Telecommunication Networks Protocols Modeling and Analysis

Vehicular Communications and Networks

TCP/IP Network Administration

Modeling and Simulation Tools for Emerging Telecommunication Networks

Routing, Flow, and Capacity Design in Communication and Computer Networks

TCP/IP Network Administration

Modeling and Simulation of Computer Networks and Systems

Comprehensive, authoritative, practical—an essential guide to the design and operation of telecommunication networks. The past decade has seen what can only be described as an evolutionary leap in the field of telecommunication networks. The penetration of data networks, the emergence of the integrated services digital network (ISDN) and Broadband ISDN, and the development of fast packet switching, are just some of the dramatic developments that have emerged over the past few years alone. This book was designed to function as a practical introduction to the core concepts, techniques, and methodologies underlying each of these developments and common to the design and operation of all forms of existing telecommunication networks. Key topics covered include: The physical layer of the OSI reference model Performance evaluation techniques Queueing theory fundamentals and their applications to networks Layers 2 and 3 of the OSI reference model— including an in-depth discussion of protocol standards, routing algorithms, and flow and congestion control techniques LAN theory, standards, and technology and multiple access communications techniques Network interconnection and the transport layer ISDN, Broadband ISDN, and fast packet switching theory and architecture Fundamentals of Telecommunication Networks is an invaluable resource for systems developers, engineers, and managers responsible for dealing with telecommunications networks and systems. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

TCP/IP Network Administration

This book focuses on the fundamental techniques, concepts, and mechanisms used in the design, development, and operation of telecommunication networks. Topics covered include Data Communication Fundamentals, Network Protocols Architecture and the ISO Reference Model, Local Area Network Protocols and Technology, Integrated Services Digital Network (ISDN), Broadband ISDN, and more.

Modeling and Simulation Tools for Emerging Telecommunication Networks

Here is the first book to present a unified discussion of protocols that treats both voice and data networks. It emphasizes quantitative performance education of telecommunication network systems. Of interest to electrical engineers and computer science professionals working with networks, data communication and distributed systems.

Routing, Flow, and Capacity Design in Communication and Computer Networks

Network Modeling and Simulation is a practical guide to using modeling and simulation to solve real-life problems. The authors give a comprehensive exposition of the core concepts in modeling and simulation, and then systematically address the many practical considerations faced by developers in modeling complex large-scale systems. The authors provide examples from computer and telecommunication networks and use these to illustrate the process of modeling and simulation, concepts to domain-specific problems in different industries and disciplines. Key features: Provides the tools and strategies needed to build simulation models from the ground up rather than providing solutions to specific problems. Includes a new simulation tool, CA SINO built by the authors. Examines the core concepts of systems simulation and modeling. Presents code examples to illustrate the implementation process of commonly encountered simulation tasks. Offers examples of industry-standard modeling methodology that can be applied in steps to tackle any modeling problem in practice.

Modeling and Simulation of Computer Networks and Systems

In network design, the gap between theory and practice is woefully broad. This book narrows it, comprehensively and critically examining current network design models and methods. You will learn where mathematical modeling and algorithmic optimization have been under-utilized. At the opposite extreme, you will learn where they tend to fail to contribute to the twin goals of network efficiency and cost-savings. Most of all, you will learn precisely how to tailor theoretical models to make them as useful as possible in practice. Throughout, the authors focus on the traffic demands encountered in the real world of network design. Their generic approach, however, allows problem formulations and solutions to be applied across the board to virtually any type of backbone communication or computer network. For beginners, this book is an excellent introduction. For seasoned professionals, it provides immediate solutions and a strong foundation for further advances in the use of mathematical modeling for network design. Written by leading researchers with a combined 40 years of industrial and academic network design experience. Considers the development of design models for different technologies, including TCP/IP, IDN, MPLS, ATM, SONET/SDH, and WDM. Discusses recent topics such as shortest path routing and fair bandwidth assignment in IP/MPLS networks. Addresses proper multi-layer modeling across network layers using different technologies— for example, IP over ATM over SONET, IP over WDM, and IDN over SONET. Considers restoration-oriented design methods that allow recovery from failures of large-capacity transport links and transit nodes.
Read Online Telecommunication Networks Protocols Modeling And Analysis

Presents, at the end of each chapter, exercises useful to both students and practitioners.

