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NGN (Next Generation Network).

Provides a unique focus on radio protocols for LTE and LTE-Advanced (LTE-A) Giving readers a valuable understanding of LTE radio protocols, this book covers LTE (Long-Term Evolution) Layer 2/3 radio protocols as well as new features including LTE-Advanced. It is divided into two sections to differentiate between the two technologies' characteristics. The authors systematically explain the design principles and functions of LTE radio protocols during the development of mobile handsets. The book also provides essential knowledge on the interaction between mobile networks and mobile handsets. Among the first publications based on the 3GPP R10 specifications, which introduces LTE-A Beginning with an overview of LTE, topics covered include: Idle Mode Procedure; Packet Data Convergence Protocol and Public Warning Systems Presents the LTE radio interface protocol layers in a readable manner, to enhance the material in the standards publications From an expert author team who have been directly working on the 3GPP standards It is targeted at professionals working or intending to work in the area and can also serve as supplementary reading material for students who need to know how theory on the most extensively used mobile radio interface today is put into practice

Highlights of Notes -Include MCQ of all 10 Units of

Forensic Science (Question from Each Topic) - 435+ Pages Notes - Mostly Question Answer With Solution (Explanations) - 4000 + Practice Question Answer In Each Unit Given 400 MCQ (10x400 =4000) - Design by JRF Qualified Faculties - As Per New Updated Syllabus For More Details Call/whats App -7310762592,7078549303

A comprehensive introduction to M2M Standards and systems architecture, from concept to implementation Focusing on the latest technological developments, M2M Communications: A Systems Approach is an advanced introduction to this important and rapidly evolving topic. It provides a systems perspective on machine-to-machine services and the major telecommunications relevant technologies. It provides a focus on the latest standards currently in progress by ETSI and 3GPP, the leading standards entities in telecommunication networks and solutions. The structure of the book is inspired by ongoing standards developments and uses a systems-based approach for describing the problems which may be encountered when considering M2M, as well as offering proposed solutions from the latest developments in industry and standardization. The authors provide comprehensive technical information on M2M architecture, protocols and applications, especially examining M2M service architecture, access and core network optimizations, and M2M area networks

technologies. It also considers dominant M2M application domains such as Smart Metering, Smart Grid, and eHealth. Aimed as an advanced introduction to this complex technical field, the book will provide an essential end-to-end overview of M2M for professionals working in the industry and advanced students. Key features: First technical book emerging from a standards perspective to respond to this highly specific technology/business segment Covers the main challenges facing the M2M industry today, and proposes early roll-out scenarios and potential optimization solutions Examines the system level architecture and clearly defines the methodology and interfaces to be considered Includes important information presented in a logical manner essential for any engineer or business manager involved in the field of M2M and Internet of Things Provides a cross-over between vertical and horizontal M2M concepts and a possible evolution path between the two Written by experts involved at the cutting edge of M2M developments This book provides an insight into the key practical aspects and best practice of 4G-LTE network design, performance, and deployment Design, Deployment and Performance of 4G-LTE Networks addresses the key practical aspects and best practice of 4G networks design, performance, and deployment. In addition, the book focuses on the end-to-end aspects of the LTE network architecture and

different deployment scenarios of commercial LTE networks. It describes the air interface of LTE focusing on the access stratum protocol layers: PDCP, RLC, MAC, and Physical Layer. The air interface described in this book covers the concepts of LTE frame structure, downlink and uplink scheduling, and detailed illustrations of the data flow across the protocol layers. It describes the details of the optimization process including performance measurements and troubleshooting mechanisms in addition to demonstrating common issues and case studies based on actual field results. The book provides detailed performance analysis of key features/enhancements such as C-DRX for Smartphones battery saving, CSFB solution to support voice calls with LTE, and MIMO techniques. The book presents analysis of LTE coverage and link budgets alongside a detailed comparative analysis with HSPA+. Practical link budget examples are provided for data and VoLTE scenarios. Furthermore, the reader is provided with a detailed explanation of capacity dimensioning of the LTE systems. The LTE capacity analysis in this book is presented in a comparative manner with reference to the HSPA+ network to benchmark the LTE network capacity. The book describes the voice options for LTE including VoIP protocol stack, IMS Single Radio Voice Call Continuity (SRVCC). In addition, key VoLTE features are presented: Semi-persistent

