

 WILEY

Radio Network Planning and Optimisation for UMTS

SECOND EDITION



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Radio Network Planning And Optimisation For Umts

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Radio Network Planning And Optimisation For Umts:

Radio Network Planning and Optimisation for UMTS Jaana Laiho,Achim Wacker,Tomáš Novosad,2006-05-01 Radio Network Planning and Optimisation for UMTS Second Edition is a comprehensive and fully updated introduction to WCDMA radio access technology used in UMTS featuring new content on key developments Written by leading experts at Nokia the first edition quickly established itself as a best selling and highly respected book on how to dimension plan and optimise UMTS networks This valuable text examines current and future radio network management issues and their impact on network performance as well as the relevant capacity and coverage enhancement methods In addition to coverage of WCDMA radio access technology used in UMTS and the planning and optimisation of such a system the service control and management concept in WCDMA and GPRS networks are also introduced This is an excellent source of information for those considering future cellular networks where Quality of Service QoS is of paramount importance Key features of the Second Edition include High Speed Downlink Packet Access HSDPA physical layer dimensioning and radio resource management Quality of Service QoS mechanisms in network for service differentiation Multiple Input Multiple Output MIMO technology Practical network optimisation examples Service optimisation for UMTS and GPRS EDGE capacity optimisation The hot topic of service control and management in WCDMA and GPRS networks that has evolved since the first edition Companion website includes Figures Static radio network simulator implemented in MATLAB This text will have instant appeal to wireless operators and network and terminal manufacturers It will also be essential reading for undergraduate and postgraduate students frequency regulation bodies and all those interested in radio network planning and optimisation particularly RF network systems engineering professionals *UMTS Radio Network Planning, Optimization and QoS Management*

Jukka Lempäinen,Matti Manninen,2007-05-08 In cellular networks a new generation of CDMA or WCDMA based networks will start operations in most countries in the near future The standardized WCDMA technology generates new challenges in radio network planning optimization and QoS management because of the dynamic nature of its radio interface and various new services and different network operating modes Moreover new and modified radio planning phases as well as new field measurements and emphasized QoS management are needed when UMTS networks are designed and optimized Hence a practical UMTS planning process must be defined in detail from dimensioning to optimization tasks This book follows the UMTS planning process It is organized in three parts Part I UMTS configuration planning Part II UMTS topology planning and Part III UMTS network functionality The first chapter in Part I introduces the UMTS and UTRAN systems and radio network planning strategy and defines a planning process for UMTS In Chapter 2 the UMTS planning process is covered and a detailed description of the UMTS power budget is given with planning threshold examples provided

Understanding UMTS Radio Network Modelling, Planning and Automated Optimisation Maciej Nawrocki,Hamid Aghvami,Mischa Dohler,2006-07-06 This book sets out to provide the theoretical foundations that will enable radio network

planners to plan model and optimize radio networks using state of the art findings from around the globe It adopts a logical approach beginning with the background to the present status of UMTS radio network technology before devoting equal coverage to planning modelling and optimization issues All key planning areas are covered including the technical and legal implications of network infrastructure sharing hierarchical cell structure HCS deployment ultra high site deployment and the benefits and limitations of using computer aided design CAD software Theoretical models for UMTS technology are explained as generic system models stand alone services and mixed services Business modelling theory and methods are put forward taking in propagation calculations link level UMTS static and UMTS dynamic simulations The challenges and goals of the automated optimization process are explored in depth using cutting edge cost function and optimization algorithms This theory based resource containing prolific illustrative case studies explains the reasons for UMTS radio networks performance issues and how to use this foundational knowledge to model plan and optimize present and future systems **UMTS Radio**

Network Planning: Mastering Cell Coupling for Capacity Optimization Hans-Florian Geerdes,2009-03-11 The author establishes a concise system model for UMTS radio networks which describes interference coupling and its impact on the network This model is the basis for efficient radio network performance analysis as well as new optimization methods for automatic planning **UMTS Network Planning, Optimization, and Inter-Operation with GSM** Moe

