

Contents

Acknowledgments	xxiii
Introduction	xxv
Part I: PowerShell for Exchange Fundamentals	1
Chapter 1: Getting Started with Windows PowerShell	3
<hr/>	
What Is Windows PowerShell?	3
Shell History	4
When Shells Are Better than GUI Interfaces	4
Common Shell Limitations	5
The Power Behind PowerShell	5
PowerShell Basics	6
The Command-Line Interface	6
Cmdlets	8
Discovering Commands and Getting Help	15
Using Pipelines	23
Running Scripts	29
Preparing Exchange Management Shell	30
Summary	31
Chapter 2: Using Exchange Management Shell	33
<hr/>	
Why Learn Exchange Management Shell?	34
Shell versus Console	34
Direct Comparison	34
Exchange Management Console	37
Exchange Cmdlet Sets	38
Working from the Command Line	41
Getting Around	41
Windows PowerShell Drives	43
Working with Output	45
Using Variables, Aliases, and Functions	48
Using Profiles	52

Contents

Working with Windows	54
Controlling Processes	54
Controlling Services	55
Working with Windows Registry	57
Working with Event Logs	60
Summary	64
Chapter 3: Using PowerShell to Deploy Exchange Server 2007	65
Deploying Exchange Server 2007	66
Hardware Requirements	66
Software Requirements	68
Domain Requirements	69
Domain Preparation	70
Server Installation	72
/mode or /m	72
/roles or /r	72
/OrganizationName or /on	73
/TargetDir or /t	73
/SourceDir or /s	73
/UpdatesDir or /u	73
/DomainController or /dc	74
/AnswerFile or /af	74
/DoNotStartTransport	74
/EnableLegacyOutlook	74
/LegacyRoutingServer	74
/EnableErrorReporting	74
/NoSelfSignedCertificate	74
/AdamLdapPort	75
/AdamSslPort	75
/AddUmLanguagePack	75
/RemoveUmLanguagePack	76
Additional Setup Switches Available for Clustered Installs	76
Disaster Recovery	76
Deployment Scenarios	77
Single Server Deployment	78
Standard Deployment	78
Complex Deployments	80
Summary	81

Chapter 4: Working with User and Group Objects	83
Working with Recipients	84
Recipient Scope in the Exchange Management Shell	84
User and Group Object Types	86
Get-Recipient	87
Get-Mailbox	88
Get-MailContact	89
Get-Group	90
Get-DistributionGroup	91
Get-DynamicDistributionGroup	92
Exchange Server 2007 Recipient Objects	96
Exchange Server 2007 Group Objects	102
Mail-Enabled Universal Distribution Groups	102
Mail-Enabled Universal Security Groups	102
Mail-Enabled Nonuniversal Groups	103
Dynamic Distribution Groups	103
Creating and Modifying User Objects	105
New-Mailbox	106
Set-Mailbox	107
Enable-Mailbox	108
Remove-Mailbox	109
Set-CASMailbox	110
Export-Mailbox	111
Import-Mailbox	112
Creating a User Mailbox	113
Modifying a User Mailbox	119
Creating a Resource Mailbox	122
Modifying a Resource Mailbox	123
Creating a Mail User and Mail Contact	126
Modifying a Mail User and Mail Contact	127
Creating and Modifying Group Objects	128
The Dynamic Distribution Group	129
Bulk Recipient Management	130
Bulk Creating Mailboxes	131
Working with Templates	133
Bulk-Enabling Existing Users	135
Bulk Modifying Mailbox Attributes	136
Bulk Reconnect Mailboxes	136
Summary	137

Chapter 5: Public Folders	139
Database Administration	140
Installing Public Folders	140
Creating a Public Folder Database	140
Get/Set Public Folder Database Information	142
Removing a Public Folder Database	144
Working with Permissions	144
Client Folder Permissions	145
Client Folder Permissions Scripts	146
Administrative Folder Permissions	146
Top-Level Folders	148
Folder and Content Administration	149
Working with Folders	150
Creating and Removing Folders	150
Removing Public Folders	152
Summary	160
Part II: Working with Server Roles	161
Chapter 6: Configuring the Client Access Server Role	163
User Settings	164
Disabling Outlook Modes	165
Disabling Outlook Versions	166
Enabling POP3/IMAP4	167
Certificates	170
Certificate Types	171
Generating the Certificate	172
Obtaining the Certificate	174
Importing the Certificate	175
Enabling the Certificate	176
Copy the Certificate	176
Autodiscover	177
Proxy and Redirection	181
Outlook Anywhere	183
Working with the Offline Address Book	184
Creating the Offline Address Book	184
Address Book Generation	186
LinkAccess	186
Summary	189

Chapter 7: Configuring the Hub Transport Role	191
The Transport Server Architecture	192
Configuring the Hub Transport Server	197
Creating and Modifying Connectors	201
New-ReceiveConnector	202
New-SendConnector	203
Configuring Receive Connectors	203
Setting Relay Restrictions and Submit Permissions	206
Configuring Send Connectors	208
Setting Send Connector Permissions and Authentication	210
Linking Connectors	210
Configuring a Routing Group Connector	212
Configuring Foreign Connectors	212
Understanding Accepted Domains and Email Address Policies	213
Accepted Domains	214
Email Address Policies	214
Summary	214
Chapter 8: Configuring the Mailbox Server Role	217
Storage Groups	217
Creating Storage Groups	218
Moving Storage Groups	218
Removing Storage Groups	219
Mailbox Stores	219
Creating Databases	219
Configuring Databases	220
Removing Databases	222
Managing Mailboxes	222
Recovery Storage Groups	225
Create the RSG	226
Create the RSG Database	227
Restore the Database	227
Mount the Database	228
Restore Mail	228
Public Folders	231
Summary	233

