

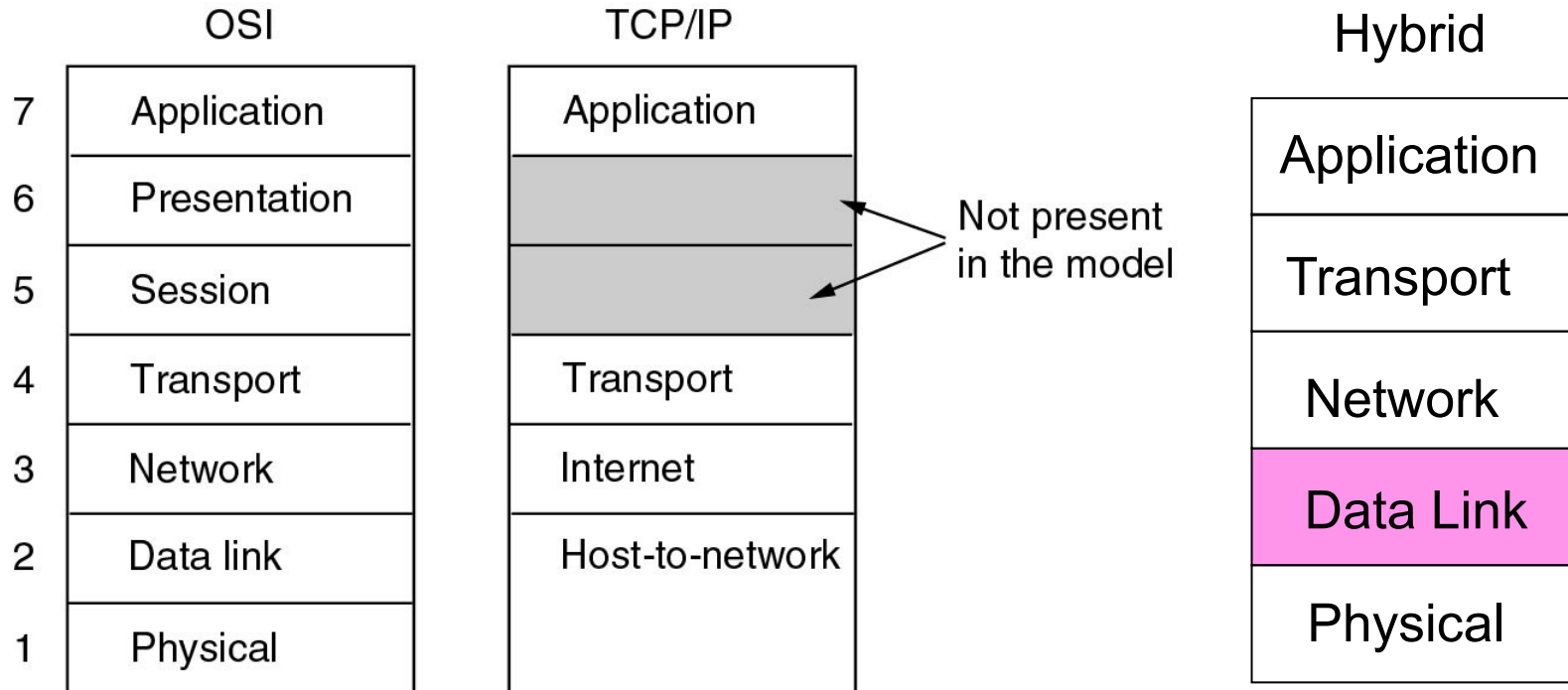
# Data Link Layer (1)

COMP90007 Internet Technologies

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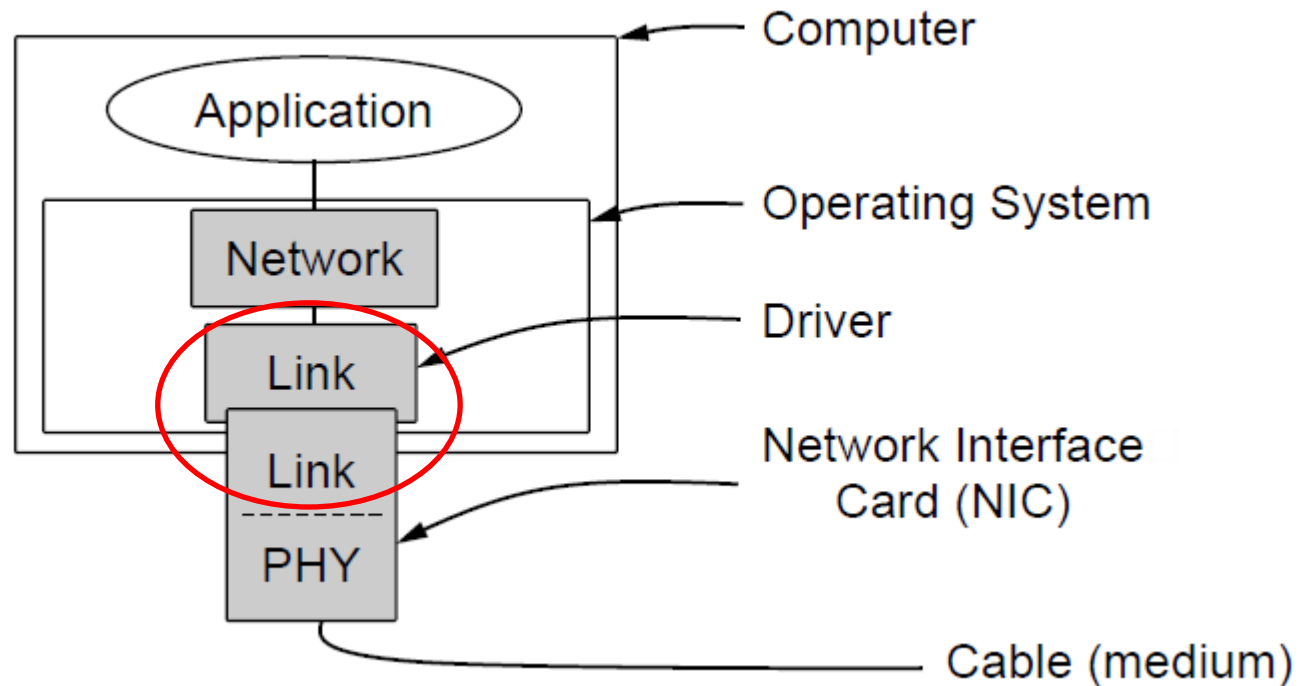
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# The Data Link Layer in OSI and TCP/IP



