

TCP and OSI Communication Model

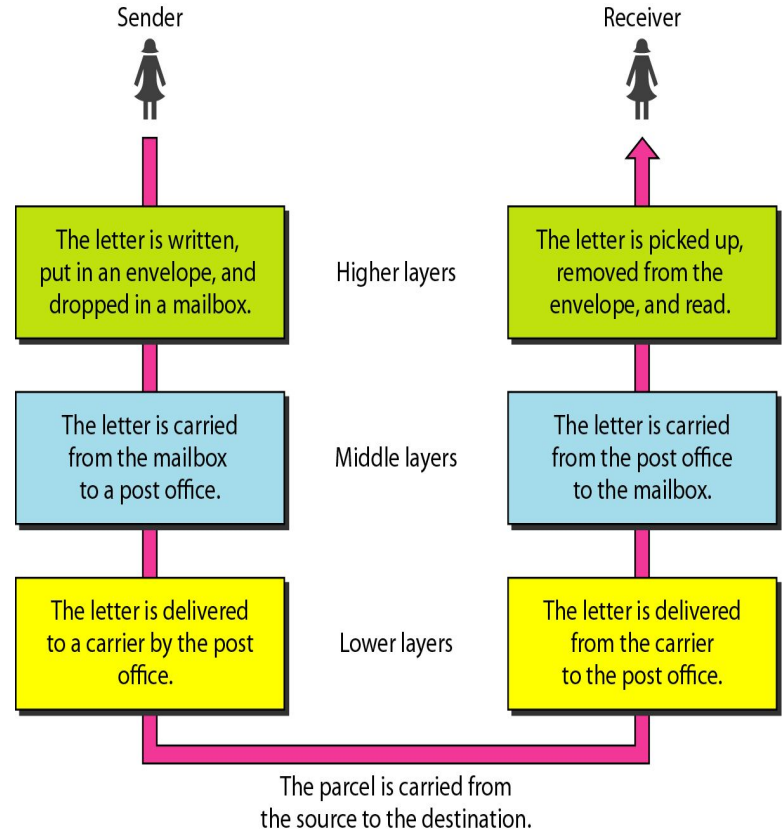
Session Objectives

After completion of the session you will be able to understand

- ✓ Layered model of communication
- ✓ OSI model of communication
- ✓ Working of each layer in OSI
- ✓ TCP/IP model of communication
- ✓ Comparison of OSI and TCP/IP model

Introduction

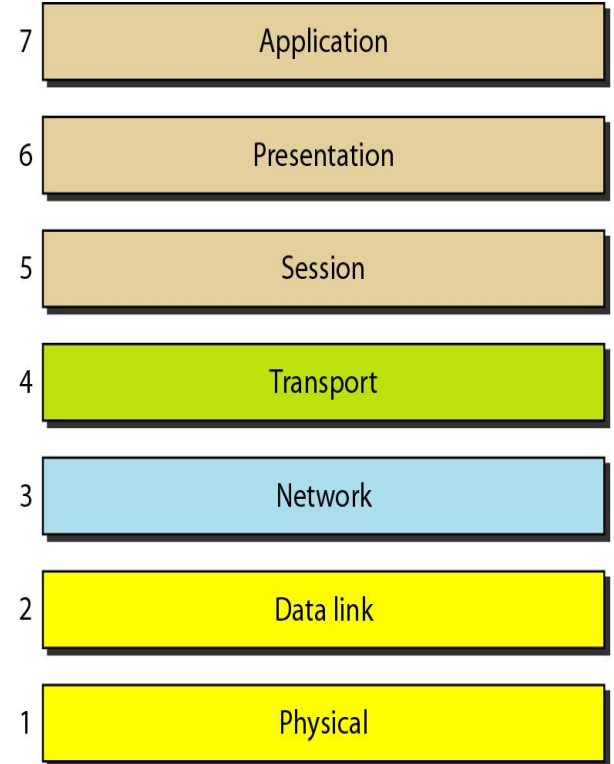
- The Layering Principle of Communication (*illustrated in adjacent figure*).
- The **three entities** are involved Sender, Carrier, Receiver.
- **Carrier**: Ethernet Cables, Wireless, Optical Fiber, Satellite.
- **Protocol**: A set of rules for communication.
- **Hardware** infrastructure for interconnection.
- **User Interface** for communication.



