



国外高校电子信息类优秀教材

网络通信技术

Network Communications Technology



(英文影印版)

Ata Elahi 著



科学出版社

THOMSON
DELMAR

汤姆森学习出版集团

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内 容 简 介

本书为国外高校电子信息类优秀教材(英文影印版)之一。

本书介绍了通信和网络的基础知识以及网络涉及的技术层面,包括数据通信介质、调制解调技术、计算机协议、以太网、令牌环网、局域网、开关技术、网络互连、光纤分布数据接口、SONET 组件、窄带 ISDN、帧延迟技术、Internet 结构、ATM 网络等,并简述了网络操作系统。

本书不仅可作为电子技术、电子工程和计算机专业的本科生教材,还可作为社会培训教材,并可供 IT 业技术人员参考。

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By Ata Elahi

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Preface

This book is a result of my teaching the course, Data Communications and Computer Networks at Southern Connecticut State University since 1987. The book covers the technology aspect of networks, rather than the theories of networks. The beta version of this textbook was tested in undergraduate level computer network courses at Southern Connecticut State University. The textbook covers networking using a *direct, practical approach* that explains the technology in simple terms. This book covers the latest topics in networking technology, such as Digital Subscriber Line (DSL), cable modems, asynchronous transfer mode (ATM), Fast Ethernet, LAN switching, and Gigabit Ethernet.

Intended Audience

This book is written primarily as an introduction to networking for students majoring in computer science technology, electronics technology, or engineering. The readability is clear and easy to understand for those in technical colleges, while the broad range of topics is appealing for those in higher level courses. For students in business application and CIS courses, the instructor may wish to omit parts of the text.

Organization

The material in this textbook is presented *practically* rather than taking a theoretical and mathematical approach. Therefore, no specialized background is required to understand the material; the first three chapters of this book form the foundation for the rest of the text. I have opted to focus on the technology aspect of networks, so each technology is presented in a separate chapter. In addition, I offer a brief introduction to computer architecture, because networks are simply another part of the computer.

Chapter 1 is an introduction to computer networks, network topologies, and types of networks.

Chapter 2 covers basic data communications, including digital signals, binary numbers, serial and parallel transmission, communication modes, digital encoding, and error detection methods used in networking. This chapter gives students the basic knowledge required for the rest of the textbook.

Chapter 3 presents an overview of computer architecture. The network is part of the computer; therefore, the reader should have a basic knowledge of computer architecture. This chapter covers the basic components of a microcomputer: the CPU, types of memory, and computer buses.

Chapter 4 covers data communication media such as twisted-pair cable, coaxial cable, fiber-optic cable, and wireless communication.

Chapter 5 covers the multiplexer, demultiplexer, types of multiplexers, T1 link architecture, and switching concepts.

Chapter 6 presents modem technology, modulation methods, Digital Subscriber Line (DSL) technology, and cable modem technology.

Chapter 7 explains the function of standards organizations and lists some computer protocols followed by a summary of the Open System Model, which explains the function of each layer. IEEE 802 committee standards are presented.

Chapter 8 covers the Ethernet Network, from operation to technical specifications and cabling. It serves as the foundation for the material on Fast Ethernet and Gigabit Ethernet covered in Chapters 10 and 13.

Chapter 9 explains the operation of a Token Ring Network, token ring technical specifications, and token bus operation.

Chapter 10 presents Fast Ethernet technology, Fast Ethernet repeaters, and different types of media used for Fast Ethernet.

Chapter 11 covers 100VG-AnyLAN networking technology and specifications.

Chapter 12 presents switching technology and its applications. It also covers VLAN operation and Firewall technology.

Chapter 13 explains Gigabit Ethernet technology and the types of media used for Gigabit Ethernet, followed by an explanation of the applications of Gigabit Ethernet.

Chapter 14 presents networking interconnection devices such as repeaters, bridges, routers, and gateways.

Chapter 15 covers Fiber Distributed Data Interface (FDDI) technology and its applications.

- Chapter 16** presents SONET components and architecture.
- Chapter 17** explains Narrowband ISDN and its applications.
- Chapter 18** covers Frame Relay technology applications and components.
- Chapter 19** explains Internet Architecture, Transmission Control Protocol and Internet Protocol, IPv6, and Internet II.
- Chapter 20** covers the application of an ATM network, ATM network components, ATM switch architecture, and ATM adaptation layers.
- Chapter 21** provides a brief overview of Networking Operating Systems, such as Windows NT and Novell NetWare.

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