- **Reliable, efficient** communication of “**frames**” between two adjacent machines.
- Handles transmission errors and flow control.

# Typical Implementation



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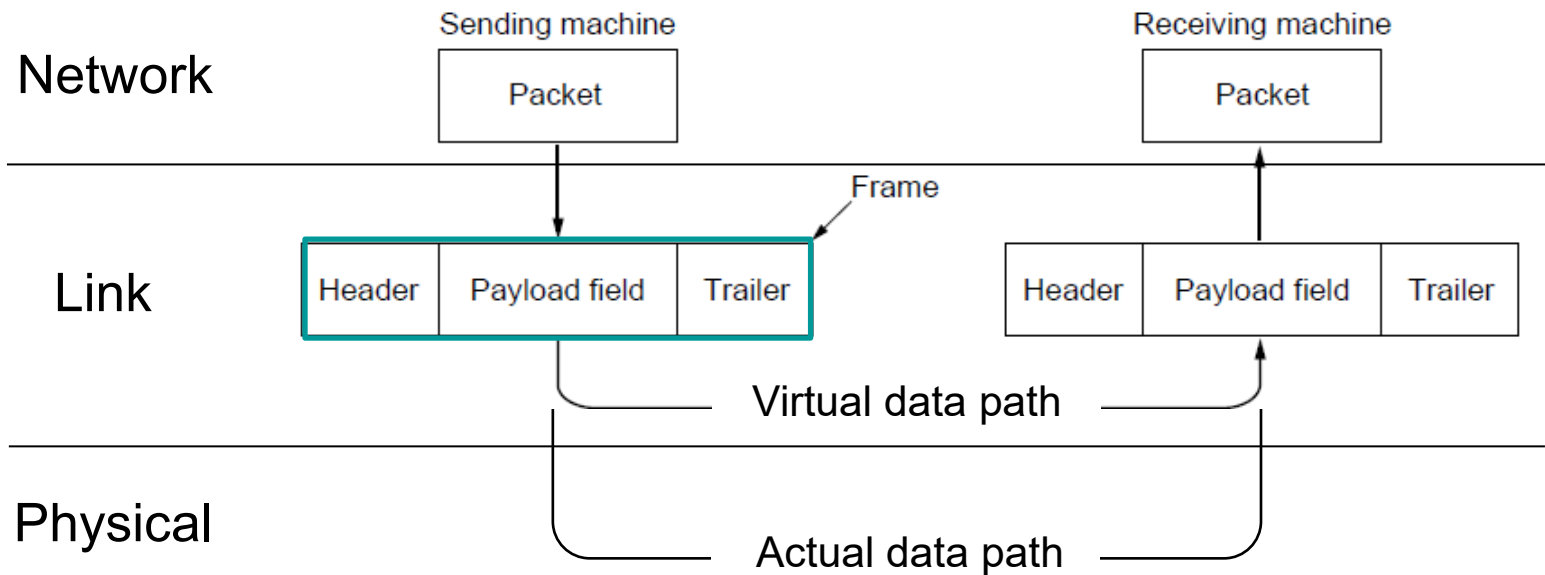
# Functions of the Data Link Layer

1. Provide a well-defined service interface to network layer
2. Handling transmission errors
3. Data flow regulation

# Relation Between Packets and Frames

## ■ Primary process:

- ❑ link layer accepts packets from the network layer, **encapsulates** them into frames, sends using the physical layer; reception is the opposite process



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# Type of Services

- **Connection-Oriented vs Connectionless:**

Whether a connection is setup before sending a message

- **Acknowledged vs Unacknowledged:**

Whether the receiver gives the sender an acknowledgement upon receiving the message

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# Services Provided to Network Layer

- Transferring data from the network layer on source host to the network layer on destination host
- Services provided:
  - Unacknowledged connectionless service
  - Acknowledged connectionless service
  - Acknowledged connection-oriented service

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# Unacknowledged Connectionless Service

- Source host transmits independent frames to recipient host without acknowledgement
- No logical connection establishment or release
- No lost frame recovery mechanism (or left to higher levels)
- Applications:
  - Ethernet LANs
  - Real-time traffic, e.g. audio video data



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# Acknowledged Connectionless Service

- Source host transmits independent frames to recipient host with acknowledgement
- No logical connection establishment or release
- Each frame is individually acknowledged, and retransmitted if lost or errors
- Application: Wireless – IEEE 802.11 WiFi

# Acknowledged Connection-Oriented Service

- Source host transmits independent frames to recipient host after connection establishment and with acknowledgement
- Connection established and released (communicate rate and details of message)
- Frames are numbered, counted, acknowledged with logical order enforced
- Application: Unreliable links such as satellite channel