

计算机科学丛书

# 数据通信与网络

(英文版)

## Introduction to Data Communications and Networking

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机械工业出版社  
China Machine Press



WCB  
McGraw-Hill

Behrouz Forouzan: Introduction to Data Communications and Networking.

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RISBN: 007-1162550

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### 图书在版编目(CIP)数据

数据通信与网络 / (美) 弗鲁赞 (Forouzan, B.) 著. - 影印本. - 北京: 机械工业出版社, 1999.5

(计算机科学丛书)

书名原文: Introduction to Data Communications and Networking

ISBN 7-111-07206-5

I. 数… II. 弗… III. 数据通信 - 通信网 IV. TN919.2

中国版本图书馆CIP数据核字(1999)第10885号

出版人: 马九荣 (北京市百万庄大街22号 邮政编码 100037)

北京市南方印刷厂印刷·新华书店北京发行所发行

1999年5月第1版第1次印刷

787mm × 1092mm 1/16 · 45印张

印数: 0 001 - 5 000册

定价: 59.00元

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# *PREFACE*

Networks and digital communications 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 communication 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 book are designed to make it particularly easy for students to understand data communication.

### **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 first eight 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 or telecommunication.

Chapters 9 through 13 describe all issues related to the data link layer. Chapters 14 to 20 discuss topics associated with the network layer. Chapter 21 describes the transport layer. Chapter 22 focuses on upper layers, which are normally combined in most protocols.

Chapter 23 describes one of the most important protocols, TCP/IP.

### **Visual Approach**

The book presents highly technical subject matter without complex formulas, 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, both often more easily grasped visually than verbally.

### **Highlighted Points**

Important concepts have been repeated in colored boxes for quick reference and immediate attention.

### **Examples and Applications**

Whenever appropriate, we have included examples that illustrate the concept introduced in the text. Also, real-life applications have been added throughout each chapter to motivate students.

### **Summary**

Each chapter ends with a summary of the material covered by that chapter. The summary is a bulleted overview of all the key points in the chapter.

### **Practice Set**

Each chapter includes a practice set designed to reinforce salient concepts and encourage students to apply them. It consists of two parts: multiple choice questions and exercises. Multiple choice questions are designed to test students' grasp of basic concepts and terminology. Exercises require deeper understanding of the material.

### **Appendixes**

The appendixes are intended to provide quick reference material or a review of materials needed to understand the concepts discussed in the book.

### **Glossary and Acronyms**

The book contains an extensive glossary and a list of acronyms.

### **How to Use the Book**

This book is written for both an academic and a professional audience. The book can be used as a self-study guide for interested professionals. As a textbook, it can be used for a one-semester or one-quarter course. The chapters are organized to provide a great deal of flexibility. The following are some suggestions:

- Chapters 1 through 12 and Chapters 14, 16, 20, 21, and 22 are fundamental to understanding the concepts of data communication and networking.
- Chapters 13, 14, 15, 20, and 23 can also be covered in a quarter or a semester.
- Chapters 17, 18, and 19, which discuss the emerging technologies, can be covered if time permits.

## Acknowledgments

It is obvious that the development of a book of this scope needs the support of many people. We must first thank the hundreds of students at De Anza College who have used the text and made useful comments. We must also thank the De Anza staff: their encouragement and support materialized the project and contributed to its success. In particular, we thank Sandy Acebo, Richard Gilberg, Martha Kanter, Anne Oney, John Perry, George Rice, Mark Sherby, Orva Stewart, and John Wanlass.

The most important contribution to the development of a book such as this comes from peer reviews. We cannot express our gratitude in words to the many reviewers who spent numerous hours reading the manuscript and providing us with helpful comments and ideas. We would especially like to acknowledge the contributions of the following reviewers:

Russell J. Clark, *University of Dayton*  
 Charles K. Davis, *University of Houston*  
 John W. Gray, *University of Massachusetts at Dartmouth*  
 James M. Frazier, *University of North Carolina at Charlotte*  
 Thomas F. Hain, *University of South Alabama*  
 Paul N. Higbee, *University of North Florida*  
 Seung Bae Im, *California State University at Chico*  
 Rose M. Laird, *Northern Virginia Community College*  
 Jorg Liebeherr, *University of Virginia*  
 Wallace C. Liu, *California State University at Fresno*  
 T. Radhakrishnan, *Concordia University*  
 Peter Maggiacomo, *Sinclair Community College*  
 Larry D. Owens, *California State University at Fresno*  
 Michael Peterson, *Iowa Western Community College*  
 Satya Prakash Saraswat, *Bentley College*  
 Heidi Schmidt, *San Francisco State University*  
 Gordon Springer, *University of Missouri at Columbia*

Special thanks go to the staff of McGraw-Hill. Betsy Jones, our senior editor, proved how a proficient editor can make the impossible, possible. Bradley Kosirog, the assistant editor, gave us help whenever we needed it. Beth Cigler, our project manager, guided us through the production process with enormous enthusiasm. We also thank Heather Burbridge in production, Kiera Cunningham in design, and Janet Renard, the copy editor.

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# *TABLE OF CONTENTS*

## **Chapter 1: INTRODUCTION 1**

### DATA COMMUNICATION 2

Components 3

### NETWORKS 4

Distributed Processing 4

Network Criteria 4

Applications 6

### PROTOCOLS AND STANDARDS 7

Protocols 7

Standards 8

### STANDARDS ORGANIZATIONS 9

Standards Creation Committees 9

Forums 11

Regulatory Agencies 12

### SUMMARY 13

### PRACTICE SET 13

Multiple Choice 13

Exercises 15

## **Chapter 2: BASIC CONCEPTS 17**

### LINE CONFIGURATION 17

Point-to-Point 18

Multipoint 18

### TOPOLOGY 18

Mesh 19

Star 21

Tree 21

Bus 22

Ring 23

Hybrid Topologies 24

TRANSMISSION MODE	24
Simplex	25
Half-Duplex	25
Full-Duplex	25
CATEGORIES OF NETWORKS	26
Local Area Network (LAN)	26
Metropolitan Area Network (MAN)	28
Wide Area Network (WAN)	28
INTERNETWORKS	29
SUMMARY	30
PRACTICE SET	30
Multiple Choice	30
Exercises	32
<b>Chapter 3: THE OSI MODEL</b>	<b>35</b>
THE MODEL	35
Layered Architecture	35
FUNCTIONS OF THE LAYERS	39
Physical Layer	39
Data Link Layer	40
Network Layer	41
Transport Layer	43
Session Layer	45
Presentation Layer	47
Application Layer	48
Summary of Layer Functions	49
SUMMARY	49
PRACTICE SET	50
Multiple Choice	50
Exercises	53
<b>Chapter 4: SIGNALS</b>	<b>55</b>
ANALOG AND DIGITAL	55
APERIODIC AND PERIODIC SIGNALS	57
Periodic Signals	57
Aperiodic Signals	58
ANALOG SIGNALS	59
Simple Analog Signals	59
Complex Signals	64
Frequency Spectrum and Bandwidth	65
DIGITAL SIGNALS	67
Amplitude, Period, and Phase	67
Decomposition of a Digital Signal	68
Medium Bandwidth and Significant Bandwidth	69
Medium Bandwidth and Data Rate: Channel Capacity	70
Use of Analog Signals to Transmit Digital Data	71
MATHEMATICAL APPROACH (OPTIONAL)	73



