Politeknik Elektronika Negeri Surabaya

Network Models

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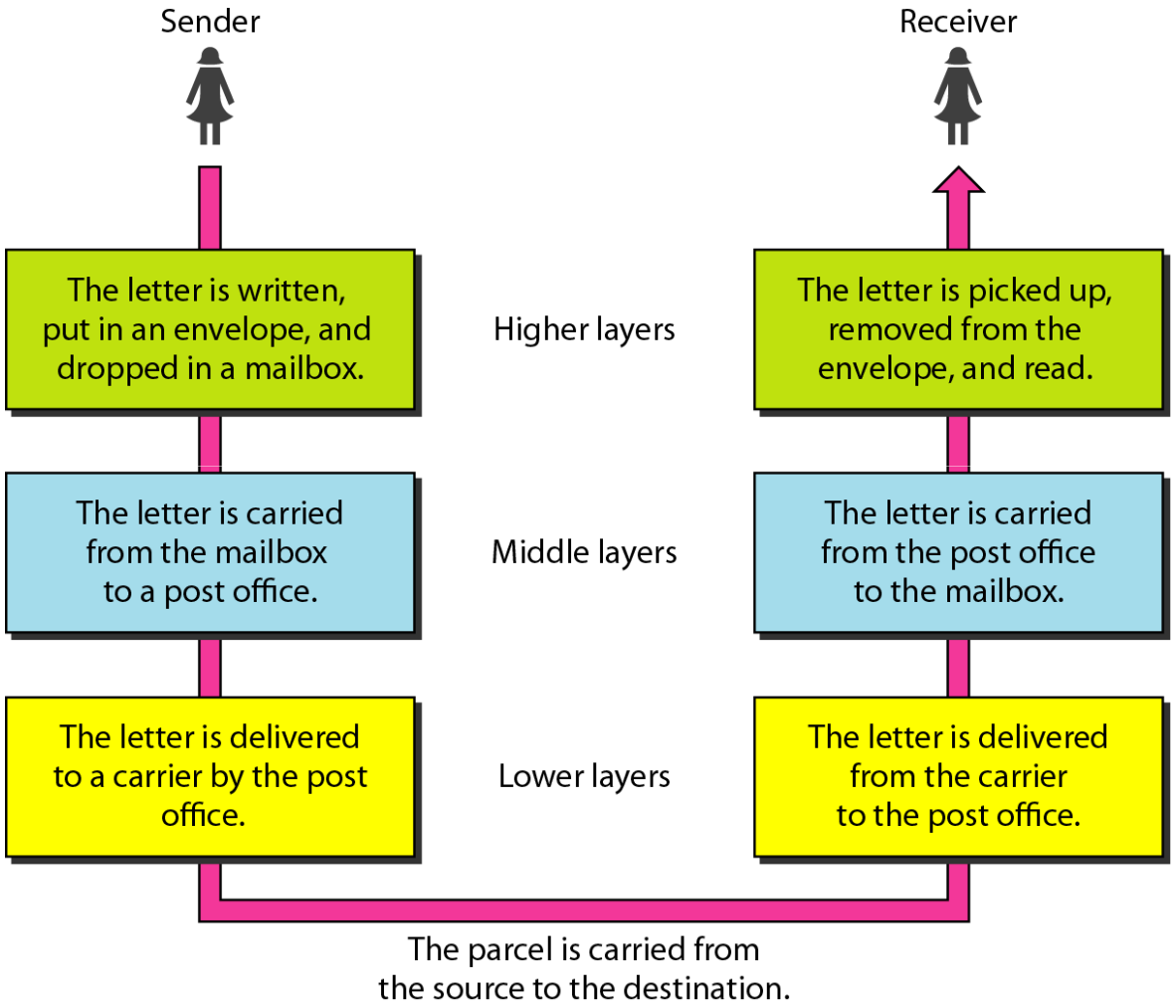
LAYERED TASKS

- We use the concept of **layers** in our daily life. As an example, let us consider two friends who communicate through postal mail. The process of sending a letter to a friend would be complex if there were no services available from the post office.

Tasks involved in sending a letter



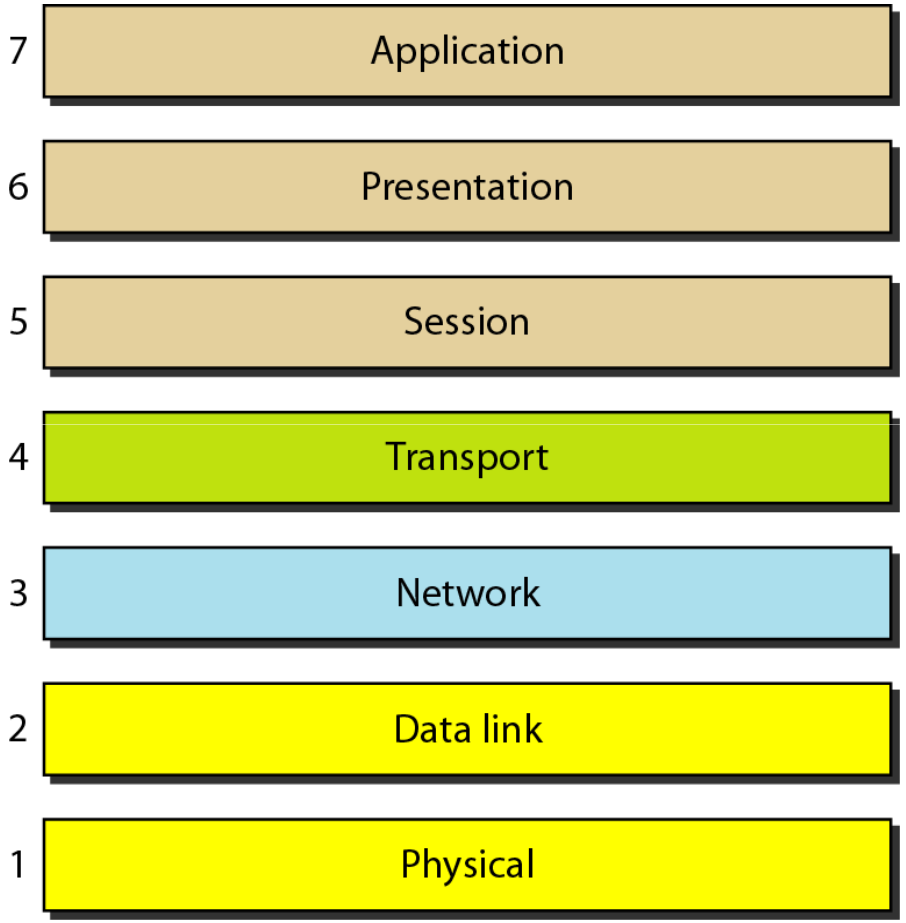
THE OSI MODEL

- Established in 1947, the International Standards Organization (**ISO**) is a multinational body dedicated to worldwide agreement on international standards. An ISO standard that covers all aspects of network communications is the Open Systems Interconnection (**OSI**) model. It was first introduced in the late 1970s.

