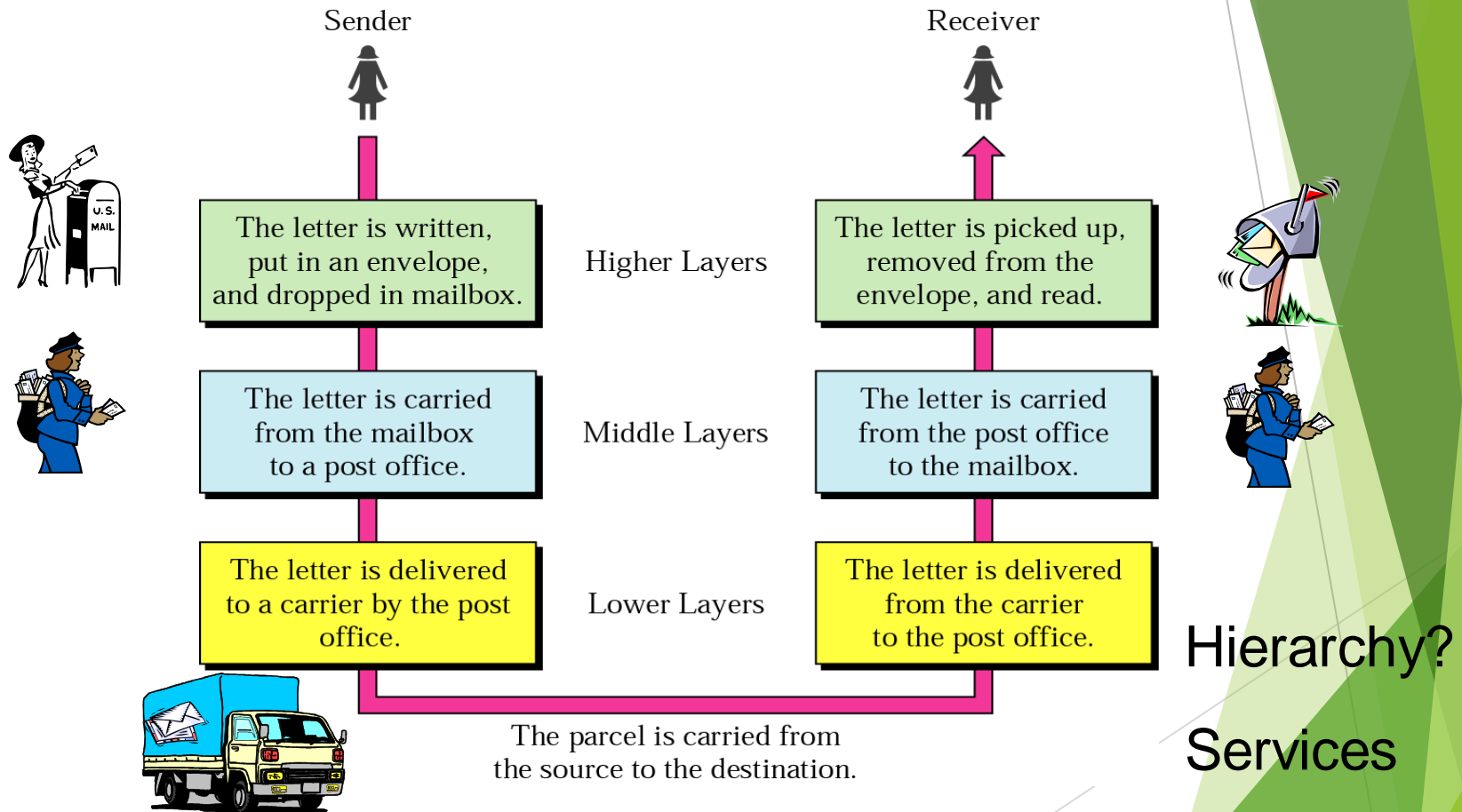


SM2

Layered Tasks

An example from the everyday life



Why layered communication?