Chapter 9: Configuring the Edge Transport Server Role	235
Overview of the Edge Transport Server Role	237
Message Categorization	238
Active Directory Application Mode	238
Edge Subscription and Synchronization	239
Features Introduced in Exchange Server 2007 SP1	240
Edge Transport Server Configuration	241
New-EdgeSubscription	242
Remove-EdgeSubscription	243
Start-EdgeSynchronization	243
Test-EdgeSynchronization	244
Preparing the Edge Transport Server	245
Preparing the Hub Transport Server	253
Verifying Configuration	257
Edge Cloning	263
Transport Agents	263
Get-TransportAgent	264
Set-TransportAgent	264
Enable-TransportAgent	264
Address Rewrite Agent	266
Edge Rules Agent	266
Anti-Spam Agents	266
Summary	271
Chapter 10: Unified Messaging	273
Creating UMDialPlan, UMIPGateway, and UMMailboxPolicy, and Setting up the UM Server	275
Setting UM Features using the Set-UM Cmdlets	278
Setting the UM Dial Plan	278
Setting the UM IP Gateway	281
Setting the UM Mailbox Policy	282
Retrieving UM Information using the Get-UM Cmdlets	284
UM User Management	286
AutoAttendants	288
Removing and Disabling UM Features	291
Summary	293

Part III: Working with PowerShell in a Production Environment	395
Chapter 11: Exchange Server 2007 Routing	297
Routing Changes in Exchange	298
Basics of Exchange Server 2007 Routing	299
Active Directory Site-Based Routing	300
Active Directory Sites	300
Route Selection Process	301
Next Hop Selection Process	302
Routing Troubleshooting	308
Common Errors	308
Routing Log Viewer	309
Message Tracking	310
Working with Active Directory Sites	313
Determining Site Membership	313
Dedicated Exchange Sites	314
Site Links	314
Working with Hub Sites	316
Coexistence with Exchange 2003	317
Link State Considerations	318
Link State Islands	319
Coexistence Routing	322
Summary	325
Chapter 12: Working with Continuous Replication	327
Understanding Continuous Replication	328
Clustered Continuous Replication	329
Local Continuous Replication	330
Standby Continuous Replication	332
Installing LCR, CCR, SCR	334
Installing Local Continuous Replication (LCR)	334
Installing Clustering Continuous Replication (CCR)	336
Seeding	346
Monitoring	349
Failover Types	353
Failover in Local Cluster Replication	353
Failover in Continuous Cluster Replication	354
Failover in Standby Continuous Replication	357

Contents

Failback	359
Failback in Local Continuous Replication	359
Failback in Cluster Continuous Replication	360
Failback in Standby Continuous Replication	360
Summary	361
Chapter 13: Single Copy Cluster	363
Automating an MSCS Install	364
Hardware Requirements	364
Software Requirements	364
Microsoft Server Cluster Installation	365
Installing Exchange on an SCC Cluster	380
Resource Management	383
Putting It All Together	385
Summary	388
Chapter 14: Troubleshooting Exchange Issues	389
Determining Server Health	390
Determining Exchange System Health	393
Testing the Anti-Spam Functions	395
Test-IPAllowListProvider	395
Test-IPBlockListProvider	396
Test-SenderID	397
Troubleshooting the Client Access Server Role Functions	399
Test-OutlookWebServices	399
Test-ActiveSyncConnectivity	400
Test-OwaConnectivity	402
Testing the Web Services with Test-WebServicesConnectivity	404
Troubleshooting the Mailbox Server Role Functions	405
Troubleshooting MAPI Connectivity	405
Testing Mailflow	406
Testing the Exchange Search Service	408
Troubleshooting Edge Synchronization	409
Troubleshooting Unified Messaging Connectivity	410
Using Get and Set Cmdlets to Gather System and Application Data	411
Using Get-Eventlog	412
Using Get-Message	414
Tracking Messages	417
Working with Event Logging Levels	420
Summary	422

Part IV: Automating Administration	423
Chapter 15: User, Group, and Public Folder Administration	425
Sample Scripts for Creating New Mailbox-Enabled Users	425
The Simple Script	426
The Improved Script	432
Adding Group Assignments for the New Users	443
Load Balancing User Creation Across Mailbox Servers	449
Creating a Public Folder for the New Users	454
Examining the newuser-publicfolder.ps1 Script	457
Running the newuser-publicfolder.ps1 Script	462
Summary	464
Chapter 16: Reporting, Maintenance, and Administration	465
Reading in Files	465
Exporting Data	468
Sending Email from PowerShell	469
Real-World PowerShell Examples	469
Applying Default Settings	469
Reporting Tasks with PowerShell	471
Reporting Mailbox Size	475
Simple Monitoring with PowerShell	483
Summary	484
Chapter 17: Using the .NET Framework to Automate Exchange PowerShell Tasks	485
Accessing PowerShell from the .NET Framework	485
Starting a Web Project	486
The Windows PowerShell Runspace	487
Solving Problems with PowerShell and the .NET Framework	495
Summary	496
Index	497