**Performance of Distributed Systems and Integrated Communication Networks**

This book covers at an advanced level mathematical methods for analysis of telecommunication networks. The book concentrates on various call models used in telecommunications such as quality of service (QoS) in packet-switched Internet Protocol (IP) networks, A synchronous Transfer M ode (ATM), and T ime Division M ultiplexing (TDM). Professionals, researchers, and graduate and advanced undergraduate students of telecommunications will benefit from this invaluable guidebook.

**Mobile and Wireless Communications**

This book provides a practical approach to modeling and analyzing communication protocols using UML 2. Network protocols are always presented with a point of view focusing on partial mechanisms and starting models. This book aims at giving the basis needed for anybody to model and validate their own protocols. It follows a practical approach and gives many examples for the description and analysis of well-known basic network mechanisms for protocols. The book firstly shows how to describe and validate the main protocol issues (such as synchronization problems, client-server interactions, layer organization and behavior, etc.) in an easy and understandable way. To do so, the book considers and presents the main traditional network examples (e.g., unidirectional flows, full-duplex communication, error recovering, alternating bit). Finally, it presents the outputs resulting from a few simulations of these UML models. Other books usually only focus either on teaching UML or on analyzing network protocols, however, this book will allow readers to model network protocols using a new perspective and integrating these two views, so facilitating their comprehension and development. Any university student studying in the field of computing science or those working in telecommunications, embedded systems or networking will find this book a very useful addition.

**Fundamentals of Telecommunication Networks, Solutions Manual**

This textbook presents a detailed introduction to the essentials of networking and communications technologies. Revised and updated, this new edition retains the step-by-step approach of the original, organized to help those without a strong knowledge of the subject matter. Features: provides chapter-ending summaries and review questions, an appendix on TCP/IP packet formats and an expanded glossary; supplies supplementary material at the associated Springer website, including teaching slides, solutions to the end-of-chapter questions and supplementary exercises with solutions; presents a greater emphasis on mobile computing and network security, and extended coverage of IPv6 (NEW); discusses networking models and standards, local area and wide area networks, network protocols, TCP/IP-based networks, network management and wireless communications; examines grid and cloud computing, microblogging, mobile ad hoc networks, near-field communication, Power over Ethernet and the Ground Positioning System (NEW).

**Computational Intelligence in Telecommunications Networks**

This book provides an introduction to the software system SMURPH, comprising a programming language, its compiler, and an execution environment, for specifying communication networks and protocols and executing those specifications in virtual worlds mimicking the behavior of real-life implementations. It particularly focuses on SMURPH’s wireless modeling capabilities. Written in a manual-like fashion, it includes a comprehensive description of SMURPH functionality, as well as illustrations and case studies to aid understanding.

**Telecommunication Networks**

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**Communication Networks**

Vehicular Communications and Networks: Architectures, Protocols, Operation and Deployment discusses VANETs (Vehicular Ad-hoc Networking) or VCS (Vehicular Communication Systems), which can improve safety, decrease fuel consumption, and increase the capacity of existing roadways and which is critical for the Intelligent Transportation System (ITS) industry. Part one covers architectures for VCS, part two describes the physical layer, antenna technologies and propagation models, part three explores protocols, algorithms, routing and information dissemination, and part four looks at the operation and deployment of vehicular communications and networks. Comprehensive coverage of the fundamental principles behind Vehicular Ad-hoc Networks (VANETS) and the rapidly growing need for their further development through overview of the design and development of key technologies and devices. Explores the practical application of this technology by outlining a number of case studies, testbeds and simulations employing vehicular communications and networks.

**Communication Protocol Engineering**

This book results from many years of teaching an upper division course on communication networks in the EECS department at the University of California, Berkeley. It is motivated by the perceived need for an easily accessible textbook that puts emphasis on the core concepts behind current and next generation networks. After an overview of how today’s Internet works and a discussion of the main principles behind its architecture, we discuss the key ideas behind Ethernet, WiFi networks, routing, Internetworking, and TCP. To make the book as self-contained as possible, brief discussions of probability and Markov chain concepts are included in the appendices. This is followed by a brief discussion of mathematical models that provide insight into the operations of network protocols. Next, the main ideas behind the new generation of wireless networks based on LTE, and the notion of QoS are presented. A concise discussion of the physical layer technologies underlying various networks is also included. Finally, a sampling of topics is presented that may have significant influence on the future evolution of networks, including overlay networks like content delivery and peer-to-peer networks, sensor networks, distributed algorithms, Byzantine agreement, source compression, SDN and NFV, and Internet of Things.
Aeronautical Telecommunications Network