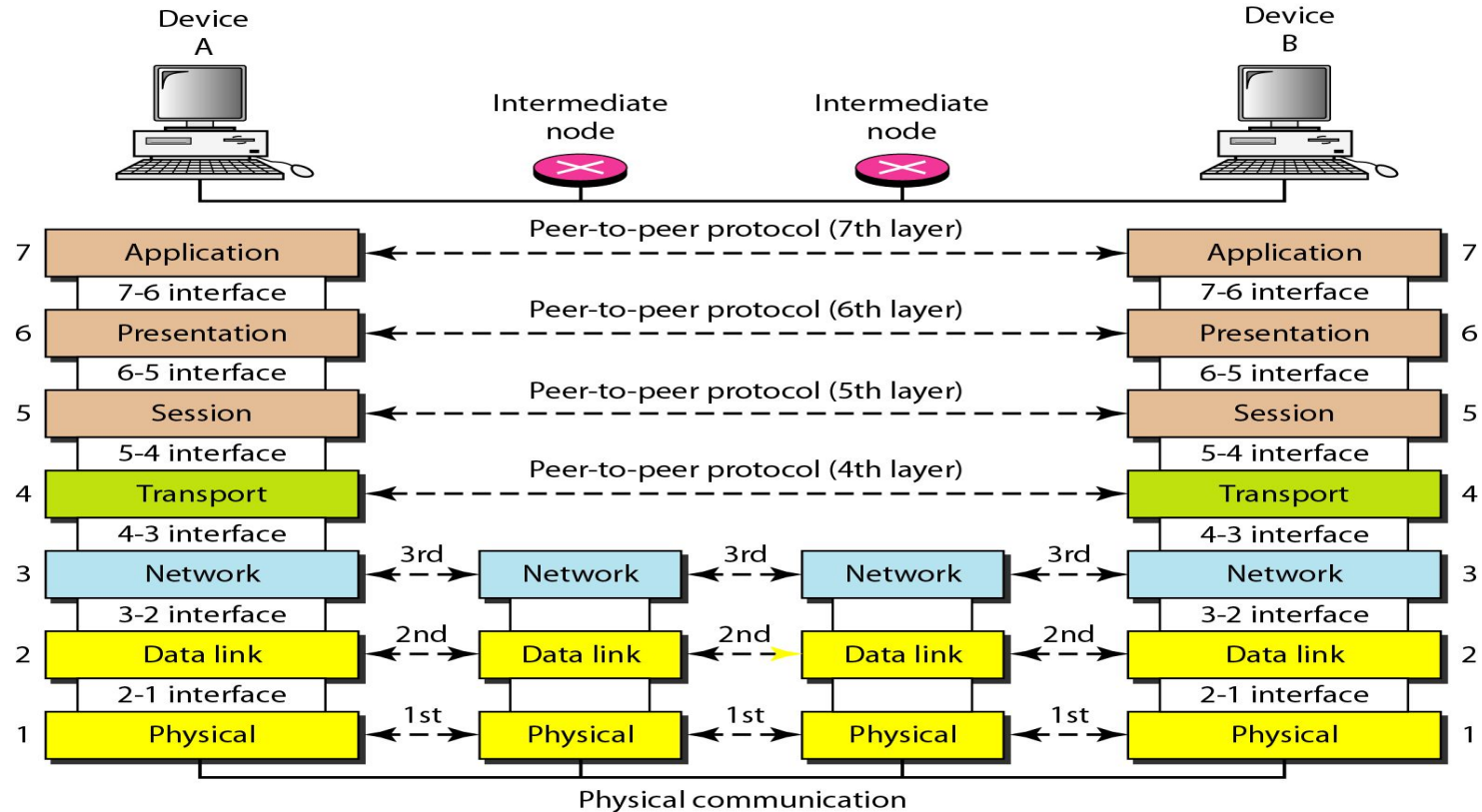
Layered Communication

OSI Layered Model

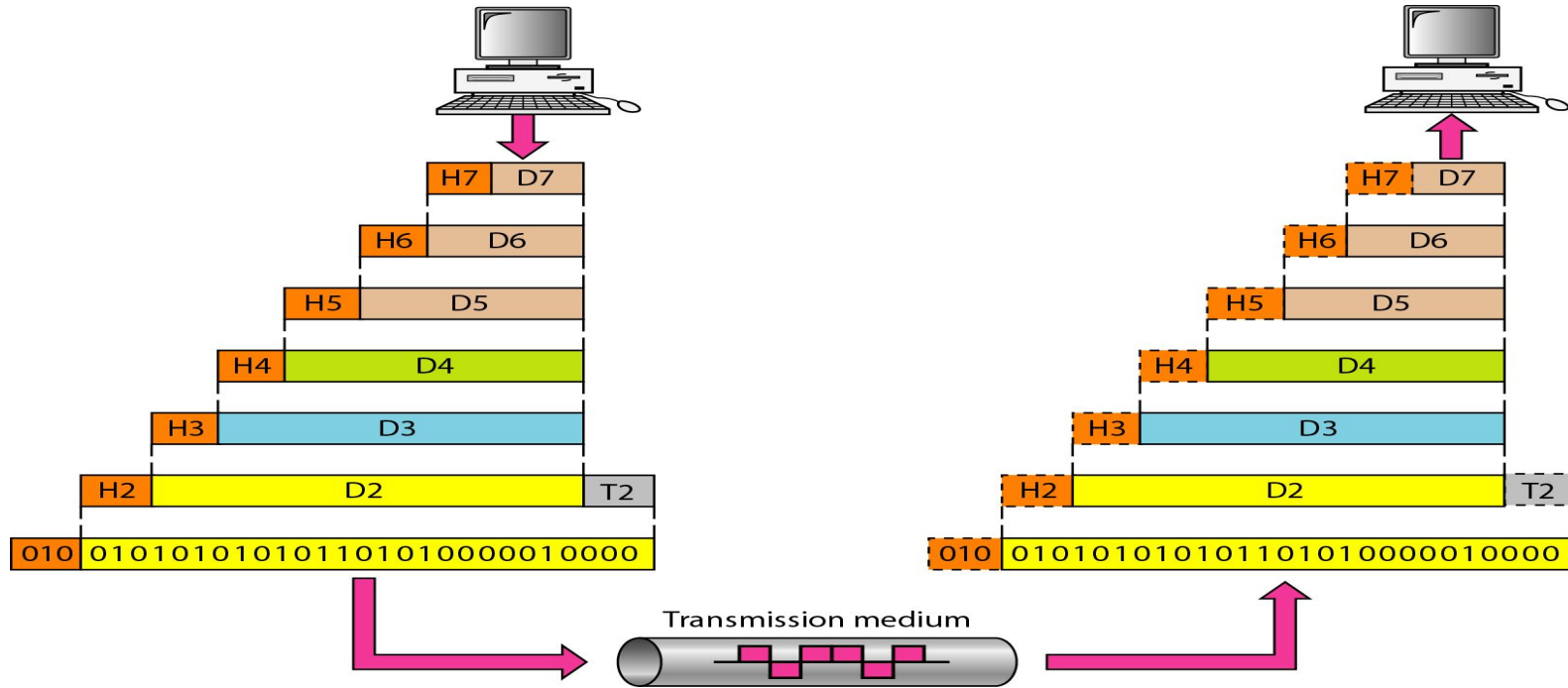
- Introduced in **1970**.
- **OSI** Stands for **Open Systems Interconnection**.
- An **ISO standard** that covers all aspects of network communications.
- Its goal is the **interoperability of diverse** communication systems with standard communication protocols.
- Here, a layer **serves** the layer above it and is served by the layer below it.
- OSI had **two major** components,
 - ✓ Basic Reference Model or Seven Layer model,
 - ✓ A set of specific protocols.



Layers Interconnection in OSI Model



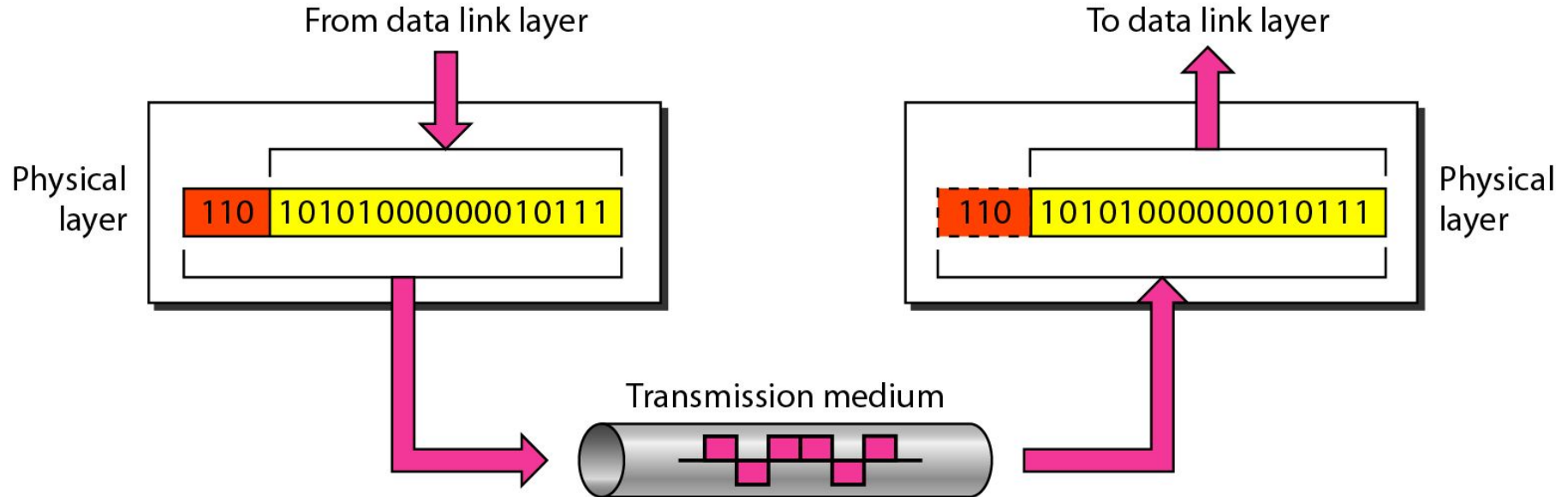
Data Exchange in OSI Model



- Each Layer Description is shown in subsequent slides

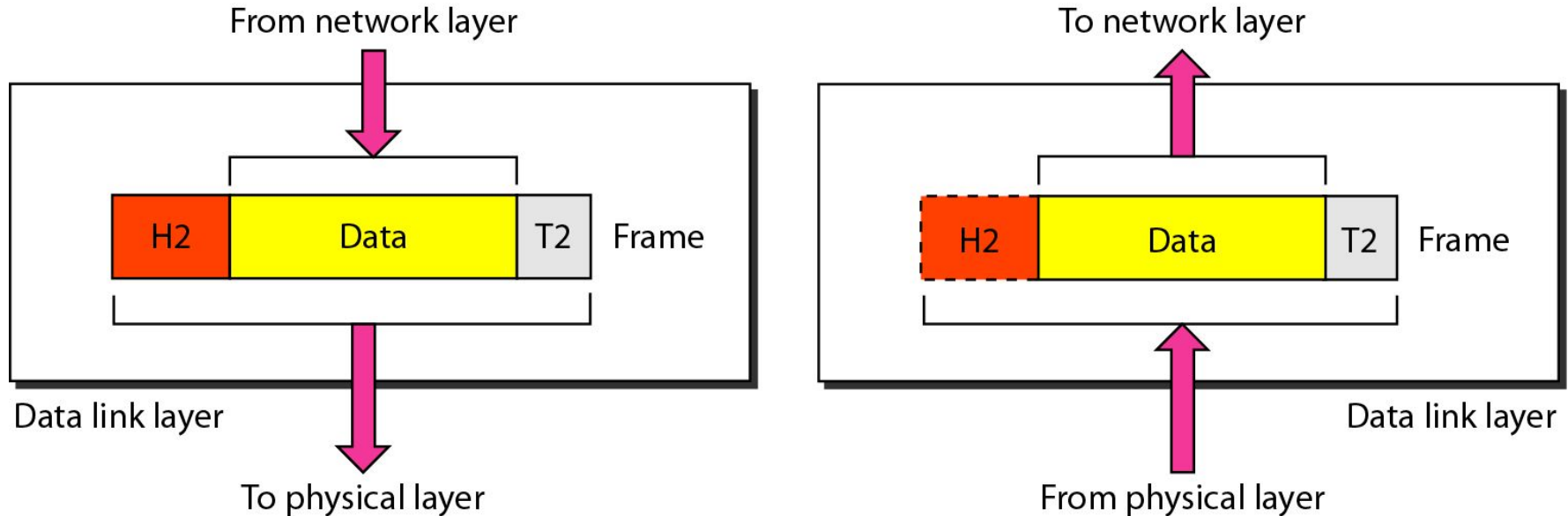
Physical Layer

The physical layer is responsible for movements of individual bits from one hop (node) to the next.

