

Broadband Optical Access Networks And Fiber To The Home Systems Technologies And Deployment Strategies

With optical fiber telecommunications firmly entrenched in the global information infrastructure, a key question for the future is how deeply will optical communications penetrate and complement other forms of communication (e.g., wireless access, on-premises networks, interconnects, and satellites). Optical Fiber Telecommunications, the seventh edition of the classic series that has chronicled the progress in the research and development of lightwave communications since 1979, examines present and future opportunities by presenting the latest advances on key topics such as: Fiber and 5G-wireless access networks Inter- and intra-data center communications Free-space and quantum communication links Another key issue is the use of advanced photonics manufacturing and electronic signal processing to lower the cost of services and increase the system performance. To address this, the book covers: Foundry and software capabilities for widespread user access to photonic integrated circuits Nano- and microphotonic components Advanced and nonconventional data modulation formats The traditional emphasis of achieving higher data rates and longer transmission distances are also addressed through chapters on space-division-multiplexing, undersea cable systems, and efficient reconfigurable networking. This book is intended as an ideal reference suitable for university and industry researchers, graduate students, optical systems implementers, network operators, managers, and investors. Quotes: "This book series, which owes much of its distinguished history to the late Drs. Kaminow and Li, describes hot and growing applied topics, which include long-distance and wideband systems, data centers, 5G, wireless networks, foundry production of photonic integrated circuits, quantum communications, and AI/deep-learning. These subjects will be highly beneficial for industrial R&D engineers, university teachers and students, and funding agents in the business sector." Prof. Kenichi Iga President (Retired), Tokyo Institute of Technology "With the passing of two luminaries, Ivan Kaminow and Tingye Li, I feared the loss of one of the premier reference books in the field. Happily, this new version comes to chronicle the current state-of-the-art and is written by the next generation of leaders. This is a must-have reference book for anyone working in or trying to understand the field of optical fiber communications technology." Dr. Donald B. Keck Vice President, Corning, Inc. (Retired) "This book is the seventh edition in the definitive series that was previously marshaled by the extraordinary Ivan Kaminow and Tingye Li, both sadly no longer with us. The series has charted the remarkable progress made in the field, and over a billion kilometers of optical fiber currently snake across the globe carrying ever-increasing Internet traffic. Anyone wondering about how we will cope with this incredible growth must read this book." Prof. Sir David Payne Director, Optoelectronics Research Centre, University of Southampton Updated edition presents the latest advances in optical fiber components, systems, subsystems and networks Written by leading authorities from academia and industry Gives a self-contained overview of specific technologies, covering both the state-of-the-art and future research challenges Master optical First Mile technologies with this end-to-end solutions guide that incorporates the most current advances and features Understand the range of First Mile technologies available in the marketplace and the policies and technologies impacting future trends Review step-by-step guides to building end-to-end solutions for optical networking Master Free Space Optics, EPON, and PON design and concepts Learn technology options with coverage of the latest optical switching systems Named by an IEEE task force, the first mile refers to the connections between business/residential subscribers and the public networks central office or point of presence. This task force, of which Cisco is a member, is developing standards and products that use Ethernet as the Layer 2 protocol of choice for the economical and efficient delivery of broadband related services. "First Mile Advanced Access Technologies" reviews the standards, policies, products, features and services related to the growing delivery of broadband services. It provides an overview of all the protocols currently bringing services to the first mile, including DSL, cable modems, ISDN, satellite, and broadband wireless. The book then moves forward detailing the advancements and capabilities of optical networking. The book also provides end-to-end solution designs, incorporating the latest advancements in the technologies and reviewing the capabilities of some of the newest optical switching systems. A specific review of scalability keeps current design guides in tune with potential future needs. "First Mile Advanced Access Technologies" offers readers step-by-step, basic to advanced coverage of an end-to-end solution for optical networking. Ashwin Gumaste is currently completing a PhD in Optical Networking and is also part of the Photonics Networking Laboratory with Fujitsu. He is the author of DWDM Network Design and Engineering Solutions from Cisco Press. , b>Tony Anthony, CCNP, CCIP, is a Technical Marketing Engineer with the Optical Networking Group at Cisco Systems. He is the author of DWDM Network Design and Engineering Solutions from Cisco Press. The mobile market has experienced unprecedented growth over the last few decades. Consumer trends have shifted towards mobile internet services supported by 3G and 4G networks worldwide. Inherent to existing networks are problems such as lack of spectrum, high energy consumption, and inter-cell interference. These limitations have led to the emergence of 5G technology. It is clear that any 5G system will integrate optical communications, which is already a mainstay of wide area networks. Using an optical core to route 5G data raises significant questions of how wireless and optical can coexist in synergy to provide smooth, end-to-end communication pathways. Optical and Wireless Convergence for 5G Networks explores new emerging technologies,

