EC 553
Communication Networks

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Grades

| Load	Percentage	Date
7th Week Exam	20%	Week of 1 Nov 2007
12th Week Exam	10%	Week of 3 December 2007
Final Exam	40%	
Participation	10%	
Report and lab	20%	

Textbook and website

- Textbook: B. Forouzan, Data Communications Networking. 3rd ed. New York: McGraw-Hill, 2004

- Website: www.aast.edu/~khedr

Syllabus

- Tentatively

Week 1	Overview
Week 2	Packet Switching
Week 3	IP addressing and subnetting
Week 4	Introduction to Routing concept
Week 5	Routing algorithms
Week 6	Routing protocols
Week 7	Multiple Access I
Week 8	Multiple access II
Week 9	LAN networks
Week 10	Token ring networks
Week 11	VOIP
Week 12	WLAN
Week 13	TCP
Week 14	Congestion control
Week 15	QOS
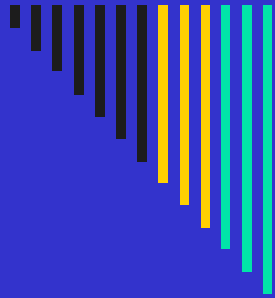
Overview of Data Communications and Networking
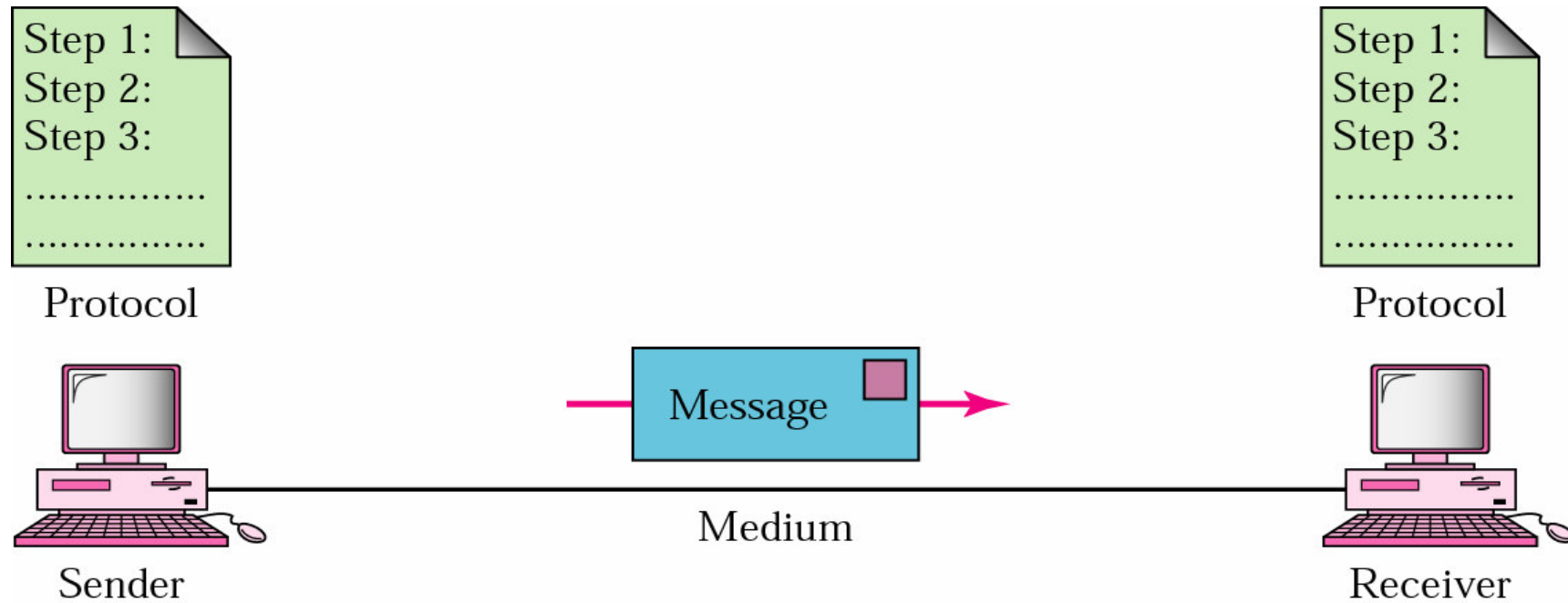
Figure 1.1 Five components of data communication
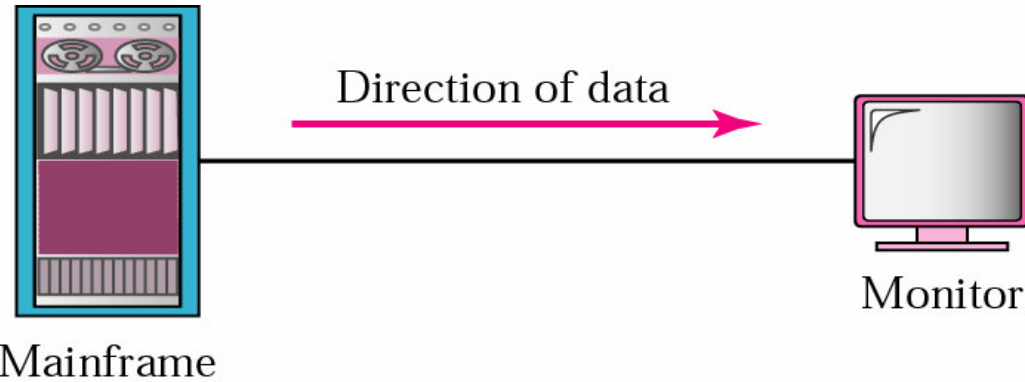
Figure 1.2   Simplex

