

Microsoft

Microsoft

Windows 管理员

VBScript

最新应用技巧

**ADVANCED
VBSCRIPT**

for Microsoft®

WINDOWS®

ADMINISTRATORS

**Don Jones
Jeffery Hicks**

China Edition

Published by Shanghai World Publishing Corporation

世界图书出版公司

Advanced VBScript for Microsoft® Windows® Administrators

*Don Jones and
Jeffery Hicks*

图书在版编目(CIP)数据

Microsoft Windows 管理员 VBScript 最新应用技巧:英文/(美)琼斯,(美)希克斯著.
—上海:上海世界图书出版公司,2007.6

ISBN 978-7-5062-8317-5

I. M… II. ①琼…②希… III. BASIC 语言-程序设计-指南-英文 IV. TP312-62

中国版本图书馆 CIP 数据核字(2007)第 082304 号

© 2007 by Microsoft Corporation. All rights reserved.

Original English language edition © 2006 by Don Jones and Jeffery Hicks. All rights reserved. Published by arrangement with the original publisher, Microsoft Corporation, Redmond, Washington, U. S. A.

Microsoft Windows 管理员 VBScript 最新应用技巧

[美]邓·琼斯 杰弗里·希克斯 著

上海世界图书出版公司 重印发行

上海市尚文路 185 号 B 楼

邮政编码 200010

(公司电话:021-63783016 转发行部)

上海市印刷七厂印刷

如发现印装质量问题,请与印刷厂联系

(质检科电话:021-63113060)

各地新华书店经销

开本:787×960 1/16 印张:35 字数:1 008 000

2007 年 6 月第 1 版 2007 年 6 月第 1 次印刷

ISBN 978-7-5062-8317-5 /T·142

图字:09-2007-443 号

定价:238.00 元

<http://www.wpcsh.com>

Acknowledgements

I'd like to thank Jeffery, who has easily been one of the best co-authors anyone could ask for. Writing a book can be exceedingly stressful and time-consuming, and a good co-author can really help alleviate a lot of that. Thanks also go out to everyone at SAPIEN Technologies: Jonathan, Alex, and Ferdinand, who provided assistance with tools and technologies that were ancillary to the book's main purpose, making things much smoother. Finally, a big cheer is due all the users at ScriptingAnswers.com, whose persistence and unwavering support of the scripting community were a primary motivation for bringing this book to market.

Don Jones
Las Vegas, NV

Writing your first book can be a daunting and sometimes frightening task. Fortunately, I had a great writing partner. Thanks, Don, for being such a terrific guide in the strange new world of publishing. Thanks, too, to the people at Visory Group. I truly appreciate the flexibility you give me to take on projects like this one. Finally, I want to say an extra big thank-you to Beth, Lucas, and Ellie. Without the love, support, and understanding of my new family ("Daddy has to work again tonight?"), I would never have made it this far. You're the reason I work so hard.

Jeffery Hicks
Syracuse, NY

Introduction

When writing my first scripting book, *Managing Windows with VBScript and WMI* (Addison-Wesley, 2004), I set out to create what was at the time an industry first: a book designed not for developers but specifically for Microsoft Windows administrators with very little VBScript experience who wanted to learn just enough VBScript to be effective. Since that book was published, Windows administrators have become more and more skilled with Windows Script Host, VBScript, Windows Management Instrumentation, and other related technologies. Because administrators attending conferences and viewing my Web site (<http://www.ScriptingAnswers.com>) are beginning to ask questions about more complex technologies and techniques, the time has come for a book that covers advanced topics.

In this book, my able co-author, Jeffery Hicks, and I try to cover some of the more advanced scripting techniques that we use every day. We certainly aren't pretending that we touch on every topic that might be considered "advanced"; after all, scripting is as varied and complex as Microsoft Windows itself. Instead, we try to cover the most useful advanced technologies, recognizing that our fellow administrators are typically as practical and pragmatic as we are. We also try to cover these technologies in much the same way that we learned about them, by presenting complete solutions and line-by-line walkthroughs, so that you can see the final product as well as a detailed description of how and why it works.

