19ECE311-COMPUTER NETWORKS

ASSIGNMENT

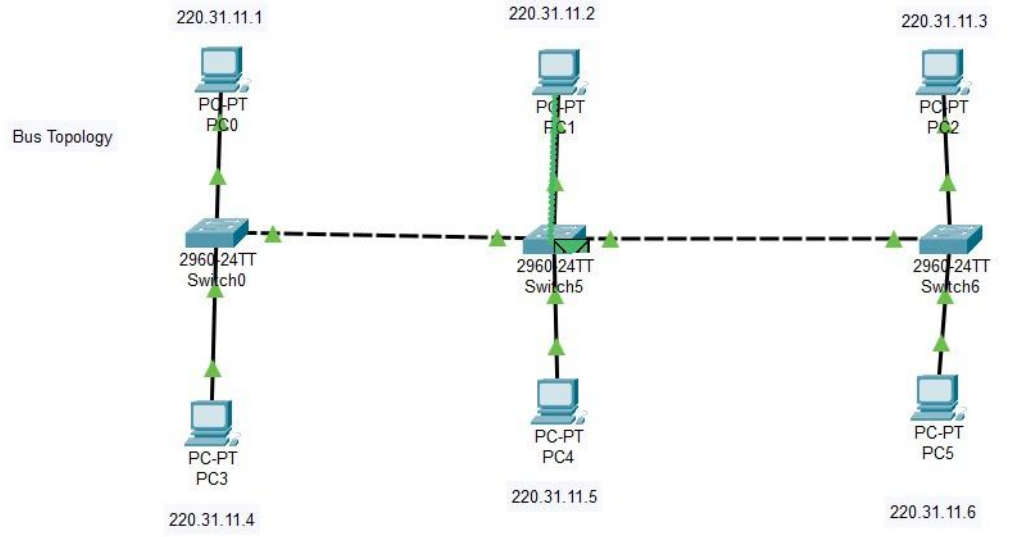
Name: NIVED G UNNI Date:28/4/25

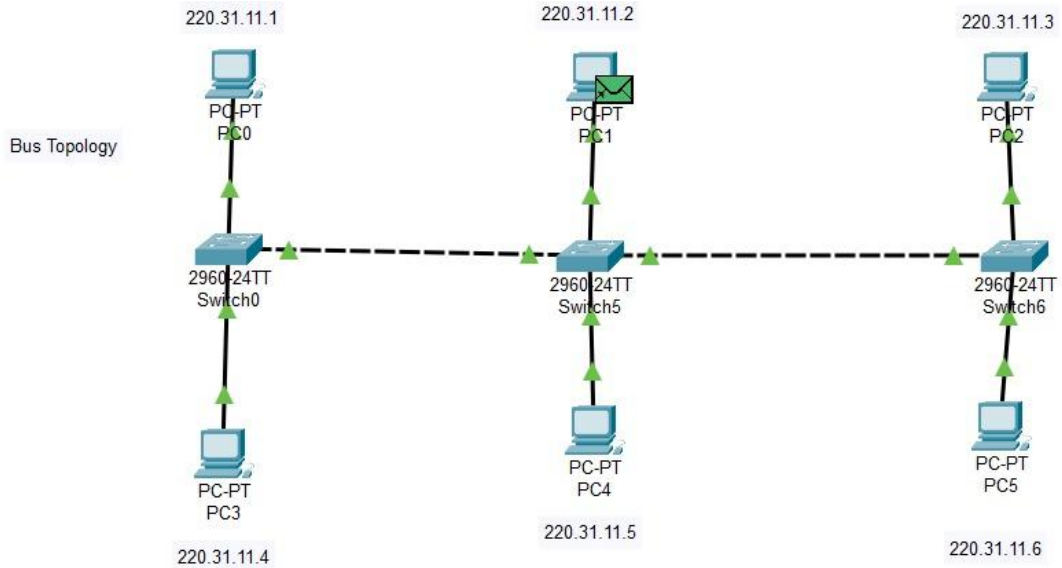
Roll no: AM.EN. U4ECE22031

Q1. Create all the topologies using Cisco Packet Tracer

1. Bus topology:

All devices share a central cable, where collisions may occur if multiple PCs send data at once. A cable failure can shut down the entire network.

