COMPUTER AWARENESS
EPISODE-11
OSI LAYERS & NETWORK

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Computer Awareness

Part 10

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Computer Awareness

Part 1 Intro/Generation/ Classification of Computers

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Part 5 Number System

Part 6 Computer Codes & Logic Gates

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Computer Awareness

Part 7 Introduction to Operating System

Part 8 Operating System

Part 9 Data Communication

Lets move on to
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OSI Model

The **OSI Model** (Open Systems Interconnection **Model**) is a conceptual framework used to describe the functions of a **networking** system.

The **OSI model** characterizes computing functions into a universal set of rules and requirements in order to support interoperability between different products and software.

It has seven layers of the OSI model

- Physical Layer
- Data link Layer
- Network Layer
- Transport Layer
- Session Layer
- Presentation Layer
- Application Layer

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Pictorial representation of OSI Model

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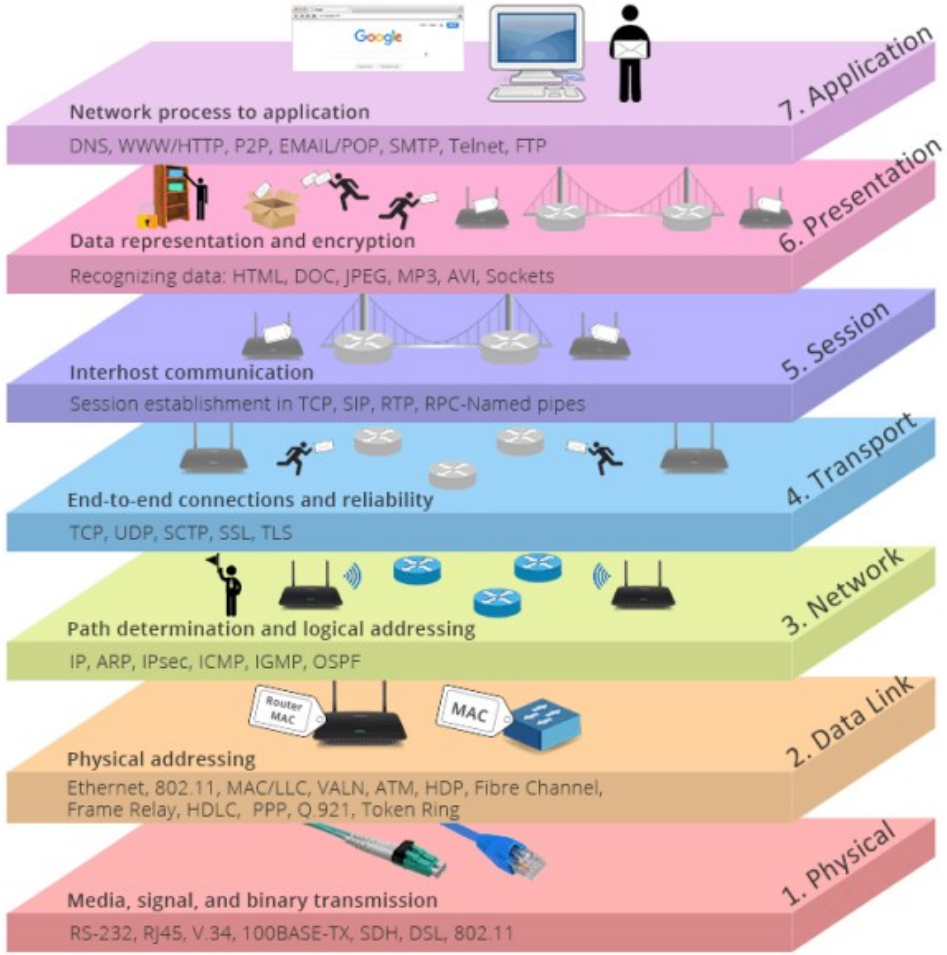
OSI Model



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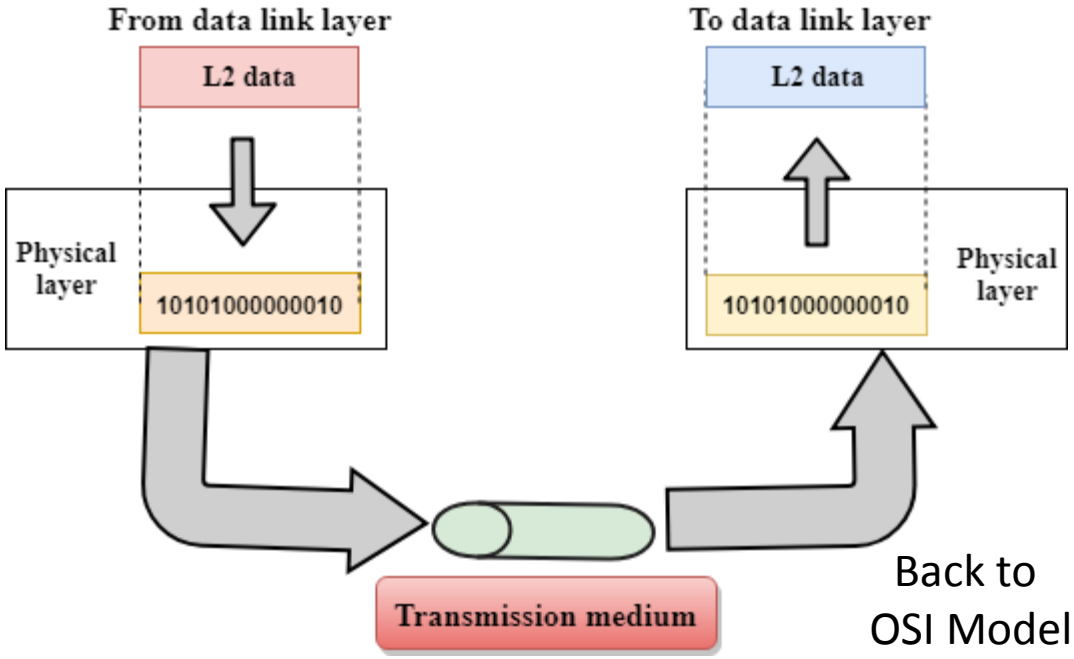
Physical Layer

