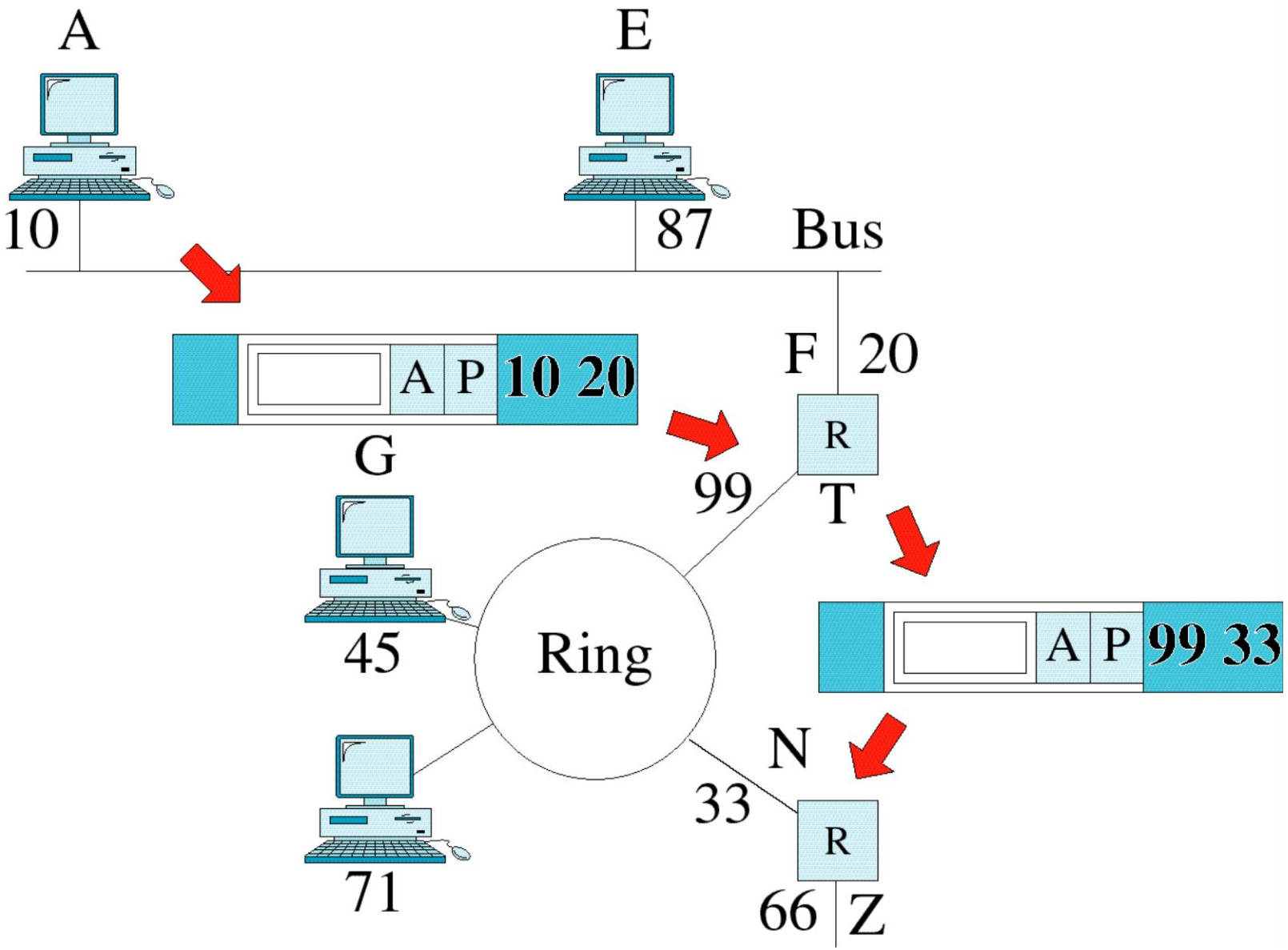
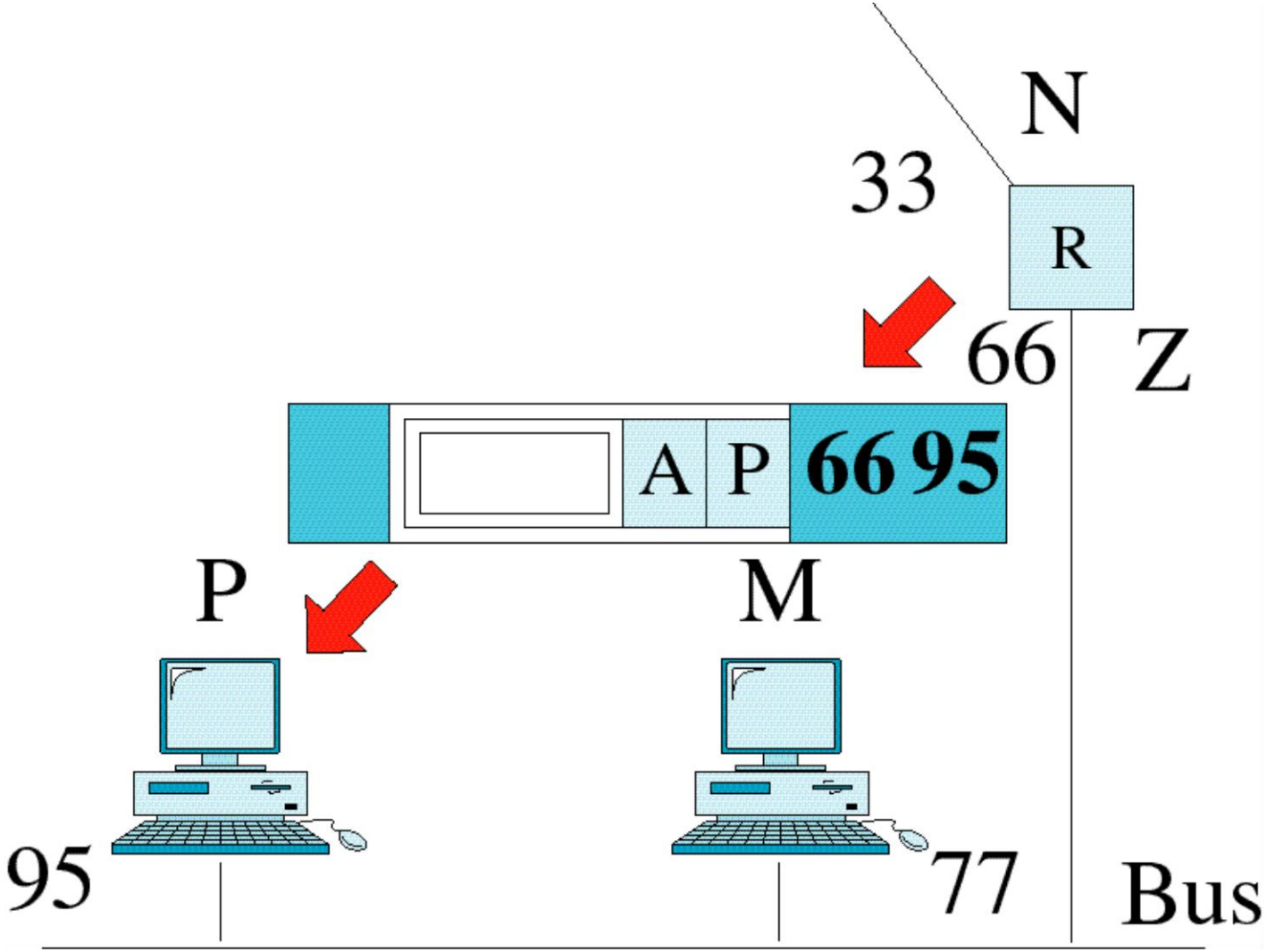
Network Layer Example

