

Mark Minasi

Darril Gibson

Wendy Henry

Aidan Finn

Byron Hynes

MASTERING

Microsoft®

Windows Server® 2008 R2

Install and Manage Windows
Server 2008 R2

Master the Features of
Server 2008 R2

Mastering

Windows Server® 2008 R2

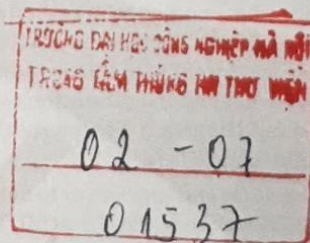
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Introduction

Welcome to *Mastering Windows Server 2008 R2*! I've got to tell you, I haven't been this excited about a new version of Server since Windows 2000, almost 10 years ago. Why? I guess because it feels...fun. Yeah, that's the word—*fun*. Here's what I mean.

R2's 10-year-old older brother, Windows Server 2000, was neat because it was such a game-changer, an OS lushly festooned with completely new concepts and tools to get to know. Now, I've seen big operating system upgrades before, like DOS 2.0 in 1982, OS 2.0 in 1992, or Windows 3.0 in 1990, and in every case things seemed to work out the same way: first we get the holy-moley-there's-so-much-new-stuff thrill of discovery and newness, then we sit down and start using the thing, and *then* we find ourselves shaking our heads saying, "OK, this [fill in the new feature] is cool, but why did they leave *this* part of it out," or "OK, this is cool, but it, um, doesn't exactly work as advertised."

In every one of those cases, the OS's vendor released the next version, better known as "version 1.1." Sure, they didn't all actually have a ".1" in their version numbers—DOS 2.0's "1.1" was DOS 3.0—but all of the 1.1s shared the same basic trait in that they were the *useful* upgrade of the game-changers. People ran those better-fitting 1.1s (MS-DOS 3.x, Windows 3.1, and OS/2 2.1 in the three examples I cited) and liked them so much that two of *their* successors—DOS 4.0 and OS/2 Warp 3—sold nary a copy. In fact, Windows 3.1's successor, Windows 95, sold well because Windows 95 itself was also a paradigm shifter. But even in the case of Windows 95, its popularity was far outpaced by *its* 1.1, Windows 98, and again, consider how *unwell* Windows Millennium Edition (Windows 98's putative replacement) sold.

Version 1.1s offer more, however, than bushels of much-needed bug fixes. They tend to sport a handful of completely new features as well, such as DOS 3.x's support for larger drives, Windows 3.1's built-in multimedia capabilities (the birth of the Windows' "bonk!" error sounds, as well as Windows 98's USB support), and now Windows Server 2008 R2's AD Recycle Bin and a host of other things you'll read about in these pages.

Beyond fixes and features, however, it's always seemed to me that the best part of a 1.1 is its "broken-in" feel, a sort of "um, sorry; this was the version that we *meant* to ship" air to the follow-on OS versions, which brings me back to why I like Server 2008 R2. I'd argue that, in a sense, 2008 R2 is a "1.1" version not merely for Windows Server 2008, but indeed for Windows 2000 Server and Windows Server 2003. Why? Well, it seems like it's the first version of Server built since Windows NT 4.0 Server where the programmers actually got some time to look back at the previous version of Server and add a bit of that "broken-in" feel that I referred to earlier.

I know that sounds odd, but as far as I can see, it's true. Server 2003 didn't get to be a decent 1.1 because Bill Gates realized in January 2002 that Microsoft's software needed a top-to-bottom overhaul to make it more secure, making it a year and half late and causing it to lack quite a number of asked-for features. Heck, Microsoft couldn't even come up with a name for it until

the last minute—its moniker was “Windows .NET Server 2003” in all of its betas and release candidates. 2008 was delayed when the embarrassing Blaster worm, which appeared about four months after Windows Server 2003’s debut, sort of demonstrated that 2002’s security cleanup job wasn’t entirely effective, and led to a major reexamination of the kernel in Windows Vista and its companion product, Windows Server 2008. Server 2008’s rushed nature is evident any number of places, but three jump to mind:

- ◆ Its arguably best new Active Directory feature, flexible password policies (which allow you to vary things like how often passwords have to be changed from person to person and from group to group within an AD domain) can’t be accessed without donning AD “deep-diving” gear and working with the cryptic ADSI Edit tool.
- ◆ Its vastly improved new FTP server is indeed great, but it’s not in the box in Server 2008; you’ve got to download it separately from a Microsoft site.
- ◆ Its enterprise-class server virtualization tool, Hyper-V Server, shipped with Server 2008 only as a beta and wasn’t available in a finished version for another five months after 2008 released to the public.

WHAT ABOUT WINDOWS 2003 R2?

And before you ask, Windows Server 2003 R2 doesn’t really count as a version of Server, much less a “1.1,” because it was nothing more than Server 2003 SP1 with the new DFSR file replication service added.