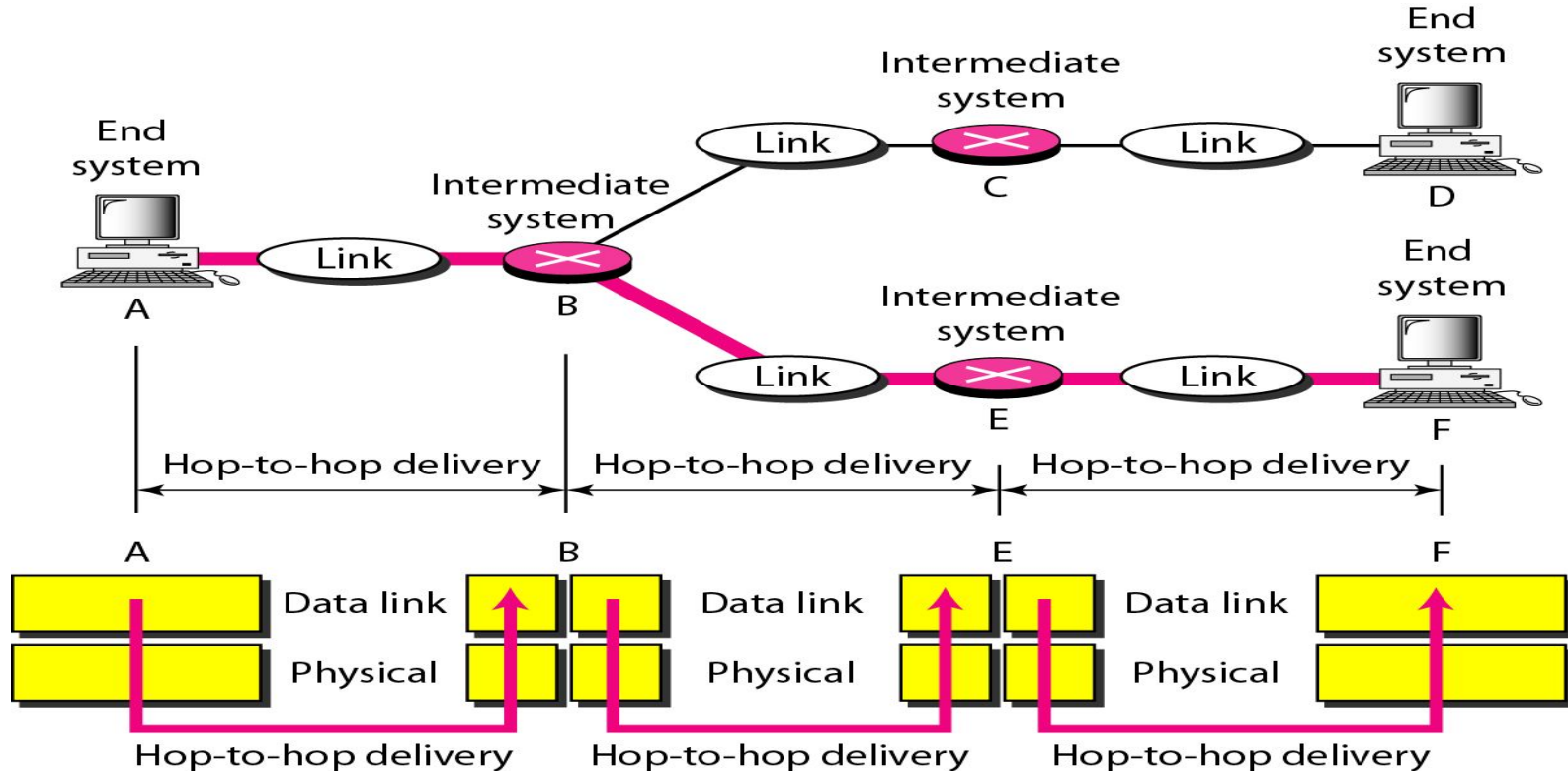


Data Link Layer

The data link layer is responsible for moving frames from one hop (node) to the next.

