universal personal communications

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802.11 WLANs and IP Networking

security, QoS, and mobility

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HOUSE
BOSTON | LONDON
artechhouse.com

Library of Congress Cataloging-in-Publication Data
Prasad, Anand R., Neeli R. Prasad
A catalog record for this book is available from the Library of Congress.

British Library Cataloguing in Publication Data
Prasad, Anand
802.11 WLANs and IP networking: security, QoS, and mobility.—(Artech House mobile communications library)
1. Wireless LANs 2. Local area networks (Computer networks)
I. Title II. Prasad, Neeli
621.3'821

ISBN 1-58053-789-8

Cover design by Yekaterina Ratner

International Standard Book Number: 1-58053-789-8

10 9 8 7 6 5 4 3 2 1

To our parents Jyoti and Ramjee Prasad,
our brother Rajeev,
and our families Akash, Ruchika and Sneha and Jami

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Preface

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(Not by wealth alone is a human satisfied)

-Rig Ved

Even after all the earthly riches are enjoyed there still remains in the heart a longing for knowledge, true knowledge. It is this longing and the desire to bring the knowledge to others that resulted in the revelation of this book.

"How do IEEE 802.11 wireless local area networks (WLANs) work together with the higher layer protocols, particularly with the IP layer? How does it really work with the mobile network? What are its issues? What is the business model of WLANs now and in the future?" were the main questions that led to the writing of this book. These questions were unanswered in our first, edited, book titled *WLAN Systems and Wireless IP for Next Generation Communications*. In this book we try to answer these questions and elaborate on them.

The first chapter introduces IEEE 802.11-based WLAN and its issues; this chapter also gives a brief overview of the complete book. In the second chapter, written by Rajeev R. Prasad, we discuss market and business for WLANs for different service providers including the mobile operator.

With this background of WLANs and market we dive deep into the WLAN standards in Chapter 3, discussing the IEEE 802.11 standard in detail. Both the medium access control (MAC) and physical layer (PHY) are covered in this chapter. The discussion of MAC enhancements for security, quality of service (QoS), and mobility are left for later chapters.

Currently the foremost issue of IEEE 802.11-based WLANs is security. The fourth chapter of the book discusses the current security solution and its issues. In this chapter various solutions being provided in the market to overcome the security issues are also discussed. Technologies discussed include Virtual Private Network (VPN), IP Security (IPSec), and Secure Session Layer (SSL). The chapter also discusses the draft IEEE 802.11i standard together with Extensible Authentication Protocol over LAN (EAPOL) which is used by IEEE 802.1x.