The OSI Model and TCP/IP Protocol Suite

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- **THE OSI MODEL**
- **LAYERS IN THE OSI MODEL**
- **TCP/IP PROTOCOL SUITE**
- **ADDRESSING**
- **TCP/IP VERSIONS**

THE OSI MODEL

Note

ISO is the organization.
OSI is the model.

ISO = International Standards Organisation

OSI = Open System Interconnection

Figure 2-1

OSI Model

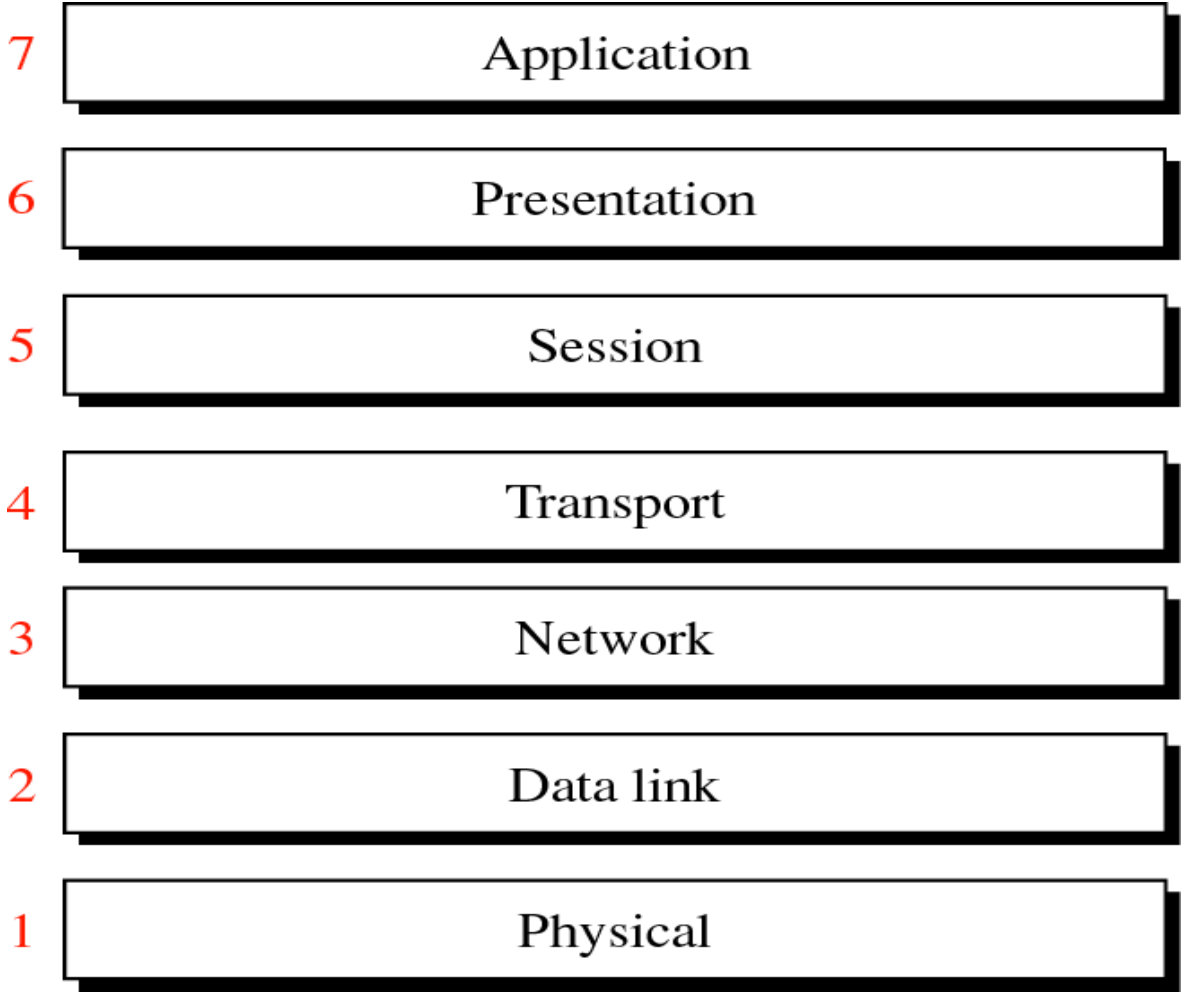
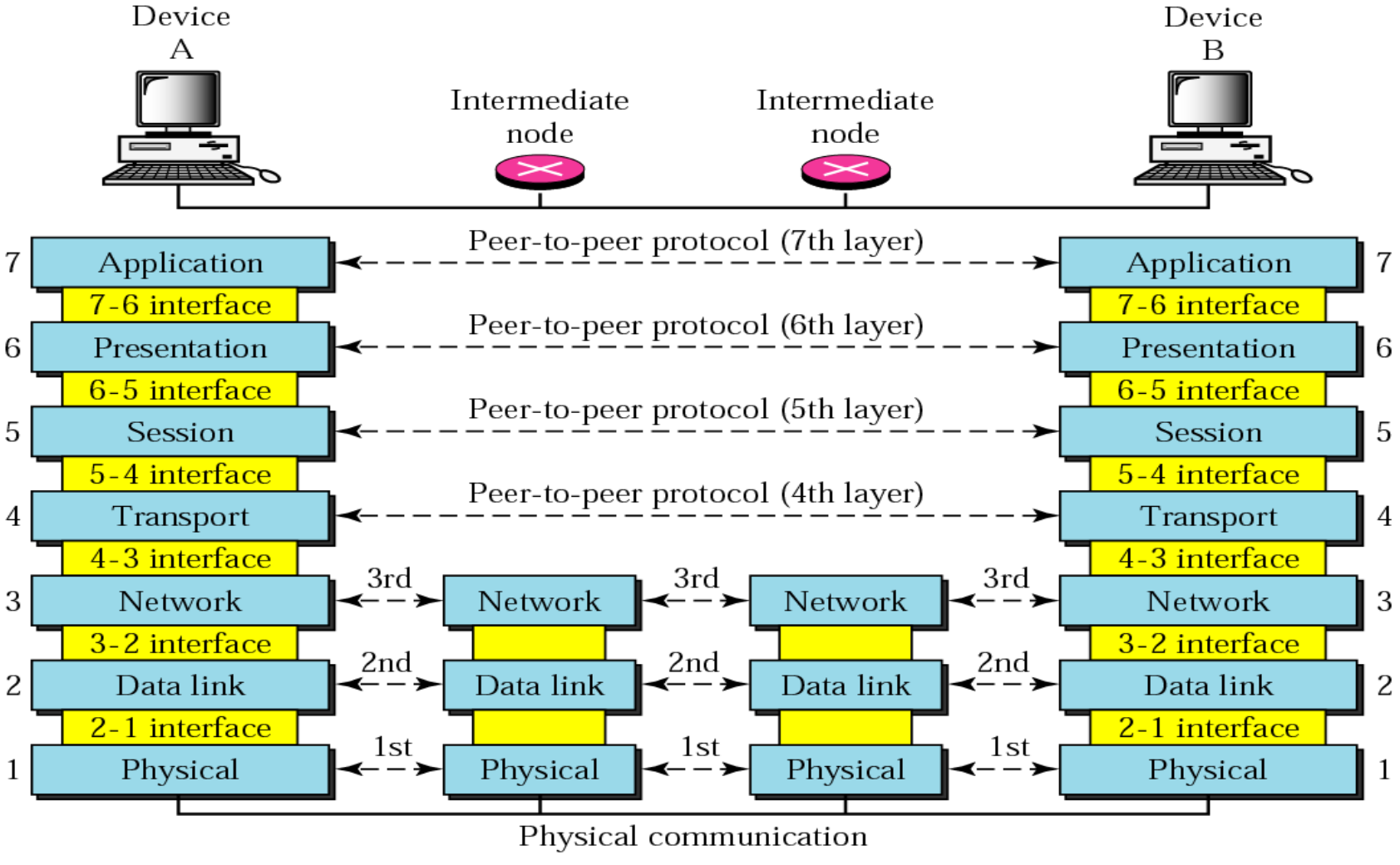


