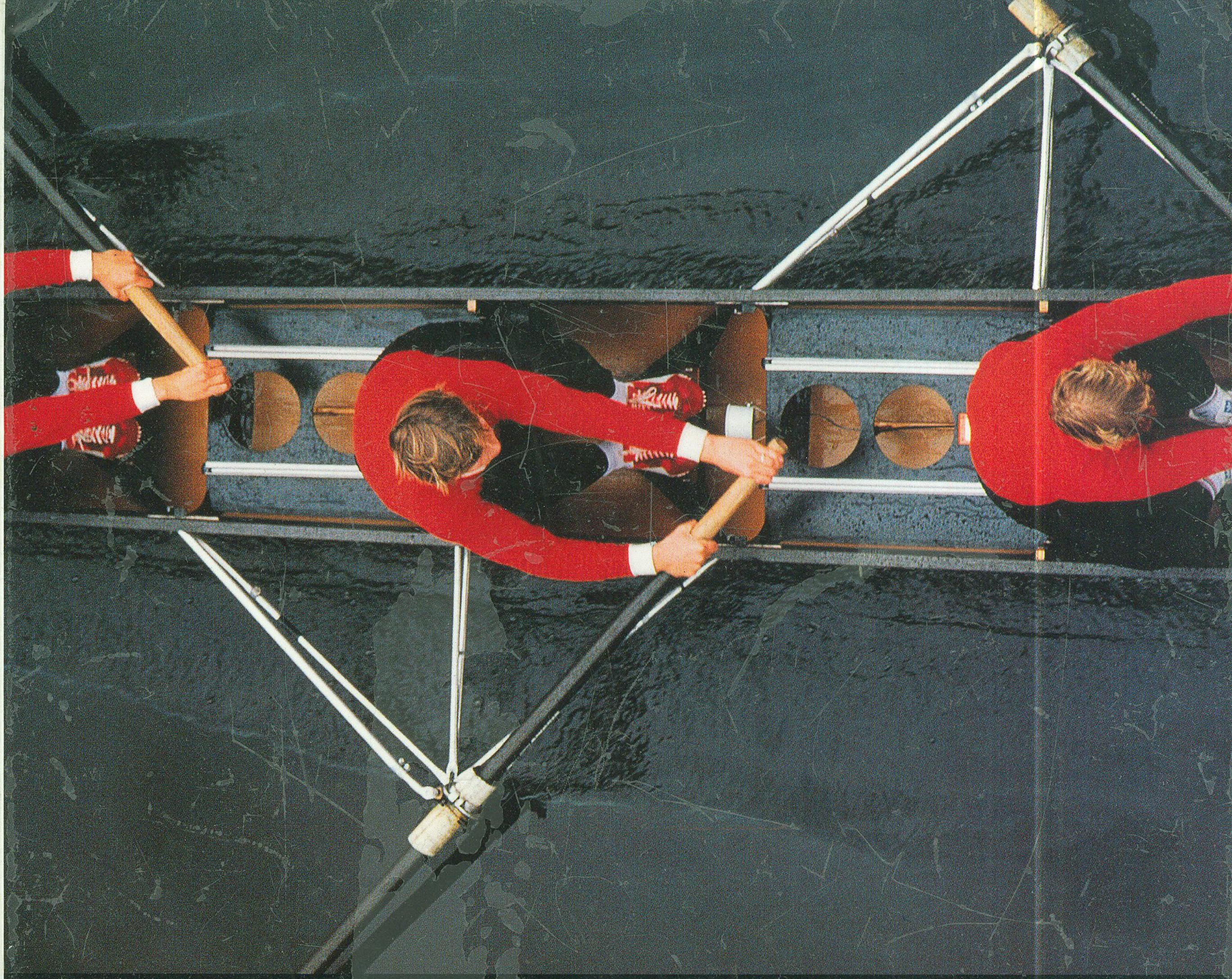

Behrouz A. Forouzan

Data Communications and Networking

2nd edition

DATA COMMUNICATIONS AND NETWORKING

Second Edition

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with

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Preface

Data communications and networking may be the fastest growing technologies in our culture today. One of the ramifications of that growth is a dramatic increase in the number of professions where an understanding of these technologies is essential for success—and a proportionate increase in the number and types of students taking courses to learn about them. Today, students wanting to understand the concepts and mechanisms underlying telecommunications and networking come from a variety of academic and professional backgrounds. To be useful, a textbook on data communications and networking must be accessible to students without technical backgrounds while still providing substance comprehensive enough to challenge more experienced readers. This text is written with this new mix of students in mind.

