

Read Online Epc And 4g Packet Networks Second Edition Driving The Le Broadband Revolution By Olsson Magnus Published By Academic Press 2nd Second Edition 2012 Hardcover

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With the rise of mobile and wireless technologies, more sustainable networks are necessary to support such communications. These next generation networks can now be utilized to strengthen the growing era of the Internet of Things. Powering the Internet of Things With 5G Networks is a comprehensive reference source for the latest scholarly research on the progression and design of fifth generation networks and their role in supporting the Internet of Things. Including a range of perspectives on topics such as privacy and security, large scale monitoring, and scalable architectures, this book is ideally designed for technology developers, academics, researchers, and practitioners interested in the convergence of the Internet of Things and 5G networks.

A comprehensive reference on the call procedures of 4G RAN and Core networks, LTE Signaling, Troubleshooting and Optimization describes the protocols and procedures of LTE. It explains essential topics from basic performance measurement counters, radio quality and user plane quality to the standards, architecture, objectives and functions of the different interfaces. The first section gives an overview of LTE/EPC network

architecture, reference points, protocol stacks, information elements and elementary procedures. The proceeding parts target more advanced topics to cover LTE/EPC signalling and radio quality analysis. This book supplements the information provided in the 3GPP standards by giving readers access to a universal LTE/EPC protocol sequence to ensure they have a clear understanding of the issues involved. It describes the normal signaling procedures as well as explaining how to identify and troubleshoot abnormal network behavior and common failure causes. Enables the reader to understand the signaling procedures and parameters that need to be analyzed when monitoring UMTS networks Covers the essential facts on signaling procedures by providing first hand information taken from real LTE/EPC traces A useful reference on the topic, also providing sufficient details for test and measurement experts who need to analyze LTE/EPC signaling procedures and measurements at the most detailed level Contains a description of LTE air interface monitoring scenarios as well as other key topics up to an advanced level LTE Signaling, Troubleshooting and Optimization is the Long Term Evolution successor to the previous Wiley books UMTS Signaling and UMTS Performance Measurement.

Why is high performance indoor wireless service needed, and how is it best implemented? As the challenge of providing better service and higher data speeds and quality for mobile applications intensifies, ensuring adequate in-building and tunnel coverage and capacity is increasingly important. A unique, single-

source reference on the theoretical and practical knowledge behind indoor and tunnel radio planning, this book provides a detailed overview of mobile networks systems, coverage and capacity solutions with 2G, 3G and 4G cellular system technologies as a backdrop. This book provides a comprehensive overview of the latest research and standardization progress towards the 5th generation (5G) of mobile communications technology and beyond. It covers a wide range of topics from 5G use cases and their requirements, to spectrum, 5G end-to-end (E2E) system architecture including core network (CN), transport network (TN) and radio access network (RAN) architecture, network slicing, security and network management. It further dives into the detailed functional design and the evaluation of different 5G concepts, and provides details on planned trials and pre-commercial deployments across the globe. While the book naturally captures the latest agreements in 3rd Generation Partnership Project (3GPP) New Radio (NR) Release 15, it goes significantly beyond this by describing the likely developments towards the final 5G system that will ultimately utilize a wide range of spectrum bands, address all envisioned 5G use cases, and meet or exceed the International Mobile Telecommunications (IMT) requirements for the year 2020 and beyond (IMT-2020). 5G System Design: Architectural and Functional Considerations and Long Term Research is based on the knowledge and consensus from 158 leading researchers and standardization experts from 54 companies or institutes around the globe, representing

key mobile network operators, network vendors, academic institutions and regional bodies for 5G.

Different from earlier books on 5G, it does not focus on single 5G technology components, but describes the full 5G system design from E2E architecture to detailed functional design, including details on 5G performance, implementation and roll-out.

Cloud Computing: Business Trends and Technologies provides a broad introduction to Cloud computing technologies and their applications to IT and telecommunications businesses (i.e., the network function virtualization, NFV). To this end, the book is expected to serve as a textbook in a graduate course on Cloud computing. The book examines the business cases and then concentrates on the technologies necessary for supporting them. In the process, the book addresses the principles of – as well as the known problems with – the underlying technologies, such as virtualization, data communications, network and operations management, security and identity management. It introduces, through open-source case studies (based on OpenStack), an extensive illustration of lifecycle management. The book also looks at the existing and emerging standards, demonstrating their respective relation to each topic. Overall, this is an authoritative textbook on this emerging and still-developing discipline, which

- Guides the reader through basic concepts, to current practices, to state-of-the-art applications.
- Considers technical standards bodies involved in Cloud computing standardization.
- Is written by innovation experts in operating systems and data

communications, each with over 20 years' experience in business, research, and teaching.