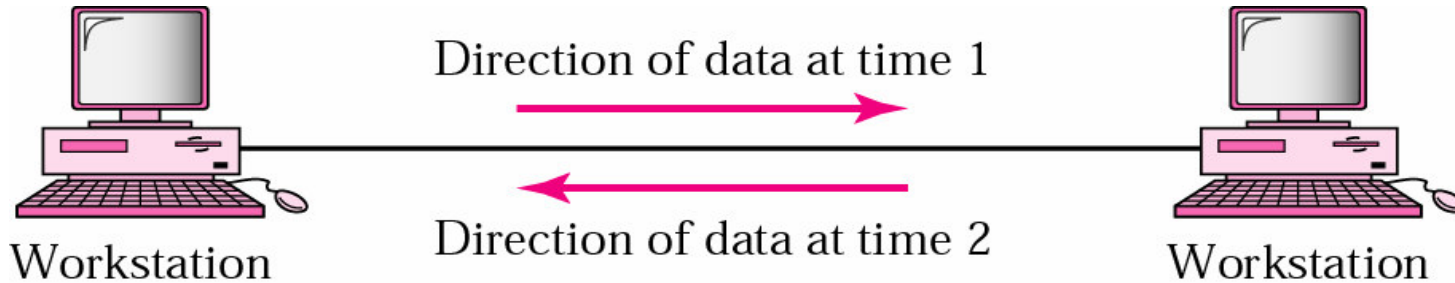Direction of data →

Mainframe   Monitor

Figure 1.3   Half-duplex

Direction of data at time 1 →
← Direction of data at time 2

Workstation   Workstation

Figure 1.4   Full-duplex

Direction of data all the time ↔

Workstation   Workstation
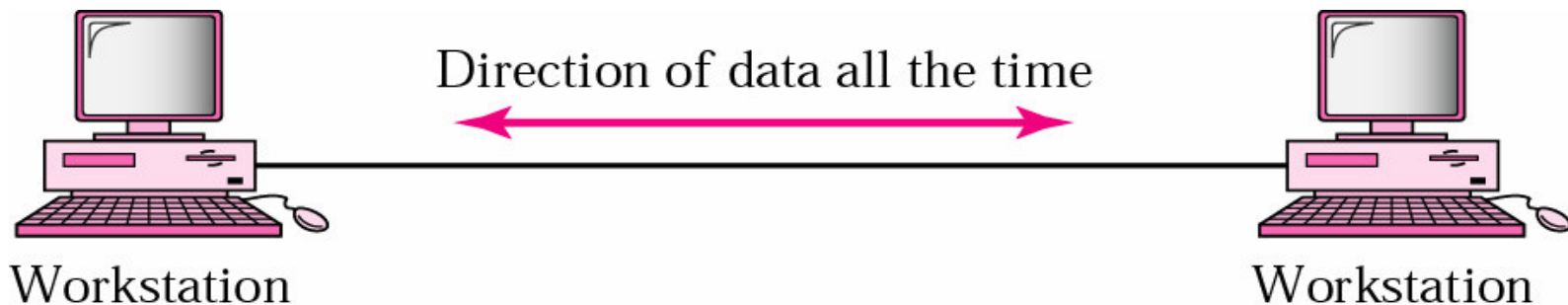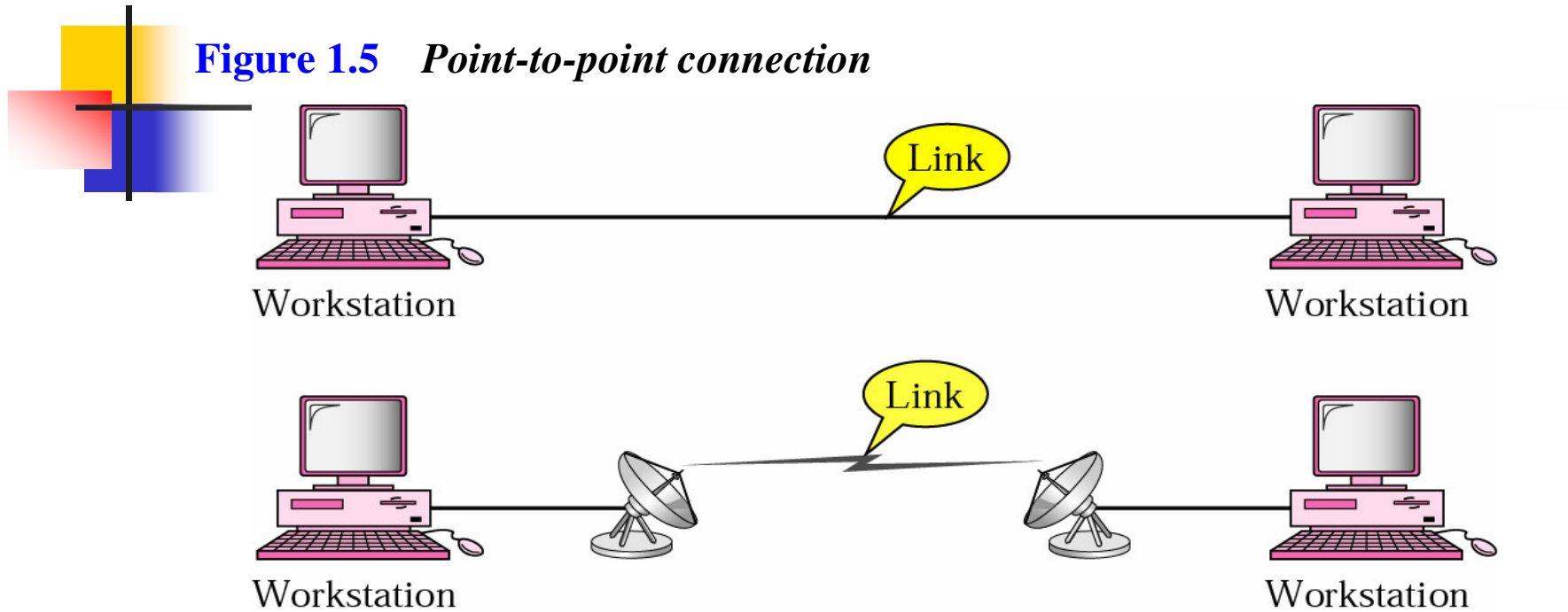
Figure 1.5   Point-to-point connection
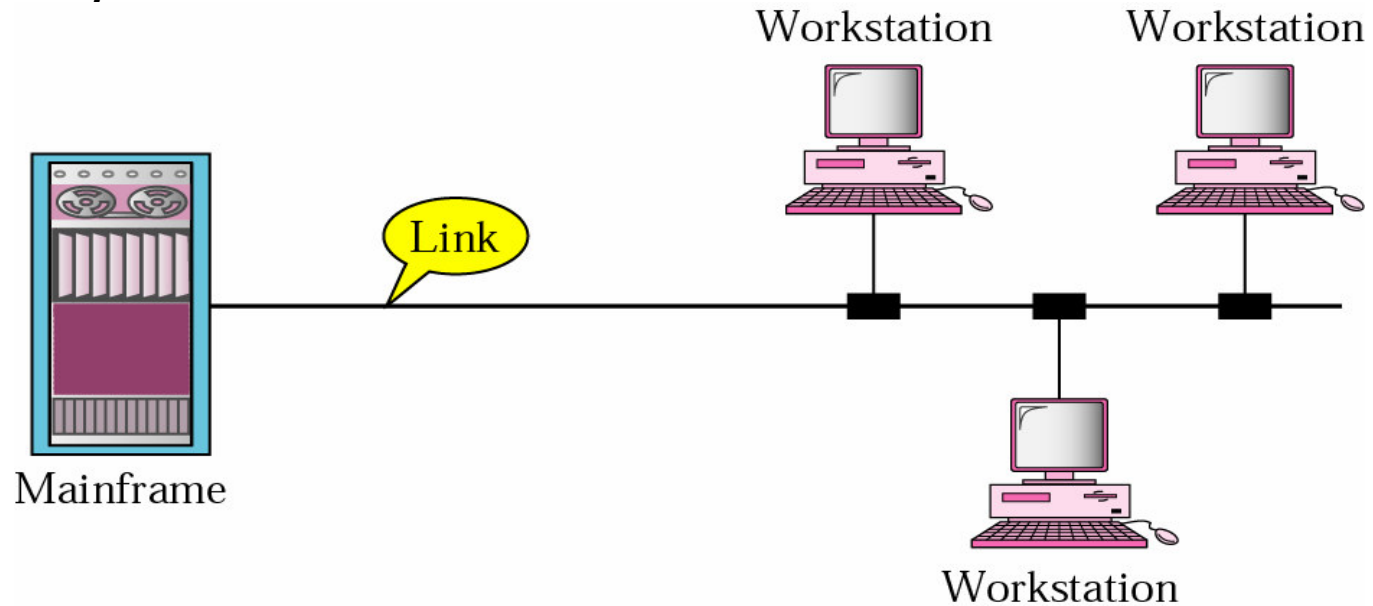