Personally, I'm delighted that Windows is now such a mature, stable product that we have the time and tools to explore automation through scripting. I'm also glad that more administrators are tackling advanced topics, which tells me that Windows has truly become an enterprise operating system, with the level of complexity and scriptability often associated with traditional enterprise-class operating systems such as UNIX.

Jeffery and I both appreciate that you've selected this book for your further scripting education. We certainly hope you find it useful! That said, we want to offer a brief word of caution: This is truly an advanced book. We don't take the time to explain basic scripting concepts, and we assume that you already have medium- to high-level scripting skills. We do cover a few basics at the beginning of the book, but only to provide a quick refresher of techniques you might not use every day.

With that caveat out of the way, I want to wish you the best of luck with your scripting efforts!

Don Jones

Who Is This Book For?

This book is intended for Microsoft Windows administrators who want to take their scripting to the next level. We're assuming readers have intermediate to advanced scripting skills and are looking for new techniques and ideas to expand their scripting toolbox. This book is also for scripting administrators who want to expand their realm into products such as Microsoft Exchange 2003 and Microsoft Virtual Server 2005. If you've never worked with VBScript before, then this book definitely isn't for you. We're not spending much time on the basics, and you'll certainly need those basics to understand what we're covering here. If you'd like a more introductory-level book, consider Don Jones' *Managing Windows with VBScript and WMI* (Addison-Wesley, 2004) or a similar title.

Conventions in This Book

This book is relatively straightforward, and there are no tricky conventions that readers need to be aware of. However, the following reader alerts are used throughout the book to point out useful information:

Reader Alert	Meaning
Tip	Provides a helpful bit of inside information about specific tasks or functions
Note	Alerts you to supplementary information
Caution	Contains important information about possible data loss, breaches of security, or other serious problems
On the CD	Identifies tools or additional information available on the CD that accompanies the book
Best Practice	Identifies techniques or conventions that are recognized as industry standards; while not following these practices won't break anything, they can make things easier and more efficient.

System Requirements

To use the *Advanced VBScript for Microsoft Windows Administrators* companion CD, you'll need a computer equipped with the following configuration:

- Pentium II (or similar) with 266-megahertz (MHz) or higher processor.
- CD-ROM or DVD-ROM drive.
- Microsoft Mouse or compatible pointing device.
- Microsoft Windows Server 2003, Microsoft Windows 2000, or Microsoft Windows XP. We assume you've installed the latest service packs, although in most cases we don't cover information specific to a given service pack (and when we do, we mention it).
- Windows Script Host (WSH) version 5.6 or later. WSH is a core component of Windows 2000 and later versions, so unless you've taken special steps to remove this software, it should already be installed.

- Some scripts—notably the ones dealing with Microsoft Exchange Server 2003, Microsoft Virtual Server 2005, or Microsoft Operations Manager 2005—require additional Microsoft products, as appropriate.
- Microsoft Internet Explorer 5.5 or later.
- Adobe Acrobat or Acrobat Reader.

About the Companion CD

To provide you with quick and easy access to the tools you need to get the most out of this book, we've included the following on the companion CD:

- The scripts presented in the book.
- Links to any of the URLs we mention that are too long to type easily.
- A number of additional tools (or links to them).

Do take a few moments to explore the CD and all it contains. If you'd like to pursue scripting beyond the topics included in this book, we invite you to visit Don's Web site at <http://www.ScriptingAnswers.com>. You'll find additional script samples, training, discussion forums for questions and answers, and more resources, all designed for Windows administrative scripting.

Support for This Book

Every effort has been made to ensure the accuracy of this book and the contents of the companion CD. Microsoft Press provides general support information for its books and companion CDs at the following Web site:

<http://www.microsoft.com/learning/support/books>

To search for book and CD corrections for this book by using the book's ISBN, go to

<http://www.microsoft.com/mspress/support/search.asp>

If you have comments, questions, or ideas regarding this book or the companion CD, please send them to Microsoft Press using either of the following methods:

E-Mail: mspinput@microsoft.com

Postal Mail:

Microsoft Press

Attn: *Advanced VBScript for Microsoft Windows Administrators* project editor

One Microsoft Way

Redmond, WA 98052

Please note that Microsoft software product support is not offered through the above addresses.