For the first time the problems of voice services self-similarity are discussed systematically and in detail with specific examples and illustrations. Self-Similar Processes in Telecommunications considers the self-similar (fractal and multifractal) models of telecommunication traffic and efficiency based on the assumption that its traffic has fractal or multifractal properties (is self-similar). The theoretical aspects of the most well-known traffic models demonstrating self-similar properties are discussed in detail and the comparative analysis of the different models' efficiency for self-similar traffic is presented. This book demonstrates how to use self-similar processes for designing new telecommunications systems and optimizing existing networks so as to achieve maximum efficiency and serviceability. The approach is rooted in theory, describing the algorithms (the logical arithmetical or computational procedures that define how a task is performed) for modeling these self-similar processes. However, the language and ideas are essentially accessible for those who have a general knowledge of the subject area and the advice is highly practical: all models, problems and solutions are illustrated throughout using numerous real-world examples. Adept at a detailed, theoretical, yet broad-based and practical mathematical approach for designing and operating numerous types of telecommunications systems and networks so as to achieve maximum efficiency.

Optimization of Computer Networks

The book outlines SySnet Modelling, a method for modelling systems architecture. The method is particularly well suited for telecom networks and systems, although a large part of it may be used in a wider context.

Modeling Communication Networks and Protocols

Distributed Computer and Communication Networks

Address the Challenges of Modern-Day Air Traffic Control (ATC) directs aircraft in the sky and on the ground to safety, while the Aeronautical Telecommunications Network (ATN) comprises all systems and phases that assist in aircraft departure and landing. The Aeronautical Telecommunications Network: A Vulence, Challenges, and Mod

Modeling and Analysis of Telecommunications Networks

Mobile and wireless communications applications have a clear impact on improving the humanity wellbeing. From cell phones to wireless internet to home and office devices, most of the applications are converted from wired into wireless communication. Smart and advanced wireless communication environments represent the future technology and evolutionary development step in homes, hospitals, industrial, vehicular and transportation systems. A very appealing research area in these environments has been the wireless ad hoc, sensor and mesh networks. These networks rely on ultra low powered processing nodes that sense surrounding environment temperature, pressure, humidity, motion or chemical hazards, etc. Moreover, the radio frequency (RF) transceiver nodes of such networks require the design of transmitter and receiver equipped with high performance building blocks including antennas, power and low noise amplifiers, mixers and voltage controlled oscillators. Nowadays, the researchers are facing several challenges to design such building blocks while complying with ultra low power consumption, small area and high performance constraints. CMOS technology represents an excellent candidate to facilitate the integration of the whole transceiver on a single chip. However, several challenges have to be tackled while designing and using nanoscale CMOS technologies and require innovative ideas from researchers and circuit designers. While major researchers and applications have been focusing on RF wireless communication, optical wireless communication based system has started to draw some attention from researchers for a terrestrial system as well as for aerial and satellite terminals. This renewed interest in optical wireless communications is driven by several advantages such as no licensing requirements policy, no RF radiation hazards, and no need to dig up roads besides its large bandwidth and low power consumption. This second part of the book, Mobile and Wireless Communications: Key Technologies and Future Applications, covers the recent development in ad hoc and sensor networks, the implementation of state of the art of wireless transceivers building blocks and recent development on optical wireless communication systems. We hope that this book will be useful for students, researchers and practitioners in their research studies.

Communication Networks

Communication Networks: Principles and Practice is a simple and jargon-free presentation on the core concepts of networking. The book adopts a novel approach, wherein each chapter first details a particular concept of networking and then explains its use examples from contemporary technologies like TCP/IP, ATM, JG Networks, etc. Divided into the following three parts, the book covers the important topics of communication, networking, and computer networks.

