LEARNING MADE EASY

12th Edition

Networking

for dummies®

A Wiley Brand

Design, manage, maintain, and secure a network

Set up a server and manage Windows user accounts

Take your network to the cloud

Doug Lowe

Bestselling author of more than 30 *For Dummies* titles

Networking

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12th Edition

by Doug Lowe

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Networking For Dummies®, 12th Edition

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Contents at a Glance

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Introduction

Welcome to the 12th edition of *Networking For Dummies*, the book that's written especially for people who have this nagging feeling in the back of their minds that they should network their computers but haven't a clue about how to start or where to begin.

Do you often copy a spreadsheet to a flash drive just so you can give it to someone else in your office? Are you frustrated because you can't use the fancy color laser printer that's on the financial secretary's computer? Do you wait in line to use the computer that has the customer database? You need a network!

Or maybe you already have a network, but you have just one problem: Someone promised that a network would make your life easier, but it's instead turned your computing life upside down. Just when you had this computer thing figured out, someone popped into your office, hooked up a cable, and said, "Happy networking!" Makes you want to scream.

Regardless, you've found the right book. Help is here, within these humble pages.

This book talks about networks in everyday (and often irreverent) terms. The language is friendly; you don't need a graduate education to get through it. And the occasional potshot helps unseat the hallowed and sacred traditions of networkdom, bringing just a bit of fun to an otherwise dry subject. The goal is to bring the lofty precepts of networking down to earth, where you can touch them and squeeze them and say, "What's the big deal? I can do this!"

About This Book

This isn't the kind of book you pick up and read from start to finish, as if it were a cheap novel. If I ever see you reading it at the beach, I'll kick sand in your face. This book is more like a reference, the kind of book you can pick up, turn to just about any page, and start reading. Each chapter covers a specific aspect of networking, such as printing from the network, hooking up network cables, or setting up security so that bad guys can't break in. Just turn to the chapter you're interested in and start reading.

Each chapter is divided into self-contained chunks, all related to the major theme of the chapter. For example, the chapter on hooking up the network cable contains nuggets like these:

- What is Ethernet?
- All about cables
- To shield or not to shield
- Wall jacks and patch panels
- Switches

You don't have to memorize anything in this book. It's a need-to-know book: You pick it up when you need to know something. Need to know what 100BaseT is? Pick up the book. Need to know how to create good passwords? Pick up the book. Otherwise, put it down and get on with your life.

Feel free to skip the sidebars that appear throughout the book; these shaded gray boxes contain interesting info that isn't essential to your understanding of the subject at hand. The same goes for any text I mark with the Technical Stuff icon.

If you need to type something, you see the text you need to type like this: **Type this stuff**. In this example, you type **Type this stuff** at the keyboard and then press Enter. An explanation usually follows, just in case you're scratching your head and grunting, "Huh?"

Within this book, you may note that some web addresses break across two lines of text. If you're reading this book in print and want to visit one of these web pages, simply key in the web address exactly as it's noted in the text, pretending as though the line break doesn't exist. If you're reading this as an e-book, you've got it easy — just click the web address to be taken directly to the web page.

Foolish Assumptions

I'm making only two assumptions about who you are: You're someone who works with a computer, and you either have a network or you're thinking about getting one. I hope that you know (and are on speaking terms with) someone who knows more about computers than you do. My goal is to decrease your reliance on that person, but don't throw away his phone number yet.

Is this book useful for Macintosh users? Absolutely. Although the bulk of this book is devoted to showing you how to link Windows-based computers to form a network, you can find information about how to network Macintosh computers as well.

Windows 10? Gotcha covered. You'll find plenty of information about how to network with the latest and greatest Microsoft desktop operating system.

Windows Server 2019? No worries. You'll find plenty of information about the newest version of Microsoft's server operating system.

Icons Used in This Book

Those nifty little pictures in the margin aren't there just to pretty up the place. They also have practical functions.

Hold it — technical details lurk just around the corner. Read on only if you have a pocket protector.

Pay special attention to this icon; it lets you know that some particularly useful tidbit is at hand — perhaps a shortcut or a little-used command that pays off big.

Did I tell you about the memory course I took?

Danger, Will Robinson! This icon highlights information that may help you avoid disaster.