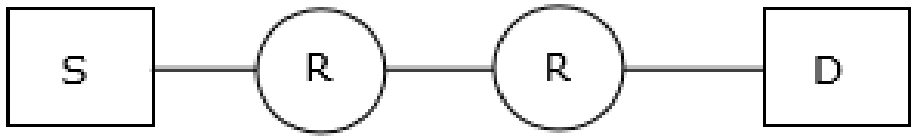


Network Layer Example



Q. No. 1 GATE 2013

Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D.



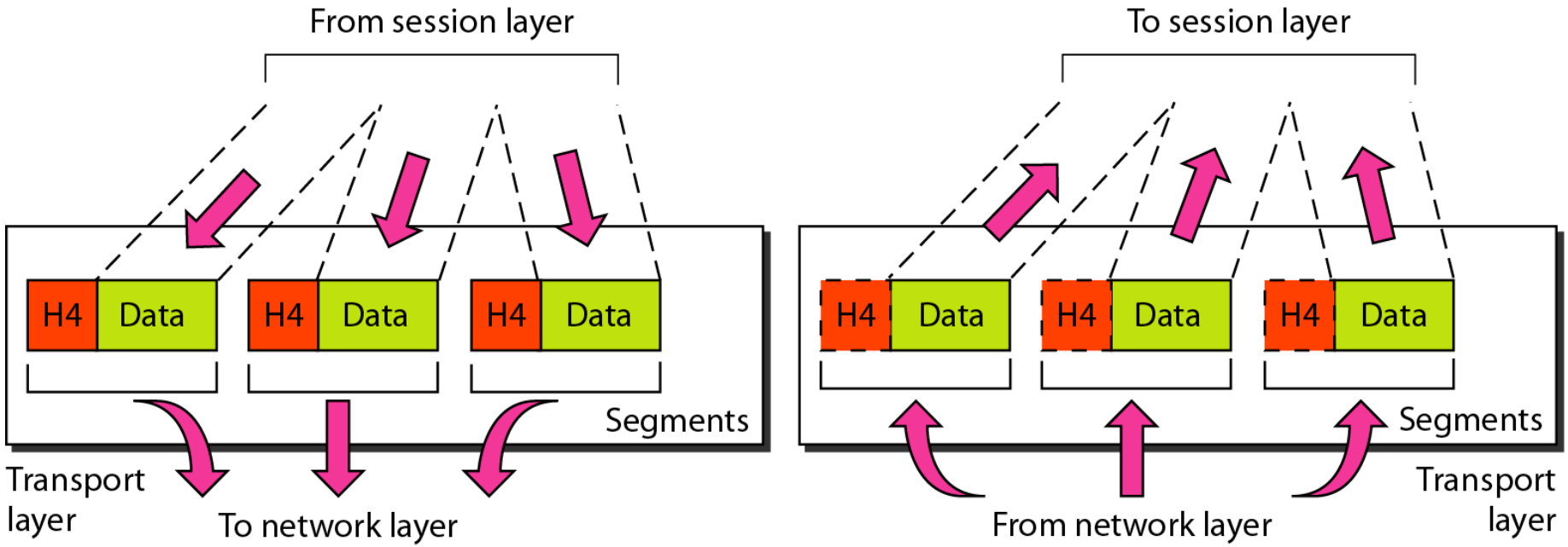
(A) Network layer – 4 times and Data link layer-4 times

