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Network Design for IP Convergence
Academic Press

The use of radio-frequency communication—commonly referred to as wireless communication—is becoming more pervasive as well as more economically and socially important. Technological progress over many decades has enabled the deployment of several successive generations of cellular telephone technology, which is now used by many billions of people worldwide; the near-universal addition of wireless local area networking to personal computers; and a proliferation of actual and proposed uses of wireless communications. The flood of new technologies, applications, and markets has also opened up opportunities for examining and adjusting the policy framework that currently governs the management and use of the spectrum and the institutions involved in it, and models for allocating spectrum and charging for it have come under increasing scrutiny. Yet even as many agree that further change to the policy framework is needed, there is debate about precisely how the overall framework should be changed, what trajectory its evolution should follow, and how dramatic or rapid the change should be. Many groups have opinions, positions, demands, and desires related to these questions—reflecting multiple commercial, social, and political agendas and a mix of technical, economic, and social perspectives. The development of technologies and associated policy and regulatory regimes are often closely coupled, an interplay apparent as early as the 1910s, when spectrum policy emerged in response to the growth of radio communications. As outlined in this report, current and ongoing technological advances suggest the need for a careful reassessment of the assumptions that inform spectrum policy in the United States today. This book seeks to shine a spotlight on 21st-century technology trends and to outline the implications of

emerging technologies for spectrum management in ways that the committee hopes will be useful to those setting future spectrum policy.

Mobile Broadcasting with WiMAX John Wiley & Sons

This updated book, reconfigured as a textbook, covers the key technologies associated with the physical transmission of data on 5G mobile systems. Following an updated overview of these technologies, the author provides a high-level description of 3GPP's mobile communications standard (5G NR) and shows how the key technologies presented earlier facilitate the transmission of very high-speed user data and control data and can provide very low latency for use cases where this is important. In the final chapter, an overview and the physical layer aspects of 5G NR enabled Fixed Wireless Access (FWA) networks is presented. Material in the first edition addressed mainly the key physical layer technologies and features associated with 3GPP release 15, the first release to support 5G. This edition adds descriptions of some of the technological advancements supported in release 16, including integrated access and backhaul (IAB), sidelink communication, NR positioning, operation in unlicensed bands, and multiple transmission points transmission. This textbook is intended for graduate and upper undergraduate engineering students and practicing engineers who have an interest in 3GPP's 5G enabled mobile and or FWA networks and want to acquire, where missing, the necessary technology background in order to understand 3GPP's physical layer specifications and operation. The author provides working problems and helpful examples throughout the text.

Encyclopedia of Mobile Computing and Commerce Morgan Kaufmann
Radio Network Planning and Optimisation for UMTS, Second Edition, is a comprehensive and fully updated introduction to WCDMA radio access technology used in UMTS, featuring new content on key developments. Written by leading experts at Nokia, the first edition quickly established itself as a best-selling

and highly respected book on how to dimension, plan and optimise UMTS networks. This valuable text examines current and future radio network management issues and their impact on network performance as well as the relevant capacity and coverage enhancement methods. In addition to coverage of WCDMA radio access technology used in UMTS, and the planning and optimisation of such a system, the service control and management concept in WCDMA and GPRS networks are also introduced. This is an excellent source of information for those considering future cellular networks where Quality of Service (QoS) is of paramount importance. Key features of the Second Edition include: High-Speed Downlink Packet Access (HSDPA) – physical layer, dimensioning and radio resource management Quality of Service (QoS) mechanisms in network for service differentiation Multiple Input – Multiple Output (MIMO) technology Practical network optimisation examples Service optimisation for UMTS and GPRS/EDGE capacity optimisation The 'hot topic' of service control and management in WCDMA and GPRS networks, that has evolved since the first edition Companion website includes: Figures Static radio network simulator implemented in MATLAB® This text will have instant appeal to wireless operators and network and terminal manufacturers. It will also be essential reading for undergraduate and postgraduate students, frequency regulation bodies and all those interested in radio network planning and optimisation, particularly RF network systems engineering professionals.
Next Generation Mobile Access Technologies IGI Global
Cellular Internet of Things: Technologies, Standards and Performance gives insight into the recent work performed by the 3rd Generation Partnership Project (3GPP) to develop systems for the Cellular Internet of Things. It presents both the design of the new Narrowband Internet of Things (NB-IoT) technology and how GSM and LTE have evolved to provide Cellular Internet of Things services. The criteria used for

the design and objectives of the standardization work are explained, and the technical details and performance of each technology is presented. This book discusses the overall competitive landscape for providing wireless connectivity, also introducing the most promising technologies in the market. Users will learn how cellular systems work and how they can be designed to cater to challenging new requirements that are emerging in the telecom industry, what the physical layers and procedures in idle and connected mode look like in EC-GSM-IoT, LTE-M, and NB-IoT, and what the expected performance of these new systems is in terms of expected coverage, battery lifetime, data throughput, access delay time and device cost. Provides a detailed introduction to the EC-GSM-IoT, LTE-M and NB-IoT technologies Presents network performance of the 3GPP cellular technologies, along with an analysis of the performance of non-cellular alternatives operating in unlicensed spectrum Includes prediction of true performance levels using state-of-the-art simulation models developed in the 3GPP standardization process