Figure 1.6   Multipoint connection

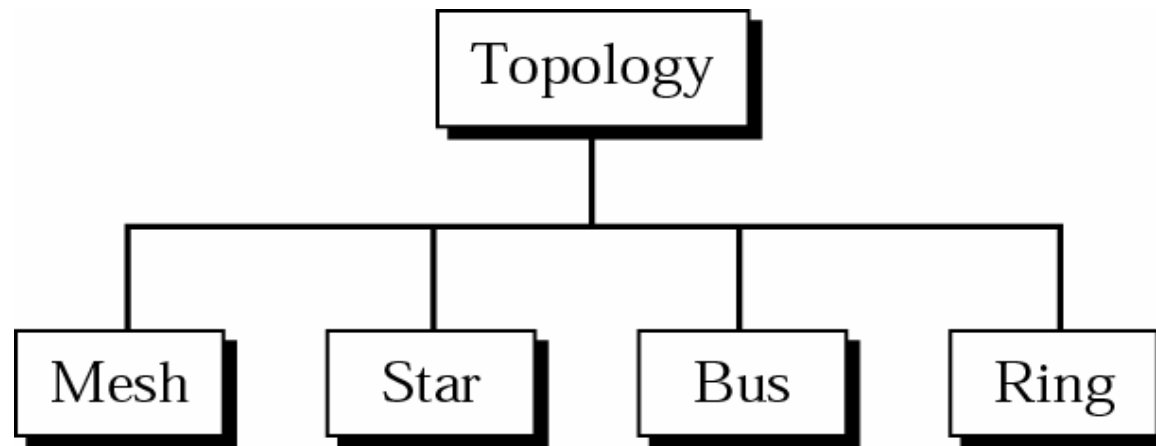**Figure 1.7 *Categories of topology***

Figure 1.8 *Fully connected mesh topology (for five devices)*
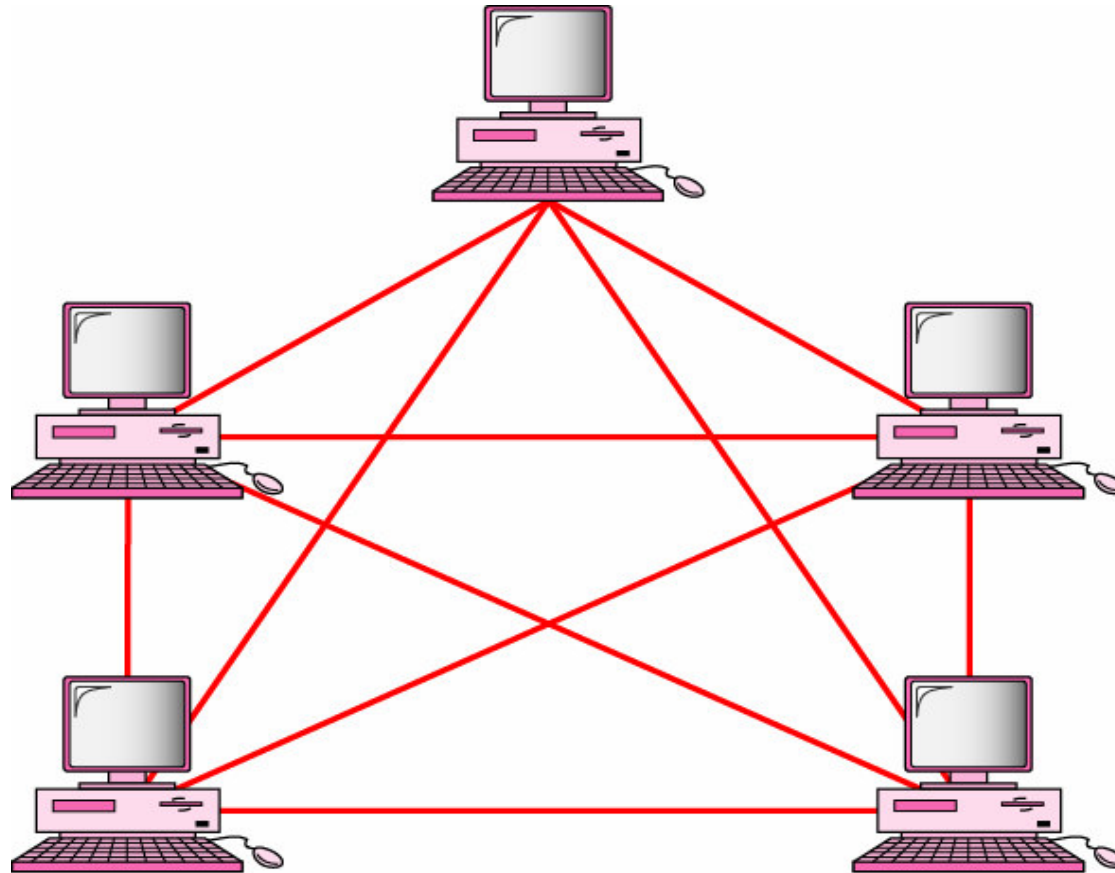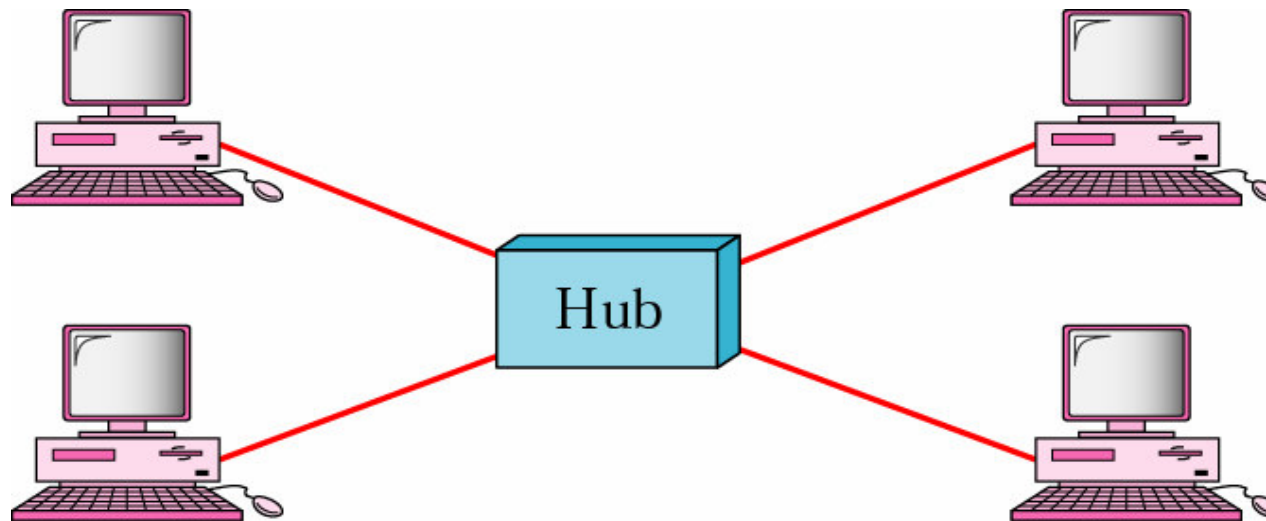
Figure 1.9   *Star topology*
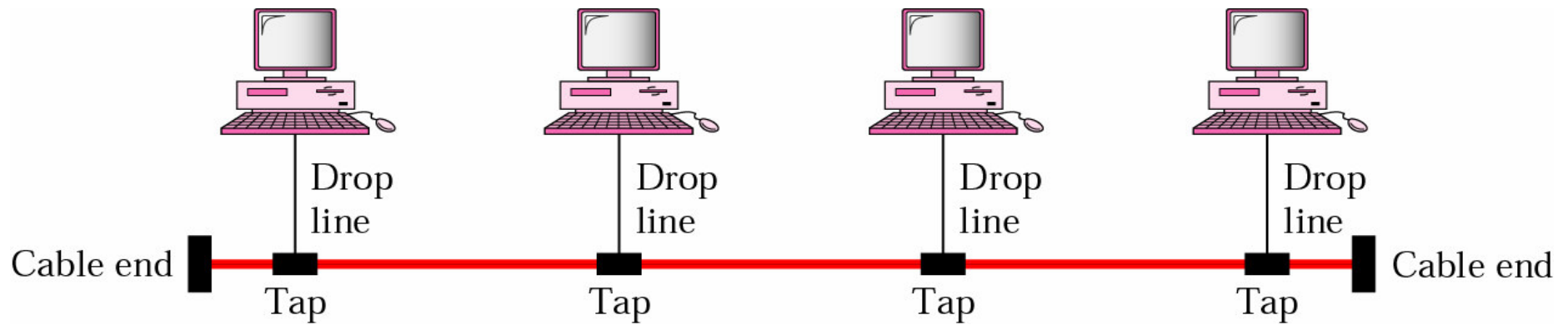
Figure 1.10   *Bus topology*

Figure 1.11 *Ring topology*
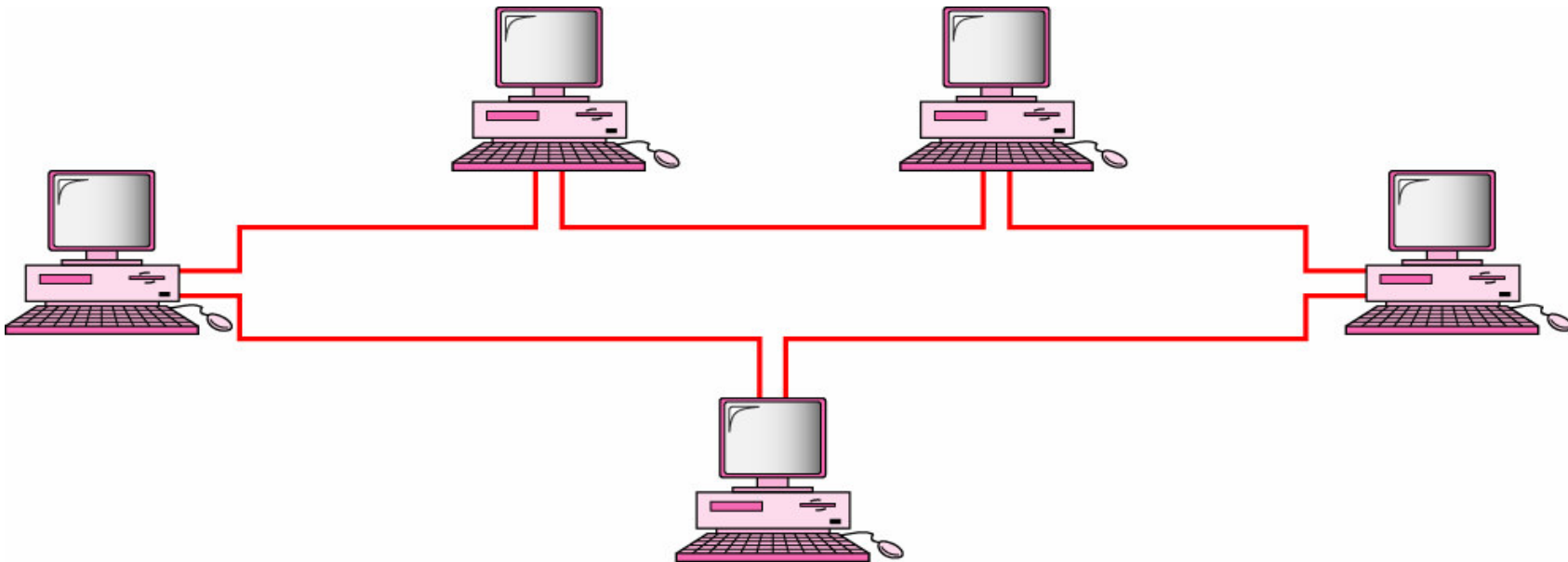
Figure 1.12 *Categories of networks*

Network

Local-area network (LAN)