- ▶ To reduce complexity of communication task by splitting it into several layered small tasks
- ▶ Functionality of the layers can be changed as long as the service provided to the layer above stays unchanged
 - ▶ makes easier maintenance & updating
- ▶ Each layer has its own task
- ▶ Each layer has its own protocol

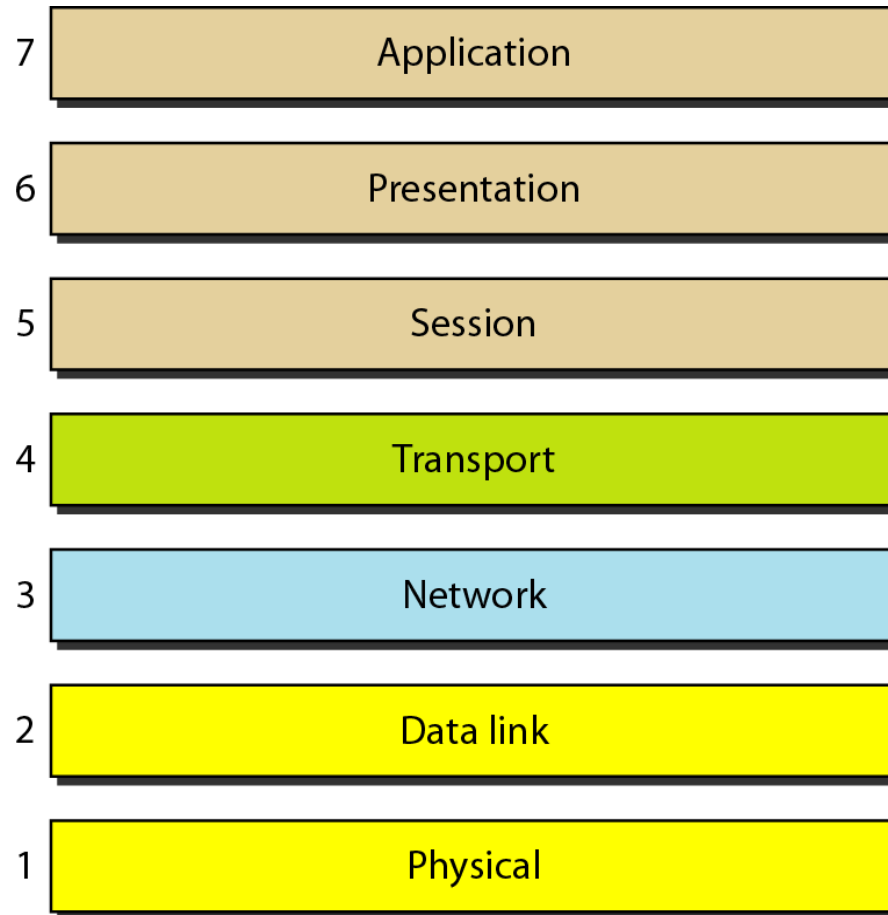
Reference Models