Radio Network Planning and Optimisation for UMTS IGI Global

While still in the early stages of research and development, cognitive radio is a highly promising communications paradigm with the ability to effectively address the spectrum insufficiency problem. Written by those pioneering the field, *Cognitive Radio Networks: Architectures, Protocols, and Standards* offers a complete view of cognitive radio-

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Cognitive Radio, Mobile Communications and Wireless Networks CRC Press

Smart Cities and Homes: Key Enabling Technologies explores the fundamental principles and concepts of the key enabling technologies for smart cities and homes, disseminating the latest research and development efforts in the field through the use of numerous case studies and examples. Smart cities use digital technologies embedded across all their functions to enhance the wellbeing of citizens. Cities that utilize these technologies report enhancements in power efficiency, water use, traffic congestion, environmental protection, pollution reduction, senior citizens care, public safety and security, literacy rates, and more. This book brings together the most important breakthroughs and advances in a coherent fashion, highlighting the interconnections between the works in different areas of computing, exploring both new and emerging

computer networking systems and other computing technologies, such as wireless sensor networks, vehicle ad hoc networks, smart grids, cloud computing, and data analytics and their roles in creating environmentally friendly, secure, and prosperous cities and homes. Intended for researchers and practitioners, the book discusses the pervasive and cooperative computing technologies that will perform a central role for handling the challenges of urbanization and demographic change. Includes case studies and contributions from prominent researchers and practitioners from around the globe Explores the latest methodologies, theories, tools, applications, trends, challenges, and strategies needed to build smart cities and homes from the bottom up Provides a pedagogy that includes PowerPoint slides, key terms, and a comprehensive bibliography *Cognitive Radio Networks* IGI Global This new volume provides an overview of the Internet of Things along with its architectures, its vital technologies, and their uses in our daily life. The book explores the integration of IoT with other emerging technologies, such as blockchain and cloud. Topics in the volume cover the many powerful features and applications of IoT, such as for weather forecasting, in agriculture, in medical science, in surveillance systems, and much more. The first section of the book covers many of the issues and challenges that arise from the Internet of Things (IoT), exploring security challenges, such as attack detection and prevention systems, as well as energy efficiency and resource management in IoT. The volume also introduces the use of IoT and smart technology in agricultural management, in healthcare diagnosis and monitoring, and in the financial industry. Chapters also focus on surveillance network technology, the technology shift from television to video streaming apps, using IoT-fog computing for smart healthcare, detection of anomalies in climate conditions, and even detection of illegal wood logging activity.

Fundamentals of 5G Mobile Networks John Wiley & Sons

Wi-Fi telephony is the latest, most cost effective, and clearest way of carrying voice data wirelessly. The great news is that it can be integrated seamlessly into the same infrastructures as currently used for computer and telephone data. The digital quality is far above current cellular technologies. This book will be among the first to discuss Session Initiation Protocol (SIP), Quality of Service (QoS), and interoperability in connection with Wi-Fi

telephony. Security challenges are also presented and solved along these malleable wireless boundaries. In short, this book provides all the information necessary for effective, reliable, crystal clear Wi-Fi telephony service and implementation. *Using current telephone and computer infrastructure this technology can be implemented at low cost *The importance of Quality of Service (QoS) and security of Wi-Fi telephony is considered *Enhances the clarity of a call beyond a basic cellular phone using digital data transfer

Encyclopedia of Multimedia Technology and Networking, Second Edition Springer

Fundamentals of 5G Mobile Networks

provides an overview of the key features of the 5th Generation (5G) mobile networks, discussing the motivation for 5G and the main challenges in developing this new technology. This book provides an insight into the key areas of research that will define this new system technology paving the path towards future research and development. The book is multi-disciplinary in nature, and aims to cover a whole host of intertwined subjects that will predominantly influence the 5G landscape, including the future Internet, cloud computing, small cells and self-organizing networks (SONs), cooperative communications, dynamic spectrum management and cognitive radio, Broadcast-Broadband convergence, 5G security challenge, and green RF. This book aims to be the first of its kind towards painting a holistic perspective on 5G Mobile, allowing 5G stakeholders to capture key technology trends on different layering domains and to identify potential inter-disciplinary design aspects that need to be solved in order to deliver a 5G Mobile system that operates seamlessly.

