

Index

Symbols and Numbers

- # (pound), for adding comments to profiles, 53
- \$ (dollar sign), in variable syntax, 48
- * (asterisk), for wildcards, 11–12
- .. (double period), for parent of current location, 42
- { } (curly brackets), in function definition, 50
- | (pipeline operator). See pipelines
- : (colon), in drive syntax, 44
- (dash or hyphen), in parameter syntax, 10
- . (period), for current location, 42
- ? pseudo parameter, for help information, 19
- 32-bit processing**
 - Exchange hardware requirements, 66
 - Exchange software requirements, 68
- 64-bit processing**
 - Exchange hardware requirements, 66
 - Exchange software requirements, 68

A

- AA (AutoAttendants), in UM, 288–290**
- about_**, for getting help, 21
- accepted domains**
 - Edge Transport, 250
 - Hub Transport configuration, 255
 - Hub Transport policies, 214
- access rights, public folders, 146**
- Active Directory. See AD (Active Directory)**
- Active Directory Application Mode. See ADAM (Active Directory Application Mode)**
- Active Directory Lightweight Directory Services (AD LDS), 240**
- active/passive configuration, of mailboxes, 363. See also clustering; continous replication**

ActiveSync. See EAS (Exchange ActiveSync)

AD (Active Directory)

- CMS AD object created for CCR, 343–344
- domain preparation and, 71
- object properties, 165
- site-based routing, 300–301

AD LDS (Active Directory Lightweight Directory Services), 240

AD sites

- dedicated Exchange sites, 314
- defined, 300
- Exchange domain requirements and, 70
- Exchange uses for site membership, 300–301
- as hub sites, 316–317
- membership, 313–314
- routing based on, 212–213, 300–301
- site link costs, 314–316

ADAM (Active Directory Application Mode)

- Edge Transport server and, 237, 238
- Setup.com, 75

/AdamLdapPort, Setup.com, 75

/AdamSslPort, Setup.com, 75

Add-ADPermission cmdlet, 160

Add-DistributionGroupMember cmdlet, 129, 447

Add-PublicFolderAdministrative-Permission cmdlet, 147–148

Add-PublicFolderClientPermission cmdlet, 146, 148, 462

AddReplicaToPFRecursive.ps1, 158

Address Rewrite agent, Edge Transport server, 266

/AddUmLanguagePack, Setup.com, 75

administration, public folders and, 149–150
administrative permissions, public folders, 146–148

administrative scripts, 425–464

- applying default settings (standards), 469
- exporting data, 468–469

administrative scripts (continued)

- getting database file size, 480–482
- group assignments for new users. See user accounts, group assignments
- load balancing user accounts across mailbox servers. See user accounts, load balancing across mailbox servers
- mailbox-enabled user accounts. See mailbox-enabled user accounts
- overview of, 425
- public folder creation. See public folders, for new users
- reading in files, 465–467
- reporting mailbox size, 475–480
- reporting online defragmentation and backups, 471–475
- sending e-mail, 469
- simple monitoring, 483–484
- summary, 484

\$AdminSessionADSettings variable, 85–86

ADSI Edit

- granting access to top-level folders, 149
- viewing AD object properties, 165

/af, Setup.com, 74

Agent-generated messages, Microsoft Exchange Recipient, 101

aliases

- cmdlets for, 23
- definitions, 49–50
- fl alias for Format-List, 47
- PowerShell navigation and, 41–42
- UM accounts and, 277
- viewing list of, 49

All Users profile, 52

and operator, in multiple test conditions, 25

/AnswerFile, Setup.com, 74

Anti-Spam agent, Edge Transport server, 266–267. See also spam prevention

application data, cmdlets for gathering, 411

ASP.NET web application project, 486–487

authentication, send connectors, 210

AutoAttendants (AA), in UM, 288–290

Autodiscover

- CAS (Client Access Server), 177–180
- functions of, 399
- Outlook 2007 profiles created with, 163

automatic completion, for command entry, 21–23

automatic variables, 49

automation, benefits of Exchange Management Shell, 34

AutoSize parameter, Format-List, 47

Availability Service, CAS providing, 163

B

back pressure feature, Hub Transport, 199–200

backoff routines, in Exchange Server 2007 routing, 305–307

bandwidth, fan-out in routing and, 307–308

Booleans (true or false), 10

bridgehead servers, Exchange Server 2000/2003, 191

bulk operations

- benefits of Exchange Management Shell vs. Console, 34

- creating mailboxes, 131–132

- enabling existing users, 135–136

- modification of mailbox attributes, 136

- overview of, 130

- reconnection of mailboxes, 136–137

- templates for mailboxes, 133–134

bulk-newmailbox.v1.ps1

- creating mailbox-enabled user accounts, 432–434

- examining script, 435–441

- running script, 441–443

bulk-newmailbox.v2.ps1

- examining script, 446–448

- overview of, 443–444

- running script, 448–449

- script contents, 444–445

bulk-newmailbox.v3.ps1

- examining script, 450–453

- running script, 454

C

C#

- PowerShell similarity with, 5

- running PowerShell from, 485–486

Cached Mode, CAS disabling Outlook modes, 165–166

CAS (Client Access Server), 163–189

- AD sites and, 301
- Autodiscover feature, 177–180
- certificate types, 170–171
- copying certificates, 176–177
- disabling Outlook modes, 165–166
- disabling Outlook versions, 166–167
- enabling certificates, 176
- enabling POP3 and IMAP4, 167–170
- enabling/disabling client-access attributes, 120–121
- Exchange 2007 software requirements, 69
- generating certificates, 172–174
- importing certificates, 175
- LinkAccess, 186–189
- obtaining certificates, 174
- Offline Address Book, 184–186
- order of deploying Exchange roles, 77, 79
- Outlook Anywhere, 183–184
- overview of, 163
- proxies and redirection for client access, 181–183
- summary, 190
- user settings, 164–165

