



## 802.11° Wireless Networks

The Definitive Guide

# 802.11° Wireless Networks

The Definitive Guide

Matthew S. Gast

O'REILLY°

Beijing · Cambridge · Farnham · Köln · Paris · Sebastopol · Taipei · Tokyo



use. Online editions are also available for most titles (safari.oreilly.com). For more information contact our corporate/institutional sales department: (800) 998-9938 or corporate@oreilly.com.

Editor:

Mike Loukides

**Production Editor:** 

Matt Hutchinson

**Cover Designer:** 

Ellie Volckhausen

**Printing History:** 

April 2002:

First Edition.

Nutshell Handbook, the Nutshell Handbook logo, and the O'Reilly logo are registered trademarks of O'Reilly & Associates, Inc. Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and O'Reilly & Associates, Inc. was aware of a trademark claim, the designations have been printed in caps or initial caps. The association between the image of a horseshoe bat and 802.11 wireless networks is a trademark of O'Reilly & Associates, Inc.

 $802.11^{\odot}$  and all 802.11-based trademarks and logos are trademarks or registered trademarks of IEEE, Inc. in the United States and other countries. O'Reilly & Associates, Inc. is independent of IEEE.

While every precaution has been taken in the preparation of this book, the author and publisher assume no responsibility for errors or omissions, or for damages resulting from the use of the information contained herein.

ISBN: 0-596-00183-5

[M]



# DOCKET A L A R M Find authenticate

# **Table of Contents**

Prefa	ce	іх
1.	Introduction to Wireless Networks	<b>1</b> 1 5
2.	Overview of 802.11 Networks	7
۷.	IEEE 802 Network Technology Family Tree	8
	802.11 Nomenclature and Design	9
	802.11 Network Operations	16
	Mobility Support	20
3.	The 802.11 MAC	23
	Challenges for the MAC	25
	MAC Access Modes and Timing	27
	Contention-Based Access Using the DCF	31
	Fragmentation and Reassembly	34
	Frame Format	35
	Encapsulation of Higher-Layer Protocols Within 802.11	43
	Contention-Based Data Service	44
4.	802.11 Framing in Detail	51
	Data Frames	51
	Control Frames	60
	Management Frames	66
	Frame Transmission and Association and Authentication States	83

# DOCKET

# Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

### **Real-Time Litigation Alerts**



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

### **Advanced Docket Research**



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

### **Analytics At Your Fingertips**



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

### API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

### **LAW FIRMS**

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

### **FINANCIAL INSTITUTIONS**

Litigation and bankruptcy checks for companies and debtors.

### **E-DISCOVERY AND LEGAL VENDORS**

Sync your system to PACER to automate legal marketing.