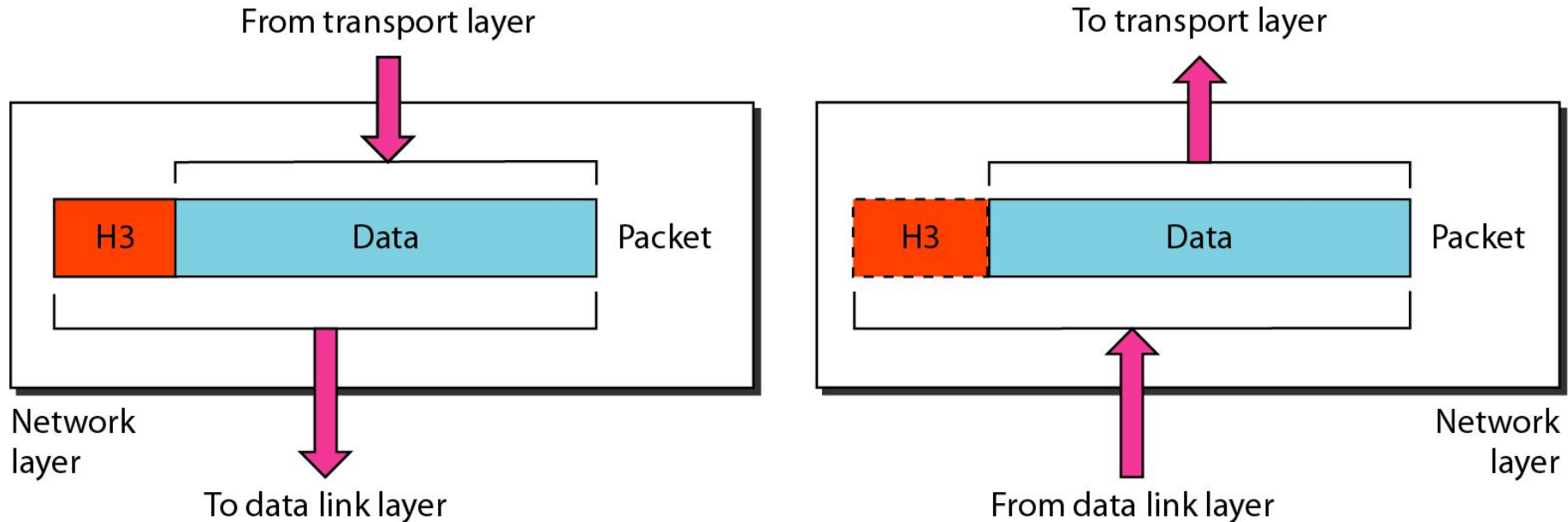


Data Link Layer Hop-to-Hop Delivery

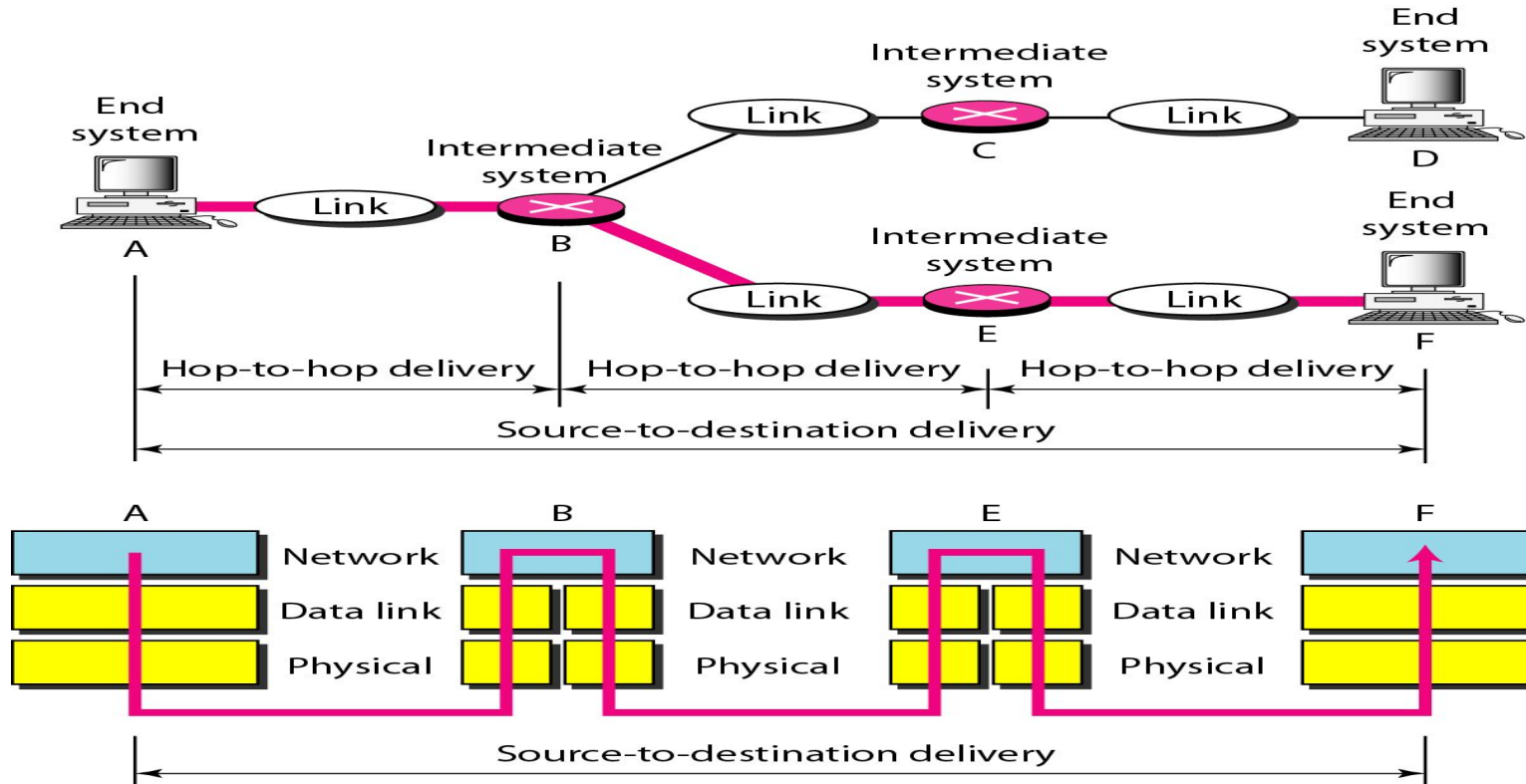


Network Layer

The network layer is responsible for the delivery of individual packets from the source host to the destination host.

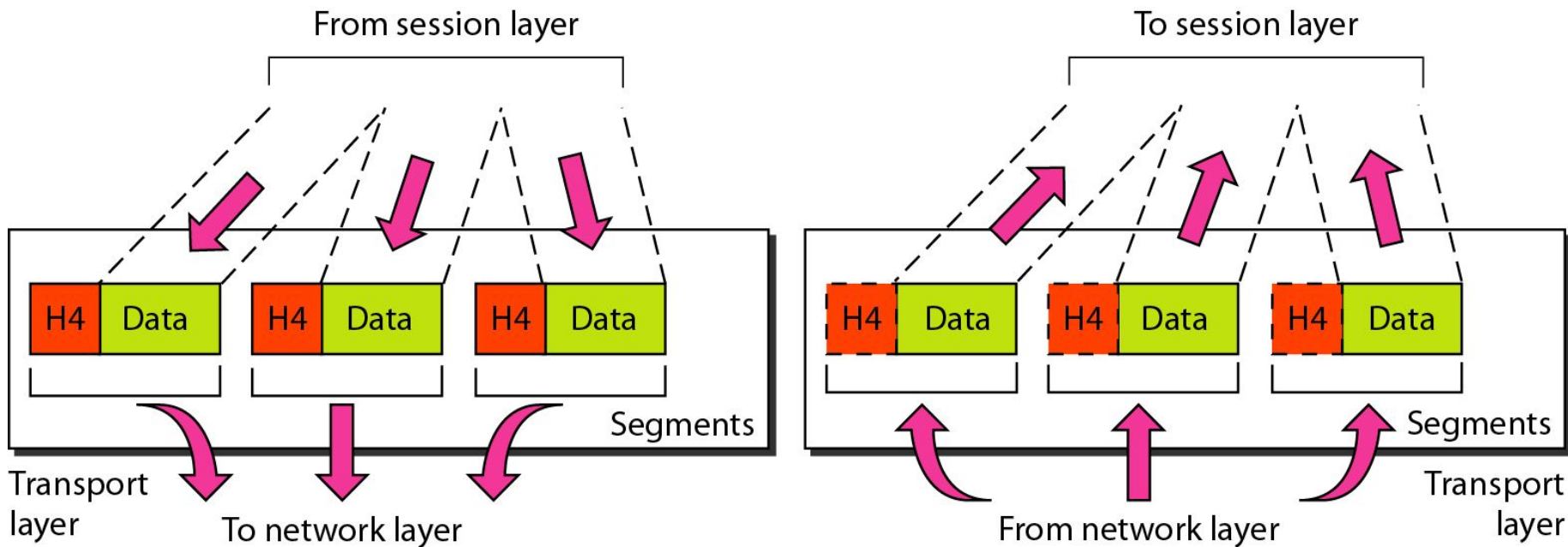


Packet Delivery at Network Layer

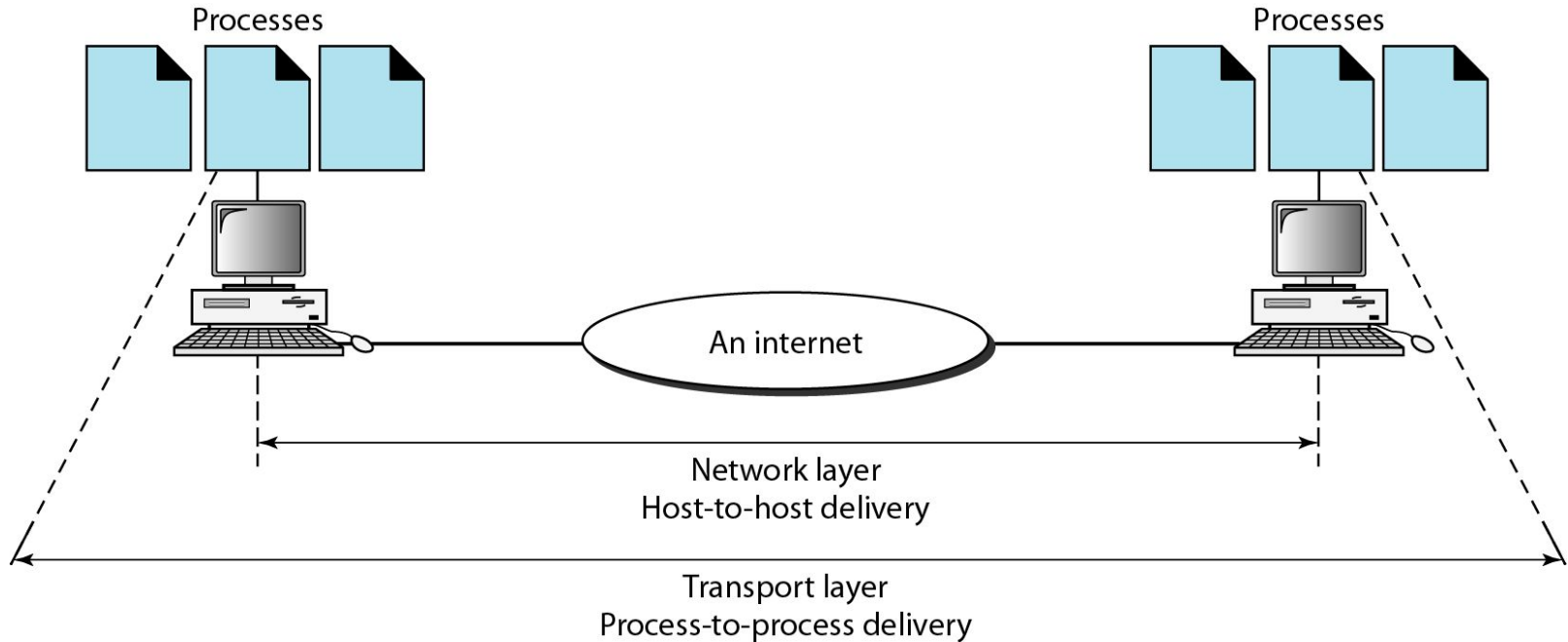


Transport Layer

The transport layer is responsible for the delivery of a message from one process to another.