CAS (Client Access Server), troubleshooting, 399–403

- overview of, 399
- `Test-ActiveSyncConnectivity` cmdlet, 400–402
- `Test-OutlookWebServices` cmdlet, 399–400
- `Test-OwaConnectivity` cmdlet, 402–403
- `Test-WebServicesConnectivity` cmdlet, 404

case sensitivity, PowerShell commands, 9**casting, 488****categorization, message**

- Edge Transport, 238
- Hub Transport, 194

CCR (Clustered Continuous Replication)

- cluster, 338–339
- cluster heartbeat, 341–342
- cluster service account, 336
- clustered mailbox server AD object, 343–344
- failback, 360
- failover, 354–357
- FSW (file share witness), 339–340

- mailbox server role, installing on primary node, 344–345
- mailbox server role, installing on secondary node, 345
- network interfaces, 342
- overview of, 329–330
- reasons for using, 330
- SCCs compared with, 330
- seeding process, 347–349
- steps in installation, 336
- structure of, 329
- Windows 2003 R2 SP2 installation and, 337

certificates, CAS

- copying, 176–177
- enabling, 176
- generating, 172–174
- importing, 175
- obtaining, 174
- overview of, 170
- request process, 171
- types of, 171

classes

- defined, 487
- PowerShell objects, 5

Clean-MailboxDatabase cmdlet, 224**Clean-up Agent, Exchange Server 2003, 224****CLI (Command Line Interface)**

- history of shells, 4
- limitations of shells, 5
- PowerShell commands corresponding to common commands, 42–43

Client Access Server. See CAS (Client Access Server)**client permissions, public folders, 145–146****cluster heartbeat**

- cluster nodes using to ensure availability, 329–330
- configuring in CCR, 341–342

cluster service account

- creating for CCR, 336, 343–344
- creating for MSCS, 366–367

Clustered Continuous Replication. See CCR (Clustered Continuous Replication)**Clustered Mailbox Server. See CMS (Clustered Mailbox Server)****cluster.exe**

- cluster cmdlets compared with, 383
- cluster installation for MSCS, 375–380

cluster.exe (continued)

configuring two node cluster with, 338

clustering. See also continuous replication

CCR. See CCR (Clustered Continuous Replication)

fault tolerance and, 327

history of, 328

LCR. See LCR (Local Continuous Replication)

monitoring cluster status, 349–350

resource management, 383–385

SCCs. See SCCs (Single Copy Clusters)

SCR. See LCR (Local Continuous Replication)

switches for clustered installs, 76

clusters

creating for CCR, 338–339

installing for MSCS, 375–380

cmd.exe

automatic completion, 22

shell history and, 4

cmdlets

aliases, 23

finding with `Get-Command`, 17–19

finding with `Get-Help`, 15–17

managing services, 56

optional and required parameters, 13–14

overview of, 8–9

parameter details for, 20–21

pipelines for passing data between, 23–24

sets of cmdlets in Exchange Management Shell, 38–41

syntax details for, 20

tab expansion feature for entering, 21–23

verb-noun pair in cmdlet names, 9–10

CMS (Clustered Mailbox Server)

AD object created for, 343–344

CCR and, 329, 336

in Exchange clustering, 328

installing Exchange on SCCs, 380–381

installing mailbox server role on primary node, 344–345

installing mailbox server role on secondary node, 345

monitoring cluster status, 349–350

setup switches, 76

coexistence routing, 317–318, 322–325

Command Line Interface. See CLI (Command Line Interface)

command-line interface, 6–8

commands, PowerShell. See cmdlets

CommandType parameter, `Get-Command` cmdlet, 18

comments

added to script, 432

adding to profiles, 53

comparison operators, 24

complex deployment, Exchange Server 2007, 80–81

Component parameter, `Get-Help` cmdlet, 38–40

composition, pipelines and, 23

conditionals, testing variable values, 436–437

Connect-Mailbox cmdlet

modifying resource mailboxes, 123

reconnecting disconnected mailbox, 224–225

connectors

creating/modifying, 201–202

Exchange Server 2000/2003, 191

foreign connectors, 212

linking send and receive connectors, 210–211

`New-ReceiveConnector` cmdlet, 202–203

`New-SendConnector` cmdlet, 203

receive connectors, 203–207

routing group connectors, 208–210

send connectors, 208–210

Content Filter agent, 268–270

continuous replication

CCR (Clustered Continuous Replication). See CCR (Clustered Continuous Replication)

failback, 359

failover, 353

installing, 334

LCR (Local Continuous Replication). See LCR (Local Continuous Replication)

monitoring cluster status, 349–350

monitoring cmdlets, 349

monitoring replication status, 350–352

overview of, 327–328

Performance Monitor, 352

SCR (Standby Continuous Replication). See SCR (Standby Continuous Replication)

seeding, 346–349

summary, 361

CreatePipeline method, 488–489

CSV (comma-separated value) files

in `bulk-newmailbox.v1.ps1`, 435–437

- creating bulk mailboxes, 131–132
- creating simple script based on, 426
- exporting data as, 468–469
 - `Import-Csv` cmdlet, 430
- reading in files and, 466

