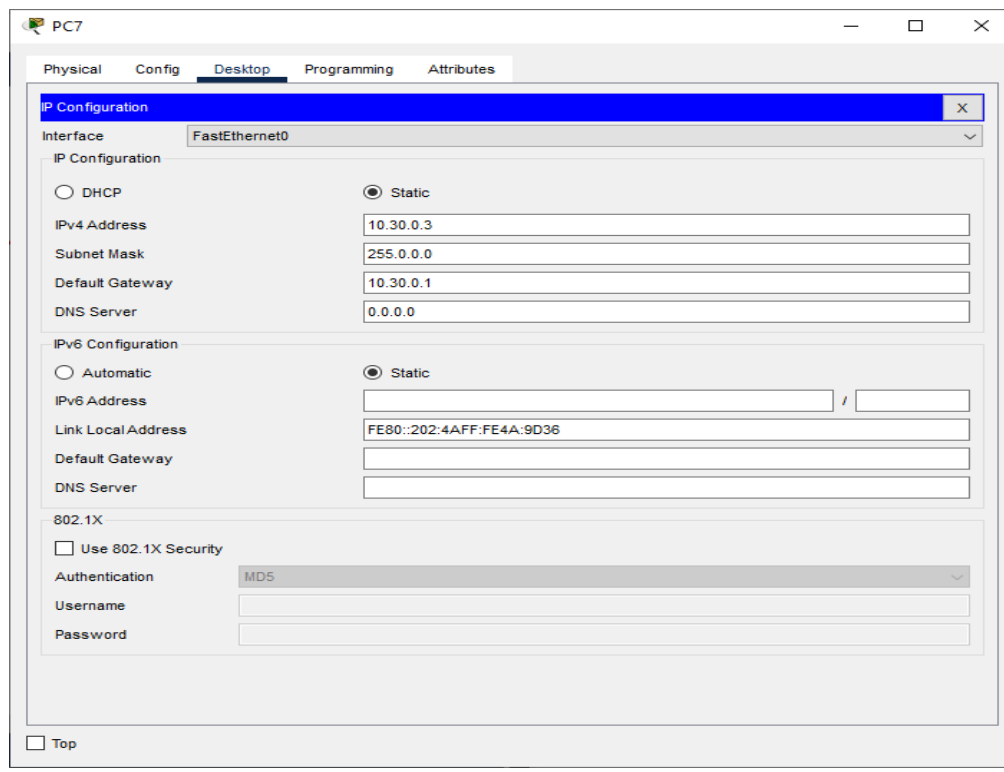
Configuring PC6:

The screenshot shows the configuration window for PC6. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 address is 10.30.0.2, subnet mask is 255.255.255.248, default gateway is 10.30.0.1, and DNS server is 0.0.0.0. The IPv6 address is empty, link local address is FE80::200:CFF:FE40:DCD0, and default gateway and DNS server are empty. The '802.1X' section is collapsed, and the 'Use 802.1X Security' checkbox is unchecked. The 'Authentication' dropdown is set to 'MD5', and the 'Username' and 'Password' fields are empty. A 'Top' button is located at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	10.30.0.2
Subnet Mask	255.255.255.248
Default Gateway	10.30.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::200:CFF:FE40:DCD0
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC7:



The screenshot shows the configuration window for PC7. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 10.30.0.3, Subnet Mask to 255.0.0.0, Default Gateway to 10.30.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing the 'Static' radio button selected. The IPv6 Address is empty, Link Local Address is FE80::202:4AFF:FE4A:9D36, Default Gateway is empty, and DNS Server is empty. The '802.1X' section is expanded, showing 'Use 802.1X Security' unchecked, Authentication set to MD5, Username empty, and Password empty. A 'Top' button is at the bottom left.

PC7

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 10.30.0.3

Subnet Mask 255.0.0.0

Default Gateway 10.30.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::202:4AFF:FE4A:9D36

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

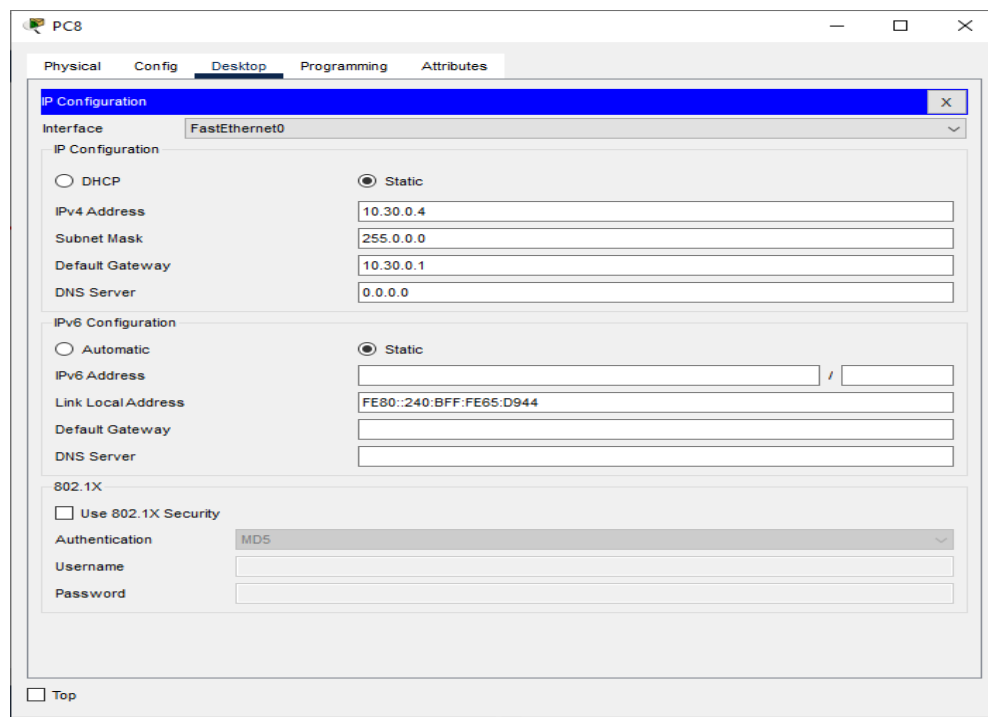
Authentication MD5

Username

Password

☐ Top

Configuring PC8:



The screenshot shows the configuration window for PC8. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 10.30.0.4, Subnet Mask to 255.0.0.0, Default Gateway to 10.30.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing the 'Static' radio button selected. The IPv6 Address is empty, Link Local Address is FE80::240:BFF:FE65:D944, Default Gateway is empty, and DNS Server is empty. The '802.1X' section is expanded, showing 'Use 802.1X Security' unchecked, Authentication set to MD5, Username empty, and Password empty. A 'Top' button is at the bottom left.

PC8

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 10.30.0.4

Subnet Mask 255.0.0.0

Default Gateway 10.30.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::240:BFF:FE65:D944

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

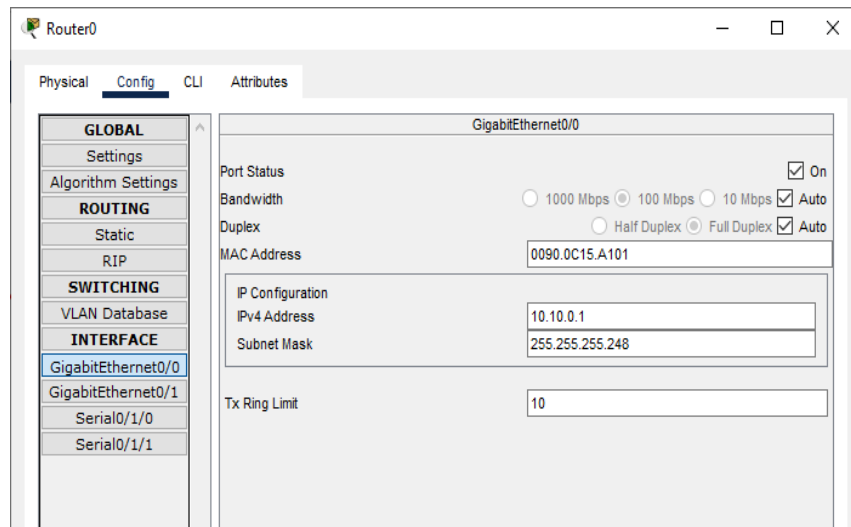
Username

Password

☐ Top

Configuring IP addresses on Router 0

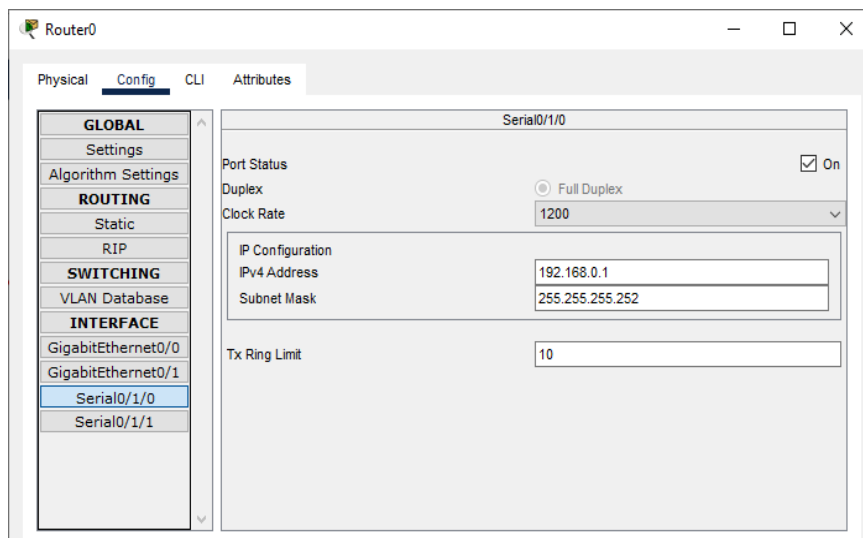
i) Interface G0/0



The screenshot shows the configuration window for Router0, specifically the 'Config' tab for the GigabitEthernet0/0 interface. The left sidebar lists various configuration categories: GLOBAL, Settings, Algorithm Settings, ROUTING, Static, RIP, SWITCHING, VLAN Database, and INTERFACE. Under the INTERFACE category, GigabitEthernet0/0 is selected. The main configuration area for GigabitEthernet0/0 includes the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0090.0C15.A101
- IP Configuration:
 - IPv4 Address: 10.10.0.1
 - Subnet Mask: 255.255.255.248
- Tx Ring Limit: 10

ii) Interface S0/1/0



The screenshot shows the configuration window for Router0, specifically the 'Config' tab for the Serial0/1/0 interface. The left sidebar lists various configuration categories: GLOBAL, Settings, Algorithm Settings, ROUTING, Static, RIP, SWITCHING, VLAN Database, and INTERFACE. Under the INTERFACE category, Serial0/1/0 is selected. The main configuration area for Serial0/1/0 includes the following settings:

- Port Status: ☒ On
- Duplex: ☒ Full Duplex
- Clock Rate: 1200
- IP Configuration:
 - IPv4 Address: 192.168.0.1
 - Subnet Mask: 255.255.255.252
- Tx Ring Limit: 10

Configuring IP addresses on Router 1

i) Interface G0/0

The screenshot shows the configuration window for Router1, specifically for the GigabitEthernet0/0 interface. The left sidebar shows the configuration tree with 'INTERFACE' expanded and 'GigabitEthernet0/0' selected. The main panel displays the following settings:

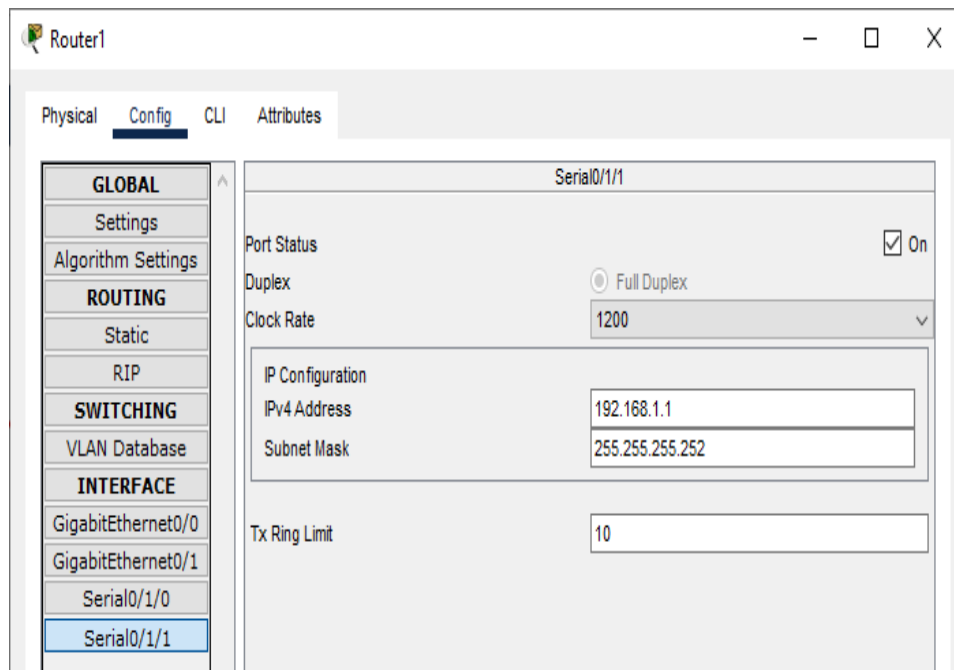
GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.9670.9B01
IP Configuration	
IPv4 Address	10.20.0.1
Subnet Mask	255.255.255.248
Tx Ring Limit	10

ii) Interface S0/1/0

The screenshot shows the configuration window for Router1, specifically for the Serial0/1/0 interface. The left sidebar shows the configuration tree with 'INTERFACE' expanded and 'Serial0/1/0' selected. The main panel displays the following settings:

Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input checked="" type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	192.168.0.2
Subnet Mask	255.255.255.252
Tx Ring Limit	10

iii) Interface S0/1/1

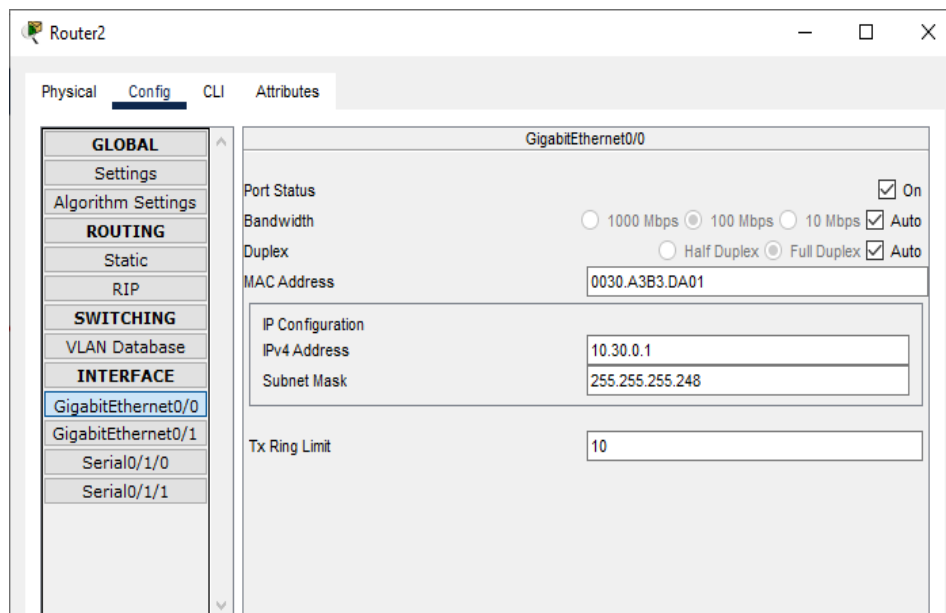


The screenshot shows the configuration window for Router1, specifically for the Serial0/1/1 interface. The left sidebar has a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under INTERFACE, Serial0/1/1 is selected. The main panel shows the following settings:

Serial0/1/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input checked="" type="radio"/> Full Duplex
Clock Rate	1200
IP Configuration	
IPv4 Address	192.168.1.1
Subnet Mask	255.255.255.252
Tx Ring Limit	10

