Optical Networks A Practical Perspective

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Optical Networks John Wiley & Sons
The last two years have seen significant developments in the standardization of GMPLS and its implementation in optical and other networks. GMPLS: Architecture and Applications brings you completely up to date, providing the practical information you need to put the growing set of GMPLS-supported services to work and manage them effectively. This book begins by defining GMPLS's place in a transport network, leveraging your knowledge of MPLS to give you an understanding of this radically new control plane technology. An overview of GMPLS protocols follows, but the real focus is on what comes afterwards: in-depth examinations of the architectures underpinning GMPLS in real-world network environments and current and emerging GMPLS applications. This one-of-a-kind resource delivers immensely useful information for software architects, designers and programmers, hardware developers, system testers, and network operators--and also for managers and other decision-makers. Written by two industry researchers at the forefront of the development of GMPLS. Provides a practical look at GMPLS protocols for signaling, routing, link and resource management, and traffic engineering. Delves deep into the world of GMPLS applications, including traffic engineering, path computation, layer one VPNs, point-to-multipoint connectivity, service management, and resource protection. Explores three distinct GMPLS control plane architectures: peer, overlay, and hybrid, and explains the GMPLS UNI and NNIs. Explains how provisioning challenges can be met in multi-region networks and details the provisioning systems and tools relied on by the GMPLS control plane, along with the standard MIB modules used to manage a GMPLS system.
Handbook of Optimization in Telecommunications Springer Science & Business Media
TomorrowÕs networks will integrate optical transmission and IP to deliver unprecedented performance and manageability. Next Generation Optical Networks gives both electrical and data networking engineers essential information for building these networks. It reviews emerging standards such as MPLS and MPLmS, key optical technologies, and critical applications for enterprise, ISP, and carrier environments.
GMPLS John Wiley & Sons
Introduction to optical networks -- Propagation of signals in optical fiber -- Components -- Modulation and demodulation -- Transmission system engineering -- Client layers of the optical layer -- WDM network elements -- WDM network design -- Control and management -- Network survivability -- Access networks -- Photonic packet switching -- Deployment considerations.
Springer Handbook of Optical Networks Springer Science & Business Media
In this book, the authors describe the fundamental concepts and practical aspects of wireless sensor networks. The book provides a comprehensive view to this rapidly evolving field, including its many novel applications, ranging from protecting civil infrastructure to pervasive health monitoring. Using detailed examples and illustrations, this book provides an inside track on the current state of the technology. The book is divided into three parts. In Part I, several node architectures, applications and operating systems are discussed. In Part II, the basic architectural frameworks, including the key building blocks required for constructing large-scale, energy-efficient sensor networks are presented. In Part III, the challenges and approaches pertaining to local and global management strategies are presented – this includes topics on power management, sensor node localization, time synchronization, and security. At the end of each chapter, the authors provide practical exercises to help students strengthen their grip on the subject. There are more than 200 exercises altogether. Key Features: Offers a comprehensive introduction to the theoretical and practical concepts pertaining to wireless sensor networks Explains the constraints and challenges of wireless sensor network design; and discusses the most promising solutions Provides an in-depth treatment of the most critical technologies for sensor network communications, power management, security, and programming Reviews the latest research results in sensor network design, and demonstrates how the individual components fit together to build complex sensing systems for a variety of application scenarios Includes an accompanying website containing solutions to exercises (http://www.wiley.com/go/dargie_fundamentals) This book serves as an introductory text to the field of wireless sensor networks at both graduate and advanced undergraduate level, but it will also appeal to researchers and practitioners wishing to learn about sensor network technologies and their application areas, including environmental monitoring, protection of civil infrastructure, health care, precision agriculture, traffic control, and homeland security.
Optical Networking Morgan Kaufmann
bull; Master advanced optical network design and management strategies bull; Learn from real-world case-studies that feature the Cisco Systems ONS product line bull; A must-have reference for any IT professional involved in Optical networks
Optical Network Design and Implementation Addison-Wesley Professional
& • Combines information generally obtained from ITU, ANSI and Bellcore specs and the IETF - all in one place. & & • Demonstrates the essentials of IP to optical professionals - and teaches IP professionals the essentials of optical. & & • Authors are recognized as the absolute best in this field.
FTTX Concepts and Applications Springer
This book takes a pragmatic approach to deploying state-of-the-art optical networking equipment in metro-core and backbone networks. The book is oriented towards practical implementation of optical network design. Algorithms and methodologies related to routing, regeneration, wavelength assignment, sub rate-traffic grooming and protection are presented, with an emphasis on optical-bypass-enabled (or all-optical) networks. The author has emphasized the economics of optical networking, with a full chapter of economic studies that offer guidelines as to when and how optical-bypass technology should be deployed. This new edition contains: new chapter on dynamic optical networking and a new chapter on flexible/elastic optical networks. Expanded coverage of new physical-layer technology (e.g., coherent detection) and its impact on network design and enhanced coverage of ROADM architectures and properties, including colorless, directionless, contentionless and gridless. Covers 'hot' topics, such as Software Defined Networking and energy efficiency, algorithmic advancements and techniques, especially in the area of impairment-aware routing and wavelength assignment. Provides more illustrative examples of concepts are provided, using three reference networks (the topology files for the networks are provided on a web site, for further studies by the reader). Also exercises have been added at the end of the chapters to enhance the book's utility as a course textbook.
Computer and Communication Networks Prentice Hall
Passive optical network (PON) technologies have become an important broadband access technology as a result of the growing demand for bandwidth-hungry video-on-demand applications. Written by the leading researchers and industry experts in the field, Passive Optical Networks provides coherent coverage of networking technologies, fiber optic transmission technologies, as well as the electronics involved in PON system development. Features: - An in-depth overview of PON technologies and the potential applications that they enable - Comprehensive review of all major PON standards and architecture evolutions, as well as their pros and cons - Balanced coverage of recent research findings with economic and engineering considerations - Presents system issues of protocols, performance, management and protection - Extensive references to standards and research materials for further studies This book provides an authoritative overview of PON technologies and system requirements and is ideal for engineers and managers in industry,