Figure 2-2

OSI layers

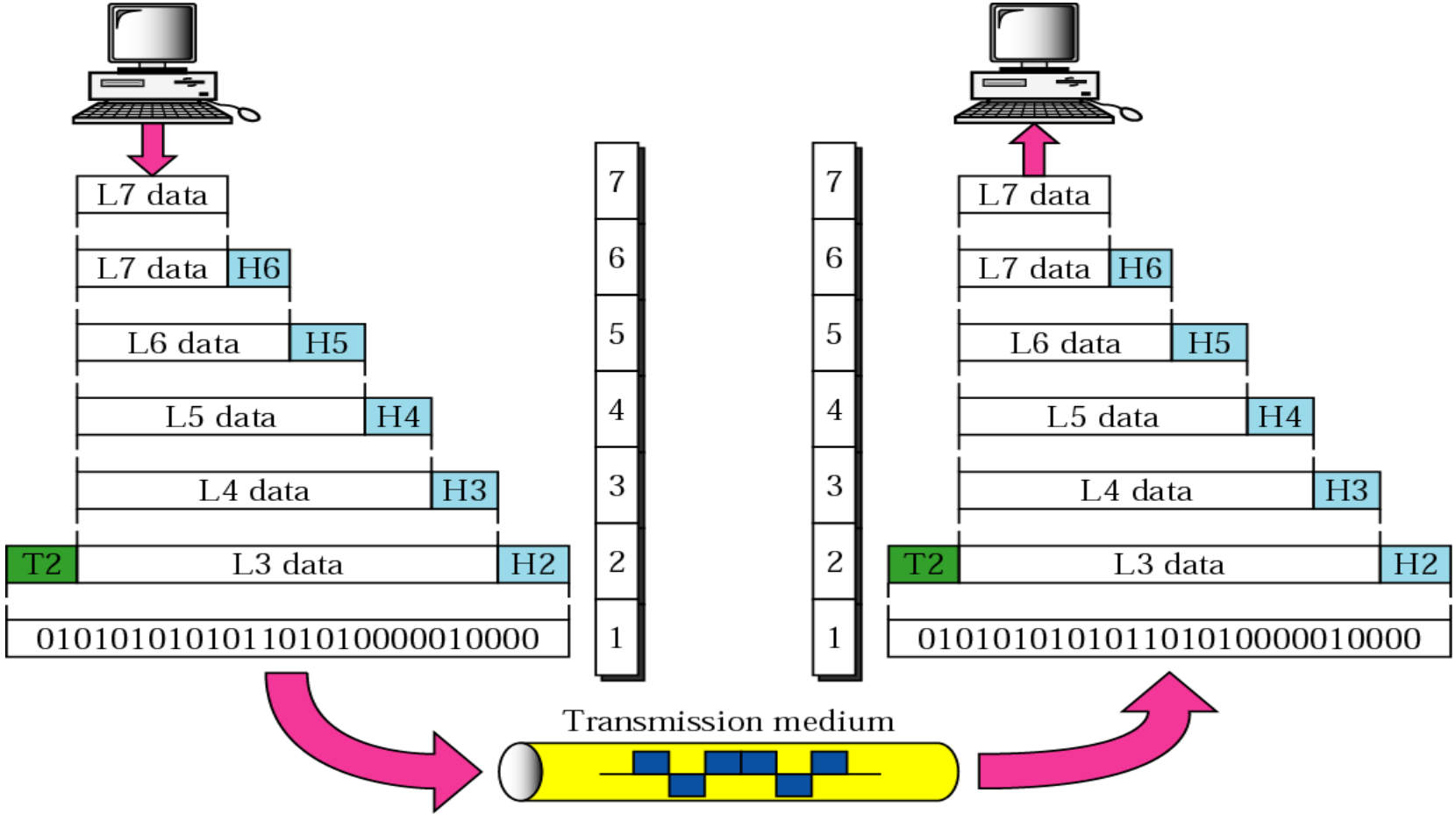


Note

Headers are added to the data at layers 6, 5, 4, 3, and 2. Trailers are usually added only at layer 2.