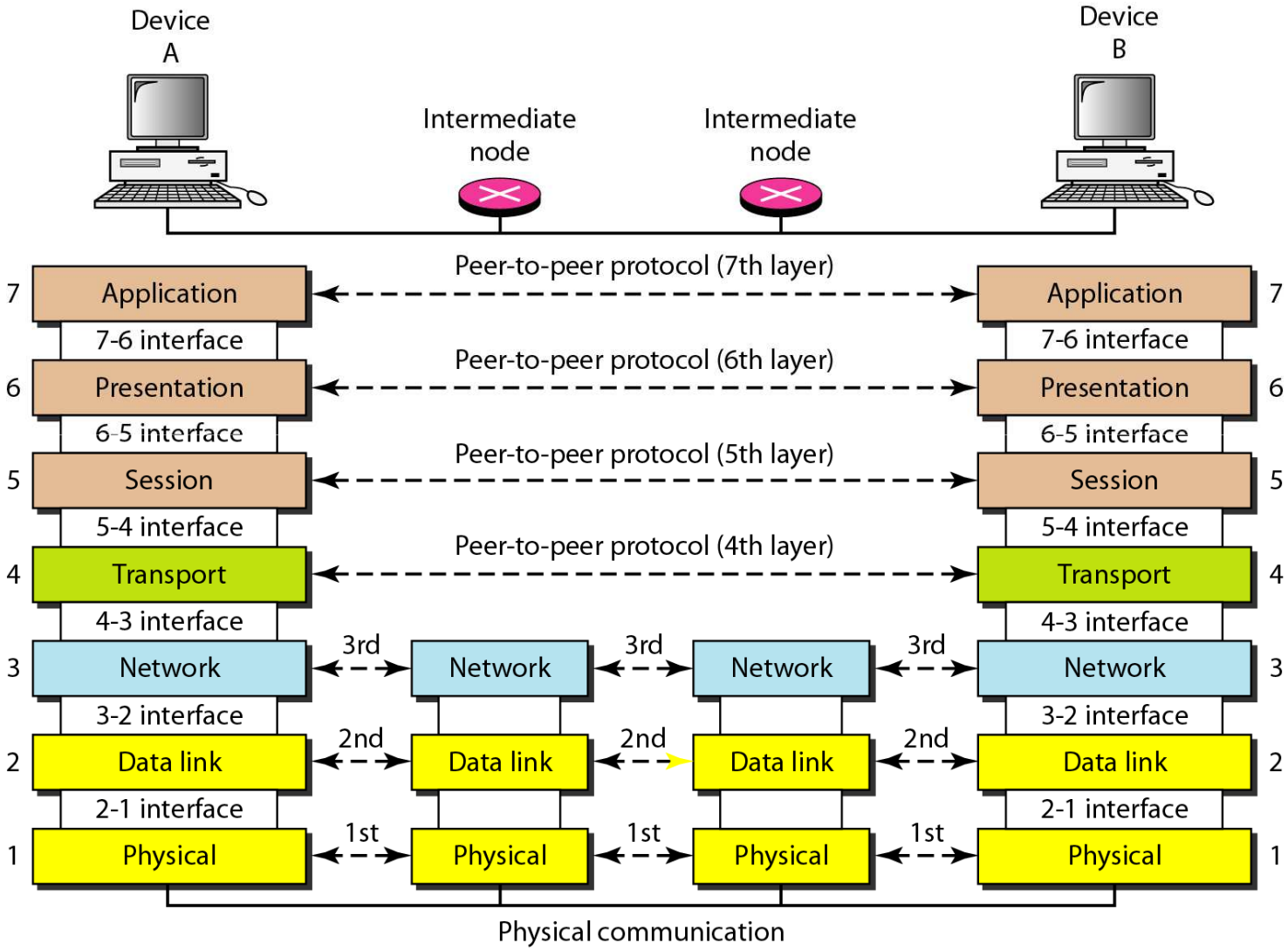
Note

ISO is the organization.
OSI is the model.