university researchers, and graduate students. - Balances treatment of the optical technologies with systems issues such as protocols, performance, management and protection - Covers latest developments in WDM-PONS, protection switching, dynamic bandwidth allocation - Practical coverage with a chapter on PON applications and deployment - Case studies on implementing PONs

Optically Amplified WDM Networks Springer Nature

Computer and Communication Networks, Second Edition first establishes a solid foundation in basic networking concepts, TCP/IP schemes, wireless networking, Internet applications, and network security. Next, Mir delves into the mathematical analysis of networks, as well as advanced networking protocols. This fully-updated text thoroughly explains the modern technologies of networking and communications among computers, servers, routers, and other smart communication devices, helping readers design cost-effective networks that meet emerging requirements. Offering uniquely balanced coverage of all key basic and advanced topics, it teaches through extensive, up-to-date case studies, 400 examples and exercises, and 250+ illustrative figures. Nader F. Mir provides the practical, scenario-based information many networking books lack, and offers a uniquely effective blend of theory and implementation. Drawing on extensive experience in the field, he introduces a wide spectrum of contemporary applications, and covers several key topics that competitive texts skim past or ignore completely, such as Software-Defined Networking (SDN) and Information-Centric Networking.

Elastic Optical Networks Springer

This updated, second edition textbook provides a thorough and accessible treatment of semiconductor lasers from a design and engineering perspective. It includes both the physics of devices as well as the engineering, designing and testing of practical lasers. The material is presented clearly with many examples provided. Readers of the book will come to understand the finer aspects of the theory, design, fabrication and test of these devices and have an excellent background for further study of optoelectronics.