Figure 2-3

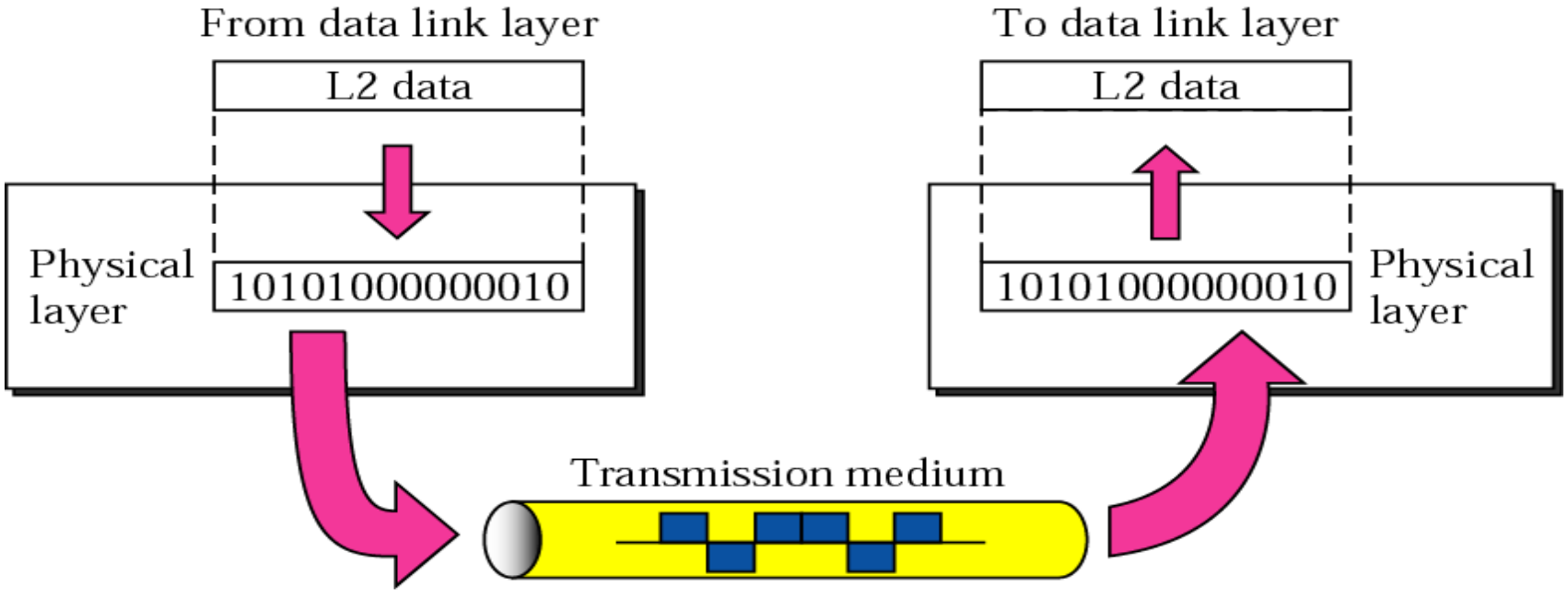
An exchange using the OSI model



LAYERS IN THE OSI MODEL

Figure 2-4

Physical Layer

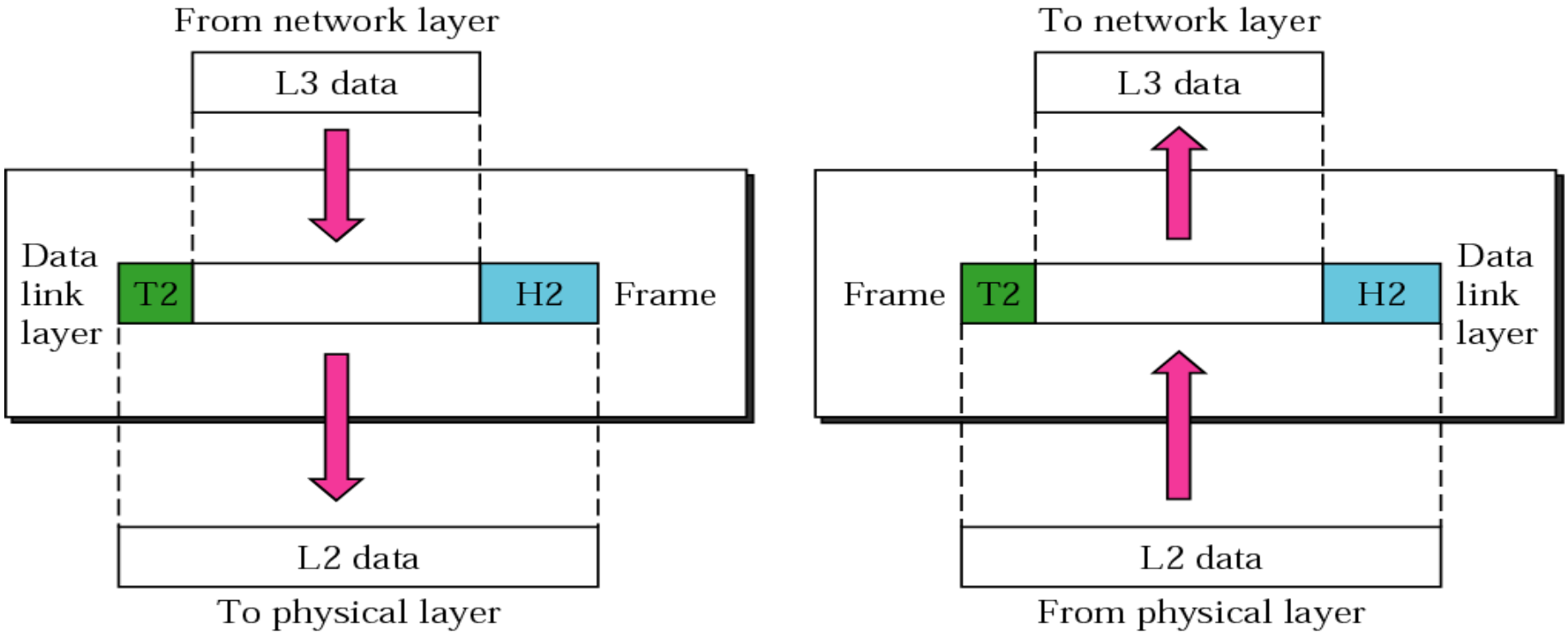


Physical Layer

- Physical Characteristics of Interfaces & Media
- Representation Of Bits
- Data Rate
- Synchronization of Bits
- Line Configuration
- Physical Topology
- Transmission Mode

Figure 2-5

Data Link Layer



Data Link Layer

- **Framing**
- **Physical Addressing**
- **Flow Control**
- **Error Control**
- **Access Control**

Figure 2-6

Node-to-node delivery

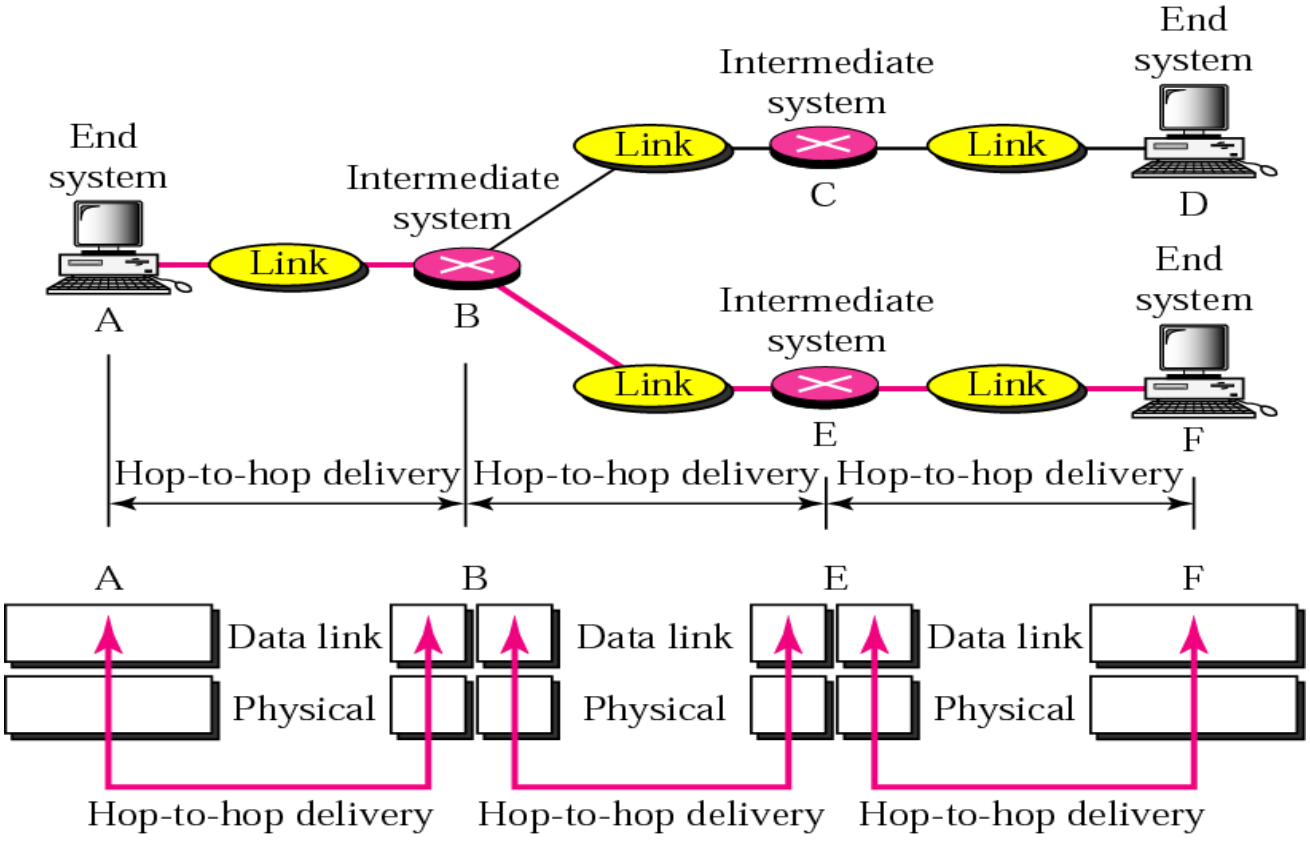
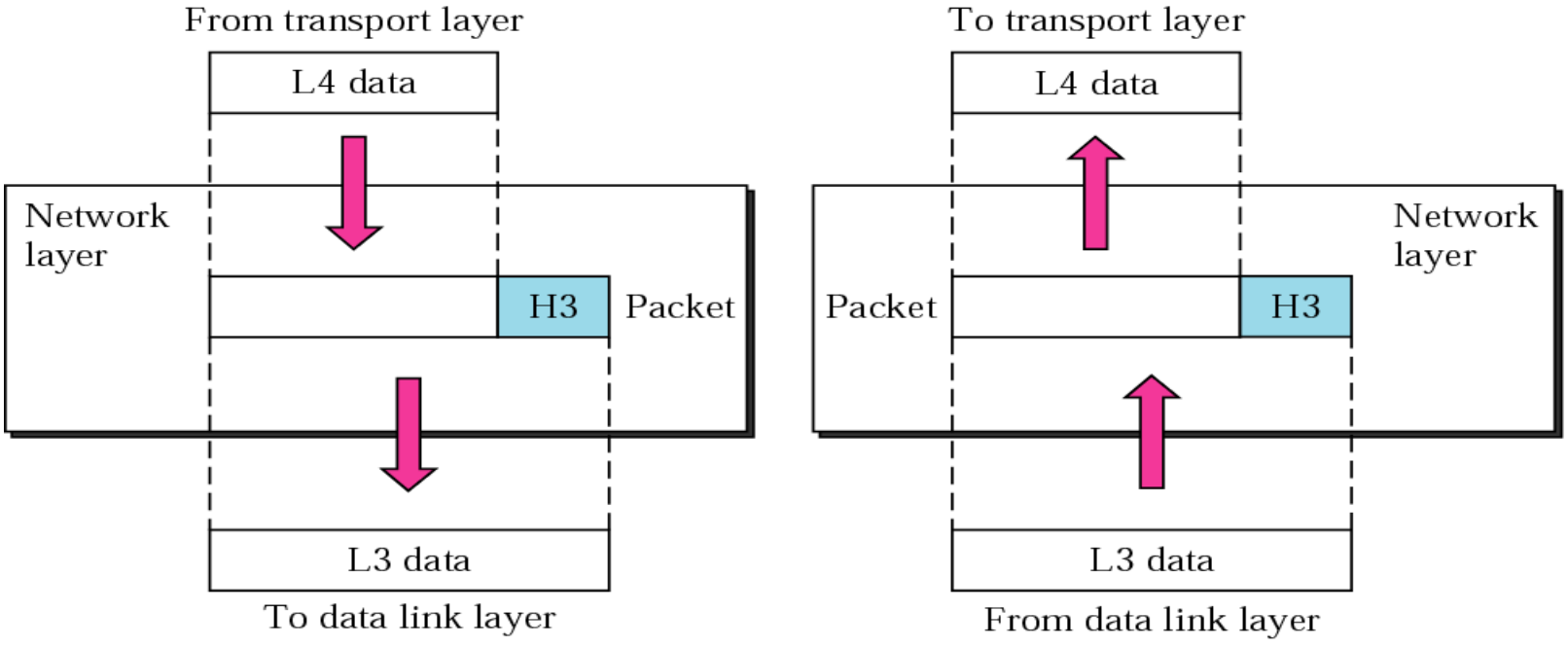