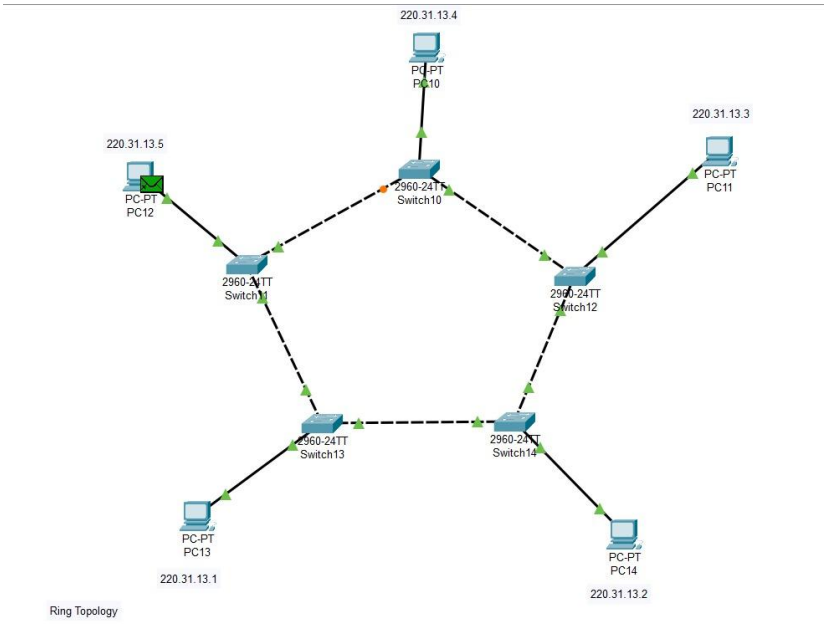




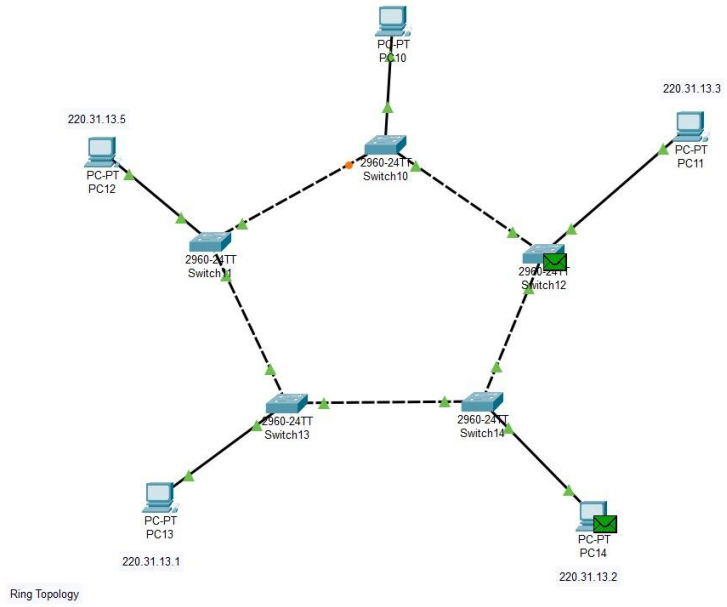
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.12.2

Pinging 220.31.12.2 with 32 bytes of data:

Reply from 220.31.12.2: bytes=32 time=3ms TTL=128
Reply from 220.31.12.2: bytes=32 time=1ms TTL=128
Reply from 220.31.12.2: bytes=32 time=2ms TTL=128
Reply from 220.31.12.2: bytes=32 time<1ms TTL=128

Ping statistics for 220.31.12.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

2. Ring Topology:

PCs form a closed loop, sending data in one direction. A single failure can disrupt communication unless a backup ring is in place. Transmission time may be longer.