concepts, and approaches for seamlessly integrating optical-wireless for 5G and beyond. Considering both fronthaul and backhaul perspectives, this timely book provides insights on managing an ecosystem of mixed and multiple access network communications focused on optical-wireless convergence. Topics include Fiber-Wireless (FiWi), Hybrid Fiber-Wireless (HFW), Visible Light Communication (VLC), 5G optical sensing technologies, approaches to real-time IoT applications, Tactile Internet, Fog Computing (FC), Network Functions Virtualization (NFV), Software-Defined Networking (SDN), and many others. This book aims to provide an inclusive survey of 5G optical-wireless requirements, architecture developments, and technological solutions.

This book will highlight the motivation for coherent optics in access and introduce digital coherent optical system in detail, including advanced modulation formats, architecture of modulation and detection, and DSP flow for both transmitter and receiver. This book will also demonstrate potential approaches to re-design and re-engineer the digital coherent concept from long-haul and metro solutions to the access network, leveraging reduction in complexity and cost as well as the benefits of capacity increases and operational improvements. This book will illustrate the details on optimization of the digital, optical, and electrical complexity and standardization and interoperability.

Optical Access Networks and Advanced Photonics: Technologies and Deployment Strategies

NOC '98 - Networks and Optical Communication

1-8 April 1993, Berlin, FRG

From Technologies to Applications

Broadband Cable TV Access Networks

NOC 2001

This volume contains the proceedings of the NOC 2001 at Adastral park, UK, June 26-29 2001. With about 70 papers, this book highlights the gigabit ethernet PON developments, and other work on standard broadband PONs such as, dynamic bandwidth assignment. There are 10 papers on optical packet switching and work on optical cross-connects and DWDM for long-haul systems is presented.

Advanced Fiber Access Networks takes a holistic view of broadband access networks—from architecture to network technologies and network economies. The book reviews pain points and challenges that broadband service providers face (such as network construction, fiber cable efficiency, transmission challenges, network scalability, etc.) and how these challenges are tackled by new fiber access transmission technologies, protocols and architecture innovations. Chapters cover fiber-to-the-home (FTTH) applications as well as fiber backhauls in other access networks such as 5G wireless and hybrid-fiber-coax (HFC) networks. In addition, it covers the network economy, challenges in fiber network construction and deployment, and more. Finally, the book examines scaling issues and bottlenecks in an end-to-end broadband network, from Internet backbones to inside customer homes, something rarely covered in books. Provides the latest information on end-to-end broadband access networks, from architecture to network technologies and network economies

The annual International Conference on Access Networks (AccessNets) aims to provide a forum that brings together researchers and scientists from academia as well as managers and engineers from industry to meet and exchange ideas and recent work on all aspects of access networks. AccessNets 2008 was the third edition of this event, which was successfully held in Las Vegas, Nevada, USA, during October 15-17, 2008. The conference consisted of two keynote addresses, five invited talks, seven technical sessions, and two panel sessions. Leonid Kazovsky from Stanford University and Kevin Schneider, Chief Technology Officer of ADTRAN, delivered their exciting keynote - dresses on "Future Evolution of Broadband Access," and "Carrier Ethernet and the Evolving Access Networks," respectively. Maurice Gagnaire, Martin Reisslein, Martin Maier, Paolo Giacomazzi, and John M. Cioffi gave interesting invited talks on different research topics on access networks. The technical papers presented original and fundamental - search advances in the area of access networks, while the panels focused on the interesting topics of "Fiber Assisted Wireless for Broadband Access Networks and Dynamic Spectrum Management (DSM) Successes. " These conference proceedings include all the technical papers that were presented at AccessNets 2008. We hope that it will become a useful reference for researchers and practitioners working in the area of access networks.

