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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 MAN using Cisco Packet Tracer.

# Theory

# Observations

# LAN

# A computer network diagram with many computers connected to each other Description automatically generated

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |

# A computer screen shot of a computer program Description automatically generated

Ping PC1 -> PC2

# WAN

# A diagram of a computer network Description automatically generated

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |

# A computer screen shot of a computer program Description automatically generated

Ping PC0 -> PC4

# 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 |  |  |

# A screenshot of a computer Description automatically generated

# A screenshot of a computer program Description automatically generated

Ping PC0 -> Laptop0

# Self Assessment –

Q1. What are some challenges associated with managing and securing a WAN compared to 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 in Packet 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.