- ▶ OSI reference model
- ▶ TCP/IP

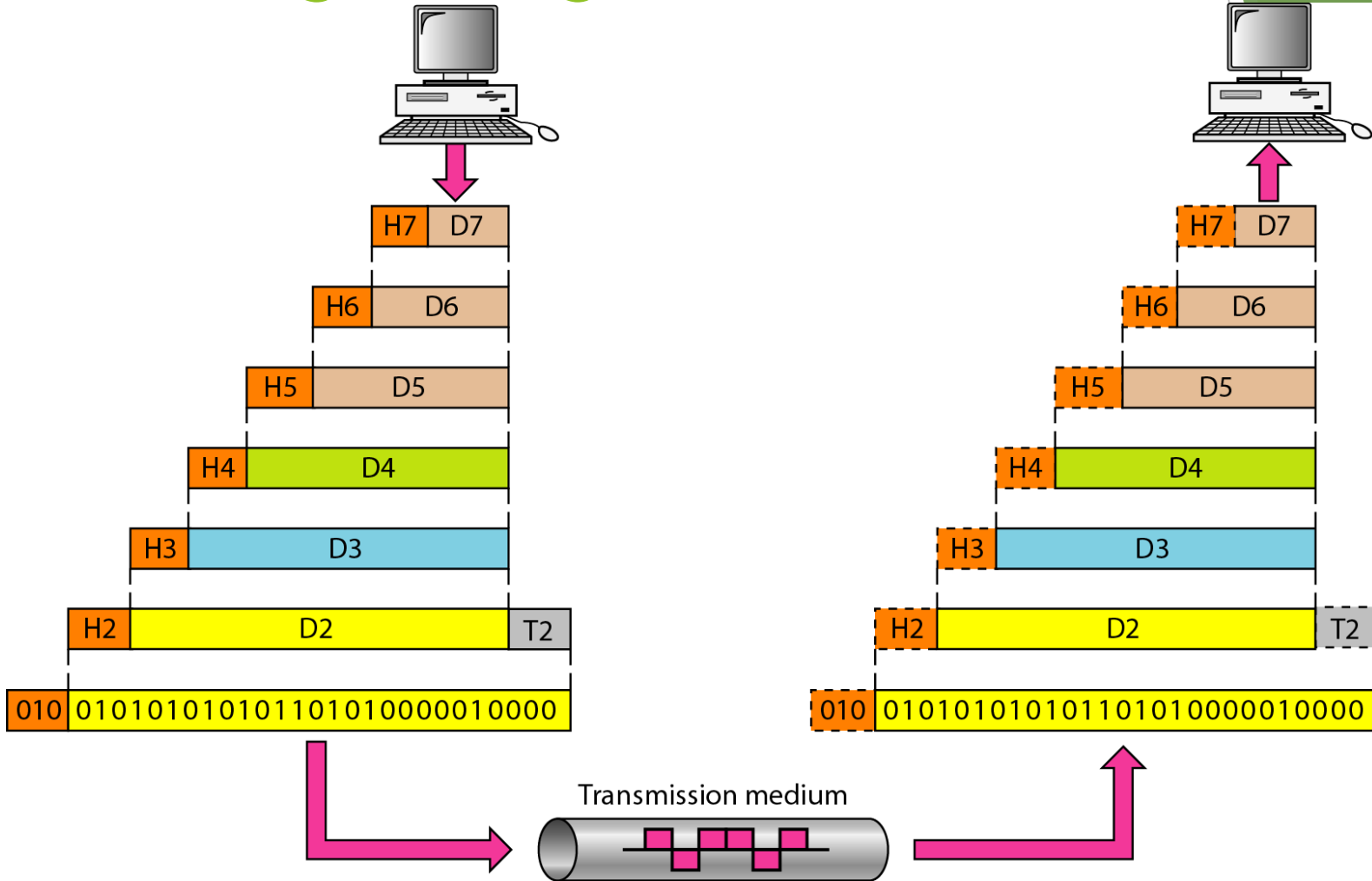
OSI Reference model

- ▶ Open System Interconnection
 - ▶ 7 layers
1. Create a layer when different abstraction is needed
 2. Each layer performs a well define function
 3. Functions of the layers chosen taking internationally standardized protocols
 4. Number of layers - large enough to avoid complexity