(B) Network layer – 4 times and Data link layer-3 times

(C) Network layer – 4 times and Data link layer-6 times

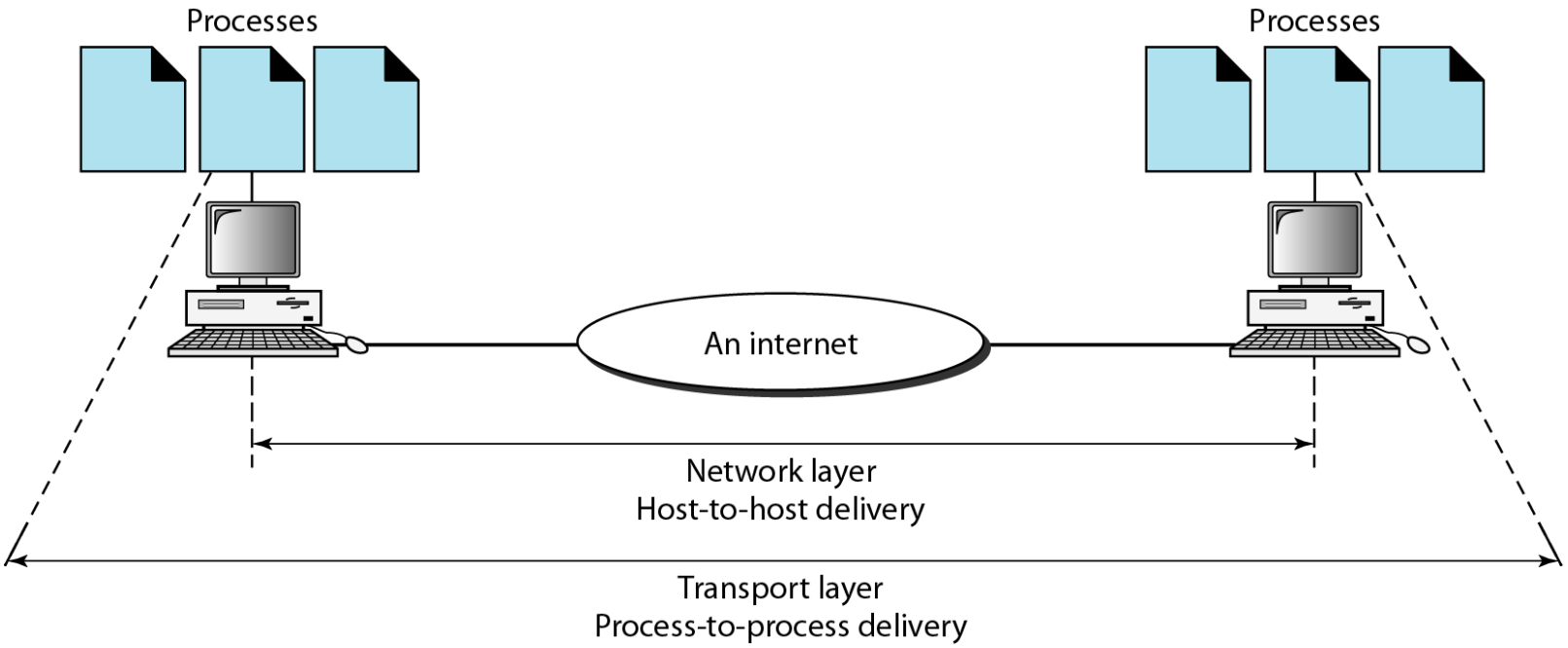
(D) Network layer – 2 times and Data link layer-6 times