The Tactile Internet will change the landscape of communication by introducing a new paradigm that enables the remote delivery of haptic data. This book answers the many questions surrounding the Tactile Internet, including its reference architecture and adapted compression methods for conveying haptic information. It also describes the key enablers for deploying the applications of the Tactile Internet. As an antecedent technology, the IoT is tackled, explaining the differences and similarities between the Tactile Internet, the Internet of Things and the Internet of Everything. The essentials of teleoperation systems are summarized and the challenges that face this paradigm in its implementation and deployment are also discussed. Finally, a teleoperation case study demonstrating an application of the Tactile Internet is investigated to demonstrate its functionalities, architecture and performance.

Optical and Wireless Convergence for 5G Networks

Recent Advances and Lessons from Practice

Broadband Access

Broadband Optical Access Networks and Fiber-to-the-Home

Gigabit-capable Passive Optical Networks

Long-haul and Access Networks, Optical Metro, and WDM

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.

This book presents fundamental passive optical network (PON) concepts, providing you with the tools needed to understand, design, and build these new access networks. The logical sequence of topics begins with the underlying principles and components of optical fiber communication technologies used in access networks. Next, the book progresses from descriptions of PON and fiber-to-the-X (FTTX) alternatives to their application to fiber-to-the-premises (FTTP) networks and, lastly, to essential measurement and testing procedures for network installation and maintenance. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

Written by experts in the field, this book provides an overview of all forms of broadband subscriber access networks and technology, including fiber optics, DSL for phone lines, DOCSIS for coax, power line carrier, and wireless. Each technology is described in depth, with a discussion of key concepts, historical development, and industry standards. The book contains comprehensive coverage of all broadband access technologies, with a section each devoted to fiber-based technologies, non-fiber wired technologies, and wireless technologies. The four co-authors' breadth of knowledge is featured in the chapters comparing the relative strengths, weaknesses, and prognosis for the competing technologies. Key Features: Covers the physical and medium access layers (OSI Layer 1 and 2), with emphasis on access transmission technology. Compares and contrasts all recent and emerging wired and wireless standards for broadband access in a single reference. Illustrates the technology that is currently being deployed by network providers, and also the technology that has recently been or will soon be standardized for deployment in the coming years, including vectoring, wavelength division multiple access, CDMA, OFDMA, and MIMO. Contains detailed discussion on the following standards: 10G-EPON, G-PON, XG-PON, VDSL2, DOCSIS 3.0, DOCSIS Protocol over EPON, power line carrier, IEEE 802.11 WLAN/WiFi, UMTS/HSPA, LTE, and LTE-Advanced. Broadband Access will be of interest to broadband service providers, access network equipment vendors, regulators, telecommunications consultants, technical sales and marketing, field application engineers, and product validation and testing organizations. University students and researchers in topics related to broadband access will also find the book useful as a quick reference to a wide range of technologies.

"This book presents a comprehensive overview of emerging optical access network solutions to efficiently meet the anticipated growth in bandwidth demand"--Provided by publisher.

First Mile Access Networks and Enabling Technologies

Wireline and Wireless - Alternatives for Internet Services

FTTX Concepts and Applications

QoS for Fixed and Mobile Ultra-Broadband

Optical Fiber Telecommunications IV-A

In this dissertation, we design a new reservation MAC scheme that arbitrates upstream transmission, prevents collisions, and varies bandwidth according to demand and priority. The new access scheme exploits both WDM and TDM to cater for both light and heavy bandwidth requirements. We analyzed, evaluated, and simulated the performance and practicality of the proposed scheme.