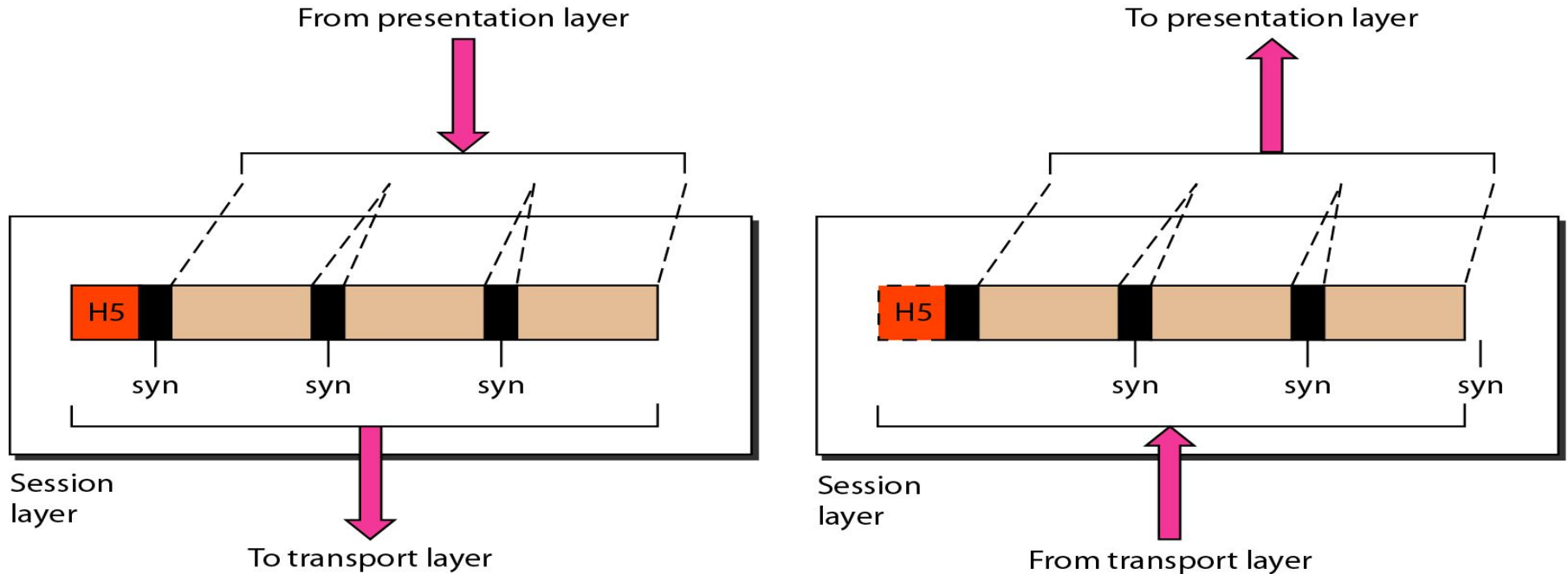


Process to Process Delivery at Transport Layer



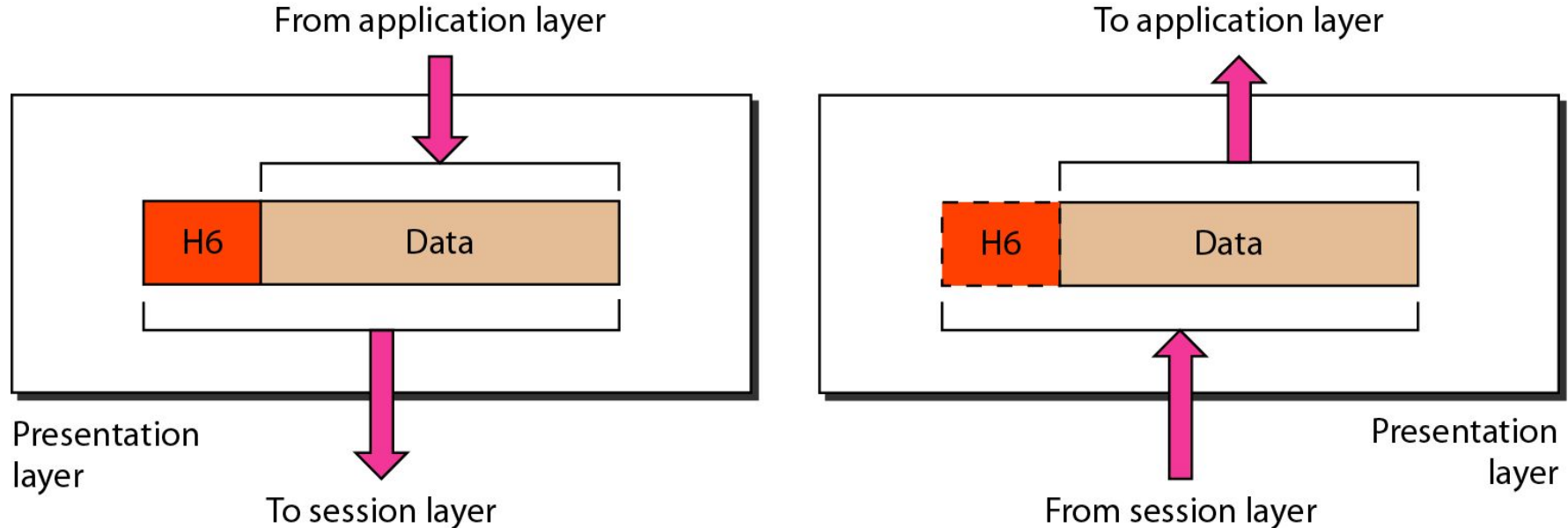
Session Layer

The session layer is responsible for dialog control and synchronization.



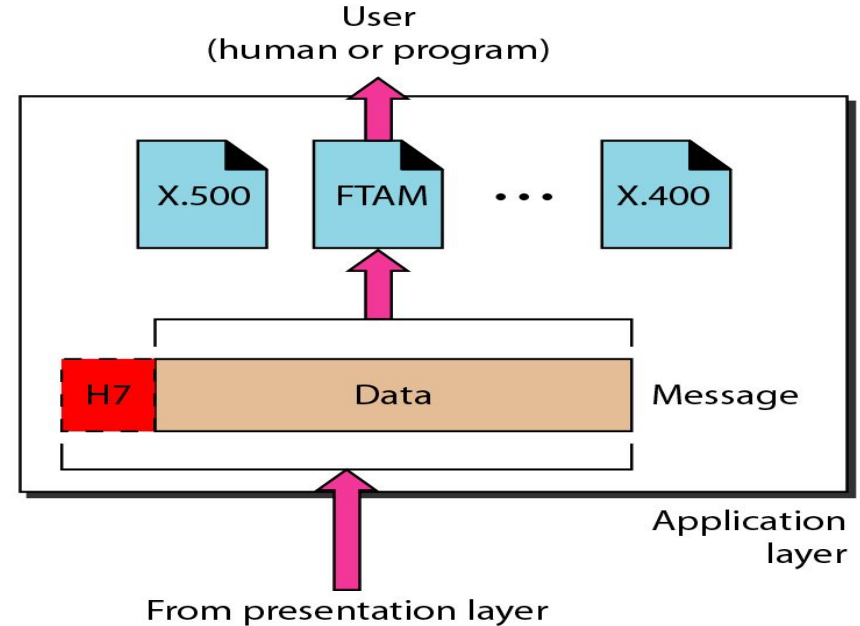
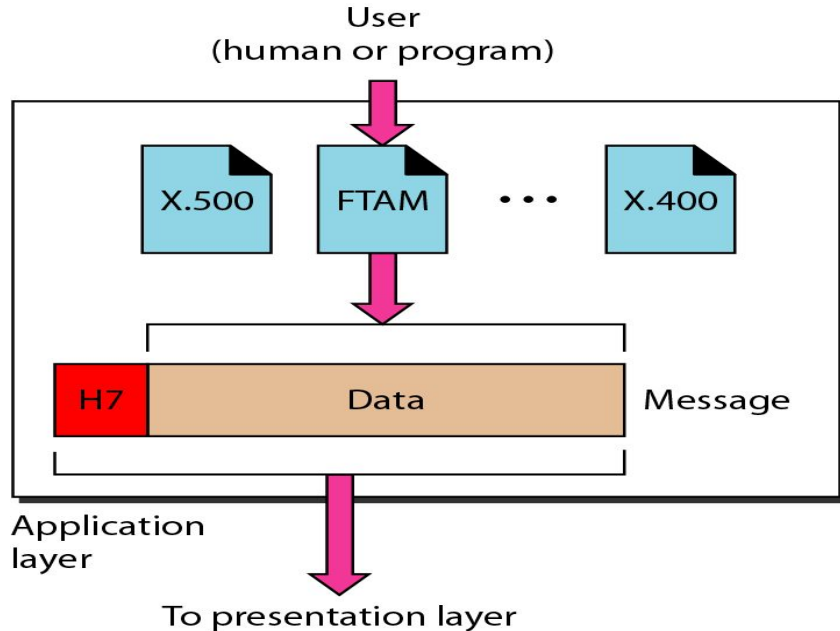
Presentation Layer

The presentation layer is responsible for translation, compression, and encryption.