Metropolitan-area network (MAN)
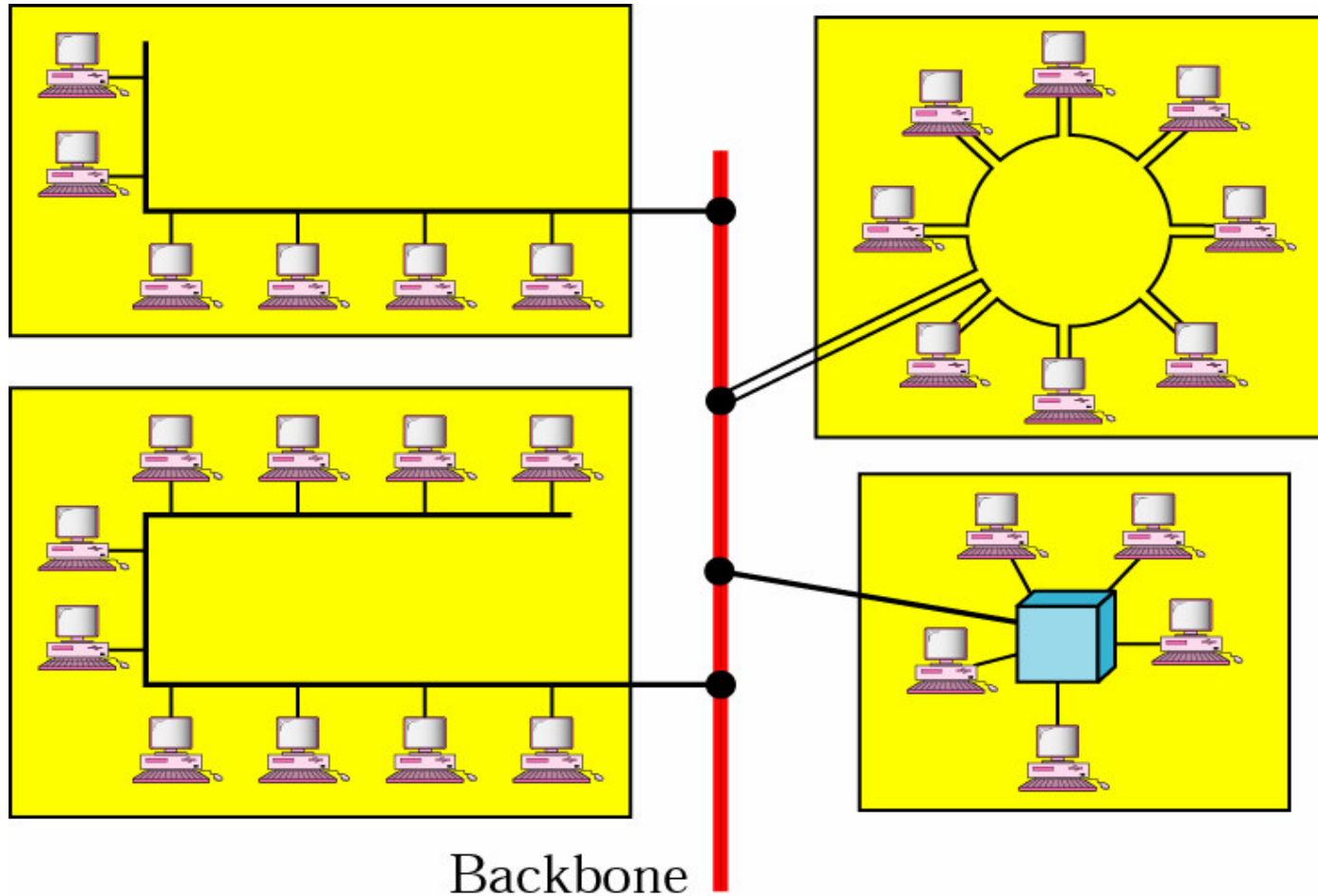
Wide-area network (WAN)

Figure 1.13 *LAN*

Backbone
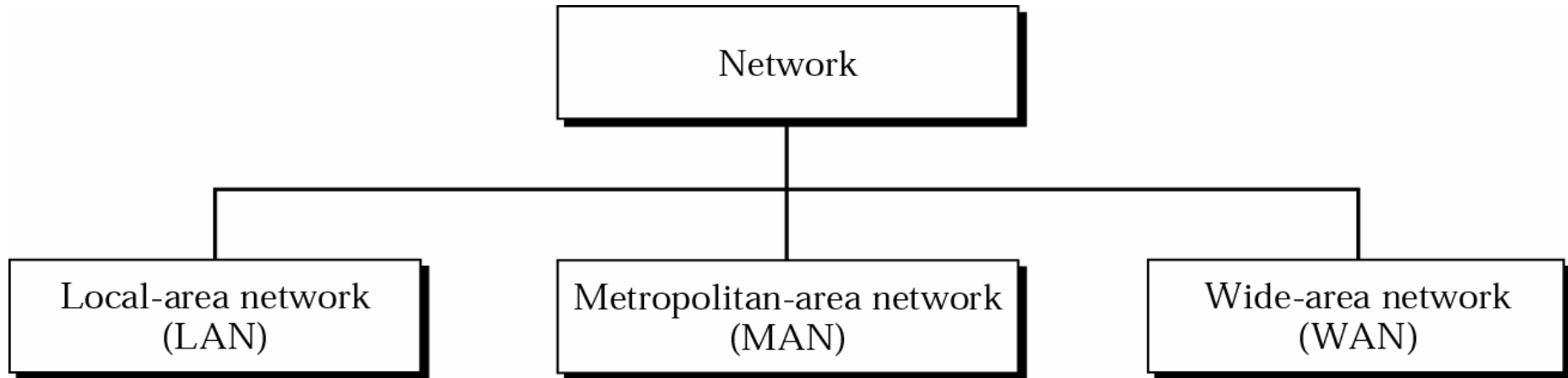
b. Multiple-building LAN

Figure 1.14 *MAN*

Public city network
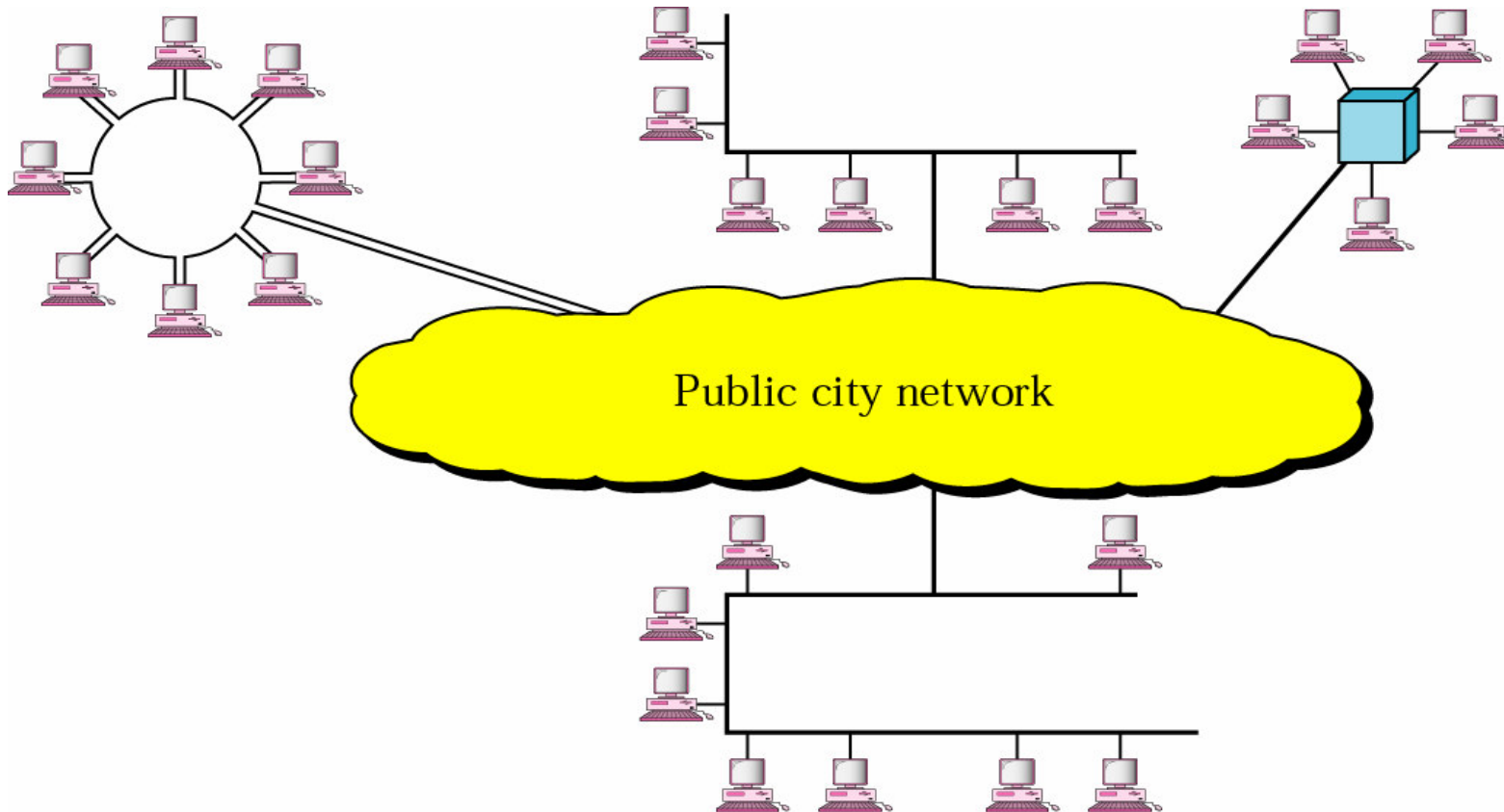
Figure 1.15 WAN
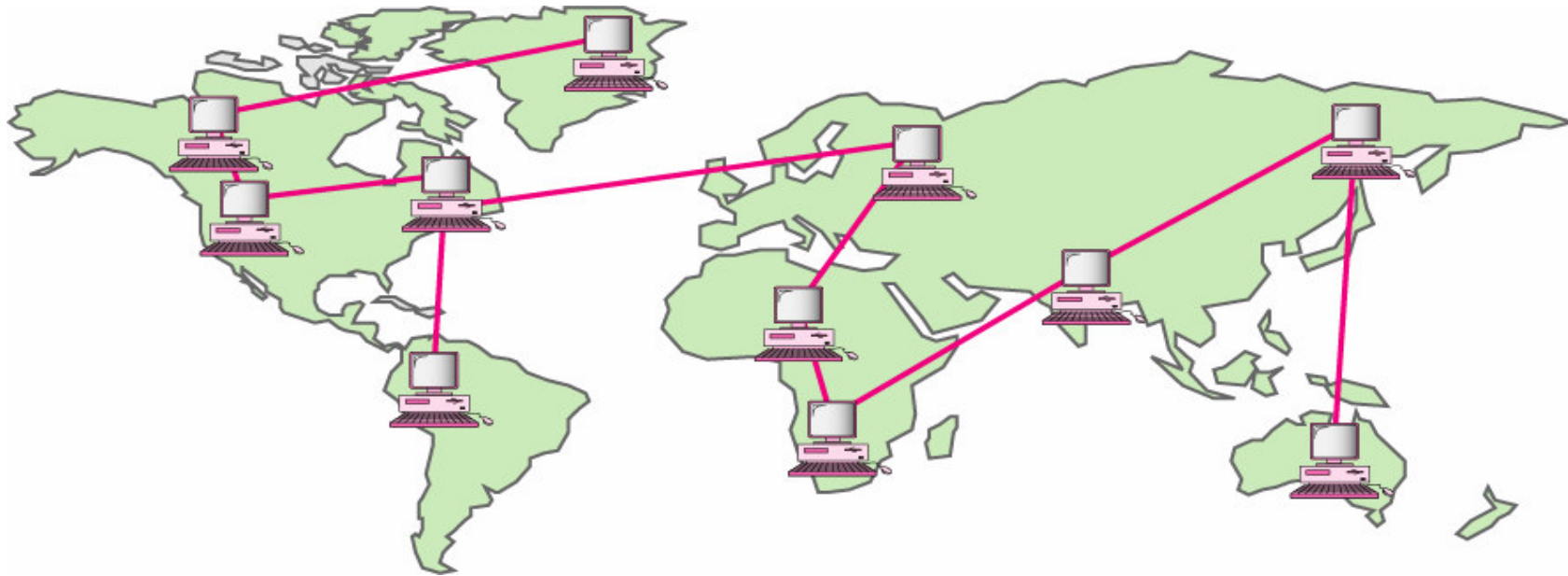
Figure 2.1   Protocols *Sending a letter*