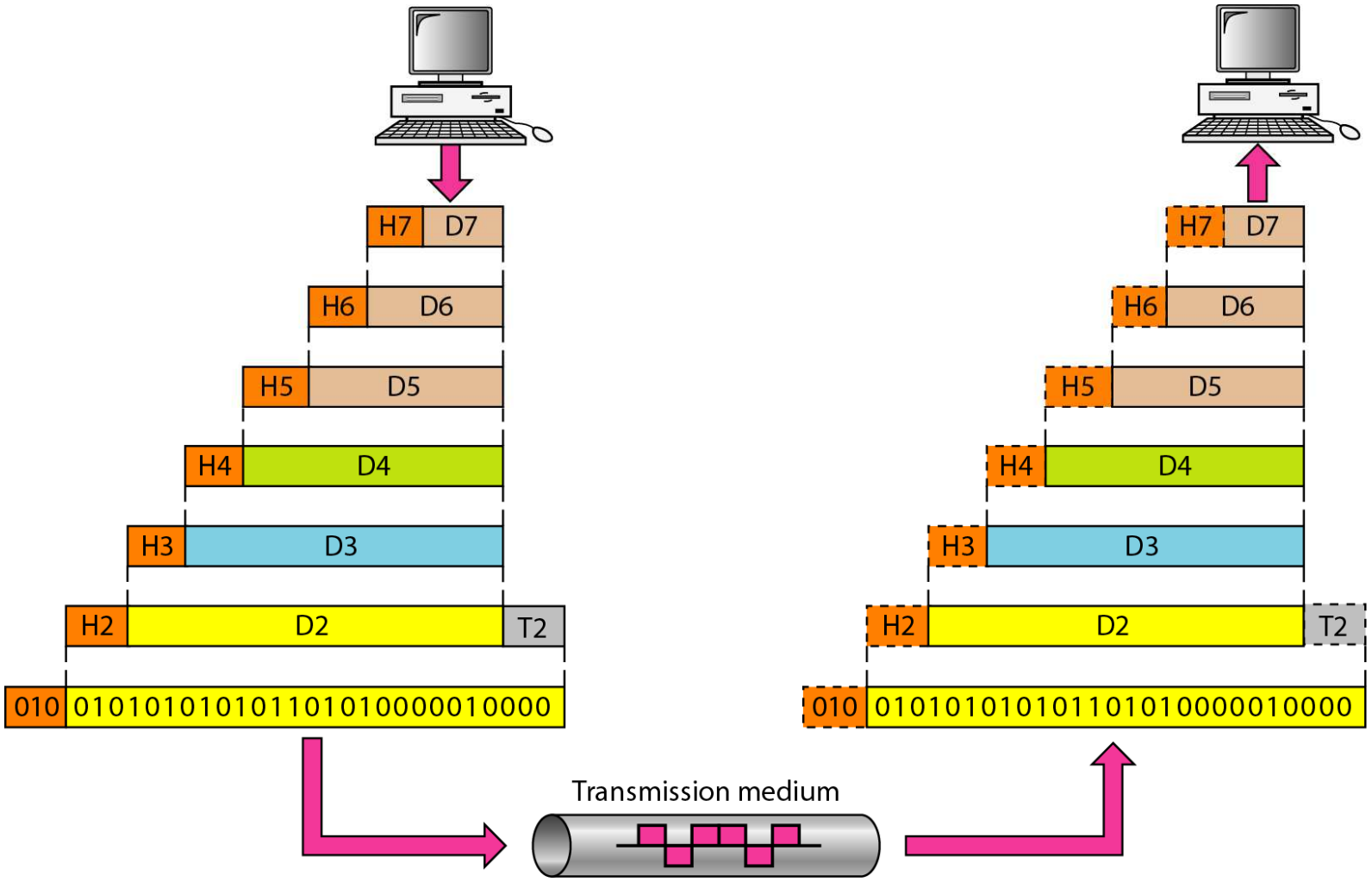
Seven layers of the OSI model



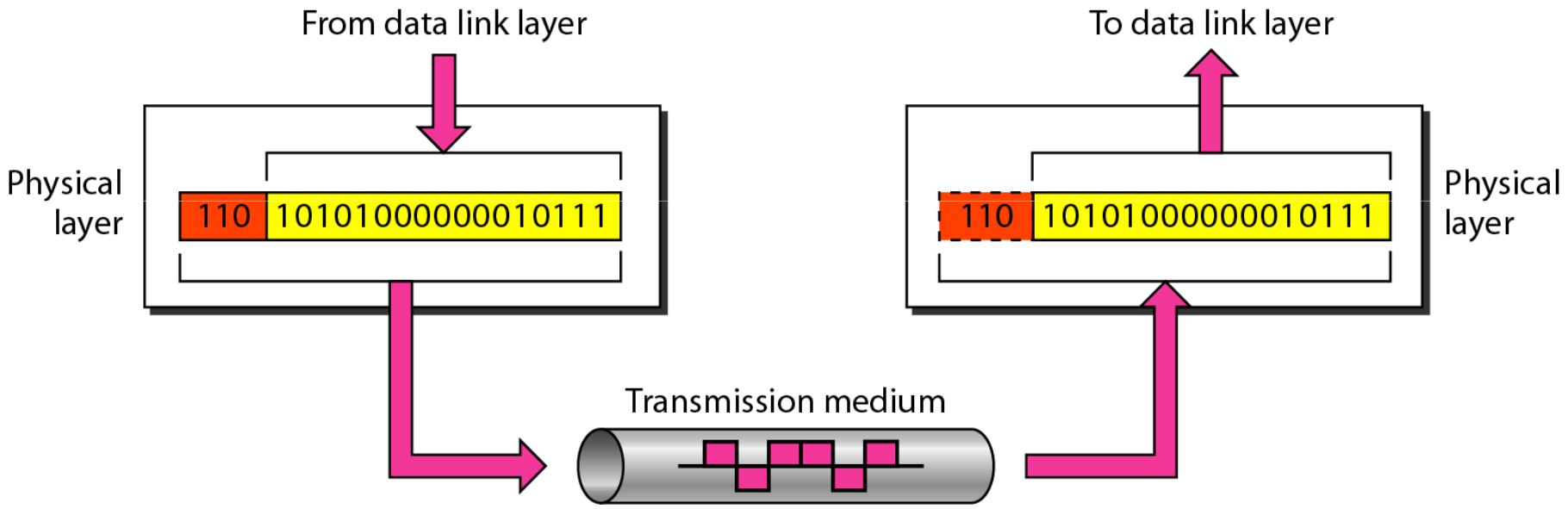
The interaction between layers in the OSI model