Transport Layer



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

Reliable process-to-process delivery of a message



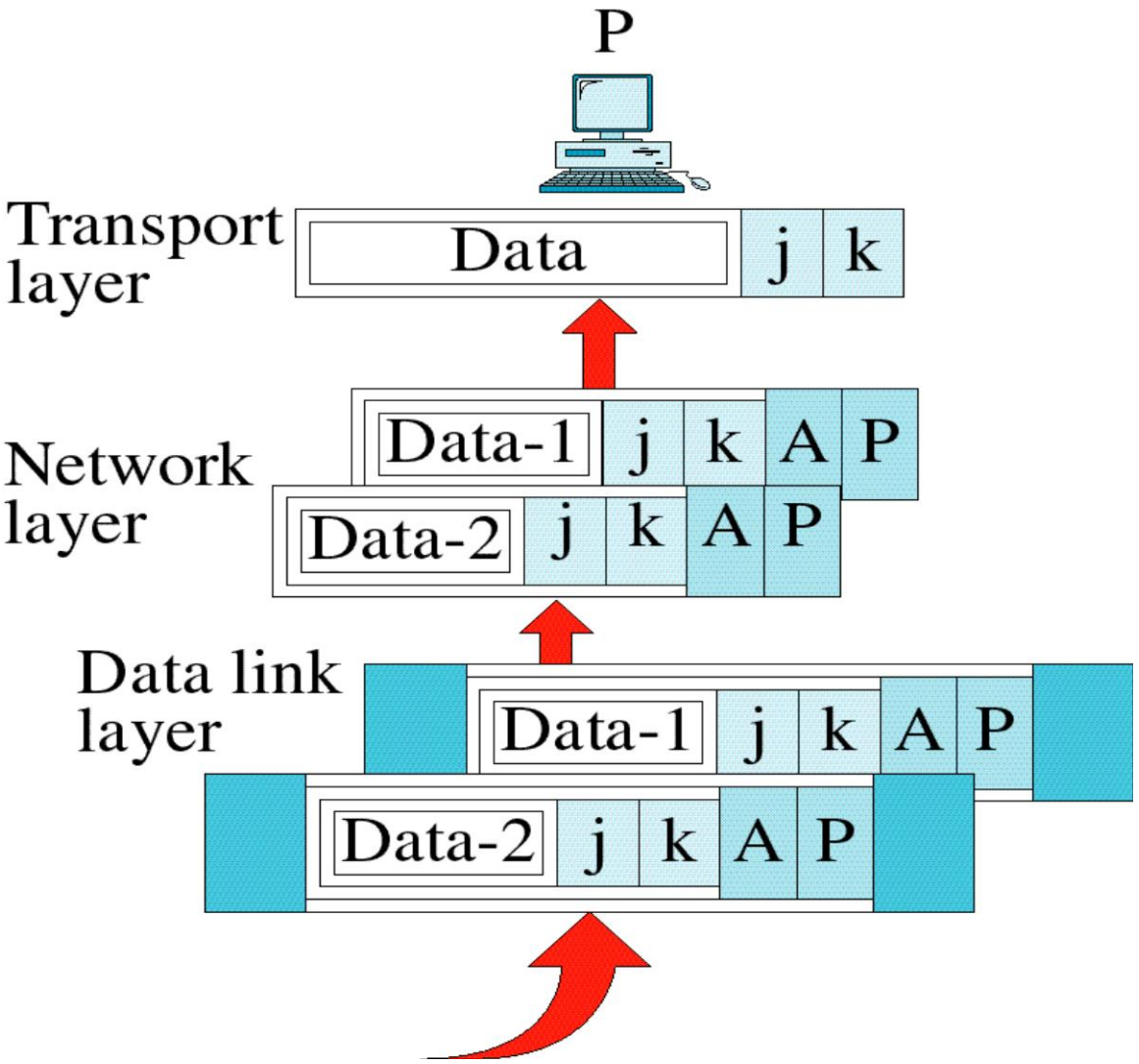
Transport Layer

Responsibility of transport layer

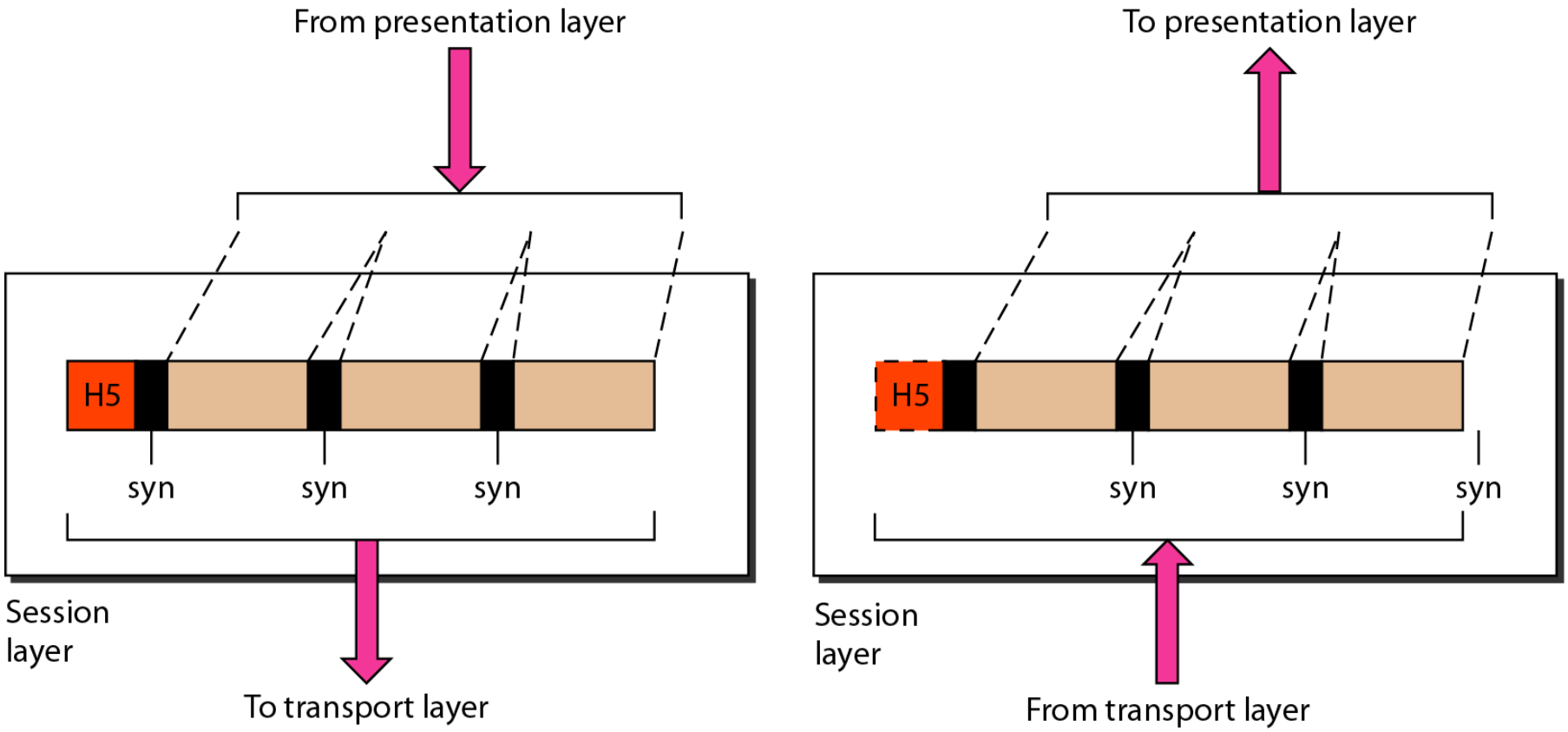
- Purpose of this layer is to provide a reliable mechanism for the exchange of data between two processes in different computers.
- Segmentation and Reassembly
- Ensures that the data units are delivered error free.
- Ensures that data units are delivered in sequence.
- Ensures that there is no loss or duplication of data units.
- Provides connectionless or connection oriented service.