Current User profile, 52

D

DAS (direct attached storage), 330

data

- replication, 153–155
- script for exporting, 468–469

data types

- casting and, 488
- finding, 25–26
- parameter input values, 10

database, public folders

- creating, 140–141
- getting/setting database information, 142–144
- overview of, 140
- removing, 142–144

databases

- LCR, 334–335
- mailbox store. See mailbox store (database)
- recovery storage groups. See RSG (Recovery Storage Groups)
- script for getting database file size, 480–482
- storage groups. See storage groups

date and time, cmdlets for managing, 483

delayed fanout, in Exchange Server 2007 routing, 307–308

Delivery Status Notifications (DSNs), 101

delivery type, routing, 303

denial of service attacks, 235

deploying Exchange Server 2007, 65–82

- complex deployment, 80–81
- disaster recovery, 76–77
- domain preparation, 70–71
- domain requirements, 69–70
- hardware requirements, 66–67
- overview of, 65–66
- sequence for installing server roles, 77
- setup switches for clustered installs, 76
- setup switches for server installation, 72–76
- single server deployment, 78
- software requirements, 68–69

- standard deployment, 78–80
- summary, 81–82

direct attached storage (DAS), 330

Disable-Mailbox cmdlet

- modifying resource mailboxes, 123
- removing Exchange mailbox, 223

Disable-MailContact cmdlet, 127

Disable-UMIPGateway cmdlet, 292

Disable-UMServer cmdlet, 291

disaster recovery

- Exchange deployment and, 76–77
- web-based tool for, 496

disk space, Exchange hardware requirements, 67

DISKPART.EXE, 372

Dismount-Database cmdlet, 353

Distinguished Name (DN)

- granting access to top-level folders and, 149
- UM accounts and, 277

distribution groups

- adding user accounts to, 443
- dynamic. See dynamic distribution groups
- `Get-DistributionGroup` cmdlet, 91–92
- universal, 102

DN (Distinguished Name)

- granting access to top-level folders and, 149
- UM accounts and, 277

DNS

- creating DNS cluster record in MSCS install, 367–369
- Edge Transport server configuration, 245, 250
- Hub Transport server configuration, 197–199, 253, 255
- resolution of MX records, 237

DNS Delivery, routing, 303

domain controllers

- Exchange domain requirements, 70
- setup switches for, 72

/DomainController or /dc, Setup.com, 74

domains, Exchange 2007

- level function, 70
- preparation, 70–71
- requirements, 69–70

/DoNotStartTransport, Setup.com, 74

drives

- changing from current location to new drive, 44

drives (continued)

- hives exposed as, 57
- listing available, 43

DSNs (Delivery Status Notifications), 101

dynamic distribution groups

- creating, 129–130
- Get-DynamicDistributionGroup cmdlet, 92–93
- viewing, 103–105

E

EAS (Exchange ActiveSync)

- client access to, 163
- enabling/disabling client-access attributes, 120–121
- Exchange 2007 access methods, 165
- SSL and, 170
- Test-ActiveSyncConnectivity cmdlet, 400–402

.edb file, 219

edge cloning, Edge Transport server, 263

Edge Rules agent, 266

Edge services, Exchange 2007 software requirements, 69

edge subscription

- to AD site in Exchange organization, 237
- configuring Edge Transport servers, 250–253
- exporting, 250
- importing, 252, 257
- overview of, 239
- verifying configuration of Edge Transport servers, 257

Edge Transport server, 235–271

- ADAM and, 238
- Address Rewrite agent, 266
- Anti-Spam agent, 266–267
- back pressure feature, 199–200
- cmdlets for, 236
- configuring, 241–242
- configuring with edge subscription or EdgeSync, 250–253
- configuring without edge subscription or EdgeSync, 245–250
- content filtering, 268–270
- edge cloning, 263

- Edge Rules agent, 266
- edge subscription and synchronization, 239
- Enable-TransportAgent cmdlet, 264–265
- Get-TransportAgent cmdlet, 264
- Hub Transport server prepared for EdgeSync, 253–257
- IP Allow List, 267
- IP Allow List Provider, 267
- IP Block List, 268
- IP Block List Provider, 268
- message categorization, 238
- new features in Exchange 2007 SP1, 240–241
- New-EdgeSubscription cmdlet, 242–243
- order of deploying Exchange roles, 77
- overview of, 235, 237
- Recipient filtering, 271
- Remove-EdgeSubscription cmdlet, 243
- sender filtering, 270
- Sender Reputation, 271
- SenderID, 270
- Set-TransportAgent cmdlet, 264
- Start-EdgeSubscription cmdlet, 243
- summary, 271
- Test-EdgeSubscription cmdlet, 244
- transport agents, 263
- verifying configuration, 257–262
- X-MS-Exchange-Organization-SenderIdResult: PASSJunk E-Mail filter, 268–270

EdgeSync

- configuring Edge Transport server, 250–253
- ESRA (Exchange Sync Replication Account) and, 250–251
- Hub Transport server prepared for, 253–257
- synchronization provided by, 239
- Test-EdgeSynchronization cmdlet, 409–410
- verifying configuration of Edge Transport servers, 257

else statement, 446–447

elseif statement, 451

e-mail

- as business critical application, 327
- junk mail filtering, 268–270
- policies for e-mail addresses, 214
- public folders enabled to receive, 158