An exchange using the OSI model



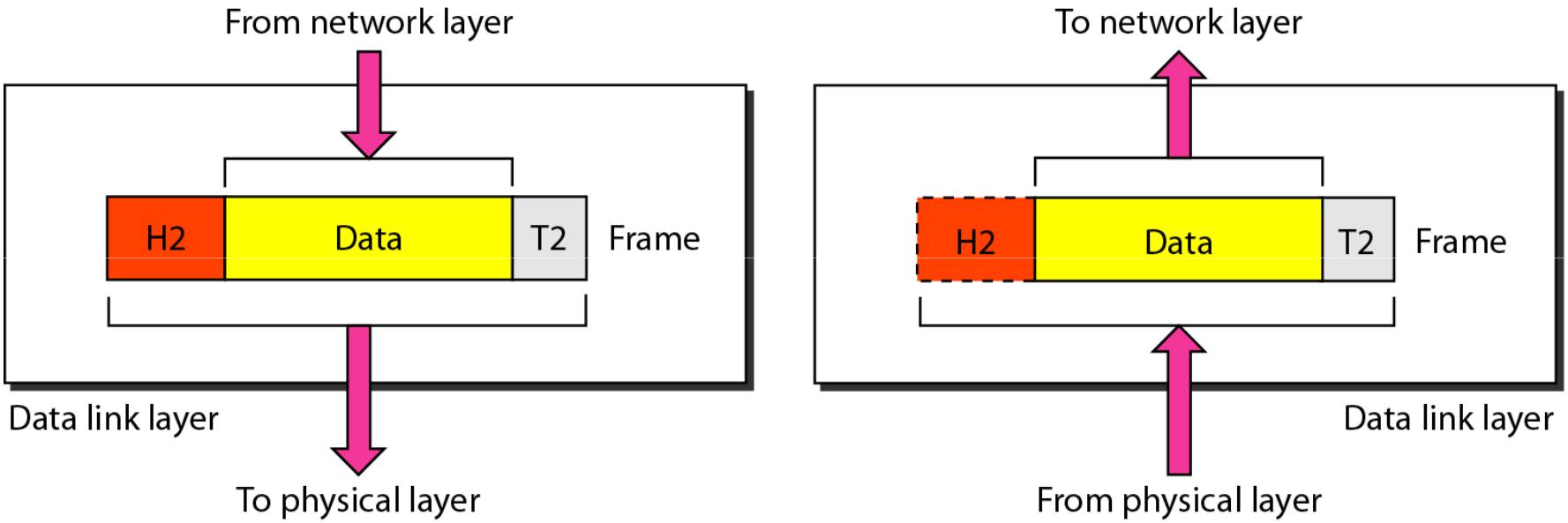
Physical layer



Note

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

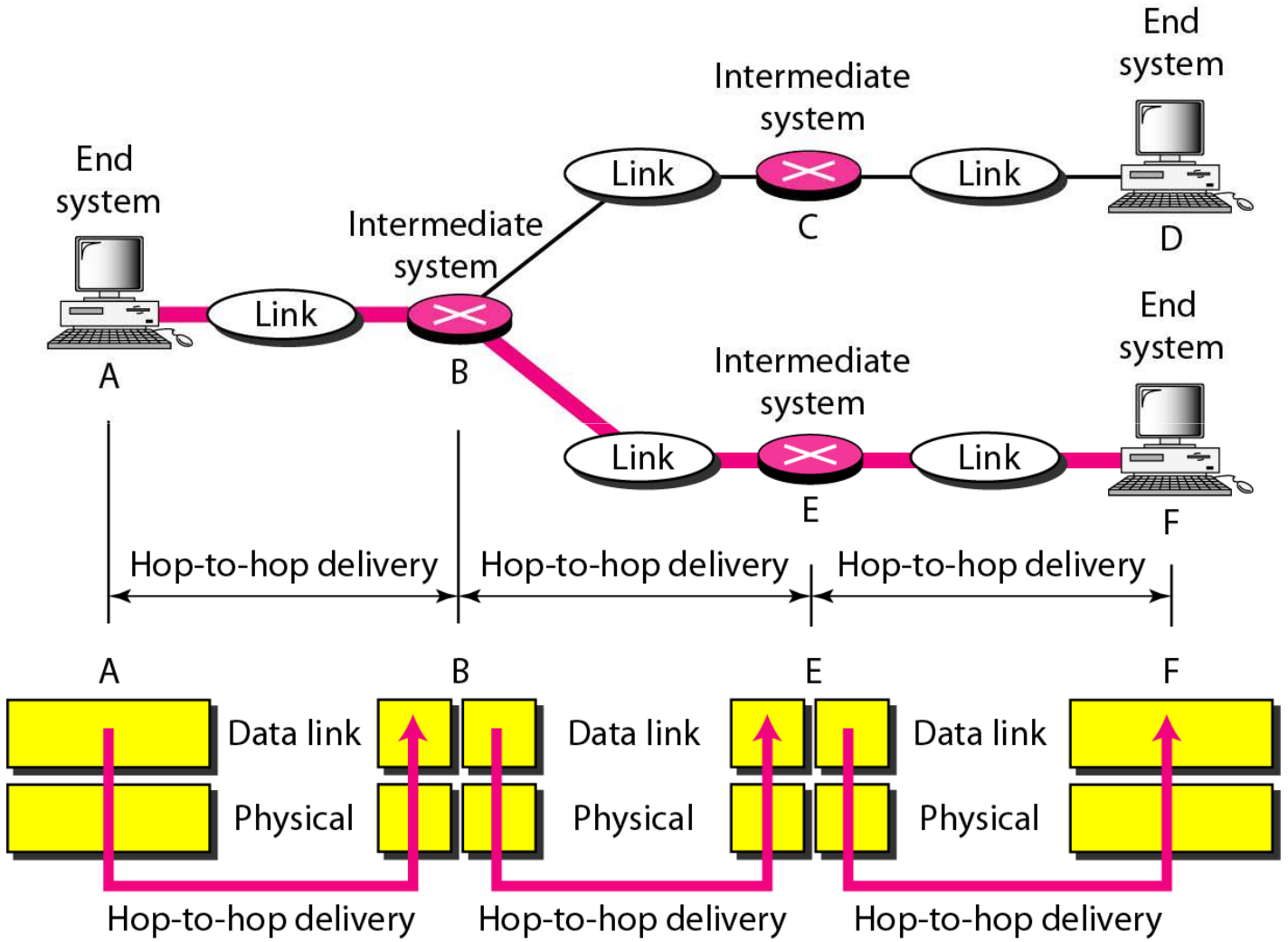
Data link layer



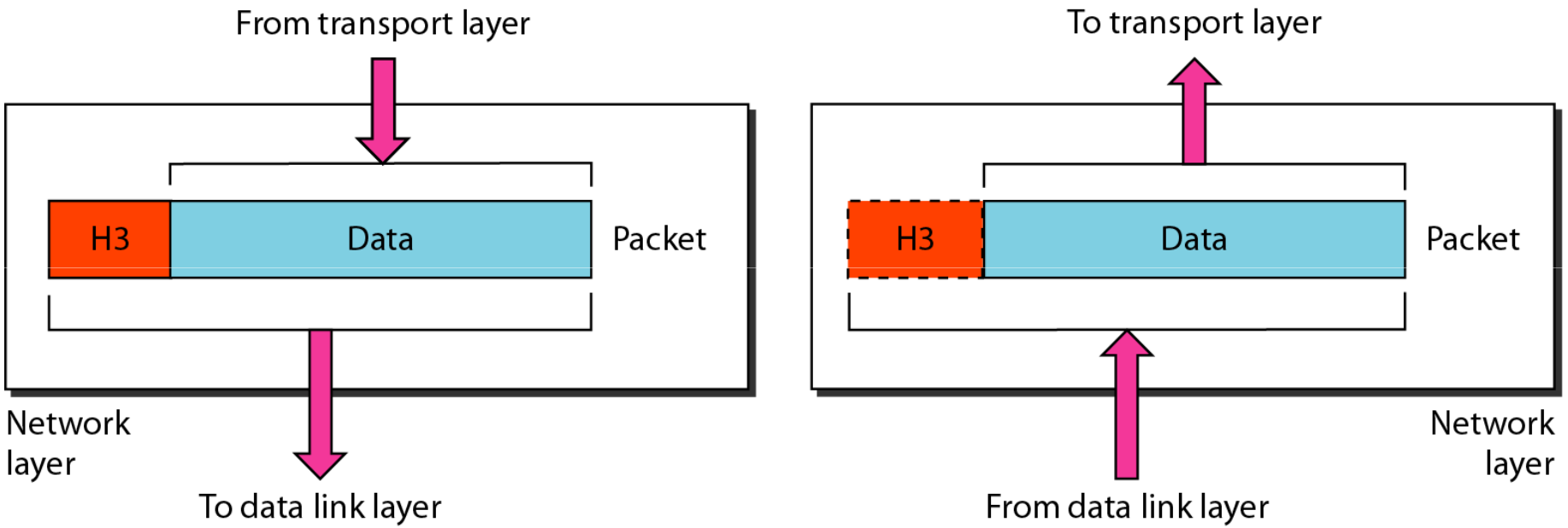
Note

