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The Technology and Business of Mobile Communications

Springer Science & Business Media

The telecommunications industry has advanced in rapid, significant and unpredictable ways into the 21st century. Global Networks: Design, Engineering and Operation guides the global industry and academia even further by providing an in-depth look at the current and developing trends, as well as examining the complex issues of developing, introducing, and managing cutting-edge telecommunications technologies. The author draws upon his considerable experience in the telecommunications industry to educate engineers designing equipment and systems on the hardware and software features essential to fault tolerant operation. He describes how to design networks that are fault tolerant and global in scope; how to identify best engineering and operations practices; and examines the role of technology labs in carrier networks. Software and hardware engineering practices are covered in depth. Hardware and software designs are explained with an emphasis on application and interaction of craft and operators with equipment and systems. The author proposes that equipment, systems and network designs should be integrated with the engineering and operations teams that run them. Practice, experience and a historical background are used to describe which designs and technologies fit which network services and applications. Global Networks is a complete and thorough assessment of the communications industry today, written by an author of international renown. Key features: Comprehensive treatment of the key theories and technologies associated with the design of modern communications networks, including equipment, systems and network design Coverage of equipment and software design, mobile networks, integration and the characteristics of large network outages Written in an accessible style and fully illustrated, it offers a complete and up-to-date picture of communications technologies from initial design through to application Includes a section on future challenges such as the Exabyte traffic growth and an assessment of the dual roles of IPV4 and IPV6

Testing, Specifications and Standard Bodies for Engineers and Managers John Wiley & Sons

Using numerous practical examples, this book examines the evolution of EC telecommunications law following the achievement of liberalisation, the main policy goal of the 1990s. After reviewing the development of regulation in the run-up to liberalisation, the author identifies the methods used to direct the liberalisation process and tests their validity in the post-

liberalisation context. A critical analysis is made of the claim that competition law will offer sufficient means to regulate the sector in the future. Particular emphasis is given to the way in which EC Competition Law changed in the 1990s using the essential facilities doctrine, an expansive non-discrimination principle and the policing of cross-subsidisation to tackle what were then thought of as regulatory matters. Also examined within the work is the procedural and institutional interplay between competition law and telecommunications regulation. In conclusion, Larouche explores the limits of competition law and puts forward a long-term case for sector-specific regulation, with a precise mandate to ensure that the telecommunications sector as a whole fulfils its role as a foundation for economic and social activity.

High Speed Radio Access for Mobile Communications John Wiley & Sons

An Introduction to UMTS: Specifications, Testing and Standards Bodies is the most comprehensive text for practicing engineers and technicians about testing, specification and standards bodies of cellular communications equipment. It is aimed at those responsible for developing and maintaining both mobile and base station units. Each chapter discusses in detail the necessary elements moving to the more advanced components. In addition to testing, specification and standards bodies, readers will learn: the development life cycle of UE and Node-B building blocks; what needs to be tested; when and how testing should be performed; as well as certification formalities, including processes and procedures; and testing tools and languages. Hardcover edition \$119.95

Radio Network Planning and Optimisation for UMTS CRC Press

A thorough, detailed look into the world of the telecommunications, the internet, and information industries and their relation to networks and security, global specialists have come together in this volume to reveal their ideas on related topics. This reference includes notable discussions on the design of telecommunications networks, information management, network inventory, security policy and quality, and internet tomography and statistics.

An Introduction to LTE WIT Press

Technological Developments in Networking, Education and Automation includes a set of rigorously reviewed world-class manuscripts addressing and detailing state-of-the-art research projects in the following areas: Computer Networks: Access Technologies, Medium Access Control, Network architectures and Equipment, Optical Networks and Switching, Telecommunication Technology, and Ultra Wideband Communications. Engineering Education and Online Learning: including development of courses and systems for engineering, technical and liberal studies

programs; online laboratories; intelligent testing using fuzzy logic; taxonomy of e-courses; and evaluation of online courses.

