Wireless Network Hacks & Mods FOR DUMMIES®

by Danny Briere and Pat Hurley

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Dedication

Pat: I would like to dedicate this book to my baby daughter, Annabel, who gives me improbable faith in my own genes. Thanks for making me smile every time you pooter.

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Introduction

Welcome to *Wireless Network Hacks & Mods For Dummies.* This book was written to help you get the most out of your wireless network. Whether you've got one access point that you'd like to do more with, or a whole house full of wireless gear, you can do a lot to boost your performance and extend the core wireless functionality. Whatever your situation, we're here to help you supercharge your wireless network.

Wireless Network Hacks & Mods For Dummies is *not* an electronics mod or software hacker's guide to wireless gear. As intricate as these devices have gotten these days, if you think you know how to retool a motherboard for performance, you don't need us to tell you what to do. Second, more and more off-the-shelf software can now help you accomplish what used to require backdoor hacking.

Our focus is on helping you use the current equipment on the market, with the current software tools and design techniques, to put together the most comprehensive and high-performance home wireless network you can possibly get. You're not going to pry open your wireless access point and start soldering high-performance chips onto its motherboard (at least not under our guidance).

Wireless Network Hacks & Mods For Dummies picks up where our more beginner-level book, *Wireless Home Networking For Dummies,* published by Wiley, left off. If you have not installed a network yet, you might consider buying both books so that you can cover the more basic installation issues at the same time you read about how to broaden and optimize that network's performance after it is installed.

About This Book

If you've installed some level of wireless capability in your home and want to take it to the next level, or are thinking of purchasing a wireless computer network and want a high-powered setup from the get-go, this is the book for you. Here's the bottom line: If you want to (or have) cut the cord, we want to help you improve your network.

If you have a wireless network, you have probably realized that performance can vary wildly around your home. What's more, you might be trying to add additional gear onto your network, only to find it does not seem to solve the problems you set out to fix. You're not alone — many of those who have mastered the first stage of getting a wireless network up and running have wondered how they can simply get more out of it. Towards that end, this book helps you get the most out of your network over the long term.

With this book in hand, you'll have all the information that you need to know about the following topics:

- Planning a wireless network that can cover your whole home, including in your car and outside the walls of the house
- Evaluating and selecting advanced wireless networking equipment for installation in your home
- Installing and configuring multiple wireless networking devices that work together seamlessly
- Understanding the issues surrounding boosting your wireless signals to increase the range and throughput of your network
- Securing your wireless network from nosy neighbors and hackers
- Playing computer games over a high-performance wireless network and across the Internet
- Connecting your audio-visual gear to your wireless network and sharing MP3, video files, DVDs, and more around the whole house
- Talking with people worldwide, for free, over your wireless network
- Protecting your home with wireless surveillance
- Using your wireless gear on the road
- Setting up your own hot spot to share wireless access with others
- Outfitting your car with a wireless network
- Discovering devices that you'll be able to connect to your wireless home network in the future

System Requirements

There are no minimum requirements from a wireless equipment or computer perspective for this book. Just about any computer will work over a wireless connection, as long as it has some sort of networking capability (which covers most of the computers still working today).

If your home network is anything like ours, you want to end up with a wireless network that connects old and new computers and devices, newer and older operating systems, Windows and Mac-affiliated devices, and a whole lot more. *Wireless Network Hacks & Mods For Dummies* will help you get there.

That having been said, the newest versions of Windows and Mac OS do the best job of helping you quickly and painlessly optimize your wireless network. Much of the sophistication in wireless networking has occurred relatively recently. Most of the advanced wireless gear and software, as well as most of the newer wireless audio/visual, gaming, and similar gear, have been designed around the latest operating systems and hardware interface capabilities. So if your computer does not have USB ports, Windows Wireless Networking, or other similarly "modern" computer conveniences, you're likely to be at a huge disadvantage in trying to adopt at least some of the ideas and recommendations in this book.

As a result, we mostly cover optimizing wireless networks that connect PCs running the Windows operating system (Windows 95 or later) or the Mac OS (Mac OS 9 or later) — with a particular focus on Windows XP and Mac OS X. Although wireless networking is also popular among Linux users, Linux-specific instructions are not provided in this book.

How This Book Is Organized

This book is organized into several chapters that are grouped into five parts. The chapters are presented in a logical order — flowing from an intense tutorial on wireless technologies, to installing, optimizing, and using your wireless home network — but feel free to use the book as a reference and read the chapters in any order that you want.