SUMMARY 74

PRACTICE SET 75

Multiple Choice 75

Exercises 77

## **Chapter 5: ENCODING 79**

DIGITAL-TO-DIGITAL ENCODING 79

Unipolar 80

Polar 82

Bipolar 85

ANALOG-TO-DIGITAL ENCODING 90

Pulse Amplitude Modulation (PAM) 91

Pulse Code Modulation (PCM) 92

Sampling Rate 94

DIGITAL-TO-ANALOG ENCODING 95

Aspects of Digital-to-Analog Encoding 95

Amplitude Shift Keying (ASK) 96

Frequency Shift Keying (FSK) 99

Phase Shift Keying (PSK) 101

Quadrature Amplitude Modulation (QAM) 104

Bit/Baud Comparison 106

ANALOG-TO-ANALOG ENCODING 107

Amplitude Modulation (AM) 108

Frequency Modulation (FM) 110

Phase Modulation (PM) 112

SUMMARY 112

PRACTICE SET 114

Multiple Choice 114

Exercises 118

## **Chapter 6: TRANSMISSION OF DIGITAL DATA: INTERFACES AND MODEMS 121**

DIGITAL DATA TRANSMISSION 121

Parallel Transmission 122

Serial Transmission 123

DTE-DCE INTERFACE 125

Data Terminal Equipment (DTE) 126

Data Circuit-Terminating Equipment (DCE) 126

Standards 127

EIA-232 Interface 127

OTHER INTERFACE STANDARDS 134

EIA-449 134

EIA-530 138

X.21 139

MODEMS 140

Transmission Rate 142

Modem Standards 145

SUMMARY	152
PRACTICE SET	154
Multiple Choice	154
Exercises	160

## **Chapter 7: TRANSMISSION MEDIA    163**

GUIDED MEDIA	164
Twisted-Pair Cable	164
Coaxial Cable	168
Optical Fiber	169
UNGUIDED MEDIA	176
Radio Frequency Allocation	176
Propagation of Radio Waves	176
Terrestrial Microwave	181
Satellite Communication	182
Cellular Telephony	184
PERFORMANCE	187
SUMMARY	188
PRACTICE SET	190
Multiple Choice	190
Exercises	195

## **Chapter 8: MULTIPLEXING    197**

MANY TO ONE/ONE TO MANY	197
TYPES OF MULTIPLEXING	198
Frequency-Division Multiplexing (FDM)	199
Time-Division Multiplexing (TDM)	202
Inverse Multiplexing	209
MULTIPLEXING APPLICATION:	
THE TELEPHONE SYSTEM	210
Common Carrier Services and Hierarchies	210
Analog Services	211
Digital Services	213
SUMMARY	219
PRACTICE SET	220
Multiple Choice	220
Exercises	223

## **Chapter 9: ERROR DETECTION AND CORRECTION    225**

TYPES OF ERRORS	225
Single-Bit Error	226
Multiple-Bit Error	226
Burst Error	227
DETECTION	227
Redundancy	227
Vertical Redundancy Check (VRC)	228

Longitudinal Redundancy Check (LRC)	230
Cyclic Redundancy Check (CRC)	232
Checksum	235
<b>ERROR CORRECTION</b>	<b>237</b>
Single-Bit Error Correction	237
Hamming Code	238
Multiple-Bit Error Correction	241
<b>SUMMARY</b>	<b>242</b>
<b>PRACTICE SET</b>	<b>243</b>
Multiple Choice	243
Exercises	245
<b>Chapter 10: DATA LINK CONTROL</b>	<b>247</b>
<b>LINE DISCIPLINE</b>	<b>248</b>
ENQ/ACK	248
<b>FLOW CONTROL</b>	<b>253</b>
Stop-and-Wait	253
Sliding Window	255
<b>ERROR CONTROL</b>	<b>258</b>
Automatic Repeat Request (ARQ)	258
Stop-and-Wait ARQ	259
Sliding Window ARQ	261
<b>SUMMARY</b>	<b>267</b>
<b>PRACTICE SET</b>	<b>268</b>
Multiple Choice	268
Exercises	270
<b>Chapter 11: DATA LINK PROTOCOLS</b>	<b>273</b>
<b>ASYNCHRONOUS PROTOCOLS</b>	<b>274</b>
XMODEM	274
YMODEM	275
ZMODEM	275
BLAST	275
Kermit	275
<b>SYNCHRONOUS PROTOCOLS</b>	<b>276</b>
<b>CHARACTER-ORIENTED PROTOCOLS</b>	<b>276</b>
Binary Synchronous Communication (BSC)	277
BSC Frames	278
Data Transparency	281
<b>BIT-ORIENTED PROTOCOLS</b>	<b>282</b>
HDLC	284
Frames	286
More about Frames	291
Link Access Procedures	300
<b>SUMMARY</b>	<b>300</b>
<b>PRACTICE SET</b>	<b>302</b>
Multiple Choice	302
Exercises	304