Figure 2-7

Network Layer



Network Layer

- **Logical Addressing**
- **Routing**

Figure 2-8

End-to-end delivery

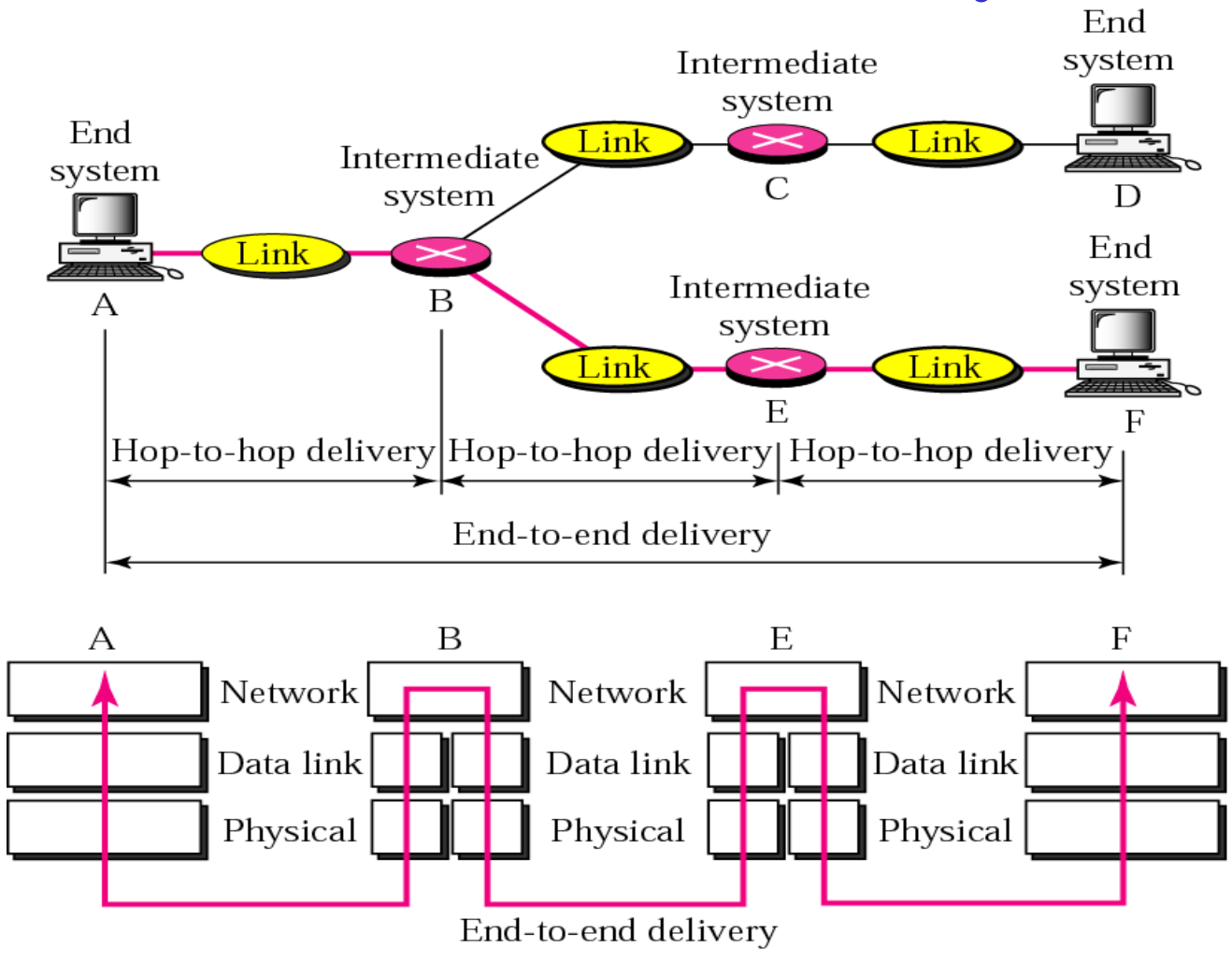
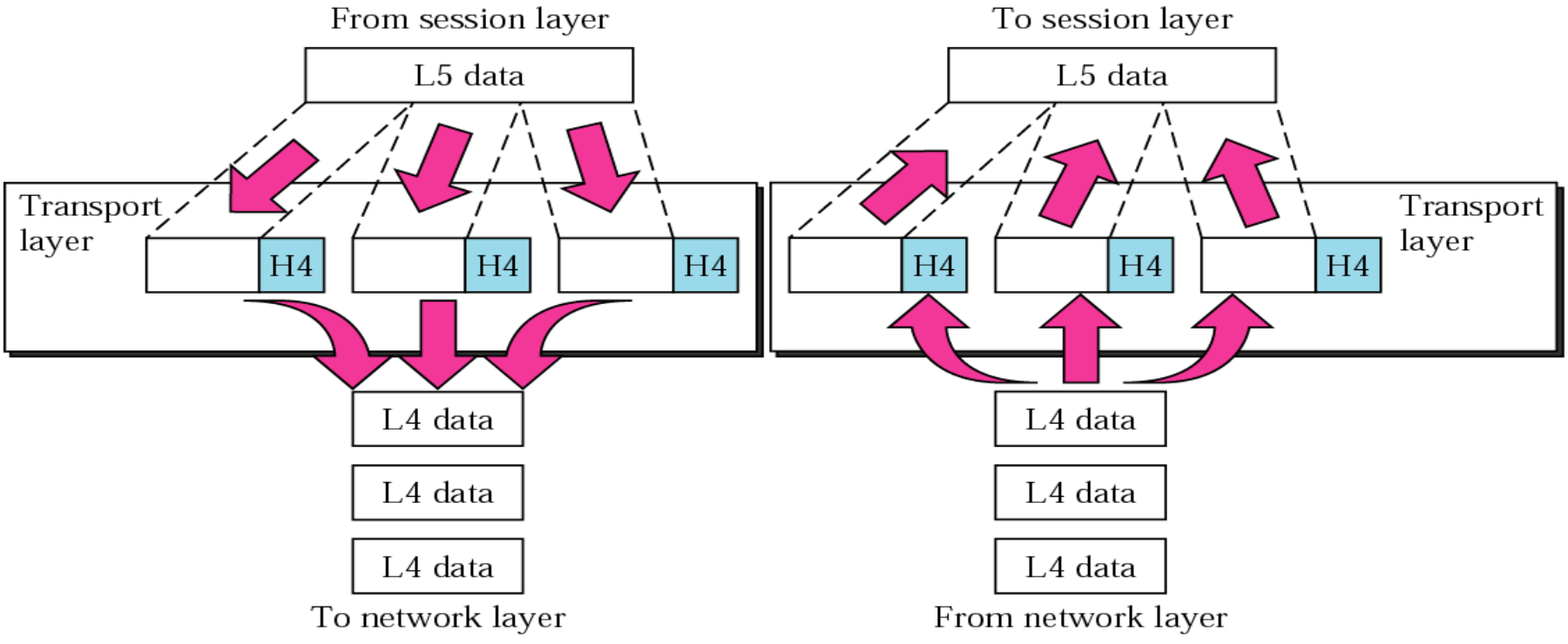


Figure 2-9

Transport Layer



Transport Layer

- **Service-Point Addressing**
- **Segmentation & Reassembly**
- **Connection Control**
- **Flow Control**
- **Error Control**