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

Hop-to-hop delivery



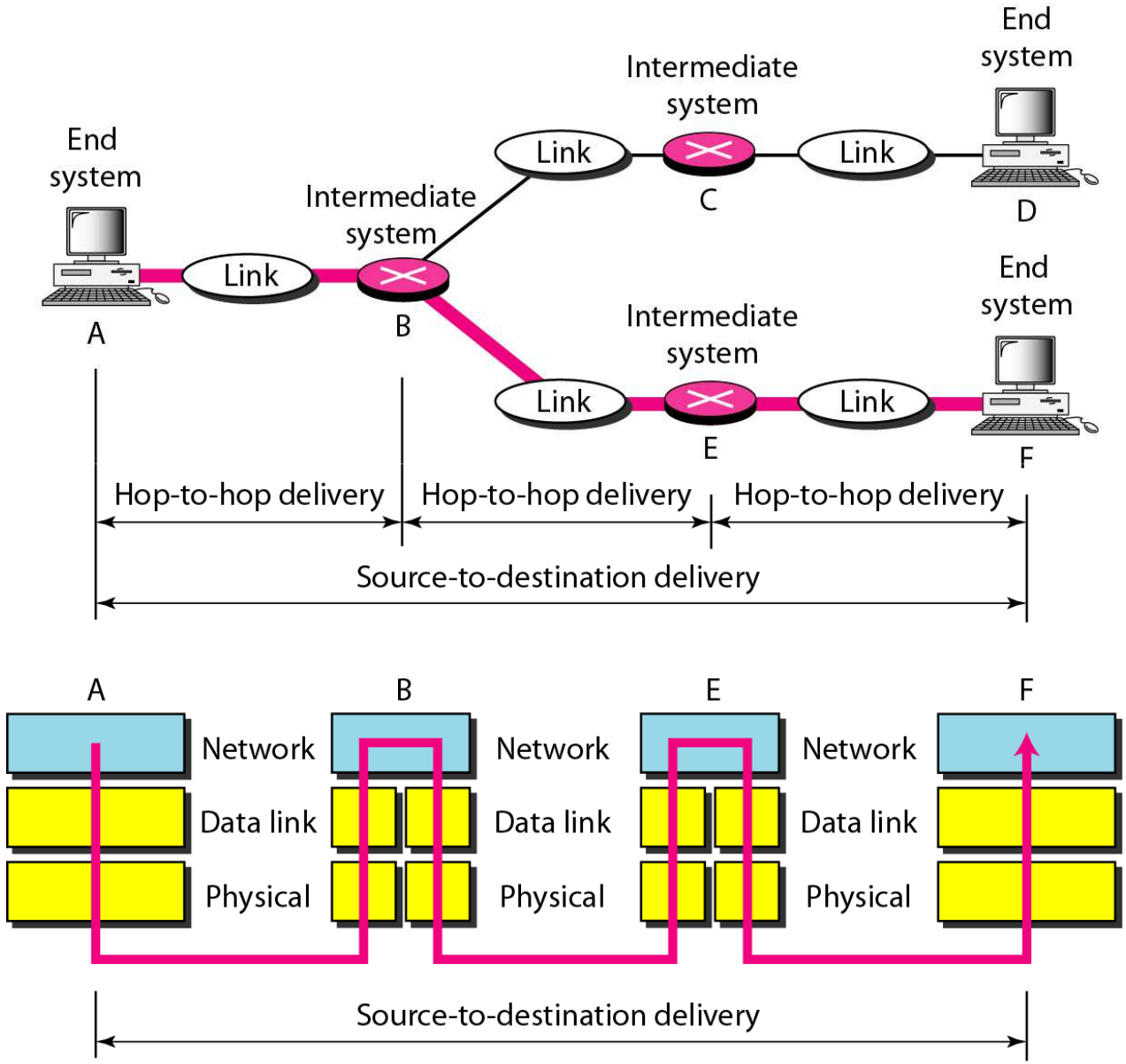
Network layer



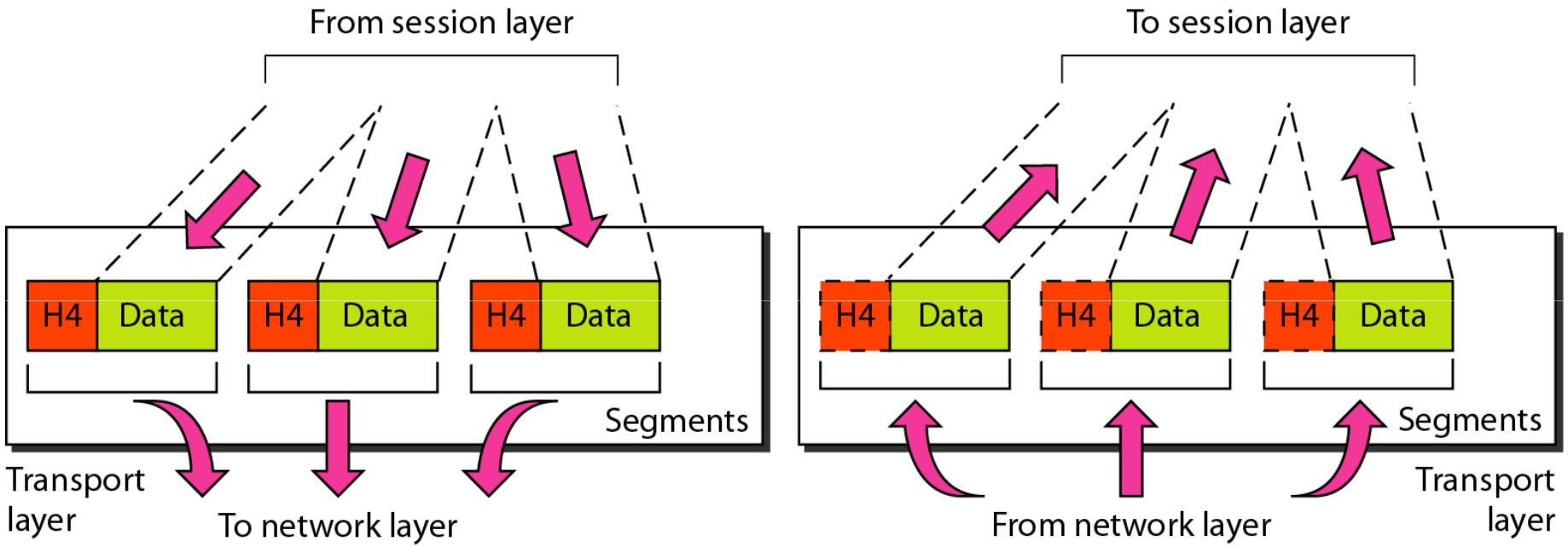
Note

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

Source-to-destination delivery