MIMO Processing for 4G and Beyond: Fundamentals and Evolution offers a cutting-edge look at multiple-input multiple-output (MIMO) signal processing, namely its detection (in both time and frequency domains) and precoding. It examines its integration with OFDM, UWB, and CDMA, along with the impact of these combinations at the system level. Massive M
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The adoption of smartphones has had as a corollary the use of services that require streaming, such as video streaming, which is a constraint for the 4G mobile network. The integration of the network of Wi-Fi hotspots deployed by the operators adds capacity to the 4G mobile network. The use of Wi-Fi technology in carrier networks is the result of developments coordinated by the IEEE, WFA and WBA standardization bodies. For its part, the 3GPP standardization body has been working to integrate Wi-Fi technology into the 4G mobile network. The first part of this book presents the characteristics of the Wi-Fi radio interface. The different IEEE 802.11b / g / n / ac physical layers characterize the implementation in the 2.4 GHz ISM frequency bands and U- NII at 5 GHz. The MAC layer defines a number of media access procedures such as scanning, associating, or transferring data. The second part of this book deals with the architecture of the 4G network based on the Wi-Fi interface. This architecture defines several models corresponding, on the one hand, to Wi-Fi access controlled or not, On the other hand, to a handover

controlled by the network or by the mobile. The integration of Wi-Fi technology resulted in a redefinition of attachment and session set-up procedures.

Smartphones have the ability to activate simultaneously the two radio interfaces, LTE and Wi-Fi, which allows to direct certain services to one and / or the other of the interfaces. The ANDSF and HotSpot 2.0 functions provide the mobile with rules for network selection and traffic control to determine which traffic is to be routed to what type of interface.

"Provides a holistic view of cutting-edge and up-to-date technology by industry professionals who attend those standards meetings where specifications are decided"--

A revised edition of the text that offers a comparative introduction to global wireless standards, technologies, and their applications The revised and updated fourth edition of From GSM to LTE-Advanced Pro and 5G: An Introduction to Mobile Networks and Mobile Broadband offers an authoritative guide to the technical descriptions of the various wireless technologies currently in use. The author—a noted expert on the topic—explains the rationale behind their differing mechanisms and implementations while exploring the advantages and limitations of each technology. The fourth edition reflects the significant changes in mobile network technology that have taken place since the third edition was published. The text offers a new chapter on 5G NR that explores its non-standalone and standalone architecture. In the Wi-Fi chapter, additional sections focus on the new WPA3 authentication protocol, the new 802.11ax air interface and protocol extensions like 802.11k and 11v for meshed networks. This important book: Presents the various systems based on the standards, their practical implementation and design assumptions, and their performance and capacity

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Provides an in-depth analysis of each system in practice
Offers an updated edition of the most current changes to mobile network technology Includes questions at the end of each chapter and answers on the accompanying website that make this book ideal for self-study or as course material
Written for students and professionals of wireless technologies, the revised fourth edition of From GSM to LTE-Advanced Pro and 5G provides an in-depth review and description of the most current mobile networks and broadband.

A practical guide to LTE design, test and measurement, this new edition has been updated to include the latest developments This book presents the latest details on LTE from a practical and technical perspective. Written by Agilent's measurement experts, it offers a valuable insight into LTE technology and its design and test challenges. Chapters cover the upper layer signaling and system architecture evolution (SAE). Basic concepts such as MIMO and SC-FDMA, the new uplink modulation scheme, are introduced and explained, and the authors look into the challenges of verifying the designs of the receivers, transmitters and protocols of LTE systems. The latest information on RF and signaling conformance testing is delivered by authors participating in the LTE 3GPP standards committees. This second edition has been considerably revised to reflect the most recent developments of the technologies and standards. Particularly important updates include an increased focus on LTE-Advanced as well as the latest testing specifications. Fully updated to include the latest information on LTE 3GPP standards Chapters on conformance testing have been majorly revised and there is an increased focus on LTE-Advanced Includes new sections on testing challenges as well as over the air MIMO testing, protocol testing and the most up-to-date test capabilities of

instruments Written from both a technical and practical point of view by leading experts in the field

An expert treatment of the state-of-the-art in green and soft communications, covering theory, design, and resource management strategies.