- restoring mail, 228–231
- script for sending, 469
- UCE (Unsolicited Commercial E-mail), 235
- E-mail AutoConfiguration, Outlook 2007, 179**
- EMC (Exchange Management Console)**
 - cmdlets for graphical management, 485
 - Exchange Management Shell vs., 34–36
 - layout of, 37–38
 - mailbox management, 222
 - message tracking, 310
 - New Mailbox Wizard, 115–116
 - Organization Configuration node, 37
 - public folder database created with, 140
 - Recipient Configuration node, 37, 93–94
 - recovery storage group management, 225
 - Server Configuration node, 37
 - storage groups created with, 218
 - Toolbox node, 38
- Enable-DatabaseCopy cmdlet, 334**
- /EnableErrorReporting, Setup.com, 74**
- Enable-ExchangeCertificate cmdlet, 176**
- /EnableLegacyOutlook, Setup.com, 74**
- Enable-Mailbox cmdlet**
 - bulk-enabling existing users, 135–136
 - creating resource mailboxes, 123
 - enabling existing user or IntOrgPerson object, 108–109
- Enable-MailContact cmdlet, 127**
- Enable-MailPublicFolder cmdlet, 158**
- Enable-OutlookAnywhere cmdlet, 183–184**
- Enable-StorageGroupCopy cmdlet, 335, 346**
- Enable-TransportAgent cmdlet, 264–265**
- Enable-UMAutoAttendant cmdlet, 289**
- Enable-UMMailbox cmdlet, 276–277**
- eq (equals), comparison operators, 24**
- equipment mailboxes, creating, 122**
- error checking, adding to scripts, 432**
- error reporting**
 - bulk-newmailbox.v1.ps1, 441–443
 - bulk-newmailbox.v2.ps1, 446–448
 - bulk-newmailbox.v3.ps1, 452
 - during server installation, 74
- errors, Exchange Server 2007 routing, 308–309**
- ESE (Extensible Storage Engine), 66, 238**
- ESRA (Exchange Sync Replication Account), 250–251**
- event logs**
 - Get-EventLog cmdlet, 412–414
 - Get-EventLogLevel cmdlet, 420–422
 - querying remote, 471
 - in Windows OS, 60–63
- EVS (Exchange Virtual Server), 336**
- Exchange 5.5 servers, Exchange 2007 domain requirements and, 70**
- Exchange Active Directory Topology service, 300**
- Exchange Install Domain Servers Group, 105**
- Exchange Management Console. See EMC (Exchange Management Console)**
- Exchange Management Shell, 33–64**
 - advantages of, 34
 - aliases, 49–50
 - cmdlet sets, 38–41
 - event logs in Windows OS and, 60–63
 - Exchange Management Console compared with, 34–36
 - as extension of PowerShell, 6–8
 - functions, 50–52
 - navigating PowerShell, 41–43
 - output, 45–47
 - overview of, 33
 - PowerShell drives, 43–44
 - preparing, 30
 - processes, controlling in Windows OS, 54–55
 - profiles, 52–54
 - Registry in Windows OS, 57–60
 - script creation, 425–426
 - services, controlling in Windows OS, 55–56
 - summary, 64
 - tasks, 8
 - variables, 48–49
 - verb names, 9–10
- Exchange Organization, 70**
- Exchange Organization Administrators Group, 105**
- Exchange Public Folder Administrators, 149**
- Exchange Recipient, 101**
- Exchange Recipient Administrators Group, 105**
- Exchange Security Groups, 104–105**
- Exchange Server 2000/2003**
 - bridgehead servers and connectors, 191
 - CAS (Client Access Server) compared with, 163

Exchange Server 2000/2003 (continued)

- Clean-up Agent in Exchange 2003, 224
- coexistence Exchange 2003 with Exchange 2007, 317–318
- dedicated AD sites for, 314
- Exchange 2007 domain requirements and, 70
- link state in Exchange 2003, 318–319
- relay restrictions and submit permissions, 206–207
- routing, 297
- routing compared with Exchange 2007, 299
- routing difference between Exchange versions, 299
- Routing Group Connectors and, 210

Exchange Server 2007

- access methods, 165
- Autodiscover, 177–180
- CAS proxy and redirection, 181–183
- connector types, 201–202
- deploying. See deploying Exchange Server 2007
- deployment and administration with PowerShell, 3
- Exchange Public Folder Administrators role, 149
- Hub Transport role, 191
- installing on SCCs (Single Copy Clusters), 380–383
- new features in Exchange 2007 SP1, 240–241
- relay restrictions and submit permissions, 206–207
- routing. See routing, Exchange Server 2007
- routing difference between Exchange versions, 299
- Routing Group Connectors and, 210
- troubleshooting. See troubleshooting Exchange 2007

Exchange Servers Group, 104

Exchange Sync Replication Account (ESRA), 250–251

Exchange variables, 49

Exchange View-Only Administrators Group, 104–105

Exchange Virtual Server (EVS), 336

Exchange Web Services, CAS providing, 163

Exchange2003Interop Group, 104

execution policies, PowerShell scripts, 30

Export-Csv cmdlet, 468–469

exporting data, 468–469

Export-Mailbox cmdlet, 111–112

Extensible Storage Engine (ESE), 66, 238

ExternalScript command elements, 18

F

failback

- CCR, 360
- cmdlets for, 359
- LCR, 359–360
- SCR, 360–361

failover

- CCR, 354–357
- cmdlets for, 353
- LCR, 353–354
- parameters in CCR, 341–342
- SCR, 357–359

fan-out in routing, 307–308

fault tolerance, cluster designs and, 327

file share witness (FSW)

- creating/assigning for CCR, 339–340
- overview of, 329–330

file system

- Exchange 2007 hardware requirements, 67
- navigating PowerShell, 41

FilePath parameter, 47

files

- script for getting database file size, 480–482
- script for reading in files, 465–467

filters

- event logs, 62
- objects, 24–25

filters, Edge Transport

- content filtering, 268–270
- recipient filtering, 271
- sender filtering, 270

firewalls, Outlook Anywhere and, 183

f1 alias, 47

foreach loops

- bulk-newmailbox.v2.ps1, 446–448
- bulk-newmailbox.v3.ps1, 453
- progress bar and, 440–441

foreign connectors, Hub Transport, 212

forest level function, Exchange 2007 domain requirements, 70

Format-List

event messages, 61
output list, 27, 47
process details, 54
send connectors, 209
service details, 56