- It is first layer of OSI Model
- It transmits raw bit stream over the physical Medium
- Example Protocols : Coax, Fiber, Wireless



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Data link Layer

- The data link layer, or layer 2, is the second layer of the seven-layer OSI model of computer networking.
- This layer is the protocol layer that transfers data between nodes on a network segment across the physical layer.
- Services of Data Link layer
  - Framing and Link Access
  - Reliable Delivery
  - Flow Control
  - Error Detection
  - Error Correction
  - Half Duplex and Full Duplex
- Example Protocols: Ethernet. SLLIP, PPP, FDDI

Pictorial representation of OSI Model

Pictorial representation of Data link Layer

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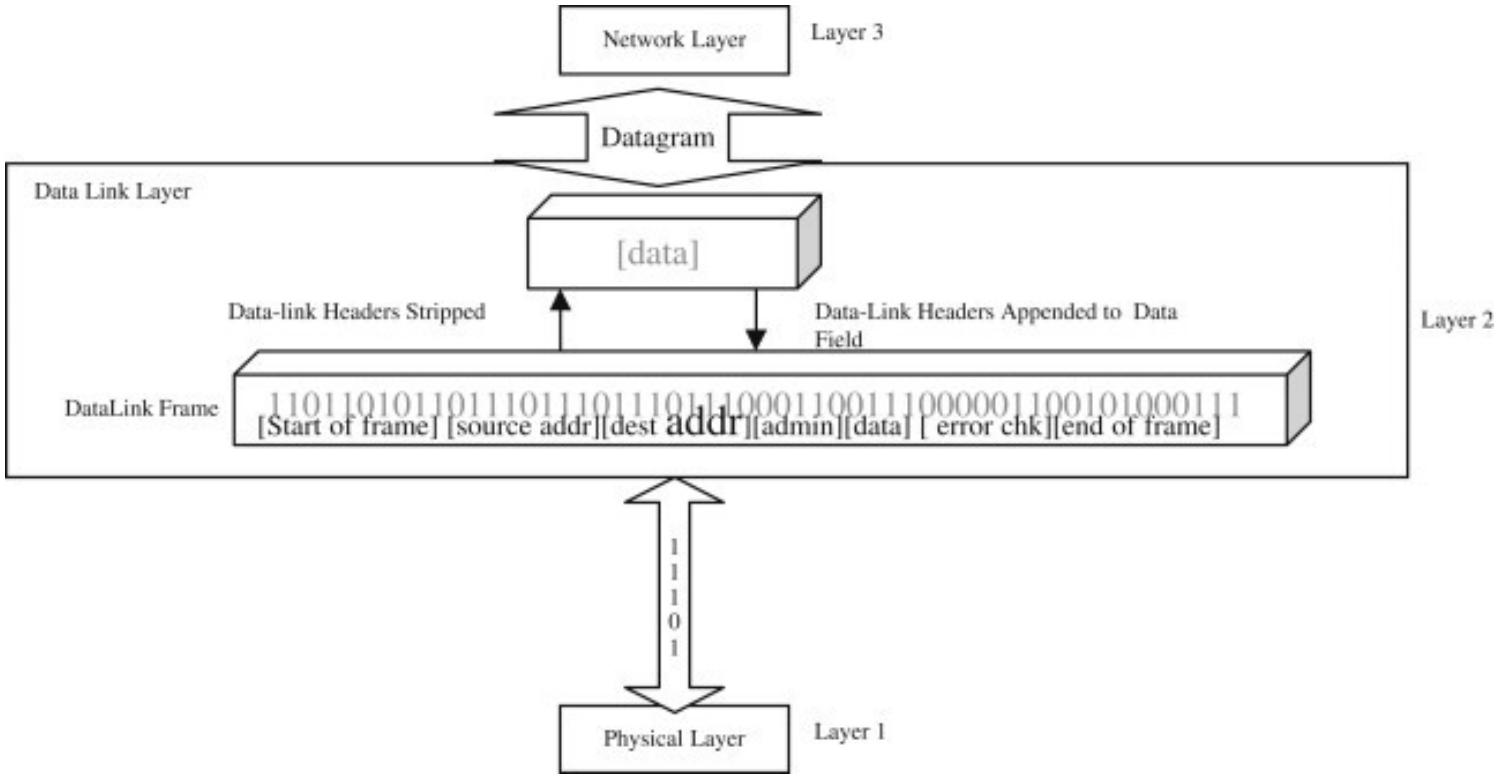
Data link Layer



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Explanation of Data link Layer

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Network Layer

- The **Network Layer** is the third **layer** of the OSI model.
- It handles the service requests from the transport **layer** and further forwards the service request to the data link **layer**.
- The **network layer** translates the logical addresses into physical addresses.
- Example Protocols : IP, IPSec, ICMP, IGMP

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Pictorial representation of Network Layer