Fundamentals of Telecommunication Networks

This complete guide to setting up and running a TCP/IP network is essential for network administrators, and invaluable for users of home systems that access the Internet. The book starts with the fundamentals -- what protocols do and how they work, how addresses and routing are used to move data through the network, how to set up your network connection -- and then covers, in detail, everything you need to know to exchange information via the Internet. Included are discussions on advanced routing protocols (RIPv2, OSPF, and BGP) and the gateware software package that implements them, a tutorial on configuring important network services -- including DNS, a pache, sendmail, Samba, PPP, and DHCP -- as well as expanded chapters on troubleshooting and security. TCP/IP Network Administration is also a command and syntax reference for important packages such as gpp, ppd, named, dhcpcd, and sendmail. With coverage that includes Linux, Solaris, BSD, and System V TCP/IP implementations, the third edition contains: Overview of TCP/IP Delivering the data Network services Getting started Basic configuration Configuring the interface Configuring routing Configuring DNS
UAV Swarm Networks: Models, Protocols, and Systems

Mobile Wireless Communications

Networking and Telecommunications: Concepts, Methodologies, Tools, and Applications

Modeling Telecom Networks and Systems Architecture

Networking and Telecommunications Protocols Modeling And Analysis

Telecommunication Networks

Delay Tolerant Networks

UAV Swarm Networks: Models, Protocols, and Systems

Modeling and Simulation of Computer Networks and Systems: Methodologies and Applications introduces you to a broad array of modeling and simulation issues related to computer networks and systems. It focuses on the theories, tools,
applications and uses of modeling and simulation in order to effectively optimize networks. It describes methodologies for modeling and simulation of new generations of wireless and mobile networks and cloud and grid computing systems. Drawing upon years of practical experience and using numerous examples and illustrative applications recognized experts in both academia and industry, discuss: Important and emerging topics in computer networks and systems including but not limited to: modeling, simulation, analysis and security of wireless and mobile networks especially as they relate to next-generation wireless networks. Methodologies, strategies, and tools, and strategies needed to build computer networks and systems modeling and simulation from the bottom up. Different network performance metrics including, mobility, congestion, quality of service, security and more. Modeling and Simulation of Computer Networks and Systems is a must have resource for network architects, engineers and researchers who want to gain insight into optimizing network performance through the use of modeling and simulation. Discusses important and emerging topics in computer networks and systems including but not limited to: modeling, simulation, analysis and security of wireless and mobile networks especially as they relate to next generation wireless networks. Provides the necessary methodologies, strategies, and tools needed to build computer networks and systems modeling and simulation from the bottom up. Includes comprehensive review and evaluation of simulation tools and methodologies, and different network performance metrics including, mobility, congestion, quality of service, security and more.

Packet Guide to Core Network Protocols

Telecommunication Networks

This book contains a selection of papers presented at a symposium organized under the aegis of COST. The main objective of the book is to enhance existing tools and develop new modeling and simulation tools for research in emerging multi-service telecommunication networks in the areas of model performance improvements, multilayer traffic modeling, and the important issue of evaluation and validation of the new modeling tools.

Network Routing

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Communications and Networking

As embedded systems become more and more complex, so does the challenge of enabling fast and efficient communication between the various subsystems that make up a modern embedded system. Facing this challenge from a practical standpoint, Communication Protocol Engineering outlines a hands-on methodology for developing effective communication protocols for large-scale systems. A Complete Roadmap This book brings together the leading methods and techniques developed from state-of-the-art methodologies for protocol engineering, from specification and description methods to cleanroom engineering and agile methods. Popovic leads you from conceptualization of requirements to analysis, design, implementation, testing, and verification. He covers the four main design languages: specifications and description language (SDL); message sequence charts (MSCs); tree and tabular combined notation (TTCN); and unified modeling language (UML). With over 150 figures, this guide also serves as a finite state machine (FSM) library programmer's reference manual. The author demonstrates how to build an FSM library, explains the components of such a library, and applies the principles to a FSM library-based example. Nowhere else are the fundamental principles of communication protocols so clearly and effectively applied to real systems development than in Communication Protocol Engineering. No matter what stage of the process you find yourself, this is the ideal tool to make your systems successful.