Configuring IP addresses on Router 2

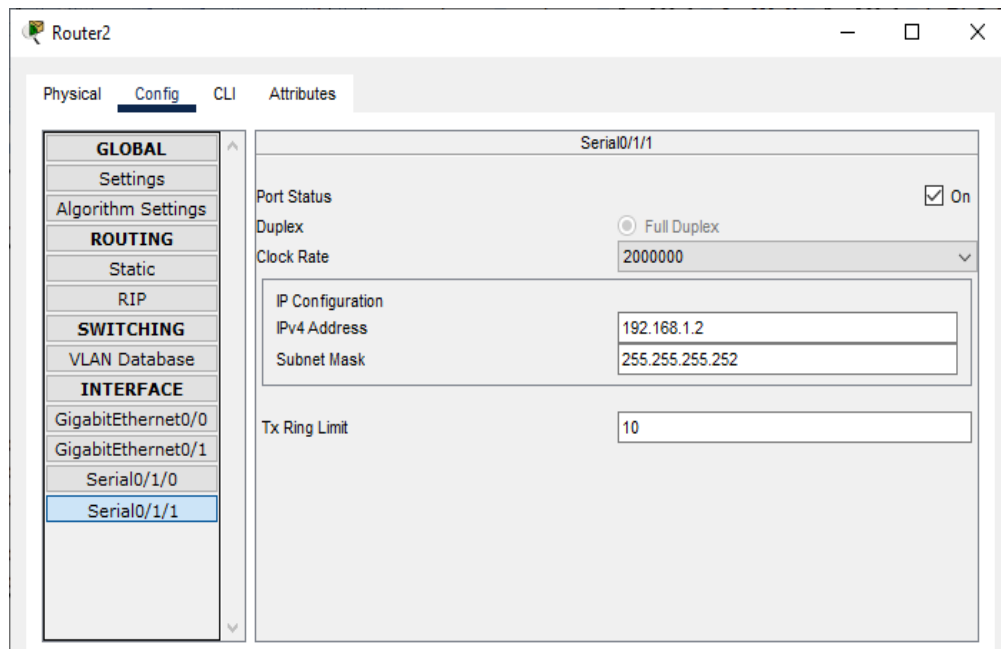
i) Interface G0/0



The screenshot shows the configuration window for Router2, specifically for the GigabitEthernet0/0 interface. The left sidebar has a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under INTERFACE, GigabitEthernet0/0 is selected. The main panel shows the following settings:

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.A3B3.DA01
IP Configuration	
IPv4 Address	10.30.0.1
Subnet Mask	255.255.255.248
Tx Ring Limit	10

ii) Interface S0/1/1



Configuring Router 0 for RIPv2 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#router rip
Router(config-router)#version
2
Router(config-router)#network 10.10.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#exit
Router(config)#
```

Configuring Router 1 for RIPv2 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#router rip
Router(config-router)#version
2
Router(config-router)#network 10.20.0.0
```

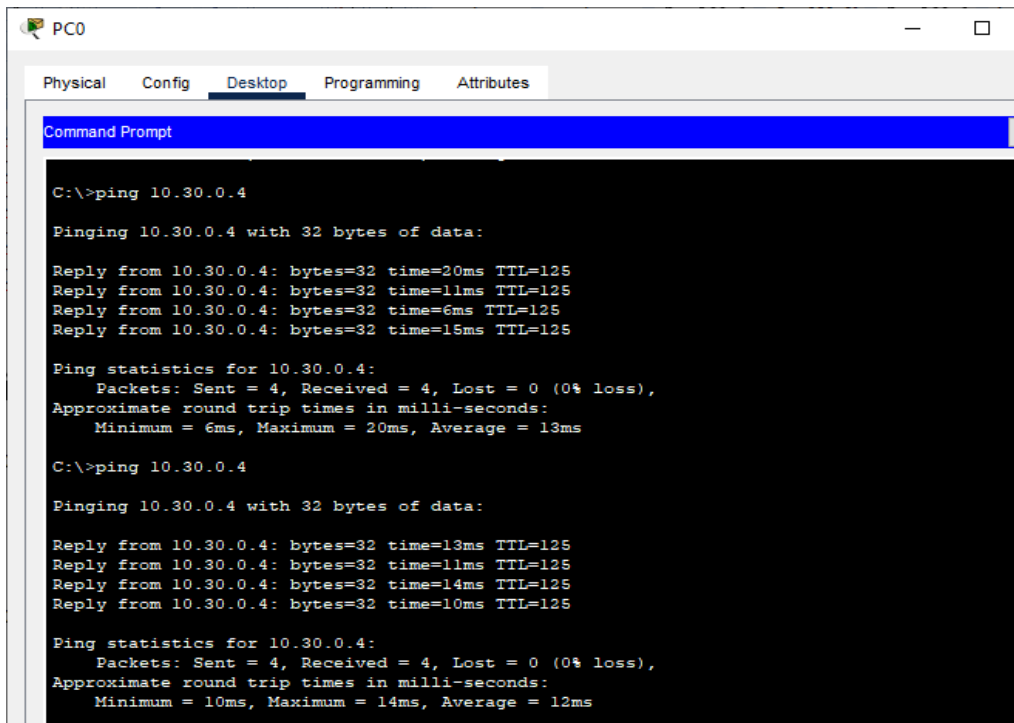
```
Router(config-router)#network 192.168.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#
```

Configuring Router 2 for RIPv2 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#router rip
Router(config-router)#version
2
Router(config-router)#network 10.30.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#
```

Checking the connectivity by using the ping command

- i) Pinging PC8 (ip address 10.30.0.4) from PC0



The screenshot shows a Windows Command Prompt window titled "PC0". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes", with "Desktop" selected. The command prompt shows the execution of the "ping 10.30.0.4" command twice. The first execution shows four successful replies with varying round trip times (20ms, 11ms, 6ms, 15ms) and a statistics summary: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Minimum = 6ms, Maximum = 20ms, Average = 13ms. The second execution also shows four successful replies with varying round trip times (13ms, 11ms, 14ms, 10ms) and a statistics summary: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Minimum = 10ms, Maximum = 14ms, Average = 12ms.

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 10.30.0.4

Pinging 10.30.0.4 with 32 bytes of data:

Reply from 10.30.0.4: bytes=32 time=20ms TTL=125
Reply from 10.30.0.4: bytes=32 time=11ms TTL=125
Reply from 10.30.0.4: bytes=32 time=6ms TTL=125
Reply from 10.30.0.4: bytes=32 time=15ms TTL=125

Ping statistics for 10.30.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 20ms, Average = 13ms

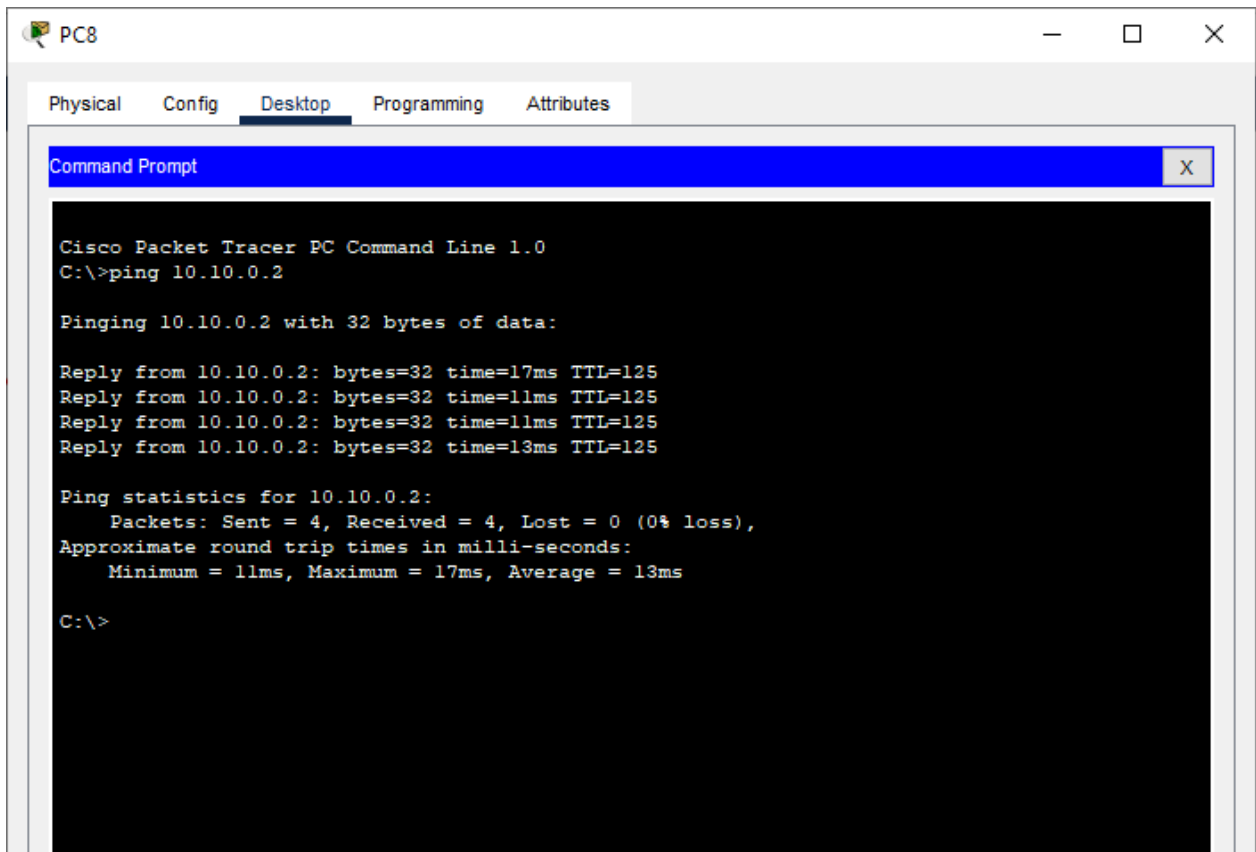
C:\>ping 10.30.0.4

Pinging 10.30.0.4 with 32 bytes of data:

Reply from 10.30.0.4: bytes=32 time=13ms TTL=125
Reply from 10.30.0.4: bytes=32 time=11ms TTL=125
Reply from 10.30.0.4: bytes=32 time=14ms TTL=125
Reply from 10.30.0.4: bytes=32 time=10ms TTL=125

Ping statistics for 10.30.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 14ms, Average = 12ms
```

ii) Pinging PC0 (ip address 10.10.0.2) from PC8



The screenshot shows a window titled 'PC8' with tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The command prompt shows the output of a ping command from PC8 to PC0 (10.10.0.2). The output indicates that all four packets were received successfully with 0% loss.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.10.0.2

Pinging 10.10.0.2 with 32 bytes of data:

Reply from 10.10.0.2: bytes=32 time=17ms TTL=125
Reply from 10.10.0.2: bytes=32 time=11ms TTL=125
Reply from 10.10.0.2: bytes=32 time=11ms TTL=125
Reply from 10.10.0.2: bytes=32 time=13ms TTL=125

Ping statistics for 10.10.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 17ms, Average = 13ms