Application Layer

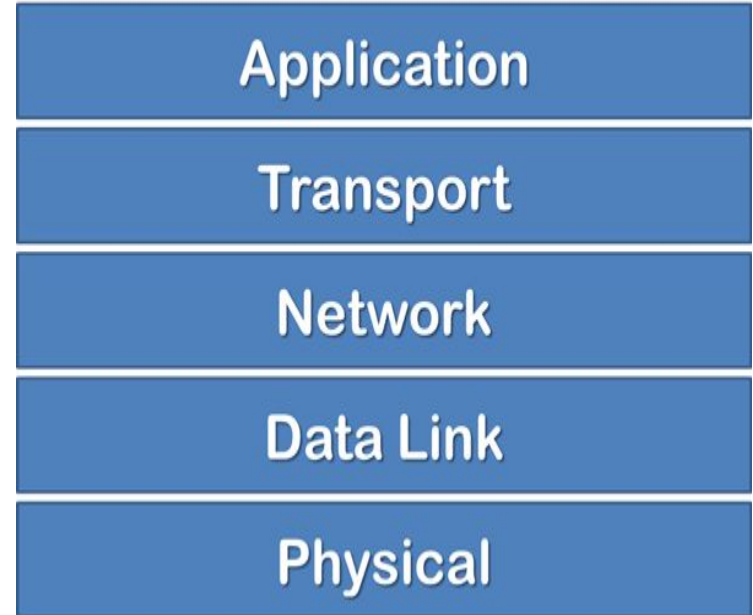
The application layer is responsible for providing services to the user.



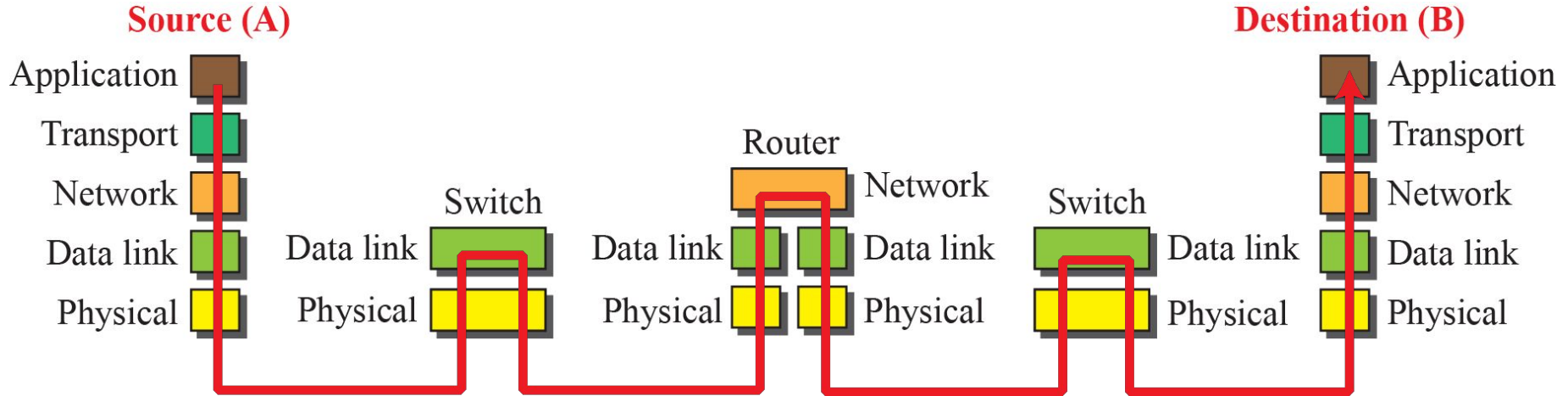
TCP/IP Communication Model

- **TCP/IP** means **Transmission Control Protocol** and Internet Protocol.
- It is the network model used in the **current Internet** architecture as well.
- Developed by Department of Defence's Project Research Agency (ARPA, later DARPA) as a part of a research project of network interconnection to connect remote machines.
- Protocols are **set of rules** which govern every possible communication over a network.