scheduling (SPS), TTI bundling, Quality of Service (QoS), VoIP with C-DRX, Robust Header Compression (RoHC), and VoLTE Vocoders and De-Jitter buffer. The book describes several LTE and LTE-A advanced features in the evolution from Release 8 to 10 including SON, eICIC, CA, CoMP, HetNet, Enhanced MIMO, Relays, and LBS. This book can be used as a reference for best practices in LTE networks design and deployment, performance analysis, and evolution strategy. Conveys the theoretical background of 4G-LTE networks Presents key aspects and best practice of 4G-LTE networks design and deployment Includes a realistic roadmap for evolution of deployed 3G/4G networks Addresses the practical aspects for designing and deploying commercial LTE networks. Analyzes LTE coverage and link budgets, including a detailed comparative analysis with HSPA+. References the best practices in LTE networks design and deployment, performance analysis, and evolution strategy Covers infrastructure-sharing scenarios for CAPEX and OPEX saving. Provides key practical aspects for supporting voice services over LTE, Written for all 4G engineers/designers working in networks design for operators, network deployment engineers, R&D engineers, telecom consulting firms, measurement/performance tools firms, deployment subcontractors, senior undergraduate students and graduate students

interested in understanding the practical aspects of 4G-LTE networks as part of their classes, research, or projects.

Wireless Public Safety Networks, Volume Two: A Systematic Approach presents the latest advances in the wireless Public Safety Networks (PSNs) field, the networks established by authorities to either prepare the population for an eminent catastrophe, or those used for support during crisis and normalization phases. Maintaining communication capabilities in a disaster scenario is crucial for avoiding loss of lives and damages to property. This book examines past communication failures that have directly contributed to the loss of lives, giving readers in-depth discussions of the public networks that impact emergency management, covering social media, crowdsourcing techniques, wearable wireless sensors, moving-cells scenarios, mobility management protocols, 5G networks, broadband networks, data dissemination, and the resources of the frequency spectrum. Provides a focus on specific enabling technologies which can help the most on the deployment and usage of PSNs in real world scenarios Proposes a general framework that has the capability to fulfill the public safety requirements and dynamically adapt to different public safety situations Investigates the problem of data dissemination over PSNs, presenting a review of the state-of-the-art of different information and

communication technologies

Presents the principles, design, development and applications of the Diameter protocol suite The Diameter protocol was born in the Internet Engineering Task Force (IETF) and designed to be a general-purpose Authentication, Authorization, and Accounting (AAA) protocol applicable to many network environments. This book is for everyone who wants to understand the Diameter protocol and its applications. This book explains the place Diameter holds in global telecommunication networks and teaches system architects and designers how to incorporate Diameter into their network environments. Diameter: New Generation AAA Protocol - Design, Practice and Applications begins by describing the foundation of Diameter step-by-step, starting with building blocks of the protocol, and progressing from a simple two-party exchange to a multi-party exchange involving complex routing. It discusses the motivation for using Diameter, talks about its predecessor, RADIUS, and introduces the open source Diameter implementation, freeDiameter. The book expands beyond protocol basics to cover end-to-end communication, security functionality, and real-world applications, extending to the backend infrastructure of mobile telecommunications. In addition, an advanced chapter teaches readers how to develop Diameter extensions for their own AAA applications. Written by

an experienced author team who are members of the group that standardized Diameter in the IETF and are at the forefront of this cutting-edge technology Presents the still-developing topic of Diameter from both introductory and advanced levels Makes available for download a virtual machine containing the open source implementation: <https://diameter-book.info> Provides hands-on experience via freeDiameter examples and exercises throughout the book Diameter: New Generation AAA Protocol - Design, Practice and Applications will appeal to system architects and system designers, programmers, standardization experts new to Diameter, students and researchers interested in technology that is deployed by many network operators.

The Internet of Things (IoT) has grown from a niche market for machine-to-machine communication into a global phenomenon that is touching our lives daily. The key aspects of IoT are covered in this book, including the anatomy of an IoT device and how it is connected to a backend system, the nuances of data extraction and keeping the data safe and secure, the role of the SIM card in cellular connected IoT devices, and how IoT devices are controlled. Low-power wide-area devices that will allow almost anything to be connected, how IoT devices are being connected around the world, and how 5G and edge computing will continue to drive new use cases are

explained. Overcoming the challenges of creating IoT applications and hardware is covered. Detailed examples of how IoT is being used in the spaces of industrial, consumer, transportation, robotics, and wearables are provided. The IoT industry is explained. Finally, the future of IoT is covered in light of technical, social, and economic advances.

Real-world instruction in the design and deployment of 3G networks Pin down the technical details that make 3G wireless networking actually work. In 3G Wireless Networks, experts Clint Smith and Daniel Collins dissect critical issues of compatibility, internetworking, and voice/data convergence, providing you with in-depth explanations of how key standards and protocols intersect and interconnect. This guide digs into the gritty details of day-to-day network operations, giving you a chance to understand the difficulties service providers will experience in making the changeover from 2nd Generation systems (CDMS etc.) to 2.5 Generation systems like WAP and EDGE and finally to full throttle 3G networks. It describes key standards, digs deep into the guts of relevant network protocols, and details the full range of compatibility issues between the US (CDMA 2000) and European (WCDMA) versions of the standard. Plenty of call flow diagrams show you exactly how the technologies work.