This book is intended as a graduate/post graduate level textbook for courses on high-speed optical networks as well as computer networks. The ten chapters cover basic principles of the technology as well as latest developments and further discuss network security, survivability, and reliability of optical networks and priority schemes used in wavelength routing. This book also goes on to examine Fiber To The Home (FTTH) standards and their deployment and research issues and includes examples in all the chapters to aid the understanding of problems and solutions. Presents advanced concepts of optical network devices Includes examples and exercises in all the chapters of the book to aid the understanding of basic problems and solutions for undergraduate and postgraduate students Discusses optical ring metropolitan area networks and queuing system and its interconnection with other networks Discusses routing and wavelength assignment Examines restoration schemes in the survivability of optical networks

Gigabit-capable passive optical networks (G-PON) have a large and increasing base of support among telecommunications operators around the world. Written by two of the experts in the field, this book explains G-PON in detail, both the original 2.5 Gb/s version and XG-PON, the 10 Gb/s second generation. The foundation established by this book is also invaluable in understanding NG2 (next-generation 2) G-PON, which is built upon a number of XG-PON systems on parallel wavelengths. As well as a history that clarifies the reasons for many of the existing features, the book looks at current and evolving technology and discusses some of the alternatives for future access networks.

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

Access Nets

Papers on optical access networks

The Tactile Internet

Components

Broadband Optical Access Systems Based on ATM-Passive Optical Networks (PON)

Advanced Fiber Access Networks

Volume IVA is devoted to progress in optical component research and development. Topics include design of optical fiber for a variety of applications, plus new materials for fiber amplifiers, modulators, optical switches, light wave devices, lasers, and high bit-rate electronics. This volume is an excellent companion to Optical Fiber Telecommunications IVB: Systems and Impairments (March 2002, ISBN: 0-12-3951739). - Fourth in a respected and comprehensive series - Authoritative authors from a range of organizations - Suitable for active lightwave R&D designers, developers, purchasers, operators, students, and analysts - Lightwave components reviewed in Volume A -Lightwave systems and impairments reviewed in Volume B - Up-to-the minute coverage

This book will discuss the principles of operation and features for the emerging consumer home terminals such as digital set-top boxes and cable modems. This book will also provide the detailed technical principles of both fiber optics and RF cable TV systems.

Fiber-based access is recognized as the most promising technology for solving broadband bandwidth bottlenecks. Time division multiplexing passive optical networks (TDM-PONs) that are passive and non-reconfigurable are currently the most widely deployed type of fiber access networks. However, due to their passive nature, TDM-PONs faces several limitations such as inflexible service area coverage, lack of intelligence for control, and inability to counteract security attacks. In order to address the current limitations of optical access networks, we propose reconfigurable technologies for next generation PONs. Two novel reconfigurable technologies are proposed, analyzed, and experimentally evaluated. The first solution is a reconfigurable power-and wavelength- assignment technology based on a novel non-volatile, reconfiguration node. The proposed remote node can reconfigure the network to adapt it to varying degrees of deployment conditions and/or network attacks. Moreover, the proposed remote node incorporates a novel quasi-passive device that does not consume energy once it is reconfigured into a new latching state. Therefore, the proposed remote node has very low energy consumption and does not require local power supply to preserve the passive character of the distribution network. In particular, two novel quasi-passive optical power splitter technologies based on Micro-Electro-Mechanical Systems (MEMS) and transition metal oxide have been designed for the reconfigurable device. A simulation study shows the proposed reconfigurable device would outperform traditional passive splitter in terms of maximum number of supportable users under realistic deployment conditions. The second solution addresses the issue of reconfigurable network consolidation and infrastructure simplification. Current TDM-PONs suffers from limited reach and split-ratio. To enhance the performance in terms of service range and quality of service, reconfigurable network consolidation is a promising solution. It can also simplify the network and reduce cost. We propose the following novel reconfigurable technologies for consolidation and simplification of next generation access networks: (1) Passive reach-extension technology for the drop section of optical access networks; (2) Sleep mode ONUs for energy saving; (3) Centrally managed optical signature that can monitor and protect the upstream link; and (4) Multi-rate burst mode receivers. These reconfigurable technologies can bring the intelligence into optical access networks and improve the efficiency and flexibility for next generation optical access networks.