Part 1: Making Your World Wireless

The first part of the book is an in-depth primer on networking and on wireless networking. If you are not overly familiar with the concepts of networking a computer, this part of the book provides a quick foundation on wireless gear, standards, and concepts, so that you can appreciate the advice provided in the rest of the book. Chapter 1 presents a total view of all the devices we intend to help you wirelessly network; Chapter 2 discusses the state of standards and important technology trends that affect the operation, optimization, and future-proofing of your network; Chapter 3 provides an overview of the key elements of a home wireless network; and Chapter 4 introduces you to the key broadband Internet access technologies that your wireless home network uses to connect outside your home and gives you the information you need to connect the two networks (wireless and Internet access) together.

Part II: Boosting Performance on Your Wireless Network

The second part of the book helps you plan your extended and expanded wireless home network. It helps you understand how to create a whole home wireless footprint; how to link your wireless network with other wired technologies in your home; how to track and maintain the operation of your entire home network; how to optimize your network's overall performance; and how to secure your wireless network. This is the part to turn to if you want to learn how to measure the performance of your wireless network and what to do to improve that performance.

Part III: Wireless on the Go

Part III discusses how to use your wireless network on the road. It helps you understand how you can access the Internet from remote wireless access sites called *hot spots* in coffee shops, hotels, airports, and other public locations. We tell you how to keep your communications safe from eavesdroppers while on the road, and even how to put wireless connectivity in your car. The last chapter in this part covers how to set up your own wireless hot spot, so you can help others communicate wirelessly on the road too.

Part IV: Cool Wireless Toys

After you get your wireless home network running in perfect shape, now comes the fun. Part IV of the book presents many cool things that you can do over a wireless network, including playing multi-user computer games, connecting your audio-visual equipment, viewing rooms via wireless surveillance (even over the Internet!), and talking over your wireless network to anyone in the world. What's the fun of a high-powered wireless network without cool toys?

Part V: The Part of Tens

Part V provides a couple of top-ten lists that we think you'll find interesting — ten great online sources for specific areas of high-performance networking and the ten most frequently-asked security questions about Wi-Fi security (a topic that puzzles even the most experienced users sometimes).

Icons Used in This Book

All of us these days are hyper-busy people, with no time to waste. To help you find the especially useful nuggets of information in this book, we've marked the information with little icons in the margin. The following icons are used in this book:

As you can probably guess, the Tip icon calls your attention to information that can save you time or maybe even money. If your time is really crunched, you might try just skimming through the book and reading the tips.

The little bomb in the margin alerts you to pay close attention and tread softly. You don't want to waste time or money fixing a problem that could have been avoided in the first place.

This icon is your clue that you should take special note of the advice that you find there . . . or that this paragraph reinforces information that has been provided elsewhere in the book. Bottom line: You will accomplish the task more effectively if you remember this information.

Face it, computers and wireless networks are high-tech toys — we mean *tools* — that make use of some pretty complicated technology. For the most part, however, you don't need to know how it all works. The Technical Stuff icon identifies the paragraphs that you can simply skip if you're in a hurry or you just don't care to know.

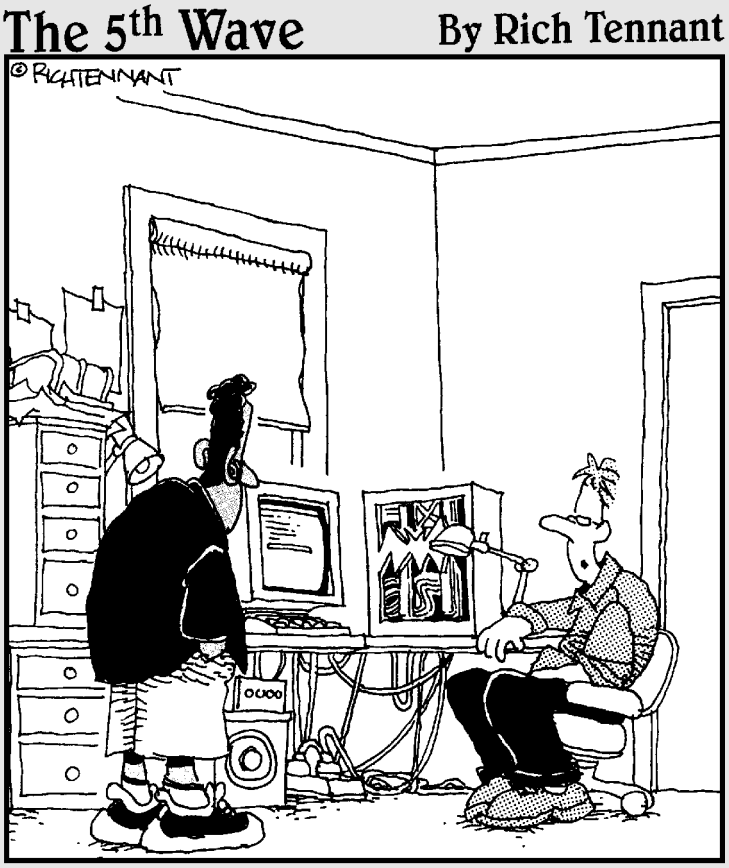
Where to Go from Here

Where you should go next in this book depends on what you know and what you are trying to accomplish. If you are still relatively new to wireless technologies and networking in general, we recommend that you start at the beginning with Part I. When you feel comfortable with networking terminology, or you just get bored with the lingo, move on to the chapters about monitoring and boosting your network in Part II. If you've got your network operation well in hand, check out Part III to help you extend this on the road. Part IV gives you the most useful and fun ways to use your network — this lets you get the most bang for your wireless buck.