As wireless networks take ever-bigger bites out of the USD 350 billion dollar telephone market, they create their own performance problems. International customers require global networks; more customers mean bigger

networks; new services create more complicated networks. Then there's changing out the network; each time a provider introduces a new technology or capability, it has to do so without interrupting service delivery to existing customers. Here is realistic advice on metrics, troubleshooting methods, design guidelines, revenue assurance and more, from a team that has performed the same services for AT&T Wireless, Nextel and Verizon.

Describes the technological solutions and standards which will enable the migration of voice and SMS services over to LTE/EPC networks Main drivers for the introduction of Long Term Evolution of UTRAN (LTE) is to provide far better end user experience for mobile broadband services. However, service providers also need to have a clear strategy of how to offer voice and messaging services for consumers and enterprises. The voice service over LTE is becoming increasingly important when the smartphone penetration is increasing rapidly. Smartphones require both good quality voice and high speed broadband data. This book provides the exhaustive view to industry-approved technologies and standards behind the Voice over LTE (VoLTE). Whether a decision maker or technology analyst, this book explains a topic of substantial global market interest. It provides a good introduction to the technology and is useful for operators who may be deploying VoLTE, product managers responsible for VoLTE products and those who work in implementation and standardization of related technologies. Provides a comprehensive overview of industry-approved technologies and

standards, providing vital information for decision makers and those working on the technology. Written by authors working at the cutting edge of mobile communications technology today, bringing a mix of standards and product background, guaranteeing in-depth practical and standards information. Covering the technical and practical elements of VoLTE, explaining the various approaches for providing voice services over LTE.

"Provides comprehensive insight into practical realizations of PCNs. The author's wide experience and lucid presentation provide a thought-provoking and information-intensive content, providing an insight into future mobile communications."--Telematics India

During the first decade of this new millennium, it is estimated that more than €100 billion will be invested in the third generation (3G) Universal Mobile Telecommunications System (UMTS) in Europe. This fact represents an amazing challenge from both a technical and commercial perspective. Written by experts in the field, this book gives a detailed description of the elements in the UMTS network architecture: the User Equipment (UE), the UMTS Radio Access Network (UTRAN) and the core network. The completely new protocols based on the needs of the new Wideband Code Division Multiple Access (WCDMA) air interface are highlighted by considering both Frequency- and Time-Division Duplex modes. The book further introduces the key features of existing topics in Releases 5, 6 and 7. Get the most out of your Samsung GALAXY Tab At last--a tablet that puts the power of a full computer right in your hands! This hands-on guide shows you show to

tap into your Galaxy Tab's full range of business productivity and entertainment features. How to Do Everything: Samsung GALAXY Tab teaches you how to connect to wireless networks, sync data with your PC or Mac, browse the Web, use e-mail, and much more. Harness the power of the Android operating system, maximize the built-in and third-party applications, and maintain and troubleshoot your Galaxy Tab with help from this practical, time-saving resource. set up, navigate, and customize your Galaxy Tab Connect seamlessly to as many wireless networks as you need Synchronize your Galaxy Tab with your PC or Mac using Samsung Kies Play movies on your Galaxy Tab or your TV Take photos and videos and share them online and offline Check e-mail, communicate with instant messaging, and browse the Web from anywhere Keep up with your social networks on the go Read e-books and PDFs in the palm of your hand Navigate easily with Google Maps Install and use versatile applications from the Android Market Troubleshoot, maintain, and secure your Galaxy Tab Connect to your work network via virtual private networking

Discover all the security risks and exploits that can threaten iOS-based mobile devices iOS is Apple's mobile operating system for the iPhone and iPad. With the introduction of iOS5, many security issues have come to light. This book explains and discusses them all. The award-winning author team, experts in Mac and iOS security, examines the vulnerabilities and the internals of iOS to show how attacks can be mitigated. The book explains how the operating system works, its overall

security architecture, and the security risks associated with it, as well as exploits, rootkits, and other payloads developed for it. Covers iOS security architecture, vulnerability hunting, exploit writing, and how iOS jailbreaks work Explores iOS enterprise and encryption, code signing and memory protection, sandboxing, iPhone fuzzing, exploitation, ROP payloads, and baseband attacks Also examines kernel debugging and exploitation Companion website includes source code and tools to facilitate your efforts iOS Hacker's Handbook arms you with the tools needed to identify, understand, and foil iOS attacks.