Figure 2-10

Reliable end-to-end delivery of a message

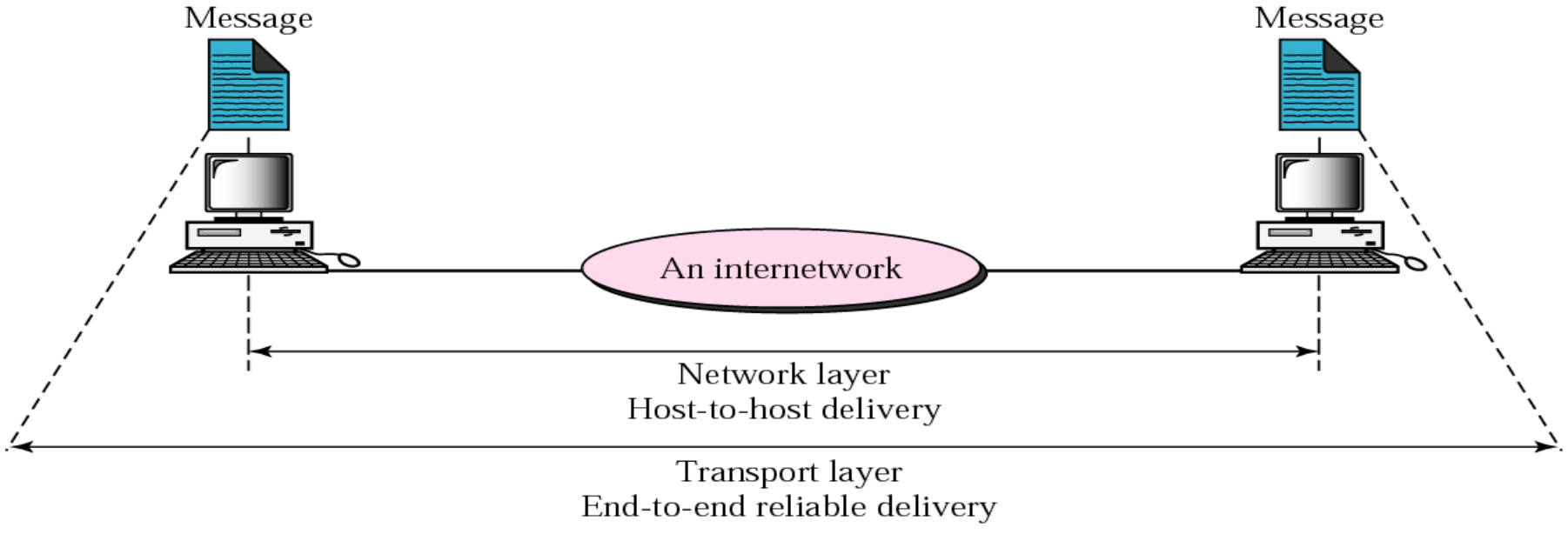


Figure 2-11

Session Layer

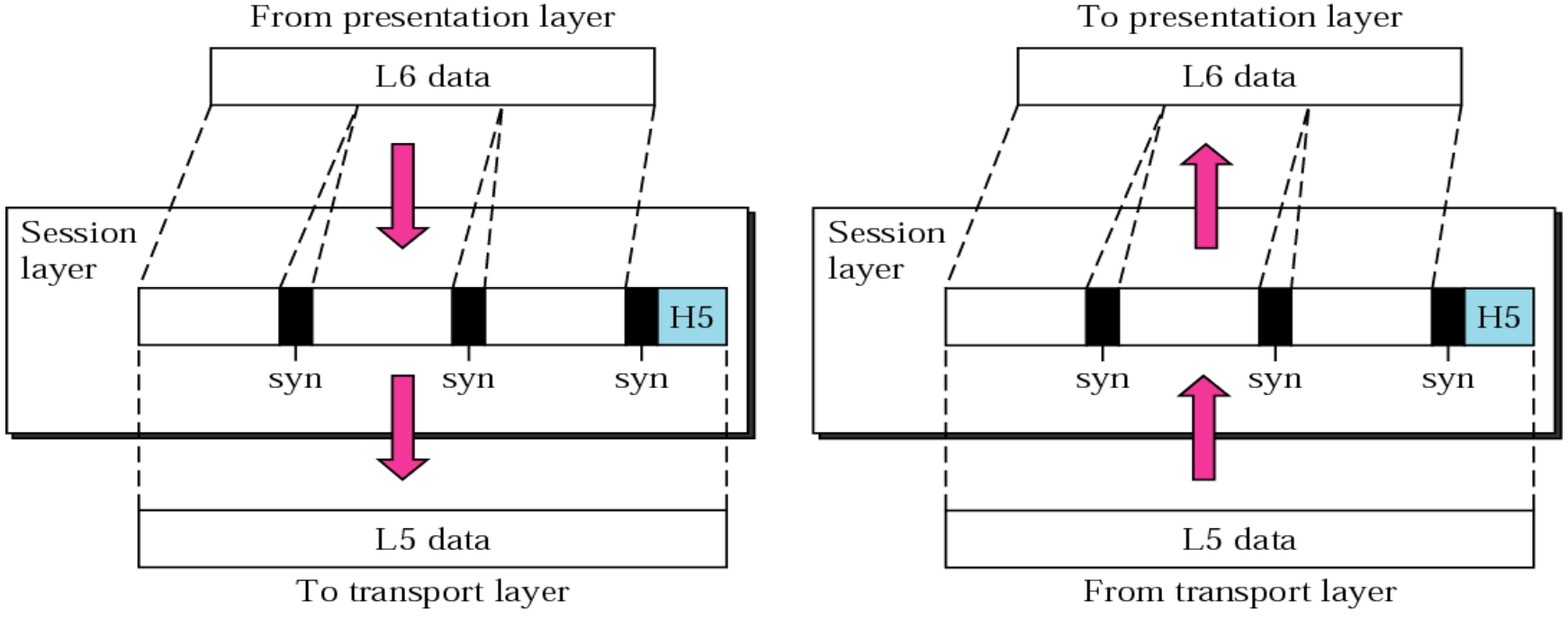


Figure 2-12

