CSS2C08

COMPUTER NETWORKS

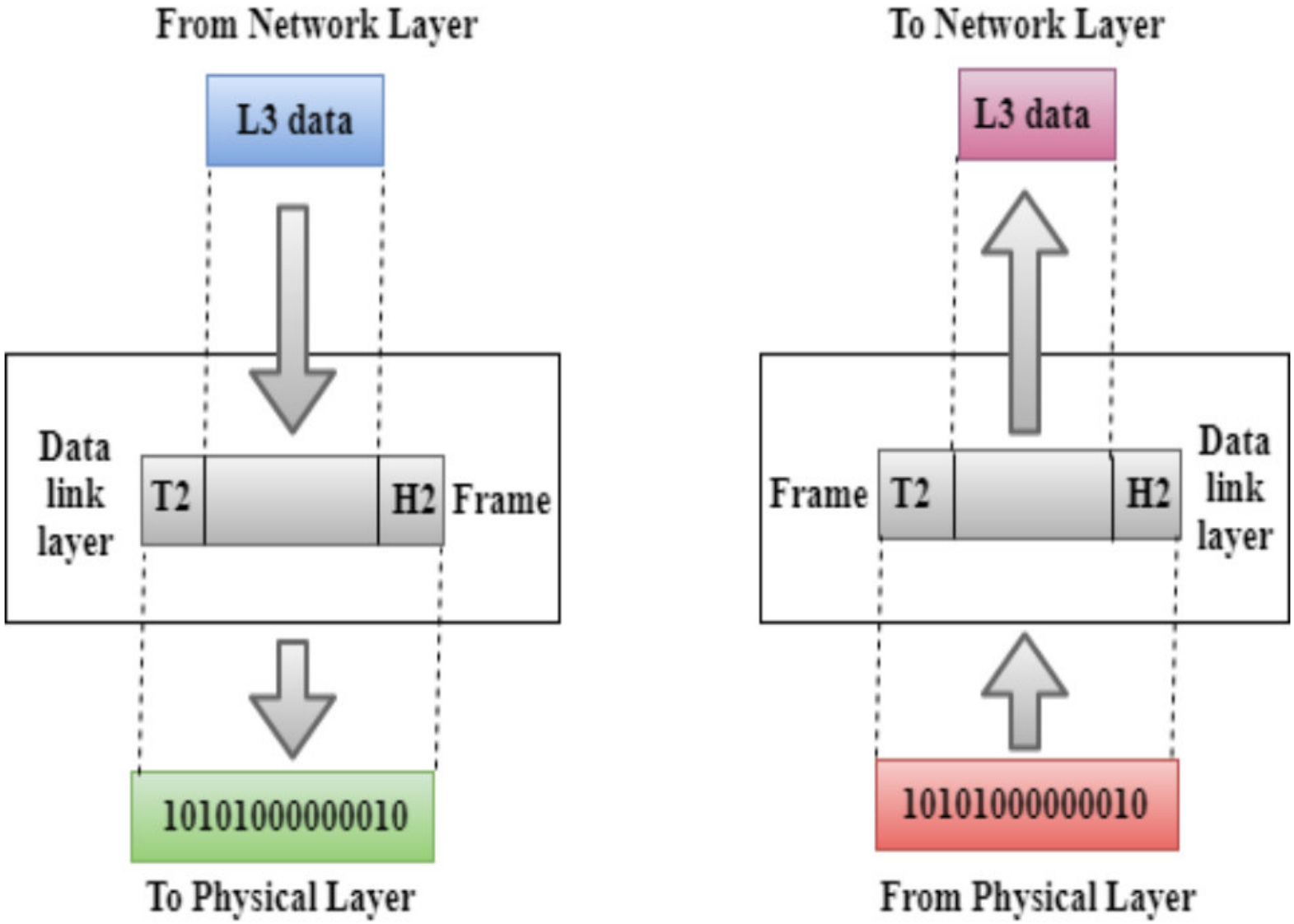
MODULE 4

1. LINK LAYER SERVICES
2. ERROR DETECTION AND CORRECTION
3. MULTIPLE ACCESS PROTOCOLS
4. LAN ADDRESS
5. ARP
6. ETHERNET
7. HUBS ,BRIDGES and SWITCHES
8. WIRELESS LINKS
9. PPP
10. ATM

LINK LAYER SERVICES

- Data Link Layer is second layer of OSI Layered Model.
- Data link layer hides the details of underlying hardware and represents itself to upper layer as the medium to communicate.
- It is used for error free transfer of data frames.
- It provides a reliable and efficient communication between two or more devices.

- Data link layer is responsible for converting data stream to signals bit by bit and to send that over the underlying hardware. At the receiving end, Data link layer picks up data from hardware which are in the form of electrical signals, assembles them in a recognizable frame format, and hands over to upper layer.
- Data link layer has two sub-layers:
  - **Logical Link Control:** It deals with protocols, flow-control, and error control
  - **Media Access Control:** It deals with actual control of media


From Network Layer
L3 data
Data link layer
T2
H2
Frame
10101000000010
To Physical Layer
To Network Layer
L3 data
Frame
T2
H2
Data link layer
10101000000010
From Physical Layer

- **Functions of the Data-link layer:**

1. **Framing:** The data link layer translates the physical's raw bit stream into packets known as Frames. The Data link layer adds the header and trailer to the frame. The header which is added to the frame contains the hardware destination and source address.

2. **Physical Addressing:** The Data link layer adds a header to the frame that contains a destination address. The frame is transmitted to the destination address mentioned in the header.
3. **Flow Control:** Flow control is the main functionality of the Data-link layer. It is the technique through which the constant data rate is maintained on both the sides so that no data get corrupted. It ensures that the transmitting station such as a server with higher processing speed does not exceed the receiving station, with lower processing speed.

4. **Error Control:** Error control is achieved by adding a calculated value CRC (Cyclic Redundancy Check) that is placed to the Data link layer's trailer which is added to the message frame before it is sent to the physical layer. If any error seems to occur, then the receiver sends the acknowledgment for the retransmission of the corrupted frames.
5. **Access Control:** When two or more devices are connected to the same communication channel, then the data link layer protocols are used to determine which device has control over the link at a given time.