Transport Layer Example

Transport Layer Example



Session Layer



The session layer is responsible for dialog control and synchronization.

Session Layer

Responsibility of Session layer

- Session layer provides mechanism for controlling the dialogue between the two end systems. It defines how to start, control and end conversations (called sessions) between applications.
- This layer requests for a logical connection to be established on an end-user's request.
- Any necessary log-on or password validation is also handled by this layer.
- Session layer is also responsible for terminating the connection.
- This layer provides services like dialogue discipline which can be full duplex or half duplex.
- Session layer can also provide check-pointing mechanism such that if a failure of some sort occurs between checkpoints, all data can be retransmitted from the last checkpoint.

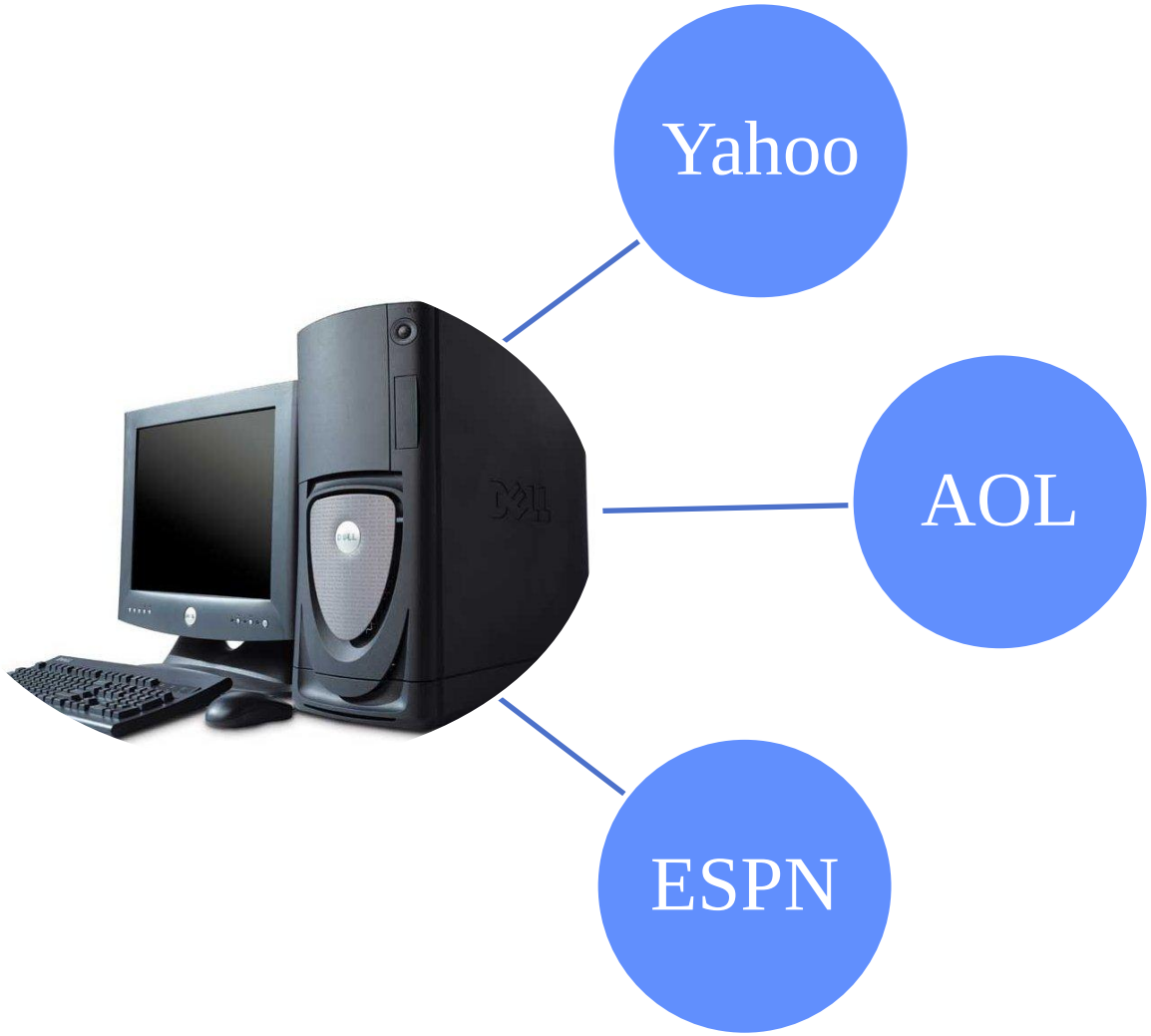
Basic Functions for the Session Layer Protocols