**Chapter 12: LOCAL AREA NETWORKS 307****PROJECT 802 307**

IEEE 802.1 309

LLC 309

MAC 309

Protocol Data Unit (PDU) 309

**ETHERNET 310**

Access Method: CSMA/CD 311

Addressing 312

Electrical Specification 312

Frame Format 312

Implementation 314

**TOKEN BUS 319****TOKEN RING 319**

Access Method: Token Passing 319

Addressing 321

Electrical Specification 322

Frame Formats 322

Implementation 325

**FDDI 327**

Access Method: Token Passing 327

Addressing 330

Electrical Specification 330

Frame Format 332

Implementation: Physical Medium Dependent (PMD) Layer 333

**COMPARISON 335****SUMMARY 335****PRACTICE SET 337**

Multiple Choice 337

Exercises 341

**Chapter 13: METROPOLITAN AREA NETWORKS 343****IEEE 802.6 343**

Access Method: Dual Bus 343

Distributed Queues 346

Ring Configuration 348

Operation: DQDB Layers 349

Implementation 350

**SMDS 351**

Connection and Access 352

**SUMMARY 353****PRACTICE SET 354**

Multiple Choice 354

Exercises 355

**Chapter 14: SWITCHING: A NETWORK LAYER FUNCTION 357**

CIRCUIT SWITCHING	358
Space-Division Switches	359
Time-Division Switches	362
Space- and Time-Division Switching Combinations	364
PACKET SWITCHING	365
Datagram Approach	366
Virtual Circuit Approach	367
MESSAGE SWITCHING	369
NETWORK LAYER	370
Connection-Oriented and Connectionless Services	370
SUMMARY	371
PRACTICE SET	372
Multiple Choice	372
Exercises	374

**Chapter 15: INTEGRATED SERVICES DIGITAL NETWORK (ISDN) 375**

SERVICES	375
Bearer Services	375
Teleservices	376
Supplementary Services	376
HISTORY	376
Voice Communication over Analog Networks	376
Voice and Data Communication over Analog Networks	377
Analog and Digital Services to Subscribers	377
Integrated Digital Network (IDN)	378
Integrated Services Digital Network (ISDN)	379
SUBSCRIBER ACCESS TO THE ISDN	380
B Channels	380
D Channels	380
H Channels	381
User Interfaces	381
Functional Grouping	383
Reference Points	385
THE ISDN LAYERS	385
Physical Layer	387
Data Link Layer	392
Network Layer	394
BROADBAND ISDN	398
Services	399
Physical Specifications	400
SUMMARY	401
PRACTICE SET	403
Multiple Choice	403
Exercises	407

**Chapter 16: X.25 409****X.25 LAYERS 409**

- Physical Layer 410
- Data Link Layer 410
- Network Layer 410

**PACKET LAYER PROTOCOL 411**

- Information Packets 411
- Control Packets 413
- Complete Packet Sequence 417
- Virtual Channel ID Numbers 418

**SUMMARY 419****PRACTICE SET 419**

- Multiple Choice 419
- Exercises 421

**Chapter 17: FRAME RELAY 423****FRAME RELAY LAYERS 424**

- Physical Layer 424
- Data Link Layer 425

**FRAME RELAY OPERATION 426**

- Relay 427
- Switching 427
- Congestion Control 429

**IMPLEMENTATION 429****SUMMARY 430****PRACTICE SET 431**

- Multiple Choice 431
- Exercises 432

**Chapter 18: ATM 433****DESIGN GOALS 433**

- Packet Networks 434
- Mixed Network Traffic 434
- Cell Networks 435
- Additional Advantages of ATM 439

