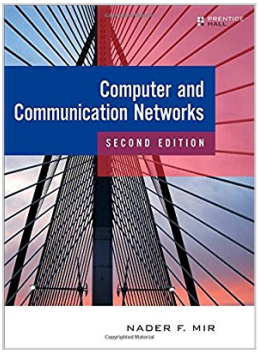

Computer and Communication Networks (2nd Edition)

By Nader F. Mir

Computer and Communication Networks (2nd Edition) By Nader F. Mir

Computer and Communication Networks, Second Edition, **explains the modern technologies of networking and communications, preparing you to analyze and simulate complex networks, and to design cost-effective networks for emerging requirements. Offering uniquely balanced coverage of basic and advanced topics, it teaches through case studies, realistic examples and exercises, and intuitive illustrations.**

Nader F. Mir establishes a solid foundation in basic networking concepts; TCP/IP schemes; wireless and LTE networks; Internet applications, such as Web and e-mail; and network security. Then, he delves into both network analysis and advanced networking protocols, VoIP, cloud-based multimedia networking, SDN, and virtualized networks.

In this new edition, Mir provides updated, practical, scenario-based information that many networking books lack, offering a uniquely effective blend of theory and implementation. Drawing on extensive field experience, he presents many contemporary applications and covers key topics that other texts overlook, including P2P and voice/video networking, SDN, information-centric networking, and modern router/switch design.

Students, researchers, and networking professionals will find up-to-date, thorough coverage of

- Packet switching
- Internet protocols (including IPv6)
- Networking devices
- Links and link interfaces
- LANs, WANs, and Internetworking
- Multicast routing, and protocols
- Wide area wireless networks and LTE
- Transport and end-to-end protocols
- Network applications and management
- Network security
- Network queues and delay analysis

- Advanced router/switch architecture
- QoS and scheduling
- Tunneling, VPNs, and MPLS
- All-optical networks, WDM, and GMPLS
- Cloud computing and network virtualization
- Software defined networking (SDN)
- VoIP signaling
- Media exchange and voice/video compression
- Distributed/cloud-based multimedia networks
- Mobile ad hoc networks
- Wireless sensor networks

Key features include

- More than three hundred fifty figures that simplify complex topics
- Numerous algorithms that summarize key networking protocols and equations
- Up-to-date case studies illuminating concepts and theory
- Approximately four hundred exercises and examples honed over Mir’s twenty years of teaching networking

Computer and Communication Networks (2nd Edition)

By Nader F. Mir

Computer and Communication Networks (2nd Edition) By Nader F. Mir

Computer and Communication Networks, Second Edition, **explains the modern technologies of networking and communications, preparing you to analyze and simulate complex networks, and to design cost-effective networks for emerging requirements. Offering uniquely balanced coverage of basic and advanced topics, it teaches through case studies, realistic examples and exercises, and intuitive illustrations.**

Nader F. Mir establishes a solid foundation in basic networking concepts; TCP/IP schemes; wireless and LTE networks; Internet applications, such as Web and e-mail; and network security. Then, he delves into both network analysis and advanced networking protocols, VoIP, cloud-based multimedia networking, SDN, and virtualized networks.

In this new edition, Mir provides updated, practical, scenario-based information that many networking books lack, offering a uniquely effective blend of theory and implementation. Drawing on extensive field experience, he presents many contemporary applications and covers key topics that other texts overlook, including P2P and voice/video networking, SDN, information-centric networking, and modern router/switch design.

Students, researchers, and networking professionals will find up-to-date, thorough coverage of

- Packet switching
- Internet protocols (including IPv6)
- Networking devices
- Links and link interfaces
- LANs, WANs, and Internetworking
- Multicast routing, and protocols
- Wide area wireless networks and LTE
- Transport and end-to-end protocols
- Network applications and management
- Network security
- Network queues and delay analysis
- Advanced router/switch architecture
- QoS and scheduling
- Tunneling, VPNs, and MPLS
- All-optical networks, WDM, and GMPLS
- Cloud computing and network virtualization
- Software defined networking (SDN)
- VoIP signaling
- Media exchange and voice/video compression
- Distributed/cloud-based multimedia networks
- Mobile ad hoc networks
- Wireless sensor networks