Broadband Cable Access Networks focuses on broadband distribution and systems architecture and concentrates on practical concepts that will allow the reader to do their own design, improvement, and troubleshooting work. The objective is to enhance the skill sets of a large population that designs and builds broadband cable plants, as well as those maintaining and troubleshooting it. A large cross-section of technical personnel who need to learn these skills design, maintain, and service HFC systems from signal creation through transmission to reception and processing at the customer end point. In addition, data/voice and video specialists need to master and reference the basics of HFC design and distribution before contending with the intricacies of their own unique services. This book serves as an essential reference to all cable engineers—those who specifically design and maintain the HFC distribution plant as well as those primarily concerned with data/voice technology as well as video technology. Concentrates on practical concepts that will allow the user to do his own design, improvement, and trouble-shooting work. Prepares cable engineers and technicians to work with assurance as they face the latest developments and future directions. Concise and tightly focused, allowing readers to easily find answers to questions about an idea or concept they are developing in this area.

From Static to Elastic Networks

Reconfigurable Technology for Future Optical Access Networks

Broadband Access and Network Management

Broadband Communications Networks

Optical WDM Networks

Metro Optical Networks

Ethernet Passive Optical Networks is the IEEE's (Institute of Electrical and Electronics Engineers) approved architecture of choice for the next generation of broadband access. Written by an author of the IEEE 802.3ah standard, this is the first book to explain the EPON architecture, analyze its performance, and annotate the standard. For any engineer or graduate student building equipment for broadband access or service provider offering such service, this will serve as the "authorized" guide to EPON.

The evolution of broadband access networks toward bimodal fiber-wireless (FiWi) access networks, described in this book, may be viewed as the endgame of broadband access. After discussing the economic impact of broadband access and current worldwide deployment statistics, all the major legacy wireline and wireless broadband access technologies are reviewed. State-of-the-art GPON and EPON fiber access networks are described, including their migration to next-generation systems such as OCDMA and OFDMA PONs. The latest developments of wireless access networks are covered, including VHT WLAN, Gigabit WiMAX, LTE and WMN. The advantages of FiWi access networks are demonstrated by applying powerful network coding, heterogeneous optical and wireless protection, hierarchical frame aggregation, hybrid routing and QoS continuity techniques across the optical-wireless interface. The book is an essential reference for anyone working on optical fiber access networks, wireless access networks or converged FiWi systems.

Broadband optical access network is an ideal solution to alleviate the first/last mile bottleneck of current Internet infrastructures. Richly illustrated throughout to help clarify important topics, Broadband Optical Access Networks covers the architectures, protocols enabling technologies of broadband optical access networks, and all current and future competing technologies for access networks. This comprehensive work presents the evolution of optical access networks, including reach extension, bandwidth enhancement, and discusses the convergence of optical and wireless technologies for broadband access, making it an invaluable reference for researchers, electrical engineers, and graduate students.

In the not too distant future, internet access will be dominated by wireless networks. With that, wireless edge using optical core next-generation networks will become as ubiquitous as traditional telephone networks. This means that telecom engineers, chip designers, and engineering students must prepare to meet the challenges and opportunities that the development and deployment of these technologies will bring. Bringing together cutting-edge coverage of wireless and optical networks in a single volume, Internet Networks Wired, Wireless, and Optical Technologies provides a concise yet complete introduction to these dynamic technologies. Filled with case studies, illustrations, and practical examples from industry, the text explains how wireless, wireline, and optical networks work together. It also: Covers WLAN, WPAN, wireless access, 3G/4G cellular, RF transmission Details optical networks involving long-haul and metropolitan networks, optical fiber, photonic devices, and VLSI chips Provides clear instruction on the application of wireless and optical networks Taking into account recent advances in storage, processing, sensors, displays, statistical data analyses, and autonomic systems, this reference provides forward thinking engineers and students with a realistic vision of how the continued evolution of the technologies that touch wireless communication will soon reshape markets and business models around the world.