You are welcome to contact the authors at <http://www.ScriptingAnswers.com> to ask questions or discuss problems that you might have regarding the scripts included on the CD that accompanies this book.

Contents at a Glance

Part I The Basics of Advanced Windows Scripting

- 1 Getting Started.....3
- 2 Script Security..... 41

Part II Packaging Your Scripts

- 3 Windows Script Files 57
- 4 Windows Script Components..... 95
- 5 HTML Applications: Scripts with a User Interface..... 125

Part III The Basics of Advanced Windows Scripting

- 6 Remote Scripting 161
- 7 Database Scripting..... 179
- 8 Advanced ADSI and LDAP Scripting 207
- 9 Using ADO and ADSI Together 245
- 10 Advanced WMI Scripting 261
- 11 WMI Events..... 285
- 12 Better Scripting with WMI Tools 319
- 13 Advanced Scripting in Windows XP and Windows Server 2003..... 353

Part IV Scripting for the Enterprise

- 14 Group Policy Management Scripting 393
- 15 Exchange 2003 Scripting..... 425
- 16 Microsoft Operations Manager 2005 Scripting..... 463
- 17 Virtual Server 2005 Scripting..... 483

Part V Appendix

- Advanced Script Editor Features 505

Table of Contents

Acknowledgements	xiii
Introduction	xv

Part I The Basics of Advanced Windows Scripting

1	Getting Started.....	3
	Prerequisite Knowledge.....	3
	Understanding Windows Script Host Basics.....	4
	Using the <i>FileSystemObject</i> Library	15
	Understanding Arrays	22
	Understanding Active Directory Services Interface Fundamentals	24
	Understanding Windows Management Instrumentation Fundamentals	29
	Advanced Scripting Goals	34
	Securing Your Scripts	34
	Creating Your Own Script Components and Libraries	34
	Running Scripts Remotely	35
	Retrieving Information from Active Directory	35
	Manipulating Information Stored in a Database.....	35
	Managing Your Windows Environment with WMI Events	35
	Using New WMI Classes with Windows XP and Windows Server 2003	35
	Managing Group Policy Objects with Scripting.....	35
	Managing Your Exchange 2003 Environment	36
	Incorporating Your Scripts into Microsoft Operations Manager	36
	Creating a Visual Interface for Your Script with Internet Explorer and	36
	HTML Applications (HTAs)	
	What We Won't Cover	36
	Finding Information about JScript, Perl, Python, and KiXtart	37
	The Right Tool for the Job.....	38
	Scripting Techniques	39
	Summary	39
2	Script Security.....	41
	Script Encoding and Decoding.....	41

Script Signing and the Windows Script Host TrustPolicy	43
Understanding Digital Certificates and Script Signing	43
Understanding WSH TrustPolicy	46
Configuring WSH TrustPolicy in Your Environment	47
Signing Scripts by Using a Digital Certificate	49
Using Software Restriction Policies	52
Alternate Credentials	52
Using the <i>RunAs</i> Command	52
Using Scheduled Tasks Credentials	53
Using ADSI Alternate Credentials	53
Using WMI Alternate Credentials	54
Summary	54

Part II **Packaging Your Scripts**

3 Windows Script Files	57
Defining Windows Script Files	57
Understanding XML	58
The <i>package</i> Tag	59
The <i>comment</i> Tag	59
The <i>job</i> Tag	59
The <i>runtime</i> Tag	60
The <i>description</i> Tag	60
The <i>example</i> Tag	60
The <i>named</i> Tag	61
The <i>object</i> Tag	61
The <i>script</i> Tag	62
Creating Script Jobs	63
Including Other Scripts	63
Adding Resources	63
Creating Examples and Help Text	64
Using Named Parameters	65
The <i>name</i> Property	65
The <i>helpstring</i> Property	65
The <i>type</i> Property	66
The <i>required</i> Property	66
Viewing a Windows Script File in Action	67