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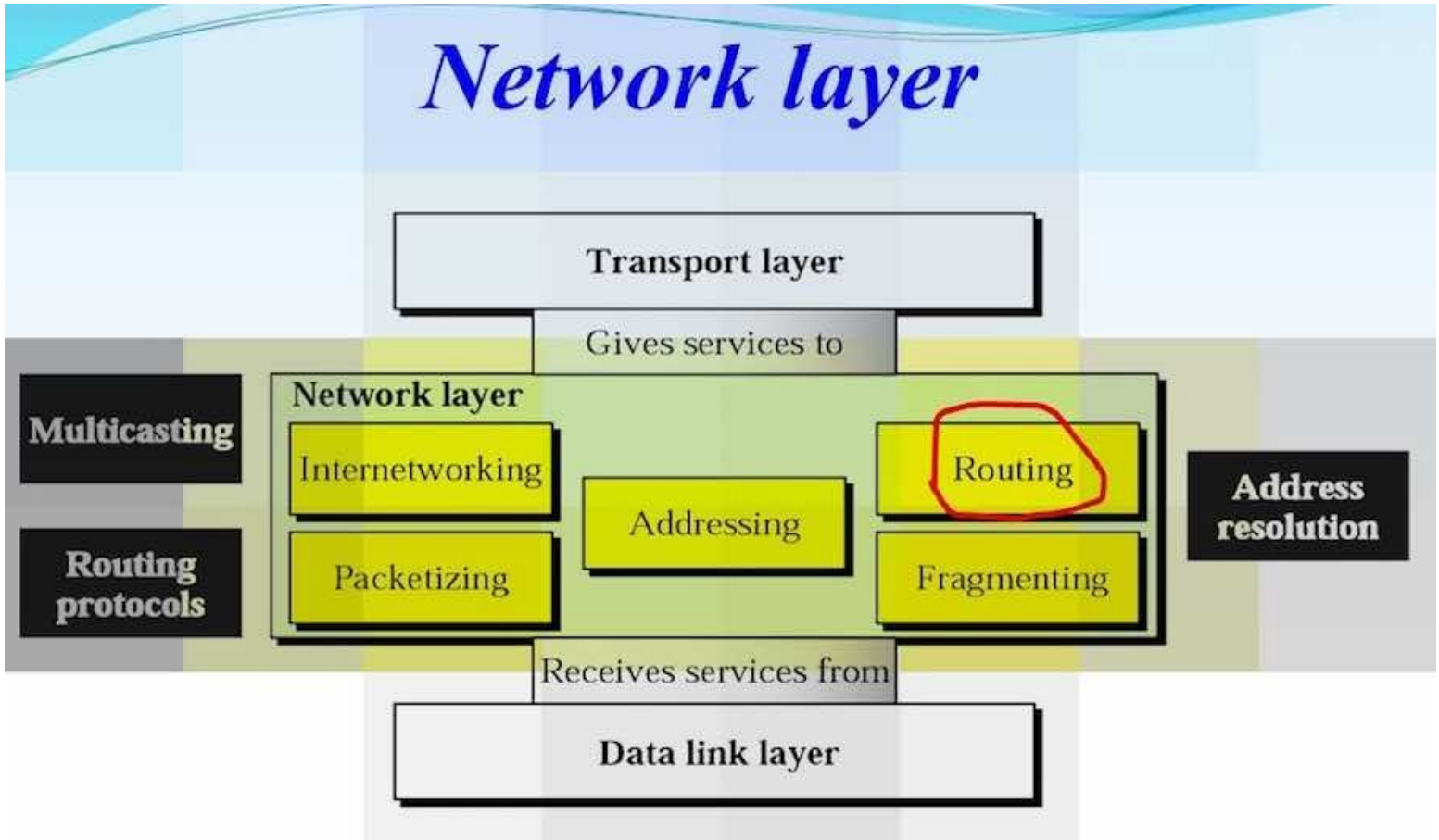
Network Layer



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Explanation of Network Layer

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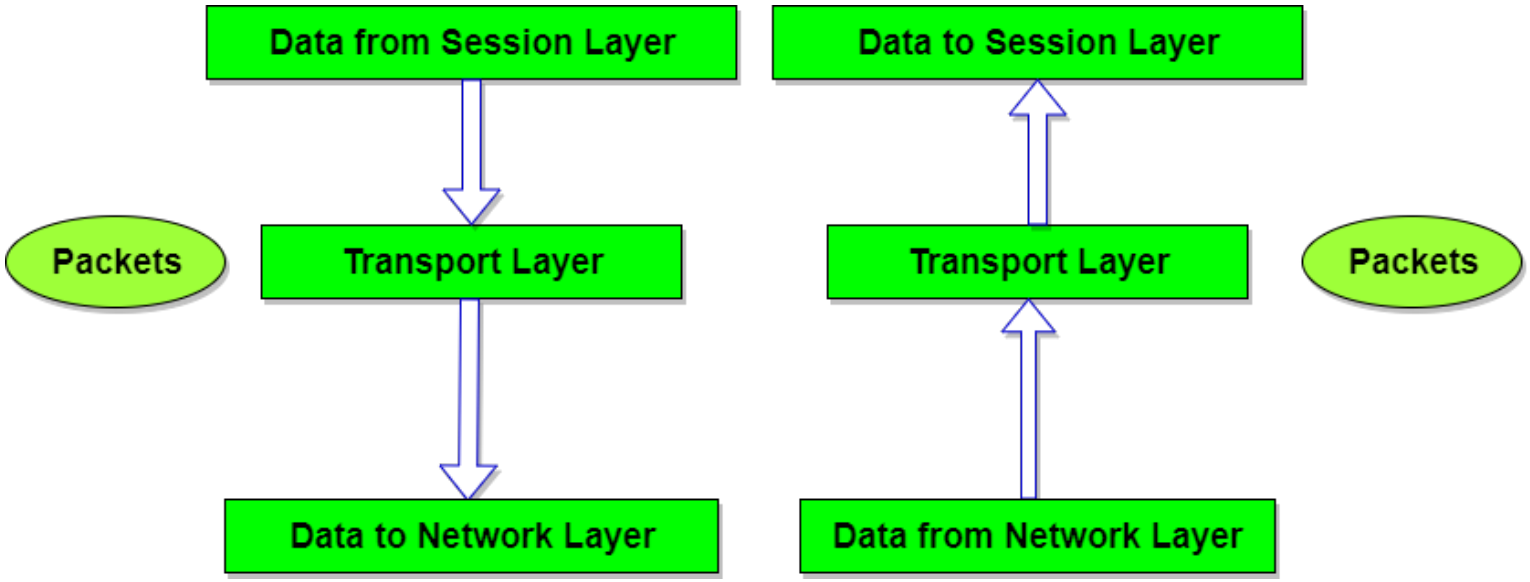
Transport Layer

- The **transport layer** is the fourth **layer** in the open system interconnection (OSI) model, and is responsible for end-to-end communication over a network.
- It provides logical communication between application processes running on different hosts within a layered architecture of protocols and other network components.
- Example Protocols : TCP, UDP, ECN, SCTP, DCCP