Third International Conference on Access Networks, AccessNets 2008, Las Vegas, NV, USA, October 15-17, 2008. Revised Papers

Transport Technologies for Broadband Optical Access Networks

Coherent Optics for Access Networks

Advances in Optical Networks and Components

FiWi Access Networks

The HFC Plant

Advanced Fiber Access Networks takes a holistic view of broadband access networks-from architecture to network technologies and network economies. The book reviews pain points and challenges that broadband service providers face (such as network construction, fiber cable efficiency, transmission challenges, network scalability, etc.) and how these challenges are tackled by new fiber access transmission technologies, protocols and architecture innovations. Chapters cover fiber-to-the-home (FTTH) applications as well as fiber backhauls in other access networks such as 5G wireless and hybrid-fiber-coax (HFC) networks. In addition, it covers the network economy, challenges in fiber network construction and deployment, and more. Finally, the book examines scaling issues and bottlenecks in an end-to-end broadband network, from Internet backbones to inside customer homes, something rarely covered in books. Provides the latest information on end-to-end broadband access networks, from architecture to network technologies and network economies

Broadband Optical Access Networks John Wiley & Sons

Provides a comprehensive and updated account of WDM optical network systems Optical networking has advanced considerably since 2010. A host of new technologies and applications has brought a significant change in optical networks, migrating it towards an all-optical network. This book places great emphasis on the network concepts, technology, and methodologies that will stand the test of time and also help in understanding and developing advanced optical network systems. The first part of Optical WDM

Networks: From Static to Elastic Networks provides a qualitative foundation for what follows—presenting an overview of optical networking, the different network architectures, basic concepts, and a high-level view of the different network structures considered in subsequent chapters. It offers a survey of enabling technologies and the hardware devices in the physical layer, followed by a more detailed picture of the network in the remaining chapters. The next sections give an in-depth study of the three basic network structures: the static broadcast networks, wavelength routed networks, and the electronic/optical logically routed networks, covering the characteristics of the optical networks in the access, metropolitan area, and long-haul reach. It discusses the networking picture; network control and management, impairment management and survivability. The last section of the book covers the upcoming technologies of flex-grid and software defined optical networking. Provides concise, updated, and comprehensive coverage of WDM optical networks Features numerous examples and exercise problems for the student to practice Covers, in detail, important topics, such as, access, local area, metropolitan, wide area all-optical and elastic networks Includes protocols, design, and analysis along with the control and management of the networks Offers exclusive chapters on advance topics to cover the present and future technological trends, such as, software defined optical networking and the flexible grid optical networks Optical WDM Networks: From Static to Elastic Networks is an excellent book for under and post graduate students in electrical/communication engineering. It will also be very useful to practicing professionals in communications, networking, and optical systems.

Provides extensive coverage of standardized QoS technologies for fixed and mobile ultra-broadband networks and services—bringing together technical, regulation, and business aspects The Quality of Service (QoS) has been mandatory for traditional telecommunication services such as telephony (voice) and television (TV) since the first half of the past century, however, with the convergence of telecommunication networks and services onto Internet technologies, the QoS provision remains a big challenge for all ICT services, not only for traditional ones. This book covers the standardized QoS technologies for fixed and mobile ultra-broadband networks and services, including the business aspects and QoS regulation framework, which all will have high impact on the ICTs in the current and the following decade. QoS for Fixed and Mobile Ultra-Broadband starts by introducing readers to the telecommunications field and the technology, and the many aspects of both QoS and QoE (Quality of Experience). The next chapter devotes itself to Internet QoS, starting with an overview of numerous technology protocols and finishing with business and regulatory aspects. The next three chapters look at QoS in NGN and Future Networks, QoS for fixed ultra-broadband, and QoS for mobile ultra-broadband. The book also provides readers with in-depth accounts of services in fixed and mobile ultra-broadband; broadband QoS parameters, KPIs, and measurements; network neutrality; and the QoS regulatory framework. Comprehensively covers every aspect of QoS technology for fixed and mobile ultra-broadband networks and services, including the technology, the many regulations, and their applications in business Explains how the QoS is transiting from the traditional telecom world to an all-IP world Presents all the fundamentals of QoS regulation, as well as SLA regulation QoS for Fixed and Mobile Ultra-Broadband is an excellent resource for managers, engineers, and employees from regulators, ICT government organizations, telecommunication companies (operators, service providers), ICT companies, and industry. It is also a good book for students and professors from academia who are interested in understanding, implementation, and regulation of QoS for fixed and mobile ultra-broadband.