Format-Table

changing column labels, 478
event messages, 61
output tables, 28–29, 46–47
Recipient types, 94–96

FSW (file share witness)

creating/assigning for CCR, 339–340
overview of, 329–330

Function keyword, 50–51

Functionality parameter, Get-Help cmdlet, 38–39, 41

functions, PowerShell, 50–52

G

GAL (Global Address List), 100

Get verb

for gathering system and application data, 411
output and, 26, 45
verb names, 9

Get-ADPermission cmdlet, 206

Get-ADSite cmdlet, 316–317

Get-ADSiteLink cmdlet, 315–316

Get-Alias cmdlet, 23, 50

Get-CASMailbox cmdlet, 167

Get-ChildItem cmdlet, 57

Get-ClusteredMailboxServer-Status cmdlet, 349, 383, 385

Get-Command cmdlet, 17–19

Get-Content cmdlet, 466, 470

Get-Date cmdlet, 483

Get-DistributionGroup cmdlet

querying distribution groups, 91–92
viewing mail-enabled groups, 102–103

Get-DynamicDistributionGroup cmdlet

querying dynamic distribution groups, 92–93
viewing dynamic distribution groups, 104, 130

Get-EventLog cmdlet

accessing event logs on local server, 471
controlling diagnostic logging levels, 62–63
filtering results obtained with, 472–473
troubleshooting Exchange 2007, 412–414
viewing event logs, 60–62

Get-EventLogLevel cmdlet, 420–422

Get-ExchangeServer cmdlet, 391–392

Get-Group cmdlet

querying existing groups, 90–91
viewing mail-enabled groups, 102–103

Get-Help cmdlet

Component parameter, 38–40
finding cmdlets with, 15–17
finding comparison operators, 24
Functionality parameter, 38–39, 41
parameter details, 20–21
Role parameter, 16–17, 38–39
using help information effectively, 19–20

Get-ItemProperty cmdlet, 59

Get-Mailbox cmdlet

adding parameters to, 489–490
gathering mailbox-enabled users, 463
Identity parameter used as positional parameter, 14
ResultSize parameter, 12
user settings for client access, 165
viewing mailboxes and attributes, 88–89

Get-MailboxDatabase cmdlet

checking status of LCR database, 335
getting information for mailbox database, 460

Get-MailboxStatistics cmdlet

bulk reconnection of mailboxes, 136–137
finding disconnected mailboxes, 224
reporting mailbox size, 475–476

Get-MailContact cmdlet, 89–90, 100

Get-Message cmdlet, 414–417

Get-MessageTrackingLog cmdlet, 310–313, 417–420

Get-NetworkConnectionInfo cmdlet, 199

Get-Process cmdlet, 54

Get-PSDrive cmdlet, 43–44

Get-PublicFolder cmdlet

creating public folders and, 152
folder replication and, 154
returning public folder object with, 460

Get-PublicFolderAdministrative-Permission cmdlet, 147

Get-PublicFolderDatabase cmdlet, 142–143, 461
Get-PublicFolderStatistics cmdlet, 158–160
Get-Queue cmdlet, 194
Get-ReceiveConnector cmdlet, 204, 206
Get-Recipient cmdlet
displaying recipients with, 94
returning Recipient objects with, 87–88
viewing dynamic distribution groups, 104
viewing mail contacts in AD forest, 100
viewing mail-enabled groups, 102–103
Get-RoutingGroupConnector cmdlet, 210
Get-Service cmdlet
enabling POP3 and IMAP4, 167–168
managing services, 55
parameters for input values, 12
Get-StorageGroup cmdlet, 226
Get-StorageGroupCopyStatus cmdlet
seeding and, 349
snapshot of current replication status, 350
Get-TransportAgent cmdlet, 264
Get-TransportPipeline cmdlet, 196
Get-TransportServer cmdlet, 197, 305
Get-UM cmdlets
for information retrieval, 284–286
reviewing UM configuration, 277–278
Get-UMActiveCalls cmdlet, 285
Get-UMAutoAttendant cmdlet, 285
Get-UMDialPlan cmdlet, 277, 285
Get-UMHuntGroup cmdlet, 285
Get-UMIPGateway cmdlet, 278, 285
Get-UMMailbox cmdlet, 286
Get-UMMailboxPIN cmdlet, 286
Get-UMMailboxPolicy cmdlet, 278
Get-UMServer cmdlet, 278, 286
Get-UMVirtualDirectory cmdlet, 286
Get-User cmdlet, 25, 136
Get-WMIObject cmdlet, 471
Global Address List (GAL), 100
Global Catalog Servers, 70
Graphical User Interfaces (GUIs)
history of shells and, 4
vs. shells, 4
groups
assignments for new users. See user
accounts, group assignments

cmdlets for identifying group object types,
86–96
creating/modifying, 128–129
dynamic distribution groups, 103–105
Get-Group cmdlet, 90–91
nonuniversal groups, 103
overview of, 101
universal distribution groups, 102
universal security groups, 102–103
user account assignments. See user
accounts, group assignments

gt (greater than), comparison operator, 24
GUIDs, 277

GUIs (Graphical User Interfaces)

history of shells and, 4
vs. shells, 4

H

hardware requirements

Exchange 2007, 66–67
MSCS (Microsoft Cluster Server), 364

**HeartBeatLostInterfaceTicks
parameter, failover and, 341**

**HeartBeatLostNodeTicks parameter,
failover and, 341–342**

help

effective use of help information, 19–20
Get-Help cmdlet. See **Get-Help cmdlet**
help files as supplement to cmdlet help, 21