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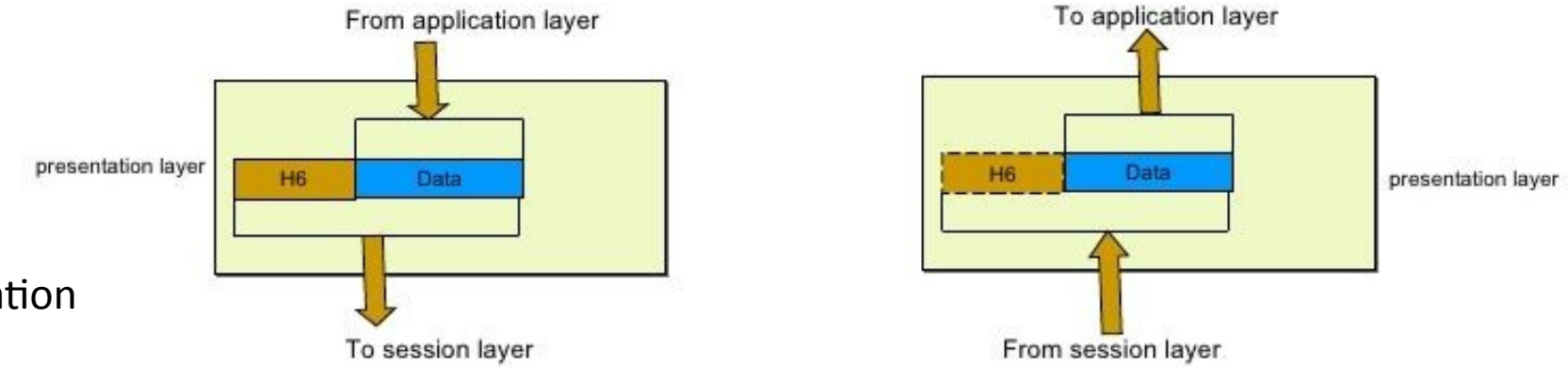
Presentation Layer

- The **presentation layer** is **layer** 6 of the 7-**layer** Open Systems Interconnection (OSI) model.
- It is used to present data to the application **layer** (**layer** 7) in an accurate, well-defined and standardized format.
- The **presentation layer** is sometimes called the syntax **layer**
- Example Protocols : SSL, FTP, IMAP, SSH

Presentation Layer (dependency)



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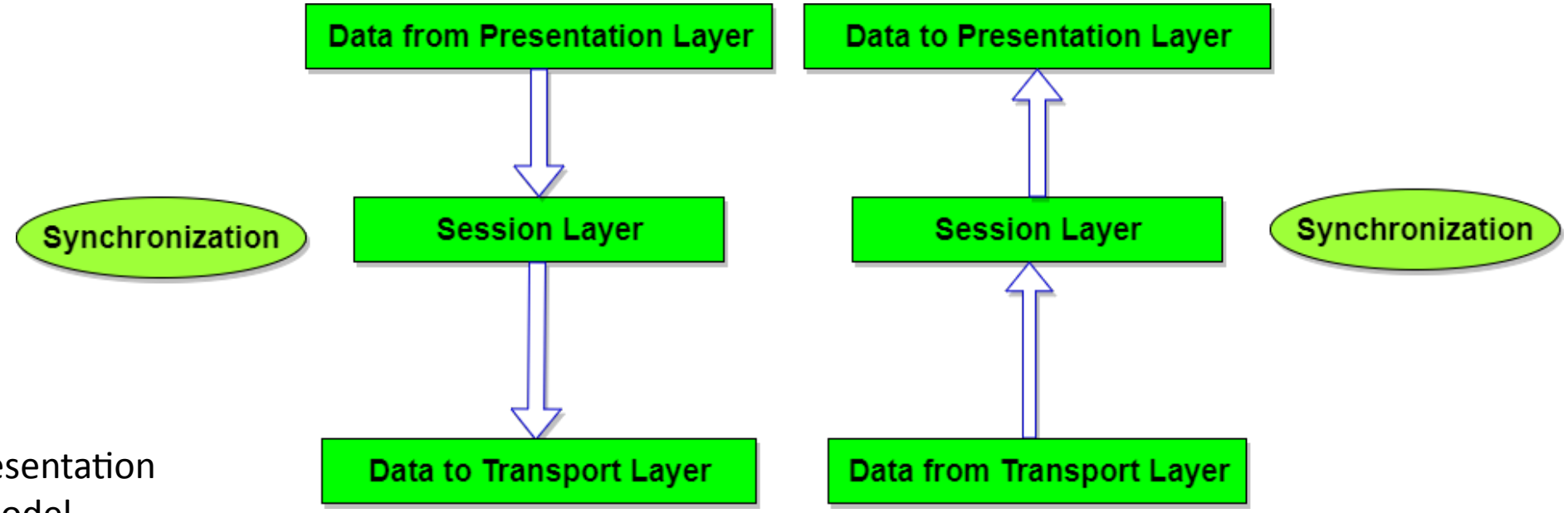
Session Layer

- In the seven-layer OSI model of computer networking, the session layer is layer 5.
- The session layer provides the mechanism for opening, closing and managing a session between end-user application processes, i.e., a semi-permanent dialogue.
- Example Protocols: VARIOUS, API'S, SOCKETS



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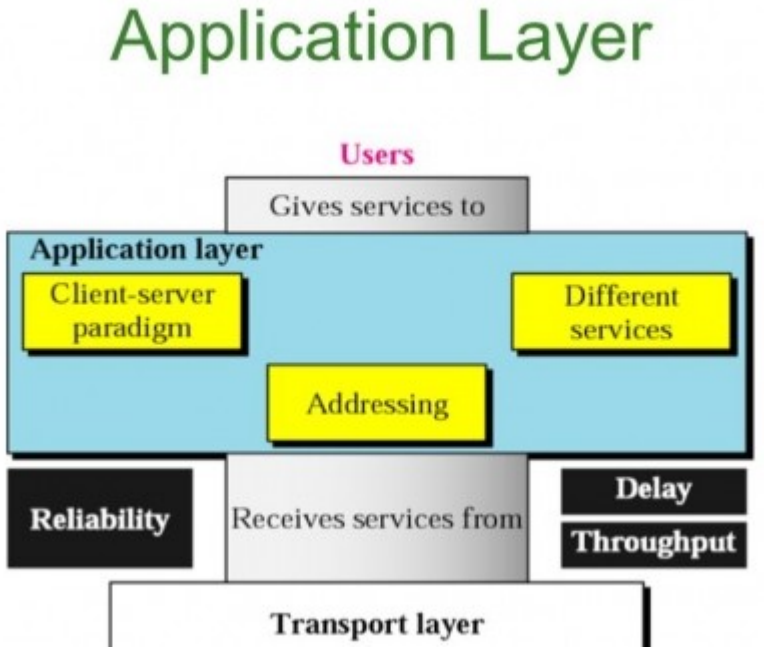
Application Layer