7-8 April 1993, Berlin, FRG

Internet Networks

Enhancing the Last Mile Access

The ComSoc Guide to Passive Optical Networks

Broadband Optical Access Networks

Broadband Cable Access Networks

Describes the major architectures, standards, and technologies of Passive Optical Networks (PONs) The ComSoc Guide to Passive Optical Networks provides readers with a concise explanation of the key features of Passive Optical Networks (PONs); the different types of PON architectures and standards; key issues of PON devices, management, and implementation; and the promising business opportunities in access networks. Written for a broad audience, ranging from developers to users, this indispensable book provides an understanding o the evolutionary path of PON access systems and their positioning with respect to the cable, copper, and wireless competitors for broadband access networks. In

addition, **The ComSoc Guide to Passive Optical Networks: Provides brief, high-level overviews of the architectures and applications of Fiber-to-the-Home (FTTH) or Fiber-to-the-Curb (FTTC) access networks and the alternative HFC, subscriber line, and WiMAX access systems Awards readers with a clear understanding of what BPON, GPON, WDM-PON and EPON are and how they work, together with an introduction to their respective standards Carefully defines all acronyms and technical terms, making the book accessible to those who may not be specialists in this area Gives readers an appreciation of the last mile problems in telecommunications access networks, and the opportunities in optical-wireless integration Considering the key evolutions within the access network technologies as well as the unprecedented levels of bandwidth demands by end users, this book condenses the relentless research, design, and deployment experience of state-of-the-art access networks. Furthermore, it shares the critical steps and details of the developments and deployment of these emergent technologies; which is very crucial particularly as telecommunications vendors and carriers are looking for cost-effective ultra-broadband “last-mile” access solutions to stay competitive in the “post bubble” era. The book is written to provide a comprehensive overview of the major broadband access technologies and deployments involving internationally recognized authors and key players. Due to its scope and depth, the proposed book is able to fill an important gap of today’s available literature.**

Broadband Optical Access and Fiber-to-the-Home (FTTH) will provide the ultimate broadband service capabilities. Compared with the currently well-deployed broadband access technologies of ADSL (Asymmetric Digital Subscriber Line) and Cable Modems, optical broadband access with Fiber-to-the-User’s home will cater for much higher speed access for new services. Broadband Optical Access Networks and Fiber-to-the-Home presents a comprehensive technical overview of key technologies and deployment strategies for optical broadband access networks and emerging new broadband services. The authors discuss network design considerations, new services, deployment trends and operational experiences, while explaining the current situation and providing insights into future broadband access technologies and services. Broadband Optical Access Networks and Fiber-to-the-Home: Offers a comprehensive, up-to-date introduction to new developments in broadband access network technologies and services. Examines the impact of research and development in photonics technologies on broadband access and FTTH. Covers ADSL, VDSL with FTTC (Fiber-to-the-Curb), Cable Modem over HFC (Hybrid-Fiber Coax) and Gigabit Ethernet. Discusses the roles of Broadband Wireless LAN and integrated FTTH/Wireless Broadband Access as well as Broadband Home Networks. Provides a global view of broadband network development, presenting different technical and system deployment approaches and strategic considerations for comparison. Gives insight into the worldwide broadband competition and the future of this technology. Broadband Optical Access Networks and Fiber-to-the-Home will be an invaluable resource for engineers in research and development, network planners, business managers, consultants as well as analysts and educators for a better understanding of the future of broadband in the field of telecommunications, data communications, and broadband multimedia service industries.

Advanced Link and Transport Control Protocols for Broadband Optical Access Networks

Principles and Practice

Technologies and Deployment Strategies

Ethernet Passive Optical Networks

Wired, Wireless, and Optical Technologies

1-8 April 1993, Berlin, FRG.