Optical Network Design and Planning Elsevier

Optical Networking Best Practices Handbook presents optical networking in a very comprehensive way for nonengineers needing to understand the fundamentals of fiber, high-capacity, high-speed equipment and networks, and upcoming carrier services. The book provides a practical understanding of fiber optics as a physical medium, sorting out single-mode versus multi-mode and the crucial concept of Dense Wave-Division Multiplexing.

Fiber Optics Engineering Academic Press

Nowadays, the Internet plays a vital role in our lives. It is currently one of the most effective media that is shifting to reach into all areas in today's society. While we move into the next decade, the future of many emerging technologies (IoT, cloud solutions, automation and AI, big data, 5G and mobile technologies, smart cities, etc.) is highly dependent on Internet connectivity and broadband communications. The demand for mobile and faster Internet connectivity is on the rise as the voice, video, and data continue to converge to speed up business operations and to improve every aspect of human life. As a result, the broadband communication networks that connect everything on the Internet are now considered a complete ecosystem routing all Internet traffic and delivering Internet data faster and more flexibly than ever before. This book gives an insight into the latest research and practical aspects of the broadband communication networks in support of many emerging paradigms/applications of global Internet from the traditional architecture to the incorporation of smart applications. This book includes a preface and introduction by the editors, followed by 20 chapters written by leading international researchers, arranged in three parts. This book is recommended for researchers and professionals in the field and may be used as a reference book on broadband communication networks as well as on practical uses of wired/wireless broadband communications. It is also a concise guide for students and readers interested in studying Internet connectivity, mobile/optical broadband networks and concepts/applications of telecommunications engineering.

Broadband Communications Networks McGraw Hill Professional

Fiber optic communications and the data cabling revolution -- Optical fiber theory -- Optical fiber production techniques -- Optical fiber connection theory and basic techniques -- Practical aspects of connection technology -- Connectors and joints, alternatives and applications -- Fiber optic cables -- Optical fiber highways -- Optical fiber highway design -- Component choice -- Specification definition -- Acceptance test methods -- Installation practice -- Final acceptance testing -- Documentation -- Repair and maintenance -- Case study -- Future developments.

Network Security John Wiley & Sons

The fourth edition of Optical Networks continues the tradition of being the authoritative source on optical networking technologies and techniques. Uniquely emphasizing practical networking issues that affect organizations as they evaluate, deploy, or develop optical networks, Optical Networks serve as your guide for every step of optical networking--from planning to implementation through ongoing maintenance. Optical communications has undergone a sea change since the 3rd edition was published. The advent and rapid commercialization of high-speed coherent optics with advanced modulation formats completely changed the way network architecture and link design are conceived and implemented. All of these and more are now discussed in this 4th edition, offering a comprehensive view of a state-of-the-art optical network. Changes to this edition include: Legacy protocols and systems that are being phased out are de-emphasized, and new trends, such as data-centric networks are added to bring current perspectives on optical communication and networks. Addresses the most recent trends especially in coherent systems, new fiber types, and Ethernet protocols, ROADMs, client interfaces, and coherent optics. Explores the significant advances in electronic chips, line systems, transmissions systems, client/short reach optics, subsea networks, and network design and architecture. Covers advanced topics such as CDC ROADM, hybrid amplifiers, and 400G. Provides a practical perspective on optical networks written by experts with significant real-world industry experience. Every chapter updated with new descriptions and technological developments. Provides an excellent tool as both a reference for practitioners and textbook for students. Filled with examples, figures, and problem sets to aid in development of dependable, speedy networks.