So, how’d we get our first not-built-under-the-gun version of Server in nearly 10 years? Well, the main key to understanding this is in noticing that as of as of October 22, 2009, we got—for the first time in quite some time—*two* versions of Windows Server in less than two years. That hasn’t been the case since the days of NT 3.x and NT 4, and we all know whom we can thank for this “bonus” version of Windows Server...Vista. Yup, in the end analysis, it was Vista’s horrendous failure in the marketplace that made Microsoft decide to try to essentially “change the conversation” by taking advantage of the fact that two of the biggest objections voiced about Vista—“there are no drivers for Vista” and “Vista runs too slowly on my machine”—became largely insupportable with the passage of time, allowing them to make fairly small changes to Vista, rebrand it as “Windows 7,” and release it. We Server folks can just be thankful that someone in Redmond decided, “Heck, as long as we’re releasing a minor upgrade of the desktop OS, we may as well let the server guys do the same thing,” which led to Windows Server 2008 R2. Without Vista, we might have been waiting until 2013 for new Server stuff to play with.

OH, AND BY THE WAY...

Let me clarify that I’m not casting aspersions about Windows 7, because I liked Vista from the very beginning for its largely overlooked under-the-hood security- and reliability-enhancing kernel changes. History may show that Windows 7 will turn out to be one of the most successful 1.1s in operating system history.

Who Is The Book For?

Like every other book in this 15-year-plus series, we've aimed this book at people who need to know how to install, configure, maintain, and troubleshoot a Windows network. Readers of previous editions, however, may recall that the books were getting a bit too large, so we split our Server 2008 and R2 coverage into two books: a "networking novice" volume, *Mastering Windows Server 2008 Networking Foundations*, and this book.

Now, if you *haven't* read *Networking Foundations*, must you go out and get a copy? Well, it depends on how much you already know about networking, and Windows networking in particular. Before tackling this book, I strongly recommend that you be comfortable with these topic areas (all of which are covered in *Networking Foundations*):

- ◆ What does a computer network do?
- ◆ How does Windows security work in general? What are authentication and authorization, and how do they differ? What is a file permission?
- ◆ How do you install a Windows operating system?
- ◆ Do you have a basic working level of comfort with the Windows GUI and Microsoft Management Consoles (MMCs) in particular? The command line? Can you use `regedit.exe` to do basic registry editing?
- ◆ Can you partition and format hard drives in Windows?
- ◆ Do you know how to configure IP addresses on a Windows system? Can you set up a Dynamic Host Configuration Protocol (DHCP) server on a Windows system to provide automatic IP addresses to clients on a network?
- ◆ How do you set up Windows name services with Windows Internet Name Services (WINS) and Domain Name Service (DNS)?

Please don't tackle this book until you're comfortable with these Windows networking basics—the last thing we'd want would for you to start reading and get immediately confused and frustrated. (After all, you could get confused and frustrated absolutely free of charge by reading most of the stuff on the Internet about Windows networking...why pay for it?)

What's Inside?

Chapter 1 starts out with an overview of Windows Server 2008 and Windows Server 2008 R2 (let's henceforth abbreviate that "Server 2008/R2"), as well as a high-level look at why you'd want to upgrade to either of them, and Chapter 2 shows you how to install them on your servers and how to begin to integrate them with your existing network, if you've got one. Chapter 2 is actually a great example of R2's "1.1-ness," because Server 2008's setup routine is a new platform named Panther that makes installation and deployment quite easy...and R2 installs with an updated Panther.

Veterans of Windows networking will expect Server 2008/R2 to look like other versions of Windows does, with a desktop, a Start menu, and a host of graphically based tools, but Server 2008 introduced a new option for Server installation called Server Core, a version of Server with no Start menu and a very limited GUI. Its great selling points are that it uses less CPU and RAM than

the full versions of Server 2008/R2 and is easier to secure than them because there's less code to have to patch. (Not having to install Internet Explorer patches really thins out the "critical patch" list.) Chapter 3 gets you started on Server Core, and I recommend that you spend time learning it. Chapter 4 looks at how IPv4 networking changes with 2008/R2, and Chapter 5 does the same for DNS, answering the question, "How do I build a DNS infrastructure that is both secure and is also crafted to serve an Active Directory best?"

Speaking of AD, Chapter 6 is the first chapter to address that essential Windows Server technology, with an explanation of how to build the most common, and simplest, type of Active Directory: one that contains just one domain and just one location. Even if you're going to build huge, globe-spanning ADs, this first look provides a necessary foundation, so don't skip it. Then, once you've got your AD up, you'll need to create and manage user accounts, and Chapter 7 shows you how. Once you've got a working AD in place, then it's time to get some payback from all your design and setup work, and the tool for that is Group Policy. The good news is that Group Policy is a great way to control 10 or 10,000 machines and user accounts centrally; the bad news is that Group Policy can be a mite complex—but Chapter 8 helps on that score. The fourth AD-related chapter, Chapter 9, covers Active Directory delegation, a process that lets you create user accounts that are a bit more powerful than regular old users but not as all-powerful as a full-blown domain administrator, allowing you to fine-tune exactly how much power you give each user.

