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Security in Next Generation Mobile Networks: SAE/LTE and WiMAX

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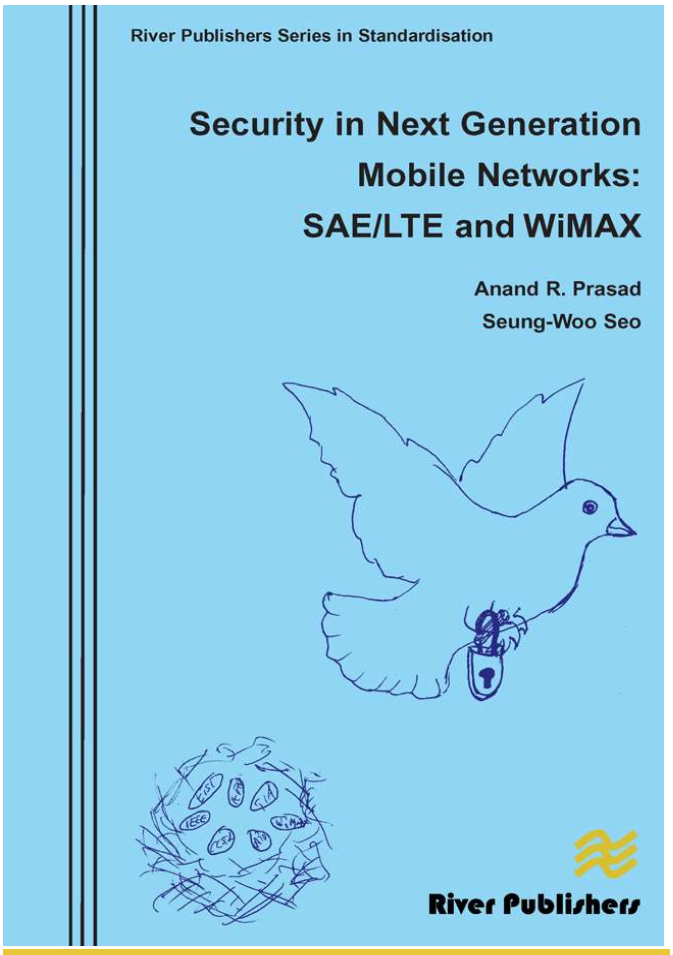
Starting from voice services with simple terminals, today a mobile device is nothing sort of a small PC in the form of smart-phones. The result has been a huge increase in data-services giving mobile communication access to critical aspects of human society / life. This has led to standardization of SAE/LTE (System Architecture Evolution / Long Term Evolution) by 3GPP and IEEE 802.16e / WiMAX. Together with penetration of mobile communications and new standardization come new security issues and thus the need for new security solutions. This book provides a fresh look at those security aspects, with main focus on the latest security developments of 3GPP SAE/LTE and WiMAX. SAE/LTE is also known as Evolved Packet System (EPS).

The intended audience for this book is mobile network and device architects, designers, researchers and students. The goal of the authors, who have a combined experience of more than 25 years in mobile security standardization, architecture, research, and education, is to provide the book?s readers with a fresh and up-to-date look at the architecture and challenges of EPS and WiMAX security. This book includes 6 chapters, where the first 3 chapters are intended to be introductory ones, and the remaining 3 chapters provide more in-depth discussions. The book starts with Chapter 1 where we give a background of Next Generation Mobile Networks (NGMN) activity and requirements. Following explanation of NGMN, Chapter 2 provides an overview of security, telecommunication systems and their requirements. Chapter 3 provides some background on standardization. Chapter 4 discusses the EPS (or SAE/LTE) security architecture developed by 3GPP. In particular, this chapter covers the authentication and key agreement method for SAE/LTE together with newly defined key hierarchy. This chapter also addresses the challenging aspects of SAE/LTE interworking and mobility with UMTS together with the necessary key-exchange technologies. The focus of Chapter 5 is WiMAX (IEEE 802.16) security. Chapter 5 provides an in-depth discussion of the WiMAX security requirements, the authentication aspects of PKMv2, and the overall WiMAX network security aspects. In Chapter 6 we briefly cover security for (i) Home(evolved)NodeB (H(e)NB) is the Femto solution from 3GPP), (ii) Machine-to-Machine (M2M) security and (iii) Multimedia Broadcast and Multicast Service (MBMS) and Group Key Management.

Contents:
Preface;

- Introduction to next generation mobile networks (NGMN) and security requirements;
- Security basics;
- Standardization process in 3GPP and IEEE/WiMAX;
- SAE/LTE Security;
- Security in IEEE 802.16e / WiMAX;
- Security for other systems like M2M and 3GPP Femto; Abbreviations; Index.



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