Game Theory for Wireless Communications and Networking Intl. Engineering Consortiu

Future generations of wireless networks will place great demands on the performance of radio access technology. This book describes the features of various mobile access technologies and assesses their strengths and weaknesses. In particular, it describes the underlying principles and practical implementation schemes for time division duplexing (TDD). The book begins with an overview of next generation wireless systems. It then describes the basics of duplex communication modes, interference in cellular systems, and multiple user access techniques. Focusing on TDD systems, dynamic channel assignment algorithms are discussed, as are multi-hop communications schemes, radio resource

management, interference cancellation, and smart antennas. Real-world examples from UMTS, wireless LAN, and Bluetooth systems are described. The book is aimed at all those involved in the design and implementation of wireless systems, as well as at graduate students and researchers working in the area of wireless communications. For more information visit www.cambridge.org/9780521826228.

Technologies for Home Networking
CRC Press

Advances in hardware, software, and audiovisual rendering technologies of recent years have unleashed a wealth of new capabilities and possibilities for multimedia applications, creating a need for a comprehensive, up-to-date reference. The Encyclopedia of Multimedia Technology and Networking provides hundreds of contributions from over 200 distinguished international experts, covering the most important issues, concepts, trends, and technologies in multimedia technology. This must-have reference contains over 1,300 terms, definitions, and concepts, providing the deepest level of understanding of the field of multimedia technology and networking for academicians, researchers, and professionals worldwide.

Mobile and Wireless Communications John Wiley & Sons

In the past several years, there has been an increasing trend in the use of Radio Frequency Identification (RFID) and Wireless Sensor Networks (WSNs) as well as in the integration of both systems due to their complementary nature, flexible combination, and the demand for ubiquitous computing. As always, adequate security remains one of the open areas of concern before wide deployment of RFID and WSNs can be achieved. Security in RFID and Sensor Networks is the first book to offer a comprehensive discussion on the security challenges and solutions in RFID, WSNs, and integrated RFID and WSNs, providing an essential reference for those who regularly interface with these versatile technologies. Exposes Security Risks The book begins with a discussion of current security issues that threaten the effective use of RFID technology. The contributors examine multi-tag systems, relay attacks, authentication protocols, lightweight cryptography, and host of other topics related to RFID safety. The book then shifts the focus to WSNs, beginning with a background in sensor network security before moving on to survey intrusion detection, malicious node detection, jamming, and other issues of concern to WSNs and their myriad of applications.

Offers Viable Solutions In each chapter, the contributors propose effective solutions to the plethora of security challenges that confront users, offering practical examples to aid in intuitive understanding. The last part of the book reviews the security problems inherent in integrated RFID & WSNs. The book ends with a glimpse of the future possibilities in these burgeoning technologies and provides recommendations for the proactive design of secure wireless embedded systems.

The Wireless Dawn..... IGI Global

A broad overview of the home networking field, ranging from wireless technologies to practical applications In the future, it is expected that private networks (e.g., home networks) will become part of the global network ecosystem, participating in sharing their own content, running IP-based services, and possibly becoming service providers themselves. This is already happening in the so-called "social networks" and peer-to-peer file sharing networks on the Internet—making this emerging topic one of the most active research areas in the wireless communications field. This book bridges the gap between wireless networking and service research communities, which, until now, have confined their work to their respective fields. Here, a number of industry professionals and academic experts have contributed chapters on various aspects of the subject to present an overview of home networking technologies with a special emphasis on the user as the center of all activities. Coverage includes: Networked home use cases and scenarios Media format, media exchange, and media interoperability Location-aware device and service discovery Security in smart homes Secure service discovery protocol implementation for wireless ad-hoc networks Multimedia content protection in consumer networks Mobile device connectivity in home networks Unlicensed mobile access/generic access network Wireless sensor networks in the home Ultra-wideband and sensor networking in the home environment With a balanced mix of practice and theory, Technologies for Home Networking focuses on the latest technologies for speedier, more reliable wireless networking and explains how to facilitate workable end-to-end solutions from a user's perspective. This book is an ideal resource for practicing engineers, designers, and managers with an interest in home networking and also serves as a valuable text for graduate students. Value-Added Services for Next Generation Networks CRC Press

The "Encyclopedia of Mobile Computing and Commerce" presents current trends in mobile computing and their commercial applications. Hundreds of internationally renowned scholars and practitioners have written comprehensive articles exploring such topics as location and context awareness, mobile networks, mobile services, the socio impact of mobile technology, and mobile software engineering.

