NETWORK TOPOLOGIES, LAN, MAN, WAN & INTERNET

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What is a Computer Network?

- A collection of interconnected devices
- Allows sharing of data and resources
- Uses hardware and communication protocols

Importance of Networks

- Resource Sharing
- Communication and Collaboration
- Centralized Data Management
- Cost Efficiency

Network Topologies Overview

- Defines how devices are connected
- Affects performance, scalability, reliability

Bus Topology

- Single central cable (bus) connects all devices
- Easy to set up, low cost
- Performance issues with heavy traffic

Star Topology

- All devices connected to a central hub/switch
- Easy to manage, scalable
- Failure of central device affects entire network

Ring Topology

- Devices connected in a circular manner
- Data flows in one direction
- Failure in a single node may break the network

Mesh Topology

- Every device connected to every other device
- High redundancy and reliability
- Expensive and difficult to maintain

Hybrid Topology

- Combination of two or more topologies
- Flexible and scalable
- Complex design

LAN - Definition

- Local Area Network
- Covers small areas: homes, offices, schools

Characteristics of LAN

- High-speed data transfer
- Low cost of setup
- Owned and managed by a single organization

Uses of LAN

- File sharing
- Printer and hardware sharing
- Collaborative work environments

MAN - Definition

- Metropolitan Area Network
- Covers city or metropolitan region

Characteristics of MAN

- Medium to high speed
- Used by ISPs, universities, government

Examples of MAN

- City-wide fiber optic networks
- University campuses
- Public Wi-Fi zones

WAN - Definition

- Wide Area Network
- Covers large geographic areas

Characteristics of WAN

- Slower compared to LAN/MAN
- Uses satellite, fiber, microwave links

Examples of WAN

- International corporate networks
- Banking network infrastructure

Internet - Introduction

- World's largest WAN
- Interconnection of millions of networks

How Internet Works

- Uses TCP/IP protocols
- Routers direct data packets
- Servers provide services like web, email

Services of the Internet

- World Wide Web
- Email
- Cloud Storage
- Social Media
- Streaming and Communication Apps

Conclusion

- Topologies define structure
- LAN, MAN, WAN serve different geographic needs
- Internet connects the world