Pedagogy: including benchmarking; group-learning; active learning; teaching of multiple subjects together; ontology; and knowledge management. Instruction Technology: including internet textbooks; virtual reality labs, instructional design, virtual models, pedagogy-oriented markup languages; graphic design possibilities; open source classroom management software; automatic email response systems; tablet-pcs; personalization using web mining technology; intelligent digital chalkboards; virtual room concepts for cooperative scientific work; and network technologies, management, and architecture. Coding and Modulation: Modeling and Simulation, OFDM technology, Space-time Coding, Spread Spectrum and CDMA Systems. Wireless technologies: Bluetooth, Cellular Wireless Networks, Cordless Systems and Wireless Local Loop, HIPERLAN, IEEE 802.11, Mobile Network Layer, Mobile Transport Layer, and Spread Spectrum. Network Security and applications: Authentication Applications, Block Ciphers Design Principles, Block Ciphers Modes of Operation, Electronic Mail Security, Encryption & Message Confidentiality, Firewalls, IP Security, Key Cryptography & Message Authentication, and Web Security. Robotics, Control Systems and Automation: Distributed Control Systems, Automation, Expert Systems, Robotics, Factory Automation, Intelligent Control Systems, Man Machine Interaction, Manufacturing Information System, Motion Control, and Process Automation. Vision Systems: for human action sensing, face recognition, and image processing algorithms for smoothing of high speed motion. Electronics and Power Systems: Actuators, Electro-Mechanical Systems, High Frequency Converters, Industrial Electronics, Motors and Drives, Power Converters, Power Devices and Components, and Power Electronics.

The Fundamentals Springer Science & Business Media

"Where this book is exceptional is that the reader will not just learn how LTE works but why it works" Adrian Scrase, ETSI Vice-President, International Partnership Projects Following on the success of the first edition, this book is fully updated, covering the latest additions to LTE and the key features of LTE-Advanced. This book builds on the success of its predecessor, offering the same comprehensive system-level understanding built on explanations of the underlying theory, now expanded to include complete coverage of Release 9 and the developing specifications for LTE-Advanced. The book is a collaborative effort of more than 40 key experts representing over 20 companies actively participating in the development of LTE, as well as academia. The book highlights practical implications, illustrates the expected performance, and draws comparisons with the well-known WCDMA/HSPA standards. The authors not only pay special attention to the physical layer,

giving an insight into the fundamental concepts of OFDMA-FDMA and MIMO, but also cover the higher protocol layers and system architecture to enable the reader to gain an overall understanding of the system. Key New Features: Comprehensively updated with the latest changes of the LTE Release 8 specifications, including improved coverage of Radio Resource Management RF aspects and performance requirements Provides detailed coverage of the new LTE Release 9 features, including: eMBMS, dual-layer beamforming, user equipment positioning, home eNodeBs / femtocells and pico cells and self-optimizing networks Evaluates the LTE system performance Introduces LTE-Advanced, explaining its context and motivation, as well as the key new features including: carrier aggregation, relaying, high-order MIMO, and Cooperative Multi-Point transmission (CoMP). Includes an accompanying website containing a complete list of acronyms related to LTE and LTE-Advanced, with a brief description of each (http://www.wiley.com/go/sesia_theumts) This book is an invaluable reference for all research and development engineers involved in implementation of LTE or LTE-Advanced, as well as graduate and PhD students in wireless communications. Network operators, service providers and R&D managers will also find this book insightful.

Wireless Data Technologies John Wiley & Sons

In India, the mobile subscribers base is increasing at a phenomenal rate. After the successful adoption of Second Generation (2G) Technology GSM and 2.5G Technology GPRS, the industry is now rapidly moving towards Third Generation (3G) Networks. The book, written by two young engineers, touches almost every imaginable aspect of a 3G Network, spanning across topics such as: UMTS Network Architecture (including Access Network and Core Network), Protocols (including RRC, NBAP, RANAP, MM/GMM, MAP and GTP), Procedures (including UTRAN Procedures, Mobility Management, Call/Session handling and Security Management), and Services (including Supplementary Services and Value-added Services). Also the book covers topics like IP Multimedia Sub-system (IMS) and SIGTRAN. Besides these, the book includes the status of deployment of 3G UMTS Networks across the world and provides a brief introduction to 4G Networks setting the tone for future advancements.

FutureTech 2012 Volume 2 IGI Global

Ongoing advancements in modern technology have led to significant developments with smart technologies. With the numerous applications available, it becomes imperative to conduct research and make further progress in this field. Smart Technologies: Breakthroughs in Research and Practice provides comprehensive and interdisciplinary research on the most emerging areas of information science and technology. Including innovative studies on image and speech recognition, human-computer interface, and wireless technologies, this multi-volume book is an ideal source for researchers, academicians, practitioners, and students interested in advanced technological applications and developments.

