**Learning Tips for Chapter 4**

This chapter provides the most comprehensive description of the OSI model, and it introduces and provides a summary of the TCP/IP whose upper layers are described more fully in Chapter 5 and whose lower layers are described in more detail in Chapters 6 and 7.

Encapsulation and decapsulation are important concepts. The contents of header fields added by senders at each layer inform receivers how to handle data at that layer.

The different types of addressing (port numbers, IP addresses, MAC addresses) are also important to understand.

Technologies map to specific TCP/IP and OSI layers. For example, routers are Layer 3 (Network layer) and switches are Layer 2 (Data Link). Associating a technology to its layer help you understand what it does.

Do not ignore the Key Concepts in Chapter 4 Presentation.

You are also encouraged to leverage the supplement videos and readings for this chapter.

Use the Chapter 4 Problems and Exercises tips to assist with any problems and exercises that you may be assigned.

The appendices for Chapter 4 provide additional information on numerous topics in this chapter.

**Especially Important Sections**

Section 4.2

Section 4.3

Section 4.4 and each of its subsections

**Especially Important Figures and Tables**

*Note:* It is important to read/study the discussion related to each figure and table that is identified.

Table 4-1

Figures 4-4 and 4-5

Table 4-2

Figures 4-6, 4-7, and 4-8

Figure 4-9

Figure 4-10

Figure 4-11

Figure 4-14

Figure 4-15

Table 4-5

Figure 4-17

Figure 4-18

Figure 4-20

Figure 4-24

Figure 4-25

Table 4-6

Figure 4-32

Figure 4-33

Figure 4-35

Figure 4-36

**Especially Important Key Terms**

Address resolution protocol (ARP)

Application layer firewall

Connectionless service

Connection-oriented service

Data encapsulation

Datagram

De-encapsulation

Host

IPsec

Layer 3 switch

Layer 4 switch

Load balancing

Media converter

Network adapter

NAT

Packet filtering

Port

PDU

Router

TLS

**Especially Important Review Questions**

Questions 1-6, 8, 9, 11-16, 20, 21, 23-32

**Especially Important Problems and Exercises**

Exercises 4-2, 4-3, and 4-4