- **Creating a connection** – session/communication session between an APPLICATION in one computer and another APPLICATION in another computer
  - **THREE-WAY-HANDSHAKE**: a method widely used to establish and end connection
    - Sender sends SYN message to request a session to the receiver
    - Receiver replies by sending ACK message to acknowledge the SYN message sent by the sender, and SYN message to request a session to the sender
    - Sender replies by sending ACK message to acknowledge the SYN message sent by the receiver

Basic Functions for the Session Layer Protocols

- **Managing multiple sessions**
  - A computer can establish multiple sessions with several other computers
    - e.g., session 1: exchanging information over the World Wide Web with www.yahoo.com
    - session 2: exchanging information over the World Wide Web with www.google.com
    - session 3: exchanging information over the World Wide Web with www.espn.com
  - Two computers can also establish multiple sessions,
    - e.g., function 1: exchanging information over the World Wide Web;
    - function 2: exchanging information over the FTP;
    - function 3: exchanging information over the email

A computer can establish multiple sessions with several other computers



Two computers can establish multiple sessions

mail

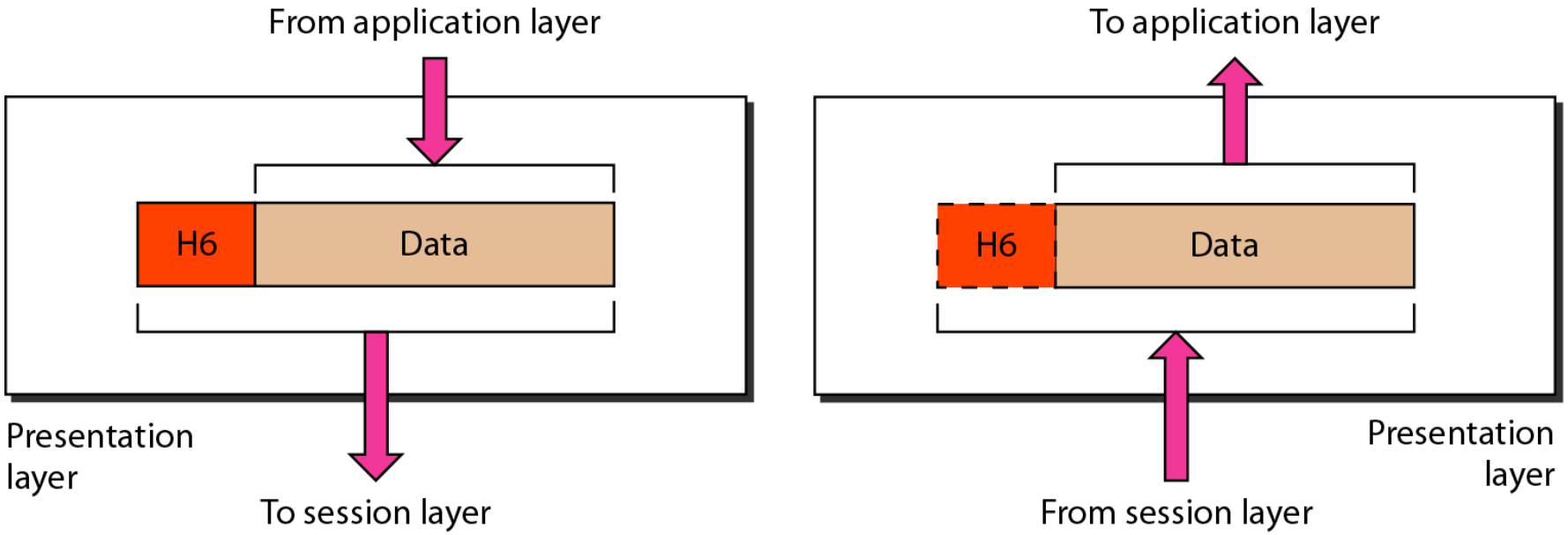
music

news

Basic Functions for the Session Layer Protocols

- **Ending a session**
  - **THREE-WAY-HANDSHAKE**: a method widely used to establish and end connection
    - Sender sends FIN message to close a session to the receiver
    - Receiver replies by sending ACK message to acknowledge the FIN message sent by the sender, and FIN message to close a session to the sender
    - Sender replies by sending ACK message to acknowledge the FIN message sent by the receiver