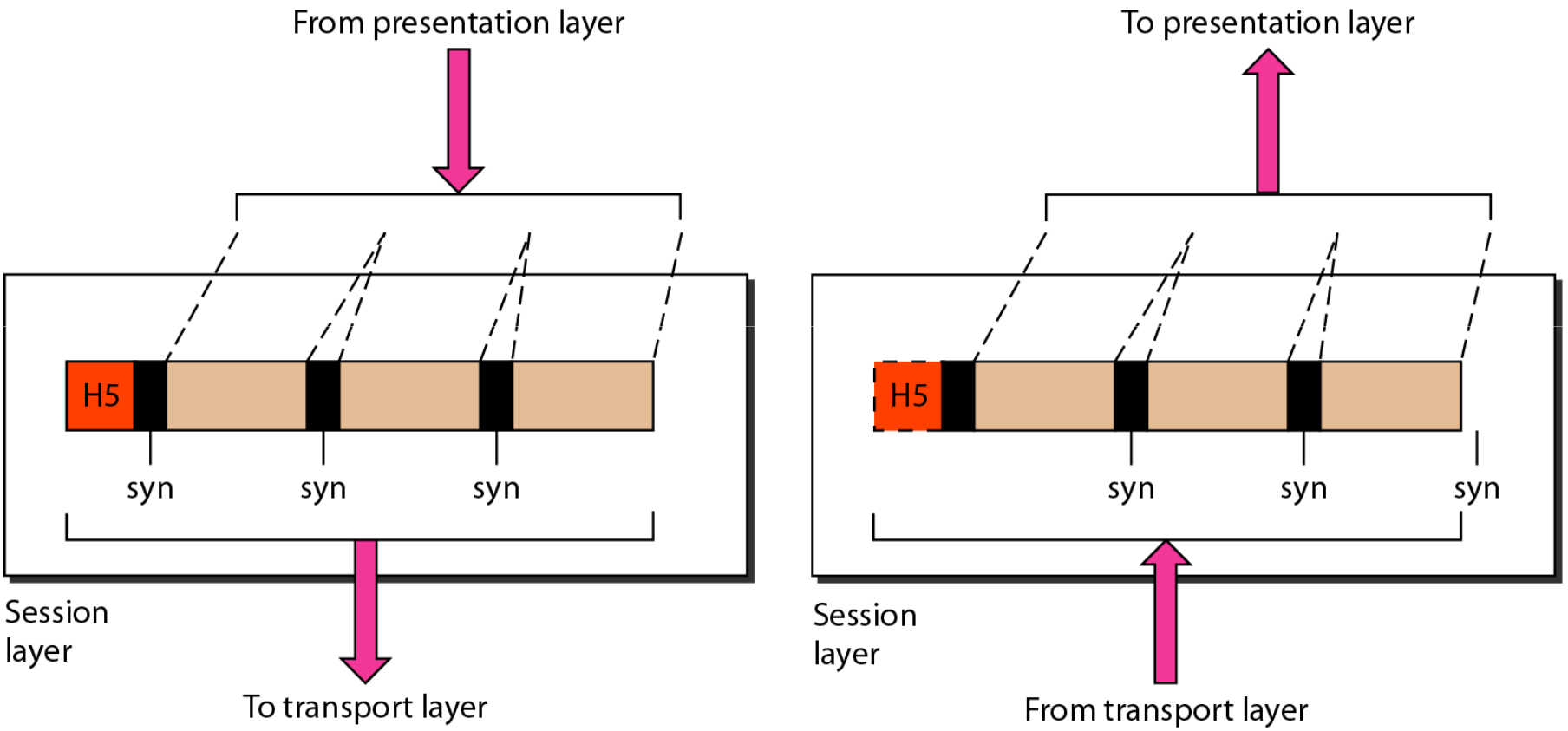
Transport layer



Note

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

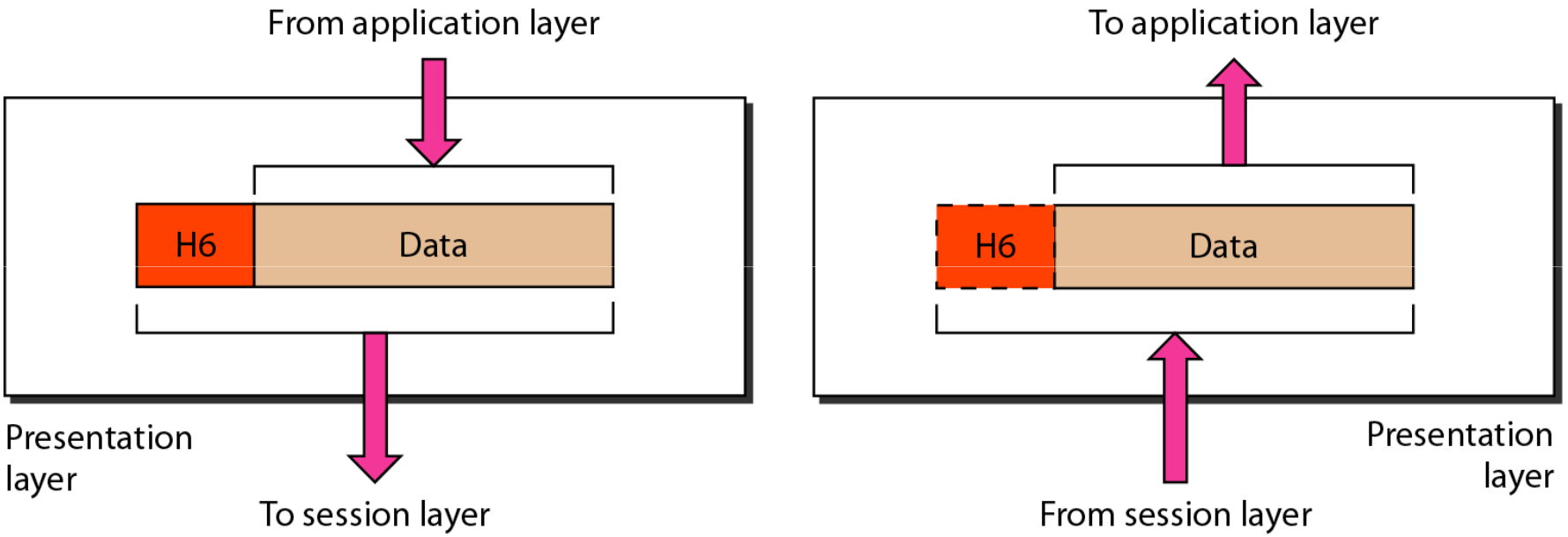
Session layer



Note

The **session layer** is responsible for **dialog control and synchronization**.