Sender

Receiver

The letter is written, put in an envelope, and dropped in mailbox.	Higher Layers	The letter is picked up, removed from the envelope, and read.
The letter is carried from the mailbox to a post office.	Middle Layers	The letter is carried from the post office to the mailbox.
The letter is delivered to a carrier by the post office.	Lower Layers	The letter is delivered from the carrier to the post office.

The parcel is carried from the source to the destination.

Figure 2.2   Internet layers

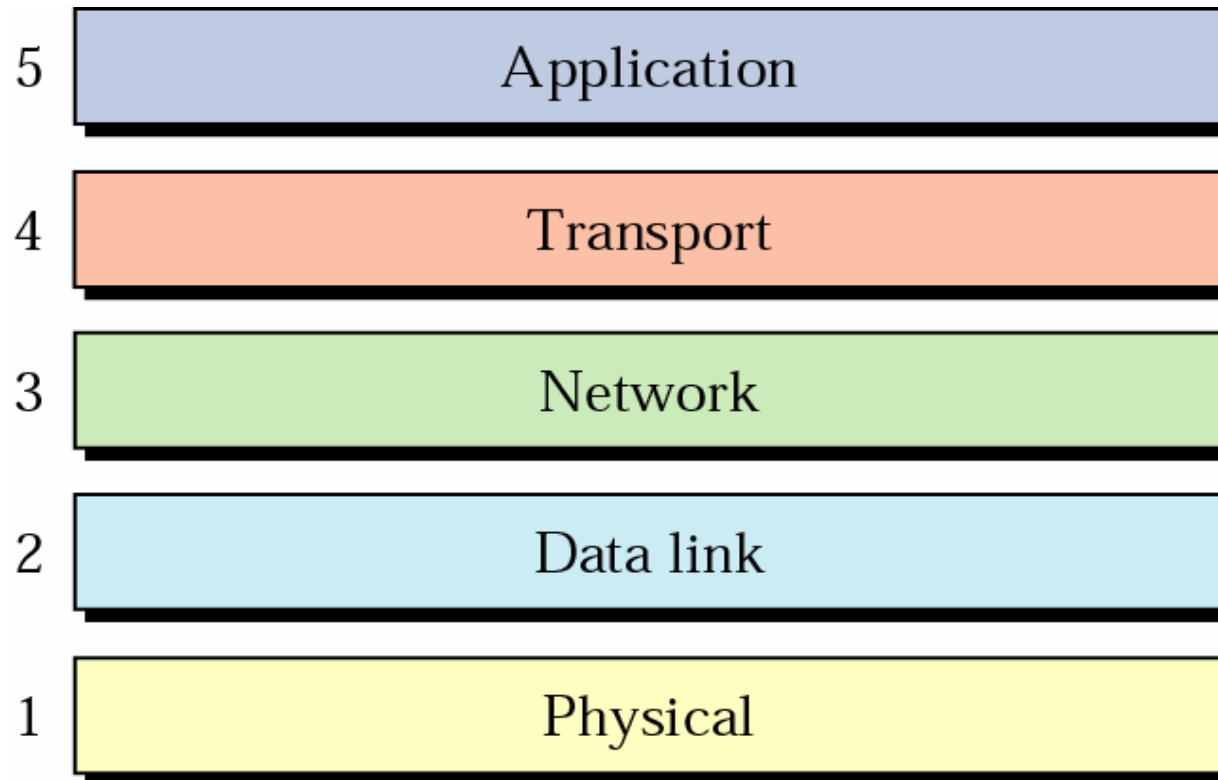|	
5	Application
4	Transport
3	Network
2	Data link
1	Physical

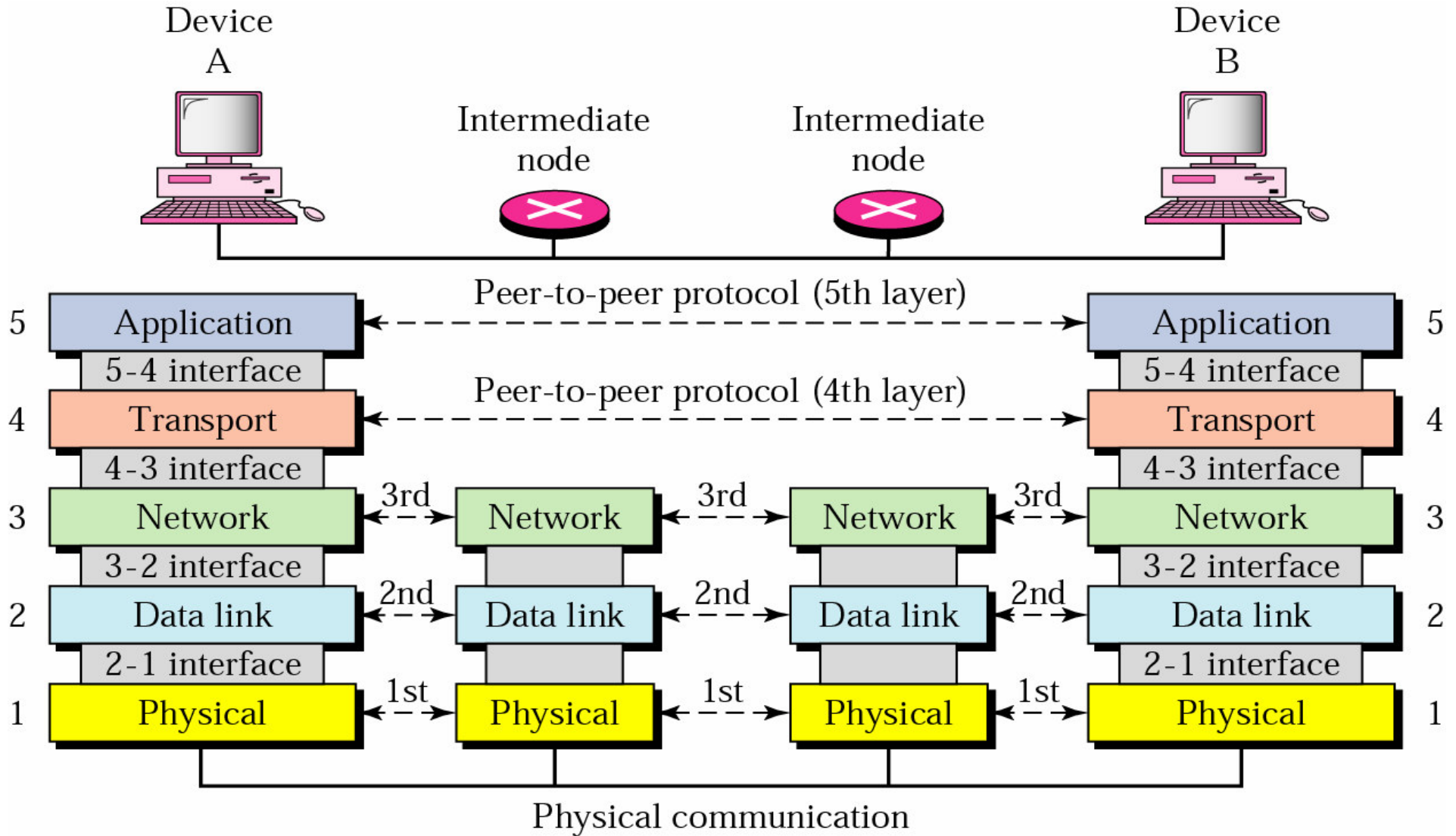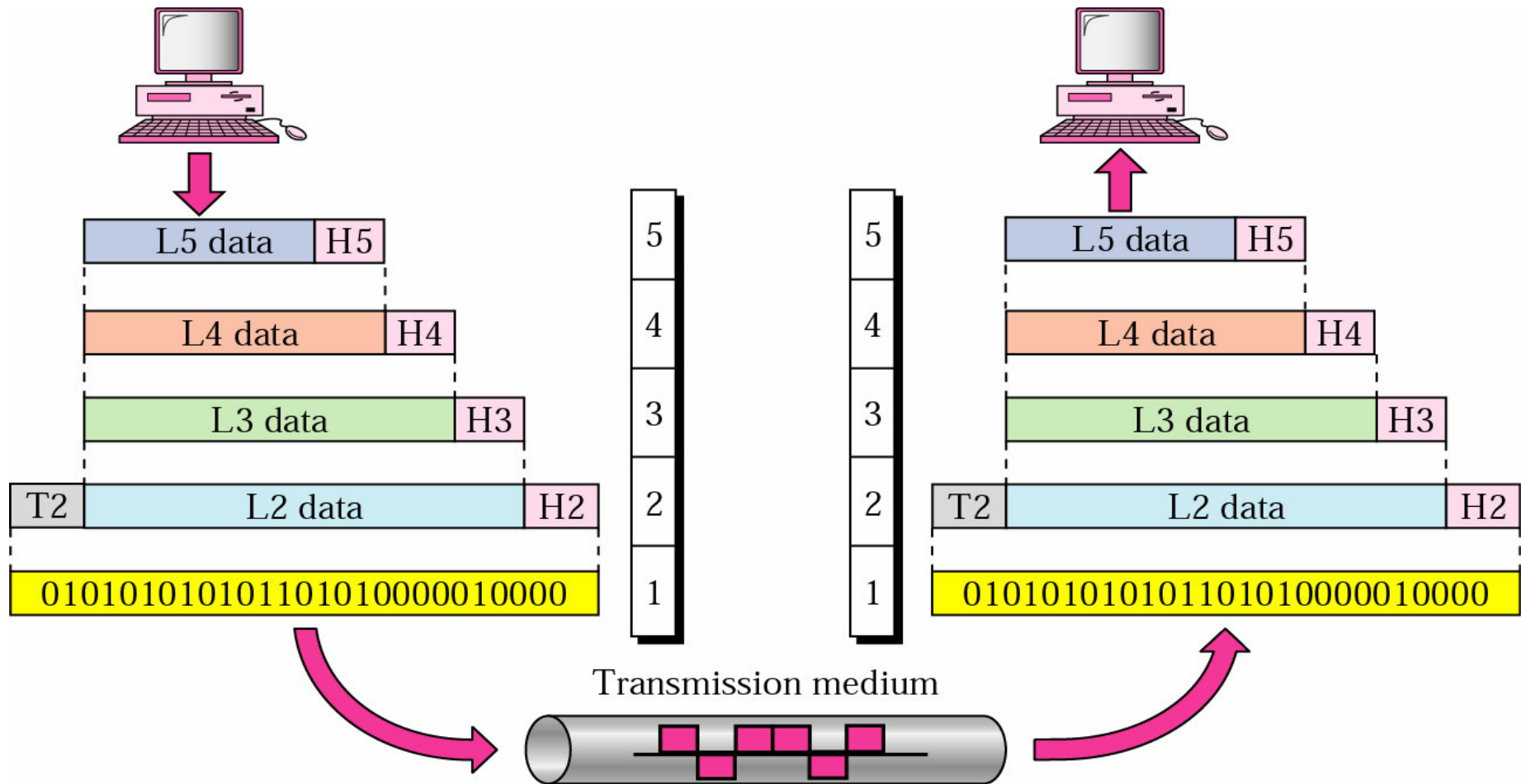# Figure 2.3   Peer-to-peer processes