Broadband Circuits for Optical Fiber Communication Morgan Kaufmann

Optical Fiber Telecommunications V (A&B) is the fifth in a series that has chronicled the progress in the research and development of lightwave communications since the early 1970s. Written by active authorities from academia and industry, this edition not only brings a fresh look to many essential topics but also focuses on network management and services. Using high bandwidth in a cost-effective manner for the development of customer applications is a central theme. This book is ideal for R&D engineers and managers, optical systems implementers, university researchers and students, network operators, and the investment community. Volume (A) is devoted to components and subsystems, including: semiconductor lasers, modulators, photodetectors, integrated photonic circuits, photonic crystals, specialty fibers, polarization-mode dispersion, electronic signal processing, MEMS, nonlinear optical signal processing, and quantum information technologies. Volume (B) is devoted to systems and networks, including: advanced modulation formats, coherent systems, time-multiplexed systems, performance monitoring, reconfigurable add-drop multiplexers, Ethernet technologies, broadband access and services, metro networks, long-haul transmission, optical switching, microwave photonics, computer interconnections, and simulation tools. Biographical Sketches Ivan Kaminow retired from Bell Labs in 1996 after a 42-year career. He conducted seminal studies on electrooptic modulators and materials, Raman scattering in ferroelectrics, integrated optics, semiconductor lasers (DBR , ridge-waveguide InGaAsP and multi-frequency), birefringent optical fibers, and WDM networks. Later, he led research on WDM components (EDFAs, AWGs and fiber Fabry-Perot Filters), and on WDM local and wide area networks. He is a member of the National Academy of Engineering and a recipient of the IEEE/OSA John Tyndall, OSA Charles Townes and IEEE/LEOS Quantum Electronics Awards. Since 2004, he has been Adjunct Professor of Electrical Engineering at the University of California, Berkeley. Tingye Li retired from AT&T in 1998 after a 41-year career at Bell Labs and AT&T Labs. His seminal work on laser resonator modes is considered a classic. Since the late 1960s, He and his groups have conducted pioneering studies on lightwave technologies and systems. He led the work on amplified WDM transmission systems and championed their deployment for upgrading network capacity. He is a member of the National Academy of Engineering and a foreign member of the Chinese Academy of Engineering. He is a recipient of the IEEE David Sarnoff Award, IEEE/OSA John Tyndall Award, OSA Ives Medal/Quinn Endowment, AT&T Science and Technology Medal, and IEEE Photonics Award. Alan Willner has worked at AT&T Bell Labs and Bellcore, and he is Professor of Electrical Engineering at the University of Southern California. He received the NSF Presidential Faculty Fellows Award from the White House, Packard Foundation Fellowship, NSF National Young Investigator Award, Fulbright Foundation Senior Scholar, IEEE LEOS Distinguished Lecturer, and USC University-Wide Award for Excellence in Teaching. He is a Fellow of IEEE and OSA, and he has been President of the IEEE LEOS, Editor-in-Chief of the IEEE/OSA J. of Lightwave Technology, Editor-in-Chief of Optics Letters, Co-Chair of the OSA Science & Engineering Council, and General Co-Chair of the Conference on Lasers and Electro-Optics. For nearly three decades, the OFT series has served as the comprehensive primary resource covering progress in the science and technology of optical fiber telecom. It has been essential for the bookshelves of scientists and engineers active in the field. OFT V provides updates on considerable progress in established disciplines, as well as introductions to new topics. [OFT V]... generates a value that is even higher than that of the sum of its chapters.

Introduction to Wireless Communications and Networks John Wiley & Sons

A self-contained guide to OCDMA for Next-Generation FTTH systems, from the fundamentals to cutting-edge research and practical perspectives.

Network Routing Morgan Kaufmann

This comprehensive handbook brings together experts who use optimization to solve problems that arise in telecommunications. It is the first book to cover in detail the field of optimization in telecommunications. Recent optimization developments that are frequently applied to telecommunications are covered. The spectrum of topics covered includes planning and design of telecommunication networks, routing, network protection, grooming, restoration, wireless communications, network location and assignment problems, Internet protocol, World Wide Web, and stochastic issues in telecommunications. The book’s objective is to provide a reference tool for the increasing number of scientists and engineers in telecommunications who depend upon optimization.