Wireless Technology Prospects and Policy Options Cambridge University Press

Used to explain complicated economic behavior for decades, game theory is quickly becoming a tool of choice for those serious about optimizing next generation wireless systems. Illustrating how game theory can effectively address a wide range of issues that until now remained unresolved, Game Theory for Wireless Communications and Networking provides a systematic introduction to the application of this powerful and dynamic tool. This comprehensive technical guide explains game theory basics, architectures, protocols, security, models, open research issues, and cutting-edge advances and applications. It describes how to employ game theory in infrastructure-based wireless networks and multihop networks to reduce power consumption—while improving system capacity, decreasing packet loss, and enhancing network resilience. Providing for complete cross-referencing, the text is organized into four parts:

Fundamentals—introduces the fundamental issues and solutions in applying different games in different wireless domains, including wireless sensor networks, vehicular networks, and OFDM-based wireless systems Power Control Games—considers issues and solutions in power control games Economic Approaches—reviews applications of different economic approaches, including bargaining and auction-based approaches Resource Management—explores how to use the game theoretic approach to address radio resource management issues The book explains how to apply the game theoretic model to address specific issues, including resource allocation, congestion control, attacks, routing, energy management, packet forwarding, and MAC. Facilitating quick and easy reference to related optimization and algorithm methodologies, it supplies you with the background and tools required to use game theory to drive the improvement and development of next generation wireless systems. Cellular Internet of Things John Wiley & Sons

The "Encyclopedia of Mobile Computing and Commerce" presents current trends in mobile computing and their commercial applications. Hundreds of internationally renowned scholars and practitioners have written comprehensive articles exploring such topics as location and context awareness, mobile networks, mobile services, the socio impact of mobile technology, and mobile software engineering.

Spectrum Sharing John Wiley & Sons

The increasing popularity of wireless networks makes interference and cross-talk between multiple systems inevitable. This book describes techniques for quantifying this, and the effects on the performance of wireless networks operating in the unlicensed bands. It also presents a variety of system-level solutions, obviating the need for new hardware implementations. The book starts with basic concepts and wireless protocols before moving on to interference performance evaluation, interference modeling, coexistence solutions, and concluding with common misconceptions and pitfalls. The theory is illustrated by reference to real-world systems such as Bluetooth and WiFi. With a number of case studies and many illustrations, this book will be of interest to graduate students in electrical engineering and computer science, to practitioners designing new WLAN and WPAN systems or developing new techniques for interference suppression, and to general users of merging wireless technologies.

RFID and Sensor Networks Cambridge University Press

This book offers a comprehensive explanation on how to dimension, plan, and optimize WiMAX networks. The first part of the text introduces WiMAX networks architecture, physical layer, standard, protocols, security mechanisms, and highly related radio access technologies. It covers system framework, topology, capacity, mobility management, handoff management, congestion control, medium access control (MAC), scheduling, Quality of Service (QoS), and WiMAX mesh networks and security. Enabling easy understanding of key concepts and technologies, the second part presents practical examples and illustrative figures to explain planning techniques and optimization algorithms. The author provides both theoretical and practical information to ensure in-depth, realistic results.

Real-Life Applications of the Internet of Things Springer Nature

A Practical Guide to the Business and Technology of Fixed Mobile Convergence

Written by telecommunications experts, *Fixed Mobile Convergence* explains how to consolidate fixed, mobile, wireless, and wireline networks into a seamless environment enabling a uniform converged communication experience. You will learn how to create FMC-based networks, services, and solutions; support advanced technologies such as Voice over Wi-Fi; and converge them with legacy

networks. You'll also discover how to develop a phased strategy for effective rollout of FMC multi-mode devices and services, with reliable security and quality of service. The book includes details on integrating next-generation technologies such as near field communication, Bluetooth PAN, WiMax, presence, and unified messaging to create a seamless mobility ecosystem. Seamlessly converge fixed, mobile, wireless, and wireline networks Understand the "Four Cs" of FMC-cost, coverage, capacity, and convenience Understand the technology behind FMC components: fixed, mobile, and convergence Overcome converged network deployment and proliferation barriers Conform to IETF, 3GPP, and other relevant standards for FMC Offer uniform access-independent voice, data, instant communications, and unified messaging services across legacy fixed and mobile networks Design and launch scalable FMC solutions using IMS, UMA/GAN, femtocells, VoWi-Fi, VCC, and other enablers Add LBS, presence, M-to-M, and other advanced services

Cellular Technologies for Emerging Markets IGI Global

In the NGN world, no truer words are spoken than "the future is now." And the competition in the information networking arena will only intensify in the next 5-10 years. Choosing the correct NGN-VAS strategy now will set your company apart. *Value Added Services for Next Generation Networks* examines the quest for the real added value in modern commu