Environmental Health Risk III John Wiley & Sons

Provides an introduction to the technical and business aspects of mobile telecommunications, exploring the complete eco-system of the industry with the key segments and how they interact with each other. This industry has seen rapid technical advancements in recent years, yet the basics of providing coverage and capacity to the end users have not changed. The authors introduce these technical basics to the reader and then show how a network is deployed. Technical innovation has been pivotal to the rapid advancement of this industry and the book details some of the main innovations over the years. The book highlights some of the current challenges the industry is facing and how innovation is driven by these challenges. Mobile operators business structures are examined, from the purchasing spectrum to deploying the network and attracting and retaining customers. The role of the regulator is not overlooked, and its role in ensuring a competitive market where consumers have sufficient choice. The authors detail current challenges faced by the operators and how they are using business innovation to overcome these challenges. In describing the changing face of mobile telecoms, the book covers business challenges as well as the technological challenges faced today by the industry. The advent of the Smart phones, which support multiple technologies that compliment and sometimes compete with mobile cellular technology has had a profound impact on the industry, sometimes challenging the role of the mobile operator. A discussion of these yet-unanswered challenges provides some insight into where the industry is heading. The technical aspects of this book are pitched at undergraduate first year mathematics and physics subject levels, making it easily comprehensible to the undergraduate students studying relevant fields. As the title denotes, this book will be at an introductory level, giving a broad coverage to many of the significant technical and business aspects of the industry.

UMTS Networks Artech House

Highly regarded as the book on the air interface of 3G cellular systems WCDMA for UMTS has again been fully revised and updated. The third edition now covers the key features of 3GPP Release 6 ensuring it remains the leading principal resource in this constantly progressing area. By providing a deep understanding of the WCDMA air interface, the practical approach

of this third edition will continue to appeal to operators, network and terminal manufacturers, service providers, university students and frequency regulators. Explains the key parts of the 3GPP/WCDMA standard Presents network dimensioning, coverage and capacity of WCDMA Introduces TDD and discusses its differences from FDD Key third edition updates include: Covers the main 3GPP Release 6 updates Further enhances High Speed Downlink Packet Access (HSDPA) chapter with a number of new simulation results Explains High Speed Uplink Packet Access (HSUPA) study item Introduces the new services including their performance analysis : Push-to-Talk over Cellular (PoC), streaming, See What I See (SWIS) and multiplayer games Presents a number of new WCDMA field measurement results: capacity, end-to-end performance and handovers Includes completely updated antenna beamforming and multiuser detection sections featuring new simulation results Introduces TD-SCDMA and compares it to Release TDD

Competition Law and Regulation in European Telecommunications John Wiley & Sons

The design and development of cost-effective mobile broadband wireless access networks is a key challenge for many mobile network operators. The over-dimensioning or under-dimensioning of an access network results in both additional costs and customer dissatisfaction. Thushara Weerawardane introduces new transport technologies and features for High Speed Packet Access (HSPA) and Long-Term Evolution (LTE) networks. Using advanced scientific methods, he proposes new adaptive flow control and enhanced congestion control algorithms, then defends them with highly-developed analytical models derived from Markov chains. For faster analysis, compared to long-lasting detailed simulations, these models provide optimum network performance and ensure reliable quality standards for end users during transport network congestion. Further, the author investigates and analyzes LTE transport network performance by introducing novel traffic differentiation models and buffer management techniques during intra-LTE handovers.

UMTS Networks and Beyond John Wiley & Sons

From the editors of the highly successful WCDMA for UMTS, this new book provides a comprehensive and up-to-date reference to High Speed Packet Access (HSPA) technologies for WCDMA. The editors cover both HSDPA and HSUPA, including an in-depth description and explanation of 3GPP standards, and expected performance based on simulations and first measurements. The text also discusses the impact of HSDPA and HSUPA on network dimensioning, covers applications and end-to-end performance in detail, and includes a section on radio frequency requirements and terminal design considerations. The most comprehensive and advanced guide to the HSDPA (High Speed Downlink Packet Access) and HSUPA (High Speed Uplink Packet Access) technologies and standardisation, HSDPA/HSUPA for UMTS: Analyses the impact of HSDPA/HSUPA on network dimensioning, discussing co-existence with R99 (Release 99) and GPRS/EDGE (General Packet Radio Services/ Enhanced Data GSM Environment) Contains a section on applications and end-to-end (e2e) performance Includes a chapter on radio frequency (RF) requirements and terminal design considerations, covering different RF bands, multi-band HSDPA and multi-mode HSDPA+EDGE challenges, power consumption Provides numerous illustrations of 3GPP (Third Generation Partnership Project) standards and performance This title provides excellent coverage of the area for system, element and chip designers, network planners, technical managers with vendors, operators and application developers. It is also ideal for postgraduates and researchers in related areas.