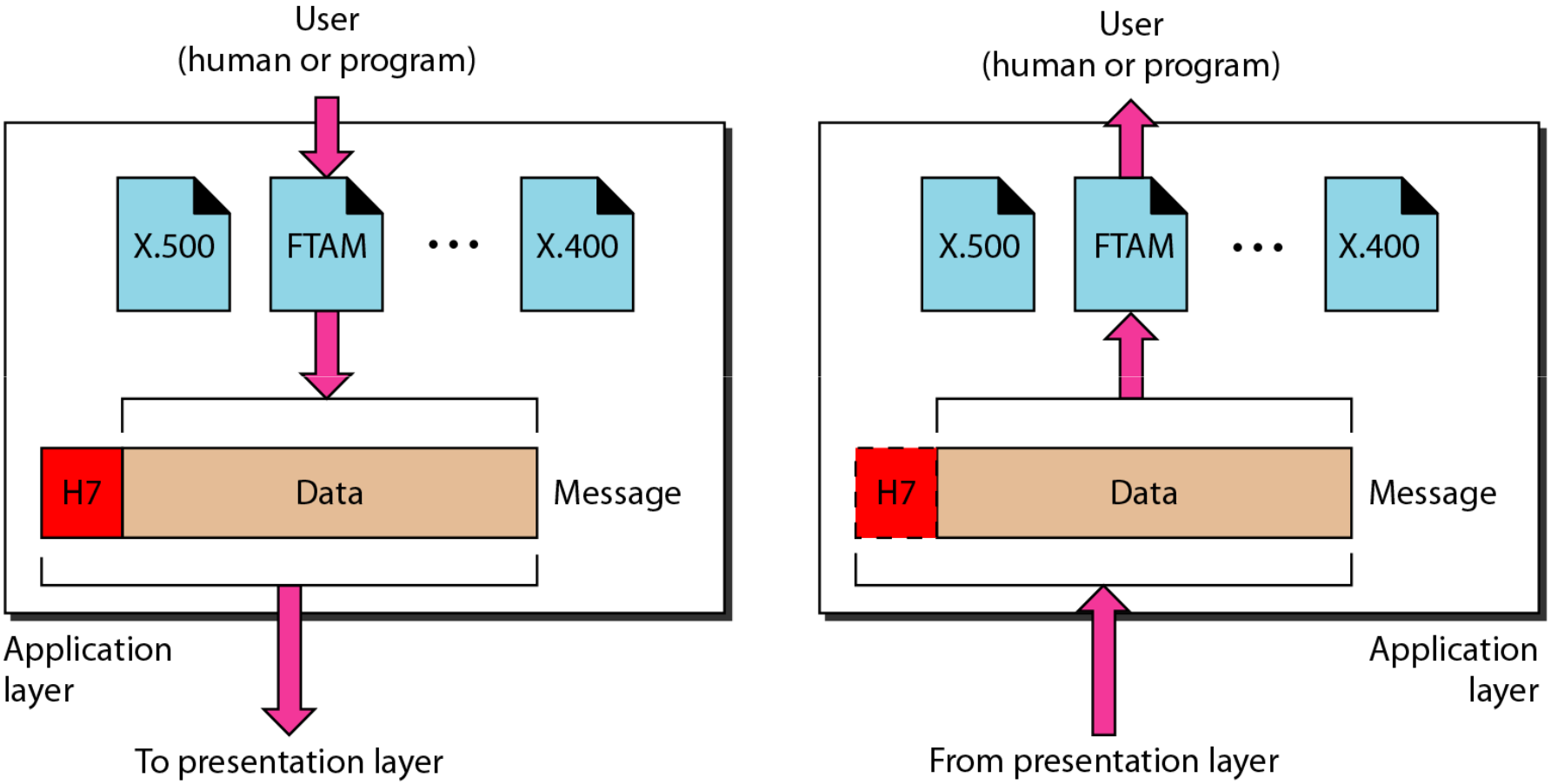
Presentation layer



Note

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

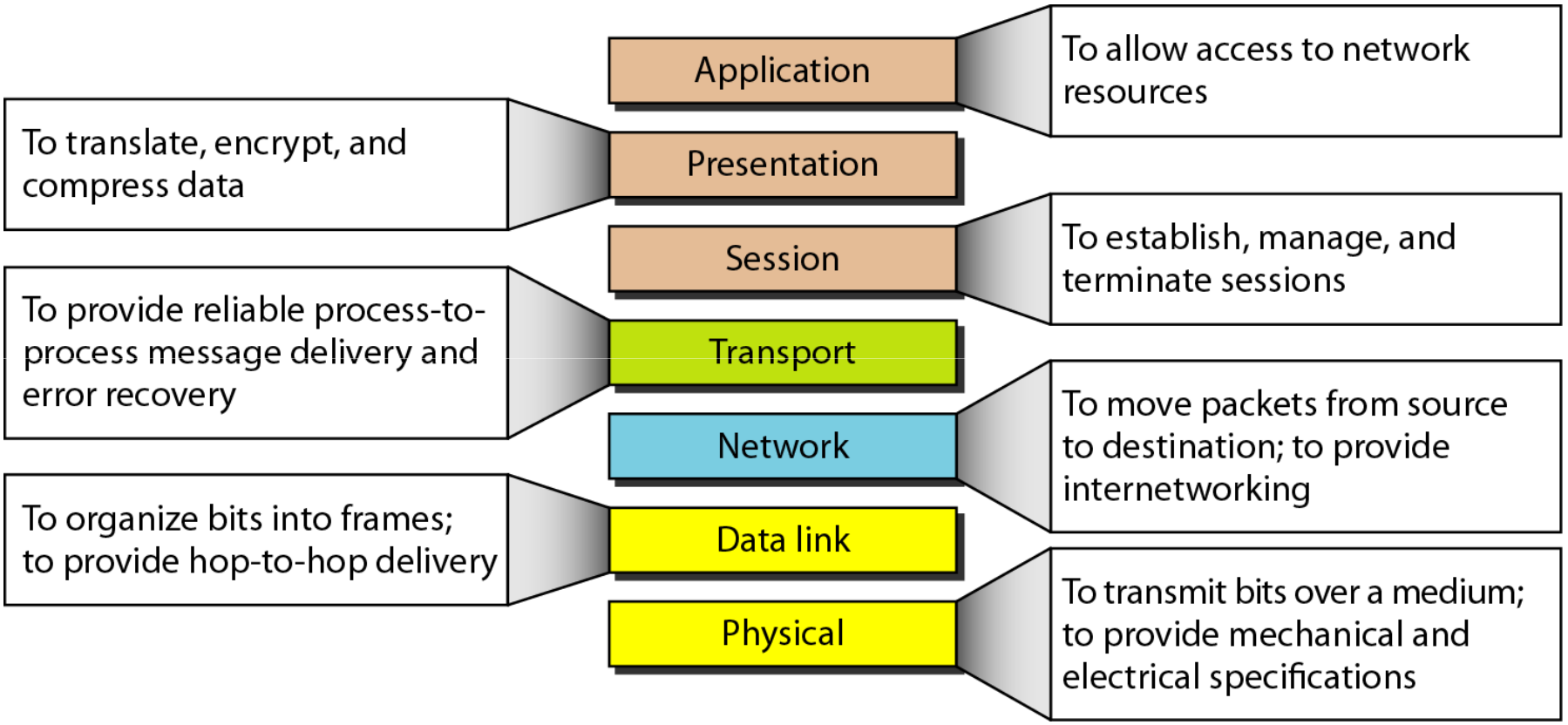
Application layer



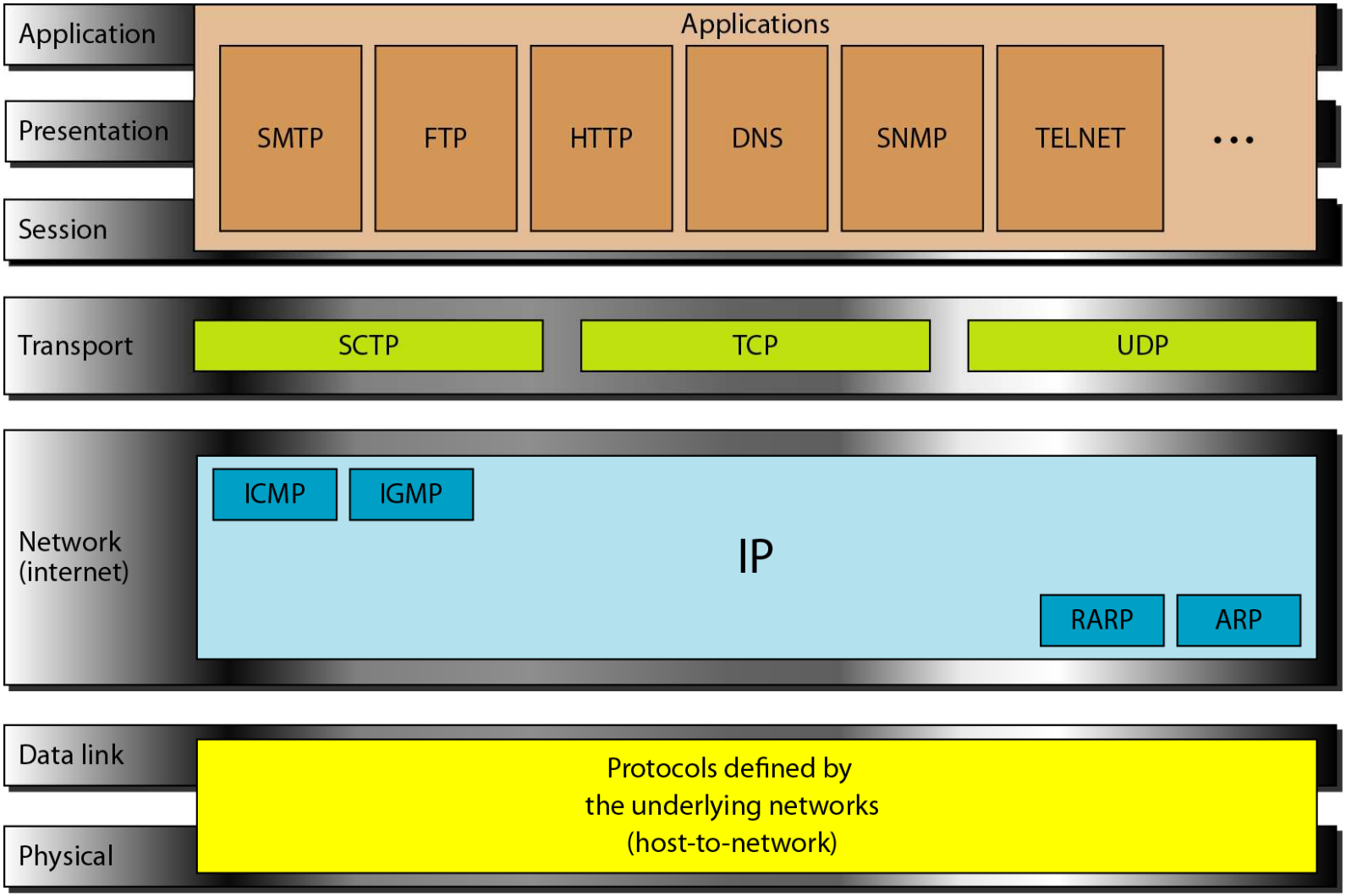
Note

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

Summary of layers



TCP/IP and OSI model



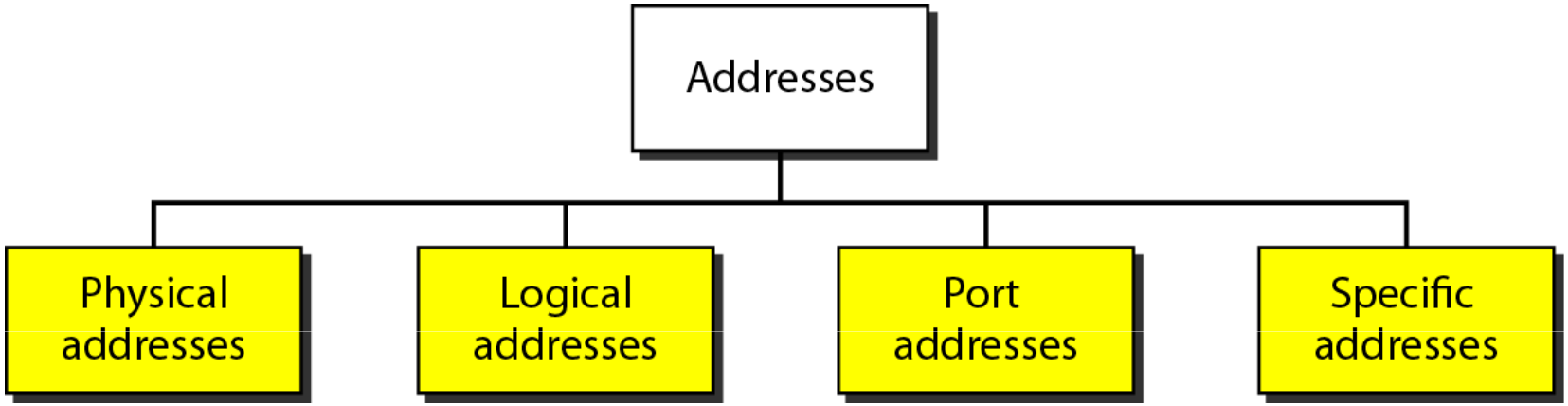
ADDRESSING

- Four levels of addresses are used in an internet employing the TCP/IP protocols: physical, logical, port, and specific.