Help function, based on Get-Help, 19

hierarchy, of public folders, 155–156

high availability

CAS Availability Service, 163
continuous replication and, 328
folder replication and, 153
Mailbox server role and, 217

HKEY_CURRENT_USER, 57

HKEY_LOCAL_MACHINE, 57

hop selection process, in Exchange 2007
routing, 302–304

hub sites

AD sites enabled as, 316–317
routing and, 304–305

Hub Transport server, 191–216
accepted domain policies, 214

- AD IP site links and, 212–213
- AD sites and, 300
- back pressure feature, 199–200
- Categorizer, 194
- configuring, 197
- connectors, creating/modifying, 201–202
- connectors, linking, 210–211
- DNS configuration, 197–199
- EdgeSync and, 253–257
- e-mail address policies, 214
- foreign connectors, configuring, 212
- Local (MAPI) Delivery, 194
- mail routing and, 299–300
- `New-ReceiveConnector` cmdlet, 202–203
- `New-SendConnector` cmdlet, 203
- order of deploying Exchange roles, 77
- overview of, 191
- policies, 213–214
- priority queueing, 200
- receive connectors, configuring, 203–206
- relay restrictions and submit permissions, 206–207
- routing group connectors, configuring, 212
- send connectors, configuring, 208–210
- server limits, 201
- SMTP Receive, 192
- SMTP Send/Remote Delivery, 194–197
- Submission Queue, 193–194
- summary, 214–215
- transport pipeline, 192

I

Identity parameter

- as positional parameter, 14
- as required parameters, 13
- wildcards and, 12

if statements

- `bulk-newmailbox.v2.ps1`, 446–448
- `bulk-newmailbox.v3.ps1`, 451–452
- `newuser-publicfolder.ps1`, 458–460
- testing variable values, 436–437

IIS virtual directory, 184

IMAP4 (Internet Message Access Protocol version 4)

- CAS enabling, 167–170

- client-access attributes, enabling/disabling, 120–121
- Exchange 2007 access methods, 165
- `Set-CASMailbox` cmdlet and, 110–111
- SSL and, 170

IMF (Intelligent Message Filter), 268

Import-Csv cmdlet

- bulk creation of mailboxes, 131–132
- `bulk-newmailbox.v3.ps1`, 452
- creating mailbox-enabled user accounts, 430
- reading in files and, 466–467

Import-ExchangeCertificate cmdlet, 175

Import-Mailbox cmdlet, 112–113

InfoPath, 152

input values, parameters, 10–12

integers (numbers), parameter input values, 10

Intelligent Message Filter (IMF), 268

Internet Message Access Protocol version 4.

- See **IMAP4 (Internet Message Access Protocol version 4)**

I/O operations per second (IOPS), Exchange 2007, 66

IOPS (I/O operations per second), Exchange 2007, 66

IP Allow List

- Edge Transport server, 267
- `Test-IPAllowListProvider` cmdlet, 395–396

IP Allow List Provider, 267

IP Block List

- Edge Transport server, 268
- `Test-IPBlockListProvider` cmdlet, 396–397

IP Block List Provider, 268

IPM_Subtree, public folder trees, 150, 155

iSCSI, limitations for passive storage, 331

Item cmdlets, working with Registry keys, 58

items, PowerShell navigation, 41, 44

J

Journaling Rule agent, 266

junk mail

- content filtering, 268–270
- Outlook Junk E-Mail filter, 270

K

KCC (Knowledge Consistency Checker), 300
keys, Registry, 58
Knowledge Consistency Checker (KCC), 300

L

LCR (Local Continuous Replication), 140
enabling databases, 334–335
enabling storage groups, 335
failback, 359–360
failover, 353–354
installing, 334
overview of, 330–332
reasons for using, 332
seeding process, 347–349

LDAP (Lightweight Directory Access Protocol), 238

least cost algorithm
coexistence routing and, 322
Exchange 2003 and, 319
fan-out in routing and, 308
hub sites and, 305, 316–317
site links and, 314

/LegacyRoutingServer, Setup.com, 74

licenses, Edge Transport server, 250

Lightweight Directory Access Protocol (LDAP), 238

like, comparison operator, 24

link state, 297, 318–319

link state islands, 319–322

LinkAccess, 186–189

linked mailboxes, creating, 117–119

list format. See Format-List

List parameter, Get-EventLog cmdlet, 61

LLR (Lost Log Resiliency), 353

load balancing, user accounts across mailbox servers, 449–454

Local (MAPI) Delivery, Hub Transport server, 194

Local Continuous Replication. See LCR (Local Continuous Replication)

location, PowerShell item, 41

log shipping, 328, 346

LogName parameter, Get-EventLog cmdlet, 61

Lost Log Resiliency (LLR), 353
lt (less than), comparison operator, 24
LUNs, logging, 331

M

mail contacts
creating, 126–127
Get-MailContact cmdlet, 89–90
modifying, 127–128
overview of, 100

Mail Exchanger (MX) records, 237

mail forest contact, 100

mail routing. See routing, Exchange Server 2007

mail users
creating, 126–127
modifying, 127–128
overview of, 100–101

Mailbox server roles, troubleshooting, 405–409
cmdlets for, 405
Test-ExchangeSearch cmdlet, 408–409
Test-Mailflow cmdlet, 406–407
Test-MapiConnectivity cmdlet, 405–406