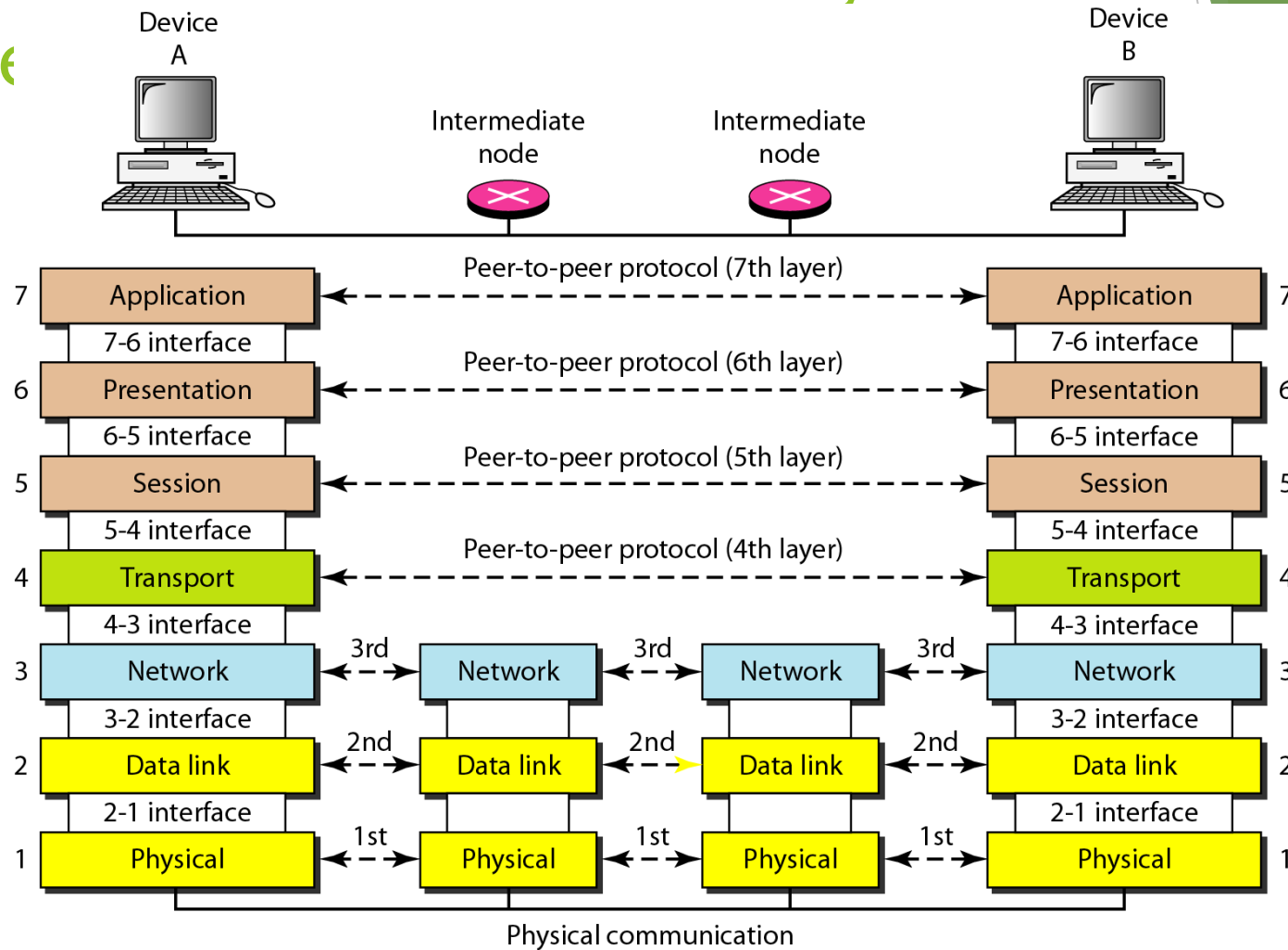
Seven layers of the OSI model



Exchange using OSI Model



The interaction between layers in the

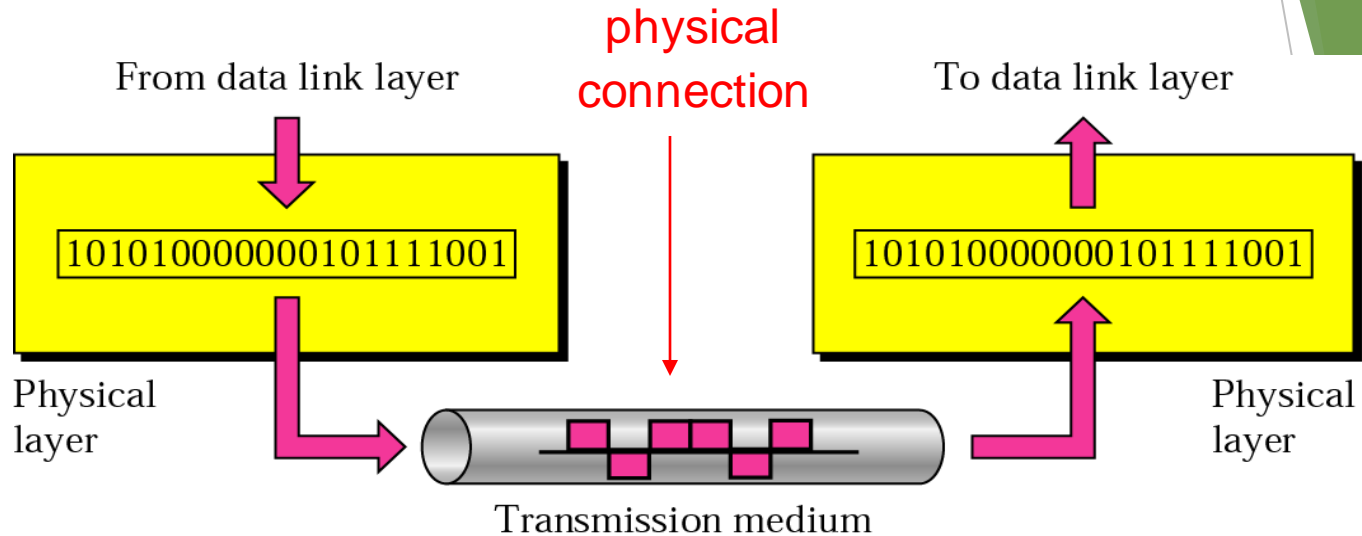


Issues, to be resolved by the layers

- ▶ Larger bandwidth at lower cost
- ▶ Error correction