- An **application layer** is an abstraction **layer** that specifies the shared communications protocols and interface methods used by hosts in a communications network.
- The **application layer** abstraction is used in both of the standard models of computer networking: the Internet Protocol Suite (TCP/IP) and the OSI model.
- Example Protocols: HTTP, FTP, IRC, SSH, DNS



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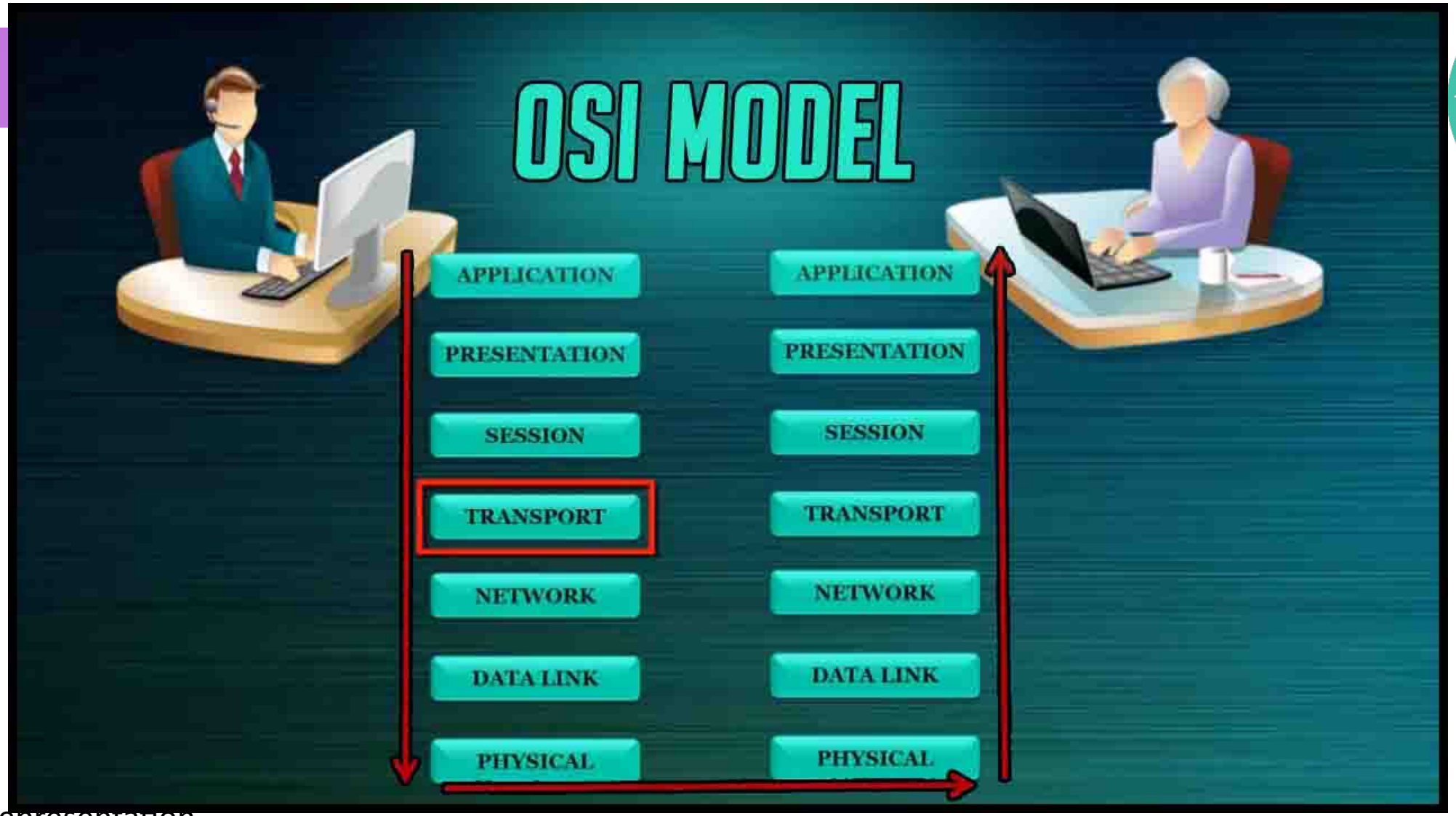

