

## Preface

इन्द्रियस्येन्द्रियस्यार्थे रागद्वेषौ व्यवस्थितौ ।  
तयोर्न वशमागच्छेत्तौ ह्यस्य परिपन्थिनौ ॥

indriyasyendriyasyārthe rāga-dveṣau vyavasthitau  
tayor na vaśam āgacchet tau hy asya paripanthinau

Attraction and aversion of the senses to their corresponding sense objects is unavoidable.  
One should not be controlled by them; since they are obstacles in one's path.

—The Bhagvad-Gita (3.34)

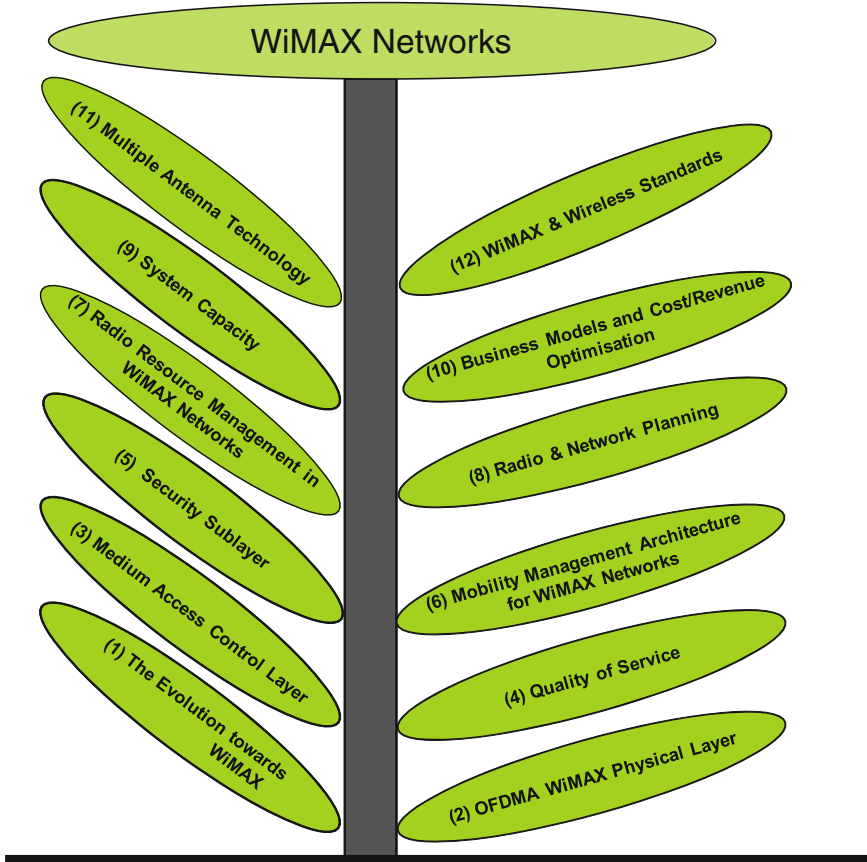
Worldwide Interoperability for Microwave Access (WiMAX) is a technology covering broad range of topics. To the best of our knowledge, WiMAX Networks is a first book that deals with all the relevant areas shown in Fig. 1 namely, quality of service (QoS), security, mobility, radio resource management (RRM), multiple input multiple output (MIMO) antenna, planning, and cost/revenue optimization, medium access control (MAC) layer, physical layer, network layer, and so on.

Chapter 1 introduces the WiMAX and locates its place among the existing and future wireless systems.

Aspects of OFDM and OFDMA WiMAX physical layer is well covered in Chapter 2.

Chapter 3 covers link layer issues, having its main focus on Medium Access Control (MAC) Layer. The term quality of service (QoS) is clearly explained in Chapter 4, considering the WiMAX into account.

Security is a primary subject for WiMAX and for secure communications, privacy and confidentiality are fundamental issues. Chapter 5 has taken care of this important subject.



**Fig. 1** Tree structure of the book

Chapter 6 presents mobility architecture with integrated QoS support and the proposed architecture can accommodate different wired and wireless technologies.

The radio resource management (RRM) in OFDMA based cellular networks such as WiMAX is addressed in Chapter 7. Four different sub-carriers allocation algorithm with low complexity are evaluated for WiMAX cellular systems.

Chapter 8 first discusses the propagation models and then introduces the cellular planning in the context of WiMAX.

A model to compute the support physical throughput is proposed for WiMAX in Chapter 9 as a function of the achievable carrier-to-noise-plus-interference ratio (CNIR).

Chapter 10 first introduces general aspects about the business models for WiMAX and then address the cost/revenue optimization for these networks, for cellular configuration with and without relays.

Multiple Input and Multiple Output (MIMO) technology options for the WiMAX has been discussed in Chapter 11.

Finally, Chapter 12 concludes the WiMAX Networks by comparing WiMAX with other wireless standards and highlights its potential.

We would greatly appreciate if readers would provide extra effort in improving of the quality of the book by pointing out any errors. We strongly believe nothing is errorless.

Ramjee Prasad  
Fernando J. Velez



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WiMAX Networks

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Prasad, R.; Velez, F.J.

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