- ▶ Flow control
- ▶ Addressing
- ▶ Multiplexing
- ▶ Naming
- ▶ Congestion control
- ▶ Mobility
- ▶ Routing
- ▶ Fragmentation
- ▶ Security
- ▶

OSI Layers

Physical layer



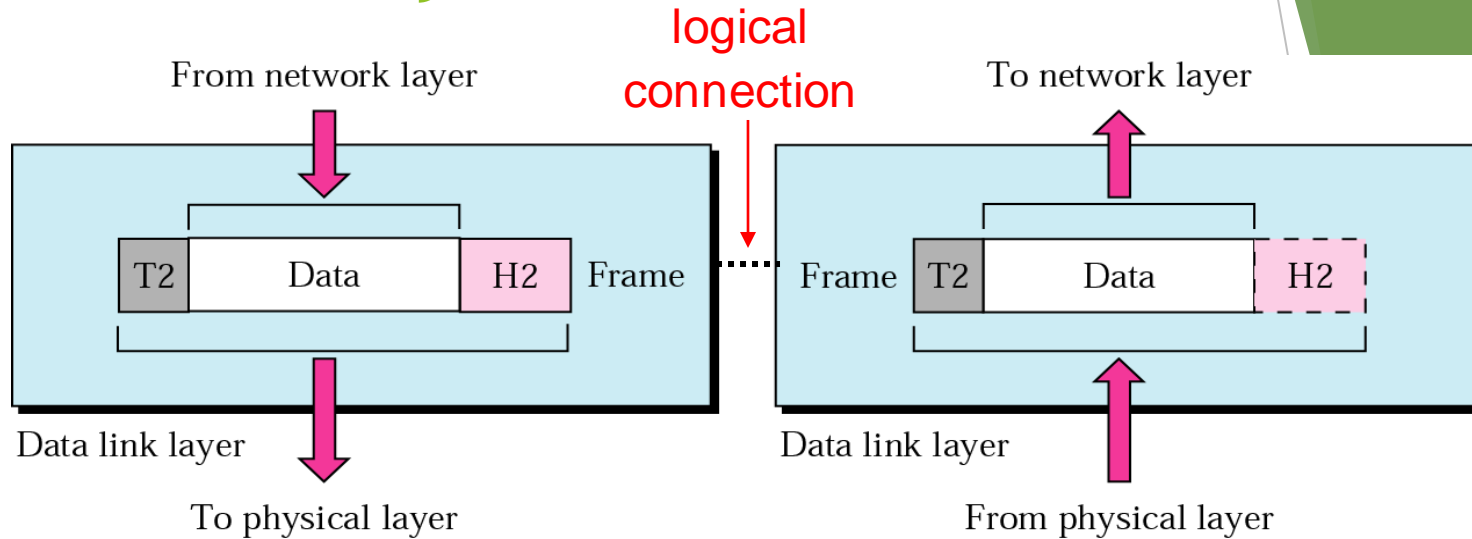
Transporting bits from one end node to the next