C:\>
```

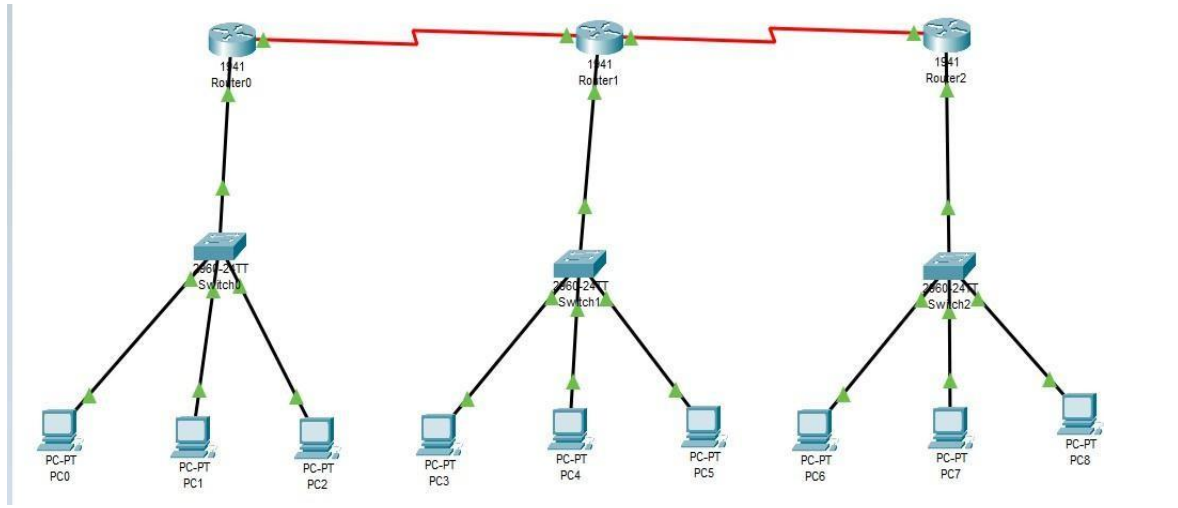
Result:

Hence the RIPv2 has been studied and verified through the given network

Practical No 7

Aim: Using Packet Tracer, create a network with three routers with OSPF and each router associated network will have minimum three PC and show Connectivity

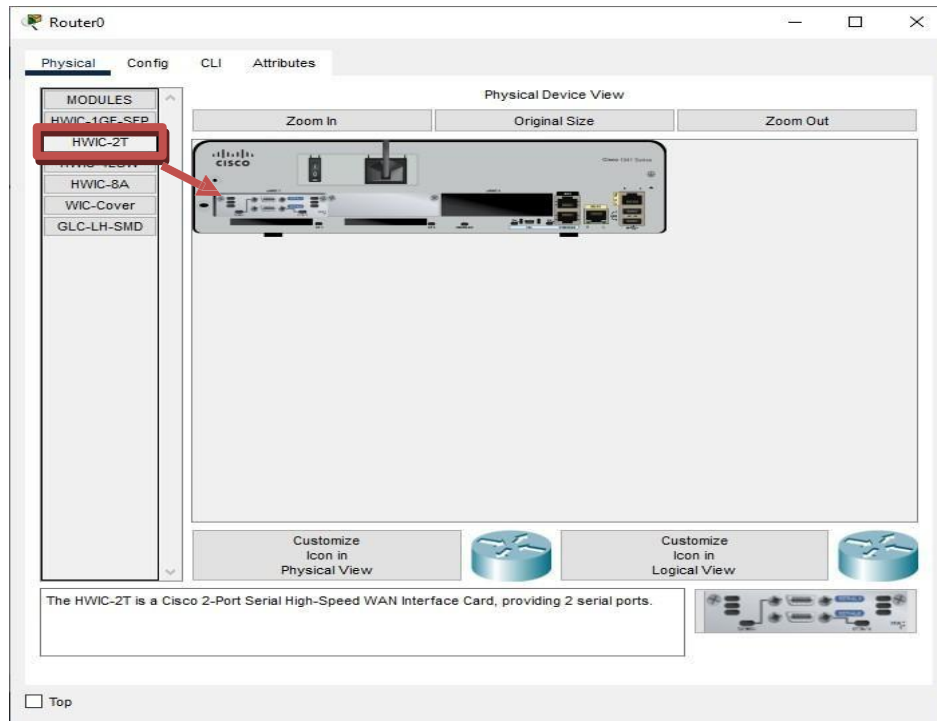
We use the following topology for the present case



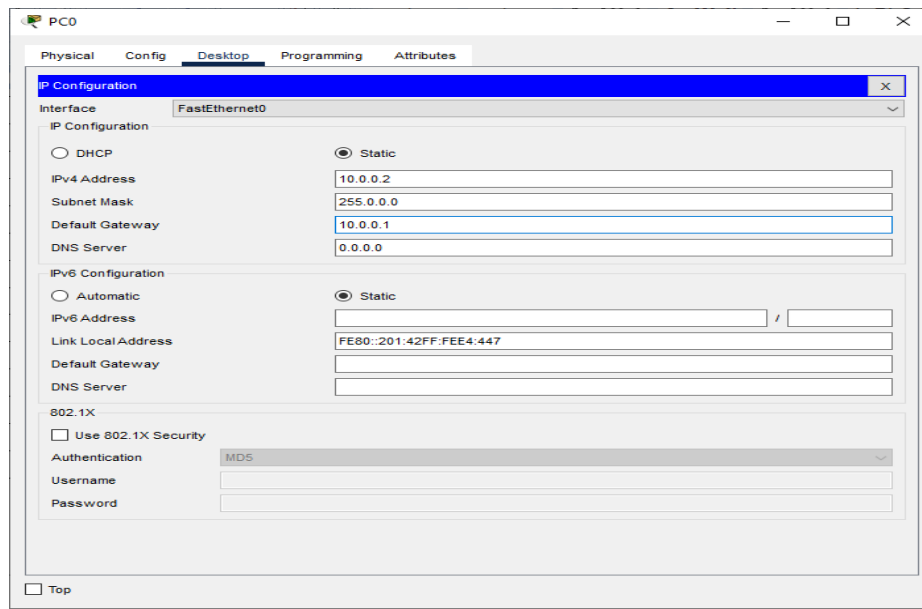
We configure the above network using the following IP addresses

Host	Interface	IP address	Default Gateway	Subnet Mask	Wildcard Mask
Router 0	G0/0	10.0.0.1		255.0.0.0	0.255.255.255
	S0/1/0	40.0.0.1			
Router 1	G0/0	20.0.0.1			
	S0/1/0	40.0.0.2			
	S0/1/1	50.0.0.1			
Router 2	G0/0	30.0.0.1			
	S0/1/1	50.0.0.2			
PC0	FastEthernet0	10.0.0.2	10.0.0.1		
PC1	FastEthernet0	10.0.0.3			
PC2	FastEthernet0	10.0.0.4			
PC3	FastEthernet0	20.0.0.2	20.0.0.1		
PC4	FastEthernet0	20.0.0.3			
PC5	FastEthernet0	20.0.0.4			
PC6	FastEthernet0	30.0.0.2	30.0.0.1		
PC7	FastEthernet0	30.0.0.3			
PC8	FastEthernet0	30.0.0.4			

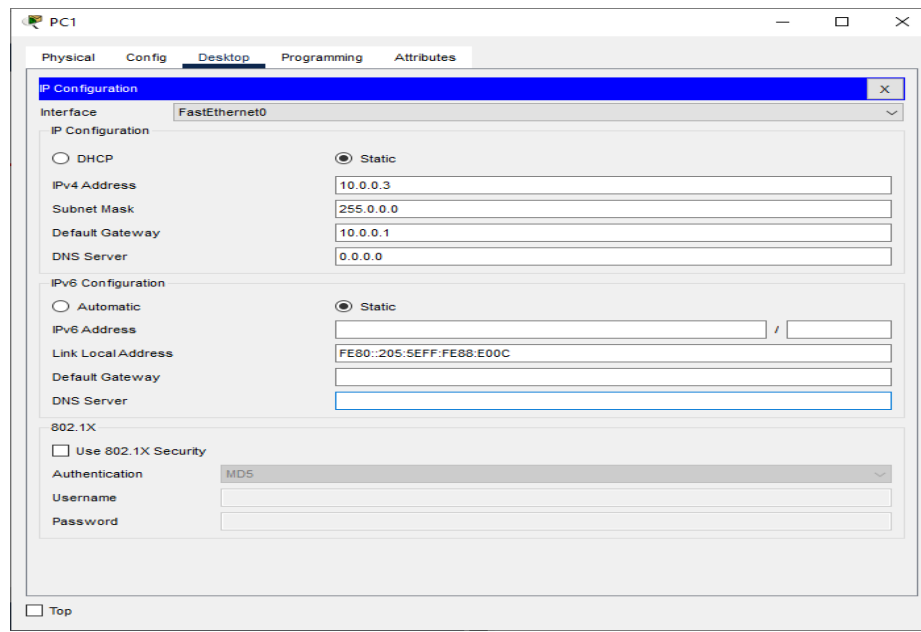
Adding Serial Interface in each Router



Configuring PC0:



Configuring PC1:



The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below these are fields for 'IPv4 Address' (10.0.0.3), 'Subnet Mask' (255.0.0.0), 'Default Gateway' (10.0.0.1), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below these are fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::205:5EFF:FE88:E00C), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox 'Use 802.1X Security' (unchecked), a dropdown 'Authentication' (MD5), and fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.3

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::205:5EFF:FE88:E00C

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

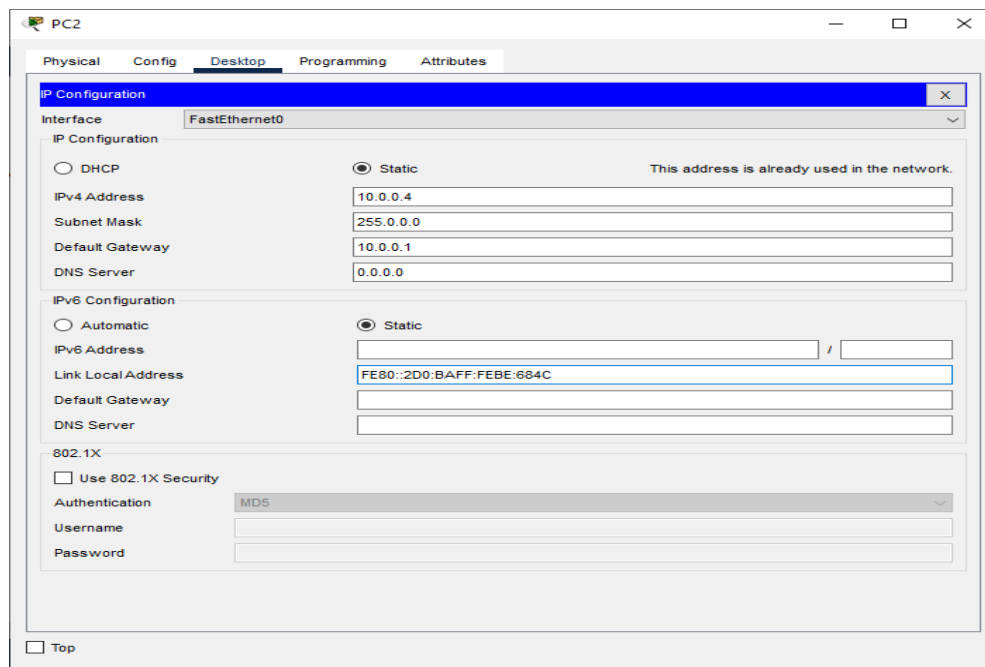
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC2:



The screenshot shows the 'PC2' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below these are fields for 'IPv4 Address' (10.0.0.4), 'Subnet Mask' (255.0.0.0), 'Default Gateway' (10.0.0.1), and 'DNS Server' (0.0.0.0). A message 'This address is already used in the network.' is displayed next to the 'Static' radio button. The 'IPv6 Configuration' section also has two radio buttons: 'Automatic' (unselected) and 'Static' (selected). Below these are fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::2D0:BAFF:FE8E:684C), 'Default Gateway' (empty), and 'DNS Server' (empty). The '802.1X' section has a checkbox 'Use 802.1X Security' (unchecked), a dropdown 'Authentication' (MD5), and fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static This address is already used in the network.

IPv4 Address: 10.0.0.4

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:BAFF:FE8E:684C

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

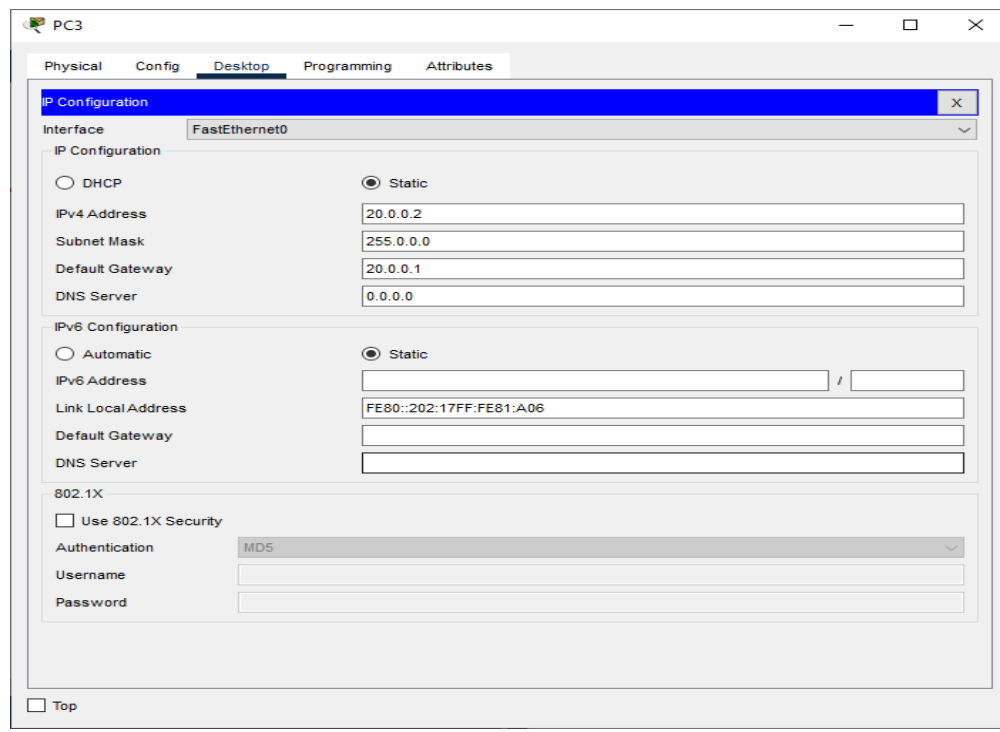
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC3:

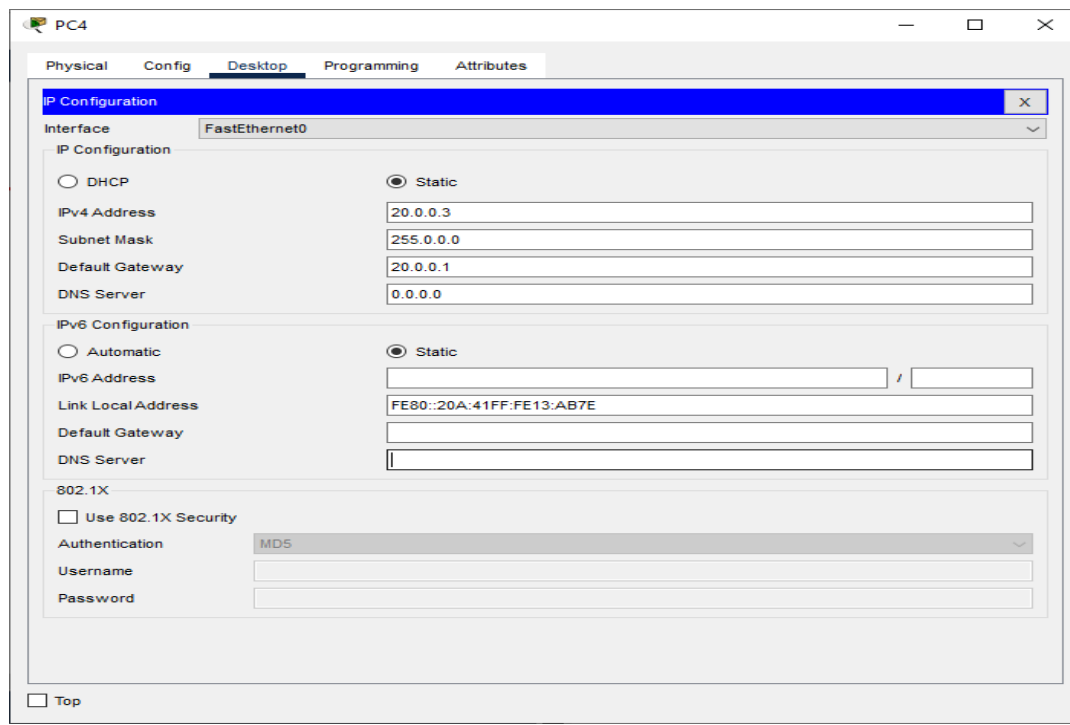


The screenshot shows the 'PC3' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IPv4 Address: 20.0.0.2, Subnet Mask: 255.0.0.0, Default Gateway: 20.0.0.1, and DNS Server: 0.0.0.0. The IPv6 settings are: IPv6 Address: (empty), Link Local Address: FE80::202:17FF:FE81:A06, Default Gateway: (empty), and DNS Server: (empty). The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked, 'Authentication' set to 'MD5', and 'Username' and 'Password' fields empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	20.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::202:17FF:FE81:A06
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC4:



The screenshot shows the 'PC4' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IPv4 Address: 20.0.0.3, Subnet Mask: 255.0.0.0, Default Gateway: 20.0.0.1, and DNS Server: 0.0.0.0. The IPv6 settings are: IPv6 Address: (empty), Link Local Address: FE80::20A:41FF:FE13:AB7E, Default Gateway: (empty), and DNS Server: (empty). The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked, 'Authentication' set to 'MD5', and 'Username' and 'Password' fields empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	20.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::20A:41FF:FE13:AB7E
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC5:

The screenshot shows the configuration window for PC5. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration includes an address of 20.0.0.4, a subnet mask of 255.0.0.0, a default gateway of 20.0.0.1, and a DNS server of 0.0.0.0. The IPv6 configuration includes a static address field, a link local address of FE80::2E0:F9FF:FE0D:3AA, and empty fields for default gateway and DNS server. The 802.1X section shows 'Use 802.1X Security' is unchecked, and 'Authentication' is set to 'MD5'.

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 20.0.0.4

Subnet Mask: 255.0.0.0

Default Gateway: 20.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE0D:3AA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Configuring PC6:

The screenshot shows the configuration window for PC6. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration includes an address of 30.0.0.2, a subnet mask of 255.0.0.0, a default gateway of 30.0.0.1, and a DNS server of 0.0.0.0. The IPv6 configuration includes a static address field, a link local address of FE80::2E0:F9FF:FE9A:D3AA, and empty fields for default gateway and DNS server. The 802.1X section shows 'Use 802.1X Security' is unchecked, and 'Authentication' is set to 'MD5'.