Seeking the Truth from Mobile Evidence: Basic Fundamentals, Intermediate and Advanced Overview of Current Mobile Forensic Investigations will assist those who have never collected mobile evidence and augment the work of professionals who are not currently performing advanced destructive techniques. This book is intended for any professional that is interested in pursuing work that involves mobile forensics, and is designed around the outcomes of criminal investigations that involve mobile digital evidence. Author John Bair brings to life the techniques and concepts that can assist those in the private or corporate sector. Mobile devices have always been very dynamic in nature. They have also become an integral part of our lives, and often times, a digital representation of where we are, who we communicate with and what we document around us. Because they constantly change features, allow user enabled security, and or encryption, those employed with extracting user data are often overwhelmed with the

process. This book presents a complete guide to mobile device forensics, written in an easy to understand format. Provides readers with basic, intermediate, and advanced mobile forensic concepts and methodology Thirty overall chapters which include such topics as, preventing evidence contamination, triaging devices, troubleshooting, report writing, physical memory and encoding, date and time stamps, decoding Multi-Media-Messages, decoding unsupported application data, advanced validation, water damaged phones, Joint Test Action Group (JTAG), Thermal and Non-Thermal chip removal, BGA cleaning and imaging, In-System-Programming (ISP), and more Popular JTAG boxes – Z3X and RIFF/RIFF2 are expanded on in detail Readers have access to the companion guide which includes additional image examples, and other useful materials The book aims to provide a broad overview of various topics of the Internet of Things (IoT) from the research and development priorities to enabling technologies, architecture, security, privacy, interoperability and industrial applications. It is intended to be a standalone book in a series that covers the Internet of Things activities of the IERC ? Internet of Things European Research Cluster from technology to international cooperation and the global "state of play". The book builds on the ideas put forward by the European research Cluster on the Internet of Things Strategic Research Agenda and presents global views and state of the art results on the challenges facing the research, development and deployment of IoT at the global level. Today we see the integration of Industrial, Business and Consumer Internet which is bringing together the Internet of People, Internet of Things, Internet of Energy, Internet of Vehicles, Internet of

Media, Services and Enterprises in forming the backbone of the digital economy, the digital society and the foundation for the future knowledge and innovation based economy in supporting solutions for the emerging challenges of public health, aging population, environmental protection and climate change, the conservation of energy and scarce materials, enhancements to safety and security and the continuation and growth of economic prosperity. Penetration of smartphones and advances in machine to machine and wireless communication technology will be the main drivers for IoT development. The IoT contribution is in the increased value of information created by the number of interconnections among things and the transformation of the processed information into knowledge shared into the Internet of Everything. The connected devices are part of ecosystems connecting people, processes, data, and things which are communicating in the cloud using the increased storage and computing power and pushing for standardization of communication and metadata. In this context the next generation of the Cloud technologies will need to be flexible enough to scale autonomously, adaptive enough to handle constantly changing connections and resilient enough to stand up to the huge flows in data that will occur. For 2025 analysts forecast that there will be six devices per human on the planet, which means 50 billion more connected devices over the next 12 years. The Internet of Things market is connected to this devices growth from industrial machine to machine (M2M) systems, smart meters and wireless sensors. Enabling technologies such as nanoelectronics, MEMS, embedded systems, intelligent device management, smart phones, telematics, smart network infrastructure, cloud computing and software technologies will create new products, new services, new interfaces by creating smart environments and smart spaces with applications ranging

from Smart Cities, smart transport, buildings, energy, grid, to smart health and life. Technical topics discussed in the book include: Introduction Internet of Things in a wider context: Time for convergence. Internet of Things Strategic Research Agenda Interconnection and Integration of the Physical World into the Digital World Scalable Architectures for IoT Applications IoT standardisation requirements and initiatives. Standardisation and Innovation. Service Openness and Interoperability Software define and virtualization of network resources Mobile devices enable IoT evolution from industrial applications to mass consumer applications Innovation through Interoperability and Standardisation when everything is connected anytime at anyplace Security, privacy, trust, safety, dependability: new challenges for IoT Internet of Things Industrial Applications

