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William R. Stanek, James O'Neill, and Jeffrey Rosen

Microsoft® PowerShell, VBScript, and JScript

Bible

Tap the power of automation with scripts

Master three scripting tools with this one guide

Script in Windows and revolutionize your job

The book you need to succeed!

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Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

About the Authors

William R. Stanek (http://www.williamstanek.com/) has over 20 years of hands-on experience with advanced programming and development. He is a leading technology expert, an award-winning author, and a pretty-darn-good instructional trainer. Over the years, his practical advice has helped millions of technical professionals all over the world. He has written more than 75 books, including *Microsoft Exchange Server 2007 Administrator's Pocket Consultant*, *Microsoft Windows Vista Administrator's Pocket Consultant*, *Microsoft Windows Server 2008 Administrator's Pocket Consultant,* and *Windows Server 2008 Inside Out*.

Mr. Stanek has been involved in the commercial Internet community since 1991. His core business and technology experience comes from over 11 years of military service. He has substantial experience in developing server technology, encryption, and Internet solutions. He has written many technical white papers and training courses on a wide variety of topics. He frequently serves as a subject matter expert and consultant.

Mr. Stanek has an MS with distinction in information systems and a BS magna cum laude in computer science. He is proud to have served in the Persian Gulf War as a combat crewmember on an electronic warfare aircraft. He flew on numerous combat missions into Iraq and was awarded nine medals for his wartime service, including one of the United States of America's highest flying honors, the Air Force Distinguished Flying Cross. Currently, he resides in the Pacific Northwest with his wife and children.

James O'Neill was born in 1965, used his first Microsoft product at the age of 13, and has scarcely stopped since. He describes himself as a compulsive explainer, which led him to work as a technical trainer and run a small training

company in the 1990s. He joined Microsoft Consulting Services in 2000, and after six years there working with a wide variety of clients he moved back to a role where he can explain more, becoming an evangelist, talking to IT professionals primarily about Windows platform technologies. He is a veteran of every Microsoft operating system and network technology since DOS 3.1 MS-Net and Windows 1.03, and has used a dozen or so programming and scripting languages. Over the last two years, he has become increasingly evangelical about PowerShell, using it to write libraries that support Windows 2008 virtualization and Office Communications Server. He lives near Oxford, England with his wife and two children, and occasionally manages to find time for photography and scuba diving. He has a worrying tendency to write about himself in the third person.

Jeffrey Rosen has a Masters of Business Administration from Case Western Reserve, Weatherhead School of Management, specializing in Information Systems. He is a Microsoft Certified Architect, an MCSE specializing in messaging and security, and a CISSP. He began his career working with Microsoft Mail and Novell Netware. Since then, Jeffrey has worked for Microsoft Consulting Services for nine years on large and complex Exchange deployments. He is a co-author of *Professional PowerShell for Exchange 2007 SP1.*

About the Technical Editor

Andrew Edney has been an IT professional for more than 12 years and has, over the course of his career, worked for a range of high-tech companies, such as Microsoft, Hewlett-Packard, and Fujitsu Services. He has a wide range of experience in virtually all aspects of Microsoft's computing solutions, having designed and architected large enterprise solutions for government and private-sector customers. Over the years, Andrew has made a number of guest appearances at major industry events, presenting on a wide range of information systems subjects, such as an appearance at the annual Microsoft Exchange Conference in Nice where he addressed the Microsoft technical community on mobility computing. Andrew is currently involved in numerous Microsoft beta programs, including next-generation Windows operating systems and next-generation Microsoft Office products. He actively participates in all Windows Media Center beta programs and was heavily involved in the Windows Home Server beta program. In addition, Andrew has written a number of books including: *Windows Home Server User's Guide* (2007), *Pro LCS: Live Communications Server Administration* (2007), *Getting More from Your Microsoft Xbox 360* (2006), *How to Set Up Your Home or Small Business Network* (2006), *Using Microsoft Windows XP Media Center 2005* (2006), *Windows Vista: An Ultimate Guide* (2007), *PowerPoint 2007 in Easy Steps* (2007), *Windows Vista Media Center in Easy Steps* (2007), and *Using Ubuntu Linux* (2007).