PC6

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 30.0.0.2

Subnet Mask: 255.0.0.0

Default Gateway: 30.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE9A:D3AA

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

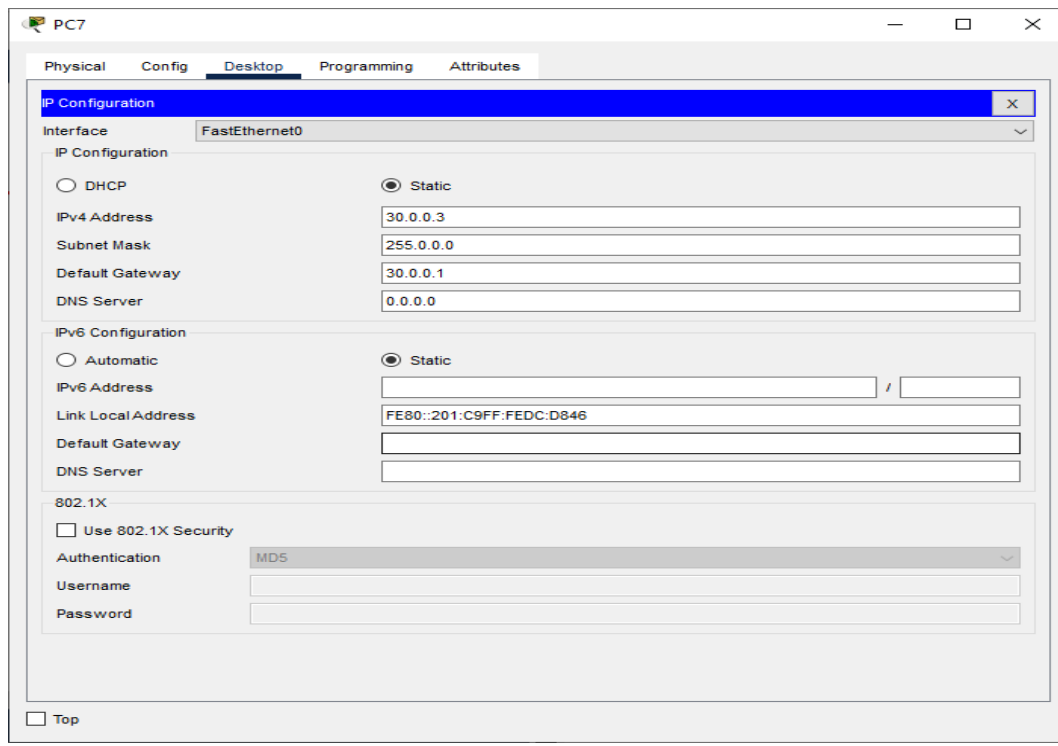
Authentication: MD5

Username:

Password:

☐ Top

Configuring PC7:

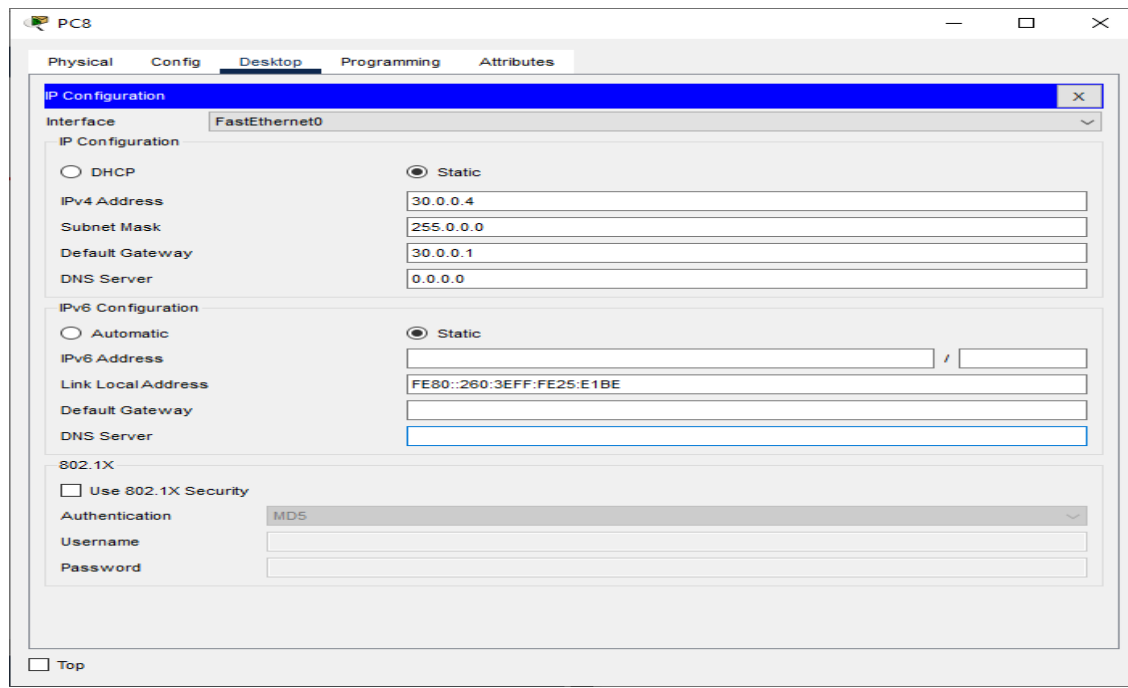


The screenshot shows the configuration window for PC7. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.3, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected. The IPv6 Address field is empty, and the Link Local Address is set to FE80::201:C9FF:FEDC:D846. The '802.1X' section is collapsed. A 'Top' button is at the bottom left.

IP Configuration	
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::201:C9FF:FEDC:D846
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring PC8:



The screenshot shows the configuration window for PC8. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.4, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected. The IPv6 Address field is empty, and the Link Local Address is set to FE80::260:3EFF:FE25:E1BE. The '802.1X' section is collapsed. A 'Top' button is at the bottom left.

IP Configuration	
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::260:3EFF:FE25:E1BE
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

Configuring IP addresses on Router 0

i) Interface G0/0

The screenshot shows the configuration window for Router0, specifically the 'Config' tab for the GigabitEthernet0/0 interface. The left sidebar shows the configuration hierarchy: GLOBAL, Settings, Algorithm Settings, ROUTING, Static, RIP, SWITCHING, VLAN Database, and INTERFACE. Under the INTERFACE section, GigabitEthernet0/0 is selected. The main configuration area for GigabitEthernet0/0 includes the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0030.A3E4.1201
- IP Configuration:
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

ii) Interface S0/1/0

The screenshot shows the configuration window for Router0, specifically the 'Config' tab for the Serial0/1/0 interface. The left sidebar shows the configuration hierarchy: GLOBAL, Settings, Algorithm Settings, ROUTING, Static, RIP, SWITCHING, VLAN Database, and INTERFACE. Under the INTERFACE section, Serial0/1/0 is selected. The main configuration area for Serial0/1/0 includes the following settings:

- Port Status: ☒ On
- Duplex: ☒ Full Duplex
- Clock Rate: 1200
- IP Configuration:
 - IPv4 Address: 40.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

Configuring IP addresses on Router 1

i) Interface G0/0

The screenshot shows the configuration window for Router1, specifically for the GigabitEthernet0/0 interface. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under INTERFACE, GigabitEthernet0/0 is selected. The main panel displays the configuration for this interface. The Port Status is checked and set to On. Bandwidth is set to 100 Mbps (selected radio button). Duplex is set to Full Duplex (selected radio button). MAC Address is 0001.C711.B701. IP Configuration shows IPv4 Address as 20.0.0.1 and Subnet Mask as 255.0.0.0. Tx Ring Limit is set to 10.

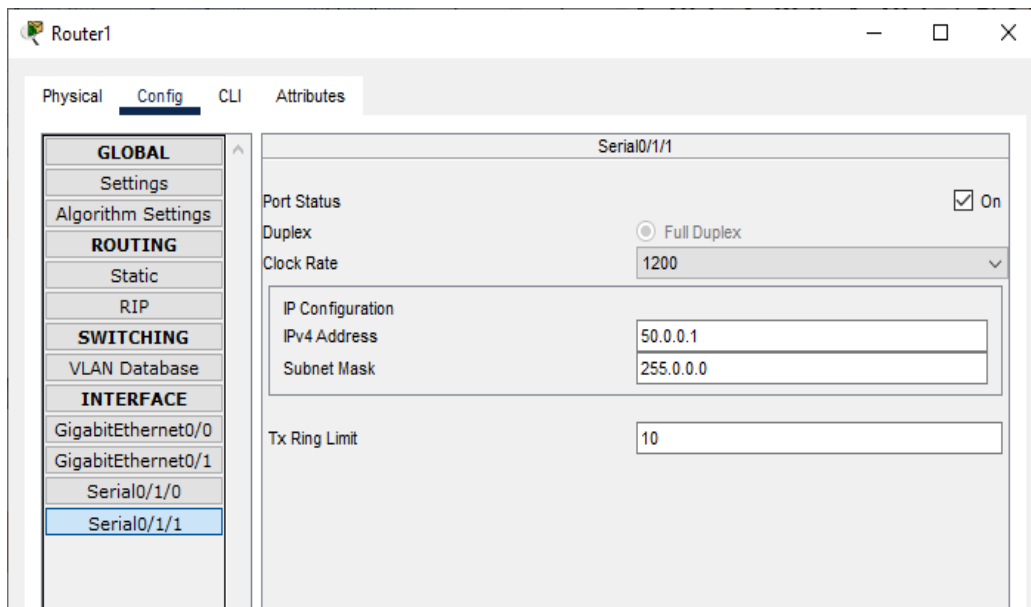
GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.C711.B701
IP Configuration	
IPv4 Address	20.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

ii) Interface S0/1/0

The screenshot shows the configuration window for Router1, specifically for the Serial0/1/0 interface. The left sidebar is the same as in the first screenshot, but Serial0/1/0 is now selected under the INTERFACE category. The main panel displays the configuration for this interface. The Port Status is checked and set to On. Duplex is set to Full Duplex (selected radio button). Clock Rate is set to 2000000. IP Configuration shows IPv4 Address as 40.0.0.2 and Subnet Mask as 255.0.0.0. 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	40.0.0.2
Subnet Mask	255.0.0.0
Tx Ring Limit	10

iii) Interface S0/1/1

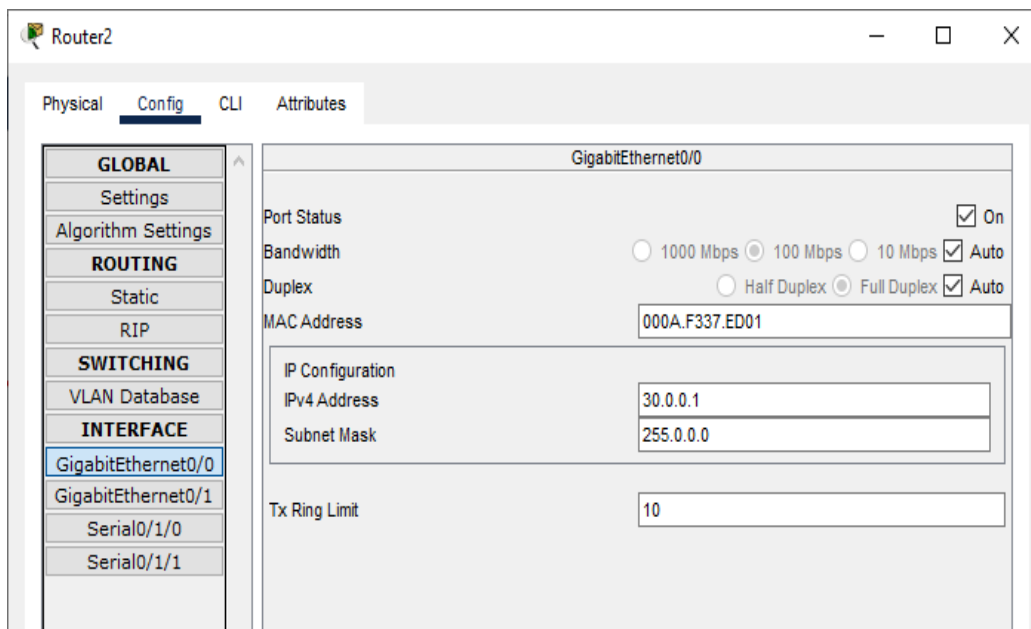


The screenshot shows the configuration window for Router1, specifically for the Serial0/1/1 interface. The left sidebar contains a tree view with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1, Serial0/1/0, Serial0/1/1). The Serial0/1/1 interface is selected. The main panel shows the following settings:

- Port Status: ☒ On
- Duplex: ☒ Full Duplex
- Clock Rate: 1200
- IP Configuration:
 - IPv4 Address: 50.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

Configuring IP addresses on Router 2

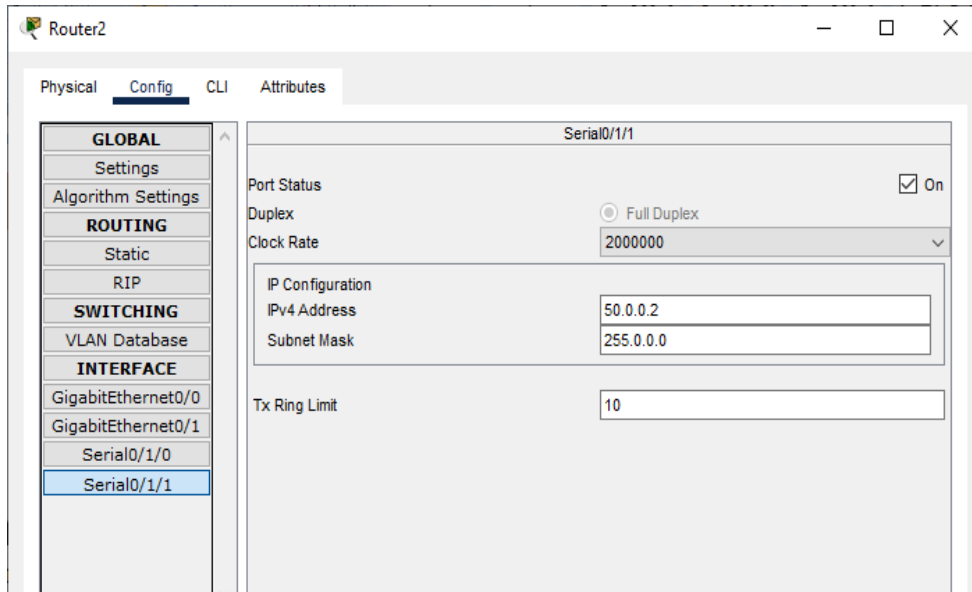
i) Interface G0/0



The screenshot shows the configuration window for Router2, specifically for the GigabitEthernet0/0 interface. The left sidebar contains a tree view with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1, Serial0/1/0, Serial0/1/1). The GigabitEthernet0/0 interface is selected. The main panel shows the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 000A.F337.ED01
- IP Configuration:
 - IPv4 Address: 30.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

ii) Interface S0/1/1



Configuring Router 0 for OSPF (using the CLI mode)