Ring Topology

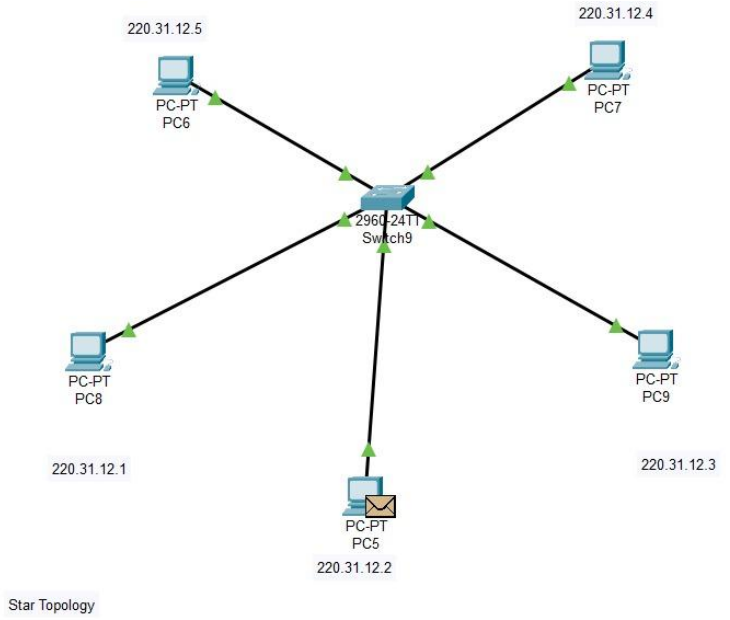


Ring Topology

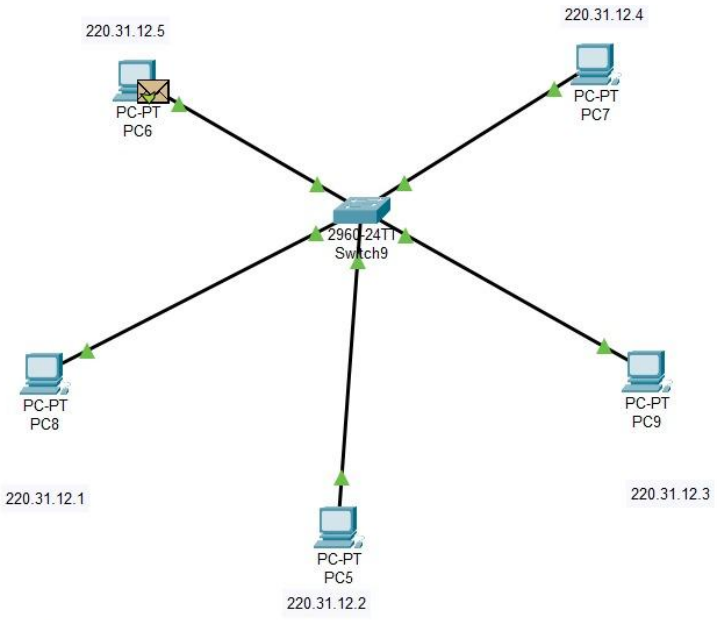
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.12.2

Pinging 220.31.12.2 with 32 bytes of data:

Reply from 220.31.12.2: bytes=32 time=3ms TTL=128
Reply from 220.31.12.2: bytes=32 time=1ms TTL=128
Reply from 220.31.12.2: bytes=32 time=2ms TTL=128
Reply from 220.31.12.2: bytes=32 time<1ms TTL=128

Ping statistics for 220.31.12.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

3. Star Topology:

Each PC connects to a central switch or hub. It ensures reliable communication, but failure of the central device causes a complete network outage.