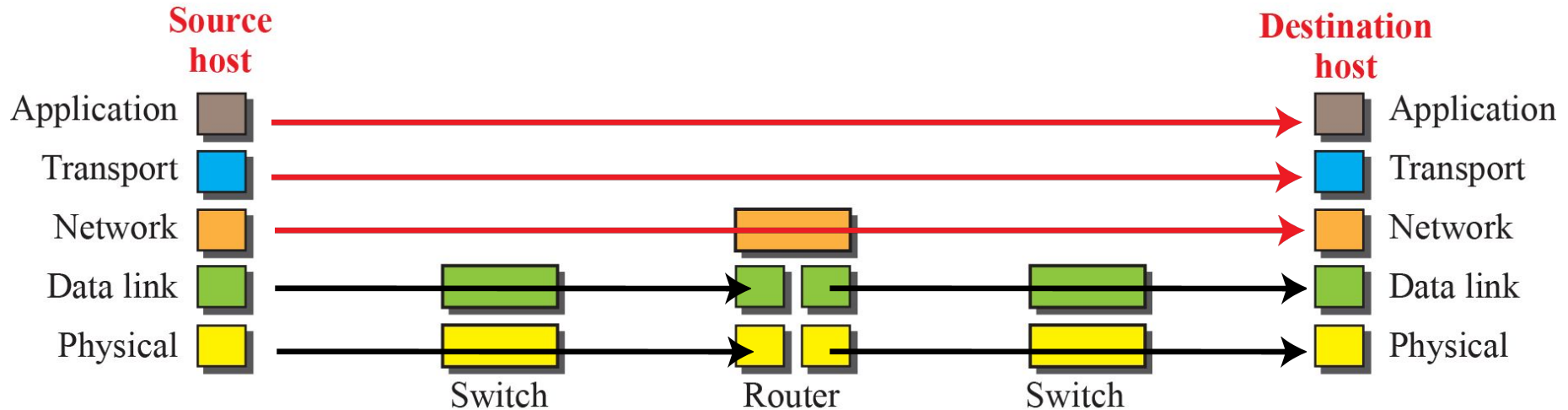
TCP/IP Model



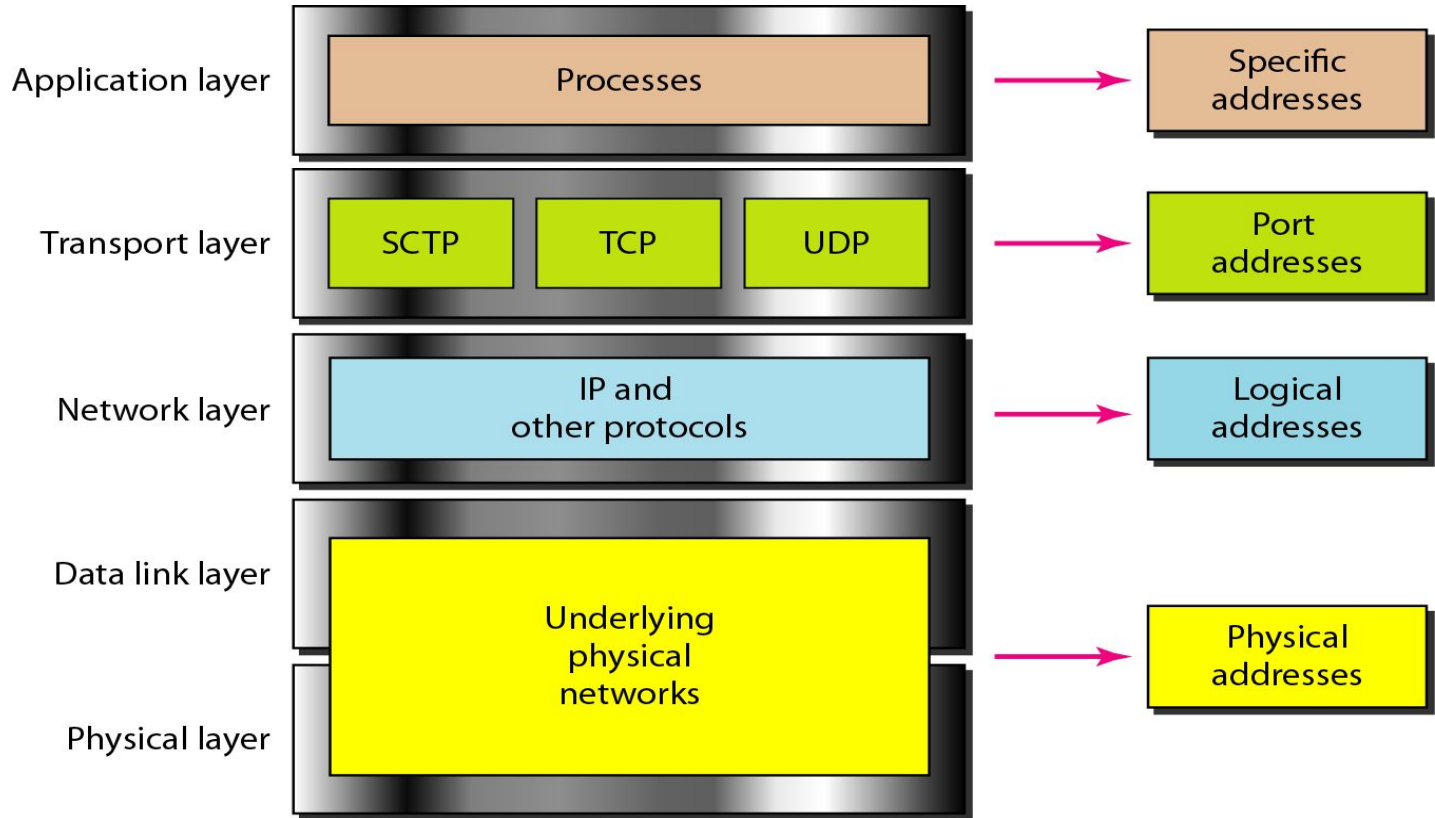
TCP/IP Communication at Data Link Layer



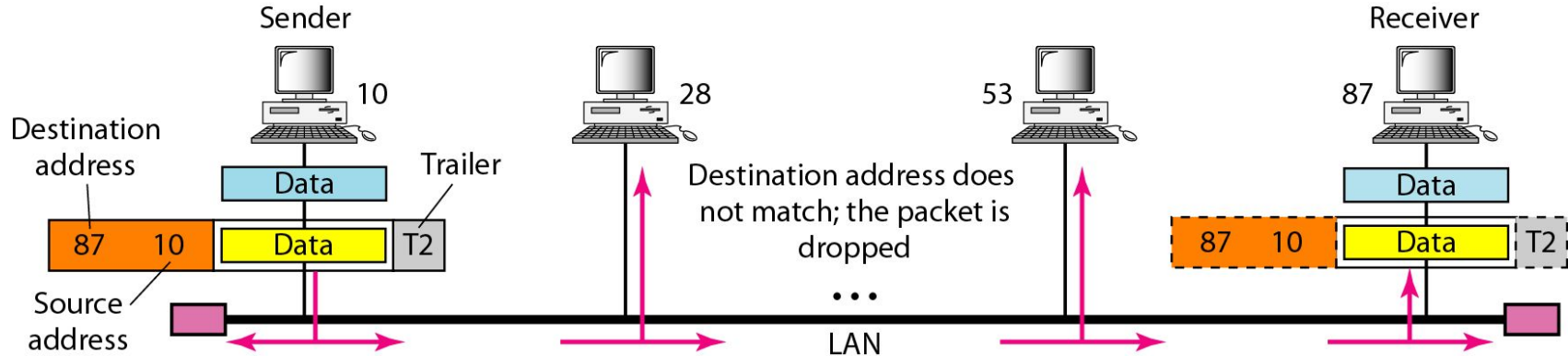
TCP/IP Communication at Network Layer



TCP/IP Addressing at different Layer



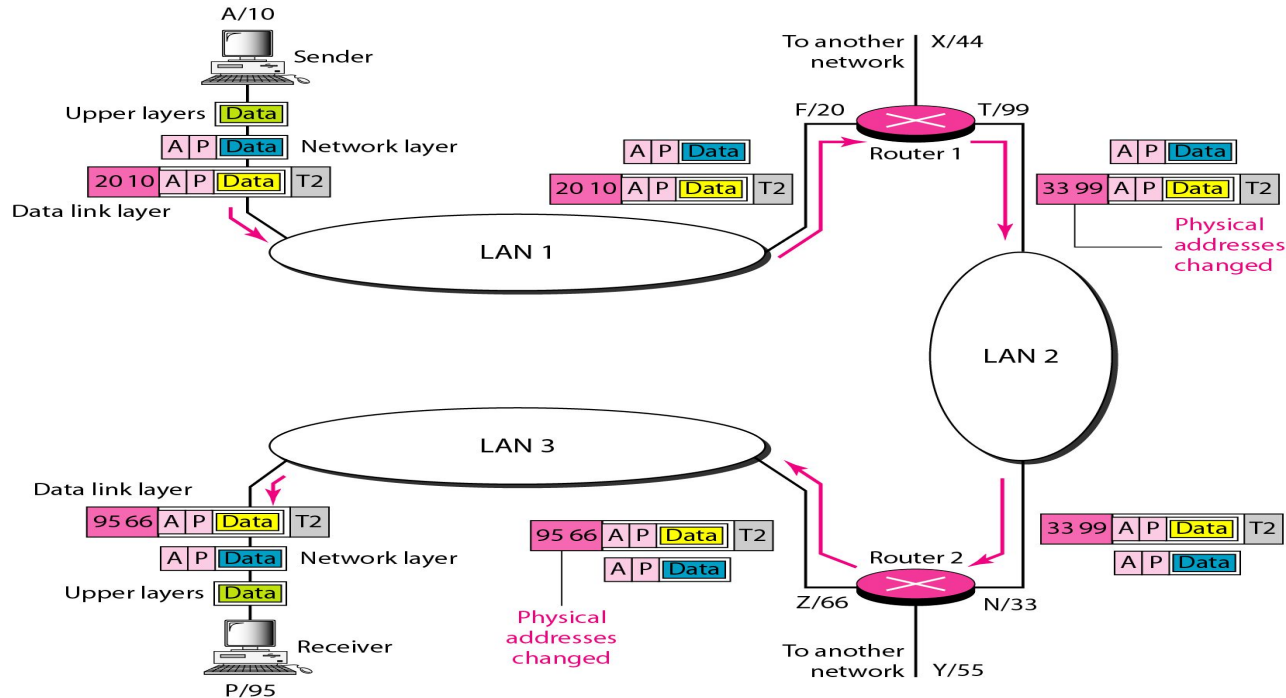
TCP/IP Physical Addressing



07:01:02:01:2C:4B

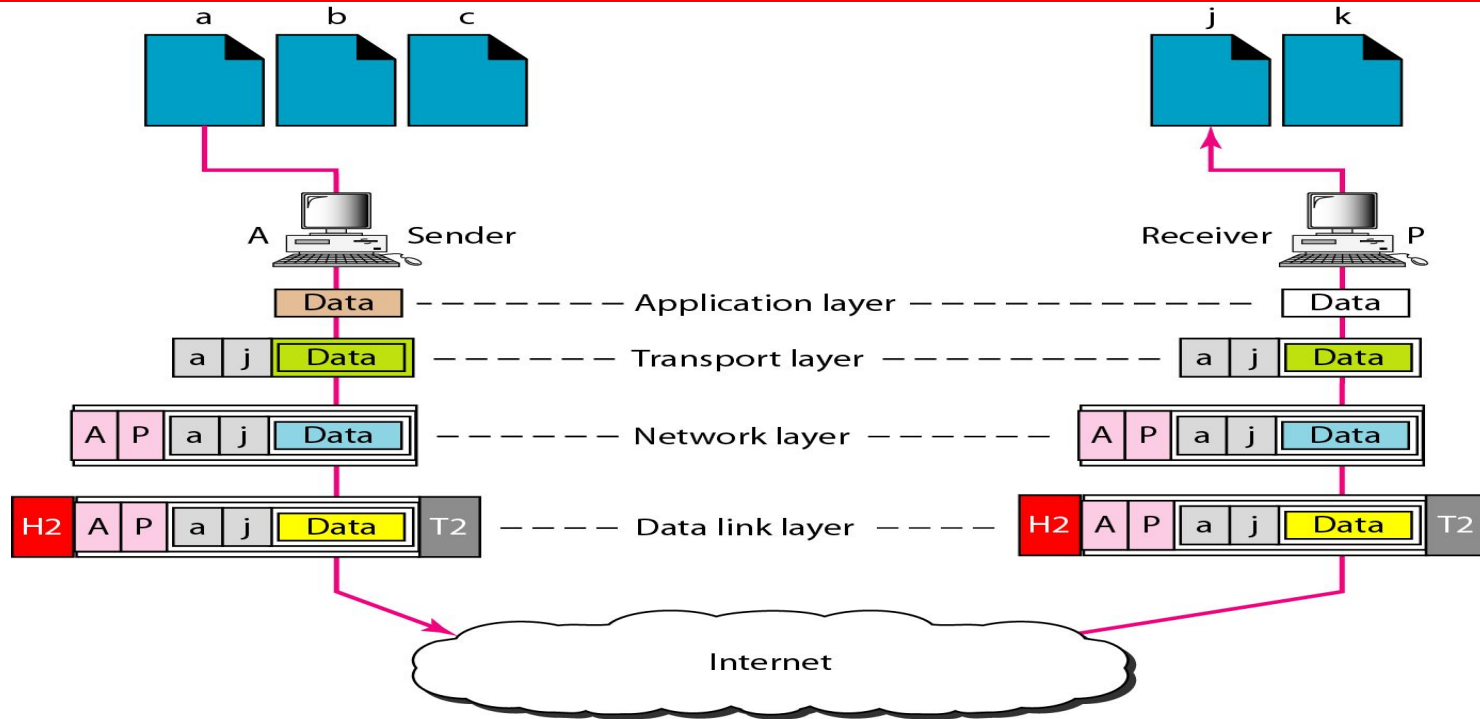
A 6-byte (12 hexadecimal digits) physical address.