```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#network 10.0.0.0 0.0.0.255 area 1  
Router(config-router)#network 40.0.0.0  
0.0.0.255 area 1  
Router(config-router)#exit  
Router(config)#
```

Configuring Router 1 for OSPF (using the CLI mode)

```
Router(config)#  
Router(config)#router  
ospf 1  
Router(config-router)#  
Router(config-router)#network 20.0.0.0 0.0 0.255 area 1  
Router(config-router)#network 40.0.0.0 0.0 0.255 area 1  
Router(config-router)#network 50.0.0.0
```

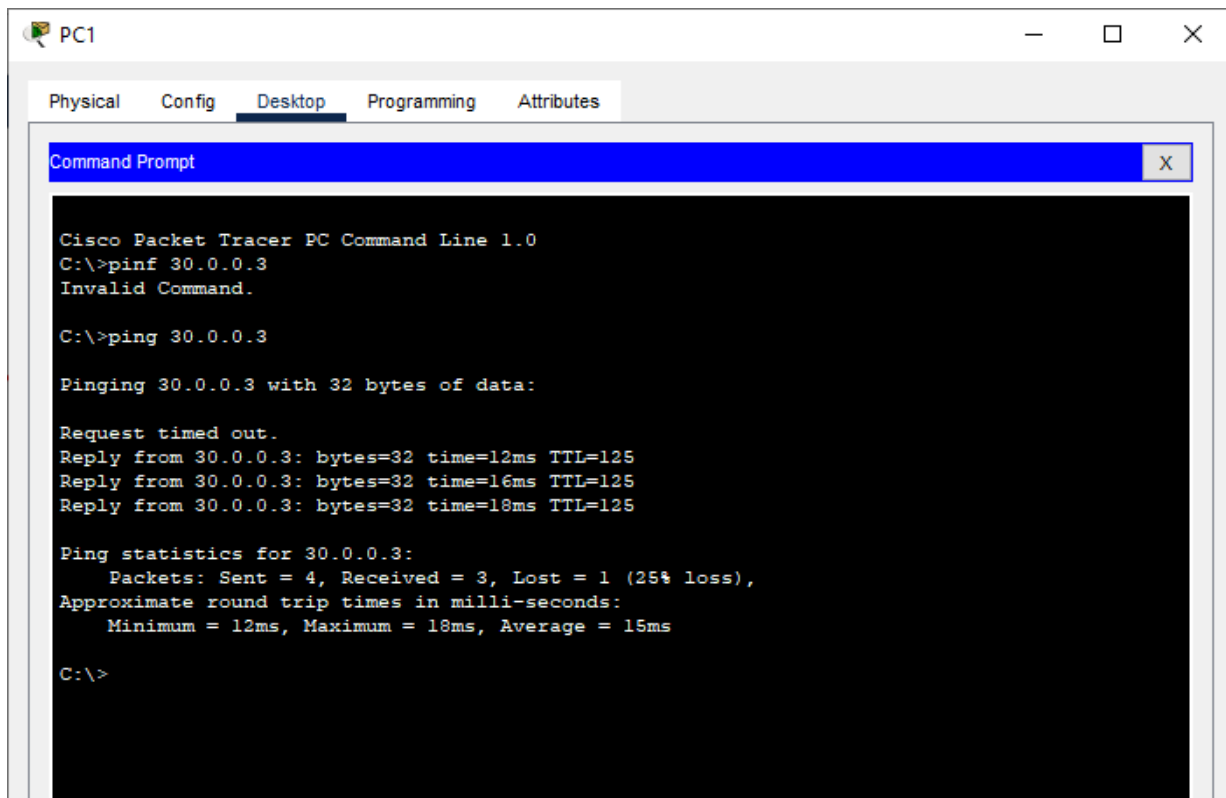
```
0.0.0.255 area 1
Router(config-router)#exit
Router(config)#
```

Configuring Router 2 for OSPF (using the CLI mode)

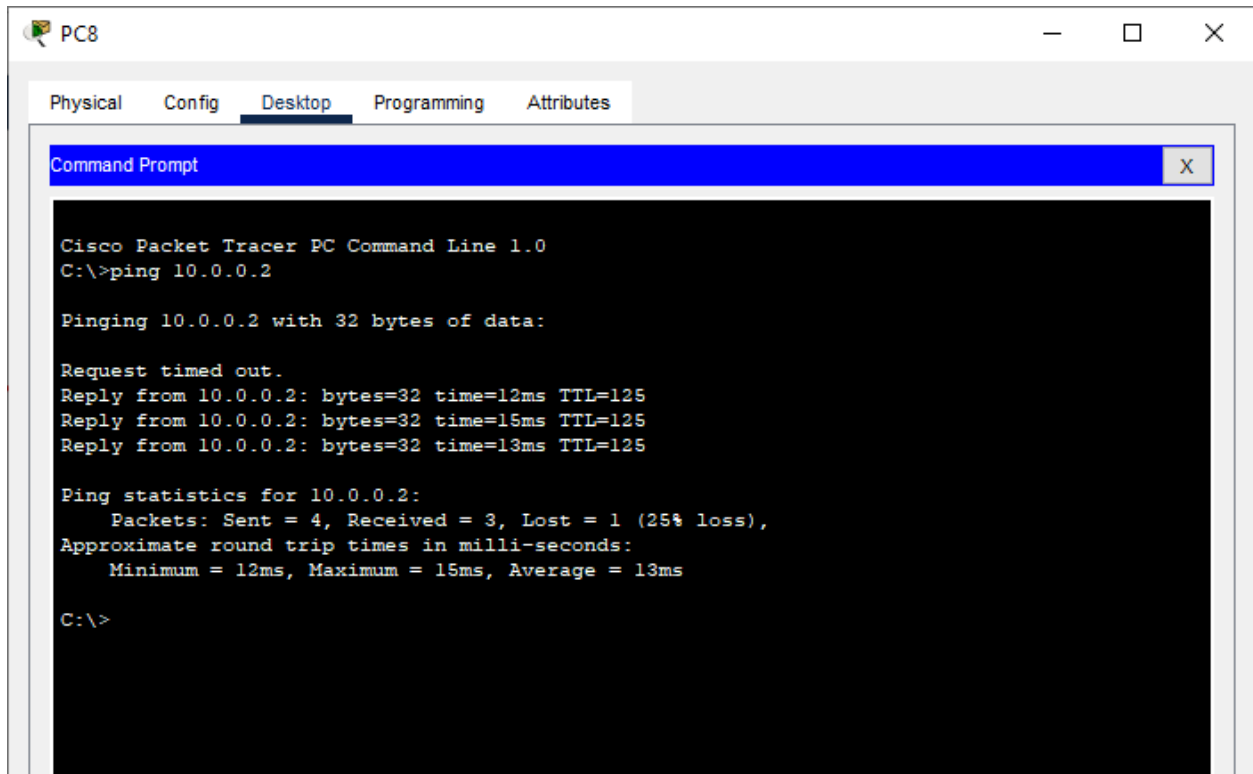
```
Router(config)#
Router(config)#router
ospf 1
Router(config-router)#
Router(config-router)#network 30.0.0.0 0.0.0.255 area 1
Router(config-router)#network 50.0.0.0
0.0.0.255 area 1
Router(config-router)# exit
Router(config)#
```

Checking the connectivity by using the ping command

- i) Pinging PC8 (ip address 10.30 0.4) from PC1



ii) Pinging PC0 (ip address 10.10.0.2) from PC8



The screenshot shows a window titled 'PC8' with tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The command prompt shows the output of a ping command to 10.0.0.2. The output indicates that 3 packets were received out of 4 sent, with a 25% loss. The round trip times are 12ms, 15ms, and 13ms, with an average of 13ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 10.0.0.2: bytes=32 time=12ms TTL=125
Reply from 10.0.0.2: bytes=32 time=15ms TTL=125
Reply from 10.0.0.2: bytes=32 time=13ms TTL=125

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 15ms, Average = 13ms

C:\>
```

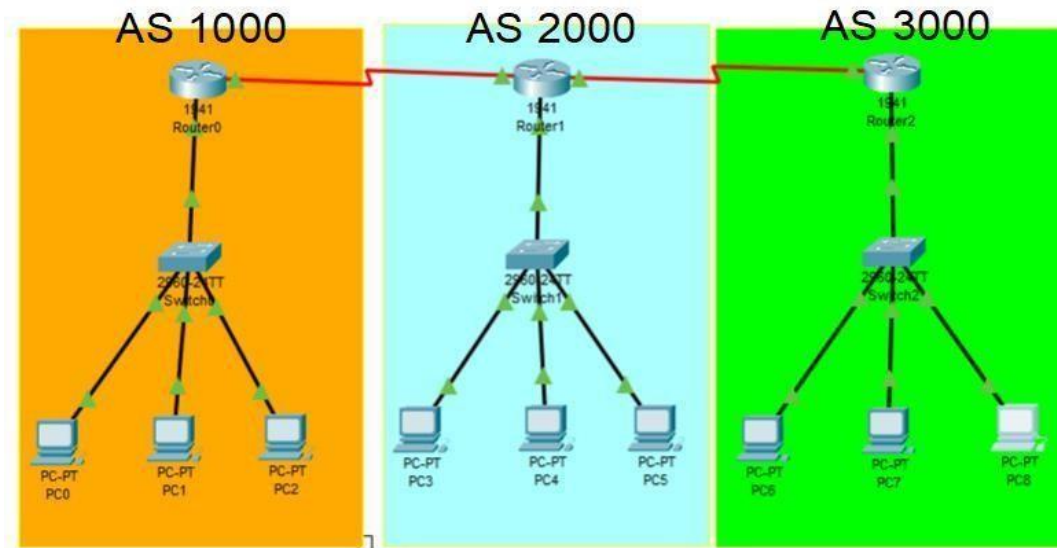
Result:

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

Practical No 8

Aim: Using Packet Tracer, create a network with three routers with BGP and each router associated network will have minimum three PC and show Connectivity

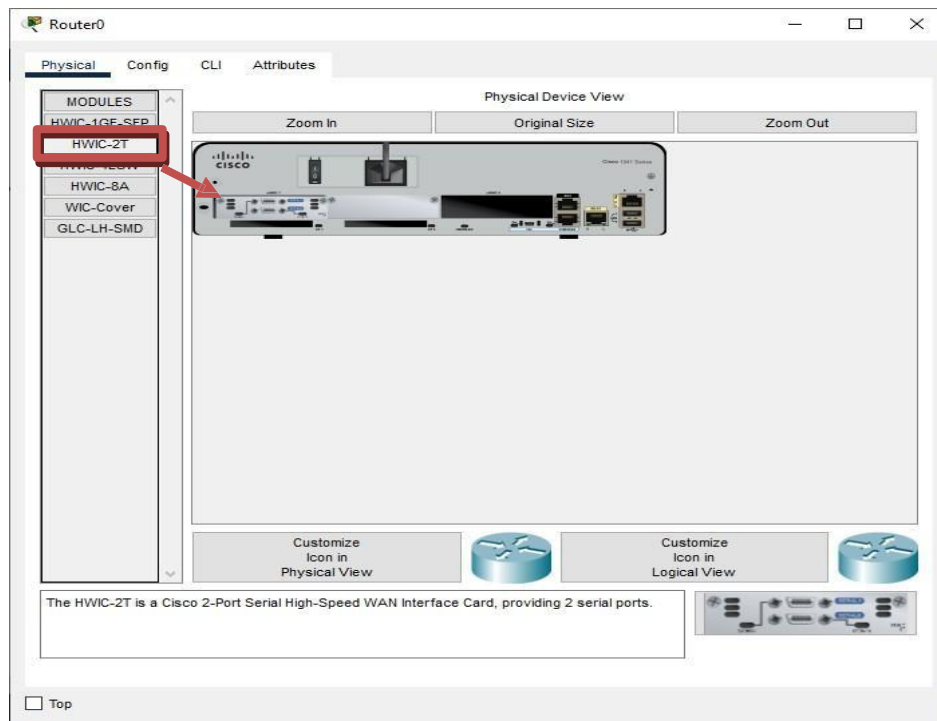
We use the following topology for the present case



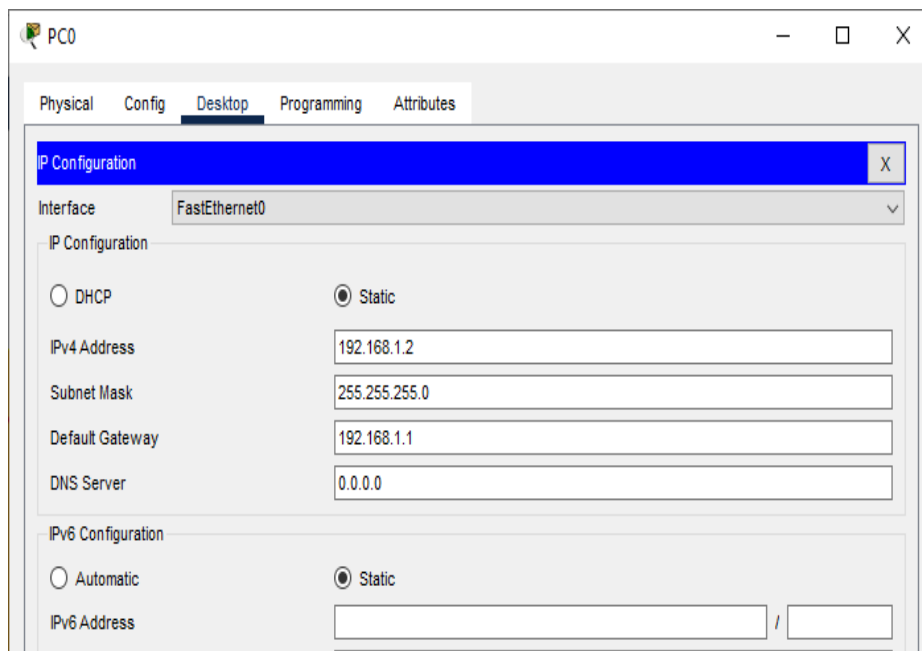
We configure the above network using the following IP addresses

Host	Interface	IP address	Network Address	Default Gateway
Router 0 AS 1000	G0/0	192.168.1.1	192.168.1.0	
	S0/1/0	10.0.0.1	10.0.0.0	
Router 1 AS 2000	G0/0	192.168.2.1	192.168.2.0	
	S0/1/0	10.0.0.2	10.0.0.0	
	S0/1/1	20.0.0.1	20.0.0.0	
Router 2 AS 3000	G0/0	192.168.3.1	192.168.3.0	
	S0/1/1	20.0.0.2	20.0.0.0	
PC0	FastEthernet0	192.168.1.2	192.168.1.0	192.168.1.1
PC1	FastEthernet0	192.168.1.3		
PC2	FastEthernet0	192.168.1.4		
PC3	FastEthernet0	192.168.2.2	192.168.2.0	192.168.2.1
PC4	FastEthernet0	192.168.2.3		
PC5	FastEthernet0	192.168.2.4		
PC6	FastEthernet0	192.168.3.2	192.168.3.0	192.168.3.1
PC7	FastEthernet0	192.168.3.3		
PC8	FastEthernet0	192.168.3.4		

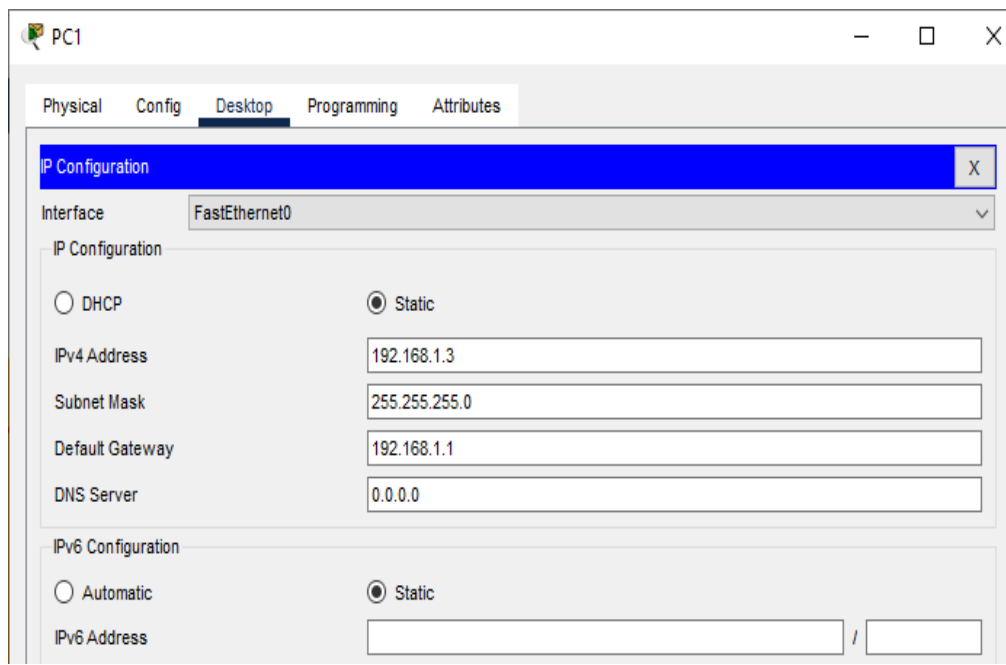
Adding Serial Interface in each Router



Configuring PC0:



Configuring PC1:

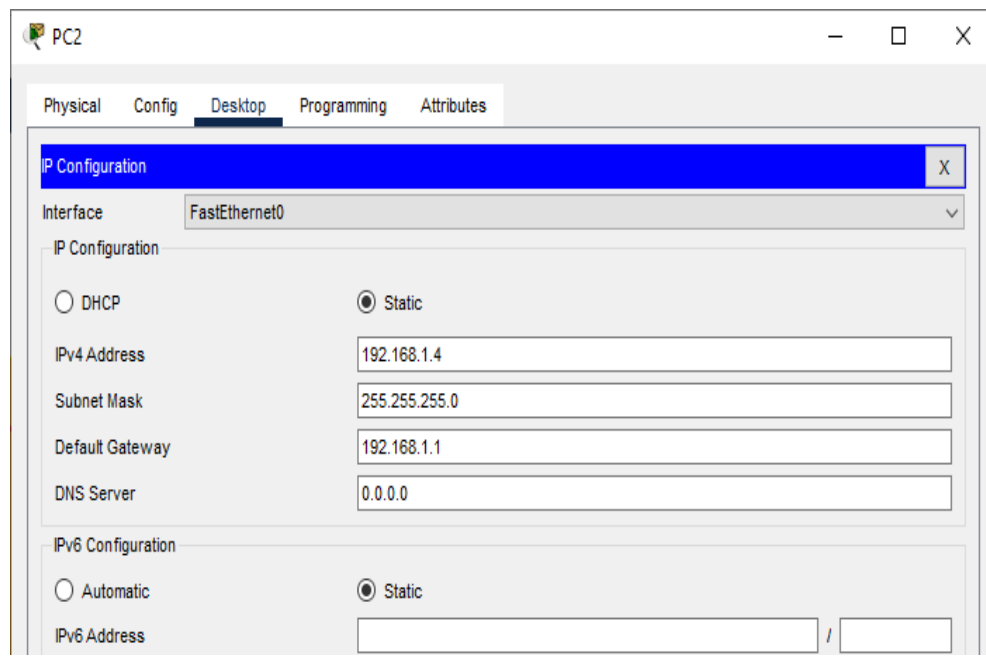


The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is highlighted in blue. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with the following values:

Field	Value
IPv4 Address	192.168.1.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
DNS Server	0.0.0.0

Under 'IPv6 Configuration', the 'Static' radio button is selected, and the 'IPv6 Address' field is empty.