Figure 2.4   An exchange using the Internet model

The physical layer is responsible for transmitting individual bits from one node to the next.

The data link layer is responsible for transmitting frames from one node to the next.

The network layer is responsible for the delivery of packets from the original source to the final destination.
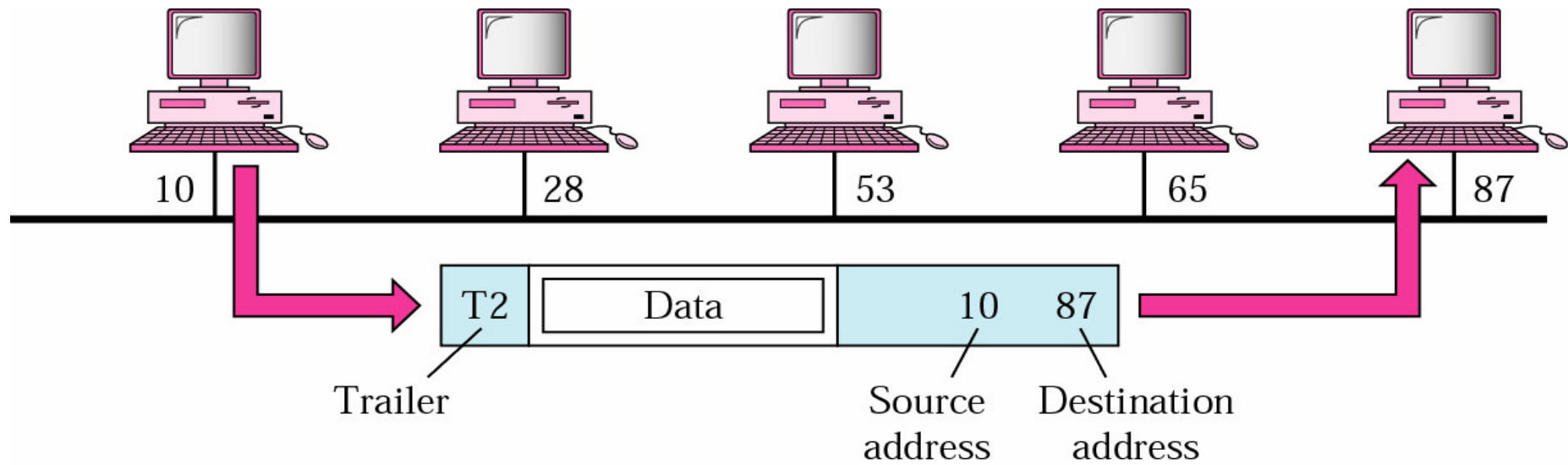
Figure 2.8 *Example 1*

Trailer

Data

10   87

Source address   Destination address
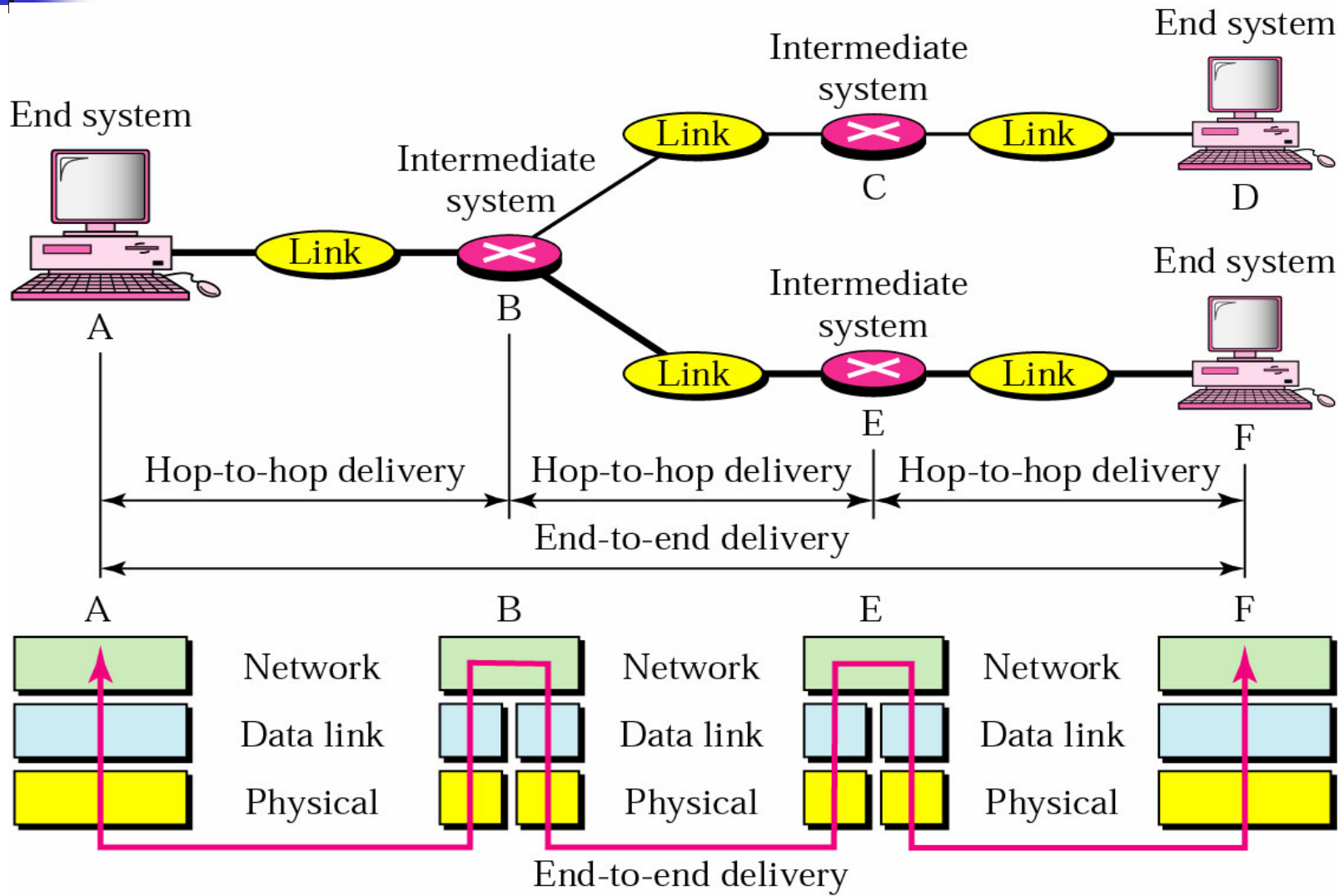
Figure 2.10 *Source-to-destination delivery*