Star Topology

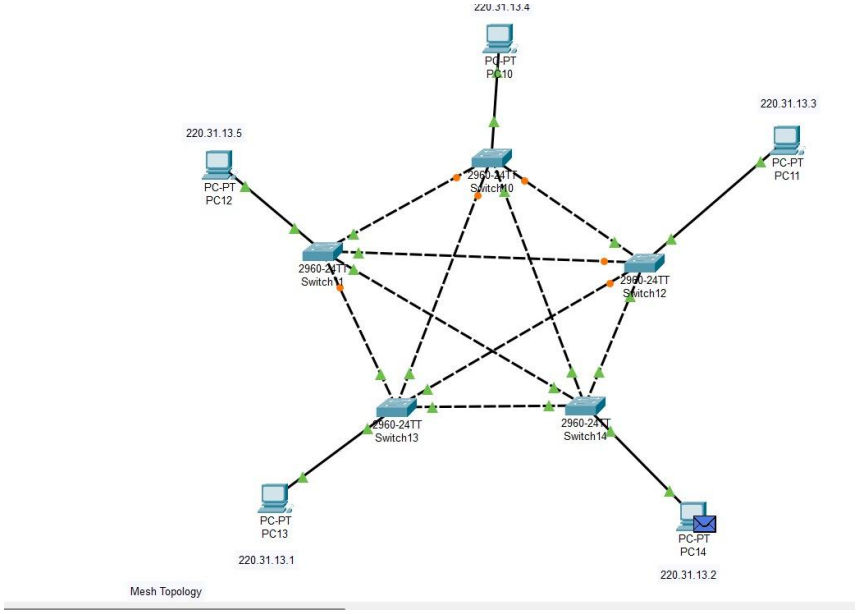


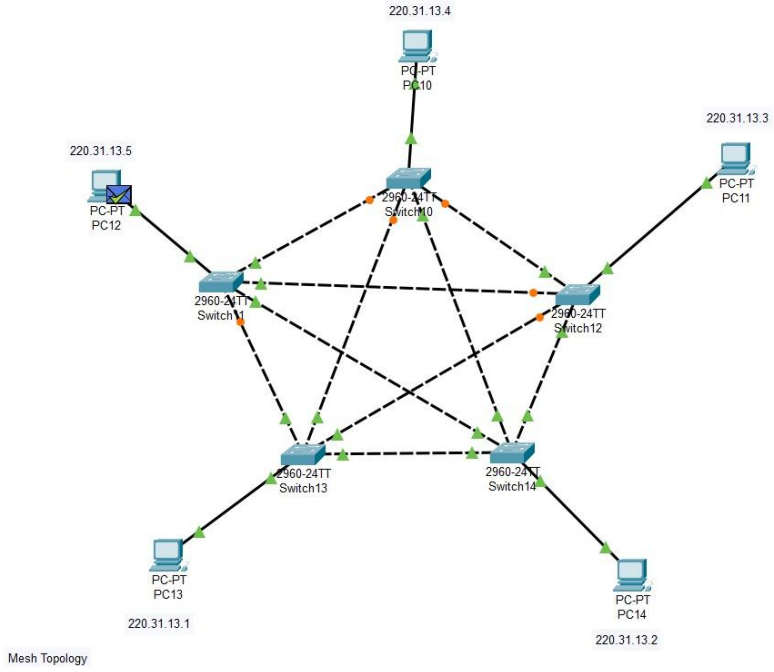
Star Topology

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.12.2

Pinging 220.31.12.2 with 32 bytes of data:

Reply from 220.31.12.2: bytes=32 time=3ms TTL=128
Reply from 220.31.12.2: bytes=32 time=1ms TTL=128
Reply from 220.31.12.2: bytes=32 time=2ms TTL=128
Reply from 220.31.12.2: bytes=32 time<1ms TTL=128

Ping statistics for 220.31.12.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

4.Mesh Topology:

Every PC has multiple connections, ensuring high reliability but at a high cost and complexity. Response times can be inconsistent.