Presentation Layer

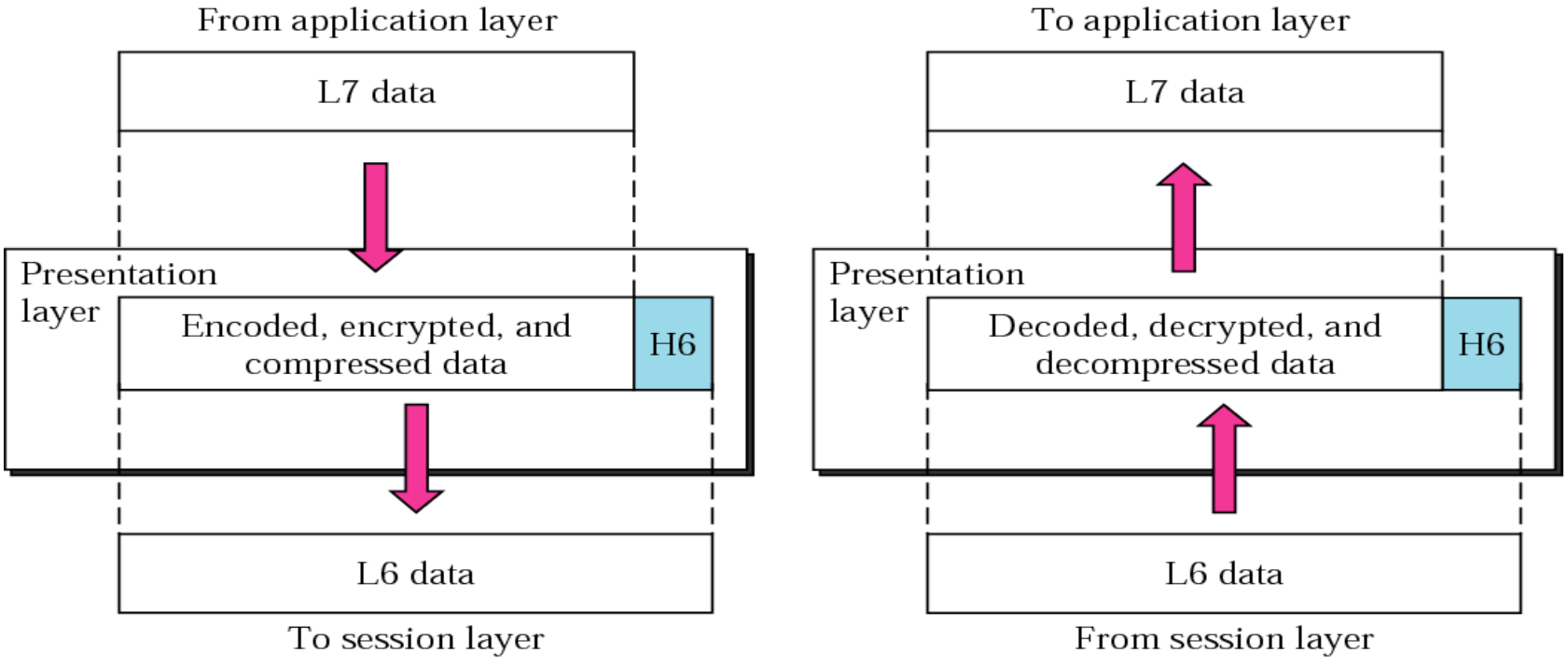


Figure 2-13

Application Layer

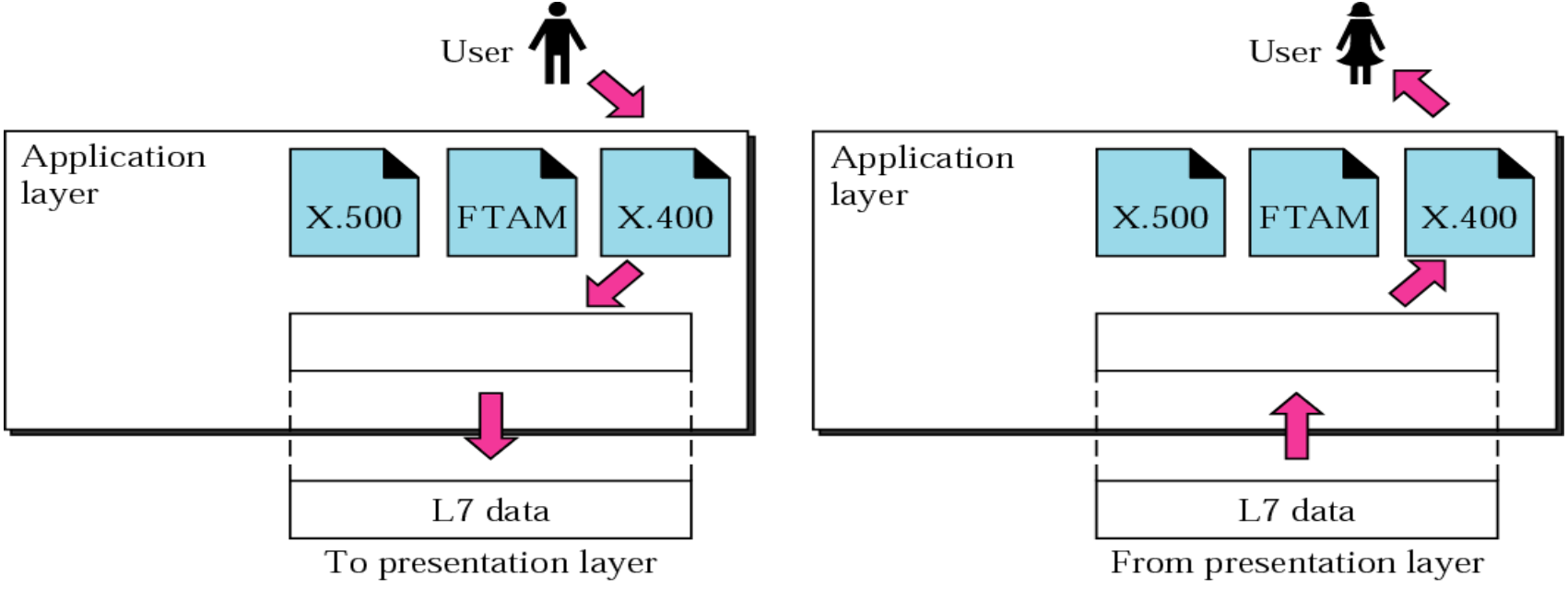
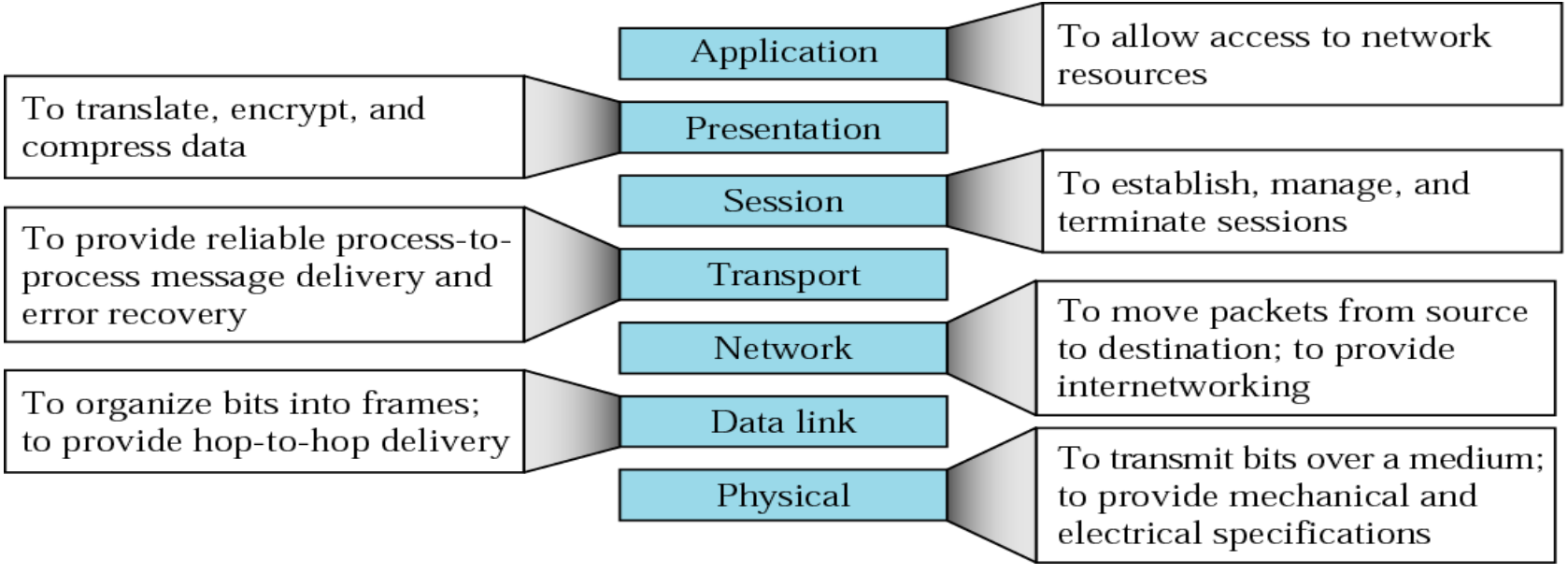


