



جامعة الموصل / كلية الهندسة
قسم الهندسة الكهربائية

Subject Title: Computer Networks

Subject Code: CNET 403

Class : 4 E&C

Instructor : Dr. Mohammed Younis Thanoun
Assistant professor

Course Description (15 weeks) or Outlines

- Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network
- Physical Layer and Media
- Data Link Layer
- Wired LANs: Ethernet
- Wireless LANs 421
- Connecting LANs, Backbone Networks, and Virtual LANs
- Network Layer: Logical Addressing
- Network Layer: Internet Protocol

Figures, Diagrams, or Examples.... etc

Figure 2.4 *An exchange using the OSI model*

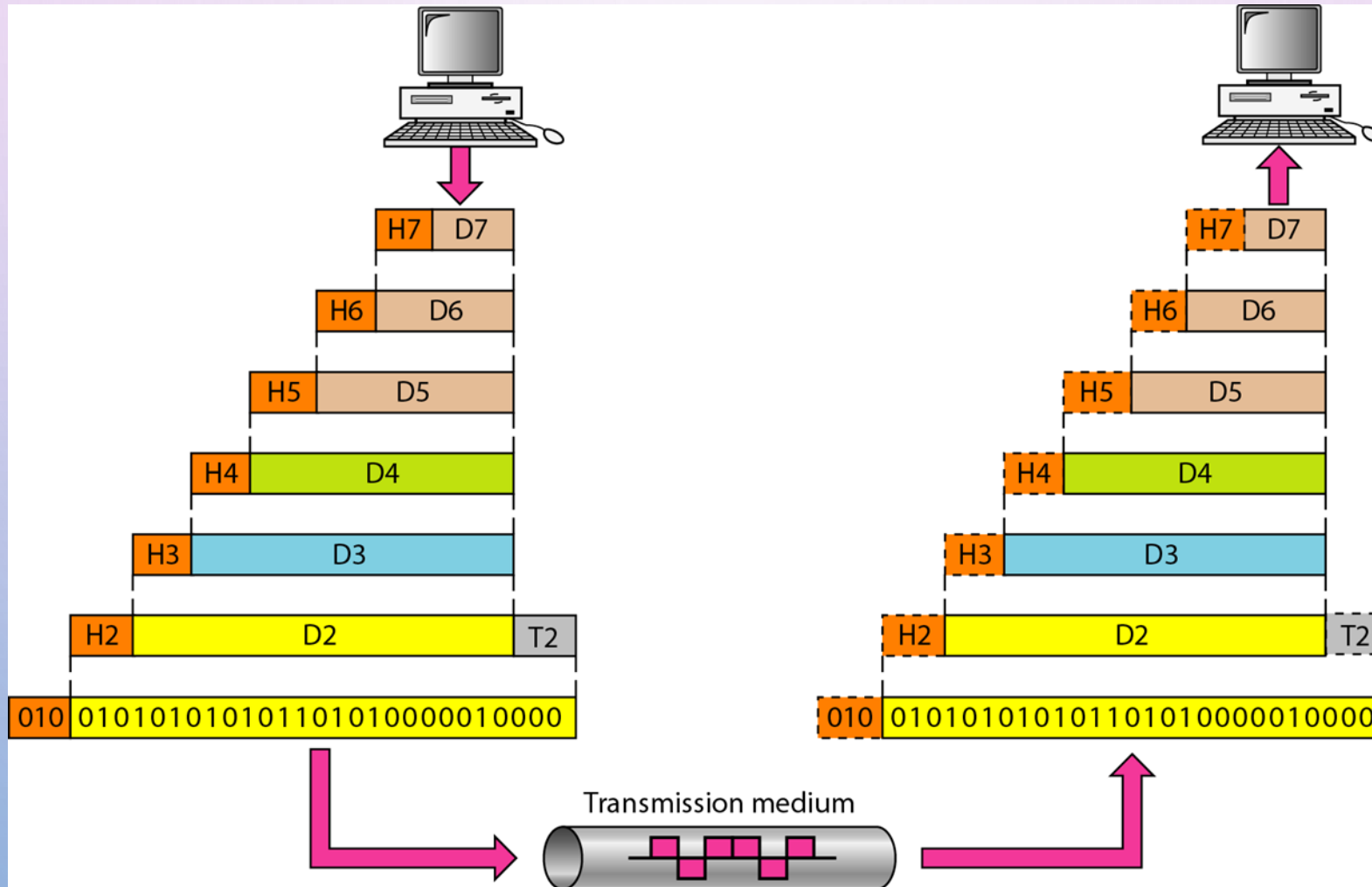
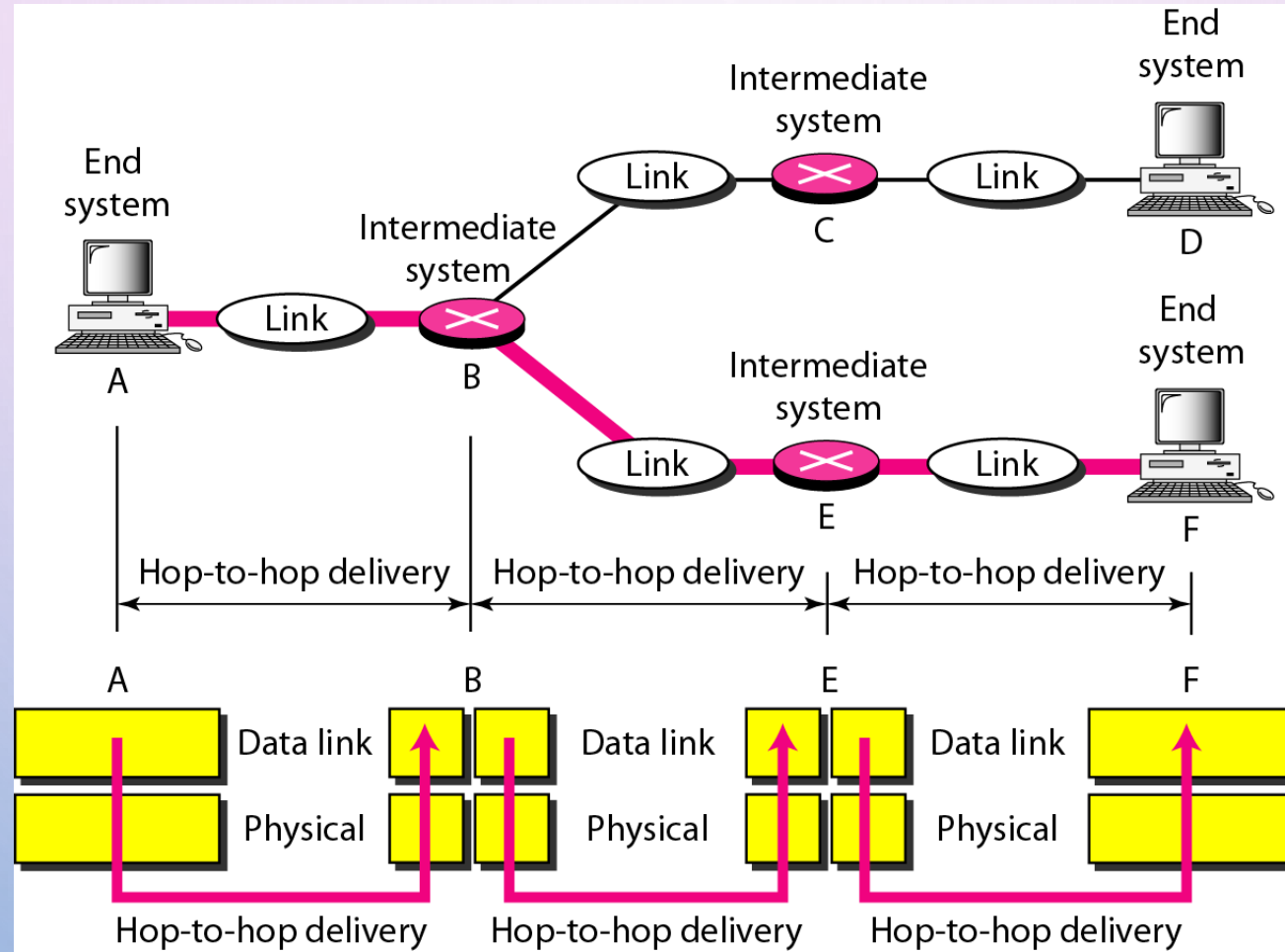