Beyond the Book

In addition to the material in the print or e-book you're reading right now, this product also comes with some access-anywhere goodies on the web. Check out the free Cheat Sheet for links to useful websites for networking information, private IP address ranges for networks, and more. To get this Cheat Sheet, simply go to `www.dummies.com` and type **Networking For Dummies Cheat Sheet** in the Search box.

Where to Go from Here

Yes, you can get there from here. With this book in hand, you're ready to plow right through the rugged networking terrain. Browse through the Table of Contents and decide where you want to start. Be bold! Be courageous! Be adventurous! Above all, have fun!

1 Getting Started with Networking

IN THIS PART . . .

Find out what a network is and what you can do with one.

Set up Windows and Mac computers to work on a network.

Access network resources such as shared storage and network printers.

Use Microsoft Office and other software on a network.

IN THIS CHAPTER

- Getting a handle on networks
- Considering why networking is useful (and is everywhere)
- Telling the difference between servers and clients
- Looking under the hood at the network operating system
- Asking "How does it work when a network works if a network works for me?" (Say what?)
- Assessing how networks change computing life
- Identifying (and offering sympathy to) the network administrator
- Comparing servers to clients: What have they got that you don't got?

Chapter 1

Let's Network!

Computer networks get a bad rap in the movies. Beginning in the 1980s, the *Terminator* movies featured Skynet, a computer network that becomes self-aware, takes over the planet, builds deadly terminator robots, and sends them back through time to kill everyone unfortunate enough to have the name Sarah Connor. In the *Matrix* movies, a vast and powerful computer network enslaves humans and keeps them trapped in a simulation of the real world. And in the 2015 blockbuster *Spectre*, James Bond goes rogue (again) to prevent the Evil Genius Ernst Blofeld from taking over the world (again) by linking the computer systems of all the world's intelligence agencies together to form a single all-powerful evil network that spies on everybody.

Fear not. These bad networks exist only in the dreams of science fiction writers. Real-world networks are much more calm and predictable. Although sophisticated networks do seem to know a lot about you, they don't think for themselves and they don't evolve into self-awareness. And although they can gather a sometimes disturbing amount of information about you, they aren't trying to kill you, even if your name is Sarah Connor.

Now that you're over your fear of networks, you're ready to breeze through this chapter. It's a gentle, even superficial, introduction to computer networks, with a slant toward the concepts that can help you use a computer that's attached to a network. This chapter goes easy on the details; the detailed and boring stuff comes later.

Defining a Network

A *network* is nothing more than two or more computers connected by a cable or by a wireless radio connection so that they can exchange information.

Of course, computers can exchange information in ways other than networks. Most of us have used what computer nerds call the *sneakernet.* That's where you copy a file to a flash drive or other portable storage device and then walk the data over to someone else's computer. (The term *sneakernet* is typical of computer nerds' feeble attempts at humor.)

The whole problem with the sneakernet is that it's slow, and it wears a trail in your carpet. One day, some penny-pinching computer geeks discovered that connecting computers with cables was cheaper than replacing the carpet every six months. Thus, the modern computer network was born.

You can create a simple computer network by hooking together all the computers in your office with cables and using the computer's *network interface* (an electronic circuit that resides inside your computer and has a special jack on the computer's backside). Then you tweak a few simple settings in the computer's operating system (OS) software, and *voilà!* You have a working network. That's all there is to it.

If you don't want to mess with cables, you can create a wireless network instead. In a wireless network, the computers use wireless network adapters that communicate via radio signals. All modern laptop computers have built-in wireless network adapters, as do most desktop computers. (If yours doesn't, you can purchase a separate wireless network adapter that plugs into one of the computer's USB ports.)

Figure 1-1 shows a typical network with four computers. You can see that all four computers are connected by a network cable to a central network device (in this case, a home router). This component, common in small networks, actually consists of three distinct but related network devices:

- **Router:** Connects your computers to the Internet
- **Switch:** Allows you to connect two or more computers together with cables
- **Wireless access point:** Lets you connect computers and other devices to your network without using cables

In the figure, you can see that two computers — Bart's gaming computer and Homer's old 1989 computer — are connected via cables to the switch component of the home router. You can also see that Lisa connects her laptop to the network wirelessly. Marge also connects her iPad to the network wirelessly.

You can also see in the figure that Homer's computer has a printer attached to it. Because of the network, Bart, Lisa, and Marge can also use this printer.