Essential reference providing best practice of LTE-A, VoLTE, and IoT Design/deployment/Performance and evolution towards 5G This book is a practical guide to the design, deployment, and performance of LTE-A, VoLTE/IMS and IoT. A comprehensive practical performance analysis for VoLTE is conducted based on field measurement results from live LTE networks. Also, it provides a comprehensive introduction to IoT and 5G evolutions. Practical aspects and best practice of LTE-A/IMS/VoLTE/IoT are presented. Practical aspects of LTE-Advanced features are presented. In addition, LTE/LTE-A network capacity dimensioning and analysis are demonstrated based on live LTE/LTE-A networks KPIs. A comprehensive foundation for 5G technologies is provided including massive MIMO, eMBB, URLLC, mMTC, NGCN and network slicing, cloudification, virtualization and SDN. Practical Guide to LTE-A, VoLTE and IoT: Paving the Way Towards 5G can be used as a practical comprehensive guide for best practices in LTE/LTE-A/VoLTE/IoT design, deployment, performance analysis and network architecture

and dimensioning. It offers tutorial introduction on LTE-A/loT/5G networks, enabling the reader to use this advanced book without the need to refer to more introductory texts. Offers a complete overview of LTE and LTE-A, IMS, VoLTE and loT and 5G Introduces readers to IP Multimedia Subsystems (IMS) Performs a comprehensive evaluation of VoLTE/CSFB Provides LTE/LTE-A network capacity and dimensioning Examines loT and 5G evolutions towards a super connected world Introduce 3GPP NB-loT evolution for low power wide area (LPWA) network Provide a comprehensive introduction for 5G evolution including eMBB, URLLC, mMTC, network slicing, cloudification, virtualization, SDN and orchestration Practical Guide to LTE-A, VoLTE and loT will appeal to all deployment and service engineers, network designers, and planning and optimization engineers working in mobile communications. Also, it is a practical guide for R&D and standardization experts to evolve the LTE/LTE-A, VoLTE and loT towards 5G evolution.

Covering the key functional areas of LTE Self-Organising Networks (SON), this book introduces the topic at an advanced level before examining the state-of-the-art concepts. The required background on LTE network scenarios, technologies and general SON concepts is first given to allow readers with basic knowledge of mobile networks to understand the detailed discussion of key SON functional areas (self-configuration, -optimisation, -healing). Later, the book provides details and references for advanced readers familiar with LTE and SON, including the latest status of 3GPP standardisation. Based on the defined next generation mobile networks (NGMN) and 3GPP SON use cases, the book elaborates to give the full picture of a SON-enabled system including its enabling technologies, architecture and operation. "Heterogeneous networks" including different cell hierarchy levels and multiple radio

access technologies as a new driver for SON are also discussed. Introduces the functional areas of LTE SON (self-optimisation, -configuration and -healing) and its standardisation, also giving NGMN and 3GPP use cases Explains the drivers, requirements, challenges, enabling technologies and architectures for a SON-enabled system Covers multi-technology (2G/3G) aspects as well as core network and end-to-end operational aspects Written by experts who have been contributing to the development and standardisation of the LTE self-organising networks concept since its inception Examines the impact of new network architectures (“Heterogeneous Networks”) to network operation, for example multiple cell layers and radio access technologies

This book constitutes the refereed proceedings of the 12th Asian Symposium on Programming Languages and Systems, APLAS 2014, held in Singapore, Singapore in November 2014. The 20 regular papers presented together with the abstracts of 3 invited talks were carefully reviewed and selected from 57 submissions. The papers cover a variety of foundational and practical issues in programming languages and systems - ranging from foundational to practical issues. The papers focus on topics such as semantics, logics, foundational theory; design of languages, type systems and foundational calculi; domain-specific languages; compilers, interpreters, abstract machines; program derivation, synthesis and transformation; program analysis, verification, model-checking; logic, constraint, probabilistic and quantum programming; software security; concurrency and parallelism; as well as tools and environments for programming and implementation.

A comprehensive resource containing the operating principles and key insights of LTE networks performance optimization LTE Optimization Engineering Handbook is a comprehensive

reference that describes the most current technologies and optimization principles for LTE networks. The text offers an introduction to the basics of LTE architecture, services and technologies and includes details on the key principles and methods of LTE optimization and its parameters. In addition, the author clarifies different optimization aspects such as wireless channel optimization, data optimization, CSFB, VoLTE, and video optimization. With the ubiquitous usage and increased development of mobile networks and smart devices, LTE is the 4G network that will be the only mainstream technology in the current mobile communication system and in the near future. Designed for use by researchers, engineers and operators working in the field of mobile communications and written by a noted engineer and experienced researcher, the LTE Optimization Engineering Handbook provides an essential guide that: Discusses the latest optimization engineering technologies of LTE networks and explores their implementation Features the latest and most industrially relevant applications, such as VoLTE and HetNets Includes a wealth of detailed scenarios and optimization real-world case studies Professionals in the field will find the LTE Optimization Engineering Handbook to be their go-to reference that includes a thorough and complete examination of LTE networks, their operating principles, and the most current information to performance optimization. Fully up-to-date coverage of the inner-workings of 3G This revised and updated edition of 3G Wireless Networks covers the changes taking place within the arena of 3G--the wireless technology that enables voice, full-featured video, CD-quality sound, and Web browsing anywhere in the world. The book covers key standards and protocols and the critical issues of compatibility, internetworking, and voice/data convergence. You will learn how to successfully design and integrate WCDMA/UMTS, CDMA2000, and SCDMA into existing

cellular/PCS networks.