Configuring PC2:

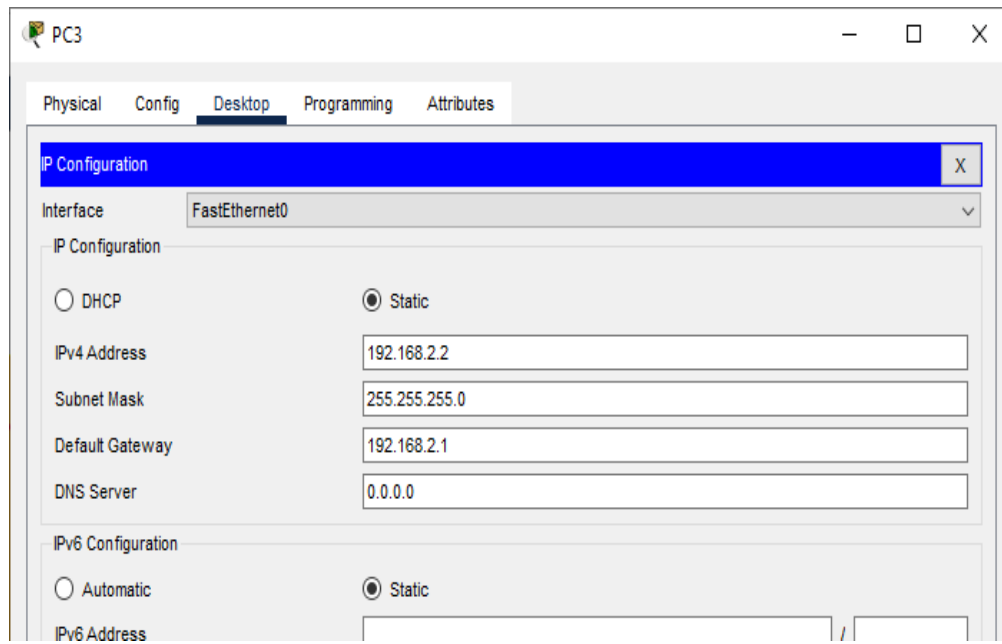


The screenshot shows the 'PC2' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is highlighted in blue. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with the following values:

Field	Value
IPv4 Address	192.168.1.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
DNS Server	0.0.0.0

Under 'IPv6 Configuration', the 'Static' radio button is selected, and the 'IPv6 Address' field is empty.

Configuring PC3:

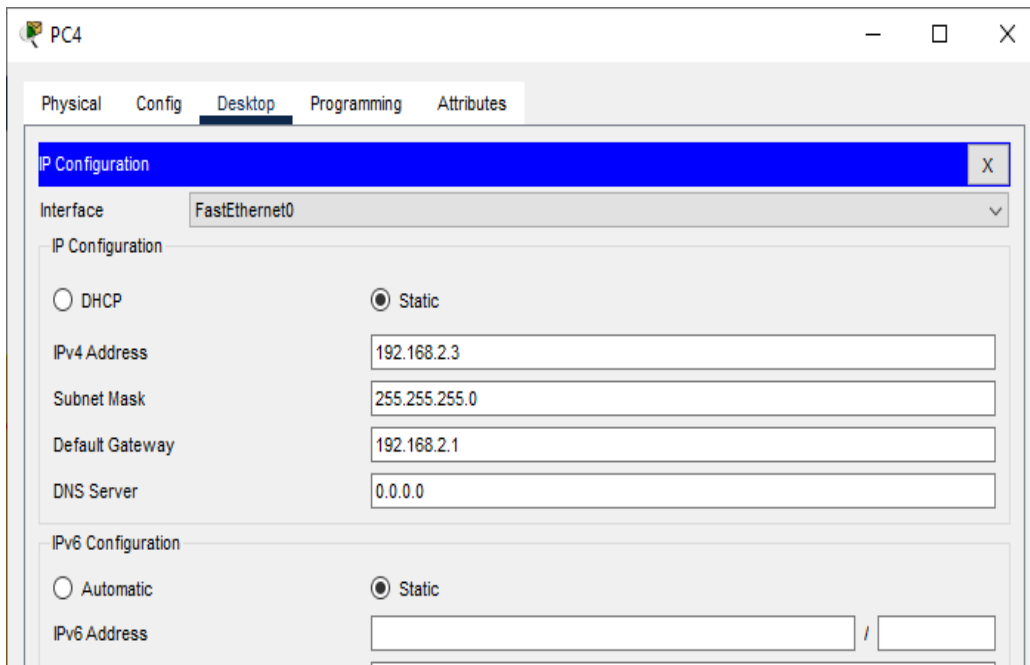


The screenshot shows the configuration window for PC3. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with the following values:

Field	Value
IPv4 Address	192.168.2.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DNS Server	0.0.0.0

The IPv6 configuration section is also visible, with the 'Static' radio button selected. The IPv6 Address field is currently empty.

Configuring PC4:

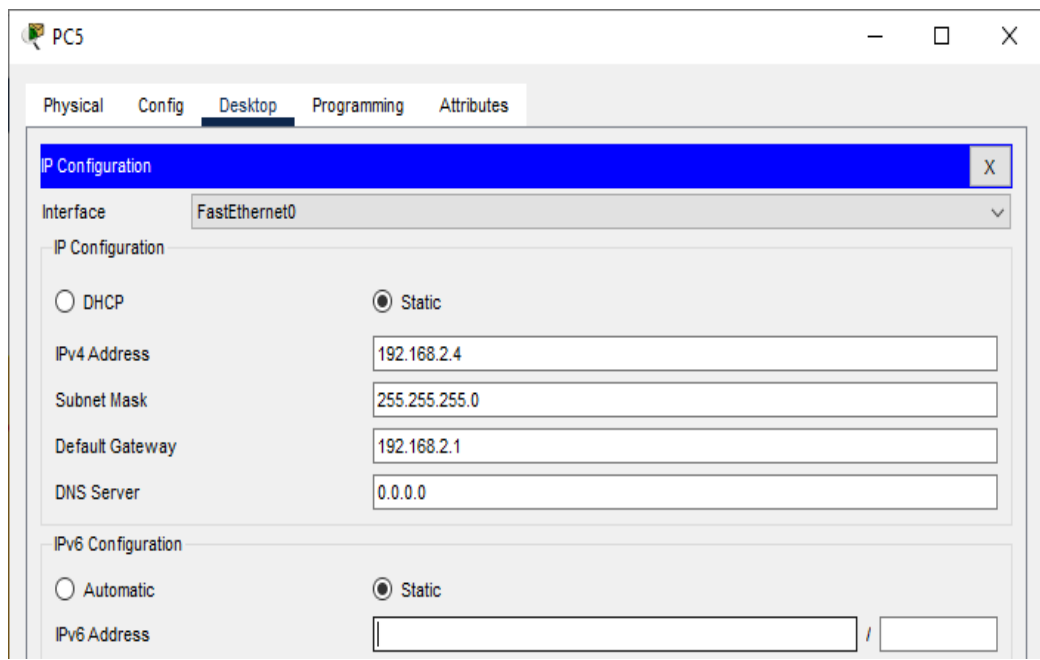


The screenshot shows the configuration window for PC4. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with the following values:

Field	Value
IPv4 Address	192.168.2.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DNS Server	0.0.0.0

The IPv6 configuration section is also visible, with the 'Static' radio button selected. The IPv6 Address field is currently empty.

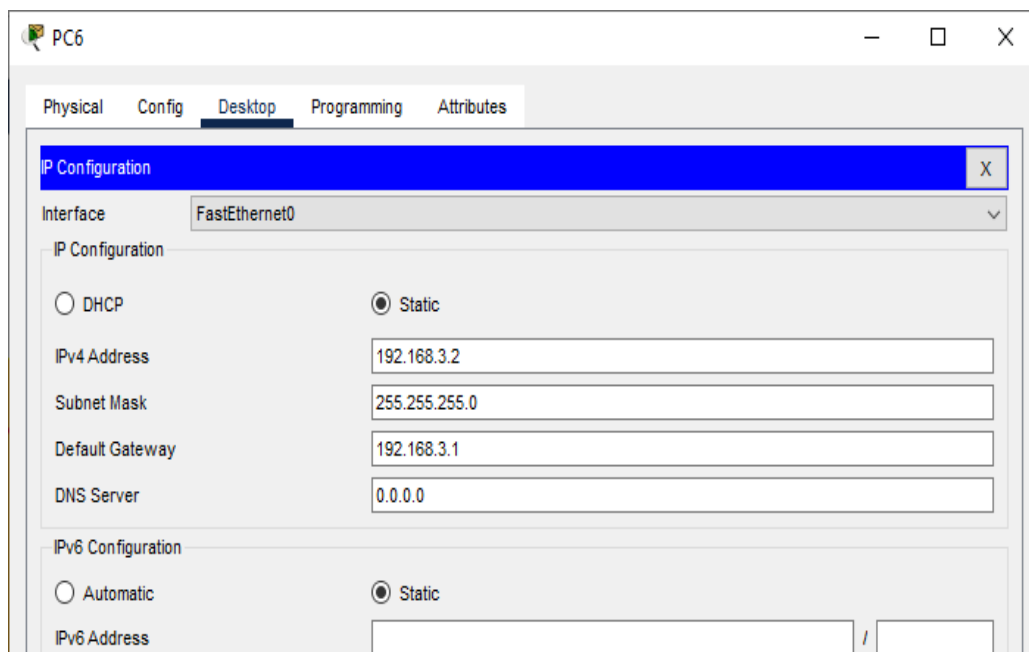
Configuring PC5:



The screenshot shows the configuration window for PC5. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Interface' is set to 'FastEthernet0'. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with: IPv4 Address: 192.168.2.4, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.2.1, and DNS Server: 0.0.0.0. The IPv6 configuration fields are empty.

Field	Value
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	
<input checked="" type="radio"/> Static	
IPv4 Address	192.168.2.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.2.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	
<input checked="" type="radio"/> Static	
IPv6 Address	

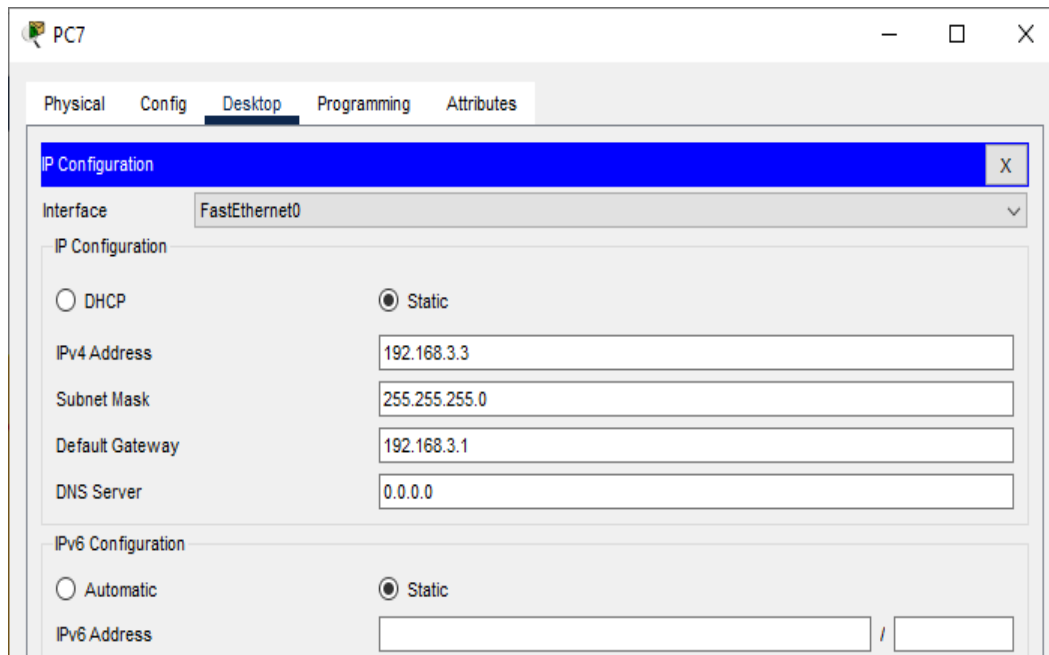
Configuring PC6:



The screenshot shows the configuration window for PC6. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Interface' is set to 'FastEthernet0'. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with: IPv4 Address: 192.168.3.2, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.3.1, and DNS Server: 0.0.0.0. The IPv6 configuration fields are empty.

Field	Value
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	
<input checked="" type="radio"/> Static	
IPv4 Address	192.168.3.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	
<input checked="" type="radio"/> Static	
IPv6 Address	

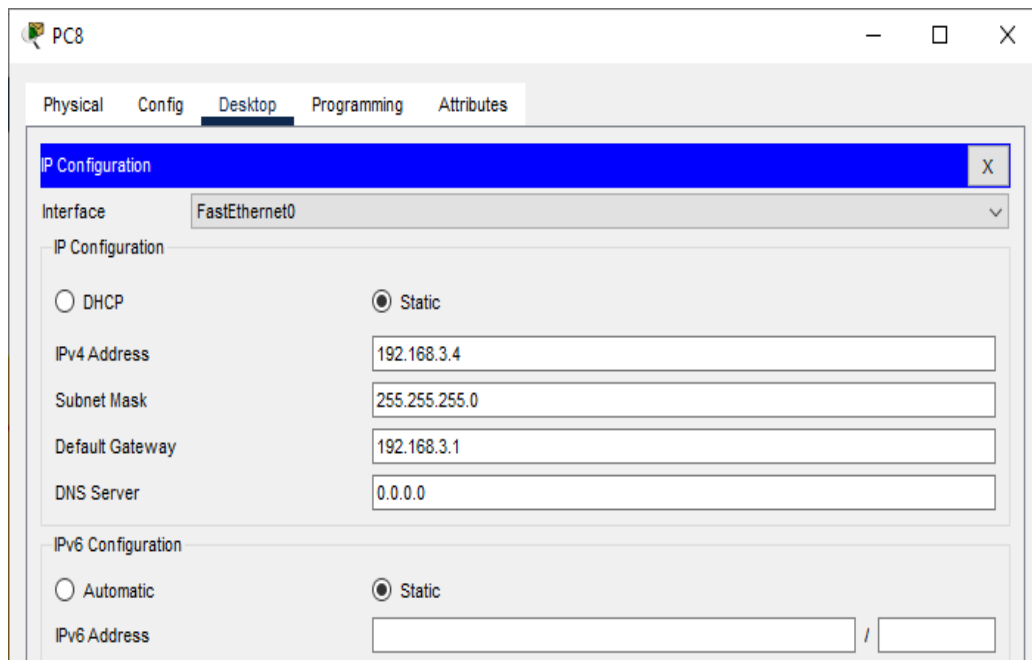
Configuring PC7:



The screenshot shows the configuration window for PC7. 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 IPv4 Address is set to 192.168.3.3, Subnet Mask to 255.255.255.0, Default Gateway to 192.168.3.1, and DNS Server to 0.0.0.0. The IPv6 Configuration section is also visible, with the 'Static' radio button selected.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.3.3
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	

Configuring PC8:



The screenshot shows the configuration window for PC8. 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 IPv4 Address is set to 192.168.3.4, Subnet Mask to 255.255.255.0, Default Gateway to 192.168.3.1, and DNS Server to 0.0.0.0. The IPv6 Configuration section is also visible, with the 'Static' radio button selected.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.3.4
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	

Configuring IP addresses on Router 0

i) Interface G0/0

The screenshot shows the configuration window for Router0, specifically for the GigabitEthernet0/0 interface. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under INTERFACE, GigabitEthernet0/0 is selected. The main panel displays the configuration for this interface. The Port Status is checked (On). Bandwidth is set to 1000 Mbps. Duplex is set to Half Duplex. MAC Address is 00D0.D398.4601. IP Configuration shows IPv4 Address as 192.168.1.1 and Subnet Mask as 255.255.255.0. Tx Ring Limit is set to 10.

GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 1000 Mbps <input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00D0.D398.4601
IP Configuration	
IPv4 Address	192.168.1.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

ii) Interface S0/1/0

The screenshot shows the configuration window for Router0, specifically for the Serial0/1/0 interface. The left sidebar is the same as in the previous screenshot, but Serial0/1/0 is now selected under the INTERFACE category. The main panel displays the configuration for this interface. The Port Status is checked (On). Duplex is set to Full Duplex. Clock Rate is set to 1200. IP Configuration shows IPv4 Address as 10.0.0.1 and Subnet Mask as 255.0.0.0. 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	1200
IP Configuration	
IPv4 Address	10.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

Configuring IP addresses on Router 1

i) Interface G0/0

The screenshot shows the configuration window for Router1, specifically for the GigabitEthernet0/0 interface. The left sidebar shows the configuration tree with 'INTERFACE' expanded and 'GigabitEthernet0/0' selected. The main panel displays the configuration for this interface.

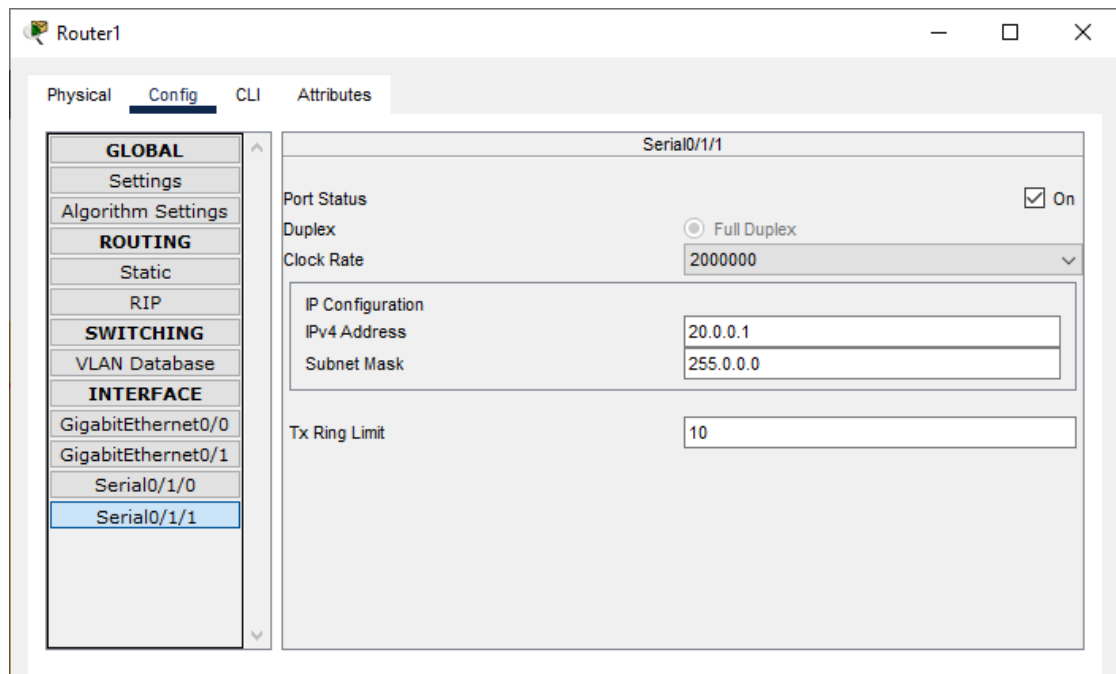
GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0090.2B5B.9E01
IP Configuration	
IPv4 Address	192.168.2.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

ii) Interface S0/1/0

The screenshot shows the configuration window for Router1, specifically for the Serial0/1/0 interface. The left sidebar shows the configuration tree with 'INTERFACE' expanded and 'Serial0/1/0' selected. The main panel displays the configuration for this interface.

Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input checked="" type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	10.0.0.2
Subnet Mask	255.0.0.0
Tx Ring Limit	10

iii) Interface S0/1/1

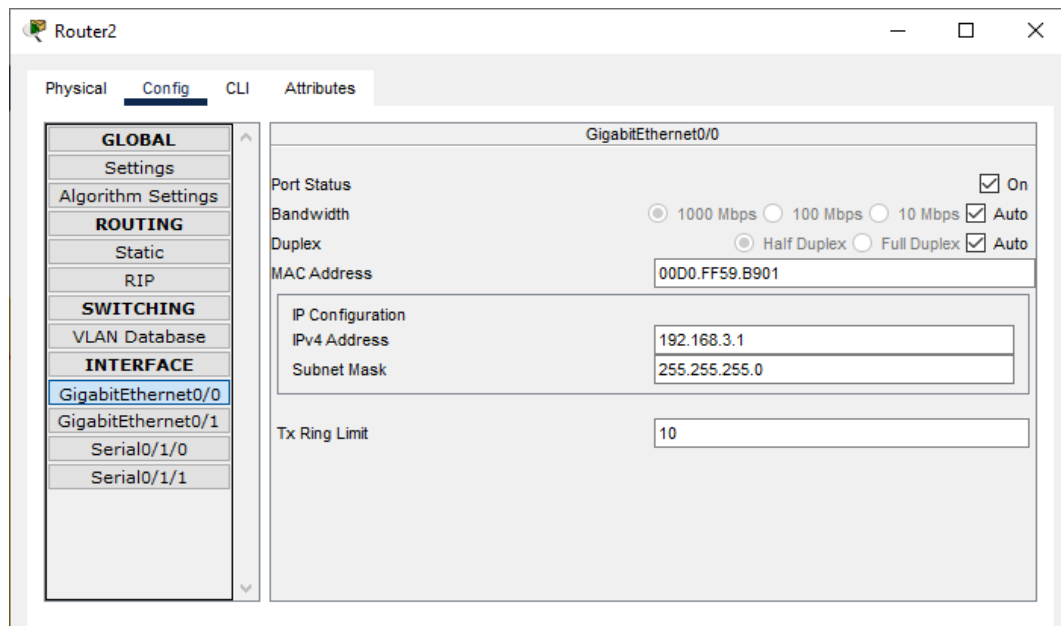


The screenshot shows the configuration window for Router1, specifically for the Serial0/1/1 interface. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under the INTERFACE category, Serial0/1/1 is selected. The main panel displays the configuration for Serial0/1/1. The Port Status is checked and set to On. Duplex is set to Full Duplex. Clock Rate is set to 2000000. The IP Configuration section shows IPv4 Address as 20.0.0.1 and Subnet Mask as 255.0.0.0. The Tx Ring Limit is set to 10.

Serial0/1/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input checked="" type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	20.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

Configuring IP addresses on Router 2

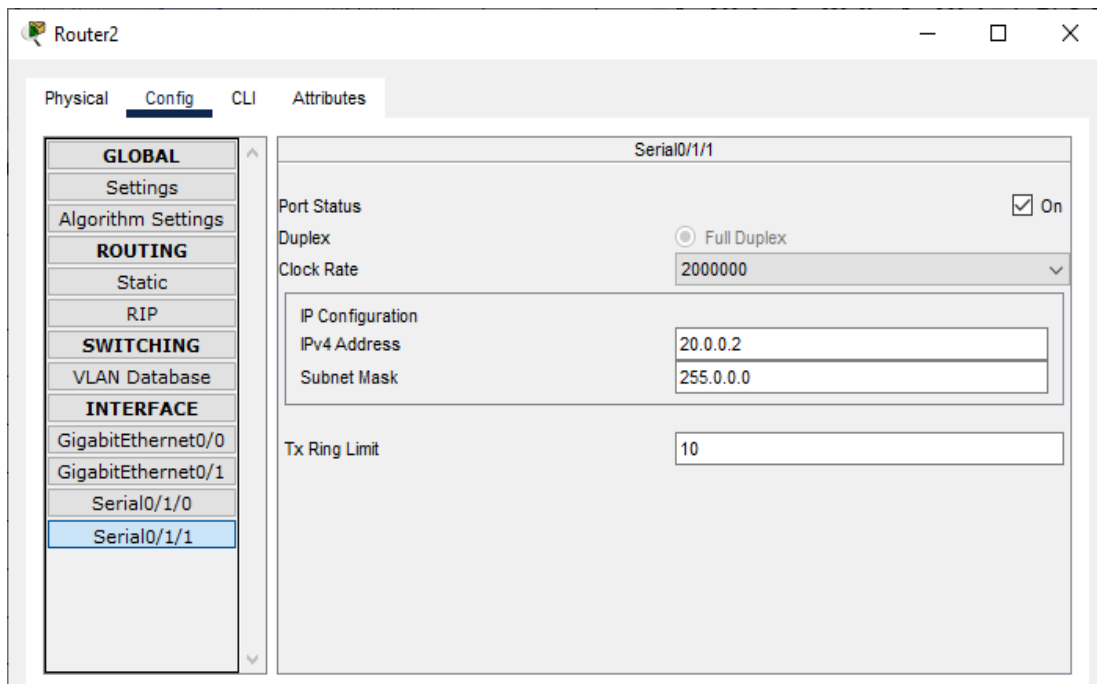
i) Interface G0/0



The screenshot shows the configuration window for Router2, specifically for the GigabitEthernet0/0 interface. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under the INTERFACE category, GigabitEthernet0/0 is selected. The main panel displays the configuration for GigabitEthernet0/0. The Port Status is checked and set to On. Bandwidth is set to 1000 Mbps. Duplex is set to Half Duplex. MAC Address is set to 00D0.FF59.B901. The IP Configuration section shows IPv4 Address as 192.168.3.1 and Subnet Mask as 255.255.255.0. The Tx Ring Limit is set to 10.

GigabitEthernet0/0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 1000 Mbps <input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input checked="" type="radio"/> Half Duplex <input type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	00D0.FF59.B901
IP Configuration	
IPv4 Address	192.168.3.1
Subnet Mask	255.255.255.0
Tx Ring Limit	10

ii) Interface S0/1/1



Configuring Router 0 for BGP (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
1000
Router(config-router)#
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#neighbor 10.0.0.2 remote-as 2000
```

Configuring Router 1 for BGP (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
2000
Router(config-router)#network 10.0.0.0
```

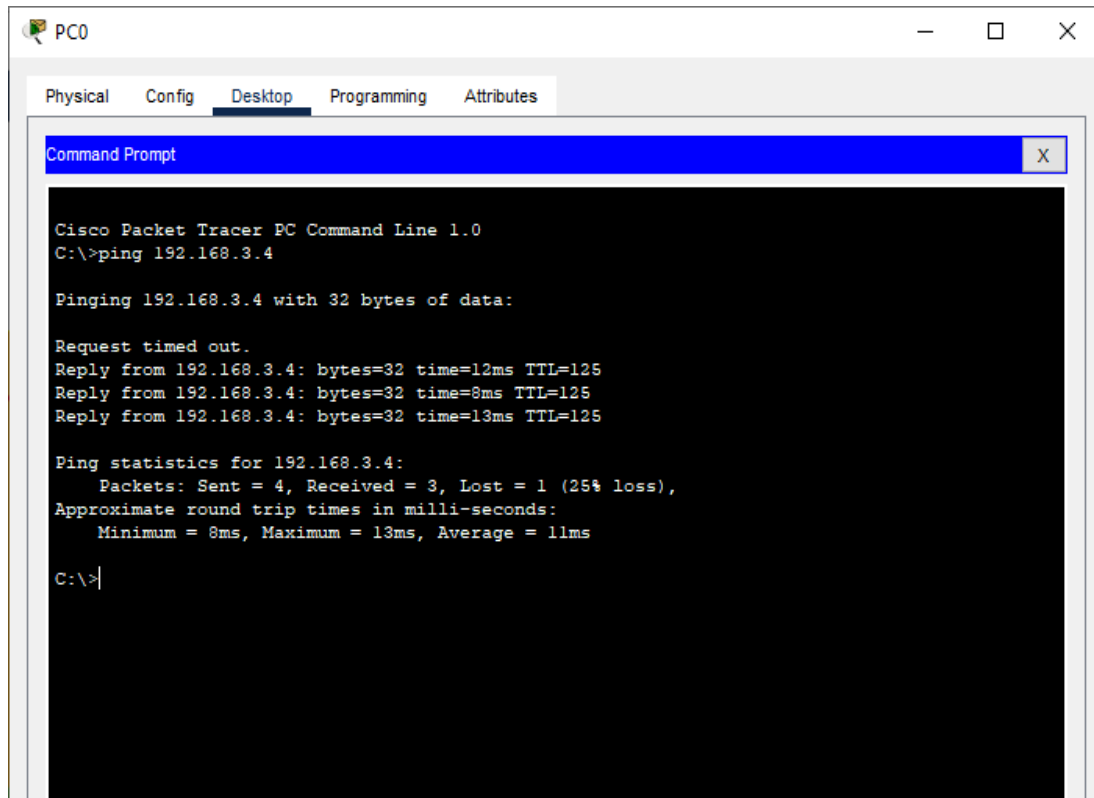
```
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#neighbor 10.0.0.1 remote-as 1000
Router(config-router)#neighbor 20.0.0.2 remote-as 3000
```

Configuring Router 2 for BGP (using the CLI mode)

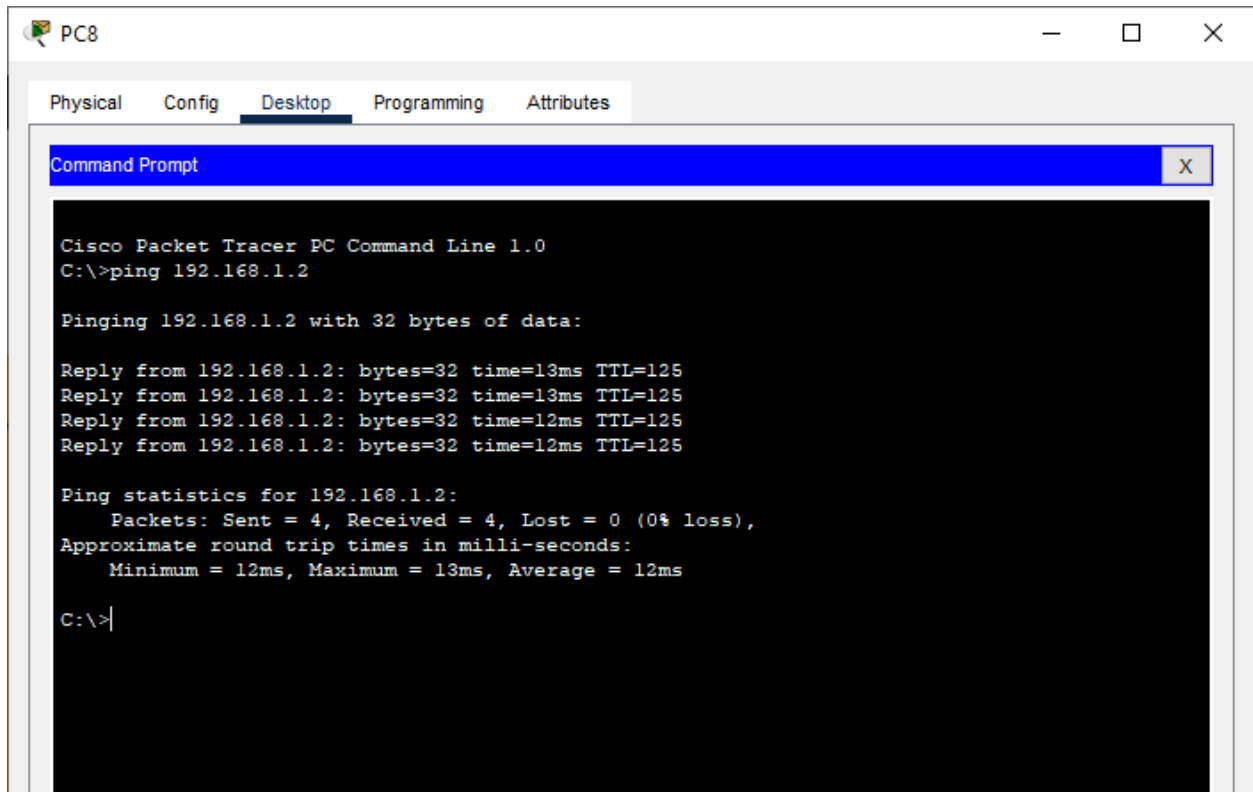
```
Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
3000
Router(config-router)#
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.3.0
Router(config-router)#neighbor 20.0.0.1 remote-as 2000
```

