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CN LAB 4

LAN, WAN, and MAN

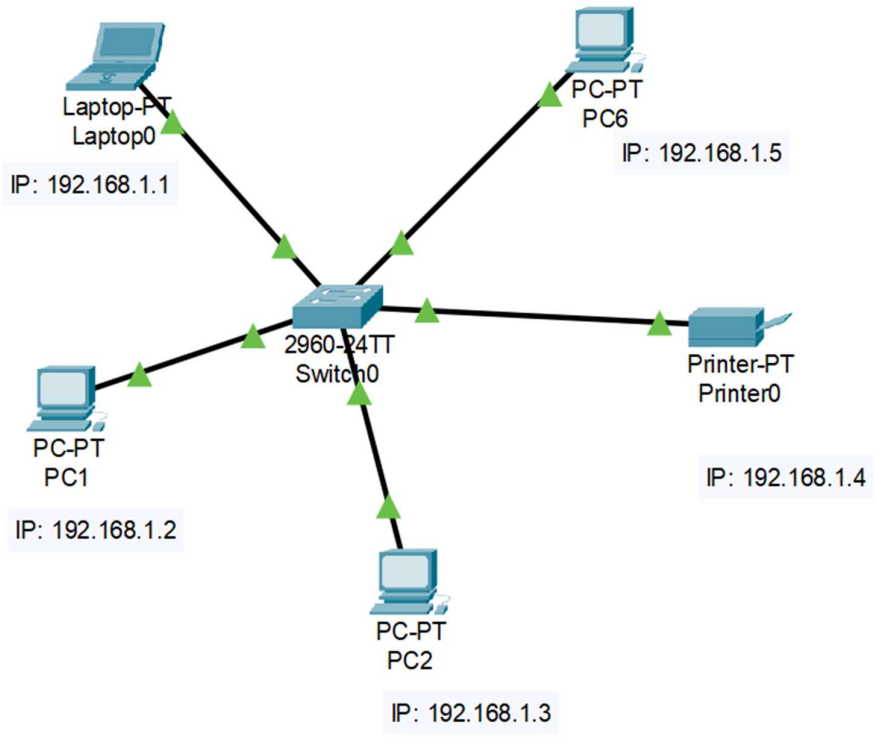
Aim

To develop a comprehensive understanding of various network types, enable identification of different networks, and practice building LAN, WAN, and MANusing Cisco Packet Tracer.