Mobile And Wireless Communications: An Introduction Universal-Publishers

The expansion and popularity of the Internet, along with the addition of wireless data functionality to wireless networks, has also contributed greatly to the growth of the wireless industry. In fact, the anticipated consumer demand for high bandwidth wireless data is commonly seen as the driving force behind current network upgrades and expansions. The number and types of companies aggressively investing in wireless technologies illustrate the importance of wireless data. Non-traditional telecommunications companies such as Cisco Systems, Intel, Microsoft, 3Com, and other professional services companies, are investing heavily in wireless product development and many have formed partnerships with wireless infrastructure manufacturers to help deliver wireless data services seamlessly to consumers. Written by a respected author this self-contained overview of wireless data technologies will provide a highly sought after technical reference to all those working within the main areas of Wireless Data Services. Provides a self-contained reference which discusses the key wireless technologies including security Presents an overview of the wireless industry and its key components such as GSM, GPRS, CDMA, TDMA, UMTS, cdma2000, and Spread Spectrum, 802.11, 15 and 16 standards Discusses the currently hot topic of Wireless Security Includes a Foreword by Dr Bill Hancock, Chief Security Officer, Exodus Communications/Cable & Wireless Provides a ready reference as well as a reference to additional materials on each topic Essential reading for all staff working for Telecom companies: engineers,

researchers, managers etc.

UMTS Peter Lang

Following on from the successful first edition (March 2012), this book gives a clear explanation of what LTE does and how it works. The content is expressed at a systems level, offering readers the opportunity to grasp the key factors that make LTE the hot topic amongst vendors and operators across the globe. The book assumes no more than a basic knowledge of mobile telecommunication systems, and the reader is not expected to have any previous knowledge of the complex mathematical operations that underpin LTE. This second edition introduces new material for the current state of the industry, such as the new features of LTE in Releases 11 and 12, notably coordinated multipoint transmission and proximity services; the main short- and long-term solutions for LTE voice calls, namely circuit switched fallback and the IP multimedia subsystem; and the evolution and current state of the LTE market. It also extends some of the material from the first edition, such as inter-operation with other technologies such as GSM, UMTS, wireless local area networks and cdma2000; additional features of LTE Advanced, notably heterogeneous networks and traffic offloading; data transport in the evolved packet core; coverage and capacity estimation for LTE; and a more rigorous treatment of modulation, demodulation and OFDMA. The author breaks down the system into logical blocks, by initially introducing the architecture of LTE, explaining the techniques used for radio transmission and reception and the overall operation of the system, and concluding with more specialized topics such as LTE voice calls and the later releases of the specifications. This methodical approach enables readers to move on to tackle the specifications and the more advanced texts with confidence.

LTE - The UMTS Long Term Evolution Intl. Engineering Consortiu

Most books on network planning and optimization provide limited coverage of either GSM or WCDMA techniques. Few scrape the surface of HSPA, and even fewer deal with TD-SCDMA. Filling this void, Evolved Cellular Network Planning and Optimization for UMTS and LTE presents an accessible introduction to all stages of planning and optimizing UMTS, HSPA,

From GSM to LTE Springer Science & Business Media

Through the use of ICT tools, such as the internet, portals, and telecommunication devices, the quality of healthcare has improved in local and global health; aiding in the development of a sustainable economy. Handbook of Research on ICTs and Management Systems for Improving Efficiency in Healthcare and Social Care brings together a valuable research collection on ICT elements needed to improve communication and collaboration between global health institutes, public and private organizations, and foundations. Highlighting the adoption and success factors in the development of technologies for healthcare, this book is essential for IT professionals, technology solution providers, researchers, and students interested in technology and its relationship with healthcare and social services.

