

- **What is a Computer Network?**

A computer network refers to a connected system of computing devices and hardware peripherals that enable communication and resource sharing among users. Common types include Local Area Networks (LANs), Metropolitan Area Networks (MANs), and Wide Area Networks (WANs).

- **Uses of Computer Networks**

Computer networks serve various purposes:

- **Communication:** Facilitates exchange of messages and information.
- **Resource Sharing:** Allows multiple users to access shared resources like printers and storage devices.
- **Information Access:** Provides access to databases and information repositories.
- **Distributed Computing:** Enables tasks to be performed collaboratively across multiple networked computers.
- **Entertainment:** Supports streaming, online gaming, and multimedia content distribution.

- **Layers of the OSI Model and Their Functions**

The OSI (Open Systems Interconnection) model consists of seven layers:

- **Layer 1: Physical Layer**
  - Establishes and terminates physical connections between devices.
  - Defines voltage levels, data rates, and physical transmission mediums.
- **Layer 2: Data Link Layer**
  - Ensures error-free transmission of data frames between nodes.
  - Manages data flow and sequence control.
- **Layer 3: Network Layer**
  - Routes data packets between different networks.
  - Controls network traffic and determines optimal routing paths.
- **Layer 4: Transport Layer**

- Manages end-to-end communication and ensures data integrity.
- Provides error-checking and flow control mechanisms.
- **Layer 5: Session Layer**
  - Establishes, manages, and terminates sessions between applications.
  - Handles synchronization and dialog control.
- **Layer 6: Presentation Layer**
  - Translates, encrypts, and compresses data for transmission.
  - Ensures data is in a format that the application layer can use.
- **Layer 7: Application Layer**
  - Provides network services directly to end-users and applications.
  - Supports functions like email, file transfer, and remote access services.

#### **Difference Between OSI and TCP/IP Model**

| <b>OSI Model</b>                                  | <b>TCP/IP Model</b>  |
|---|--|
| Follows a vertical approach                       | Follows a horizontal approach  |
| Includes separate presentation and session layers | Combines functions into fewer layers without dedicated presentation or session layers  |
| Serves as a reference model                       | Implemented directly in networking protocols   |
| Provides guidance for network design              | Used as a practical implementation model   |
| Often used for educational purposes               | Directly fits existing networking protocols without forcing them into a specific model |