Rahnema,2008-04-15 UMTS Network Planning Optimization and Inter Operation with GSM is an accessible one stop reference to help engineers effectively reduce the time and costs involved in UMTS deployment and optimization Rahnema includes detailed coverage from both a theoretical and practical perspective on the planning and optimization aspects of UMTS and a number of other new techniques to help operators get the most out of their networks Provides an end to end perspective from network design to optimization Incorporates the hands on experiences of numerous researchers Single authorship allows for strong coherency and accessibility Details the complete iteration cycle of radio link budgeting for coverage planning and dimensioning Rahnema demonstrates detailed formulation of radio capacity and coverage in UMTS and discusses the tradeoffs involved He presents complete link budgeting and iterative simulations for capacity and coverage planning along with practical guidelines UMTS Network Planning contains seventeen cohesive and well organized chapters which cover numerous topics including Radio channel structures radio channel models parameters model tuning Techniques for capacity and coverage enhancements Complete treatment of power control handoffs and radio resource practical management processes and parameters Detailed coverage of TCP protocol enhancement for operation over wireless links particularly UMTS Application of GSM measurements to plan and re engineer for UMTS radio sites Guidelines for site co location with GSM the QOS classes parameters and inter workings in UMTS AMR voice codecs and tradeoffs core and access network design architectural evolution and protocols Comprehensive discussion and presentation of practical techniques for radio performance analysis trending and troubleshooting Perfect for professionals in the field and researchers specializing in

network enhancement Engineers working on other air interfaces and next generation technologies will find many of the techniques introduced helpful in designing and deploying future wireless networks as well Students and professionals new to the wireless field will also find this book to be a good foundation in network planning performance analysis and optimization

Evolved Cellular Network Planning and Optimization for UMTS and LTE Lingyang Song, Jia Shen, 2010-08-24 Most books on network planning and optimization provide limited coverage of either GSM or WCDMA techniques Few scrape the surface of HSPA and even fewer deal with TD SCDMA Filling this void Evolved Cellular Network Planning and Optimization for UMTS and LTE presents an accessible introduction to all stages of planning and optimizing UMTS HSPA *Efficient Methods for WCDMA Radio Network Planning and Optimization* Ulrich Türke, 2007-12-08 Ulrich T rke introduces innovative models and algorithms for the evaluation of WCDMA UMTS network performance He establishes an advanced snapshot analysis method which allows the efficient and accurate analysis of large radio networks The author develops two statistical evaluation methods which furnish quick approximations of relevant results from snapshot simulations Finally he discusses the application of these methods to automatic network optimization The majority of the developed strategies are successfully applied in a commercial radio network planning and optimization tool Radio Network Planning and Optimisation for UMTS Jaana Laiho, Achim Wacker, Tomáš Novosad, 2002 Radio Network Planning and Optimisation for UMTS comprehensively explains how to dimension plan and optimise UMTS Universal Mobile Telecommunication Systems networks It introduces the properties of the spread spectrum system and provides a general overview of the physical layer of FDD WCDMA The radio network planning process for WCDMA is clearly presented and detailed information on how to dimension plan and rollout a 3G network both theoretically and practically is provided This valuable text examines current and future radio network management issues and their impact on network performance as well as the relevant capacity and coverage enhancement methods Includes automation examples of radio resource management Focuses on WCDMA FDD and introduces WCDMA TDD GPRS and EDGE and examines their interaction and synergy Provides an excellent source of information for those considering future cellular networks where Quality of Service QoS is of paramount importance Analyses the radio network planning challenges and opportunities for both greenfield and existing operators Includes an accompanying CD ROM featuring a static radio network simulator implemented in MATLAB r Authoritative and instructive this text will have instant appeal to wireless operators and network and terminal manufacturers It will also be essential reading for university students frequency regulation bodies and everyone interested in radio network planning and optimisation especially RF network systems engineering professionals MATLAB r is a registered trademark of The MathWorks Inc Optimization Methods for UMTS Radio Network Planning Andreas Eisenblätter, 2003 **Planning and Optimisation of 3g and 4g Wireless Networks** J. I. Agbinya, 2010-02-15 Packed with details of the technologies that support each network type this cutting edge reference leads the reader step by step on how to plan and optimize various