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Acknowledgments

Writing *PowerShell, VBScript, and JScript Bible* took a lot of work and research. Much of the time was spent searching for undocumented features, resolving problems with poorly documented interfaces, and exploring uncharted areas of Windows. Then, I had to write about the hidden features and the many interfaces I had discovered. I hope you'll agree that the result was worth all of the effort. The book contains over 300 code examples and dozens of working scripts, all designed to provide a top-notch tutorial and reference.

PowerShell, VBScript, and JScript Bible wouldn't have been possible without a lot of help from others and, especially, the team at Wiley: Katie Mohr, the Acquisitions Editor, and Ed Connor, the Development Editor.

A big thank you goes out to my close contacts and friends at Microsoft. Thanks also to Studio B literary agency and my agents, David Rogelberg and Neil Salkind. Neil has a terrific knack for helping me find projects that are both fun and challenging.

I hope I haven't forgotten anyone, but if I have, it was an oversight. *Honest*. ;-)

William R. Stanek

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and my children, Lisa and Paul. Kids: the book in your hands is one of the reasons why Daddy kept asking you to be quiet.

James O'Neill

To my wife, Christine, and our daughters, Madison and Isabel, I love you, and thanks for always being there for me. Also, thanks to the authors, editors, and other invaluable staff that I've had the pleasure of working with.

Jeffrey Rosen

If you've purchased *PowerShell, VBScript, and JScript Bible* or are thumbing through the book in a bookstore somewhere, you probably want to know how this book can help you. Our goal in writing *PowerShell, VBScript, and JScript Bible* is to create the best resource available on scripting the Windows operating system.

As you'll learn in this book, Windows scripting involves many different technologies. These technologies include:

- Windows operating systems
- Windows Script Host (WSH)
- Scripting languages, such as VBScript and JScript
- Windows PowerShell
- ActiveX and COM (Component Object Model) components
- Microsoft Active Directory
- ADSI (Active Directory Services Interfaces)
- WMI (Windows Management Instrumentation)

We've tried to pack in as much information about these topics as possible, and to present the information in a way that is both clear and concise. We've also tried to present Windows scripting in a unique way, offering both VBScript and JScript solutions throughout the text and then discussing how to accomplish similar tasks using PowerShell. In this way, you can learn exactly how VBScript, JScript, and PowerShell can be used with Windows. With this

approach, you gain insight into unique scripting techniques necessary to implement solutions in VBScript, JScript, and PowerShell, and, if you prefer one technique over the other, there’s no more guesswork.

Introduction

PowerShell, VBScript, and JScript Bible is a work in progress, just like the Windows operating system itself and the body of work that's grown up around it. It is quite likely that errors will make themselves apparent after this book has gone to press and found its way onto your desktop. I very much appreciate the efforts of readers who go to the trouble of pointing out mistakes in the text so I can fix them in future editions. Even more, I am grateful for readers who offer their own hints, tricks, code, and ideas to me for inclusion in future editions of this book.

I truly hope you find that *PowerShell, VBScript and JScript Bible* provides everything you need to perform essential scripting tasks. You can contact me through e-mail at `williamstanek@aol.com`. You're always welcome to write me with ideas, suggestions, improvements, or questions. If you provide an example that's used in a future edition of this book, I'll be especially grateful for your help and will credit you in that edition. I also have a Web site, which contains support material for this book, among other things. Point your browser to www.williamstanek.com/scripting/ for corrections, enhancements, news, and additional thoughts. I'll post the source code from this book as well.

Thank you!

William R. Stanek

The best introduction to a book I ever saw was from Machiavelli's *The Discourses*, where he says something like, "I'm sending you something, and if it doesn't meet the obligations I owe you, is at any rate the best I can send. For in it I have set down all I know from long experience and constant reading…you may perhaps lament my lack of skill

should my narratives be thin and also errors of judgment if I have made mistakes.”