Chapter 10 starts out a three-part series on sharing files and folders in Windows Server. Chapter 10 covers the basics of sharing folders and files and using Windows' security to control who can get to particular files. Chapter 11 covers the Distributed File System or, as it's been renamed in the past few years, Distributed File System Namespaces (DFS-N), an overlay atop simple file sharing that combines multiple file shares into one unified, easy-to-understand unit for users and that lets you deploy multiple copies of those file shares around your company so that everyone can get local, high-speed access to those shares. Chapter 12 zooms in on the most important DFS/DFS-N-based file share of all, the SYSVOL share that every Active Directory domain controller can't live without; that chapter also covers how to accomplish an essential SYSVOL upgrade, which Server 2008 offers for the first time.

Many servers serve not only files but shared printers as well, and Chapter 13 shows you how to accomplish this with Server 2008/R2. Following that, Chapter 14 shows you how to maintain and control your servers remotely using a number of built-in technologies, including Remote Desktop, a Windows feature that got a lot of upgrades in Windows Server 2008 but that many folks don't know about, so don't miss that chapter. By now, you've got some working servers (which is nice) but no clients to use those services (which makes the whole thing sort of pointless), so Chapter 15 shows you how to hook up the various varieties of Windows created in the past decade to a Windows Server 2008/R2 network. What's that you say? You've got a Mac? OK, then skip ahead to Chapter 26, and you'll get the skinny on getting Our Team to talk with Their Team. (Note that the previous sentence was cleverly crafted so that you can project whatever OS you like onto "our team" and "their team." When I was a kid, I always heard that it's a bad idea to discuss politics and religion, but in the past 15 years or so it seems that both of those topics are far safer than the "PC or Mac?" question.)

Chapter 16 gets you up and running with one of Windows' most complex Server add-ons, Microsoft's Internet Information Services (IIS), better known as the web server. You'll learn how to get IIS running, how to set up a simple website, and how to find your way around the all-new IIS management tools built into Server 2008/R2. By now, you'll have a lot of time invested in getting your server up and running, so you'll be ready for Chapters 17 and 18—monitoring your system's

performance and backing it up. If you've ever worked with a pre-2008 version of Windows Server, then get ready, because everything that you thought you knew is unfortunately wrong. (Fortunately, however, Chapter 18 will remedy that.)

Chapter 19 discusses how a Server 2008/R2 system can facilitate IP routing, which may sound like an odd topic until you consider that you need to understand a bit of IP-routing-on-a-Windows-Server before you can tackle Chapter 20, which shows you how to use your Server 2008/R2 system to set up a virtual private network. Hey, why spend money for a VPN appliance when you've already got a working server that can do it for you? (Well, there are several possible reasons, but we'll cover those in that chapter.)

Now it's time to return to Active Directory and take on some more advanced AD topics with four chapters. Chapter 21 shows you how to add multilocation awareness to your AD with a look at sites, site links, and subnets, AD-style. And if you've got multiple sites, then you may have some sites that you might be a bit uneasy about installing a domain controller into—which is why Server 2008 introduced the idea of read-only domain controllers (RODCs); learn about them in Chapter 22. After that, it's time to consider when you'd need to complicate your AD a bit by adding one, two, or a hundred more domains to it, in Chapter 23. Mergers, acquisitions, or just plain old reorganizations may require you to reshape your AD in a manner that's not all that easy, unless you learn about domain migrations, SID histories, and trust relationships—as you will in Chapter 24.

Back in Chapter 14, we considered how Windows Terminal Services let us easily control a server from hundreds of miles away, but Terminal Services—which R2 renames as Remote Desktop Services—can do a lot more than that. Chapter 25 delves more deeply into how Terminal Ser...oops, sorry, let's try it again...Remote Desktop Services lets you easily roll out applications across your network.

For our last few chapters, we cover several mildly advanced topics. Chapter 27 shows you how to set up and manage Windows Server Update Services (WSUS) on one of your services. WSUS handles one of those annoying but necessary jobs: keeping your systems patched. Chapter 28 helps you get started with a subsystem that was *supposed* to ship with Server 2008 but that instead makes you install it separately; I thought was important enough that the book needed a chapter on it: Windows SharePoint Services. Why learn SharePoint? Well, there are lots of reasons, but here's the unexpected one for many people: it's a web server that does many of the things that a file server does, and Microsoft has made very clear that it's the way it's going to go in the future when it comes to delivering file services.

You've already read that Hyper-V is a pretty big thing in Windows Server 2008 and R2, so we can't call the book complete without a chapter on that topic—and we've got a very comprehensive one on it for you, Chapter 29. Even if you don't do virtualization, give this a look, because it'll help you understand the technology and issues in server virtualization, which is a must-know field. Finally, in Chapter 30, we'll return to user management, expanding our earlier discussion of user management that we began in Chapter 7 into more advanced topics.

Stay Up-to-Date with My Free Newsletter

My coauthors and I have tried to cover as many of 2008 R2's good points and bad points, but we learn more as time goes on, and it'd be a shame for you to miss out on any of my additions to this volume. For the past decade, I've regularly put together a series of technical newsletters with tips I've recently learned, problems I've solved, and in-depth articles on things that somehow didn't