Converting an Existing Script to a WSF Utility	72
Creating and Using a Wrapper WSF	83
Summary	94
4 Windows Script Components.....	95
Understanding COM Objects, Methods, and Properties	95
Understanding Windows Script Components	96
Using the Script Component Wizard.....	101
Working with Properties	105
Working with Methods	107
Working with Events	108
Creating a Windows Script Component with a Script Editor.....	112
Viewing a Windows Script Component in Action	120
Summary	124
5 HTML Applications: Scripts with a User Interface.....	125
Understanding HTML Applications	125
Understanding the Internet Explorer Document Object Model	129
Understanding the HTML Document Hierarchy	130
Understanding HTML Events	131
Putting the DOM to Work	132
Preparing Your HTA	133
Using a Script Rather than an HTA	133
Getting the Script Ready for an HTA.....	138
Understanding HTA Requirements and Essentials.....	140
Using HTA Tags	141
Sizing an HTA	143
Using <div> and Tags.....	144
Using Inline Frames	145
Working with Forms and Fields	147
Populating a List Box	148
Creating Buttons.....	149
Connecting a Button to a Script	149
Using Check Boxes and Radio Buttons	150
Adding Graphics.....	151
Adding Subroutines and Functions.....	151
Viewing HTAs in Action	152
Summary	157

Part III The Basics of Advanced Windows Scripting

6	Remote Scripting	161
	Understanding Remote Scripting and Security	162
	Connectivity	162
	Identity	165
	Permissions	165
	Context	167
	Working with Windows Firewall	170
	Understanding Remote Scripting Objects	171
	Understanding Remote Scripting Methods	172
	Viewing Remote Scripting in Action	175
	Summary	177
7	Database Scripting	179
	Understanding ActiveX Data Objects	179
	Understanding <i>Connection</i> Objects	181
	ODBC DSN Connections	182
	Connection Strings	184
	Understanding <i>Recordset</i> Objects	185
	Forward-Only Recordsets	186
	Other Types of Recordsets	187
	Recordset Tips and Tricks	189
	Understanding <i>Command</i> Objects	191
	Understanding the Differences Between Databases	195
	Text Files	195
	Excel Workbooks	195
	Access Databases	196
	SQL Server Databases	196
	Understanding SQL	197
	Queries that Return Results	197
	Queries that Make Changes	200
	Viewing ActiveX Data Objects	202
	Summary	206
8	Advanced ADSI and LDAP Scripting	207
	Using the ADSI Scriptomatic	207
	Connecting to a Domain	209

	Creating Objects	210
	Retrieving Object Information	211
	Using Other ADSI Tools	217
	Using the ADSI Software Development Kit	217
	Using the PrimalScript Professional ADSI Wizard	225
	Writing Active Directory Queries	226
	Using Search Filters	227
	Using Data Return Limits	227
	Scripting the WinNT Provider	230
	Scripting Active Directory Security	240
	Summary	243
9	Using ADO and ADSI Together	245
	Understanding the ADSI Provider for ADO	246
	Connecting to ADSI by Using ADO	247
	Treating Active Directory as a Database	248
	Writing ADSI Queries to Retrieve Information	251
	Writing ADSI Queries to Make Changes	254
	Viewing ADO and ADSI in Action	256
	Summary	260
10	Advanced WMI Scripting	261
	Understanding Advanced WQL	262
	Selecting Specific Properties	262
	Including a <i>WHERE</i> Clause	263
	Using the <i>LIKE</i> Operator	265
	Using Queries and <i>associator</i> Classes	267
	Understanding Associations	267
	Writing Association Queries	268
	Using Reference Queries	273
	Using Advanced WMI Security Techniques	273
	Using the <i>AuthenticationLevel</i> Property	274
	Using the <i>ImpersonationLevel</i> Property	274
	Using the <i>Privileges</i> Property	275
	Viewing Advanced WMI Scripting in Action	276
	Summary	283
11	WMI Events	285
	Understanding WMI Events	285