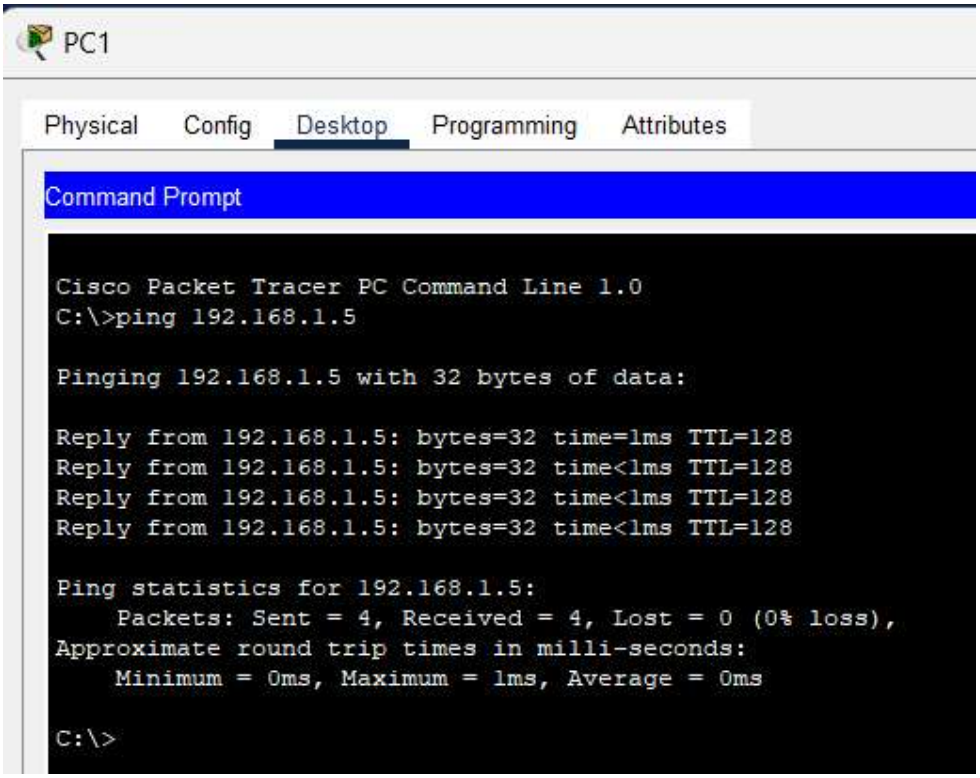
Theory

Observations

1. **LAN**

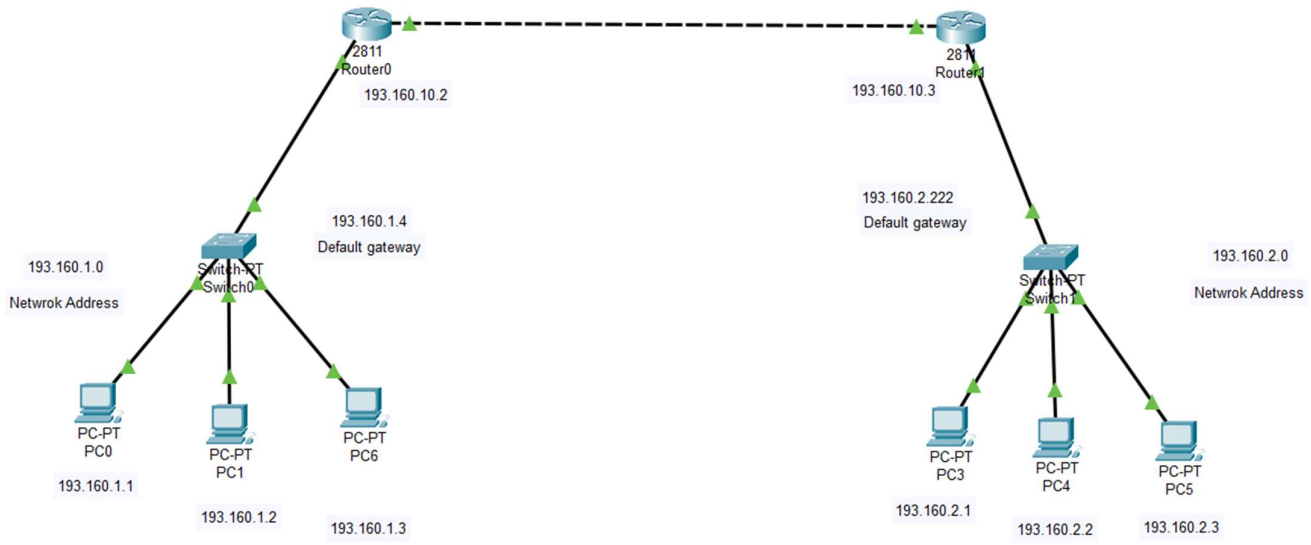


Sno	Device Name	IP	Network Address	Default Gateway
1	Laptop0	192.168.1.1	192.168.1.0	0.0.0.0
2	PC1	192.168.1.2	192.168.1.0	0.0.0.0
3	PC2	192.168.1.3	192.168.1.0	0.0.0.0
4	Printer0	192.168.1.4	192.168.1.0	0.0.0.0
5	PC6	192.168.1.5	192.168.1.0	0.0.0.0