Telecom Networks Protocol Model & Analysis

Packet Guide to Core Network Protocols

Communicating Systems with UML 2

Many argue that telecommunications network infrastructure is the most impressive and important technology ever developed. Analyzing the telecom market’s constantly evolving trends, research directions, infrastructure, and vital needs, Telecommunication Networks responds with revolutionized engineering strategies to optimize network construction. Ominously present in society, telecom networks integrate a wide range of technologies. These include quantum field theory for the study of optical amplifiers, software architectures for network control, abstract algebra required to design error correction codes, and network, thermal, and mechanical modeling for equipment platform design. Illustrating how and why network developers make technical decisions, this book takes a practical engineering approach to systematically assess the network as a whole—from transmission to switching. Emphasizing a uniform bibliography and description of standards, it explores existing technical developments and the potential for projected alternative architectural paths, based on current market indicators. The author characterizes new device and equipment advances not just as quality improvements, but as specific responses to particular technical market necessities. Aalyzing design problems to identify potential links and commonalities between different parts of the system, the book addresses interdependence of these elements and their individual influence on network evolution. It also considers power consumption and real estate, which sometimes outweigh engineering performance data in determining a product’s success. To clarify the potential limitations of each presented technology and system analysis, the book includes quantitative data inspired by real products and prototypes. Whenever possible, it applies mathematical modeling to present measured data, enabling the reader to apply demonstrated concepts in real-world situations. Covering everything from high-level architectural elements to more basic component physics, its focus is to solve a problem from different perspectives, and bridge descriptions of well-consolidated solutions with newer research trends.

Understanding Telecommunications Networks
**Analysis**

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This book constitutes the refereed proceedings of the 17th International Conference on Distributed Computer and Communication Networks, DCCN 2013, held in Moscow, Russia, in October 2013. The 22 revised full papers presented were carefully reviewed and selected from numerous submissions. The papers cover the following subjects: computer and communication networks architecture optimization; control in computer and communication networks; performance and QoS evaluation in wireless networks; modeling and simulation of network protocols; queuing theory; wireless IEEE 802.11, IEEE 802.15, IEEE 802.16 and UMTS (LTE) net-works; RFID technology and its application in intellectual transportation networks; protocols design (MAC, Routing) for centimeter and millimeter wave mesh networks; internet and web applications and services; application integration in distributed information systems.

Multiservice Loss Models for Broadband Telecommunication Networks

This book explains how telecommunications networks work. It uses straightforward language supported by copious block-schematic diagrams so that non-engineers and engineers alike can learn about the principles of fixed and mobile telecommunications networks carrying voice and data. The book covers all aspects of today's networks, including how they are planned, formed and operated, plus next generation networks and how they will be implemented. After an introductory chapter on telephony the book briefly describes all of today's networks - PSTN, mobile, cable television, the Internet, etc. - and considers how they interconnect. Individual chapters then consider the principles, technologies and network structures relating to transmission, circuit switching, signalling and control, (including voice-over-IP) networks, and mobile and telephone networks. The important subject of numbering and addressing for telephony and IP is then covered. The book concludes with a chapter designed to pull everything together, considering architecture, quality of service and performance, operations and network evolution. Despite the rapid changes taking place in telecommunications today - covering customer expectations, commercial arrangements, regulation, markets and services, as well as technology - this book's coverage of the basic principles makes it a helpful and enduring reference for undergraduate and postgraduate students, and for professionals working in the industry.

Recent Advances in Modeling and Simulation Tools for Communication Networks and Services

This book constitutes the refereed proceedings of the 4th International IFIP-TC6 Networking Conference, NETWORKING 2005, held in Waterloo, Canada in May 2005. The 105 revised full papers and 36 posters were carefully reviewed and selected from 430 submissions. The papers are organized in topical sections on peer-to-peer networks, Internet protocols, wireless security, network security, wireless performance, network support, network modeling and simulation, wireless L AN, optical networks, Internet performance and Web applications, ad-hoc networks, adaptive networks, radio resource management, Internet routing, queuing models, monitoring, network management, sensor networks, overlay multicast, QoS, wireless scheduling, multicast traffic management and engineering, mobility management, bandwidth management, DCM A, and wireless resource management.

Network 2005 Networking Technologies, Services, And Protocols; Performance of Computer And Communication Networks; Mobile and Wireless Communications Systems