Features of the Book

Several features of this text are designed to make it particularly easy for students to understand data communications and networking.

Structure

We have used the seven-layer OSI model as the framework for the text not only because a thorough understanding of the model is essential to understanding most current networking theory but also because it is based on a structure of interdependencies: Each layer builds upon the layer beneath it and supports the layer above it. In the same way, each concept introduced in our text builds upon the concepts examined in the previous sections.

The OSI model was chosen because it is a model, not a protocol. The model is independent of any protocol such as TCP/IP, IPX/SPX (Novell), or AppleTalk. We believe that in an introductory course, the model should be understood before the actual protocols are discussed. The OSI model shows the layered architecture necessary for the design of network systems.

This text is designed for students with little or no background in telecommunication or data communication. For this reason, we use a bottom-up approach. In this approach, students can learn first about telecommunications (lower layers) before learning about data communications (upper layers). For example, students can learn

about signaling, encoding, modulating, and error detection before learning about data transfer across the Internet. This eliminates the need for two courses: one for telecommunications and one for data communications.

The first nine chapters emphasize the physical layer, which is essential for understanding the rest of the layers. These chapters are particularly needed for students with no background in networking and telecommunications.

Chapters 10 through 12 describe all issues related to local area networks. Chapter 13 discusses metropolitan area networks. Chapter 14 describes switching techniques as background preparation for wide area networks.

Chapters 15 to 20 discuss topics associated with wide area networks. Chapter 21 discusses the network layer functions and the topic of internetworking local and wide area networks together. Chapters 22 and 23 focus on upper layer protocols (transport, session, presentation, and application layers).

Chapters 24 and 25 are dedicated to the TCP/IP protocol suite. These two chapters give a brief introduction and prepare the students for a course on the TCP/IP protocol suite.

Visual Approach

The book presents highly technical subject matter without complex formulas by using a balance of text and figures. The approximately 700 figures accompanying the text provide a visual and intuitive opportunity for understanding the material. Figures are particularly important in explaining networking concepts, which are based on connections and transmission. These are both often more easily grasped visually than verbally.

For example, Figure 3.8 shows the encapsulation of a network-layer packet in a data-link-layer frame. The figure also shows how network-layer addresses are unchanged compared to the data-link-layer addresses that change from station to station. Another figure, Figure 5.36, shows how an 8-QAM signal can carry three bits in each baud. Figure 8.4 clearly shows how FDM combines three modulated signals into one composite signal. Figures 25.3, 25.4, 25.5, and 25.6 show how the domain name system is divided into three domains: country, generic, and inverse domains.

Highlighted Points

We have repeated important concepts in boxes for quick reference and immediate attention.

Examples and Applications

Whenever appropriate, we have included examples that illustrate the concept introduced in the text. They also help students do the exercises at the end of each chapter.

Also, we have added real-life applications throughout each chapter. For example, in Chapter 8, after a discussion of FDM, we give an application, the analog hierarchy of the telephone system. Similarly, after discussion of TDM, we give an application, the DS hierarchy of the telephone system.

Summary

Each chapter ends with a summary of the material covered in that chapter. The summary is a brief overview of all the important points in the chapter.

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Bạn đang có trong tay thông tin cơ bản của một trong số những tài liệu có hàm lượng chất xám cao, với những thông tin vô cùng hữu ích cho quá trình học tập và nghiên cứu của bản thân bạn !

Bạn đã và đang trải qua những ưu tư, trăn trở của bản thân mình trước biển kiến thức mênh mông vô hạn và đang tìm hướng đi cho riêng mình bằng việc biến kiến thức thành tài sản tri thức của riêng bạn !

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THƯ VIỆN

Cùng với bạn, Thư viện ĐH Sư phạm Kỹ thuật Tp. HCM mong ước góp phần duy trì và phát triển văn hóa đọc !

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Thông tin tài trợ dự án!