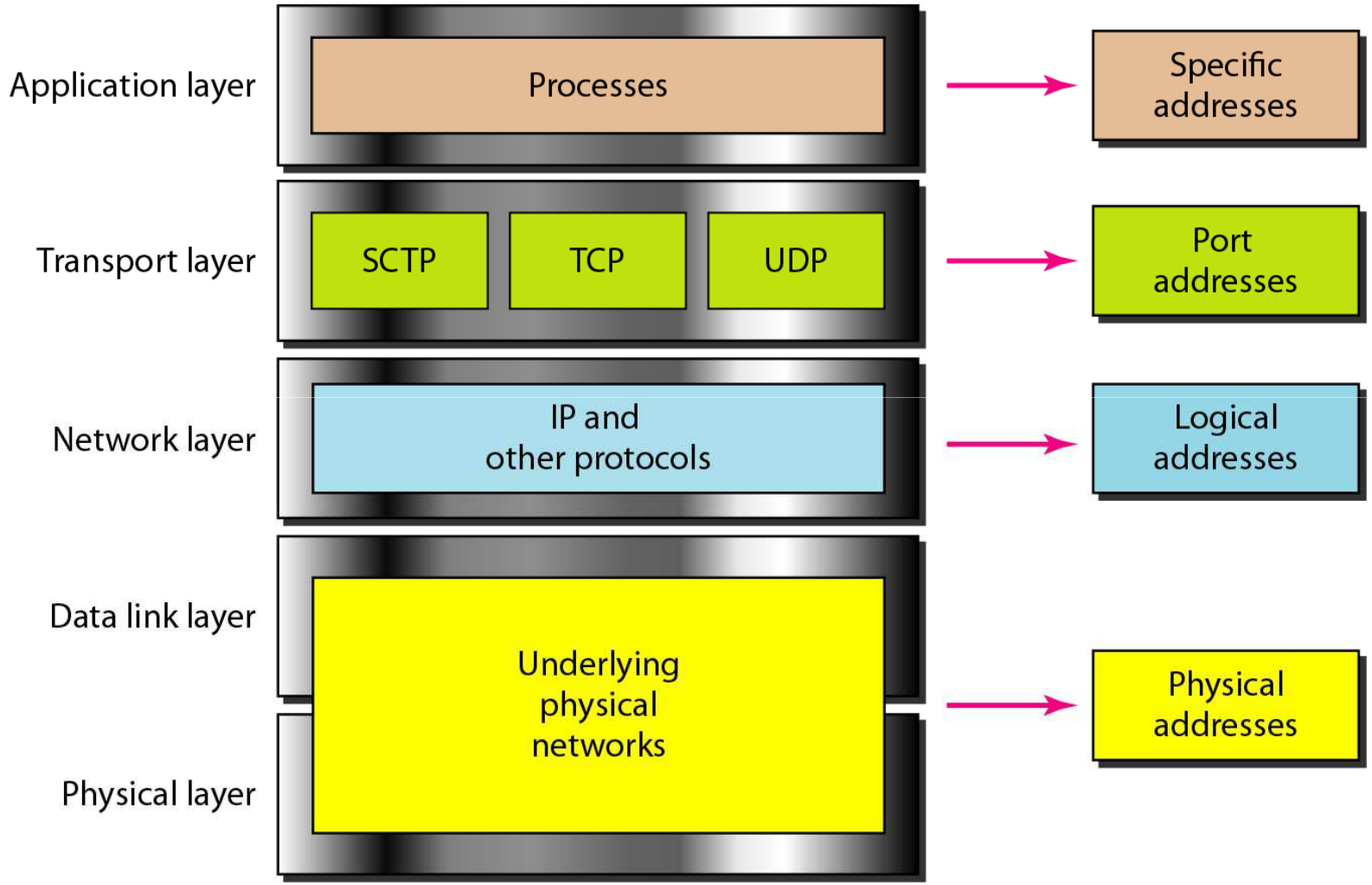
- **Topics discussed in this section:**

- Physical Addresses
- Logical Addresses
- Port Addresses
- Specific Addresses

Addresses in TCP/IP



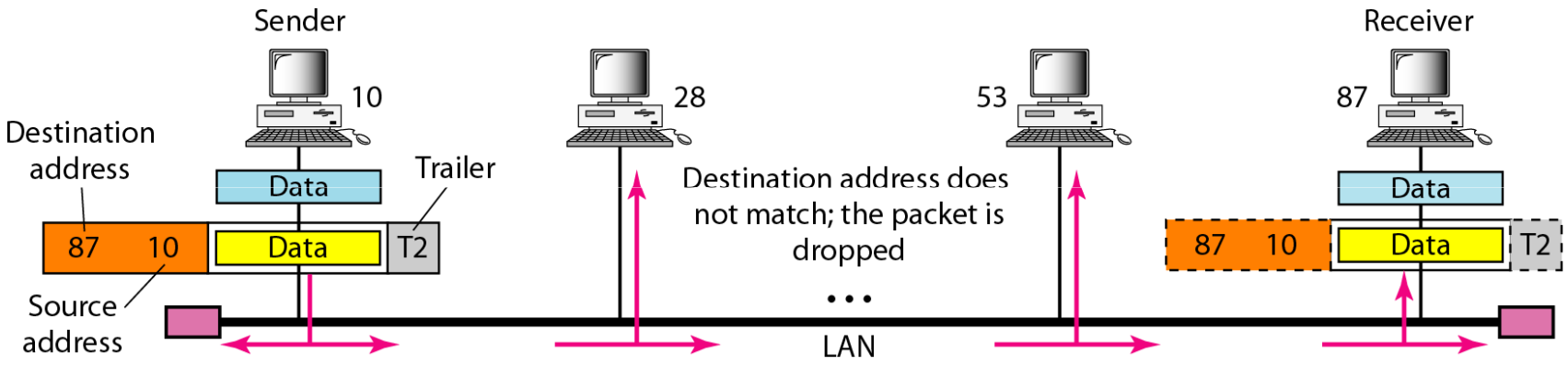
Relationship of layers and addresses in TCP/IP



Example 1

- A node with physical address 10 sends a frame to a node with physical address 87. The two nodes are connected by a link (bus topology LAN). As the figure shows, the computer with physical address **10** is the sender, and the computer with physical address **87** is the receiver.

Example 1


Sender
10
28
53
Receiver
87
Destination address
Trailer
Data
87 10
Data
T2
Destination address does not match; the packet is dropped
Source address
LAN