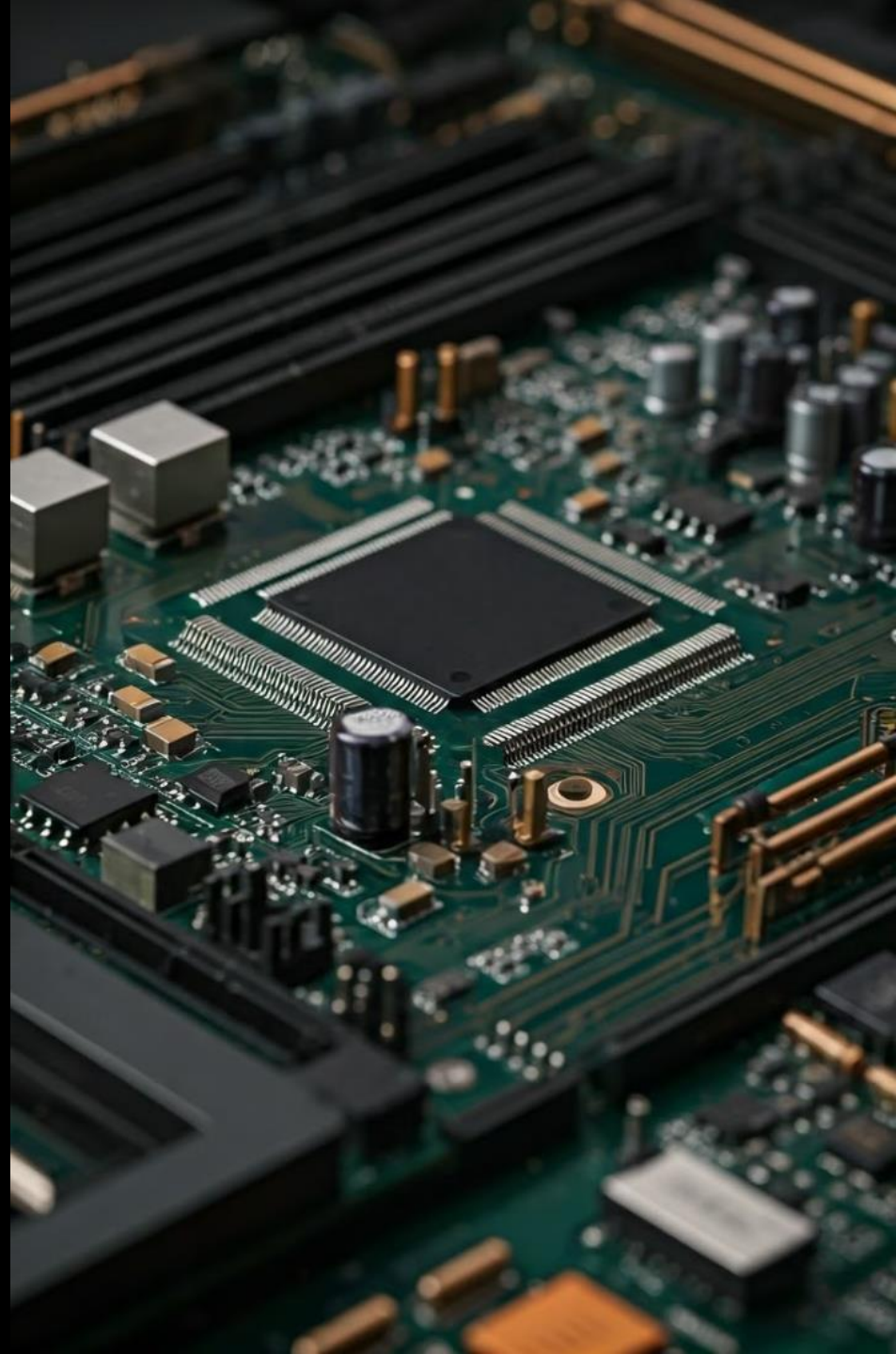
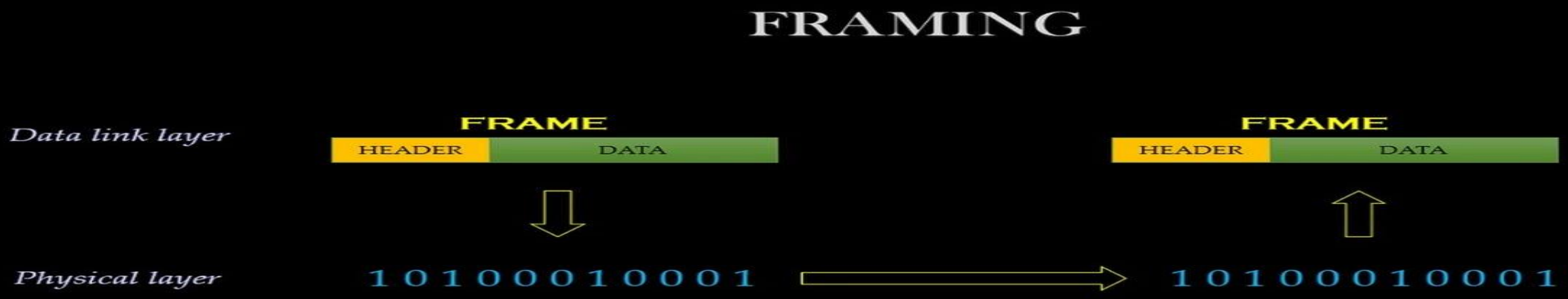
The Building Blocks in Data Link Framing

A frame in the Data Link Layer is a structured package of data that is transmitted between devices in a network. It ensures reliable transmission across the physical network.