Mailbox servers, 217–234
CCR and, 80
CCR installation and, 337
clustered. See CMS (Clustered Mailbox Server)
database cmdlets, 219
database configuration, 220–222
database creation, 219–220
database removal, 222
Exchange 2007 software requirements, 69
load balancing user accounts across mailbox servers, 449–454
mail restoration, 228–231
mailbox management cmdlets, 222–225
order of deploying Exchange roles, 77
overview of, 217–234
public folders, 231–232
RSG cmdlets, 225–226
RSG creation, 225–226
RSG database creation, 227
RSG database, mounting, 228

- RSG database restoration, 227–228
- SCC and, 80
- SCR and, 345
- storage group cmdlets, 217–218
- storage group creation, 218
- storage group, moving, 218–219
- storage group removal, 219
- summary, 233
- mailbox store (database)**
 - cmdlets, 219
 - configuring, 220–222
 - creating, 219–220
 - removing, 222
- mailbox-enabled recipients, 96**
- mailbox-enabled user accounts, 425–443**
 - CSV file for, 430
 - examining `bulk-newmailbox.v1.ps1` script, 435–441
 - improvements in `bulk-newmailbox.v1.ps1` script, 432–434
 - overview of, 425–426
 - parameters for `New-Mailbox`, 428–429
 - running improved script, 441–443
 - running simple script, 430–431
 - simple script for, 426–428
- mailboxes**
 - bulk modification of mailbox attributes, 136
 - bulk reconnection of, 136–137
 - creating bulk, 131–132
 - creating new linked mailbox, 117–119
 - creating resource mailbox, 122–123
 - creating user mailbox, 113–119
 - `Enable-Mailbox` cmdlet, 108–109
 - `Export-Mailbox` cmdlet, 111–112
 - `Get-Mailbox` cmdlet, 88–89
 - `Import-Mailbox` cmdlet, 112–113
 - management cmdlets, 222–225
 - managing user mailbox properties, 121–122
 - modifying resource mailbox, 123–126
 - modifying user mailbox, 119–122
 - `New-Mailbox` cmdlet, 106–107
 - `Remove-Mailbox` cmdlet, 109–110
 - `Set-CASMailbox` cmdlet, 110–111
 - `Set-Mailbox` cmdlet, 107–108
 - templates for, 133–134
- mail-enabled groups**
 - nonuniversal groups, 103
 - universal distribution groups, 102
 - universal security groups, 102–103
- mail-enabled public folders, 158**
- mail-enabled recipients, 96**
- mailflow, testing, 406–407**
- Majority Node Set. See MNS (Majority Node Set)**
- Management Tools, Exchange 2007, 68**
- MAPI (Messaging Application Programming Interface)**
 - Local (MAPI) Delivery, 194
 - `Set-CASMailbox` cmdlet and, 110–111
 - `Test-MapiConnectivity` cmdlet, 405–406
- MAPI Delivery, routing delivery types, 303**
- memory, Exchange 2007 hardware requirements, 67**
- message expiration timeout settings, Hub Transport servers, 201**
- Message Journal Reports, Microsoft Exchange Recipient, 101**
- message tracking**
 - Exchange 2007 routing, 310–313
 - `Get-MessageTrackingLog` cmdlet, 417–420
- messages**
 - categorization, Edge Transport servers, 238
 - categorization, Hub Transport servers, 194
 - `Get-Message` cmdlet, 414–417
- Messaging Application Programming Interface. See MAPI (Messaging Application Programming Interface)**
- methods, 487**
- Microsoft Cluster Server. See MSCS (Microsoft Cluster Server)**
- Microsoft Exchange Active Directory Topology service, 300**
- Microsoft Exchange Recipient, 101**
- Microsoft Exchange Security Groups, 104–105**
- Microsoft Identity Integration Server (MIIS), 100**
- Microsoft InfoPath, 152**
- Microsoft Management Console version 3.0 (MMC 3.0), 37**
- Microsoft Office SharePoint Services**
 - as alternative to public folders, 152
 - `LinkAccess` for integrating with OWA, 186–189
- Microsoft Outlook. See Outlook**

Microsoft SQL Server, 328
MIIS (Microsoft Identity Integration Server), 100
MMC (Microsoft Management Console) 3.0, 37
MNS (Majority Node Set)
CCR configuration, 338
FSW as update for, 339
quorum model in Windows Server 2003, 329
MNSFileShareCheckInterval parameter, 341
MNSFileShareDelay parameter, 341
/mode or /m, Setup.com, 72
modes, setup, 72
monitoring continuous replication
cluster status, 349–350
cmdlets for, 349
Performance Monitor, 352
replication status, 350–352
monitoring script, for simple monitoring, 483–484
MoveAllReplicas.ps1, 158
Move-ClusteredMailboxServer cmdlet, 385
Move-StorageGroup cmdlet, 218–219
MSCS (Microsoft Cluster Server)
cluster installation for, 375–380
cluster service account, creating, 366–367
DNS cluster record, creating, 367–369
formatting shared disk for, 372–375
hardware requirements for, 364
installation steps, 365–366
network interfaces, configuring, 372
SCCs residing in, 363
software requirements for, 364–365
MSExchangeIS key, 57–60
MSExchangeproxy.exe (Process Manager), 204
MX (Mail Exchanger) records, 237