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.

Buy or Review at Amazon.com Paperback edition \$89.95

5G Core Networks: Powering Digitalization provides an overview of the 5G Core network architecture, as well as giving descriptions of cloud technologies and the key concepts in the 3GPP rel-15/16 specifications. Written by the authors who are heavily involved in development of the 5G standards and who wrote the successful book on EPC and 4G Packet Networks, this book provides an authoritative reference on the technologies and standards of the 3GPP 5G Core network. Content includes: An overview of the 5G Core Architecture The Stand-Alone and Non-Stand-Alone Architectures Detailed presentation of 5G Core key concepts An overview of 5G Radio and Cloud technologies Learn The differences between the 5G Core network and previous core network generations How the interworking with previous network standards is defined Why certain functionality has been included and what is beyond the scope of 5G Core How the specifications relate to state-of-the-art web-scale concepts and virtualization technologies Details of the protocol and service descriptions Examples of network

deployment options Provides a clear, concise and comprehensive view of 5GS/5GC Written by established experts in the 5GS/5GC standardization process, all of whom have extensive experience and understanding of its goals, history and vision Covers potential service and operator scenarios for each architecture Explains the Service Based Architecture, Network Slicing and support of Edge Computing, describing the benefits they will bring Explains what options and parts of the standards will initially be deployed in real networks, along with their migration paths This extensively updated second edition of LTE Signaling, Troubleshooting and Performance Measurement describes the LTE signaling protocols and procedures for the third generation of mobile communications and beyond. It is one of the few books available that explain the LTE signaling messages, procedures and measurements down to the bit & byte level, and all trace examples are taken for a real lab and field trial traces. This book covers the crucial key performance indicators (KPI) to be measured during field trials and deployment phase of new LTE networks. It describes how statistic values can be aggregated and evaluated, and how the network can be optimized during the first stages of deployment, using dedicated examples to enhance understanding. Written by experts in the field of mobile communications, this book systematically describes the most recent LTE signaling procedures, explaining how to identify and troubleshoot abnormal network behavior and

common failure causes, as well as describing the normal signaling procedures. This is a unique feature of the book, allowing readers to understand the root cause analysis of problems related to signaling procedures. This book will be especially useful for network operators and equipment manufacturers; engineers; technicians; network planners; developers; researchers; designers; testing personnel and project managers; consulting and training companies; standardization bodies.

"This book is intended to serve two purposes: to provide a coherent explanation of the theories and procedures that underpin forensic radio surveying and of the network technologies being surveyed in a form that can be read cover to cover as a text book; but also to act as a reference resource that can be dipped into as needed"--

This book describes the current and most probable future wireless security solutions. The focus is on the technical discussion of existing systems and new trends like Internet of Things (IoT). It also discusses existing and potential security threats, presents methods for protecting systems, operators and end-users, describes security systems attack types and the new dangers in the ever-evolving Internet. The book functions as a practical guide describing the evolution of the wireless environment, and how to ensure the fluent continuum of the new functionalities, whilst minimizing the potential risks in

network security.

Building on the success of the first edition, UMTS Networks second edition allows readers to continue their journey through UMTS up to the latest 3GPP standardization phase, Release 5. Containing revised, updated and brand new material, it provides a comprehensive view on the UMTS network architecture and its latest developments.

Accompanied by numerous illustrations, the practical approach of the book benefits from the authors' pioneering research and training in this field.

Provides a broad yet detailed overview of the latest worldwide developments in UMTS technology.

Includes brand new sections on the IP Multimedia Subsystem and High Speed Downlink Packet Access according to 3GPP Release 5 specifications.

Contains heavily revised sections on the evolution from GSM to UMTS Multi-access, the UMTS Radio Access Network, the UMTS Core Network and services. Includes updated versions on services in the UMTS environment, security in the UMTS environment and UMTS protocols. Illustrates all points with cutting-edge practical examples gleaned from the authors' research and training at the forefront of UMTS. The illustrative, hands-on approach will appeal to operators, equipment vendors, systems designers, developers and marketing professionals who require comprehensive, practical information on the latest developments in