TCP/IP Logical Addressing



The physical addresses will change from hop to hop, but the logical addresses usually remain the same.

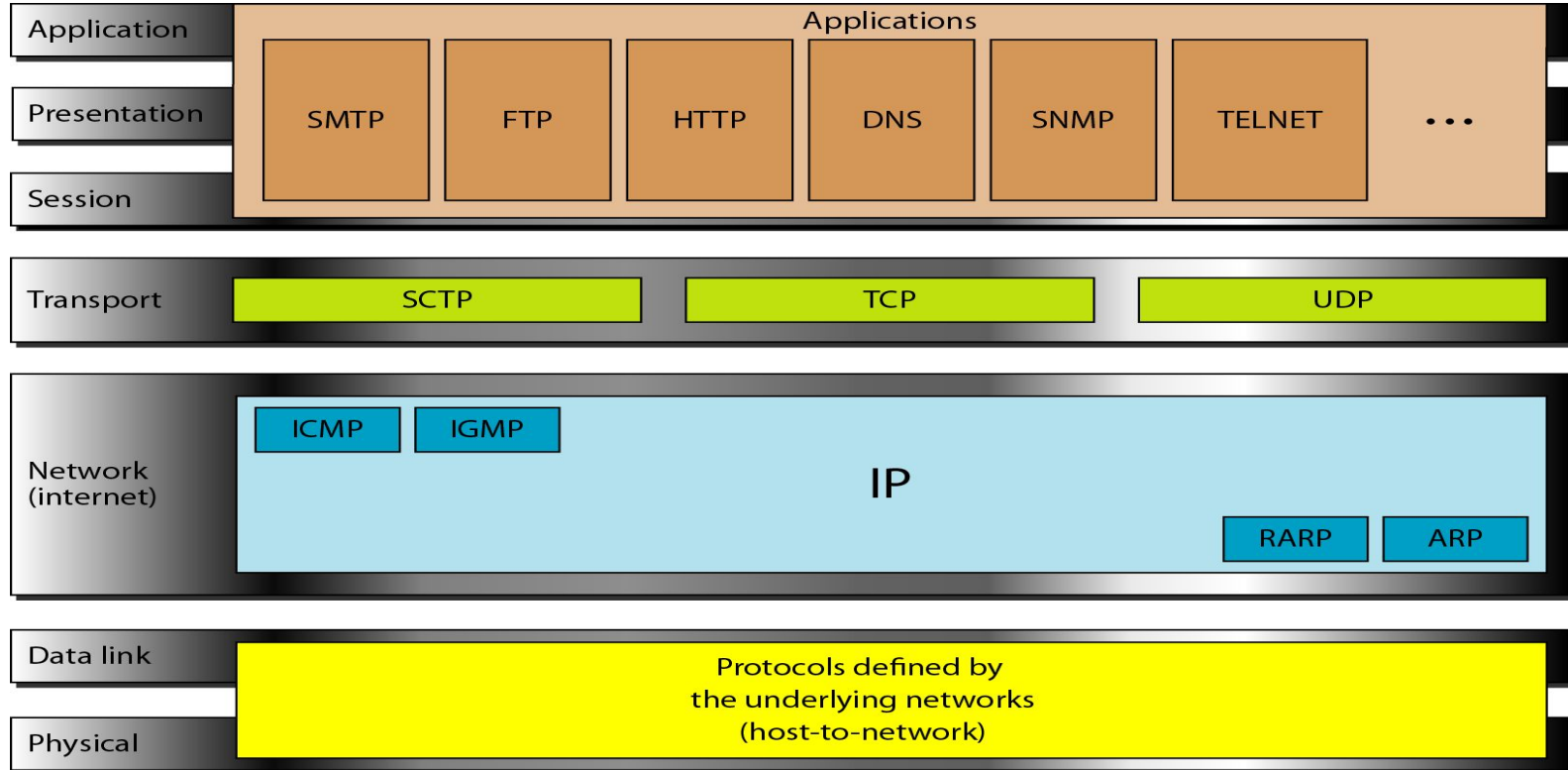
TCP/IP Port Addressing



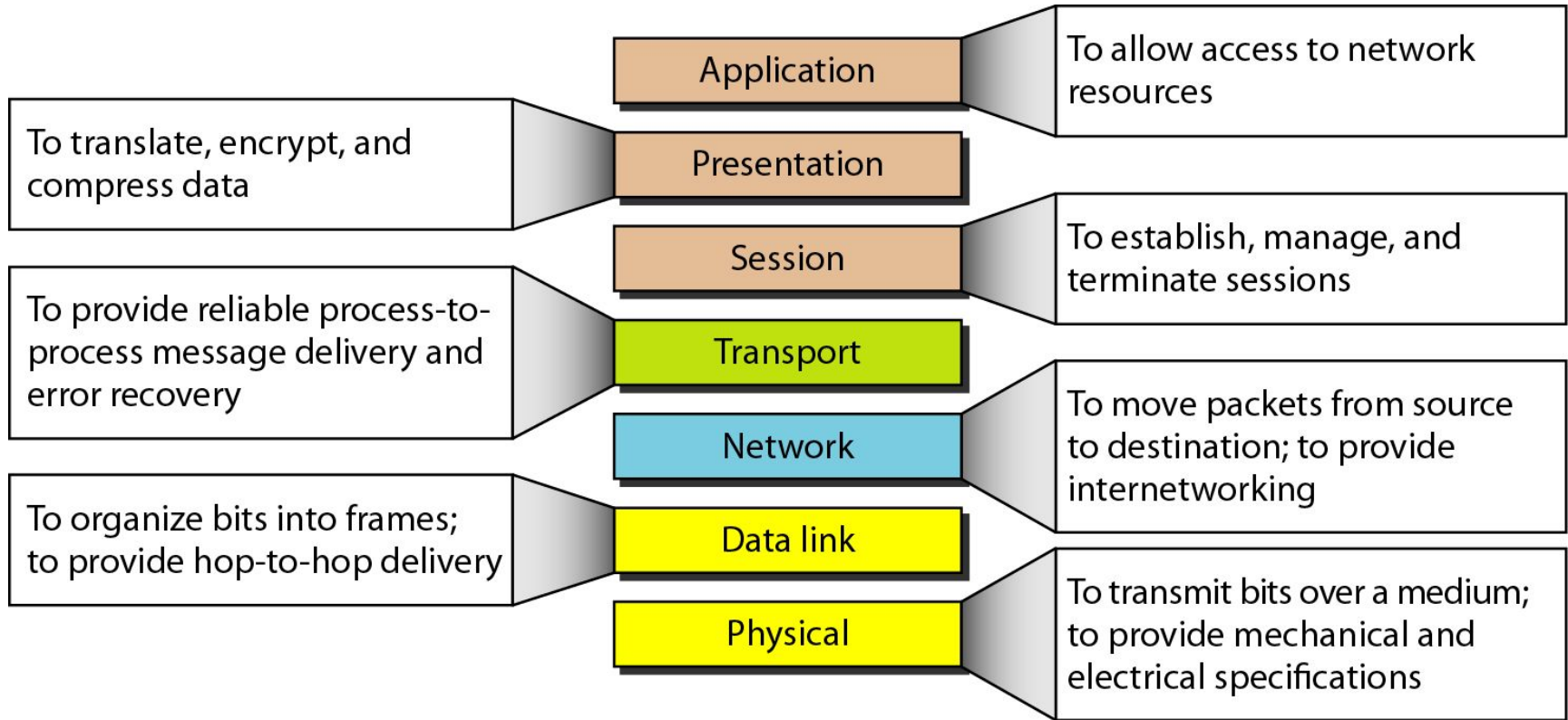
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A 16-bit port address represented as one single number.

TCP/IP and OSI Compared



Summary



*Thank
you!*