Figure 2.11 *Example 2*

Figure 2.12 *Transport layer*

From application layer

To application layer

Segments

Segments

Data H4   Data H4   Data H4

Data H4   Data H4   Data H4
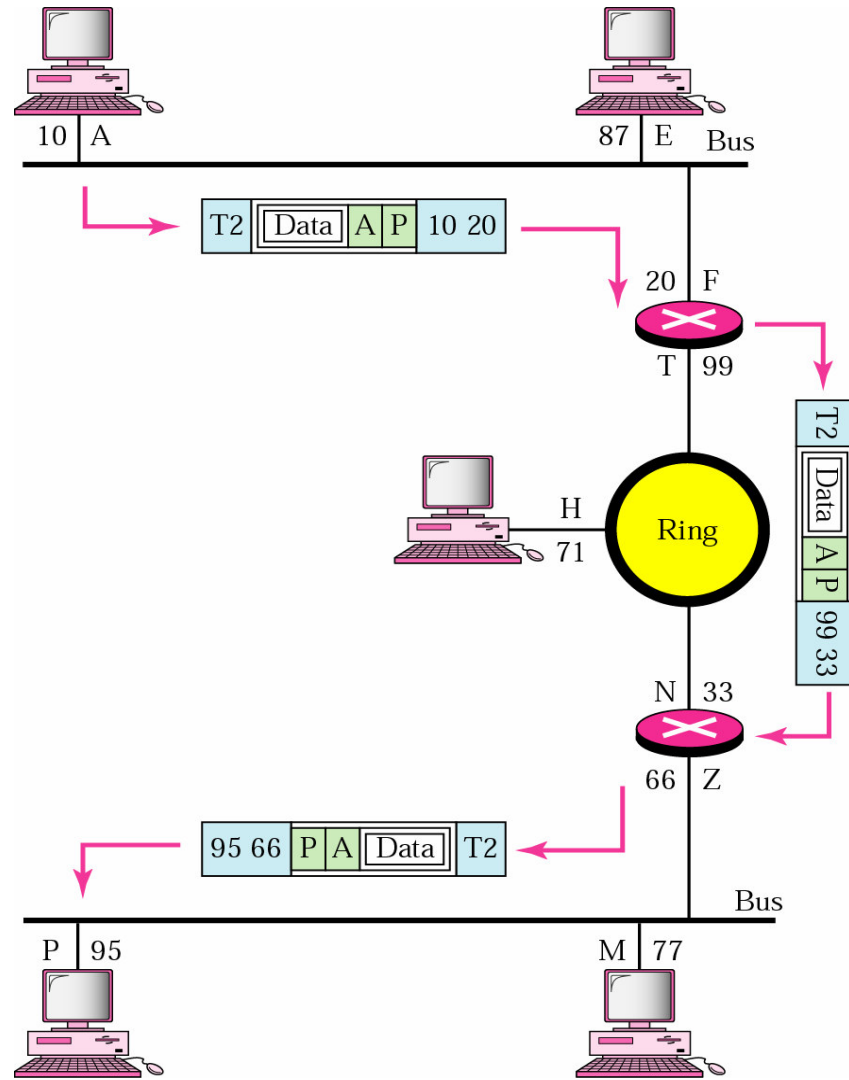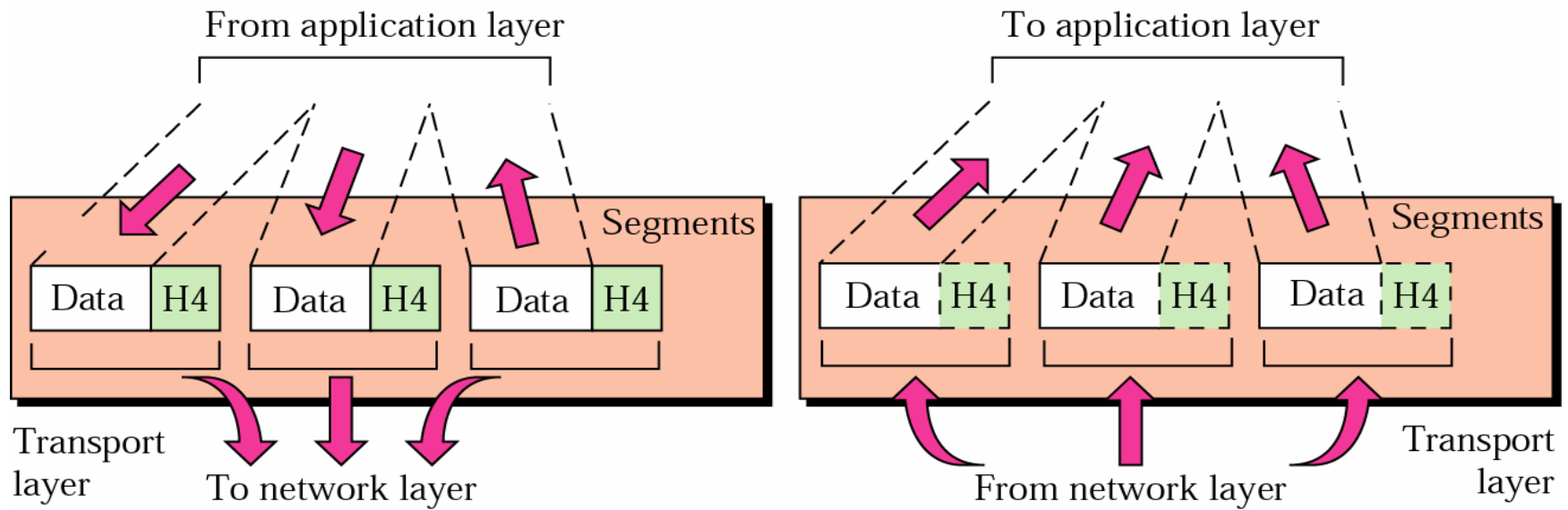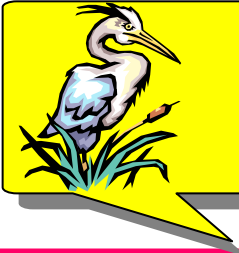
Transport
layer

To network layer

From network layer

Transport
layer

Note:

The transport layer is responsible for delivery of a message from one process to another.
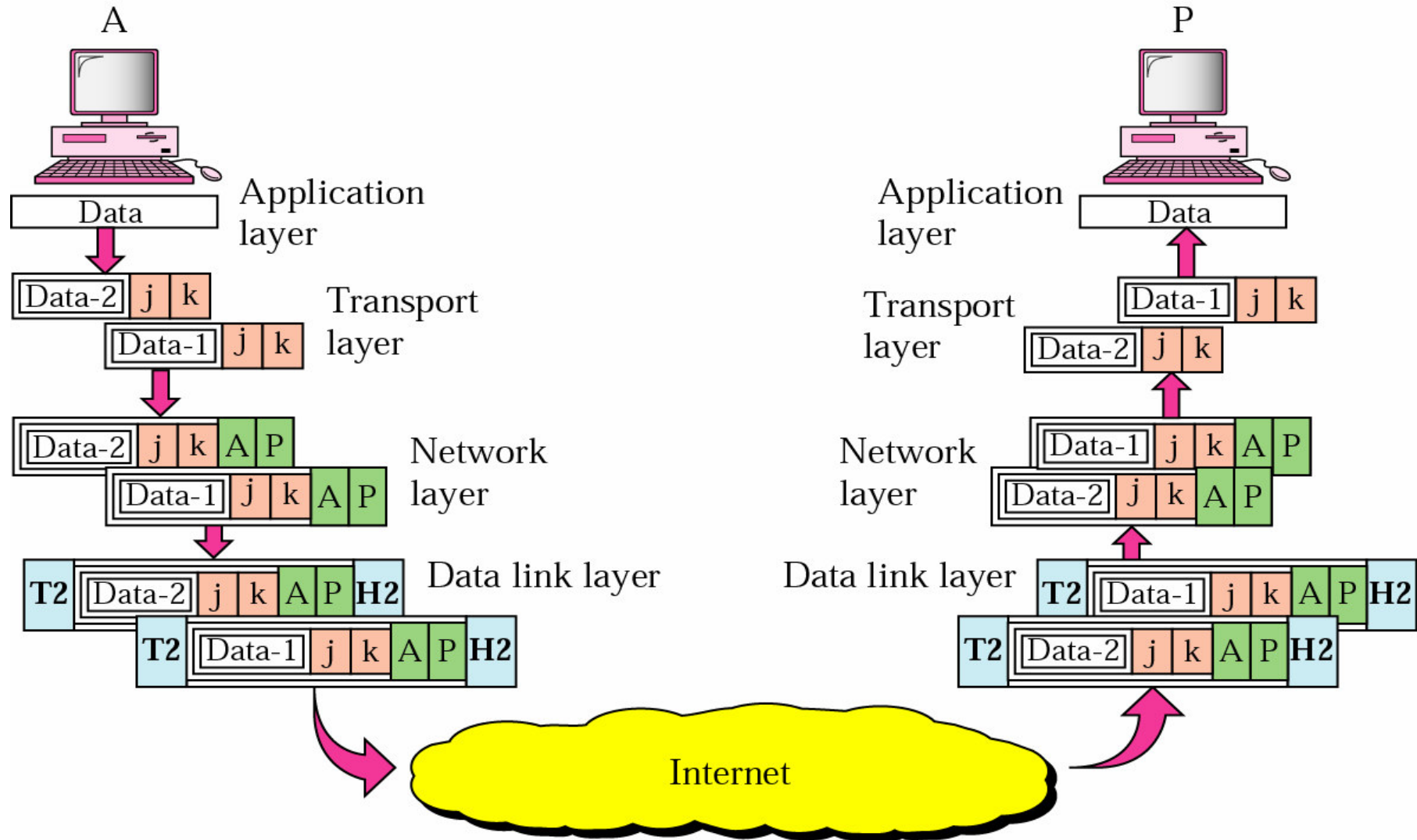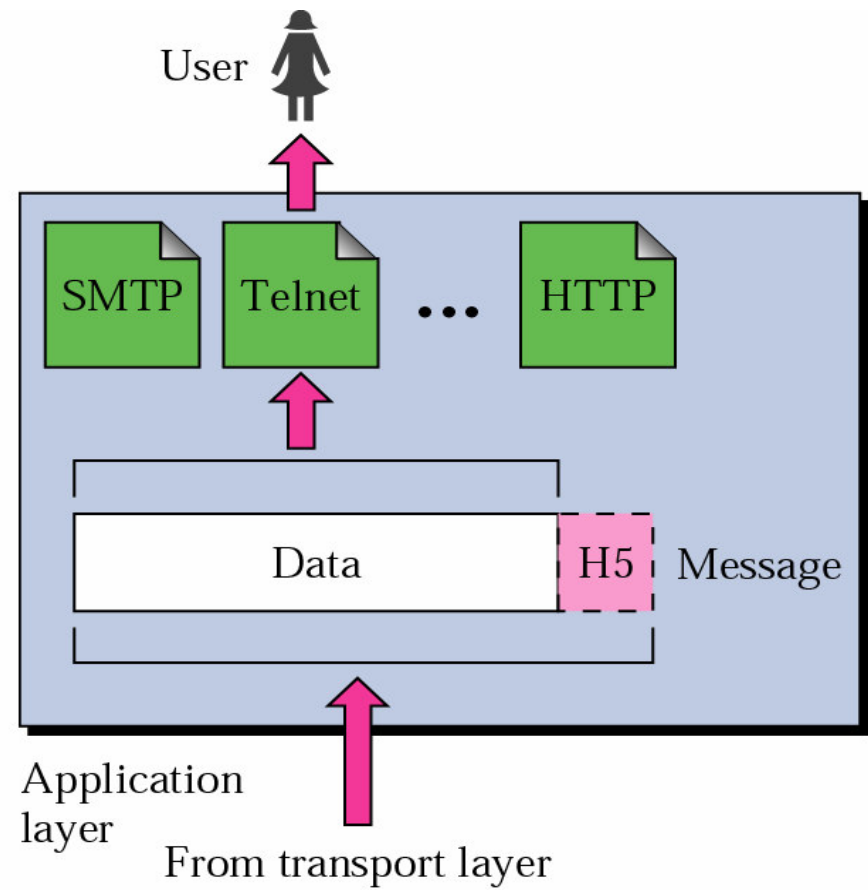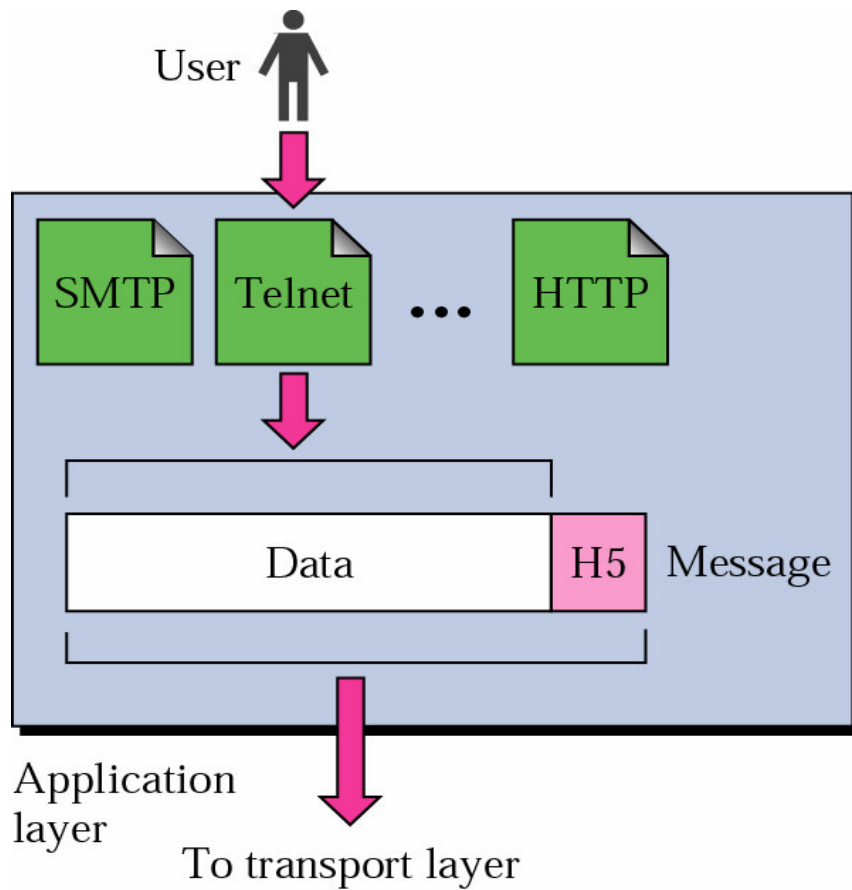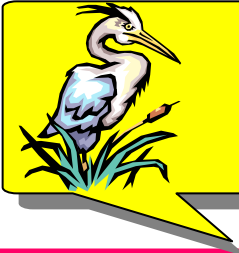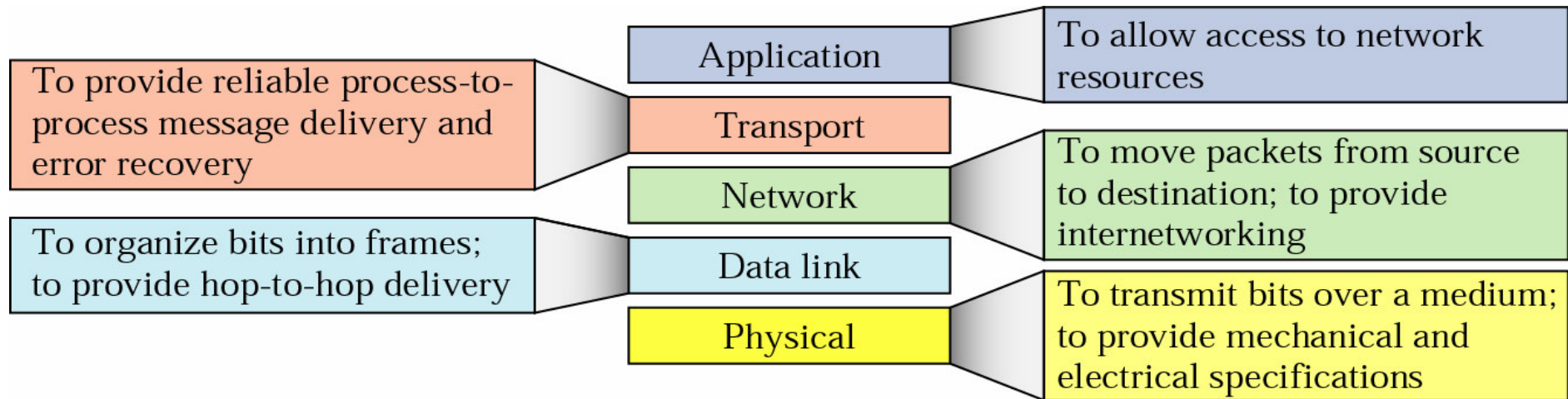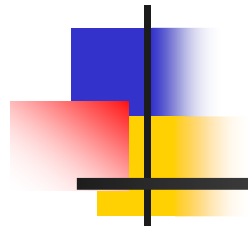
Figure 2.14 *Example 3*

Figure 2.15   *Application layer*

Note:

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

Figure 2.16 Summary of duties

To provide reliable process-to-process message delivery and error recovery	Application
	Transport
To organize bits into frames; to provide hop-to-hop delivery	Network
	Data link
	Physical

To allow access to network resources

To move packets from source to destination; to provide internetworking

To transmit bits over a medium; to provide mechanical and electrical specifications

Thank you