- type of the transmission media (twisted-pair, coax, optical fiber, air)
- bit representation (voltage levels of logical values)
- data rate (speed)
- synchronization of bits (time synchronization)

Note

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

Data Link layer

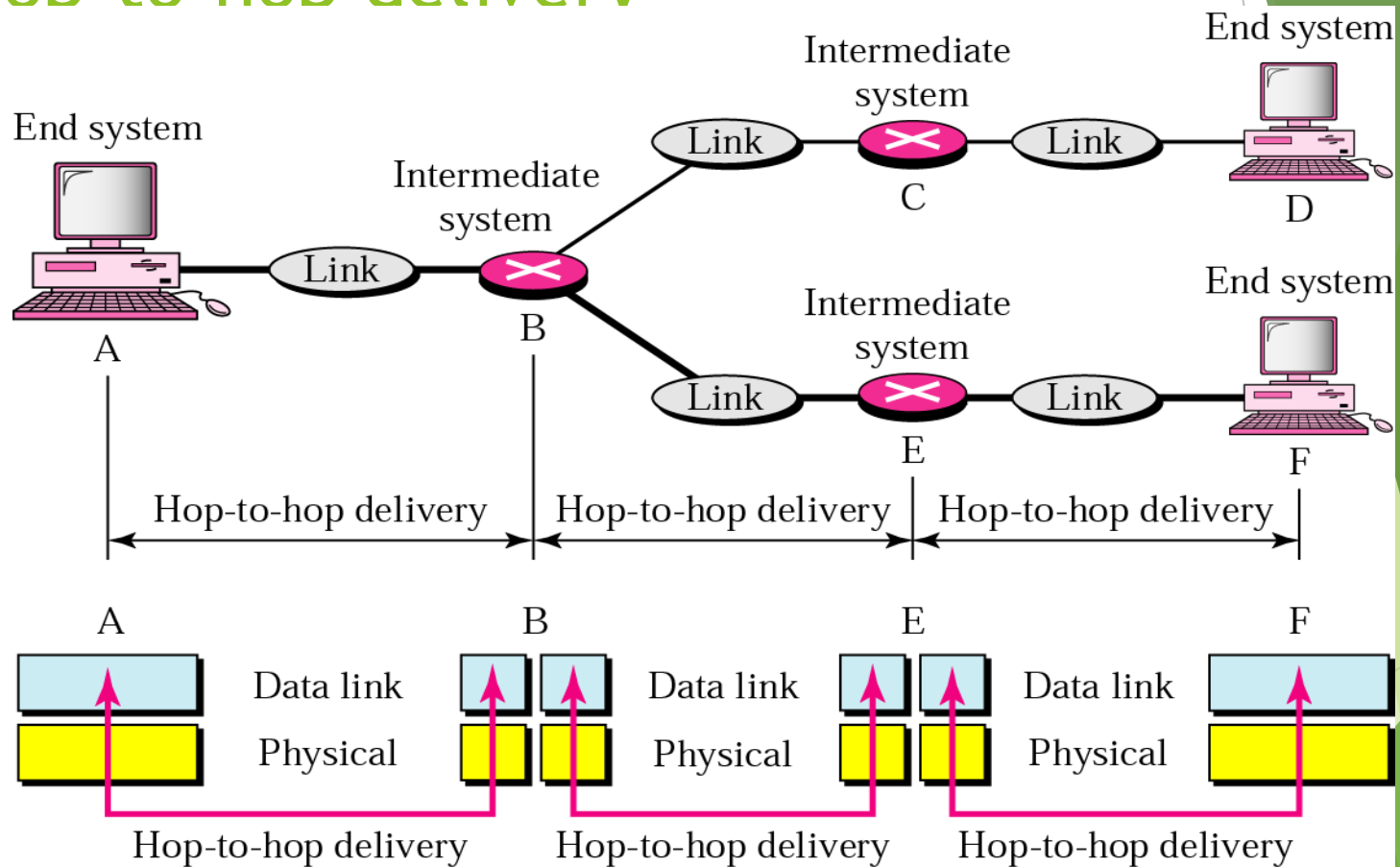


Transporting frames from one end node to the next one

