

# **QoS AND MOBILE TECHNOLOGIES**

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# PREFACE

The rapid and increasing demand for high-speed high-bandwidth wireless networks has led to the development of new mobile technologies in the recent years. These mobile technologies are innovative wireless solutions that offer flexible, dynamic, reliable and high quality services to the users around the globe by providing extended distance coverage and a plethora of applications including support for multimedia functions.

Quality of Service (QoS) is an important design factor for mobile technologies because services delivered to the users through the network should be reliable and must be of a satisfactorily high quality. Consequently, network analysts and communication engineers are tirelessly working on developing innovative wireless solutions that will provide reliable and high quality services to their customers all around the world.

## **About this book**

The emphasis of this book is on the consumer QoS requirements for emergent mobile technologies and how these requirements should be strategically delivered and managed by network analysts, service providers and communication engineers. Network performance has a predominant influence on consumer QoS and as a result of this; the performance of wireless networks is comprehensively treated in this book. Practical guidelines, implementable recommendations and feasible research openings are also suggested in this book for the interested reader in order to easily and quickly define and identify consumer QoS requirements for mobile technologies together with a framework on how to successfully manage mobile technologies. The objective of this book is to widen and stimulate the mind of the reader in identifying and meeting QoS requirements for customer services in existing and future mobile technologies.

This book provides a comprehensive view of QoS and mobile technologies. The scope of this book, therefore, is sufficiently large and deals with the relevant aspects of customer QoS requirements for mobile technologies. The target audience for this book includes postgraduate

students embarking on advanced studies, telecommunication managers from service providers to network analysts, manufacturers, consultants, regulators, researchers, standards bodies, and users from corporate and medium size companies all around the world. This book is organized to cover several research areas in the area of QoS and mobile technologies which are outlined below:

### **Part 1**

This part of the book contains seven chapters and it provides a systematic investigation into the QoS approaches in wireless networks and mobile communications. In addition to this, internet quality of service (QoS) architectures is discussed together with an expository analysis of integrated and differentiated services. An explication of QoS routing in ad hoc wireless networks is provided together with the mechanism of operation of Quality of Service (QoS) ad hoc on-demand distance vector (AODV) routing. This book part concludes with the discussion of MPLS and traffic engineering.

### **Part 2**

This part of the book contains five chapters and it is an insightful and in-depth expository analysis of mobility management approaches. The concept of nested mobile networks is first introduced to the reader and afterwards, a meticulous evaluation of NEMO extensions is provided. Handoff process in micro-mobility protocols is systematically investigated by the authors and furthermore, comparison between network simulators and open issues in NEMO is conclusively given in this book part as a guide to the interested reader for further research.

### **Part 3**

This part of the book contains twenty-three chapters and it is an extensive documentation of most of the concepts in wireless technology. Firstly, MANET routing protocols are investigated together with the modern applications of VANETs. Furthermore, the performance of vehicle-to-vehicle routing protocols are evaluated and the reader is gradually introduced to Wi-Fi and WIMAX mesh networks. The interested reader is further guided by the authors with the explanation of current trends on WIMAX using MIMO technology. With respect to Femtocell networks, self-organizing ability, synchronization, and spectrum management are systematically

treated in this part of the book. Smart grid communication, UWB communication, and Zigbee applications are discussed by the authors. Improvement of vertical handover in GPRS/Wi-Fi seamless convergence is treated together with the application of sensor network and routing protocols in wireless communication. The authors provided a study of channel assignment approach for reducing frequent re-assignment and in addition to this, association management schemes for wireless mesh networks are also presented for the reader. Furthermore, the authors highlighted the challenges in multi-radio multi-channel wireless mesh network together with an explication of local area network (LAN) communication protocols. This part of the book also contains an expository analysis of mobility support in Diffserv and MPLS networks together with a straightforward introduction to the issues in mobility management and context transfer. An advanced overview of LTE is provided together with an expository analysis of time synchronization protocols and approaches. This book part concludes with a discussion of MPLS architectures.

# TABLE OF CONTENTS

	<b>TITLE</b>	<b>No</b>
<b>PART 1:QoS APPROACHES</b>		
<b>CHAPTER 1:</b>	Introduction to QoS Approaches	2
<b>CHAPTER 2:</b>	Internet Quality Of Service Architectures	10
<b>CHAPTER 3:</b>	Integrated Services	16
<b>CHAPTER 4:</b>	Differentiated Services	20
<b>CHAPTER 5:</b>	Quality Of Service (QoS) Ad-Hoc On-Demand Distance Vector (AODV)	25
<b>CHAPTER 6:</b>	QoS Routing In Ad-Hoc Wireless Networks	31
<b>CHAPTER 7:</b>	MPLS And Traffic Engineering	38
<b>PART 2: MOBILITY MANENAGEMENT APPROACHES</b>		
<b>CHAPTER 8:</b>	Introduction to Mobility Management in Mobile Networks	43
<b>CHAPTER 9:</b>	Nested Mobile Networks	48
<b>CHAPTER 10:</b>	Evaluation of NEMO Extensions	53
<b>CHAPTER 11:</b>	Handoff Process In Micro-mobility Protocols	59
<b>CHAPTER 12:</b>	Comparison Between Network Simulators	65
<b>PART 3: WIRELESS TECHNOLOGY</b>		
<b>CHAPTER 13:</b>	Introduction to Local Area Network (LAN) Communication Protocols	70
<b>CHAPTER 14:</b>	MANET routing protocols	77
<b>CHAPTER 15:</b>	VANET Applications	87
<b>CHAPTER 16:</b>	Vehicle To Vehicle Routing Protocols	93
<b>CHAPTER 17:</b>	Wi-Fi Mesh Network	102
<b>CHAPTER 18:</b>	Overview Of Wimax Mesh	108
<b>CHAPTER 19:</b>	Current Trends On WIMAX Using MIMO Technology	120
<b>CHAPTER 20:</b>	Self-Organized Femtocell Networks	131
<b>CHAPTER 21:</b>	Self-Organized Synchronization For Femtocell Network	144
<b>CHAPTER 22:</b>	Spectrum Management In Femtocell	157
<b>CHAPTER 23:</b>	Smart Grid Communication	166
<b>CHAPTER 24:</b>	UWB Overview	175
<b>CHAPTER 25:</b>	ZIGBEE Applications	183



<b>CHAPTER 26:</b>	Improvement Of Vertical Handover In GPRS/WIFI Seamless Convergence	190
<b>CHAPTER 27:</b>	The Application Of Sensor Network And Routing Protocols In Wireless Communication	199
<b>CHAPTER 28:</b>	A Study Of Channel Assignment Approach To Reduce Frequent Reassignment	210
<b>CHAPTER 29:</b>	Association Management Schemes For Wireless Mesh Network	214
<b>CHAPTER 30:</b>	Challenges In Multi-Radio Multi-Channel Wireless Mesh Network	219
<b>CHAPTER 31:</b>	Mobility Support in Diffserv and MPLS network	224
<b>CHAPTER 32:</b>	Mobility Management And Context Transfer	228
<b>CHAPTER 33:</b>	LTE -Advanced Overview	232
<b>CHAPTER 34:</b>	Time Synchronization Protocols And Approaches	242
<b>CHAPTER 35:</b>	MPLS Architectures	246