Comprehensive coverage explaining the correlation and synergy between Next Generation Networks and the existing standardized technologies. This book focuses on Next Generation Networks (NGN), in particular, NGN architectures, protocols and services, including technologies, regulation and business aspects. NGN provides convergence between the traditional telecommunications and the Internet, and it is globally standardized by the ITU (International Telecommunication Union), where ITU is the United Nations specialized agency for Information and Communication Technologies - ICTs. The convergence towards the NGN is based on the Internet technologies, and the introductory chapters cover the Internet fundamentals of today, including architectures, protocols (IPV4, IPV6, TCP, DNS, etc.), Internet services (WWW, e-mail, BitTorrent, Skype, and more), as well as Internet governance. Further, the prerequisite for convergence of all ICT services over single network architectures is broadband access to the Internet. Hence, the book includes architectures of fixed broadband Internet access networks, such as DSL (Digital Subscriber Line) networks, cable networks, FTTH (Fiber To The Home), next generation passive and active optical networks, and metro Ethernet. It also covers network architectures for next generation 4G mobile and wireless networks (LTE, UTRAN, and IMT 4G), with emphasis on 4G mobile convergence - MHC, next generation mobile services, as well as business and regulatory aspects for next generation mobile networks and services. Comprehensive coverage explaining the correlation and synergy between Next Generation Networks and the existing standardized technologies focuses on Next Generation Networks (NGN) as defined by the ITU, including performance, service architectures and mechanisms, common IMS (IP Multimedia Subsystem) control and signalling protocols used in NGN, security approaches, identity management, NGN Service Overlay Networks, and NGN business models.

Communication Protocol Modeling

Network routing can be broadly categorized into Internet routing, PSTN routing, and telecommunication transport network routing. This book systematically considers these routing paradigms, as well as their interoperability. The authors discuss how algorithms, protocols, analysis, and operational deployment impact these approaches. A unique feature of the book is consideration of both macro-state and micro-state in routing; that is, how routing is accomplished at the level of networks and how routers or switches are designed to enable efficient routing. In reading this book, one will learn about the evolution of network routing, the role of IP and E.164 addressing in routing, and the role of traffic engineering in routing, and lessons learned from implementation and operational experience. This book explores the strengths and weaknesses that should be considered during deployment of future routing schemes as well as implementation of future routing schemes. It allows the reader to understand how different routing strategies work and are employed and the connection between them. This is accomplished in part by the authors' use of numerous real-world examples to bring the material alive. Bridges the gap between theory and practice in networking routing, and future packet based networks, as well as business challenges and opportunities for the CovisN evolved networks and services. Essential reading for engineers and employees from regulatory bodies, government organisations, telecommunication companies, ICT companies.

**Recent Advances in Modeling and Simulation Tools for Communication Networks and Services**

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Analysis of Computer and Communication Networks provides the basic techniques for modeling and analyzing two of the fundamental components of high performance networks: switching equipment, and software employed at the end nodes and intermediate switches. The book also reviews the design options used to build efficient switching equipment. Topics covered include Markov chains and queuing analysis, traffic modeling, interconnection networks, and switch architectures and buffering strategies. This book covers the mathematical theory and techniques necessary for analyzing telecommunication systems. Queuing and Markov chain analyses are provided for many protocols currently in use. The book then discusses in detail applications of Markov chains and queuing analysis to model more than 15 communications protocols and hardware components.

This book covers the design and optimization of computer networks applying a rigorous optimization methodology, applicable to any network technology. It is organized into two parts. In Part 1 the reader will learn how to model network problems appearing in computer networks as optimization programs, and use optimization theory to give insights on them. Four problem types are addressed systematically – traffic routing, capacity dimensioning, congestion control and topology design. Part 2 targets the design of algorithms that solve network problems like the ones modeled in Part 1. Two main approaches are addressed – gradient-like algorithms inspiring distributed network protocols that dynamically adapt to the network, or cross-layer schemes that coordinate the cooperation among protocols; and those focusing on the design of heuristic algorithms for long term static network design and planning problems. Following a hands-on approach, the reader will have access to a large set of examples in real-life technologies like IP, wireless and optical networks. Implementations of models and algorithms will be available in the open-source Net2Plan tool from which the user will be able to see how the lessons learned take real form in algorithms, and reuse or execute them to obtain numerical solutions. An accompanying link to the author’s own Net2Plan software enables readers to produce numerical solutions to a multitude of real-life problems in computer networks (www.net2plan.com).

Self-Similar Processes in Telecommunications

Loss networks ensure that sufficient resources are available when a call arrives. However, traditional loss network models for telephone networks cannot cope with today’s heterogeneous demands, the central attribute of Asynchronous Transfer Mode (ATM) networks. This requires multiservice loss models. This publication presents mathematical tools for the analysis, optimization and design of multiservice loss networks. These tools are relevant to modern broadband networks, including ATM networks. Addressed are networks with both fixed and alternative routing, and with discrete and continuous bandwidth requirements. Multiservice interconnection networks for switches and contiguous slot assignment for synchronous transfer mode are also presented.