Presentation Layer



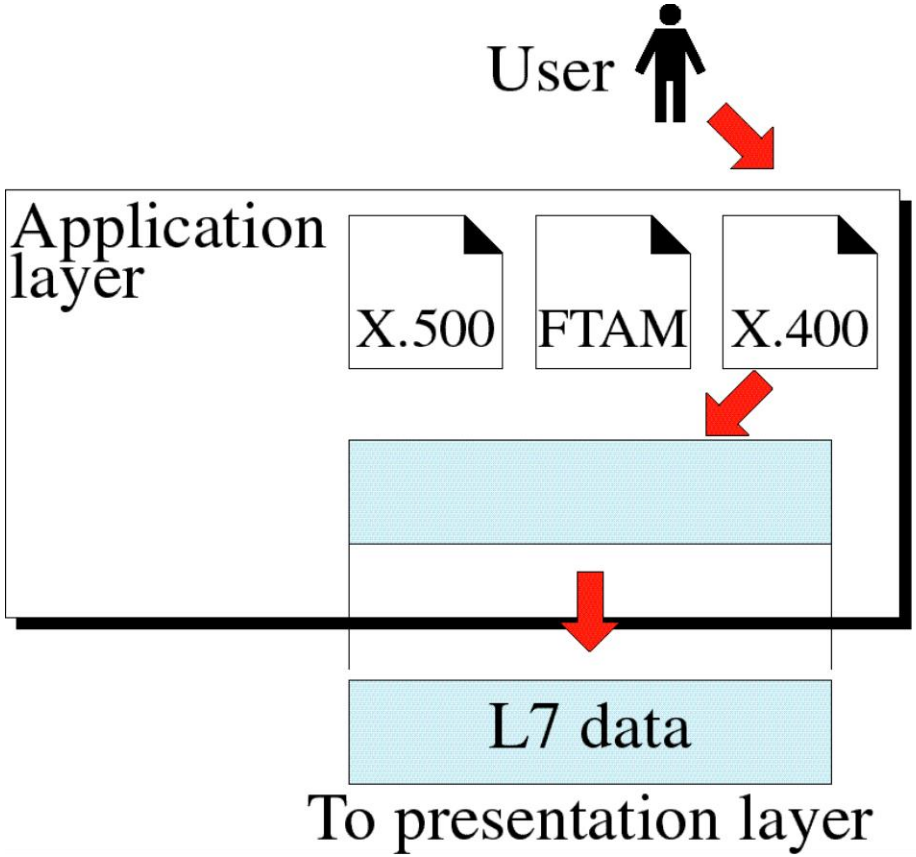
The presentation layer is responsible for translation, compression, and encryption.

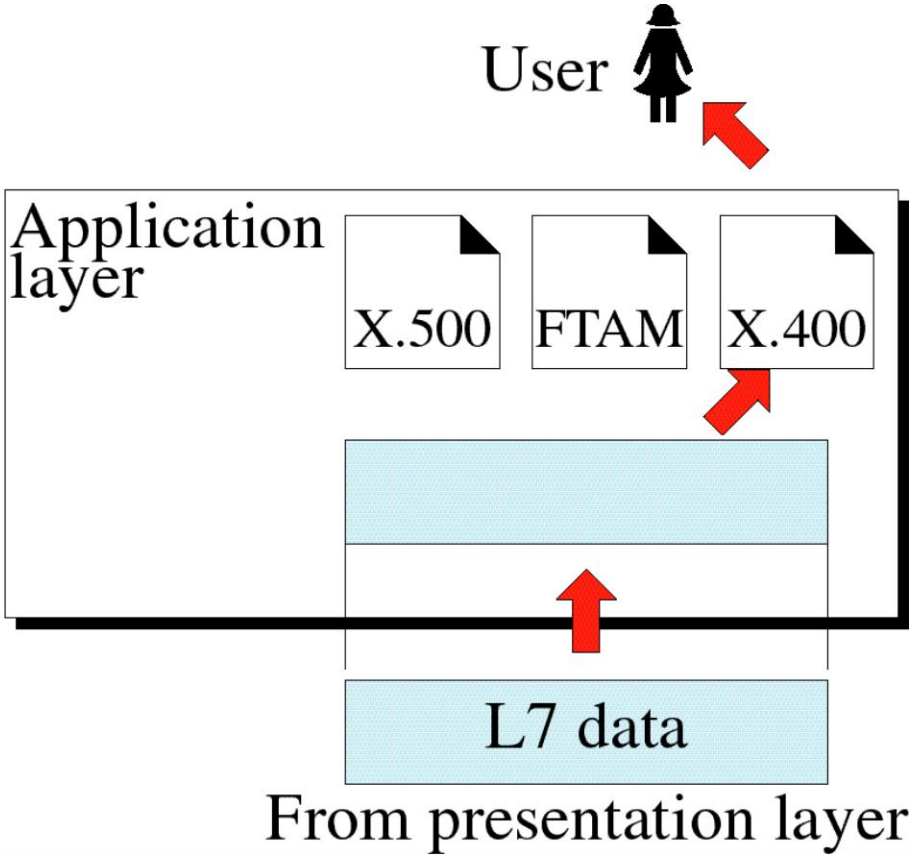
Presentation Layer

Responsibility of Presentation layer

- **Presentation layer defines the format in which the data is to be exchanged between the two communicating entities.**
- **Also handles data compression and data encryption (cryptography).**