The Role of the Data Link Layer

Framing

The data link layer encapsulates network layer packets into frames, adding header and trailer information.

Error Control

Mechanisms like checksums and retransmissions are used to detect and correct errors during data transmission.

Access Control

The data link layer manages media access, ensuring fair and efficient use of shared communication channels.

Frame Structure and Components

Preamble

A sequence of bits used for synchronization and to indicate the start of the frame.

Header

Includes source and destination addresses, as well as control information for the frame.

Payload

The actual data being transmitted, which can vary in size depending on the protocol.

Trailer

Contains error detection and correction information, such as a cyclic redundancy check (CRC).

Encapsulation and De-encapsulation

1

Encapsulation

Network layer packets are encapsulated within data link frames, adding header and trailer information.

2

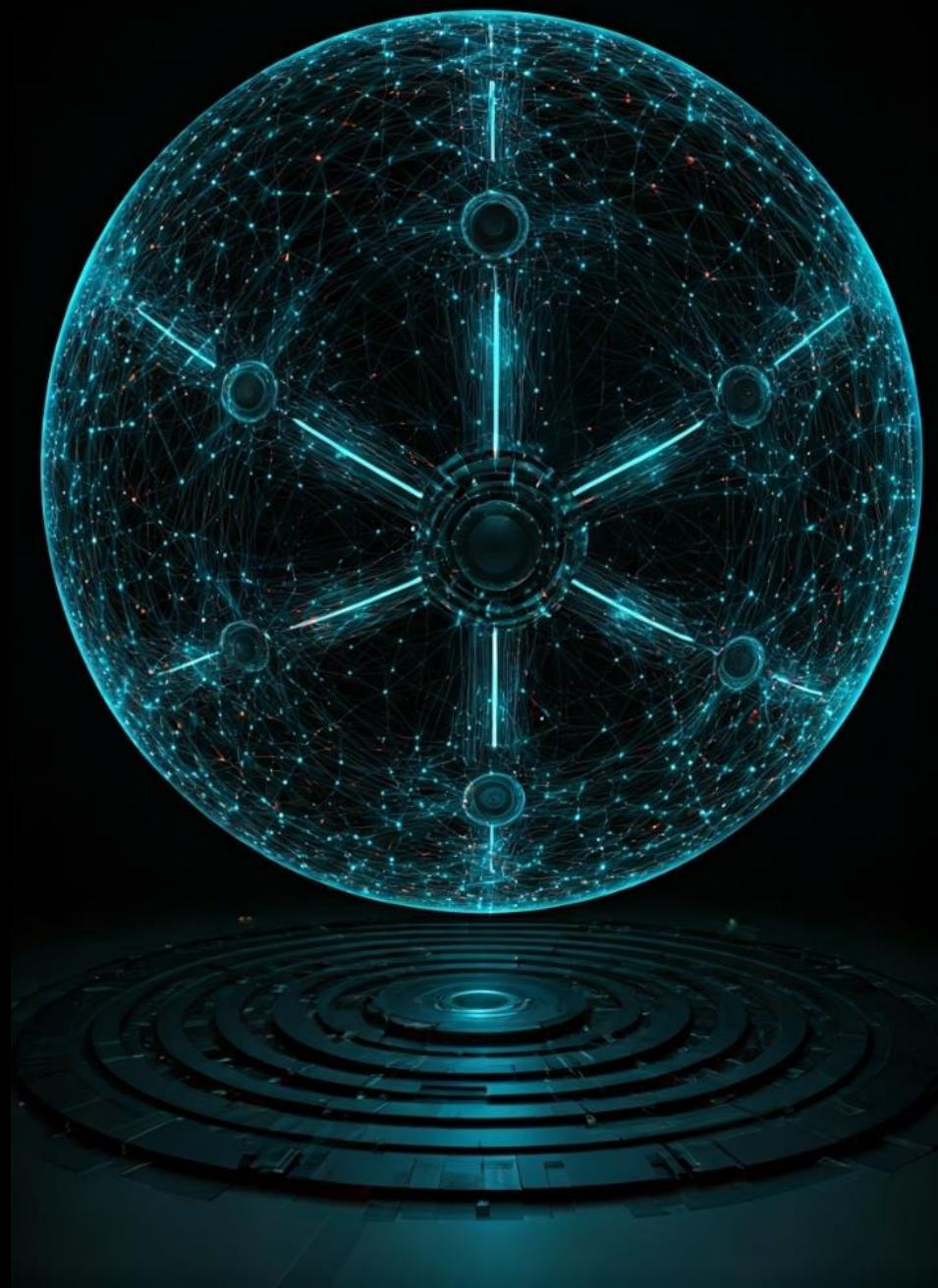
Transmission

The frames are then transmitted over the physical network, following the data link layer protocols.

3

De-encapsulation

At the receiving end, the data link frames are de-encapsulated, extracting the original network layer packets.



Conclusion

Frames are the basic units of data transmission in the Data Link Layer. They ensure error-free, reliable delivery of data between devices in a network. The structure may vary by network type, but the core function remains the same.