Understanding Consumers.....	286
Understanding Notification Queries.....	286
Understanding Filters.....	287
Understanding Polling.....	287
Using Notification Queries.....	288
Using WBEMTest.....	288
Executing a Notification Query Semisynchronously.....	291
Executing a Notification Query Asynchronously.....	294
Using Event Sinks.....	294
Using WMI Tools.....	300
Using WMI Event Registration.....	300
Using WMI Event Viewer.....	305
Viewing WMI Events in Action.....	308
Summary.....	317
12 Better Scripting with WMI Tools.....	319
Using Tools as a Scripting Shortcut.....	319
Using Scriptomatic.....	320
Listing Classes and Namespaces.....	320
Generating Scripts.....	324
Saving Scripts.....	325
Using WMIC.....	325
Connecting to Namespaces.....	326
Using Aliases.....	326
Connecting to Remote Systems.....	332
Passing Credentials.....	332
Making Queries with <i>list</i> and <i>get</i>	333
Formatting Output.....	334
Scripting with WMIC.....	337
Enumerating Instances.....	343
Using WBEMTest.....	341
Connecting to a Namespace.....	341
Using WMI Tools.....	343
Using CIM Studio.....	343
Using WMI Object Browser.....	347
Comparing WMI Wizards.....	349
Summary.....	351

13	Advanced Scripting in Windows XP and Windows Server 2003.	353
	Using New and Discontinued WMI Classes	355
	Using the Win32_PingStatus Class.	356
	Configuring the Windows Firewall.	359
	Using Disk Quota Management.	364
	Using the DNS Provider.	365
	Using Active Directory Replication and Trusts.	371
	Using Internet Information Services 6.0	374
	Managing Printing	381
	Using Windows Update Services	385
	Summary	389
Part IV	Scripting for the Enterprise	
14	Group Policy Management Scripting	393
	Introducing Group Policy Management Scripting	394
	Group Policy Management Scripting Requirements.	394
	Group Policy Management Console Object Model	394
	Scripting GPO Permissions	407
	Scripting GPO Reports.	411
	Scripting GPO Backups	412
	Scripting GPO Restores	412
	Scripting Resultant Set of Policy.	413
	Viewing GPO Scripting in Action.	414
	Summary	423
15	Exchange 2003 Scripting.	425
	Introducing Exchange Scripting.	425
	Querying Active Directory	426
	Understanding Exchange 2003 WMI Classes.	432
	Scripting the Exchange Server State Class	435
	Scripting Exchange Storage Groups	436
	Scripting Exchange Mailboxes	441
	Viewing Exchange Server Scripting in Action	454
	Summary	462
16	Microsoft Operations Manager 2005 Scripting.	463
	Introducing MOM Scripting	464
	Adding Scripts.	466

	Defining Script Parameters.	467
	Using Run Time Scripting Objects.	468
	Understanding Script Tracing and Debugging.	473
	Using Scripts in MOM.	473
	Using Response Scripts.	473
	Using Timed Scripts.	474
	Using State Variable Scripts.	474
	Using Discovery Scripts.	476
	Customizing MOM Scripts.	478
	Viewing MOM Scripting in Action.	479
	Summary.	482
17	Virtual Server 2005 Scripting.	483
	Introducing Virtual Server Scripting.	484
	Understanding the Virtual Server Object Model.	486
	Writing Provisioning Scripts.	488
	Writing Management Scripts.	490
	Obtaining Object References.	491
	Managing Multiple-Virtual-Machines Templates.	491
	Performing Virtual Machine Tasks.	492
	Performing Virtual Disk Tasks.	496
	Performing Guest OS Tasks.	497
	Performing Mouse and Keyboard Tasks.	498
	Viewing Virtual Server Scripting in Action.	498
	Summary.	501
Part V	Appendix	
	Advanced Script Editor Features.	505
	Index.	521