types of wireless networks It examines current and emerging network planning and enhancement techniques *UMTS Radio Network Planning, Optimization and QOS Management* Jukka Lempiäinen, Matti Manninen, 2003 UMTS Radio Network Planning Optimization and QOS Management describes practical planning process and gives solutions for detailed planning actions by following the planning process The role of radio planning tool environment is emphasized by specifying the requirements of the digital map production design tool field measurement tool and QOS measurement tool and by giving several examples of the results of these topics By following the content of the book a reader is able to build up an efficient UMTS planning and optimization tool environment and to carry out a practical UMTS planning and optimization project from configuration planning to field and QOS measurements *Fundamentals of Cellular Network Planning and Optimisation* Ajay R. Mishra, 2004-05-21 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 **Understanding UMTS Radio Network Modelling, Planning and Automated Optimisation** Maciej J. Nawrocki, Mischa Dohler, Hamid Aghvami, 2006-06-16 Sets out to provide the theoretical foundations that enables radio network planners to plan model and optimize radio networks using state of the art findings from around the globe This book includes illustrative case studies and explains the reasons for UMTS radio networks performance issues *Radio Network Planning and Resource Optimization* Iana Siomina, 2007 **GSM and UMTS Radio Network Planning and Design** Hassan El Rabih, 2015 *Operations Research Proceedings 2003* Dino Ahr, Roland Fahrion, Marcus Oswald, Gerhard Reinelt, 2012-12-06 This volume contains a selection of papers referring to lectures presented at the symposium Operations Research 2003 OR03 held at the Ruprecht Karls Universitiit Heidelberg September 3-5 2003 This international conference

took place under the auspices of the German Operations Research Society GOR and of Dr Erwin Teufel prime minister of Baden Wurttemberg The symposium had about 500 participants from countries all over the world It attracted academicians and practitioners working in various field of Operations Research and provided them with the most recent advances in Operations Research and related areas in Economics Mathematics and Computer Science The program consisted of 4 plenary and 13 semi plenary talks and more than 300 contributed papers selected by the program committee to be presented in 17 sections Due to a limited number of pages available for the proceedings volume the length of each article as well as the total number of accepted contributions had to be restricted Submitted manuscripts have therefore been reviewed and 62 of them have been selected for publication This refereeing procedure has been strongly supported by the section chairmen and we would like to express our gratitude to them Finally we also would like to thank Dr Werner Muller from Springer Verlag for his support in publishing this proceedings volume

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

QoS and QoE Management in UMTS Cellular Systems David Soldani,Man Li,Renaud Cuny,2006-08-25 This comprehensive volume provides state of the art guidance on Quality of Service QoS and Quality of end user Experience QoE management in UMTS cellular systems tackling planning provisioning monitoring and optimisation issues in a single accessible resource In addition a detailed discussion is provided on service applications QoS concept architecture and functions in access packet circuit switched core and backbone networks Defines and explains the differences between QoS and QoE and end to end concept based on the premise that it is the end user who is the ultimate beneficiary of QoS Covers QoS and QoE issues related to present and forthcoming service applications including multimedia messaging service MMS Video Sharing VS content download business connectivity Push to

talk over Cellular PoC Voice over IP VoIP presence instant messaging gaming streaming and browsing Presents QoS concepts and architecture as defined in 3GPP Releases 97 98 99 5 6 and 7 and provides a comprehensive description of protocols and packet data transfer across WCDMA evolved and E GPRS networks Discusses service driven radio network planning aspects for E GPRS and WCDMA Includes three detailed chapters covering concepts means and methods for QoS provisioning QoS QoE performance monitoring and optimisation This book is aimed at operators vendors deployers consultants and managers specialising in the research development implementation marketing and sales of products and tools for QoS and QoE management in UMTS networks It will also be of interest to postgraduate students and researchers in the field of telecommunications and specialising in UMTS QoS and QoE principles and practices *UMTS Signaling* Ralf Kreher, Torsten Ruedebusch, 2007-03-19 Completely revised and updated edition of UMTS Signaling Highlights of the Second Edition Includes new information and scenarios on HSPA HSDPA HSUPA and IMS Covers not only WCDMA but also TD SCDMA issues Contains up to date information on releases 5 and 6 and includes a new chapter on the future releases 7 and 8 Provides crucial information for network operators and equipment suppliers keen to understand how to handle and analyse UMTS signaling procedures in order to get the network into operation detect errors and troubleshoot faults Uses first hand real world information to explain issues which are unclear in the standards Includes comprehensive descriptions and documentation of UMTS reference scenarios for different UMTS procedures Essential reading for engineers in network operators integrators or system suppliers who need to be at the cutting edge of this technology and postgraduates in telecommunications courses especially those with a focus on signal analysis MSWiM '07 Carla-Fabiani Chiasserini, 2007

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