Application Layer





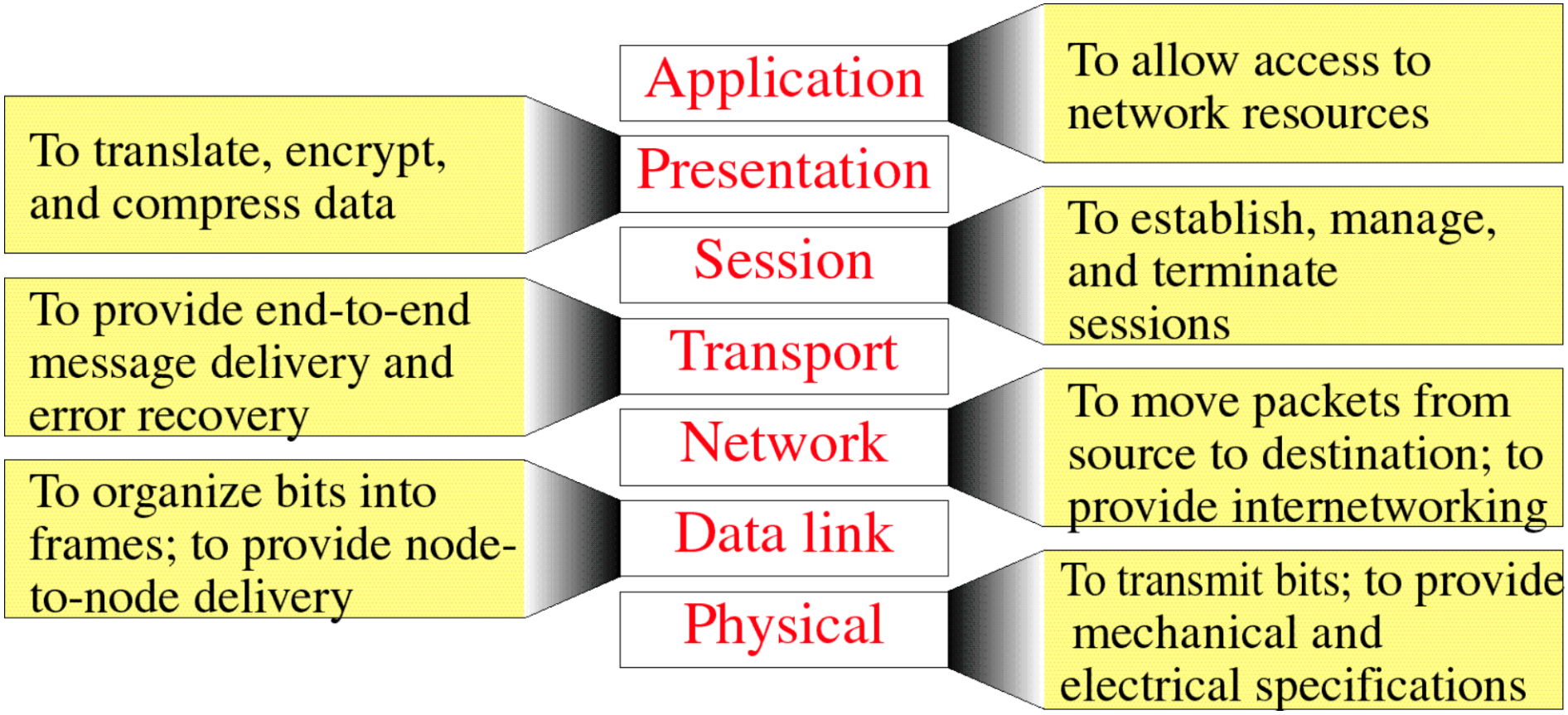
The application layer is responsible for providing services to the user.

Application Layer

Responsibility of Application layer

- Application layer interacts with application programs and is the highest level of OSI model.
- Application layer contains management functions to support distributed applications.
- Examples of application layer are applications such as file transfer, electronic mail, remote login etc.

Summary of Layer Functions



DRONACHARYA COLLEGE OF ENGINEERING, GURGAON

Computer Science & Engineering

Assignment Question

Semester- VI **Branch: CSE**

Subject with Code: Computer Networks (IT-305-F)

Q: 1 Explain Datalink & Physical layer with diagram.

Q:2 Explain the function of Network layer also discuss the services provided to the transport layer.

Q: List out the main responsibilities of Network Layer and Data link Layer.

Question :

Q: Explain TCP/IP model.

Q: Compare OSI model and TCP/IP Model.

Q: List out the responsibility of application and presentation layer