Figure 2.7 *Hop-to-hop delivery*



Example 13.1

• *Define the type of the following destination addresses:*

a. 4A:30:10:21:10:1A

b. 47:20:1B:2E:08:EE

c. FF:FF:FF:FF:FF:FF

Solution

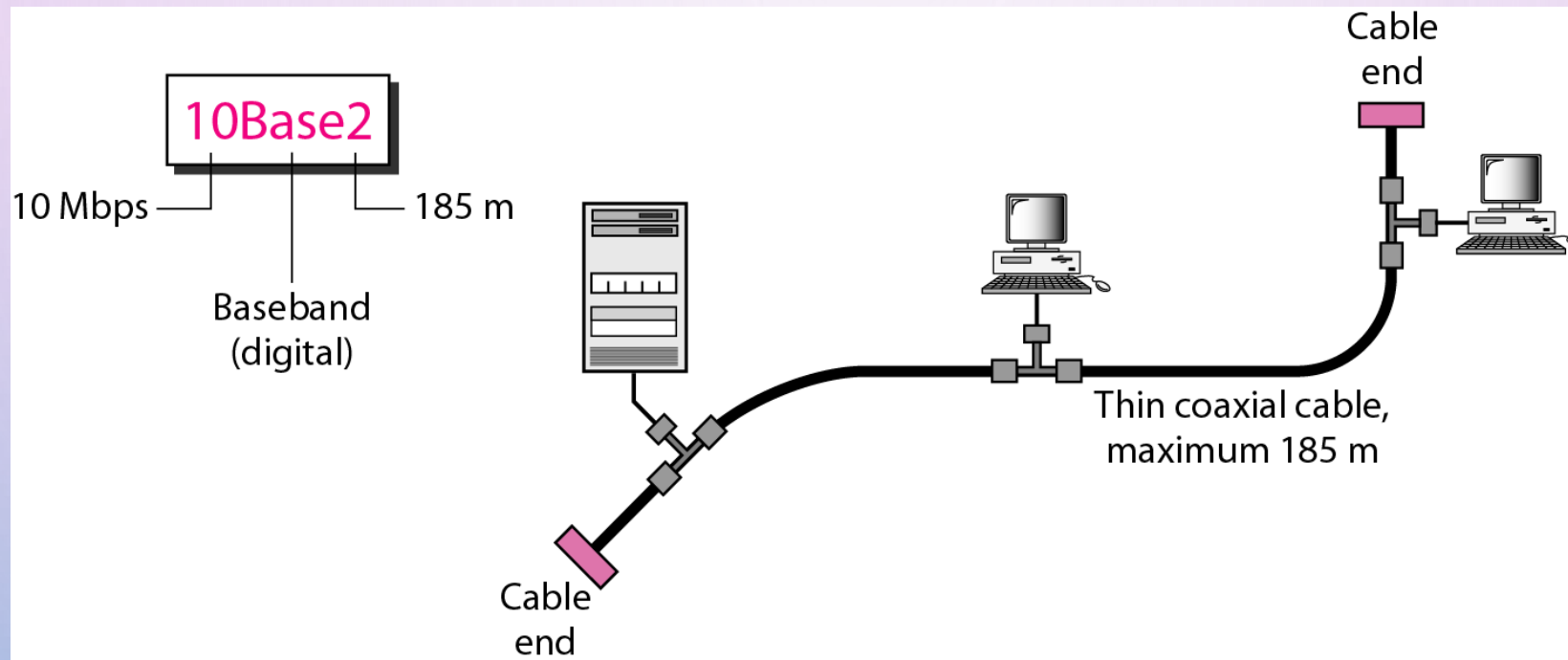
To find the type of the address, we need to look at the second hexadecimal digit from the left. If it is even, the address is unicast. If it is odd, the address is multicast. If all digits are F's, the address is broadcast. Therefore, we have the following:

a. This is a unicast address because A in binary is 1010.

b. This is a multicast address because 7 in binary is 0111.

c. This is a broadcast address because all digits are F's.

Figure 13.11 *10Base2 implementation*



Example 19.3

Find the error, if any, in the following IPv4 addresses.