Ping PC1 -> PC2

2. WAN



Sno	Device Name	IP	Network Address	Default Gateway
1	PC0	192.160.1.1	192.160.1.0	192.160.1.4
2	PC1	192.160.1.2	192.160.1.0	192.160.1.4
3	PC6	192.160.1.3	192.160.1.0	192.160.1.4
4	Router0	192.160.10.2	192.160.1.0	192.160.1.4
5	PC3	192.160.2.1	192.160.2.0	192.160.2.222
6	PC4	192.160.1.2	192.160.2.0	192.160.2.222
7	PC5	192.160.1.3	192.160.2.0	192.160.2.222
8	Router1	192.160.10.3	192.160.2.0	192.160.2.222

PC0

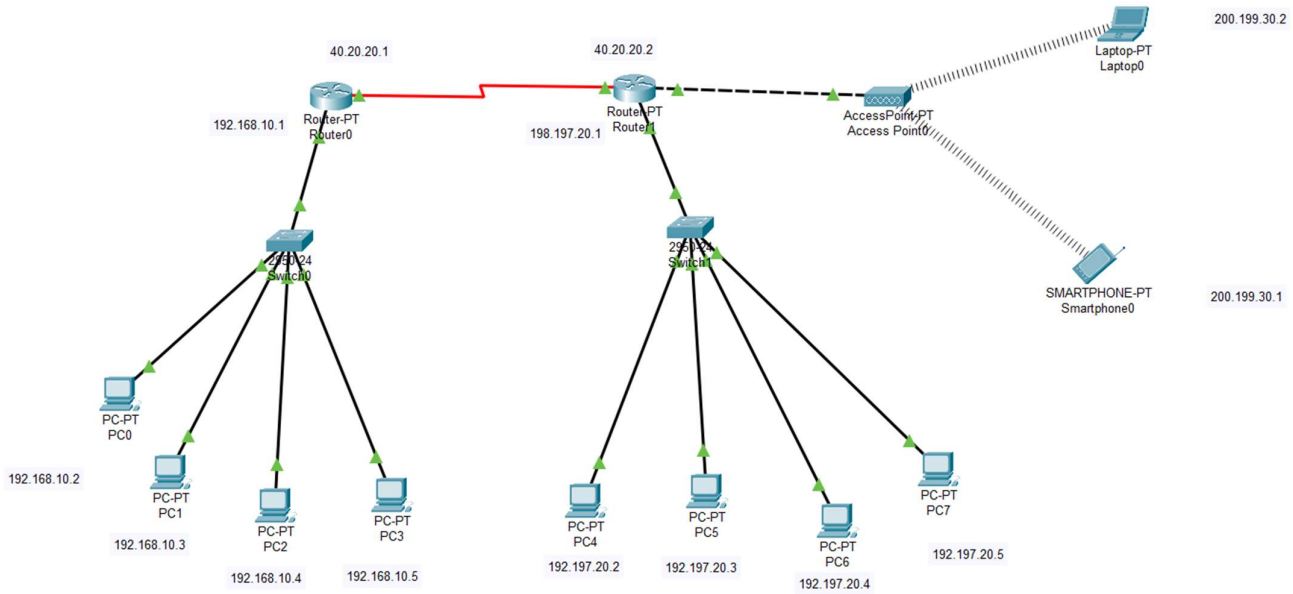
Physical Config Desktop Programming Attributes

Command Prompt X

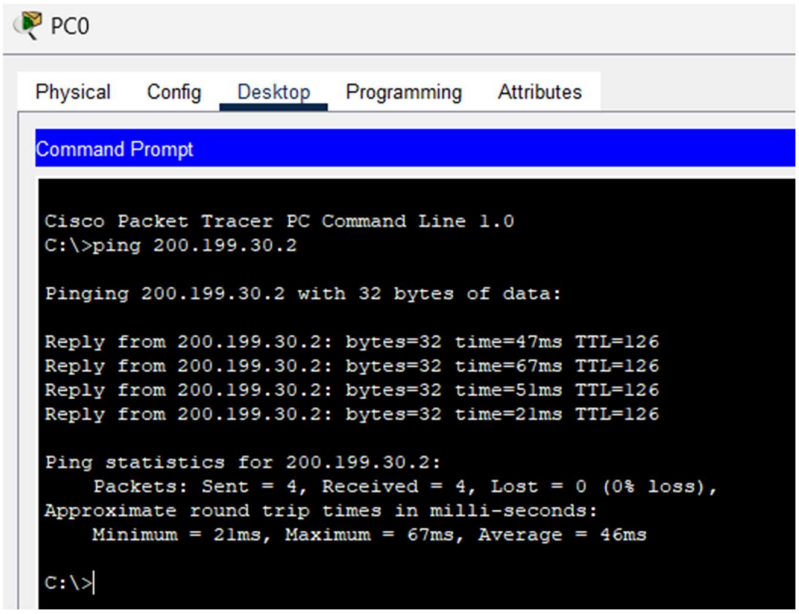
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 193.160.2.2