This book reviews the state of the art of big data analysis and smart city. It includes issues which pertain to signal processing, probability models, machine learning, data mining, database, data engineering, pattern recognition, visualisation, predictive analytics, data warehousing, data compression, computer programming, smart city, etc. Data is becoming an increasingly decisive resource in modern societies, economies, and governmental organizations. Data science inspires novel techniques and theories drawn from mathematics, statistics, information theory, computer science, and social science. Papers in this book were the outcome of research conducted in this field of study. The latter makes use of applications and techniques related to data analysis in general and big data and smart city in particular. The book appeals to advanced undergraduate and graduate students, postdoctoral researchers, lecturers and industrial researchers, as well as anyone interested in big data analysis and smart city.

How prepared are you to build fast and efficient web applications? This eloquent book provides what every web developer should know about the network, from fundamental limitations that affect performance to major innovations for building even more powerful browser applications—including HTTP 2.0 and XHR improvements, Server-Sent Events (SSE), WebSocket, and WebRTC. Author Ilya Grigorik, a web performance engineer at Google, demonstrates performance optimization best practices for TCP, UDP, and TLS protocols, and explains unique wireless and mobile network optimization requirements. You'll then dive into performance

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characteristics of technologies such as HTTP 2.0, client-side network scripting with XHR, real-time streaming with SSE and WebSocket, and P2P communication with WebRTC. Deliver superlative TCP, UDP, and TLS performance Speed up network performance over 3G/4G mobile networks Develop fast and energy-efficient mobile applications Address bottlenecks in HTTP 1.x and other browser protocols Plan for and deliver the best HTTP 2.0 performance Enable efficient real-time streaming in the browser Create efficient peer-to-peer videoconferencing and low-latency applications with real-time WebRTC transports

Video Telephony is the real time exchange of voice and video between end-users. It is the basis of a wide range of applications (e.g. Multiparty games, distance learning).

Quality of service (QoS) enables network performance control for meeting specific applications and/or end-user requirements. It is a differentiating factor for service providers.

Evolved Packet Core (EPC) is the new core network for 3GPP 4G networks. Home Subscriber Server (HSS) is the standardized master database of 3GPP next generation networks including video telephony networks and EPC. It contains the subscription related information that is needed to support the network entities when they handle sessions. The constant increase in the number of subscribers is one of the challenges for future mobile networks including video telephony networks and EPC. Virtualization is a technique used to emulate the physical characteristics of resources. It enables efficiency in resource usage and is a key technology for scalability and elasticity. This thesis proposes an architecture for QoS Enabled video telephony with a Virtualized HSS (VHSS) in a 3GPP 4G environment. It makes two main contributions. Firstly, it proposes a differentiated QoS service delivery platform that relies on EPC. This platform enables the provisioning of a refined differentiated

QoS scheme which allows prioritization between different sessions of a same video telephony application running on a same network. This new scheme is a differentiating factor for service providers. Second it proposes a preliminary mechanism for a scalable and elastic HSS in order to cope with the increasing number of subscribers. This is done by decomposing the HSS into three main layers (diameter layer, database computation layer and storage layer). Each of these layers are virtualized and can grow/shrink independently. We have built a proof of concept prototype to demonstrate the feasibility of the proposed architecture. Performance measurements have also been made to evaluate viability. This book presents comprehensive coverage of current and emerging multiple access, random access, and waveform design techniques for 5G wireless networks and beyond. A definitive reference for researchers in these fields, the book describes recent research from academia, industry, and standardization bodies. The book is an all-encompassing treatment of these areas addressing orthogonal multiple access and waveform design, non-orthogonal multiple access (NOMA) via power, code, and other domains, and orthogonal, non-orthogonal, and grant-free random access. The book builds its foundations on state of the art research papers, measurements, and experimental results from a variety of sources.

This two volume set LNCS 8630 and 8631 constitutes the proceedings of the 14th International Conference on Algorithms and Architectures for Parallel Processing, ICA3PP 2014, held in Dalian, China, in August 2014. The 70 revised papers presented in the two volumes were selected from 285 submissions. The first volume comprises selected papers of the main conference and papers of the 1st International Workshop on Emerging

Topics in Wireless and Mobile Computing, ETWMC 2014, the 5th International Workshop on Intelligent Communication Networks, IntelNet 2014, and the 5th International Workshop on Wireless Networks and Multimedia, WNM 2014. The second volume comprises selected papers of the main conference and papers of the Workshop on Computing, Communication and Control Technologies in Intelligent Transportation System, 3C in ITS 2014, and the Workshop on Security and Privacy in Computer and Network Systems, SPCNS 2014.

Get a comprehensive and detailed insight into the Evolved Packet Core (EPC) with this clear, concise and authoritative guide - a fully updated second edition that covers the latest standards and industry developments

KEY FEATURES " The only book to describe and explain the entire EPC including architecture, features and protocols, giving you the knowledge and insight to see the potential in EPC, develop EPC products and deploy LTE/EPC mobile broadband Networks " The Second Edition includes 150+ new pages and numerous new illustrations. The content has also been focused towards the mainstream deployment scenarios " Written by established experts in the 3GPP standardization process, with extensive, in-depth experience of its goals, development and future direction " Case studies of deployment scenarios show how the functions described within EPC are placed within a live network context " Forewords written by Dr. Kalyani Bogineni and Dr. Ulf Nilsson

DESCRIPTION " The latest additions to the Evolved Packet System (EPS) including e.g. Positioning,

User Data Management, eMBMS, SRVCC, VoLTE, CSFB " A detailed description of the nuts and bolts of EPC that are required to really get services up and running on a variety of operator networks " An in-depth overview of the EPC architecture and its connections to the wide variety of network accesses, including LTE, LTE-Advanced, WCDMA/HSPA, GSM, WiFi, etc." The most common operator scenarios of EPS and the common issues faced in their design " The reasoning behind many of the design decisions taken in EPC, in order to understand the full details and background of the all-IP core NEW CONTENT TO THIS EDITION " 150+ New pages, new illustrations and call flows " Covers 3GPP Release 9, 10 and 11 in addition to release 8 " Expanded coverage on Diameter protocol, interface and messages " Architecture overview " Positioning " User Data Management " eMBMS (LTE Broadcasting) " H(e)NodeB/Femto Cells " LIPA/SIPTO/Breakout architectures " Deployment Scenarios " WiFi interworking " VoLTE/MMTel, CS fallback and SRVCC SAE is the core network that supports LTE, the next key stage in development of the UMTS network to provide mobile broadband. It aims to provide an efficient, cost-effective solution for the ever-increasing number of mobile broadband subscribers There is no other book on the market that covers the entire SAE network architecture; this book summarizes the important parts of the standards, but goes be ...

As the volume of global Internet traffic increases, the Internet is beginning to suffer from a broad spectrum of performance-degrading infrastructural limitations that

threaten to jeopardize the continued growth of new, innovative services. In answer to this challenge, computer scientists seek to maintain the original design principles of the Internet while allowing for a more dynamic approach to the manner in which networks are designed and operated. The Handbook of Research on Redesigning the Future of Internet Architectures covers some of the hottest topics currently being debated by the Internet community at large, including Internet governance, privacy issues, service delivery automation, advanced networking schemes, and new approaches to Internet traffic-forwarding and path-computation mechanics. Targeting students, network-engineers, and technical strategists, this book seeks to provide a broad and comprehensive look at the next wave of revolutionary ideas poised to reshape the very foundation of the Internet as we know it.

Opportunities in 5G Networks: A Research and Development Perspective uniquely focuses on the R&D technical design of 5th-generation (5G) networks. It is written and edited by researchers and engineers who are world-renown experts in the design of 5G networks. The book consists of four sections: The first section explains what 5G is, what its re

This book constitutes the proceedings of the First International Conference on Future Access Enablers for Ubiquitous and Intelligent Infrastructures, FABULOUS 2015, held in Ohrid, Republic of Macedonia, in September 2015. The 39 revised papers cover the broad areas of future wireless networks, ambient and assisted living, smart infrastructures and security and reflect the

fast developing and vibrant penetration of IoT technologies in diverse areas of human live.

Wireless communication has evolved rapidly in recent years and demand for mobile devices with new and higher services is increasing. The 3G standard, Universal Mobile Telecommunication System (UMTS) is already upgraded with High Speed Packet Access (HSPA) to meet current demands, but this is not sufficient considering the current needs of high speed services. Considering the demand for high speed service, 3rd Generation Partnership Project (3GPP) has come up with a technology called Long Term Evolution (LTE) technology called as 4G with an objective of a radio access technology with higher data rates, lower latencies and packet services such as multimedia and games to offer better quality. LTE is designed with a goal of evolving the radio access technology under the assumption that all services would be packet-switched, rather than following the circuit-switched model of earlier systems. Moreover, LTE is accompanied by an evolution of the non-radio aspects of the complete system, under the term 'System Architecture Evolution (SAE) which includes the Evolved Packet Core (EPC) network. Together, LTE and SAE comprise the Evolved Packed System (EPS), where both the core network and the radio access networks are fully packet-switched. This thesis mainly emphasizes on Physical layer and a proof for the physical layer message sequence. The main purpose of this master thesis is to study, analyze and implement a proof of Physical layer process in control plane of LTE system. The focus is on physical layer

between the UE and eNB. Test trials were performed and screenshots for the analysis of call drops were taken and included. Results show the achievable Downlink and Uplink throughput in multi user and single user environment compared with the channel capacity of 10MHz channel. The thesis is mainly based on 3GPP LTE specifications and discussions. The methodology undertaken was divided into five parts. First, the studies part which was mainly based on 3GPP LTE specifications and real time work. Second, the testing part which was performed in a real scenario of LTE system deployed specifically for this test. Third, the analysis part, where the call setup procedure and physical layer message proof is implemented. Also, the call drops incurred during the test and its valid reason is analyzed. Fourth, the results part whereby the Average and Peak Achievable Downlink and Uplink Throughput for LTE is shown meeting the 4G requirements. Last part shows the conclusion that all the specifications mentioned by 3GPP is followed and proven that LTE is one of the best wireless communication technology of recent time.

This book focuses on the current hottest issues from the lowest layers to the upper layers of wireless communication networks and provides "real-time" research progress on these issues. The authors have made every effort to systematically organize the information on these topics to make it easily accessible to readers of any level. This book also maintains the balance between current research results and their theoretical support. In this book, a variety of novel

techniques in wireless communications and networks are investigated. The authors attempt to present these topics in detail. Insightful and reader-friendly descriptions are presented to nourish readers of any level, from practicing and knowledgeable communication engineers to beginning or professional researchers. All interested readers can easily find noteworthy materials in much greater detail than in previous publications and in the references cited in these chapters.

Provides extensive coverage of standardized QoS technologies for fixed and mobile ultra-broadband networks and services—bringing together technical, regulation, and business aspects

The Quality of Service (QoS) has been mandatory for traditional telecommunication services such as telephony (voice) and television (TV) since the first half of the past century, however, with the convergence of telecommunication networks and services onto Internet technologies, the QoS provision remains a big challenge for all ICT services, not only for traditional ones. This book covers the standardized QoS technologies for fixed and mobile ultra-broadband networks and services, including the business aspects and QoS regulation framework, which all will have high impact on the ICTs in the current and the following decade. QoS for Fixed and Mobile Ultra-Broadband starts by introducing readers to the telecommunications field and the technology, and the many aspects of both QoS and QoE (Quality of Experience). The next chapter devotes itself to Internet QoS, starting with an overview of numerous technology protocols and finishing with business and regulatory

aspects. The next three chapters look at QoS in NGN and Future Networks, QoS for fixed ultra-broadband, and QoS for mobile ultra-broadband. The book also provides readers with in-depth accounts of services in fixed and mobile ultra-broadband; broadband QoS parameters, KPIs, and measurements; network neutrality; and the QoS regulatory framework. Comprehensively covers every aspect of QoS technology for fixed and mobile ultra-broadband networks and services, including the technology, the many regulations, and their applications in business Explains how the QoS is transiting from the traditional telecom world to an all-IP world Presents all the fundamentals of QoS regulation, as well as SLA regulation QoS for Fixed and Mobile Ultra-Broadband is an excellent resource for managers, engineers, and employees from regulators, ICT government organizations, telecommunication companies (operators, service providers), ICT companies, and industry. It is also a good book for students and professors from academia who are interested in understanding, implementation, and regulation of QoS for fixed and mobile ultra-broadband.

Long Term Evolution (LTE) was originally an internal 3GPP name for a program to enhance the capabilities of 3G radio access networks. The nickname has now evolved to become synonymous with 4G. This book concentrates on 4G systems, also known as LTE-Advanced. Telecommunications engineers and students are provided with a history of these systems, along with an overview of a mobile telecommunications system. The overview addresses the components in the system as well as their function. This resource guides telecommunications engineers though many

important aspects of 4G including the air interface physical layer, Radio Access Networks, and 3GPP standardization, to name a few.

Updated new edition covering all aspects of network planning and optimization This welcome new edition provides comprehensive coverage of all aspects of network planning in all the technologies, from 2G to 5G, in radio, transmission and core aspects. Written by leading experts in the field, it serves as a handbook for anyone engaged in the study, design, deployment and business of cellular networks. It increases basic understanding of the currently deployed, and emerging, technologies, and helps to make evolution plans for future networks. The book also provides an overview of the forthcoming technologies that are expected to make an impact in the future, such as 5G. Fundamentals of Cellular Network Planning and Optimization, Second Edition encompasses all the technologies as well as the planning and implementation details that go with them. It covers 2G (GSM, EGPRS), 3G (WCDMA) and 4G (LTE) networks and introduces 5G. The book also looks at all the sub-systems of the network, focusing on both the practical and theoretical issues. Provides comprehensive coverage of the planning aspects of the full range of today's mobile network systems, covering radio access network, circuit and packet switching, signaling, control, and backhaul/Core transmission networks New elements in book include HSPA, Ethernet, 4G/LTE and 5G Covers areas such as Virtualization, IoT, Artificial Intelligence, Spectrum Management and Cloud By bringing all these concepts under one cover, Fundamentals of Cellular Network Planning and Optimization becomes essential reading for network design engineers working with cellular service vendors or operators, experts/scientists working on end-to-end issues, and undergraduate/post-graduate students.

Discover the foundations and main applications of telecommunications to smart grids In Smart Grid

Telecommunications, renowned researchers and authors Drs. Alberto Sendin, Javier Matanza, and Ramon Ferrús deliver a focused treatment of the fundamentals and main applications of telecommunication technologies in smart grids. Aimed at engineers and professionals who work with power systems, the book explains what smart grids are and where telecommunications are needed to solve their various challenges. Power engineers will benefit from explanations of the main concepts of telecommunications and how they are applied to the different domains of a smart grid.

Telecommunication engineers will gain an understanding of smart grid applications and services, and will learn from the explanations of how telecommunications need to be adapted to work with them. The authors aim to offer a simplified vision of smart grids with rigorous coverage of the latest advances in the field, while avoiding some of the technical complexities that can hinder understanding in this area. The book offers:

Discussions of why telecommunications are necessary in smart grids and the various telecommunication services and systems relevant for them An exploration of foundational telecommunication concepts ranging from system-level aspects, such as network topologies, multi-layer architectures and protocol stacks, to communications channel transmission- and reception-level aspects covering modulations, bandwidth, multiple access, signal to noise ratio, interference, transmission media impairments, and more Examinations of telecommunication-related smart grids services and systems, including SCADA, protection and teleprotection, smart metering, substation and distribution automation, synchrophasors, Distributed Energy Resources, electric vehicles, microgrids, etc. A treatment of wireline and wireless telecommunication technologies, like DWDM,

Ethernet, IP, MPLS, PONs, PLC, BPL, 3GPP cellular 4G and 5G technologies, Zigbee, Wi-SUN, LoRaWAN, Sigfox, etc., addressing their architectures, characteristics, and limitations. Ideal for engineers working in power systems or telecommunications as network architects, operations managers, planners, or in regulation-related activities, Smart Grid Telecommunications is also an invaluable resource for telecommunication network and Smart Grid architects. An all-encompassing coverage on UMTS Networks including an in-depth discussion of current work on UMTS evolution and 4G. UMTS Networks and Beyond offers a comprehensive introduction to the networking aspects of UMTS and the networks coming after UMTS. The book is unique in that it systematically compares how a particular problem, e.g. obtaining connectivity, is solved in UMTS and how the same problem is solved in a Computer Network such as the Internet. It also highlights why the respective solutions are so different. The first part of the book provides a detailed technical discussion of UMTS, including original vision, architecture, protocol stacks and overall functionality. It places UMTS in the context of its evolution of from GSM and its convergence with Computer Networks. The second part of the book discusses today's vision of 4G, and introduces upcoming networking technologies. Emphasis is on LTE / SAE as successor of UMTS; UMB, WiMAX and NGN are also discussed. The book gives an overview of what these technologies are likely to offer, of their architectures, protocols and functionality. It also discusses their differences and similarities, and whether they will qualify as 4G. Key Features: Provides readers, particularly those with a background in IP-based networks, with a technical understanding of what UMTS does, how it works and how it is likely to evolve Explains the differences in design between UMTS Networks and Computer Networks and discusses how

these design divergences can be reconciled in the future Shows how economic considerations shape the design of UMTS Motivates why particular design choices are made in UMTS Gives an in-depth introduction to LTE / SAE Provides a detailed picture of the state of the art in 4G Illustrates the theory with numerous tables and figures This comprehensive textbook is essential reading for advanced students and lecturers in communications systems and networking. It is also of interest to engineers and researchers in the field of UMTS and communications systems.

This book provides a clear, concise, complete and authoritative introduction to System Architecture Evolution (SAE) standardization work and its main outcome: the Evolved Packet Core (EPC), including potential services and operational scenarios. After providing an insightful overview of SAE's historical development, the book gives detailed explanations of the EPC architecture and key concepts as an introduction. In-depth technical descriptions of EPC follow, including thorough functional accounts of the different components of EPC, protocols, network entities and procedures. Case studies of deployment scenarios show how the functions described within EPC are placed within a live network context, while a description of the services that are predicted to be used shows what EPC as a core network can enable. This book is an essential resource for professionals and students who need to understand the latest developments in SAE and EPC, the 'engine' that connects broadband access to the internet. All of the authors have from their positions with Ericsson been actively involved in GPRS, SAE and 3GPP from a business and technical perspective for many years. Several of the authors have also been actively driving the standardization efforts within 3GPP. "There is no doubt that this book, which appears just when the mobile industry starts its transition away from legacy GSM/GPRS

and UMTS networks into the future will become the reference work on SAE/LTE. There are no better qualified persons than the authors of this book to provide both communication professionals and an interested general public with insights into the inner workings of SAE/LTE. Not only are they associated with one of the largest mobile network equipment vendors in the world, they have all actively contributed to and, in some cases, been the driving forces behind the development of SAE/LTE within 3GPP." - from the foreword by Dr. Ulf Nilsson, TeliaSonera R&D, Mobility Core and Connectivity "The authors have done an excellent job in writing this book. Their familiarity with the requirements, concepts and solution alternatives, as well as the standardization work allows them to present the material in a way that provides easy communication between Architecture and Standards groups and Planning/ Operational groups within service provider organizations." - from the foreword by Dr. Kalyani Bogineni, Principal Architect, Verizon Up-to-date coverage of SAE including the latest standards development Easily accessible overview of the architecture and concepts defined by SAE Thorough description of the Evolved Packet Core for LTE, fixed and other wireless accesses Comprehensive explanation of SAE key concepts, security and Quality-of-Service Covers potential service and operator scenarios including interworking with existing 3GPP and 3GPP2 systems Detailed walkthrough of network entities, protocols and procedures Written by established experts in the SAE standardization process, all of whom have extensive experience and understanding of its goals, history and vision ??????????(EPS)?????,???????????????????????????????????? With the increased functionality demand for mobile speed and access in our everyday lives, broadband wireless networks have emerged as the solution in providing high data rate communications systems to meet these growing needs.

Broadband Wireless Access Networks for 4G: Theory, Application, and Experimentation presents the latest trends and research on mobile ad hoc networks, vehicular ad hoc networks, and routing algorithms which occur within various mobile networks. This publication smartly combines knowledge and experience from enthusiastic scholars and expert researchers in the area of wideband and broadband wireless networks. Students, professors, researchers, and other professionals in the field will benefit from this book's practical applications and relevant studies.

Extensively updated evaluation of current and future network technologies, applications and devices This book follows on from its successful predecessor with an introduction to next generation network technologies, mobile devices, voice and multimedia services and the mobile web 2.0. Giving a sound technical introduction to 3GPP wireless systems, this book explains the decisions taken during standardization of the most popular wireless network standards today, LTE, LTE-Advanced and HSPA+. It discusses how these elements strongly influence each other and how network capabilities, available bandwidth, mobile device capabilities and new application concepts will shape the way we communicate in the future. This Second Edition presents a comprehensive and broad-reaching examination of a fast-moving technology which will be a welcome update for researchers and professionals alike. Key features: Fully updated and expanded to include new sections including VoLTE, the evolution to 4G, mobile Internet access, LTE-Advanced, Wi-Fi security and backhaul for wireless networks Describes the successful commercialization of Web 2.0 services such as Facebook, and the emergence of app stores, tablets and smartphones Examines the evolution of mobile devices and operating systems, including ARM and x86 architecture and their application to voice-optimized and multimedia devices

An Introduction to 5G Wireless Networks book is for students, engineers, managers and for marketing/sales executives, to develop a good understanding of the 5G technology. This book covers the 5G architecture, 5G New Radio (NR), 5G Next Generation Core (NG-Core), Network Slicing, Virtualization of 5G Components, Multi-access Edge Computing (MEC) and the various 5G use cases. This book provides details on the evolution of the wireless networks from 1G to 5G, status of 5G deployments and the 5G marketplace (standard bodies, open source communities and vendors). After reading this book, you will be able to have discussions with customers, interviewers and other stakeholders on the 5G concepts, ecosystem and use-cases.

Get a comprehensive and detailed insight into the Evolved Packet Core (EPC) with this clear, concise and authoritative guide a fully updated second edition that covers the latest standards and industry developments

KEY FEATURES The only book to describe and explain the entire EPC including architecture, features and protocols, giving you the knowledge and insight to see the potential in EPC, develop EPC products and deploy LTE/EPC mobile broadband Networks

The Second Edition includes 150+ new pages and numerous new illustrations. The content has also been focused towards the mainstream deployment scenarios

Written by established experts in the 3GPP standardization process, with extensive, in-depth experience of its goals, development and future direction

Case studies of deployment scenarios show how the functions described within EPC are placed within a live network context

Forewords written by Dr. Kalyani Bogineni and Dr. Ulf Nilsson

DESCRIPTION The latest additions to the Evolved Packet System (EPS) including e.g. Positioning, User Data Management, eMBMS, SRVCC, VoLTE, CSFB

A detailed description of the nuts and bolts of EPC that are required to really get services up and running on a variety of operator networks

An in-depth overview of the EPC architecture and its connections to the wide variety of network accesses, including LTE, LTE-Advanced, WCDMA/HSPA, GSM, WiFi, etc.

The most common operator scenarios of EPS and the common issues faced in their design

The reasoning behind many of the design decisions taken in EPC, in order to understand the full details and background of the all-IP core

NEW CONTENT TO THIS EDITION 150+ New pages, new illustrations and call flows

Covers 3GPP Release 9, 10 and 11 in addition to release 8

Expanded coverage on Diameter protocol, interface and messages

Architecture overview

Positioning

User Data Management

eMBMS (LTE Broadcasting)

H(e)NodeB/Femto Cells

LIPA/SIPTO/Breakout architectures

Deployment Scenarios

WiFi interworking

VoLTE/MMTel, CS fallback and SRVCC

SAE is the core network that supports LTE, the next key stage in development of the UMTS network to provide mobile broadband. It aims to provide an efficient, cost-effective solution for the ever-increasing number of mobile broadband subscribers

There is no other book on the market that covers the entire SAE network architecture; this book summarizes the important parts of the standards, but goes beyond mere description and offers

real insight and explanation of the technology Fully updated with the latest developments since the first edition published, and now including additional material and insights on industry trends and views regarding future potential applications of SAE"

Network processors are the basic building blocks of today's high-speed, high-demand, quality-oriented communication networks. Designing and implementing network processors requires a new programming paradigm and an in-depth understanding of network processing requirements. This book leads the reader through the requirements and the underlying theory of networks, network processing, and network processors. It covers implementation of network processors and intergrates EZchip Microcode Development Environment so that you can gain hands-on experience in writing high-speed networking applications. By the end of the book, the reader will be able to write and test applications on a simulated network processor. Comprehensive, theoretical, and pracitical coverage of networks and high-speed networking applications Descirbes contemporary core, metro, and access networks and their processing algorithms Covers network processor architectures and programming models, enabling readers to assess the optimal network processor typer and configuration for their application Free download from

<http://www.cse.bgu.ac.il/npbook> includes microcode development tools that provide hands-on experience with programming a network processor

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 Future mobile access networks will require upgraded

telecommunications networks; 3G LTE/ SAE is the next step, allowing data rates above 100 Mbps.

Telecommunications engineers will need to understand the new SAE/ EPC architecture and its tendency towards automatic configuration, but the complexity, length and dryness of the standards documents make it difficult for them to find the information they need and work out how to apply it to their daily product and network development. This book - a new edition of SAE and the Evolved Packet Core - provides clear, concise and comprehensive coverage of the entire SAE/ EPC architecture, explaining concepts and standards and how they are used in commercial service settings. More than just a précis of the standards, it gives real insight into their development and the real-world scenarios in which they have been used since the publication of the first edition. This second edition places more emphasis on key aspects such as mobile systems and protocols (Diameter, GTP, S1-AP), and includes new coverage of femtocells, SIPTO, LIPA, LTE relay and LTE Advanced. Up-to-date coverage of SAE including the latest standards development Easily accessible overview of the architecture and concepts defined by SAE Thorough description of the Evolved Packet Core for LTE, fixed and other wireless accesses Comprehensive explanation of SAE key concepts, security and Quality-of-Service Covers potential service and operator scenarios including interworking with existing 3GPP and 3GPP2 systems Detailed walkthrough of network entities, protocols and procedures Written by established experts in the SAE standardization process, all of whom have

extensive experience and understanding of its goals, history and vision

EPC and 4G Packet Networks Driving the Mobile Broadband Revolution Academic Press

This book describes the concept of a Software Defined Mobile Network (SDMN), which will impact the network architecture of current LTE (3GPP) networks. SDN will also open up new opportunities for traffic, resource and mobility management, as well as impose new challenges on network security. Therefore, the book addresses the main affected areas such as traffic, resource and mobility management, virtualized traffics transportation, network management, network security and techno economic concepts. Moreover, a complete introduction to SDN and SDMN concepts. Furthermore, the reader will be introduced to cutting-edge knowledge in areas such as network virtualization, as well as SDN concepts relevant to next generation mobile networks. Finally, by the end of the book the reader will be familiar with the feasibility and opportunities of SDMN concepts, and will be able to evaluate the limits of performance and scalability of these new technologies while applying them to mobile broadb and networks.

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