Key features include

- More than three hundred fifty figures that simplify complex topics
- Numerous algorithms that summarize key networking protocols and equations
- Up-to-date case studies illuminating concepts and theory
- Approximately four hundred exercises and examples honed over Mir’s twenty years of teaching networking

Computer and Communication Networks (2nd Edition) By Nader F. Mir Bibliography

- Sales Rank: #1538034 in Books
- Published on: 2014-12-28
- Original language: English
- Number of items: 1
- Dimensions: 9.20" h x 2.00" w x 7.30" l, .0 pounds
- Binding: Hardcover
- 912 pages

Editorial Review

From the Back Cover

As the number and variety of communication services grow, so do the challenges of designing cost-effective networks that meet the requirements of emerging technologies in wireless, sensor, and mesh networks. ***Computer and Communication Networks*** is the first book to offer balanced coverage of all these topics using extensive case studies and examples.

This essential reference begins by providing a solid foundation in TCP/IP schemes, wireless networking, Internet applications, and network security. The author then delves into the field's analytical aspects and advanced networking protocols.

Students and researchers will find up-to-date, comprehensive coverage of fundamental and advanced networking topics, including:

- Packet-switched networks and Internet Network protocols
- Links
- LAN Protocols
- Wireless Networks
- Transport Protocols
- Applications and Management
- Network Security
- Delay Analysis
- QoS
- High speed protocols
- Voice over IP
- Optical Networks
- Multicasting Protocols
- Compression of Voice and Video
- Sensor/Mesh Networks

Network architecture books are often criticized for not offering enough practical, scenario-based information. ***Computer and Communication Networks*** provides an effective blend of theory and implementation not found in other books.

Key features include:

- Figures and images that simplify complex topics
- Equations and algorithms
- Case studies that further explain concepts and theory
- Exercises and examples honed through the author's twelve years of teaching about networking

Overall, readers will find a thorough design and performance evaluation that provides a foundation for developing the ability to analyze and simulate complex communication networks.

About the Author

Nader F. Mir , professor and former associate chair at San Jose State University's Electrical Engineering Department, directs its off-campus graduate program for Silicon Valley companies. A senior member of IEEE, he regularly consults on patent litigation for leading companies related to communications and networking. Internationally known for his scholarly work, he has spoken at many leading conferences, published nearly one hundred refereed papers, and is currently technical editor of *IEEE Communication* magazine.

This textbook represents more than a decade of work. During this time, some material became obsolete and had to be deleted. In my days as a telecommunication engineer and a university professor, much has changed in the fields of data communications and computer networks. Nonetheless, this text covers both the foundations and the latest advanced topics of computer networking.

The Internet is a revolutionary communication vehicle by which we all conveniently communicate every day and do business with one another. Because of its complexities at both hardware and software levels, the Internet is a challenge to those who want to study this field. The growing number and variety of communication services offer obvious challenges for computer network experts in designing cost-effective networks to meet the requirements of emerging communication systems. This book fills the gaps in current available texts.

Objectives

This textbook offers a mix of theory, architecture, and applications. The lack of computer communications books presenting moderate analysis with detailed drawing figures covering both wireline and wireless communication technologies led me to write this book. The main objective of this book is to help readers learn the fundamentals and certain advance concepts of computer and communication networks, using a unified set of symbols throughout a single textbook. The preparation of this book responds to the explosive demand for learning computer communication science and engineering.

This book targets two groups of people. For people in academia, at both the undergraduate and graduate levels, the book provides a thorough design and performance evaluation of communication networks. The book can also give researchers the ability to analyze and simulate complex communication networks. For engineers who want to work in the communication and networking industry and need a reference covering various angles of computer networks, this book provides a variety of learning techniques: exercises, case studies, and computer simulation projects. The book makes it easy and fun for an engineer to review and learn from a reliable networking reference covering all the necessary concepts and performance models.