When you are done with this book, you should have a highly optimized and extensive wireless network that covers your needs from the pantry to the pool! And if you don't have a pool, we'll help you cover that part of your yard where you dream about putting one. How's that for future-proofing your wireless home network?

Part I

Making Your World Wireless



"Why am I modding my wireless network? I pimped my Xbox, my fish tank, and my Water Pik. This was next."

In this part . . .

Wireless gear touches our lives in surprising ways. It's not just computers and phones these days — there's wireless in everything from TVs and audio systems to planes, trains, and automobiles. To help you wrap your mind around the expanse of wireless, we take the time in this Part to lay out a vision of the wireless world. We talk about where you find wireless and what flavor of wireless you can expect to find in each device and place.

Then we spend some time looking at the nitty-gritty details about the standards and certifications — explaining key concepts like 802.11 and Wi-Fi — so that you'll understand exactly which pieces of wireless gear work together, and which don't.

We also review the pieces and parts that make up a wireless network. If you've already got a wireless network in place, you can skim through this quickly — it's always there for you to refer back to if you want. Finally, we review the equipment and services you need to connect your wireless networks to the Internet. Don't underestimate the importance of this step — the value of your networks increases exponentially as they are connected to other networks.

Chapter 1

Wireless Inside Everything!

In This Chapter

- Understanding the wireless world around you
- Tapping into wireless at home . . . and away
- Encountering wireless everywhere
- Getting a handle on the many uses of wireless

We recently read the following quote by a pundit commenting on the sorry state of fast food in America: "You can have cheap, good, and fast — pick any two." Up until very recently, you could say something similar about the situation in the world of electronic devices: Cheap, portable, and network-connected — pick any two.

The combination of inexpensive, small, and networked just didn't happen all that often — devices that were portable usually required a cable to work (think about a PDA that needs to be docked), or they cost a fortune but worked wirelessly (think about early "smartphones").

Luckily, there's been a revolution. That's not just marketing-speak or hyperbole — the world has gone mad for wireless, and now it's time for all of us to catch up. In *Wireless Network Hacks & Mods For Dummies,* we are going to help you do just that — catch up and move right to the head of the wireless line. And in this chapter, we begin that trek by giving you the lay of the land.

Remember: *Wireless Network Hacks & Mods For Dummies* was written to help those of you who want to achieve high performance with your wireless network. We're going to help you boost your signals, attach more devices, and in general, do a whole lot more of everything wireless. Although we won't help you rewrite the operating code for a D-Link Internet camera or splice into a MIMO antenna, we are going to help you maximize your wireless network based on off-the-shelf gear and software. This first Part of the book introduces many of the concepts that you need to know to do what we suggest in Parts II through IV. If you consider yourself pretty adept at everything wireless already, feel free to skip to Part II and get right to the nitty-gritty of boosting your performance.

Wireless Networks Are Everywhere

Where can you find the wireless *networks,* or electronic "highways," to connect all of your devices? The answer is simple: everywhere.

Wireless networks are an increasingly ubiquitous part of our existence. Satellite networks blanket the entire globe, touching just about everywhere that people live, and most places that they don't (excepting only the North and South Poles). Closer to earth, *terrestrial* (ground-based) networks of all sorts cover homes, buildings, cities, and even wider areas.

Wireless networks let you stay in contact, online, connected, entertained, and informed, no matter where you go.

Feeling at home with wireless

The main focus of *WNH&M For Dummies* (we're abbreviating the name to save a few micrometers of cartilage in our typing fingers) is on wireless networks that you would install or access from within your home.

We're not going to waste your time talking about "old style" wireless networks, like regular old-fashioned cordless phones here. We stick to the newfangled networks like Wi-Fi, Bluetooth, UWB, and ZigBee. (Don't worry if these names aren't familiar: We explain them all!)

So what can you do in your home wirelessly? The sky's the limit — anything you can do over a wired network in the home can be done wirelessly these days. Here are just a few of the cool ways you can use your wireless network:

- **Data transfer:** This one is a no-brainer — we bet you're already doing this, or planning on it. Simply put, wireless networks are a great way to transfer data (PC files, Web pages, e-mail, digital pictures, and the like) among computers in a home, and between a computer in the home and a destination on the Internet. Today, data transfers are the most common use for home wireless networks; tomorrow, data will continue to be a huge driver of wireless networking, but its relative share of network usage will decrease as newer uses for wireless networking come into being.
- **Audio:** Audio usage is exploding on many wireless networks. Just look at the millions of people buying iPods and downloading MP3 and other digital music files to them via the PCs in the home. Wireless networks take this music from the PC and send it to the home stereo or any location in the house. In Chapter 13, we tell you more about audio distribution and wireless networks.