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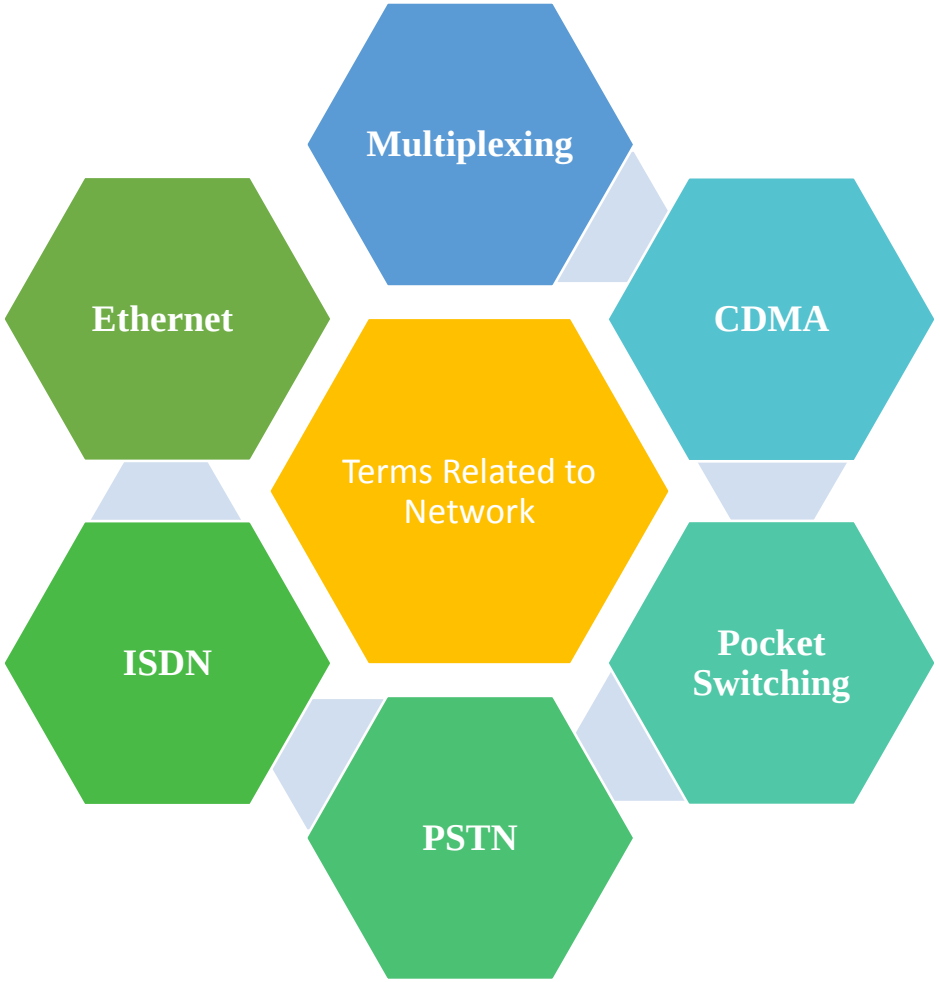

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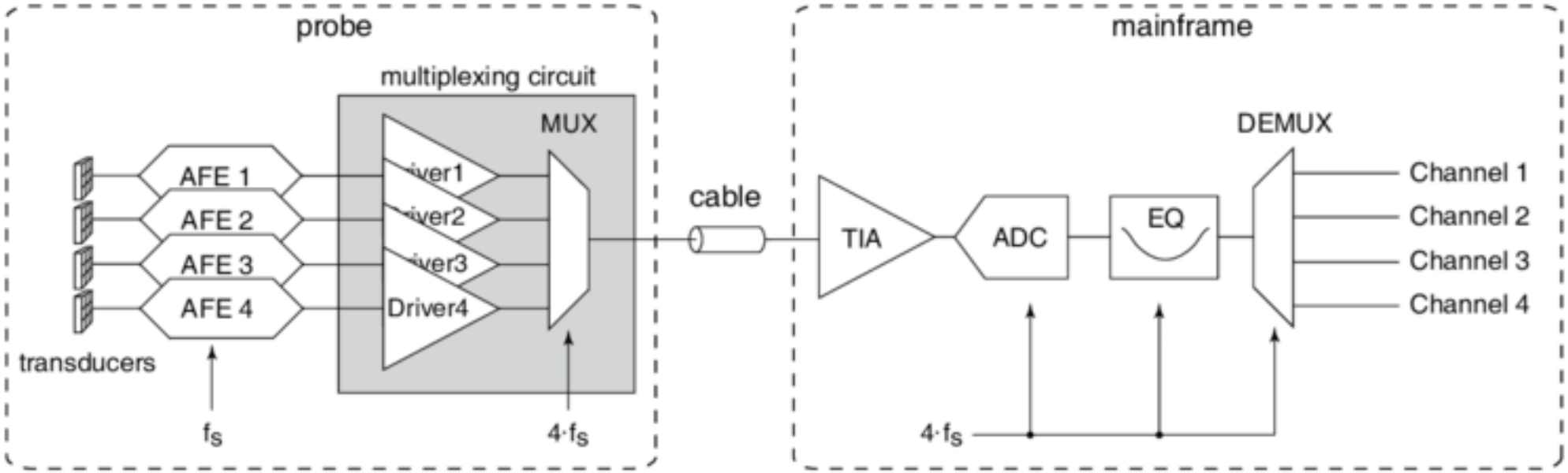
Multiplexing

Multiplexing (or muxing) is a way of sending multiple signals or streams of information over a communications link at the same time in the form of a single, complex signal; the receiver recovers the separate signals, a process called demultiplexing (or demuxing).



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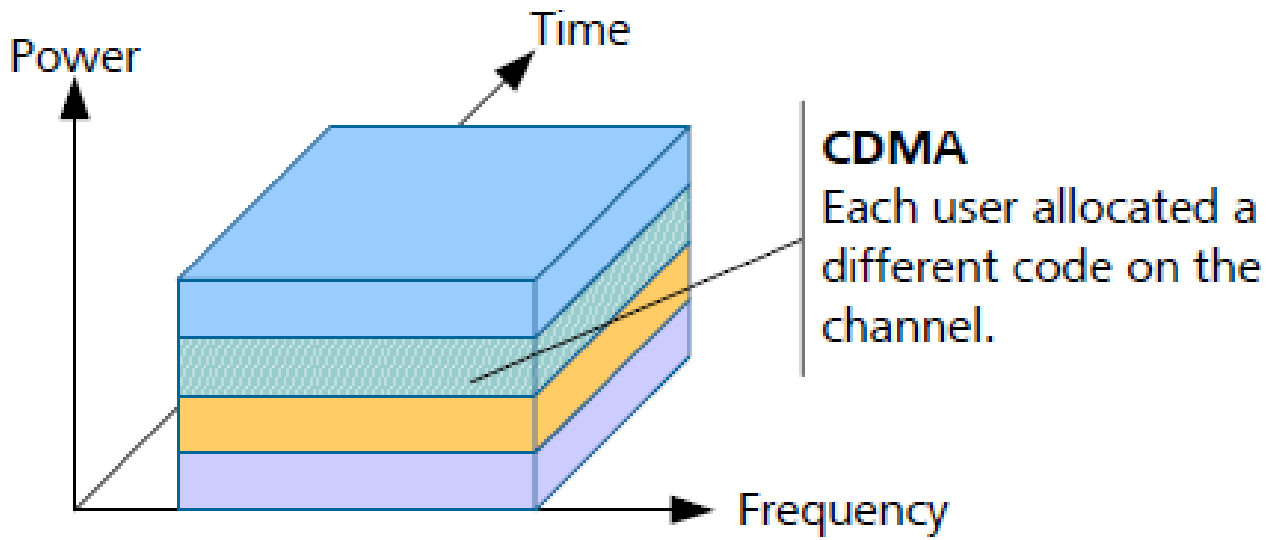
Code Division Multiple Access(CDMA)

- **Code-division multiple access** (CDMA) is a channel **access** method used by various radio communication technologies.
- CDMA is an example of **multiple access**, where several transmitters can send information simultaneously over a single communication channel.
- CDMA is used as the **access** method in many mobile phone standards.