Introduction to Semiconductor Lasers for Optical Communications John Wiley & Sons

With the advent of wavelength routing and dynamic, reconfigurable optical networks, new demands are being made in the design and operation of optical amplifiers. This book provides, for the first time, a comprehensive review of optical amplifier technology in the context of these recent advances in the field. It demonstrates how to manage the trade-offs between amplifier design, network architecture and system management and operation. The book provides an overview of optical amplifiers and reconfigurable networks before examining in greater detail the issues of importance to network operators and equipment manufacturers, including 40G and 100G transmission. Optical amplifier design is fully considered, focusing on fundamentals, design solutions and amplifier performance limitations. Finally, the book discusses other emerging applications for optical amplifiers such as optical networks for high data rate systems, free space systems, long single span links and optical digital networks. This book will be of great value to R&D engineers, network and systems engineers, telecommunications service providers, component suppliers, industry analysts, network operators, postgraduate students, academics and anyone seeking to understand emerging trends in optical networks and the consequent changes in optical amplifier design, features and applications. Provides an in depth and focused review of the new reconfigurable network architecture and its impact on optical amplifiers Addresses 40G and 100G transmission and networking Written by experts in the field with deep technical knowledge and practical experience of commercial practice and concerns

Fiber Optic Cabling BoD – Books on Demand

A strategic guide to the practical business applications of optical networking technologies Optical Networking A Wiley Tech Brief Optical networks are spreading outward from Internet backbones to cities to corporations and even to the home. Cities are in a strategic position to create a leading-edge optical infrastructure that will drive economic growth. Optical technologies can cost-effectively meet corporate bandwidth needs today and tomorrow, from optical Internet connections offering bandwidth on demand to fiber on the LAN. Fiber to the home can provide true broadband connectivity for telecommuters as well as converged multimedia offerings for consumers. The ever-expanding need for bandwidth can only be met by optical networks and their phenomenal data capacity. In this book, the real-world applications driving optical networking deployments are explored. You'll get a detailed look inside the markets for fiber, bandwidth supply and demand, and optical networking technology. Both traditional architectures, such as SONET, and emerging paradigms, such as IP over DWDM and Gigabit Ethernet, are examined. This book provides practical information, insight, and case studies about the business benefits and broad range of optical networking technologies and applications available today, including: * Optical internets that run IP directly over fiber without intervening layers of ATM and SONET * Municipal optical networks and their ability to transform local economies * Corporate optical networking deployments, from LAN to WAN to Internet connections * Gigabit Ethernet and bandwidth on demand * Fiber to the home-and why pseudobroadband alternatives such as DSL and cable modems are inadequate * Why wireless is not an alternative to fiber Wiley Tech Briefs Focused on the needs of the corporate IT and business manager, the Tech Briefs series provides in-depth information on new or emerging technologies, solutions, and vendor offerings available in the marketplace. With their accessible approach, these books will help you get quickly up-to-speed on a topic so that you can effectively compete, grow, and better serve your customers. Wiley Computer Publishing Timely. Practical. Reliable. Visit our Web site at www.wiley.com/compbooks/

WDM Systems and Networks John Wiley & Sons

Optical Networks, Third Edition continues to be the authoritative source for information on optical networking technologies and techniques. Componentry and transmission are discussed in detail with emphasis on practical networking issues that affect organizations as they evaluate, deploy, or develop optical networks. New updates in this rapidly changing technology are introduced. These updates include sections on pluggable optical transceivers, ROADM (reconfigurable optical add/drop multiplexer), and electronic dispersion compensation. Current standards updates such as G.709

OTN, as well as, those for GPON, EPON, and BPON are featured. Expanded discussions on multimode fiber with additional sections on photonic crystal and plastic fibers, as well as expanded coverage of Ethernet and Multiprotocol Label Switching (MPLS). This book clearly explains all the hard-to-find information on architecture, control and management. It serves as your guide at every step of optical networking-- from planning to implementation through ongoing maintenance. This book is your key to thoroughly understanding practical optical networks. - In-depth coverage of optimization, design, and management of the components and transmission of optical networks - Filled with examples, figures, and problem sets to aid in development of dependable, speedy networks - Focuses on practical, networking-specific issues: everything you need to know to implement currently available optical solutions