**ATM TOPOLOGY 440****ATM PROTOCOL ARCHITECTURE 442**

- Application Adaptation Layer (AAL) 442
- ATM Layer 449
- Physical Layer 453

**SUMMARY 453****PRACTICE SET 454**

- Multiple Choice 454
- Exercises 456

**Chapter 19: SONET/SDH 459**

SYNCHRONOUS TRANSPORT SIGNALS 460

PHYSICAL CONFIGURATION 461

SONET Devices 461

Sections, Lines, and Paths 462

SONET LAYERS 462

Photonic Layer 462

Section Layer 462

Line Layer 463

Path Layer 463

Device-Layer Relationships 463

THE SONET FRAME 463

Frame Format 464

Section Overhead 466

Line Overhead 466

Path Overhead 468

Virtual Tributaries 469

Types of VTs 469

MULTIPLEXING STS FRAMES 470

SUMMARY 471

PRACTICE SET 472

Multiple Choice 472

Exercises 475

**Chapter 20: NETWORKING AND INTERNETWORKING  
DEVICES 477**

REPEATERS 478

Not an Amplifier 480

BRIDGES 480

Types of Bridges 482

ROUTERS 483

Routing Concepts 485

GATEWAYS 487

ROUTING ALGORITHMS 487

Distance Vector Routing 488

Link State Routing 495

SUMMARY 502

PRACTICE SET 503

Multiple Choice 503

Exercises 506

**Chapter 21: TRANSPORT LAYER 507**

DUTIES OF THE TRANSPORT LAYER 508

End-to-End Delivery 508

Addressing 509

Reliable Delivery 510

Flow Control	513
Multiplexing	514
CONNECTION	516
Connection Establishment	516
Connection Termination	517
THE OSI TRANSPORT PROTOCOL	517
Transport Classes	517
Transport Protocol Data Unit (TPDU)	518
Connection-Oriented and Connectionless Services	519
SUMMARY	520
PRACTICE SET	521
Multiple Choice	521
Exercises	523
<b>Chapter 22:</b>	<b><i>UPPER OSI LAYERS</i></b>
	<b>525</b>
SESSION LAYER	525
Session and Transport Interaction	526
Synchronization Points	527
Session Protocol Data Unit	528
PRESENTATION LAYER	529
Translation	529
Encryption/Decryption	531
Authentication	534
Data Compression	536
APPLICATION LAYER	538
Message Handling System (MHS)	538
File Transfer, Access, and Management (FTAM)	540
Virtual Terminal (VT)	541
Directory Services (DS)	542
Common Management Information Protocol (CMIP)	543
SUMMARY	545
PRACTICE SET	546
Multiple Choice	546
Exercises	548
<b>Chapter 23:</b>	<b><i>TCP/IP</i></b>
	<b>549</b>
OVERVIEW OF TCP/IP	549
TCP/IP and the Internet	549
TCP/IP and OSI	550
Encapsulation	550
NETWORK LAYER	551
Internetwork Protocol (IP)	551
Other Protocols in the Network Layer	556
TRANSPORT LAYER	558
User Datagram Protocol (UDP)	559
Transmission Control Protocol (TCP)	559



APPLICATION LAYER	562
Domain Name System (DNS)	563
TELNET	564
File Transfer Protocols	566
File Access Using NFS and RPC	568
Electronic Mail: SMTP	569
Simple Network Management Protocol (SNMP)	571
Gopher	573
Archie	573
Veronica	573
Wide Area Information Service (WAIS)	574
Hypertext Transfer Protocol (HTTP)	574
WORLD WIDE WEB (WWW)	574
Uniform Resource Locator (URL)	575
Browser Architecture	577
SUMMARY	581
PRACTICE SET	583
Multiple Choice	583
Exercises	590
<b>Appendix A:</b>	<i>ASCII AND EBCDIC CODES</i> 593
<b>Appendix B:</b>	<i>NUMBERING SYSTEMS AND TRANSFORMATION</i> 595
<b>Appendix C:</b>	<i>REPRESENTATION OF BINARY NUMBERS</i> 607
<b>Appendix D:</b>	<i>ONE'S COMPLEMENT ARITHMETIC FOR CHECKSUM CALCULATION</i> 615
<b>Appendix E:</b>	<i>FOURIER ANALYSIS</i> 619
<b>Appendix F:</b>	<i>HARDWARE EQUIPMENT FOR ERROR DETECTION</i> 623
<b>Appendix G:</b>	<i>HUFFMAN CODING</i> 631
<b>Appendix H:</b>	<i>IP VERSION 6</i> 639
ACRONYMS	643
GLOSSARY	647
REFERENCES	675
INDEX	677