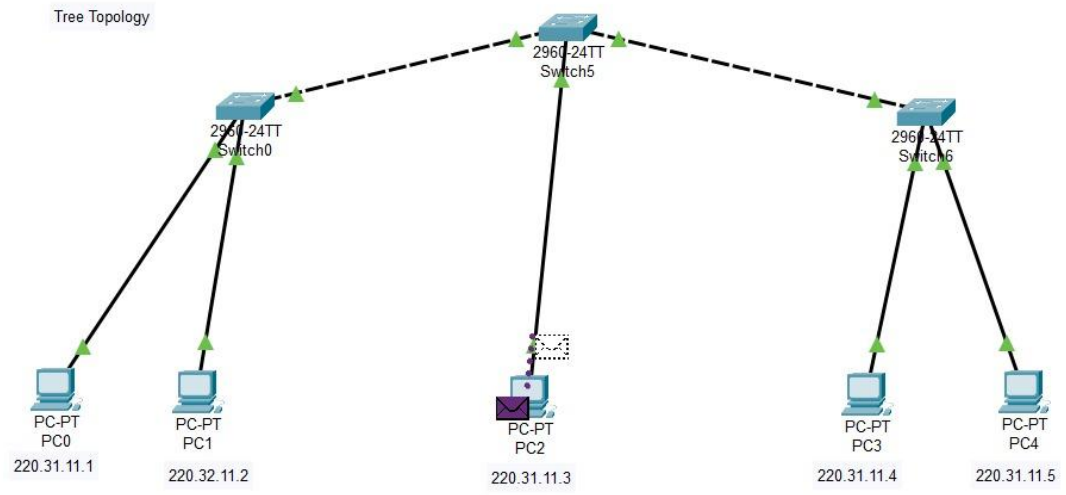


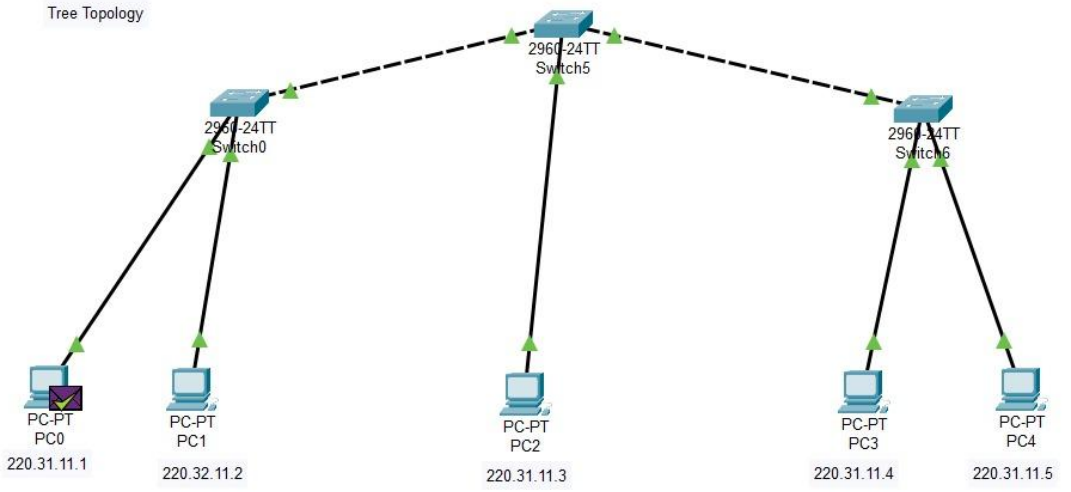


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.11.2

Pinging 220.31.11.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 220.31.11.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

5.Tree Topology:

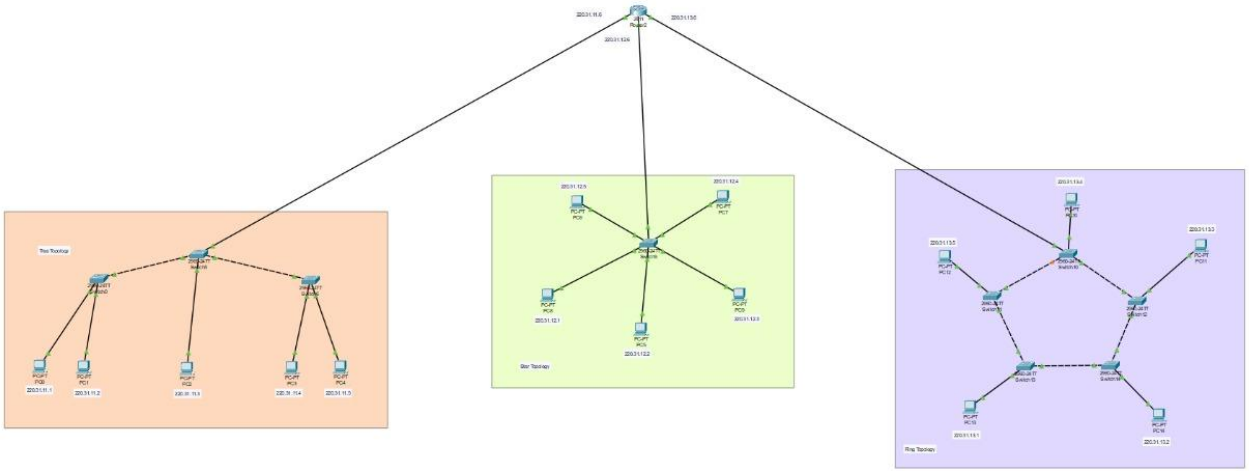
A combination of star networks in a hierarchy. If the main trunk fails, multiple devices are affected, but smaller branches may still function.





```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.11.3

Pinging 220.31.11.3 with 32 bytes of data:

Reply from 220.31.11.3: bytes=32 time=2ms TTL=128
Reply from 220.31.11.3: bytes=32 time=4ms TTL=128
Reply from 220.31.11.3: bytes=32 time<1ms TTL=128
Reply from 220.31.11.3: bytes=32 time=3ms TTL=128

Ping statistics for 220.31.11.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

Q2. Create 3 LAN networks connected via a single Router (CPT). Choose appropriate router, connection and configure it. Each LAN network is configured via Tree, Star and Ring topologies respectively.

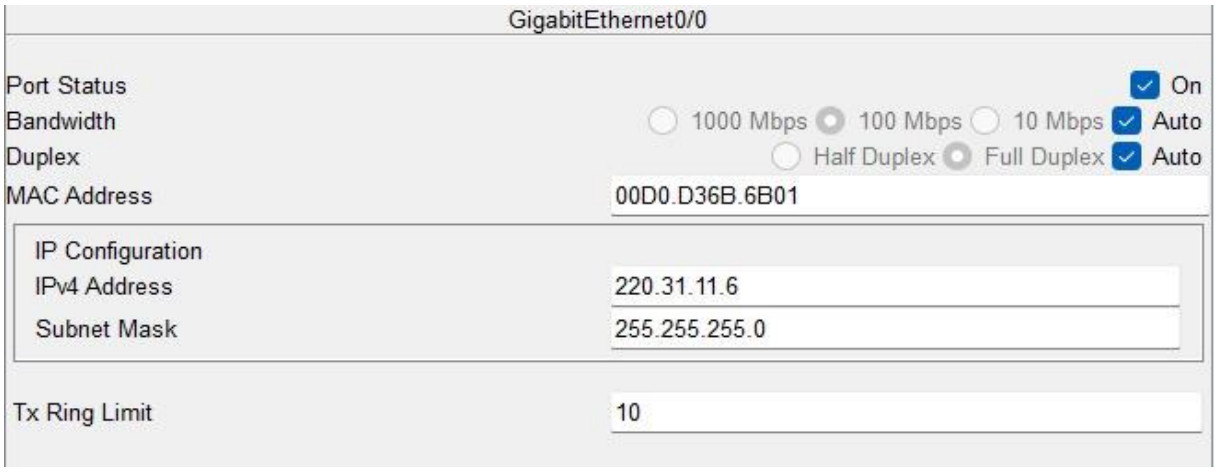


LAN1 (Tree topology): IP Addresses – 220.31.11.1 - 220.31.11.5

LAN2 (Star topology): IP Addresses – 220.31.12.1 - 220.31.12.5

LAN3 (Ring topology): IP Addresses – 220.31.13.1 - 220.31.13.5

Router Configuration:



GigabitEthernet0/1