The longer the piece that I write, the more likely I am to think of that. The experience I have in PowerShell builds on decades of seeing different scenarios and using different tools: and that experience has been gained working with people who don’t think of themselves as Programmers. Graphical management tools make it easy to find how to do a one-off task, but some repetitive tasks aren’t efficient with the GUI. Some information can’t be extracted easily from a graphical tool: some tasks just weren’t anticipated by the Programmer who wrote it. UNIX system administrators have known for a long time that there is an area, which isn’t Programming in the customary sense, of creating a large beast, with considerations such as user interface design to be taken into account. It produces something that a dictionary would define as a program—a sequence of instructions to be followed by the computer. A script is a program but not a Program (the capitalization is deliberate). Scripts are written mostly by people who are not Programmers, but just know the job they need to get done. And, usually a script will involve less time to create than a “proper” Program and will pay back the time that went into it very quickly. Want to know which of the servers you manage don’t have a key patch on them—without logging onto each one? It’s a few lines of script; a system administrator can put it together in a couple of minutes. A Programmer (capital P) won’t have fired up Visual Studio and roughed out the user interface in that time.

Better still for the Windows system administrator, most of the work has been done by someone else. Want a list of your servers? A couple of lines of script will get it from Active Directory. Want the installed patches on each of those servers? One line of PowerShell will get that. Most of the knowledge needed isn’t of a programming or scripting

language—whether you use PowerShell, VBScript, or any other environment, it is a question of understanding the task and the objects that you can call on *from* that environment. PowerShell has all of .NET, WMI, AD, and ActiveX/COM at its disposal. It needs a whole bookshelf to explain all of those things, so what we do in this book is to try to equip you, the reader, with the skills you need to use them—which is why I worry that my narratives may be thin.

Who Should Read This Book

If you are someone who is interested in any of the previously mentioned technologies, *PowerShell, VBScript and JScript Bible* is definitely a book you should read. This comes with several caveats. This book is designed for:

- Administrators who support Windows systems
- Developers who create scripts or programs for Windows systems
- Advanced users working with Windows systems

To pack in as much information as possible, We had to assume that you have basic networking skills, a basic understanding of Windows, and that Windows is already installed on your systems. With this in mind, we don’t devote entire chapters to understanding, installing, or using Windows. Beyond the introductory information in Chapters 1, 2, and 3, we don’t cover scripting basics either. We do, however, cover every facet of Windows scripting, so if you want to learn Windows scripting inside and out—including techniques not published elsewhere—you’ve come to the right source.

Although the book highlights the latest and greatest features of Windows Vista and Windows Server 2008, just about everything you learn in this book can also be applied to script Windows XP. Keep in mind that if you are using a

pre–Windows Vista system, however, you may need to check your scripts to ensure they are fully compatible.

How This Book Is Organized

Learn the basics of what goes into Windows and you will be able to use all sorts of devices and computers in the future. The book is organized in a way that enables you to start off at the very beginning with Windows, but still grow to the point where you can get going with some powerful server and programming features, if you care to.

Part I assumes that someone has set up a Windows system in front of you. After being introduced to Windows script in Chapter 1, you learn the basics of how to:

- VBScript Essentials (Chapter 2)
- JScript Essentials (Chapter 3)
- PowerShell Essentials (Chapter 4)

In Part II, you learn how to:

- Creating Scripts and Scripting Files (Chapter 5)
- VBScript and JScript Scripting Basics (Chapter 6)
- Input, Output, and Error Handling with VBScript and JScript (Chapter 7)
- Working with Files and Folders in VBscript and JScript (Chapter 8)
- Reading and Writing Files (Chapter 9)
- Managing Drives and Printers with VBScript and JScript (Chapter 10)
- Configuring Menus, Shortcusts, and Startup Applications (Chapter 11)
- Working with the Windows Registry and Event Logs (Chapter 12)

In Part III, you learn network and directory service scripting:

- Scheduling One-time and Recurring Tasks (Chapter 13)