UMTS. This second edition will also benefit students and researchers in the field of mobile networking. Learn how to use CAMEL to transfer the Intelligent Network concept to the mobile world! CAMEL (Customized Application for the Mobile network Enhanced Logic) is a standard for Intelligent Networks for mobile communications networks. It is currently deployed in all regions of the world, enabling mobile network operators to offer fast and efficient services to their subscribers. This book is an in-depth and dedicated reference on CAMEL, taking the reader through the history and development of Intelligent Networks and the essential principles of CAMEL, to the future of the technology. The author provides guidance on the various standards and specifications, and explains not only how CAMEL works but also why it works this way. Practical hints on the installation of CAMEL in the network are given throughout the book. CAMEL: Intelligent Networks for the GSM, GPRS and UMTS Network: Offers a comprehensive guide to implementing CAMEL. Gives a complete picture, including the network entities & data flows involved. Describes and explains the four CAMEL phases and their aspects. Presents an overview of the principles of Intelligent Networks, such as Finite State Machines, Trigger Detection Points, Event Detection Points and dialogue, essential to understanding CAMEL. Covers charging and accounting issues, and the impact of

CAMEL on the charging system in the mobile network. Provides practical hints over and above those mentioned in the formal specifications. This text will be an invaluable resource for intelligent network service logic designers, service network designers, network engineers, and GSM/UMTS network designers and implementers. Advanced students on courses such as 'Intelligent Networks', 'Value Added Services', and 'Service Networks' will also find it an excellent guide to the topic. Focusing on the future network architecture and its main principles, *Converging NGN Wireline and Mobile 3G Networks with IMS* provides a comprehensive view of the methods, functions, network elements, and the interfaces among them that enable the building of a service agnostic and access agnostic session control layer based on the IMS standards. After an introduction to IMS principles with market trends, technological innovations, migration issues, and global standards, the book describes converged session control and multimedia handling with ID management, service profiles, and event and applications triggering as well as admission procedures for different types of access networks. Subsequent chapters tackle the all-important aspects of IP charging mechanisms, service-based quality of service, security, border control, and legacy services, enabling a thorough appreciation of the full network requirements.

Wherever possible, the author points out the convergence of standards and details different specifications and terminology for TISPAN and 3GPP. Delivering deep insight into the role of IMS in fixed line and mobile networks, this book explains the new technologies from concepts to detailed techniques to give a clear understanding of how the next generation of converged communication can be achieved with managed quality, security, and chargeability.

With advances in technology, a mobile device today is like a mini PC that provides voice and data services in the form of smart-phones. Phenomenal increase in data services which enable mobile communication access to critical aspects of human society/life has led to standardization of SAE/LTE (System Architecture Evolution/Long Term Evolution) by 3GPP and IEEE 802.16e/WiMAX. SAE/LTE is also known as Evolved Packet System (EPS). This book addresses the newer security issues that have arisen as a result of penetration of mobile communications and standardization. In particular, the book focuses on the latest security developments in 3GPP SAE/LTE and WiMAX. The intended audience for this book are mobile network and device architects, designers, researchers and students. The goal of the authors, who have a combined experience of more than 25 years in mobile security standardization, architecture,

research, and education, is to provide the book's readers with up-to-date information about the architecture and challenges of EPS and WiMAX security. The book has six chapters; the first three chapters are intended to be introductory ones, and the remaining three chapters provide an in-depth assessment of security provisions. Chapter 1 provides a background to the Next Generation Mobile Networks (NGMN) activity and requirements. Chapter 2 provides an overview of security, telecommunication systems and their requirements. Chapter 3 provides some background information on standardization. Chapter 4 discusses the EPS (or SAE/LTE) security architecture developed by 3GPP, in particular, the authentication and key agreement method for SAE/LTE together with newly defined key hierarchy. This chapter also addresses the challenging aspects of SAE/LTE interworking and mobility with UMTS together with the necessary key-exchange technologies. The focus of Chapter 5 is WiMAX (IEEE 802.16) security and provides an in-depth discussion of the WiMAX security requirements, the authentication aspects of PKMv2, and the overall WiMAX network security aspects. Chapter 6 briefly covers security for (i) Home(evolved)NodeB [H(e)NB is the Femto solution from 3GPP], (ii) Machine-to-Machine (M2M) security and (iii) Multimedia Broadcast and Multicast Service (MBMS) and Group Key Management.