Figure 2-14

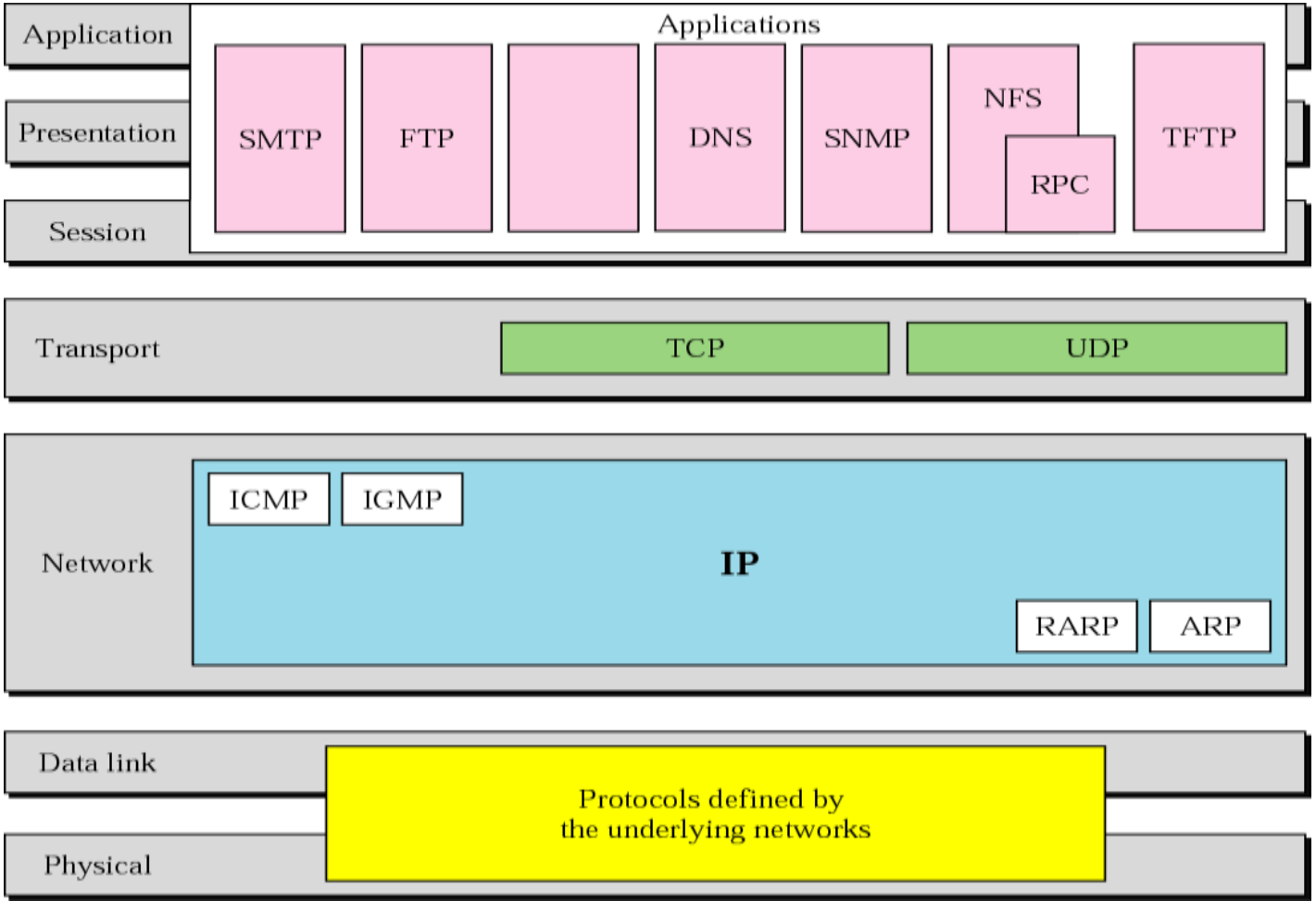
Summary of layers



TCP/IP PROTOCOL SUITE

Figure 2-15

TCP/IP and OSI model



ADDRESSING

Figure 2-16

Addresses in TCP/IP

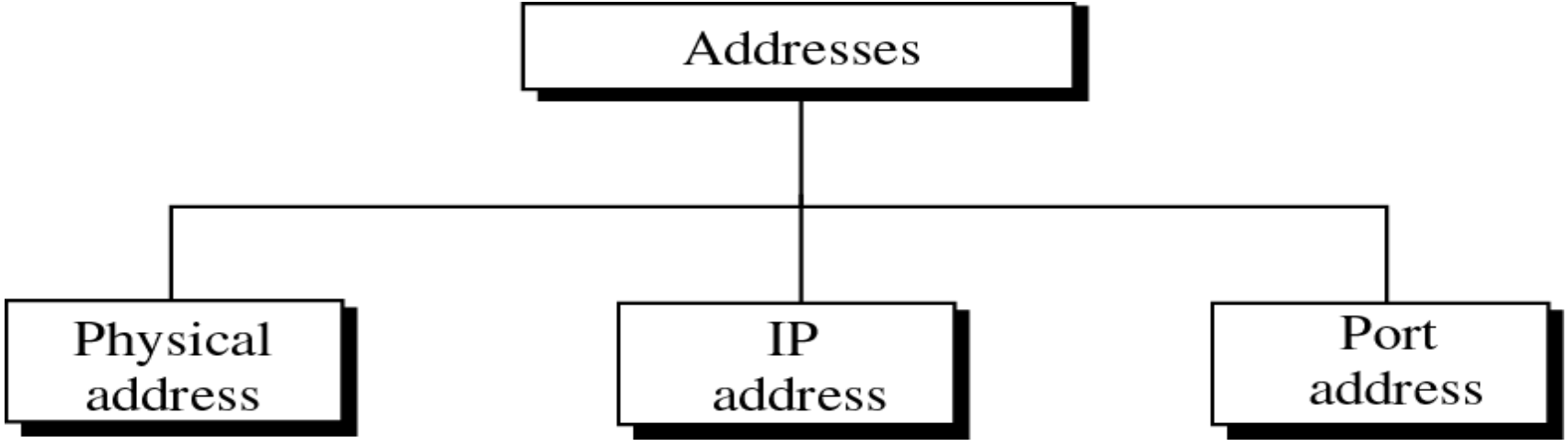
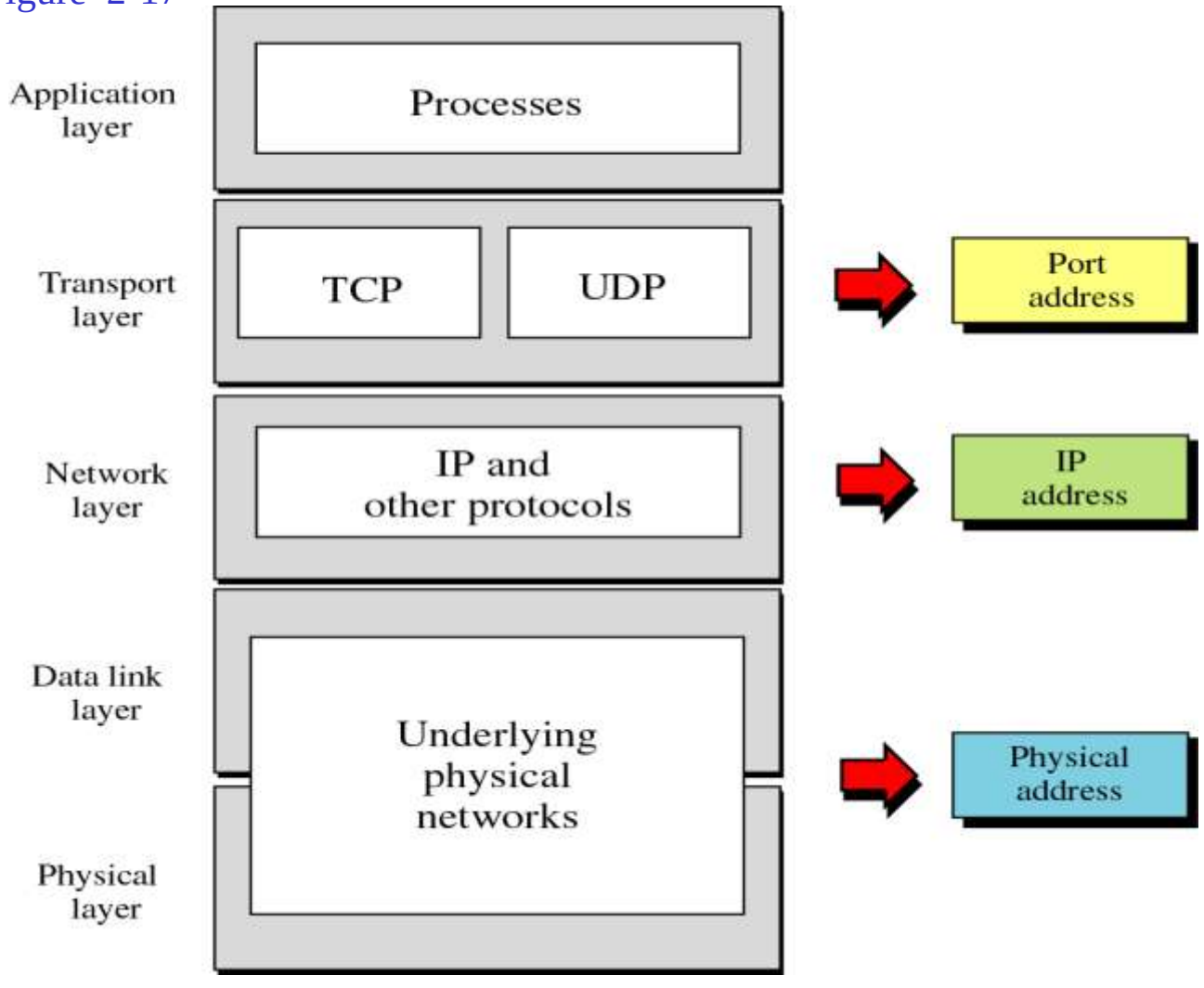


Figure 2-17



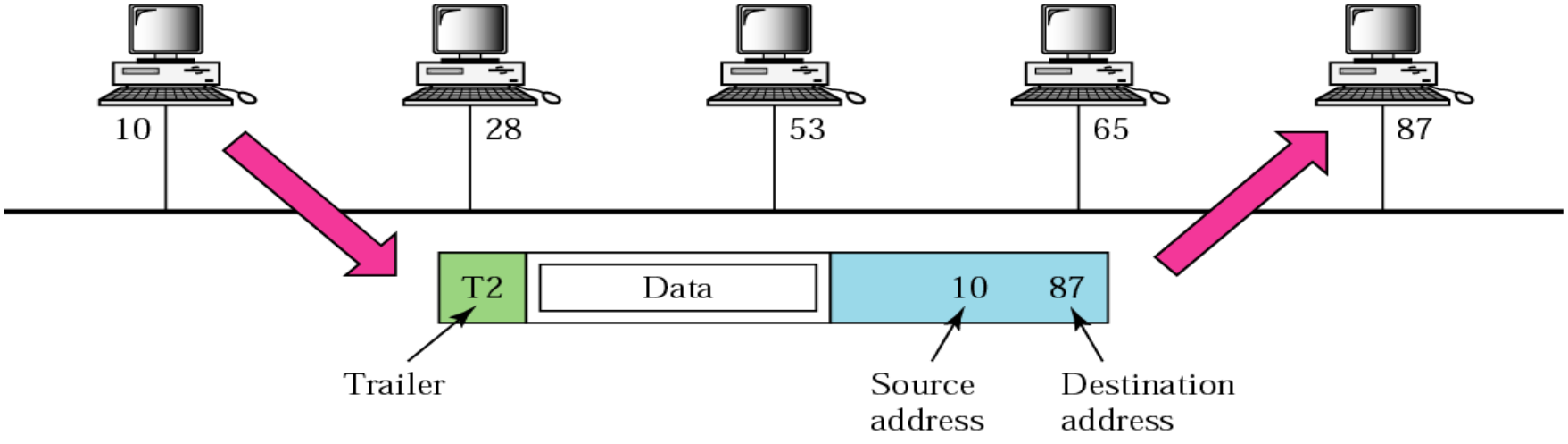
Relation-ship of layers and addresses in TCP/IP

Example 1

Figure 2.18 shows an example of physical addresses.