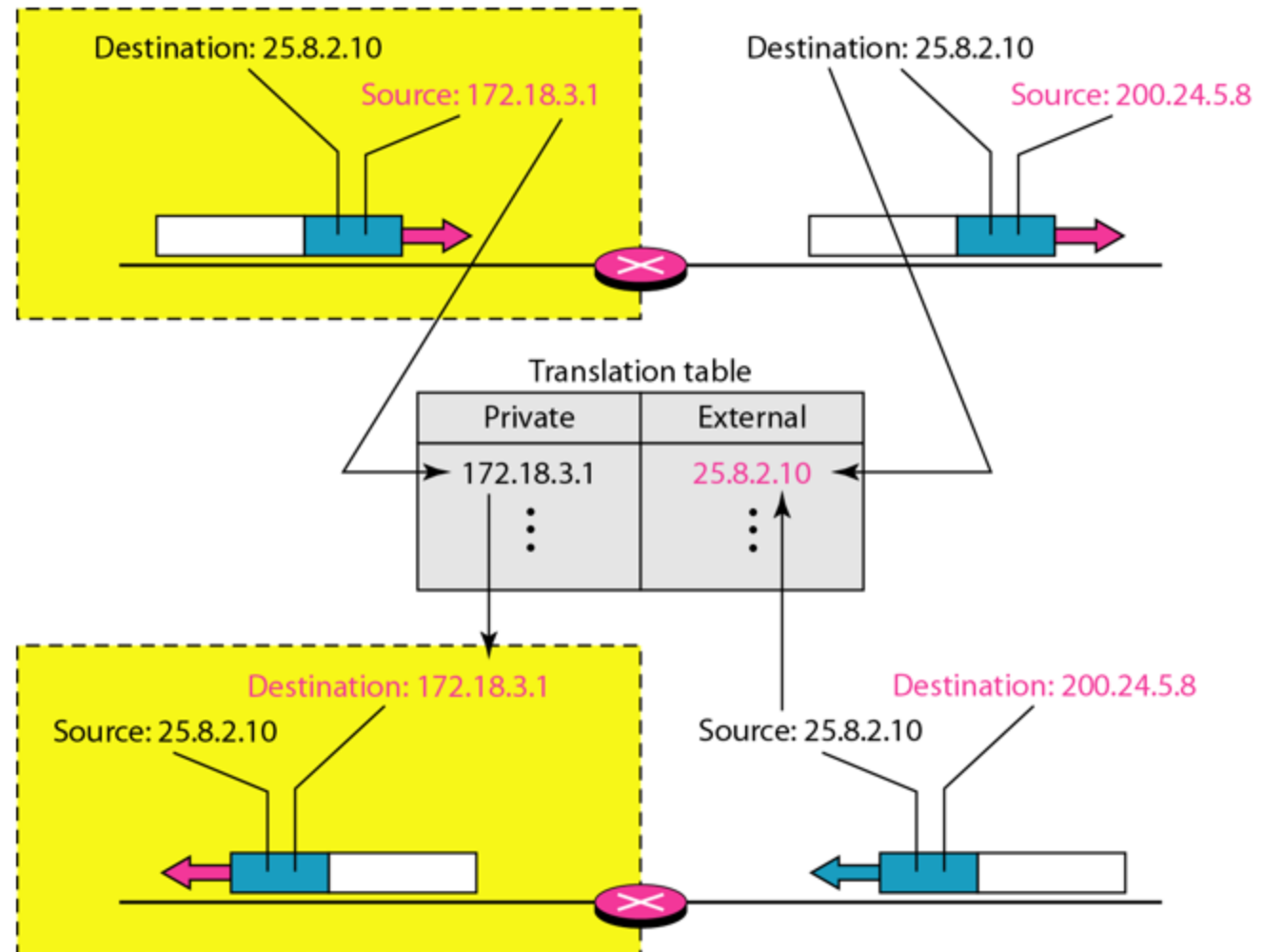
- a. 111.56.045.78
- b. 221.34.7.8.20
- c. 75.45.301.14
- d. 11100010.23.14.67

Solution

- a. There must be no leading zero (045).*
- b. There can be no more than four numbers.*
- c. Each number needs to be less than or equal to 255.*
- d. A mixture of binary notation and dotted-decimal notation is not allowed.*

Figure 19.12 NAT address translation

Using One IP Address In its simplest form, a translation table has only two columns: the private address and the external address (destination address of the packet). When the router translates the source address of the outgoing packet, it also makes note of the destination address-where the packet is going. When the response comes back from the destination, the router uses the source address of the packet (as the external address) to find the private address of the packet. Figure 19.12 shows the idea. Note that the addresses that are changed (translated) are shown in color.



TEXTBOOK OR REFERENCES

- Behrouz A. Forouzan: DATA COMMUNICATIONS AND NETWORKING
- Forouzan, Behrouz A. TCP/IP protocol suite / Behrouz A. Forouzan.—4th ed.