Organization of This Book

It would be impossible to cover all networking subjects in one textbook. The range of topics presented in this text, however, allows instructors to choose the topics best suited for their classes. Besides the explanations provided for each chapter, readers will learn how to model a communication network and how to mathematically analyze them. Readers of this text will benefit from the combination of theory and applications presented in each chapter, with the more theoretical portions of each chapter challenging those readers who are more ambitious. This book is organized into 20 chapters in two main parts as follows:

The ten chapters of Part I cover the fundamental topics in computer networking, with each chapter serving as a base for the following chapter. Part I of the book begins with an overview of networking, focusing on TCP/IP schemes, describing wireless networking, and ending with a discussion of the World Wide Web (WWW) and network security. Part I is most appropriate for readers with no experience in computer communications. The ten chapters in Part II cover detailed analytical aspects and a closer perspective of advanced networking protocols: switches, routers, multiplexers, delay and congestion analysis, multimedia networking, multicasting, data compression, voice over IP, optical networks, and sensor networks.

Chapter 1, Packet-Switched Networks, introduces computer networks, touching on the need for networks, explaining relevant packet-switched networks, and giving an overview of today's Internet. Fundamental concepts, such as messages, packets, and frames and packet switching versus circuit switching, are defined. Various types of packet-switched networks are defined, and how a message can be handled by either connection-oriented networks or connectionless networks is explained. Finally, this chapter presents a detailed analysis of packet size and optimizations.

Chapter 2, Foundation of Networking Protocols, presents the basics of the five-layer Internet Protocol reference model, as well as other protocols: the seven-layer OSI model and the equal-size packet protocol model.

Chapter 3, Networking Devices, introduces the overall architectures of networking devices, such as multiplexers, modems, and switching devices. Multiplexers are used in all layers of network. Networking modems are used for access to the Internet from remote and residential areas. Finally, switching devices, such as hubs, bridges, switches, and routers, are used to switch packets from one path to another.

Chapter 4, Data Links and Transmission, focuses on the links and transmission interfaces, the two basic components that networking starts with. This chapter presents both wired and wireless links and describes their characteristics, advantages, and channel access methods. This chapter also presents various error-detection and correction techniques at the link level and discusses the integrity of transmitted data. The chapter ends by presenting link-layer stop-and-wait and sliding-window flow control.

Chapter 5, Local Area Networks and Networks of LANs, explores the implementation of small networks, using the functional aspects of the fundamental knowledge gained in Chapters 2, 3, and Chapter 4 on basic protocols, devices, and links, respectively. The chapter provides some pointers for constructing a network with those devices and making connections, gives several examples of local area networks (LANs), and explains how such LANs are internetworked.

Chapter 6, Wireless Networks and Mobile IP, presents the basics of wireless networking. The chapter discusses challenges in designing a wireless network: management of mobility, network reliability, and frequency reuse. Next, the chapter presents an overview of wireless communication systems at all levels, from satellite to local-area networks and discusses wireless LANs and such standards as IEEE 802.11. The chapter then shifts to cellular networks, one of the main backbones of our wireless networking infrastructure. Mobile IP and Wireless mesh networks (WMNs), including WiFi and WiMAX technologies, are introduced

at the end of this chapter.

Chapter 7, Routing and Internetworking, focuses on routing in wide area networks (WANs) and introduces related routing algorithms and protocols. Our networking infrastructure is clearly classified into those networks that use optimal routes and those that use nonoptimal routes. These two classes of algorithms are described in detail. Routing protocols are also classified as those that are applied within a domain and those that are applied beyond a domain. This chapter also presents congestion-control algorithms: network-congestion control and link-flow control. The chapter also looks at random early detection for congestion control and describes a useful technique to estimate the link-blocking probability.

Chapter 8, Transport and End-to-End Protocols, first looks at the basics of the transport layer and demonstrates how a simple file is transferred. This layer handles the details of data transmission. Several techniques for transmission control and protocol (TCP) congestion control are discussed. Next, congestion-avoidance methods, which are methods of using precautionary algorithms to avoid a possible congestion in a TCP session, are presented. The chapter ends with a discussion of methods of ATM congestion control. Chapter 9, Applications and Network Management, presents the fundamentals of the application layer, which determines how a specific user application should use a network. Among the applications are the Domain Name System (DNS); e-mail protocols, such as SMTP, and the World Wide Web (WWW).

Chapter 10, Network Security, focuses on security aspects of networks. After introducing network threats, hackers, and attacks, this chapter discusses encryption techniques: public-and private-key protocols, encryption standards, key-exchange algorithms, authentication methods, digital signature and secure connections, firewalls, IPsec, and security methods for virtual private networks.