- **Voice:** We're willing to bet that every single reader of this book is currently using some sort of wireless network for voice communications (also known as phone calls). Between cordless phones in the house and cellphones everywhere, we bet you've got this covered. What's new (and to us more interesting) is how voice calls will soon become part of the unified home wireless network — traveling over the same connections that data, audio, and video do, and then converging onto your home's broadband connection. The end result (we tell you how to do this in Chapter 15) allows you to gain control over your "phones" and save money at the same time. We can see Pauly Shore saying, "Whoa, that's thrifteee."
- **Audio and video conferencing:** You don't have to limit yourself to just voice calls either. With a wireless network and a broadband Internet connection, you can move up to that *Jetsons*-esque fantasy — video phone calls. Wireless connections to laptops as well as "standalone" wireless conferencing units enable you to see and be seen, as well as heard, when you talk to far-flung friends and relatives. We tell you more about this subject in Chapter 16!
- **Home control:** This application is near and dear to our hearts, and not only because we wrote *Smart Homes For Dummies* — we're basically lazy and like to make our house work for us, instead of vice versa. With a wireless network backbone in your home, you can control lights, HVAC (heating, ventilation, and air conditioning), drapes, sprinklers, garage doors . . . basically anything, from the comfort of, well, anywhere you want to be lounging. We talk about this in Chapter 14.
- **Security and monitoring:** A wireless network doesn't just enable sloth-like and lazy behavior — it can also make you (or at least your home) safer and more secure. Wireless networks within the home can be connected to wireless networks outside the home (or with your "wired" broadband connection) and combined into one super-duper security and monitoring system. This system lets you see who's at the front door while you're at work, turn off the alarm when the nanny's there, or just let a monitoring company watch it all for you. We tell you how to do this in Chapter 14.

Offices

Wireless networks aren't just for home use — an ever-increasing number of offices and businesses are using wireless networks too. In fact, the whole concept of wireless networking was originated for business and not residential users — some of the original (and still biggest) suppliers of wireless networking gear developed their systems for providing communications in large business workplaces like warehouses and factory floors.

In the work setting, wireless networks provide services such as

- **Data connections to workspaces:** One of the most obvious uses of wireless networks within the office is to replace (or avoid the installation of) wired data connections to PCs. As more and more workers use laptop computers and handheld computers and work in more flexible settings, the "access it anywhere" nature of wireless is a big advantage. Of course, wireless will probably *never* completely replace wired networks — for an ironic example, the engineers who design all this cool wireless gear will probably still rely on super-fast wired networks to transfer their gigantic drawings, schematics, and plans across the network in a shared workspace environment. For most of us, however, the wireless state of the art is sufficient for us to "pull the plug" on wired networks.
- **Network access in conference/meeting rooms:** Many businesses deploy wireless networks specifically in conference and meeting rooms, with the thought that even if employees have wired access at their desks, they need to be wireless to be productive in meetings and group collaborations in these public spaces. Some of the newer wireless equipment we talk about throughout *WNH&M For Dummies,* such as Wi-Fi–enabled projectors, makes it easier to hold meetings, give presentations, and do all that boring stuff you have to do to pay the mortgage. We can't make it fun, but we can make it easier!
- **Guest access for Internet:** Many businesses are also creating their own "hot spots" (discussed in the next section of this chapter) for their guests, partners, and even for their own employees. Public spaces such as lobbies, outdoor areas, and even the cafeteria are being set up for Wi-Fi access to the Internet — providing an open "Wild West" Internet connection that's completely separated from the corporate network for security purposes. In Chapter 12, we talk about how to create a secure "zone" on your network for similar purposes at your home or neighborhood or for a small business.
- **Factory floor automation and monitoring:** One of the original applications that drove technology companies to develop wireless networks in the first place was to monitor, control, and automate production processes — like manufacturing processes on a factory floor. If you've ever been to a factory, you've probably noticed that most are big and spread-out. Even small factories, however, are not typically wired up with network cabling — wireless provides the perfect means for tying together the data communications from each workstation and control point on the assembly line.
- **Warehouse control and inventory tracking:** Another group of business structures that tends to be large, spread-out, and unwired are warehouses, distribution centers, and the like. Many of the original vendors of wireless gear (folks like Symbol Technologies, `www.symbol.com`) specialize in things like wireless bar code scanners and ruggedized handheld devices for use in logistics operations. Take a look next time you