3G Wireless Demystified John Wiley & Sons

This book is a collection of invited papers that were presented at the Ninth IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, September 5-8, 1998, Boston, MA. These papers are meant to provide a global view of the emerging third-generation wireless networks in the wake of the third millennium. Following the tradition of the PIMRC conferences, the papers are selected to strike a balance between the diverse interests of academia and industry by addressing issues of interest to the designers, manufacturers, and service providers involved in the wireless networking industry. The tradition of publishing a collection of the invited papers presented at the PIMRC started in PIMRC'97, Helsinki, Finland. There are two benefits to this tradition (1) it provides a shorter version of the proceedings of the conference that is more focused on a specific theme (2) the papers are comprehensive and are subject of a more careful review process to improve the contents as well as the presentation of the material, making it more appealing for archival as a reference book. The production costs of the book is subsidized by the conference and the editors have donated the royalty income of the book to the conference.

Methodology for Product Service System Innovation John Wiley & Sons

Summarizes and surveys current LTE technical specifications and implementation options for engineers and newly qualified support staff Concentrating on three mobile communication technologies, GSM, 3G-WCDMA, and LTE—while majorly focusing on Radio Access Network (RAN) technology—this book describes principles of mobile radio technologies that are used in mobile phones and service providers' infrastructure supporting their operation. It introduces some basic concepts of mobile network engineering used in design and rollout of the mobile network. It then follows up with principles, design constraints, and more advanced insights into radio interface protocol stack, operation, and dimensioning for three major mobile network technologies: Global System Mobile (GSM) and third (3G) and fourth generation (4G) mobile technologies. The concluding sections of the book are concerned with further developments toward next generation of mobile network (5G). Those include some of the major features of 5G such as a New Radio, NG-RAN distributed architecture, and

network slicing. The last section describes some key concepts that may bring significant enhancements in future technology and services experienced by customers. Introduction to Mobile Network Engineering: GSM, 3G-WCDMA, LTE and the Road to 5G covers the types of Mobile Network by Multiple Access Scheme; the cellular system; radio propagation; mobile radio channel; radio network planning; EGPRS - GPRS/EDGE; Third Generation Network (3G), UMTS; High Speed Packet data access (HSPA); 4G-Long Term Evolution (LTE) system; LTE-A; and Release 15 for 5G. Focuses on Radio Access Network technologies which empower communications in current and emerging mobile network systems Presents a mix of introductory and advanced reading, with a generalist view on current mobile network technologies Written at a level that enables readers to understand principles of radio network deployment and operation Based on the author's post-graduate lecture course on Wireless Engineering Fully illustrated with tables, figures, photographs, working examples with problems and solutions, and section summaries highlighting the key features of each technology described Written as a modified and expanded set of lectures on wireless engineering taught by the author, Introduction to Mobile Network Engineering: GSM, 3G-WCDMA, LTE and the Road to 5G is an ideal text for post-graduate

and graduate students studying wireless engineering, and industry professionals requiring an introduction or refresher to existing technologies.

Future Information Technology, Application, and Service IGI Global Translated from the second edition of a successful French publication, this book has been thoroughly updated to include full coverage of the new UMTS standard. It looks at the topic from a system's point of view and covers both the architecture and the techniques employed in the UMTS network. The introductory chapters cover the origins of UMTS and its relation to the other third generation technologies. The later chapters are more technical and describe different aspects such as the architecture, the structure of the radio interface, the protocols used and the importance of the GSM inheritance.

Smart Technologies: Breakthroughs in Research and Practice John Wiley & Sons

An Introduction to LTE explains the technology used by 3GPP Long Term Evolution. The book covers the whole of LTE, both the techniques used for radio communication between the base station and the mobile phone, and the techniques used for signalling communication and data transport in the evolved

packet core. It avoids unnecessary detail, focussing instead on conveying a sound understanding of the entire system. The book is aimed at mobile telecommunication professionals, who want to understand what LTE is and how it works. It is invaluable for engineers who are working on LTE, notably those who are transferring from other technologies such as UMTS and cdma2000, those who are experts in one part of LTE but who want to understand the system as a whole, and those who are new to mobile telecommunications altogether. It is also relevant to those working in non technical roles, such as project managers, marketing executives and intellectual property consultants. On completing the book, the reader will have a clear understanding of LTE, and will be able to tackle the more specialised books and the 3GPP specifications with confidence. Key features - Covers the latest developments in release 10 of the 3GPP specifications, including the new capabilities of LTE-Advanced Includes references to individual sections of the 3GPP specifications, to help readers understand the principles of each topic before going to the specifications for more detailed information Requires no previous knowledge of mobile telecommunications, or of the mathematical techniques that LTE uses for radio transmission and reception

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