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	00D0.D36B.6B02
IP Configuration	
IPv4 Address	220.31.12.6
Subnet Mask	255.255.255.0
Tx Ring Limit	10

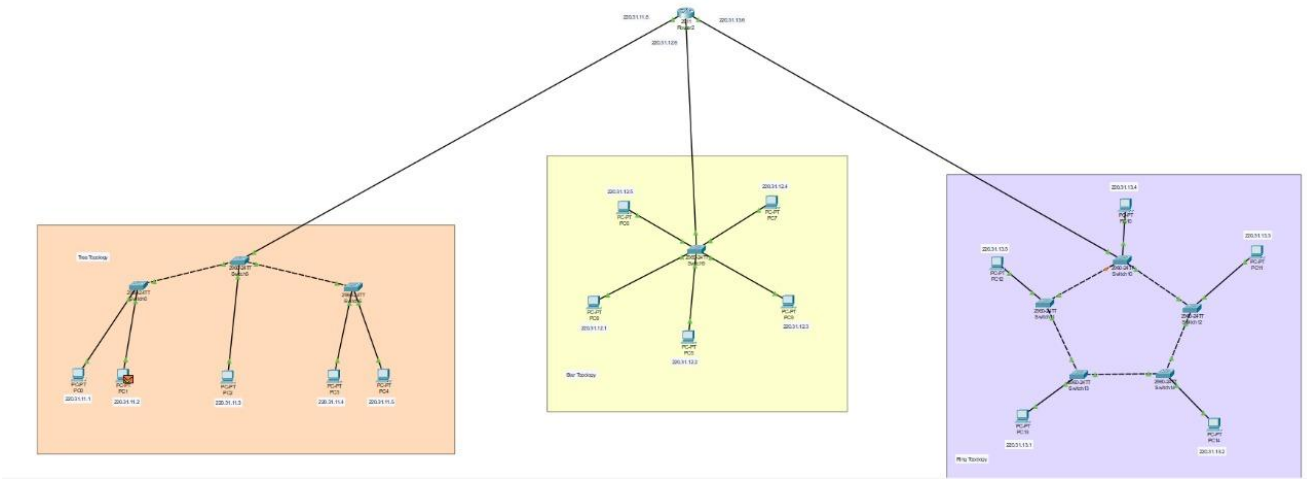
GigabitEthernet0/2

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	00D0.D36B.6B03
IP Configuration	
IPv4 Address	220.31.13.6
Subnet Mask	255.255.255.0
Tx Ring Limit	10

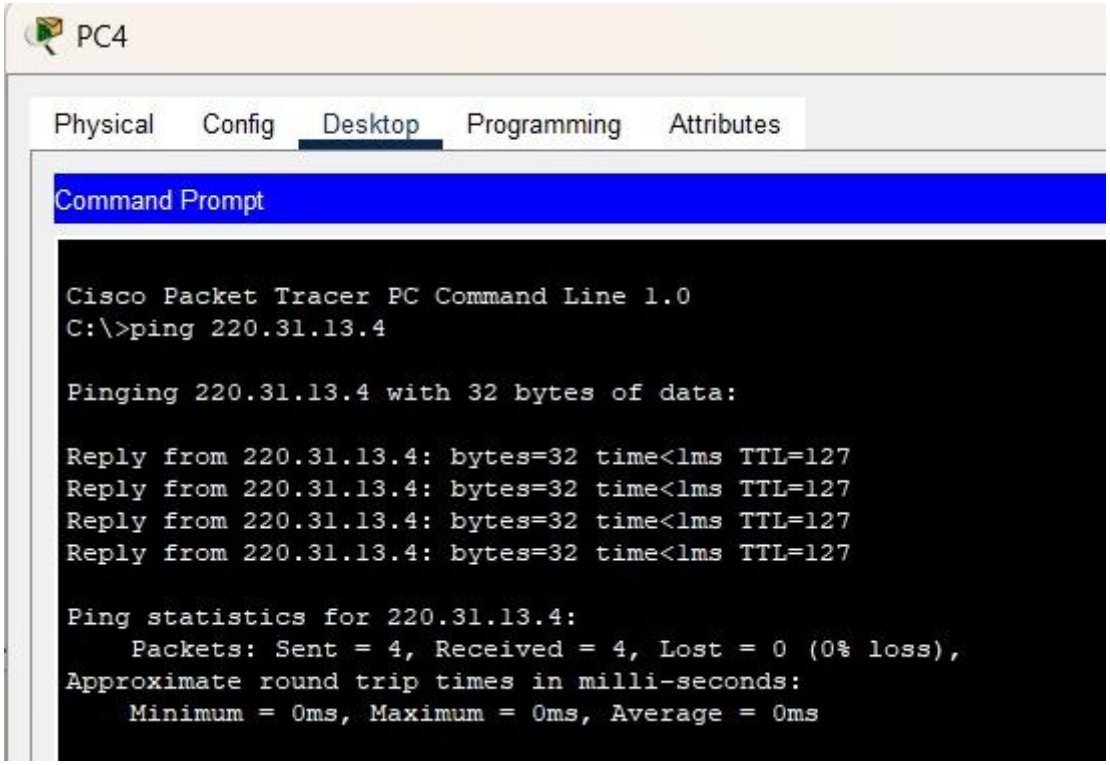
GigabitEthernet0/0 → Connected to LAN1 (Tree Topology)

GigabitEthernet0/1 → Connected to LAN2 (Star Topology)

GigabitEthernet0/2 → Connected to LAN3 (Ring Topology)



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	PC10	ICMP		0.000	N	0	(edit)	(delete)


PC4
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 220.31.13.4
Pinging 220.31.13.4 with 32 bytes of data:
Reply from 220.31.13.4: bytes=32 time<1ms TTL=127
Reply from 220.31.13.4: bytes=32 time<1ms TTL=127
Reply from 220.31.13.4: bytes=32 time<1ms TTL=127
Reply from 220.31.13.4: bytes=32 time<1ms TTL=127
Ping statistics for 220.31.13.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms