

EPC and 4G Packet Networks

Driving the Mobile Broadband Revolution

SECOND EDITION

**Magnus Olsson
Shabnam Sultana
Stefan Rommer
Lars Frid
Catherine Mulligan**



**Epc And 4g Packet Networks Second Edition Driving The
Mobile Broadband Revolution By Olsson Magnus
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Hardcover**

Martin Sauter



**Epc And 4g Packet Networks Second Edition Driving The Mobile Broadband Revolution By Olsson Magnus
Published By Academic Press 2nd Second Edition 2012 Hardcover:**

EPC and 4G Packet Networks Magnus Olsson, Catherine Mulligan, 2012-11-28 Offers detailed insight into the Evolved Packet Core EPC that covers the standards and industry developments This book describes and explains 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 Core Network for 5G Advanced](#) Stefan Rommer, Catherine Mulligan, Peter Hedman, Magnus Olsson, Lars Frid, Shabnam Sultana, 2025-02-03 The Core Network for 5G Advanced Second Edition covers up to the 3GPP release 17 18 which includes the core network for 5G Advanced as well as a large number of new features added by 3GPP to expand the initial 5G Core specifications in rel 15 16 This new release includes A complete update to reflect developments in Releases 17 and 18 along with new chapters on Service Exposure non 3GPP access 3GPP access for new use cases Edge computing Industry and Enterprise features Regulatory services and Network automation and AI ML an overview of the 5G Core Architecture and much more Examples of 5G network deployment options for different use cases are also included Written by authors who are heavily involved in the development of 5G standards and who have written several successful books on 4G and 5G Core Networks this book provides an authoritative reference on the technologies and standards of the 3GPP 5G Core network Provides a clear concise and comprehensive view of the Core Network for 5G Advanced Explains key concepts and use cases Covers 3GPP specification content up to and including release 18 Presents examples of new content including Service Exposure features for Industry use cases Automation and AI ML Written by established experts in the 5G Core standardization process all of whom have extensive experience and understanding of its goals history and vision **5G Core Networks** Stefan Rommer, Peter Hedman, Magnus Olsson, Lars Frid, Shabnam Sultana, Catherine Mulligan, 2019-11-14 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

3G / SAE Bundle Erik Dahlman,Magnus Olsson,2009-12-11 Combining information on the most important and related technologies in the mobile communications field this two book package gives the engineer a concise complete and authoritative introduction to LTE and SAE and The Evolved Packet Core Written by experts who played a leading role in the development of the standards this package gives insight into the how and why enabling the professional engineer to implement the technologies that are central to the mobile broadband revolution Includes details of the standards and technologies with 160 new pages LTE radio interface architecture LTE physical layer and LTE access procedures Contains three brand new chapters on LTE Transmission Procedures Flexible Bandwidth and LTE Evolution plus expanded details on the physical layer total LTE content is 270 pages Examines the latest developments in the evolution of LTE into IMT Advanced the next stage of 3G Evolution Gives clear explanations of the role of OFDM and MIMO technologies in HSPA and LTE Outlines the System Architecture Evolution SAE supporting LTE and HSPA evolution 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

From GSM to LTE-Advanced Martin Sauter,2014-06-23 This revised edition of Communication Systems from GSM to LTE An Introduction to Mobile Networks and Mobile Broadband Second Edition Wiley 2010 contains not only a technical description of the different wireless systems available today but also explains the rationale behind the different mechanisms and implementations not only the how but also the why In this way the advantages and also limitations of each technology become apparent Offering a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications this edition has been updated to provide the latest directions and activities in 3GPP standardization up to Release 12 and importantly includes a new chapter on Voice over LTE VoLTE There are new sections on Building Blocks of a Voice Centric Device Building Blocks of a Smart Phone Fast Dormancy IMS and High Speed Downlink Packet Access and Wi Fi Protected Setup Other sections have been considerably updated in places reflecting the current state of the technology Describes the different systems based on the standards their practical implementation and design assumptions and the performance and capacity of each system in practice is analyzed and explained Questions at the end of each chapter and answers on the accompanying website make this book ideal for self study

or as course material Fundamentals of Network Planning and Optimisation 2G/3G/4G Ajay R. Mishra, 2018-11-05 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 **4G: LTE/LTE-Advanced for Mobile Broadband** Erik Dahlman, Stefan Parkvall, Johan Skold, 2013-10-07 This book focuses on LTE with full updates including LTE Advanced Release 11 to provide a complete picture of the LTE system Detailed explanations are given for the latest LTE standards for radio interface architecture the physical layer access procedures broadcast relaying spectrum and RF characteristics and system performance Key technologies presented include multi carrier transmission advanced single carrier transmission advanced receivers OFDM MIMO and adaptive antenna solutions radio resource management and protocols and different radio network architectures Their role and use in the context of mobile broadband access in general is explained giving both a high level overview and more detailed step by step explanations This book is a must have resource for engineers and other professionals in the telecommunications industry working with cellular or wireless broadband technologies giving an understanding of how to utilize the new technology in order to stay ahead of the competition New to this edition In depth description of CoMP and enhanced multi antenna transmission including new reference signal structures and feedback mechanisms Detailed description of the support for heterogeneous deployments provided by the latest 3GPP release Detailed description of new enhanced downlink control channel structure EPDCCH New RF configurations including operation in non contiguous spectrum multi bands base stations and new frequency bands Overview of 5G as a set of well integrated radio access technologies including support for higher frequency bands and flexible spectrum management massive antenna

configurations and ultra dense deployments Covers a complete update to the latest 3GPP Release 11 Two new chapters on HetNet covering small cells heterogeneous deployments and CoMP including Inter site coordination Overview of current status of LTE release 12 including further enhancements of local area CoMP and multi antenna transmission Machine type communication Device to device communication *From GSM to LTE-Advanced Pro and 5G* Martin Sauter, 2017-10-23 A comparative introduction to major global wireless standards technologies and their applications From GSM to LTE Advanced Pro and 5G An Introduction to Mobile Networks and Mobile Broadband 3rd Edition provides technical descriptions of the various wireless technologies currently in use It explains the rationales behind their differing mechanisms and implementations while exploring the advantages and limitations of each technology This edition has been fully updated and substantially expanded to reflect the significant evolution in mobile network technology occurring over the past several years The chapter on LTE has been extensively enhanced with new coverage of current implementations of LTE carrier aggregation mobility management cell reselection and handover procedures as well as the latest developments in 5G radio and core networks in 3GPP It now features additional information on the TD LTE air interface IPv6 in mobile networks Network Function Virtualization NFV and Narrowband Internet of Things NB IOT Voice over LTE VoLTE is now treated extensively in a separate chapter featuring coverage of the VoLTE call establishment process dedicated bearer setup header compression speech codec and bandwidth negotiation supplementary service configuration and VoLTE emergency calls In addition extensive coverage of Voice over Wifi and mission critical communication for public safety organizations over LTE has been added The WLAN chapter now provides coverage of WPA2 Professional with certificates for authentication in large deployments such as the global Eduroam network and the new WLAN 60 GHz air interface Bluetooth evolution has been addressed by including a detailed description of Bluetooth Low Energy BLE in the chapter devoted to Bluetooth Describes the different systems based on the standards their practical implementation and design assumptions and the performance and capacity of each system in practice is analyzed and explained Questions at the end of each chapter and answers on the accompanying website make this book ideal for self study or as course material 3G, 4G and Beyond Martin Sauter, 2013-01-04 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 **Mobile Broadband** Mustafa Ergen,2014-06-30 **HSPA Evolution** Thomas Chapman,Erik Larsson,PETER von Wrycza,Erik Dahlman,Stefan Parkvall,Johan Skold,2014-11-24 This book is essential reading for those wishing to obtain a systems perspective and a broad view on the background performance and application of the latest developments in HSPA in the context of the demands on today s mobile broadband devices and networks It takes the reader behind the scenes of 3GPP and provides an easily accessible understanding of the basic principles the latest steps in the standard s evolution and the motivations behind the development of standardized features It covers important topics such as smartphone related features multi carrier and multi antenna operation interface architecture heterogeneous networks and HSPA system performance Offering full coverage of recent developments in HSPA up to Release 13 this book will provide a comprehensive description of one of the dominating standards for mobile broadband With this book you will Get a guided and consistent tour through the evolutionary stages of HSPA Gain an understanding of the 3GPP standardization process the driving forces behind it and the need for evolution Learn about the fundamental technology components of a modern wireless communication system such as basic link level architecture cellular system behavior traffic management and scheduling and system management Learn in detail the features of the latest HSPA development up to Release 13 Gain a deep insight into the means by which HSPA performance can be simulated and characterized the factors that drive the performance of networks and user experience and the performance expectations for the technology Obtain insight into the telecommunications market and its evolution Learn about current trends and the future direction of HSPA A full insight into the 3GPP and regulatory standardisation processes and the factors that drive evolution of the specification A walk through of the fundamental technology principles that lie behind HSPA A structured overview of the WCDMA HSPA feature set offering insider coverage starting from the core release 5 6 technologies and reviewing each of the added features up to and including the most recent developments in the area An overview of the frequency bands available for HSPA An insight into the radio performance requirements their background and implications for mobiles and networks A tutorial on simulation principles for HSPA A description of the performance of HSPA features within the context of a tutorial on the factors that drive performance **IP for 4G** David Wisely,2009-01-21 Excellent reference with expert insight into the future evolution of mobile communications 4G IP for 4G examines the concept of 4G providing an in depth background to the key technologies and developments shaping the new generation of mobile services including Wireless Local Area Networks WLANs Worldwide Interoperability for Microwave Access WiMAX IP developments SIP and Media Independent Handover Internet Multimedia Subsystem IMS and 3G HSDPA and LTE The book addresses these key technological drivers in light of

commercial propositions such as generating extra revenue and reducing costs and offers an up to date briefing on the future of mobile communications in the coming years Key features Presents and analyses the key technological drivers of 4G including WLANs WiMAX convergence and IMS Examines the rationale for IP for 4G by bringing together technologies global developments and economic arguments in one single volume Describes and puts in context the developments in the IEEE 802.21 Media Independent Handover group in particular the options for network terminal controlled handover and the likely mechanisms for seamless handover including application adaptation Written for readability as well as depth with access to detailed descriptions of technologies but also quick overviews Contains scenario descriptions to motivate the need for seamless handover and benefits for the user single sign on access to networks single billing Contains hundreds of original diagrams carefully drawn to illustrate the complex technology and quickly provide a summary of the main issues Accompanying website supports the book with additional diagrams figures and references for further reading IP for 4G is an invaluable reference for professionals in mobile fixed telecoms and ICT industries practicing telecommunications and network engineers system designers and developers Graduate level students studying MSc and higher level courses on networking will also find this book of interest

From GSM to LTE Martin Sauter, 2010-12-30 A new edition of Wiley's Communication Systems for the Mobile Information Society from the same author Wireless systems such as GSM UMTS LTE WiMAX Wi-Fi and Bluetooth offer possibilities to keep people connected while on the move In this flood of technology From GSM to LTE An Introduction to Mobile Networks and Mobile Broadband enables readers to examine and understand each technology and how to utilise several different systems for the best results This book contains not only a technical description of the different wireless systems available today but also explains the rationale behind the different mechanisms and implementations not only the how but also the why is focused on Thus the advantages and also limitations of each technology become apparent Offering a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications this new edition has been updated to provide the latest directions and activities in 3GPP standardization reaching up to Release 10 and importantly includes a new chapter on LTE The new LTE chapter covers aspects such as Mobility Management and Power Optimization Voice over LTE and Air Interface and Radio Network Provides readers with an introduction to major global wireless standards and compares the different wireless technologies and their applications The performance and capacity of each system in practice is analyzed and explained accompanied with practical tips on how to discover the functionality of different networks Offers approximately 25% new material which includes a major new chapter on LTE and updates to the existing material including Release 4 BICN in relation to GSM Questions at the end of each chapter and answers on the accompanying website <http://www.wirelessmoves.com> make this book ideal for self study or as course material

Fundamentals of Cellular Network Planning and Optimisation Ajay R. Mishra, 2004-11-19 By 2008 some 2 billion people will be using mobile phones and devices in many cases to access advanced data services Against this

backdrop the need for efficient and effective network design will be critical to the success of increasingly complex mobile networks Simon Beresford Wylie SVP Nokia Networks With the complexity of the cellular networks increasing day by day a deeper understanding of the design and performance of end to end cellular networks is required Moreover all the types of networks from 2G 2.5G 3G seem to co exist Fundamentals of Cellular Network Planning and Optimisation covers end to end network planning and optimisation aspects from second generation GSM to third generation WCDMA networks including GPRS and EDGE networks All the sub systems of the network i.e. radio network transmission network and core network have been covered with focus on both practical and theoretical issues By bringing all these concepts under one cover this book becomes essential reading for the network design engineers working either with cellular service vendors or operators experts scientists working on end to end issues and undergraduate post graduate students Key Highlights Distinctly divided into four parts 2G GSM 2.5G GPRS EDGE 3G WCDMA and introduction to 4G OFDM ALL IP WLAN Overview respectively Each part focuses on the radio transmission and core networks Concentrates on cellular network planning process and explains the underlying principles behind the planning and optimizing of the cellular networks The text will serve as a handbook for anyone engaged in the study design deployment and business of cellular networks Mobile Broadband Communications for Public Safety Ramon Ferrús, Oriol Sallent, 2015-08-07 This book provides a timely and comprehensive overview of the introduction of LTE technology for PPDR communications It describes the operational scenarios and emerging multimedia and data centric applications in demand and discusses the main techno economic drivers that are believed to be pivotal for an efficient and cost effective delivery of mobile broadband PPDR communications The capabilities and features of the LTE standard for improved support of mission critical communications e.g. proximity services group communications are covered in detail Also different network implementation options to deliver mobile broadband PPDR communications services over dedicated or commercial LTE based networks are discussed including the applicability of the Mobile Virtual Network Operator MVNO model and other hybrid models Radio spectrum matters are also discussed in depth outlining spectrum needs and providing an outlook into allocated and candidate spectrum bands for PPDR communications and suitable dynamic spectrum sharing solutions in PPDR communications Explanations are accompanied by a vast collection of references that allow the more intrigued reader to gain further insight into the addressed topics **3G Evolution** Erik Dahlman, Stefan Parkvall, Johan Skold, Per Beming, 2010-07-27 This very up to date and practical book written by engineers working closely in 3GPP gives insight into the newest technologies and standards adopted by 3GPP with detailed explanations of the specific solutions chosen and their implementation in HSPA and LTE The key technologies presented include multi carrier transmission advanced single carrier transmission advanced receivers OFDM MIMO and adaptive antenna solutions advanced radio resource management and protocols and different radio network architectures Their role and use in the context of mobile broadband access in general is explained Both a high level overview and more detailed step

by step explanations of HSPA and LTE implementation are given An overview of other related systems such as TD SCDMA CDMA2000 and WIMAX is also provided This is a must have resource for engineers and other professionals working with cellular or wireless broadband technologies who need to know how to utilize the new technology to stay ahead of the competition The authors of the book all work at Ericsson Research and are deeply involved in 3G development and standardisation since the early days of 3G research They are leading experts in the field and are today still actively contributing to the standardisation of both HSPA and LTE within 3GPP Gives the first explanation of the radio access technologies and key international standards for moving to the next stage of 3G evolution fully operational mobile broadband Describes the new technologies selected by the 3GPP to realise High Speed Packet Access HSPA and Long Term Evolution LTE for mobile broadband Gives both higher level overviews and detailed explanations of HSPA and LTE as specified by 3GPP

LTE for 4G Mobile Broadband Farooq Khan,2009-03-26 Do you need to get up to speed quickly on LTE

Understand the new technologies of the LTE standard and how they contribute to improvements in system performance with this practical and valuable guide written by an expert on LTE who was intimately involved in drafting the standard In addition to a strong grounding in the technical details you ll also get fascinating insights into why particular technologies were chosen in the development process Core topics covered include Network architecture and protocols OFDMA downlink access Low PAPR SC FDMA uplink access Transmit diversity and MIMO spatial multiplexing Channel structure and bandwidths Cell search reference signals and random access Turbo coding with contention free interleaver Scheduling link adaptation hybrid ARQ and power control Uplink and downlink physical control signaling Inter cell interference mitigation techniques Single frequency network SFN broadcast MIMO spatial channel model Evaluation methodology and system performance With extensive references a useful discussion of technologies that were not included in the standard and end of chapter summaries that emphasize all the key points this book is an essential resource for practitioners in the mobile cellular communications industry and for graduate students studying advanced wireless communications

Mobile Broadband

Mustafa Ergen,2009-04-05 This book addresses the emerging technology for Orthogonal Frequency Division Multiple Access OFDMA covering OFDMA physical layer as well as network technology The book also includes information on IEEE 802 16e and WiMAX networks and also offers a comparison with other OFDMA technologies OFDMA is the fastest growing area in the wireless marketplace and the backbone of systems used in WiMAX WiMAX is the technology that enables wireless users to communicate at any time from any location without having to find a WiFi hotspot

Mobile Broadband Multimedia

Networks Luis M. Correia,2010-07-26 Mobile Broadband Multimedia Networks Techniques Models and Tools for 4G provides the main results of the prestigious and well known European COST 273 research project on the development of next generation mobile and wireless communication systems Based on the applied research of over 350 participants in academia and industry this book focuses on the radio aspects of mobile and wireless broadband multimedia communications by

exploring and developing new methods models techniques strategies and tools towards the implementation of 4th generation mobile and wireless communication systems This complete reference includes topics ranging from transmission and signal processing techniques to antennas and diversity ultra wide band MIMO and reference scenarios for radio network simulation and evaluation This book will be an ideal source of the latest developments in mobile multimedia broadband technologies for researchers R D engineers graduates and engineers in industry implementing simulation models and conducting measurements Based on the well known and respected research of the COST 273 project Towards Mobile Broadband Multimedia Networks whose previous models have been adopted by standardisation bodies such as ITU ETSI and 3GPP Gives methods techniques models and tools for developing 4th generation mobile and wireless communication systems Includes the latest development of key technologies and methods such as MIMO systems ultra wide band and OFDM **IP for 4G** David Wisely, 2009-02-24 Excellent reference with expert insight into the future evolution of mobile communications 4G IP for 4G examines the concept of 4G providing an in depth background to the key technologies and developments shaping the new generation of mobile services including Wireless Local Area Networks WLANs Worldwide Interoperability for Microwave Access WiMAX IP developments SIP and Media Independent Handover Internet Multimedia Subsystem IMS and 3G HSDPA and LTE The book addresses these key technological drivers in light of commercial propositions such as generating extra revenue and reducing costs and offers an up to date briefing on the future of mobile communications in the coming years Key features Presents and analyses the key technological drivers of 4G including WLANs WiMAX convergence and IMS Examines the rationale for IP for 4G by bringing together technologies global developments and economic arguments in one single volume Describes and puts in context the developments in the IEEE 802.21 Media Independent Handover group in particular the options for network terminal controlled handover and the likely mechanisms for seamless handover including application adaptation Written for readability as well as depth with access to detailed descriptions of technologies but also quick overviews Contains scenario descriptions to motivate the need for seamless handover and benefits for the user single sign on access to networks single billing Contains hundreds of original diagrams carefully drawn to illustrate the complex technology and quickly provide a summary of the main issues Accompanying website supports the book with additional diagrams figures and references for further reading IP for 4G is an invaluable reference for professionals in mobile fixed telecoms and ICT industries practicing telecommunications and network engineers system designers and developers Graduate level students studying MSc and higher level courses on networking will also find this book of interest

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