Checking the connectivity by using the ping command

- i) Pinging PC8 (ip address 192.168.3.4) from PC1



ii) Pinging PC0 (ip address 192.168.1.2) from PC8



The screenshot shows a window titled "PC8" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The command prompt shows the execution of a ping command to 192.168.1.2, resulting in four successful replies with 0% loss.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=13ms TTL=125
Reply from 192.168.1.2: bytes=32 time=13ms TTL=125
Reply from 192.168.1.2: bytes=32 time=12ms TTL=125
Reply from 192.168.1.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 13ms, Average = 12ms

C:\>|
```

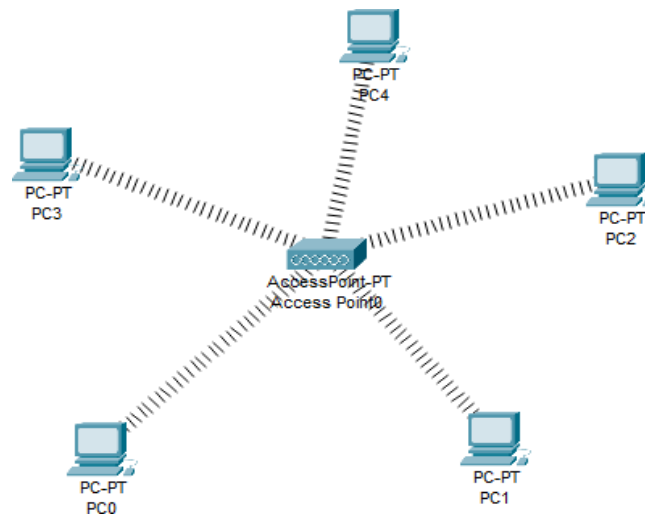
Result:

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

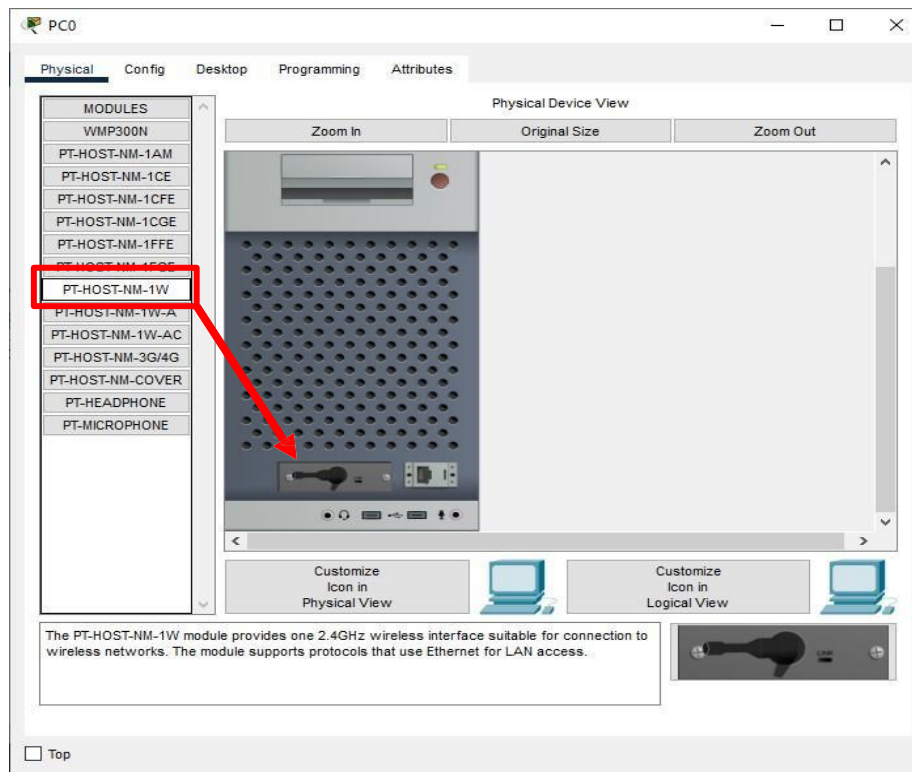
Practical No 9

Aim: Using Packet Tracer, create a wireless network of multiple PCs using appropriate access point.

We use the following topology for the present case (5PCs and an Access Point)

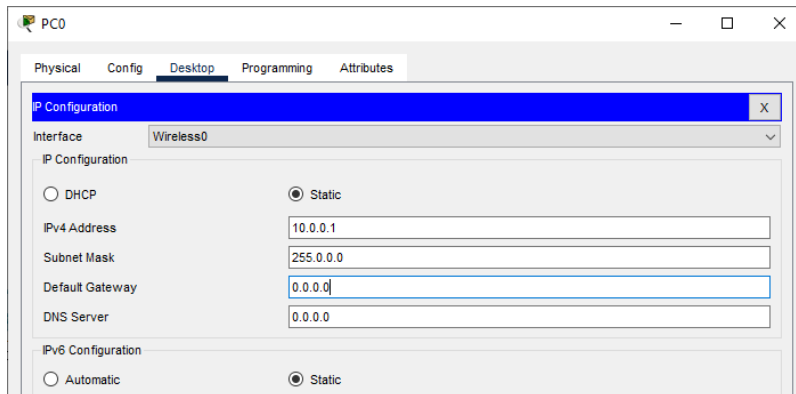


Add a Wireless interface to each PC as follows



Assigning IP Address to each PC (select Static)

1) PC0 :

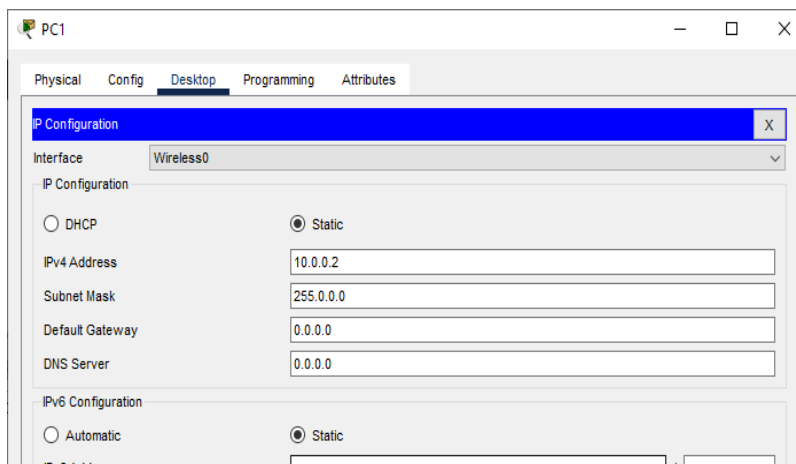


The screenshot shows the configuration window for PC0. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Static' radio button is chosen. The fields are filled with the following values:

Field	Value
IPv4 Address	10.0.0.1
Subnet Mask	255.0.0.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0

Below this, the 'IPv6 Configuration' section shows the 'Static' radio button selected.

2) PC1 :

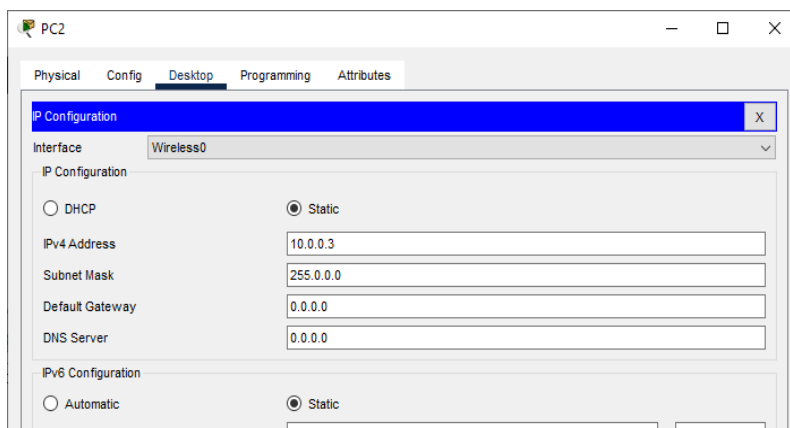


The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Static' radio button is chosen. The fields are filled with the following values:

Field	Value
IPv4 Address	10.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0

Below this, the 'IPv6 Configuration' section shows the 'Static' radio button selected.

3) PC2 :

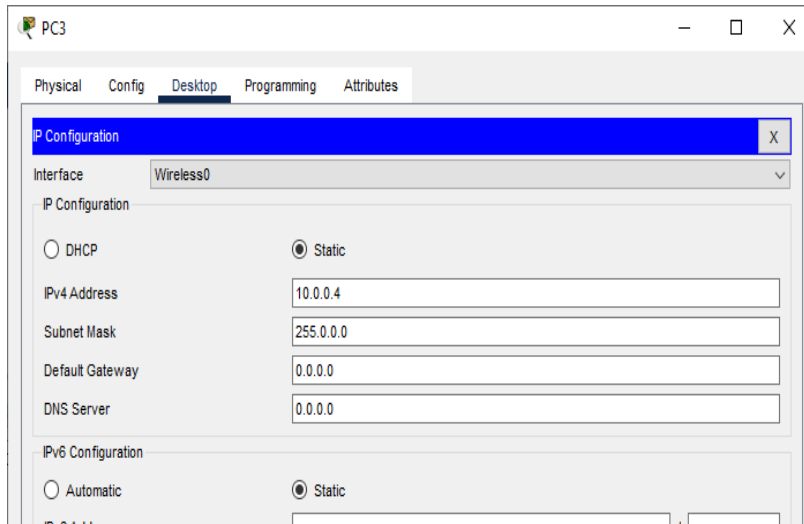


The screenshot shows the configuration window for PC2. The 'Desktop' tab is selected. Under 'IP Configuration', the 'Static' radio button is chosen. The fields are filled with the following values:

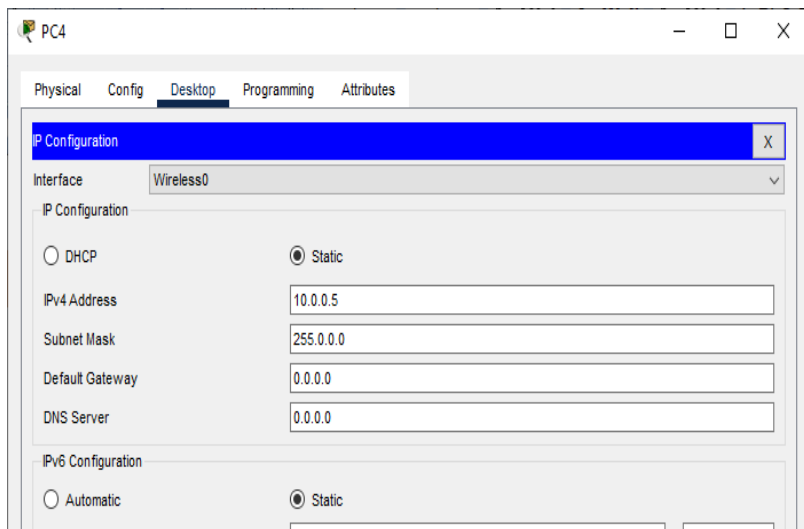
Field	Value
IPv4 Address	10.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0

Below this, the 'IPv6 Configuration' section shows the 'Static' radio button selected.

4) PC3 :



5) PC4 :

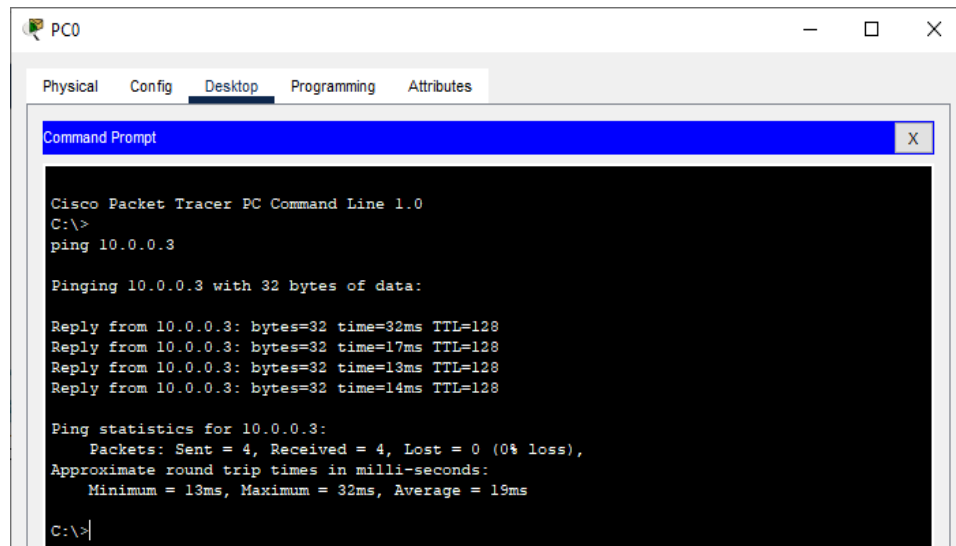


The IP addresses assigned are

Host	IP address
PC0	10.0.0.1
PC1	10.0.0.2
PC2	10.0.0.3
PC3	10.0.0.4
PC4	10.0.0.5

We verify the connectivity by sending ping message from any PC to any other

PC Pinging PC2 (10.0.0.3) from PC0 (10.0.0.1)



The screenshot shows the 'PC0' window in Cisco Packet Tracer. The 'Desktop' tab is selected, and a 'Command Prompt' window is open. The command prompt displays the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>
ping 10.0.0.3

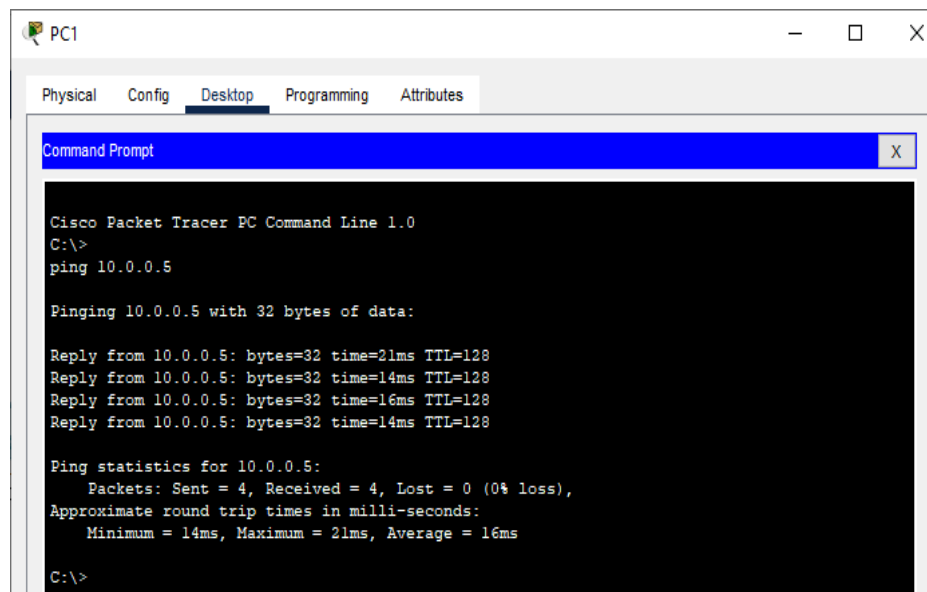
Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=32ms TTL=128
Reply from 10.0.0.3: bytes=32 time=17ms TTL=128
Reply from 10.0.0.3: bytes=32 time=13ms TTL=128
Reply from 10.0.0.3: bytes=32 time=14ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 13ms, Maximum = 32ms, Average = 19ms

C:\>
```

Pinging PC4 (10.0.0.5) from PC1 (10.0.0.2)



The screenshot shows the 'PC1' window in Cisco Packet Tracer. The 'Desktop' tab is selected, and a 'Command Prompt' window is open. The command prompt displays the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>
ping 10.0.0.5

Pinging 10.0.0.5 with 32 bytes of data:

Reply from 10.0.0.5: bytes=32 time=21ms TTL=128
Reply from 10.0.0.5: bytes=32 time=14ms TTL=128
Reply from 10.0.0.5: bytes=32 time=16ms TTL=128
Reply from 10.0.0.5: bytes=32 time=14ms TTL=128

Ping statistics for 10.0.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 21ms, Average = 16ms

C:\>
```

Result:

Hence a wireless network of multiple pc's using access point is created.