Chapter 11, Packet Queues and Delay Analysis, begins Part II, discussing Little's theorem, Markov chain theorem, and birth and death processes. Queueing-node models are presented with several scenarios: finite versus infinite queueing capacity, one server versus several servers, and Markovian versus non-Markovian systems. Non-Markovian models are essential for many network applications, as multimedia traffic cannot be modeled by Markovian patterns. In addition, delay analysis, based on networks of queues, is discussed. Burke's theorem is applied in both serial and parallel queueing nodes. Jackson's theorem is presented for situations in which a packet visits a particular queue more than once, resulting in loops or feedback.

Chapter 12, Quality of Service and Resource Allocation, covers quality-of-service issues in networking. The two broad categories of QoS discussed are the integrated services approach, for providing service quality to networks that require maintaining certain features in switching nodes; and the differentiated services approach (DiffServ), which is based on providing quality-of-service support to a broad class of applications. These two categories include a number of QoS protocols and architectures, such as traffic shaping, admission control, packet scheduling, reservation methods, the Resource Reservation Protocol (RSVP), and traffic conditioner and bandwidth broker methods. This chapter also explains fundamentals of resource allocation in data networks.

Chapter 13, Networks in Switch Fabrics, looks inside switch fabrics of such Internet devices as routers. The chapter begins by classifying characteristics of switching networks and presenting features and basic definitions of switch fabrics. As the building blocks of switching ...

Users Review

From reader reviews:

Frances Feist:

This book untitled Computer and Communication Networks (2nd Edition) to be one of several books that will best seller in this year, that is because when you read this e-book you can get a lot of benefit onto it. You will easily to buy that book in the book store or you can order it via online. The publisher of this book sells the e-book too. It makes you quicker to read this book, since you can read this book in your Smart phone. So there is no reason for your requirements to past this e-book from your list.

Charles Duda:

Reading a e-book can be one of a lot of action that everyone in the world enjoys. Do you like reading book so. There are a lot of reasons why people enjoy it. First reading a e-book will give you a lot of new facts. When you read a e-book you will get new information due to the fact book is one of several ways to share the information as well as their idea. Second, examining a book will make a person more imaginative. When you reading a book especially tale fantasy book the author will bring you to definitely imagine the story how the personas do it anything. Third, you may share your knowledge to other people. When you read this Computer and Communication Networks (2nd Edition), it is possible to tells your family, friends and soon about yours reserve. Your knowledge can inspire the others, make them reading a e-book.

Enrique Hayes:

In this period of time globalization it is important to someone to get information. The information will make a professional understand the condition of the world. The condition of the world makes the information quicker to share. You can find a lot of referrals to get information example: internet, paper, book, and soon. You can see that now, a lot of publisher in which print many kinds of book. The actual book that recommended for your requirements is Computer and Communication Networks (2nd Edition) this reserve consist a lot of the information on the condition of this world now. This particular book was represented how can the world has grown up. The terminology styles that writer use for explain it is easy to understand. The actual writer made some research when he makes this book. That is why this book suitable all of you.

John Smith:

Reserve is one of source of knowledge. We can add our know-how from it. Not only for students but in addition native or citizen require book to know the revise information of year to year. As we know those ebooks have many advantages. Beside all of us add our knowledge, also can bring us to around the world. With the book Computer and Communication Networks (2nd Edition) we can take more advantage. Don't you to be creative people? To be creative person must prefer to read a book. Just choose the best book that appropriate with your aim. Don't possibly be doubt to change your life by this book Computer and Communication Networks (2nd Edition). You can more appealing than now.

Read Computer and Communication Networks (2nd Edition) By Nader F. Mir for online ebook

Computer and Communication Networks (2nd Edition) By Nader F. Mir Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Computer and Communication Networks (2nd Edition) By Nader F. Mir books to read online.

Online Computer and Communication Networks (2nd Edition) By Nader F. Mir ebook PDF download

Computer and Communication Networks (2nd Edition) By Nader F. Mir Doc

Computer and Communication Networks (2nd Edition) By Nader F. Mir Mobipocket

Computer and Communication Networks (2nd Edition) By Nader F. Mir EPub

2MP3BSU95ZH: Computer and Communication Networks (2nd Edition) By Nader F. Mir