Code Division Multiple Access



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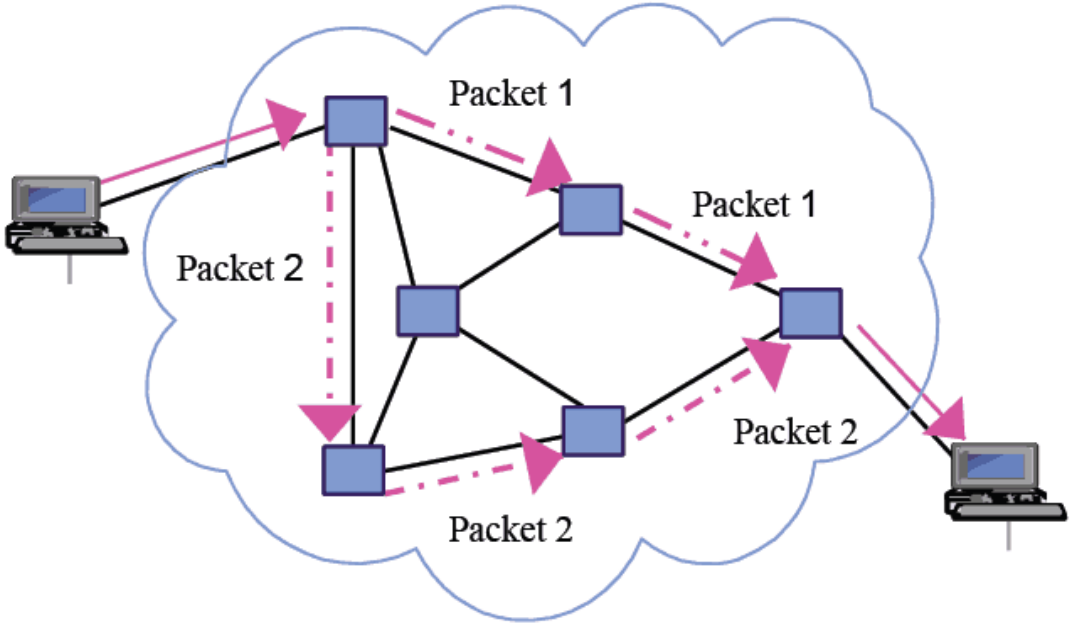
Pocket Switching

- **Packet switching** is a connectionless **network switching** technique.
- Here, the message is divided and grouped into a number of units called **packets** that are individually routed from the source to the destination.
- There is no need to establish a dedicated circuit for communication.



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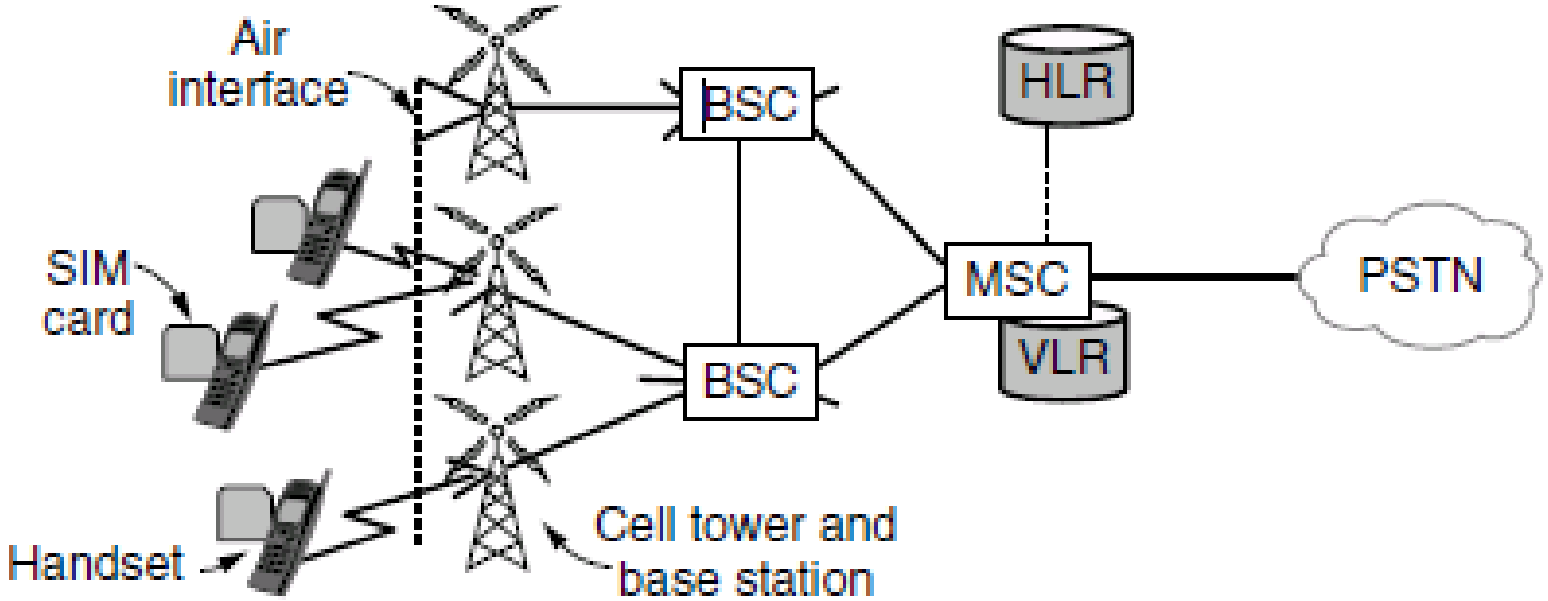
Public Switched Telephone Network(PSTN)