Pinging 193.160.2.2 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 193.160.2.2: bytes=32 time<1ms TTL=126
Reply from 193.160.2.2: bytes=32 time<1ms TTL=126

Ping statistics for 193.160.2.2:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 193.160.2.2

Pinging 193.160.2.2 with 32 bytes of data:

Reply from 193.160.2.2: bytes=32 time<1ms TTL=126
Reply from 193.160.2.2: bytes=32 time<1ms TTL=126
Reply from 193.160.2.2: bytes=32 time<1ms TTL=126
Reply from 193.160.2.2: bytes=32 time<1ms TTL=126

Ping statistics for 193.160.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping PC0 -> PC4

3. MAN



Sno	Device Name	IP	Network Address	Default Gateway
1	PC0	192.168.10.2	192.160.10.0	192.168.10.1
2	PC1	192.168.10.3	192.160.10.0	192.168.10.1
3	PC2	192.168.10.4	192.160.10.0	192.168.10.1
4	PC3	192.168.10.5	192.160.10.0	192.168.10.1
5	Router0	40.20.20.1		
6	PC4	192.197.20.2	192.197.20.0	192.197.20.1
7	PC5	192.197.20.3	192.197.20.0	192.197.20.1
8	PC6	192.197.20.4	192.197.20.0	192.197.20.1
9	PC7	192.197.20.5	192.197.20.0	192.197.20.1
10	Router1	192.197.20.6	192.197.20.0	192.197.20.1
11	Laptop0	200.199.30.2		
12	Smartphone0	200.199.30.1		



Ping PC0 -> Laptop0

Self Assessment –

Q1. What are some challenges associated with managing and securing a WAN comparedto a LAN?

When compared to a Local Area Network (LAN), managing and securing a Wide Area Network (WAN) presents unique issues. WANs cover wider geographical areas, typically spanning many cities or nations, which complicates connectivity, latency, and bandwidth management. WANs rely on third-party service providers and may use a variety of technologies, such as leased lines, MPLS, or public internet connections, making coordination and troubleshooting more difficult. Furthermore, because of their greater reach, WANs are more vulnerable to security threats, necessitating powerful encryption, authentication, and intrusion detection measures to protect data as it travels across many sites.
Packet Tracer's WAN network simulation has some restrictions, such as a limited scope of network size and

complexity. Packet Tracer may struggle to precisely imitate real-world traffic.

Q2. List the limitations or constraints that you faced of simulating WAN networks inPacket Tracer?

Packet Tracer's WAN network simulation has some restrictions, such as a limited scope of network size and complexity. Packet Tracer may fail to accurately reproduce the real-world behavior of WAN technologies such as dynamic routing protocols, QoS settings, or realistic latency across long distances. Furthermore, because Packet Tracer is primarily intended for instructional purposes, it may not include the full range of WAN devices, services, and complexities, limiting its capacity to thoroughly recreate enterprise-grade WAN scenarios.

Conclusion -

This assignment helped me to understand the various types of networks LAN, MAN and WAN, their specifications and the different types of challenges implementing and managing them. Using Cisco Packet tracer, I was able to get hands -on experience making these networks and knowing how to configure various networking devices.