Types of Networks – Detailed Documentation

1. Introduction

A network is a group of linked devices (computers, phones, servers, etc.) that exchange information, resources, and services. Networks can differ in functionality, size, coverage area, and purpose. An understanding of different network types is crucial in computer science, IT infrastructure, cybersecurity, and telecommunications.

This document explains the major network types along with their features, benefits, limitations, and real■world applications.

2. Types of Networks

Networking is often classified based on geographic coverage and extent. Major types include:

• Personal Area Network (PAN)

• Local Area Network (LAN)

• Campus Area Network (CAN)

• Metropolitan Area Network (MAN)

• Wide Area Network (WAN)

• Wireless Local Area Network (WLAN)

• Storage Area Network (SAN)

• Virtual Private Network (VPN)

3. Personal Area Network (PAN)

Definition:

The smallest network type, used to connect personal devices within a short range (about 10 meters).

Examples:

• Bluetooth pairing (phone + earphones)

• Laptop connected to mobile hotspot

• Smartwatch linked to smartphone

• Devices connected via USB

Benefits:

• Easy to set up

• Low cost

• Highly portable

Limitations:

• Very short range

• Supports few devices

4. Local Area Network (LAN)

Definition:

A LAN connects computers in a limited geographical area—home, school, office, or a building.

Examples:

• Computer labs

• Office networks

• Home Wi■Fi

• Small business networks

Features:

• High speed (100 Mbps to 10 Gbps)

• Low latency

• Controlled by a single organization

Benefits:

• Secure

• Fast data transfer

• Easy maintenance

Limitations:

• Limited geographic area

• Setup cost varies

5. Campus Area Network (CAN)

Definition:

A CAN connects multiple LANs across a wider area like a university, corporate campus, or industrial zone.

Examples:

• University■wide networks

• Multi■building hospital networks

• Corporate office parks

Benefits:

• Centralized management

• Larger coverage than LAN

• Supports large user groups

Limitations:

• Requires professional maintenance

• More costly than LAN

6. Metropolitan Area Network (MAN)

Definition:

Covers a city or large town, formed by interconnecting multiple LANs.

Examples:

• Internet Service Provider (ISP) networks

• Government city networks

• Public Wi■Fi zones

• Cable TV networks

Benefits:

• Large coverage area

• Fast inter■area connections

Limitations:

• High setup and maintenance cost

• Harder to secure than LAN

7. Wide Area Network (WAN)

Definition:

WAN covers large geographical regions such as countries or continents. It interconnects multiple LANs and MANs.

Examples:

• The Internet (largest WAN)

• Corporate offices connected globally

• Bank branches across India

Features:

• Uses fiber optics, satellites, leased lines

• Enables long■distance communication

Benefits:

• Covers vast distances

• Enables global connectivity

Limitations:

• Expensive infrastructure

• Slower than LAN

• Higher security risk

8. Wireless Local Area Network (WLAN)

Definition:

A wireless LAN that uses Wi■Fi to connect devices within a limited area.

Examples:

• Home Wi■Fi

• Office Wi■Fi

• Public Wi■Fi in cafes

Benefits:

• No physical cables

• Easily scalable

• Supports many mobile devices

Limitations:

• Can face signal interference

• Less secure than wired LAN

9. Storage Area Network (SAN)

Definition:

A specialized high■speed network providing centralized storage access.

Used In:

• Data centers

- Cloud platforms

- Banking systems

- Large enterprises

Advantages:

- Fast data access

- Scalable storage

- Centralized backup

Limitations:

- Expensive

- Requires expert management

10. Virtual Private Network (VPN)

Definition:

Creates a secure encrypted tunnel over a public network (like the Internet).

Examples:

- Employees working remotely

- Secure browsing on public Wi■Fi

- Accessing region■restricted content

Advantages:

- High security

- Allows remote access

- Encrypts communication

Limitations:

- Can be slower due to encryption

• Needs proper configuration