The public switched telephone network is the aggregate of the world's circuit-switched telephone networks that are operated by national, regional, or local telephony operators, providing infrastructure and services for public telecommunication



GSM mobile architecture

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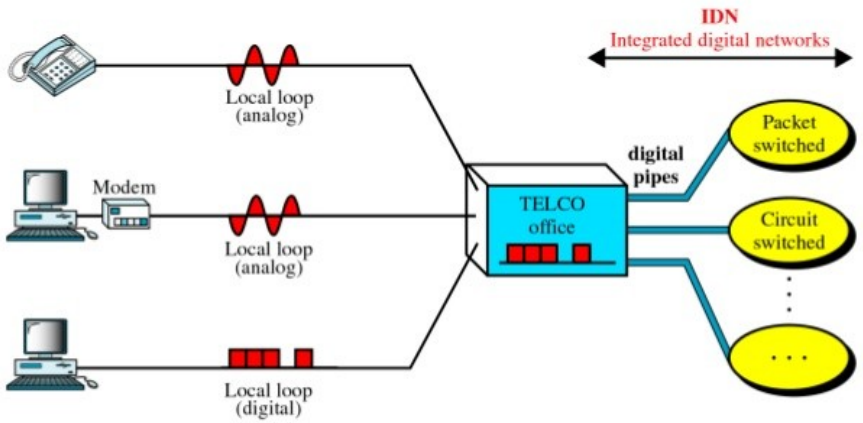
Integrated Services Digital Network(ISDN)

Integrated Services Digital Network is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network.

It was first defined in 1988 in the CCITT "Red Book".

Integrated Digital Network (IDN)



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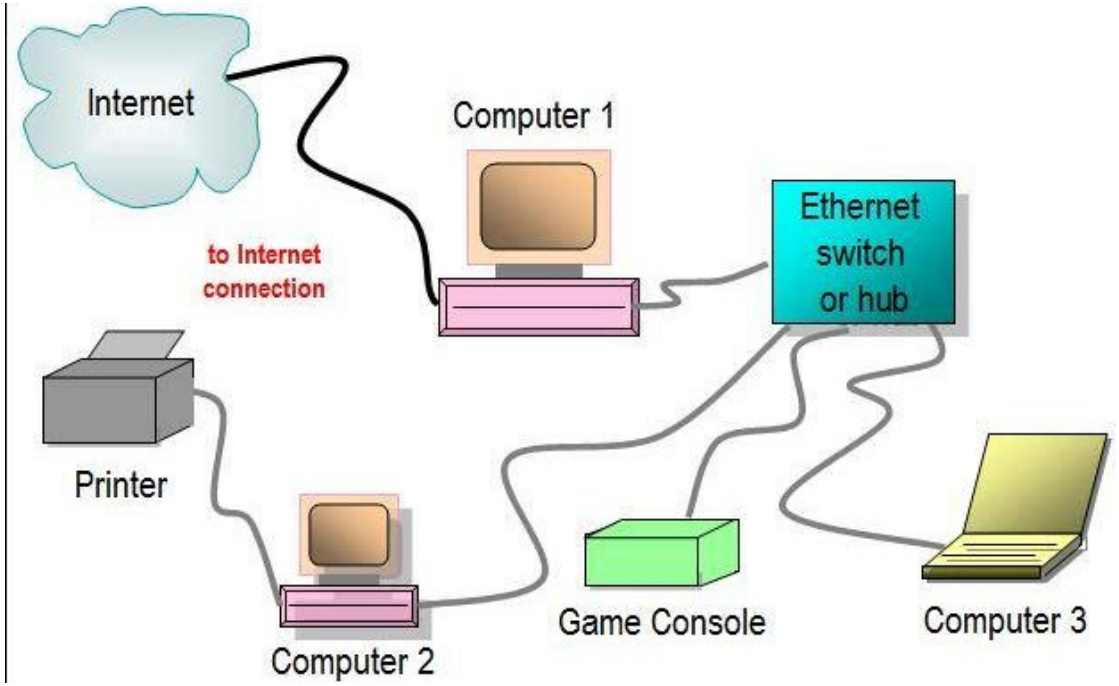
Ethernet

- **Ethernet** is a set of technologies and protocols that are used primarily in LANs.
- It was first standardized in 1980s by IEEE 802.3 standard.
- IEEE 802.3 defines the physical layer and the medium access control (MAC) sub-layer of the data link layer for wired **Ethernet networks**.



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Token

- In **networking**, a **token** is a series of bits that circulate on a **token**-ring **network**.
- When one of the systems on the **network** has the "**token**," it can send information to the other **computers**.
- Since there is only one **token** for each **token**-ring **network**, only one **computer** can send data at a time

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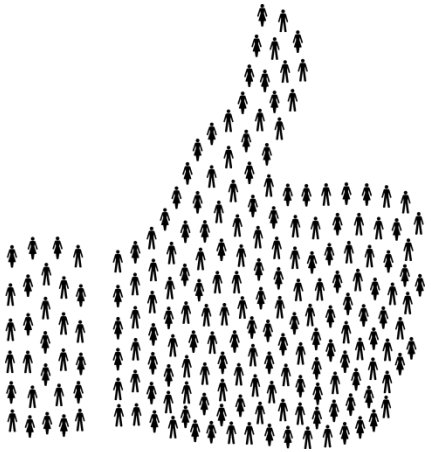
‘Hurrah!’
We completed this section



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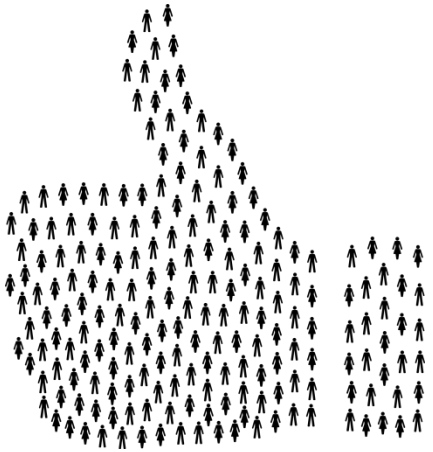

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