Figure 2-18

Physical addresses



Example 2

Most local area networks use a 48-bit (6 bytes) physical address written as 12 hexadecimal digits, with every 2 bytes separated by a hyphen as shown below:

07-01-02-01-2C-4B

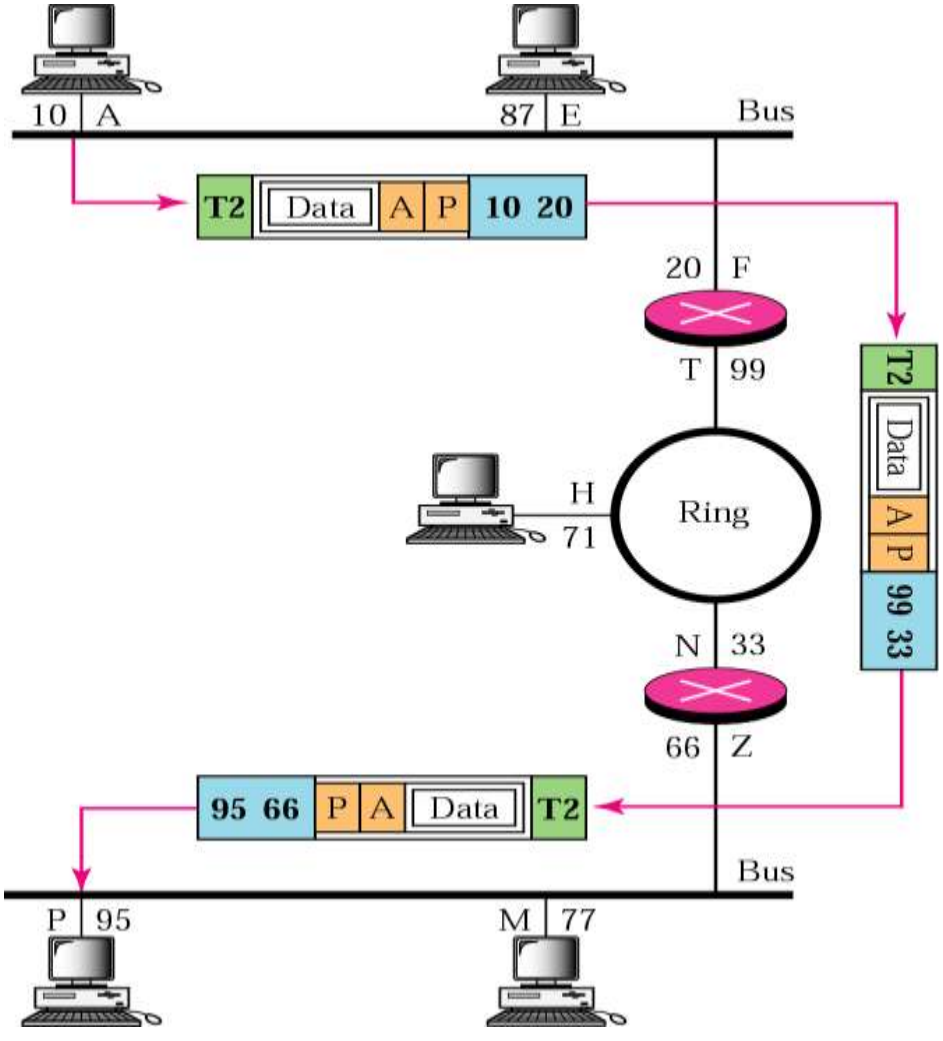
A 6-byte (12 hexadecimal digits) physical address

Example 3

Figure 2.19 shows an example of Internet addresses.

Figure 2-19

IP addresses



Example 4

As we will see in Chapter 4, an Internet address (in IPv4) is 32 bits in length, normally written as four decimal numbers, with each number representing 1 byte. The numbers are separated by a dot. Below is an example of such an address.

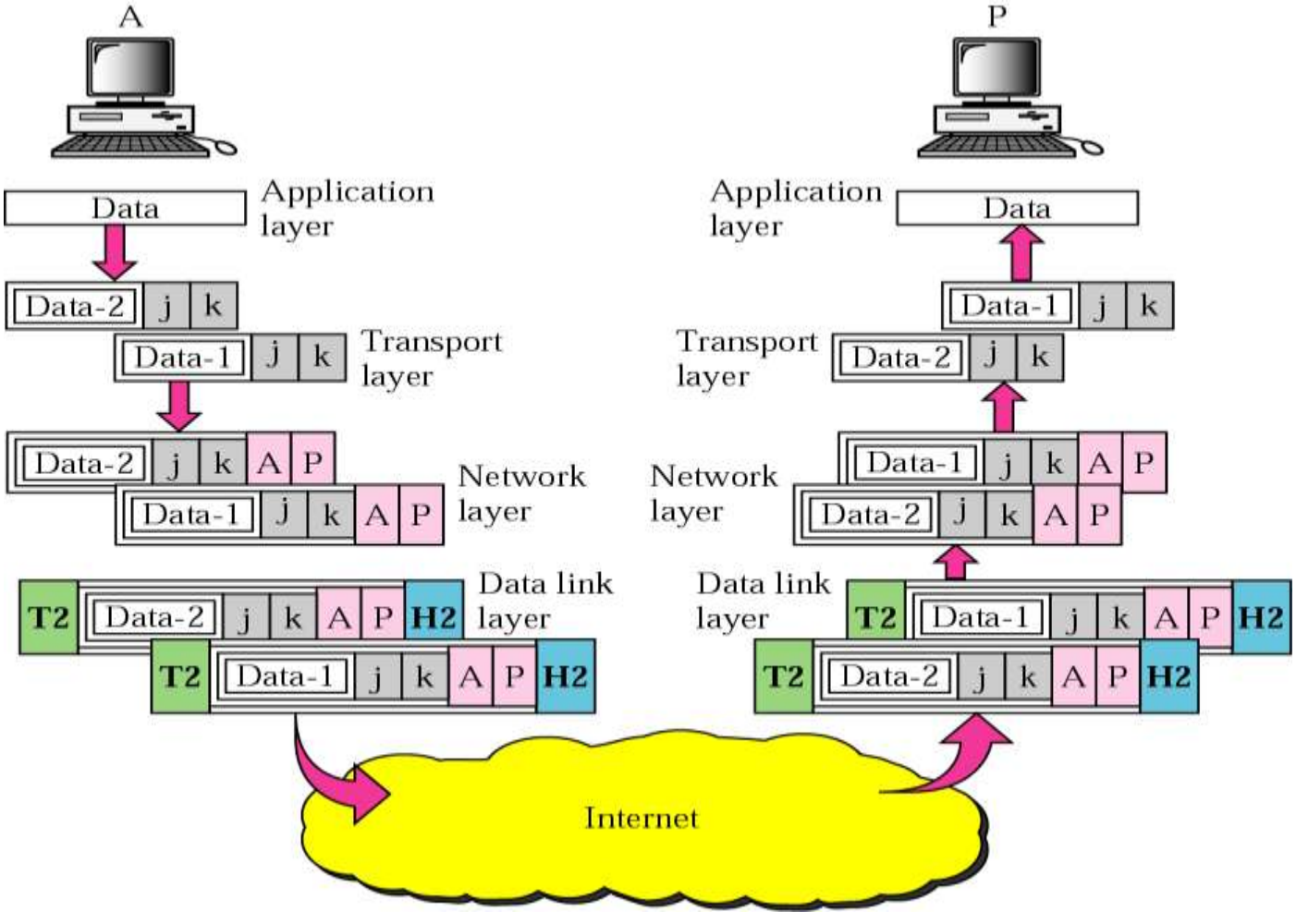
132.24.75.9

Example 5

Figure 2.20 shows an example of transport layer communication.

Figure 2-20

Port addresses



Example 6

As we will see in Chapters 11 and 12, a port address is a 16-bit address represented by one decimal number as shown below.

753 **A 16-bit port address**

2.5

TCP/IP VERSIONS

Versions:

- Version 4 (current)
- Version 5
- Version 6 (future)