- framing
- physical addressing
- flow control
- error control
- access control

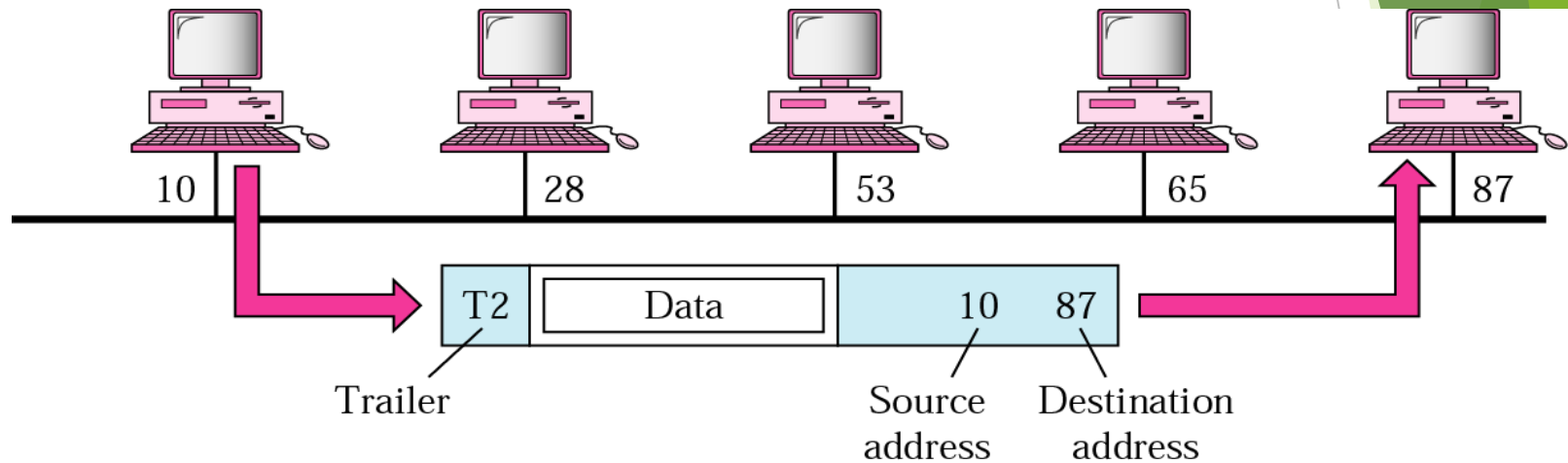
Data Link layer

- hop-to-hop delivery -



Data Link layer

- example -



Note

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

References

- ▶ DATA COMMUNICATION AND NETWORKING FOROUZAN, 4th Edition