Finally, you can see that the entire network is connected to the Internet via the router.

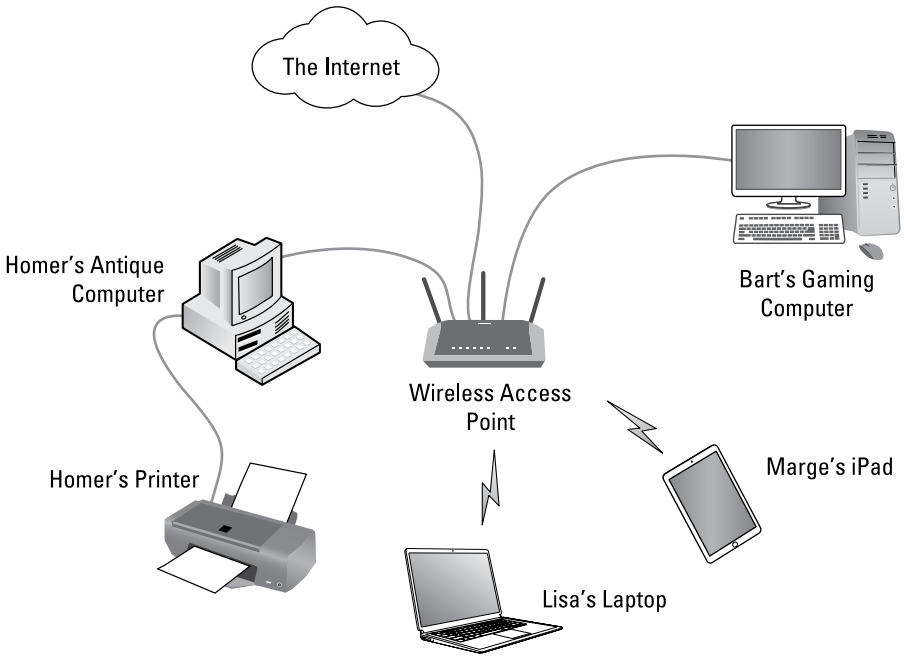

FIGURE 1-1: A typical network.

Computer networking has its own strange vocabulary. Although you don't have to know every esoteric networking term, it helps to be acquainted with a few of the basic buzzwords:

- **LAN:** Networks are often called LANs, short for *local area network.* In Figure 1-1, the LAN consists of the home router and the computers and iPad that are connected to it directly via cable or wirelessly.

  
  TECHNICAL STUFF

  LAN is the first *TLA* — or *three-letter acronym* — of this book. You don't really need to remember it or any of the many TLAs that follow. In fact, the only three-letter acronym you need to remember is TLA. You might guess that the acronym for *four-letter acronym* is *FLA.* Wrong! A four-letter acronym is an *ETLA,* which stands for *extended three-letter acronym.* After all, it just wouldn't be right if the acronym for *four-letter acronym* had only three letters.

- **WAN:** The second TLA in this book is WAN. The WAN is part of the network that connects to the Internet. WAN stands for *wide area network*.

  
  TECHNICAL STUFF

  Okay, fine. Technically, WAN is the *third* TLA. The first TLA was LAN, and the second TLA was TLA. So that makes WAN the third TLA.

- **On the network:** Every computer connected to the network is said to be "on the network." The technical term (which you can forget) for a computer that's on the network is a *node.* Another term that's commonly used to mean the same thing is *endpoint.*

- **Online, offline:** When a computer is turned on and can access the network, the computer is *online.* When a computer can't access the network, it's *offline.* A computer can be offline for several reasons. The computer can be turned off, the user may have disabled the network connection, the computer may be broken, the cable that connects it to the network can be unplugged, or a wad of gum can be jammed into the disk drive.

- **Up, down:** When a computer is turned on and working properly, it's *up.* When a computer is turned off, broken, or being serviced, it's *down.* Turning off a computer is sometimes called *taking it down.* Turning it back on is sometimes called *bringing it up.*

- **Local, remote:** A resource such as a disk drive is *local* if it resides in your computer. It's *remote* if it resides in another computer somewhere else on your network.

- **Internet:** The *Internet* is a huge amalgamation of computer networks strewn about the entire planet. Networking the computers in your home or office so that they can share information with one another and connecting your computer to the worldwide Internet are two separate but related tasks.