Now in its fifth edition, the bestselling book on UMTS has been updated to cover 3GPP WCDMA and High Speed Packet Access (HSPA) from Release 99 to Release 9. Written by leading experts in the field, the book explains HSPA performance based on simulations and field experience, and illustrates the benefits of HSPA evolution (HSPA+) both from the operators and from the end user's perspective. It continues to provide updated descriptions of the 3GPP standard including the physical layer, radio protocols on layers 1-3 and a system architecture description. The challenges and solutions regarding terminal RF design are also discussed, including the benefits of HSPA+ power saving features. There is also the addition of a new chapter on femto cells as part of the updates to this fifth edition. Key updates include: HSPA evolution (HSPA+); Multicarrier HSPA solutions; HSPA femto cells (home base stations); TD-SCDMA system description; Terminal power consumption optimization. Updated description of LTE

Addressing the security solutions for LTE, a cellular technology from Third Generation Partnership Project (3GPP), this book shows how LTE security substantially extends GSM and 3G security. It also encompasses the architectural aspects, known as SAE, to give a comprehensive resource on the topic. Although the security for SAE/LTE evolved from the security for GSM and 3G, due to different

architectural and business requirements of fourth generation systems the SAE/LTE security architecture is substantially different from its predecessors. This book presents in detail the security mechanisms employed to meet these requirements. Whilst the industry standards inform how to implement systems, they do not provide readers with the underlying principles behind security specifications. LTE Security fills this gap by providing first hand information from 3GPP insiders who explain the rationale for design decisions. Key features: Provides a concise guide to the 3GPP/LTE Security Standardization specifications Authors are leading experts who participated in decisively shaping SAE/LTE security in the relevant standardization body, 3GPP Shows how GSM and 3G security was enhanced and extended to meet the requirements of fourth generation systems Gives the rationale behind the standards specifications enabling readers to have a broader understanding of the context of these specifications Explains why LTE security solutions are designed as they are and how theoretical security mechanisms can be put to practical use

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This Standard specifies testing methods for mobile terminal information security, including the testing methods for terminal hardware security, terminal software security, and OS application security, as well as the testing methods for mobile terminal access security and information transfer security, mobile terminal personal information confidentiality security etc. This Standard applies to terminal equipment in the second generation mobile communication network and above. This Standard does not specify testing requirements related to EMC, EMI or electrical security.

This book is an in-depth, systematic and structured technical reference on 3GPP's LTE-Advanced (Releases 10 and 11), covering theory, technology and implementation, written by an author who has been involved in the inception and development of these technologies for over 20 years. The book not only describes the operation of individual components, but also shows how they fit into the overall system and operate from a systems perspective. Uniquely, this book gives in-depth information on upper protocol layers, implementation

and deployment issues, and services, making it suitable for engineers who are implementing the technology into future products and services. Reflecting the author's 25 plus years of experience in signal processing and communication system design, this book is ideal for professional engineers, researchers, and graduate students working in cellular communication systems, radio air-interface technologies, cellular communications protocols, advanced radio access technologies for beyond 4G systems, and broadband cellular standards. An end-to-end description of LTE/LTE-Advanced technologies using a top-down systems approach, providing an in-depth understanding of how the overall system works Detailed algorithmic descriptions of the individual components' operation and inter-connection Strong emphasis on implementation and deployment scenarios, making this a very practical book An in-depth coverage of theoretical and practical aspects of LTE Releases 10 and 11 Clear and concise descriptions of the underlying principles and theoretical concepts to provide a better understanding of the operation of the system's components Covers all essential system functionalities, features, and their inter-connections based on a clear protocol structure, including detailed signal flow graphs and block diagrams Includes methodologies and results related to link-level and system-level evaluations of LTE-

Advanced Provides understanding and insight into the advanced underlying technologies in LTE-Advanced up to and including Release 11: multi-antenna signal processing, OFDM, carrier aggregation, coordinated multi-point transmission and reception, eICIC, multi-radio coexistence, E-MBMS, positioning methods, real-time and non-real-time wireless multimedia applications

Security forces PMR networks are moving from proprietary technologies for their “Mission Critical Push-To-Talk” basic service, and their data services which must provide large bandwidth real-time access, to the databases. LTE Based is adopted with backup access to public MNOs to complement their own radio coverage. Specific technologies such as multicasting of video are required so the MCPTT works within a restricted bandwidth. The need to be able to change the main MNOs to provide resilient coverage requires specific choices of SIM cards, with OTA-able security domains. Practical LTE Based Security Forces PMR Networks assumes that the reader has a basic knowledge of the 4G network architecture and services, and the book focusses on the specific features and choices required to fulfill the need of security forces PMR networks. These include tactical and centralized, including LTE based voice services VoLTE and IMS. It can be used as a reference or textbook, with many detailed call flows and traces being included. The author, who has also

a long teaching career in Operations Research, provides mathematical models for the optimization of tactical network federations, multicast coverage and allocation of preemptive priorities to PMR group members. He is a pioneer in the area of Virtual Roaming, an application of graph theory and telecommunications to provide roaming without direct relations, having previously published books on SMS Hubs, SS7 Hubs, Diameter Hubs, GTP Hubs. The use of M2M (monitoring devices) for security forces with mobility is covered in detail in the book, including the new LoRa virtual roaming which goes beyond the scope of PMR.

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