N

Name parameter
Get-Command cmdlet, 17
Get-Help cmdlet, 15–16
named parameters, 13–14
names, verb-noun pair in cmdlet names, 9

namespace, creating for external access, 181
NDR (non-delivery report), 302
.NET Framework, 485–496
accessing PowerShell from, 485–486
Exchange 2007 software requirements, 68
overview of, 485
as power behind PowerShell, 5–6
problem solving with PowerShell and .NET, 495–496
starting web project, 486–487
Windows PowerShell runspace, 487–495
Net User, 137
network interfaces
configuring for cluster use in CCR, 342
configuring in MSCS install, 370–371
New Mailbox Wizard, EMC, 115–116
New verb
creating user mailbox, 113–119
verb names, 9
New-Alias cmdlet, 49–50
New-DistributionGroup cmdlet, 128
New-DynamicDistributionGroup cmdlet, 129–130
New-EdgeSubscription cmdlet, 239, 242–243
-Newest parameter, Get-EventLog cmdlet, 61
New-ExchangeCertificate cmdlet, 172–174
New-Item cmdlet, 53, 58
New-Mailbox cmdlet
creating new linked mailbox, 117–119
creating new resource mailbox, 122
creating new user mailbox, 113–117
creating new user object, 106–107
parameters for, 428–429
New-MailboxDatabase cmdlet, 219–220, 227
New-MailContact cmdlet, 126–127
New-Object cmdlet, 469
New-PublicFolder cmdlet, 150–152, 461
New-PublicFolderDatabase cmdlet, 140–141, 232
New-ReceiveConnector cmdlet, 202–203, 204–205
New-SendConnector cmdlet, 203, 208
New-StorageGroup cmdlet
creating RSG database, 226

creating SCR storage group, 345
 creating storage groups, 218
New-TimeSpan cmdlet, 483
New-UMAutoAttendant cmdlet, 288–289
New-UMDialPlan cmdlet, 275
New-UMIPGateway cmdlet, 275–276
New-UMMailboxPolicy cmdlet, 276
newuser-publicfolder.ps1
 examining, 457–462
 running, 462–464
 script contents, 455–457
Nltest utility, 314
Non_IPM_Subtree, public folder trees, 150
Non-Cached Mode, CAS disabling Outlook modes, 165–166
non-delivery report (NDR), 302
Non-Paged Memory (NPM(K)), 54
Non-SMTP Gateway Delivery, 303
nonuniversal groups, mail-enabled, 103
/NoSelfSignedCertificate, Setup.com, 74
notlike, comparison operator, 24
noun names, 10
Noun parameter, Get-Command cmdlet, 17–18
NTFS, Exchange 2007 hardware requirements, 67
numbers (integers), parameter input values, 10

O

OAB (Offline Address Book), 184–186
 creating, 184–185
 generating, 186
 overview of, 184
objects
 collecting user data objects based on
 organizational units, 23–24
 defined, 487
 filtering, 24–25
 PowerShell objects based on .NET objects, 5
 viewing AD object properties, 165
Office Outlook 2007, 139
Office SharePoint Services
 as alternative to public folders, 152
 LinkAccess for integrating with OWA,
 186–189
Offline Address Book. See OAB (Offline Address Book)
/on, Setup.com, 73
“one-liners,” 24
operating systems (OSs), Exchange 2007 software requirements, 68
optical drive, Exchange 2007 hardware requirements, 67
optional parameters, 13
or operator, multiple test conditions and, 25
Organization Configuration node, EMC, 37
/organization name, Setup.com, 73
organizational units
 collecting user data objects based on, 23–24
 Microsoft Exchange Security Groups,
 104–105
OSs (operating systems), Exchange 2007 software requirements, 68
Out-File cmdlet, 47, 468
Out-Host cmdlet, 45
Outlook
 CAS disabling Outlook modes, 165–166
 CAS disabling Outlook versions, 166–167
 /EnableLegacyOutlook for Outlook clients, 74
Outlook 2007
 Autodiscover and, 177–178
 E-mail AutoConfiguration, 179
 public folders and, 139
 upgrading e-mail clients to, 152
 web-based distribution, 184
Outlook Anywhere
 client access to, 183–184
 Exchange 2007 access methods, 165
 SSL and, 170
Outlook Junk E-Mail filter, 270
Outlook Web Access. See OWA (Outlook Web Access)
output, 45–47
 controlling, 26
 list format for displaying, 27, 47
 raw vs. formatted, 45
 table format for displaying, 46
overload methods, 488
OWA (Outlook Web Access)
 client access to, 163
 enabling/disabling client-access attributes,
 120–121

OWA (Outlook Web Access) (continued)

- Exchange 2007 access methods, 165
- LinkAccess for integrating with SharePoint
 - Services and file shares, 186–189
- proxy and redirection and, 181
- SSL and, 170
- Test-OwaConnectivity cmdlet, 180, 402–403

P

/p, setup switches, 71

/pad, setup switches, 71

page files, Exchange 2007 hardware requirements, 66, 67

Paged memory (PM(K)), 54

param keyword, 51, 427, 435

parameters, 10–12

- continuous replication, 355
- input values, 10–12
- optional and required parameters, 13
- overview of, 10
- positional and named parameters, 13–14
- receive connectors, 202–203
- send connectors, 203
- shortcuts for parameter names, 14–15
- syntax details for cmdlets and its parameters, 20
- tab expansion feature for entering, 21–23

partitions, preparing shared disk for MSCS cluster, 372–375

\$password variable, 427–428

passwords, stored as string value, 467

/pd, setup switches, 71

Performance Monitor, 352

permissions

- domain preparation and, 71
- permission groups for transport servers, 206–207
- send connectors, 210

permissions, public folders

- administrative folder permissions, 146–148
- client folder permissions, 145–146
- overview of, 144
- top-level folders, 148–149

PFDavAdmin, 139

pipelines

- adding multiple commands to, 489
- CreatePipeline method, 488–489
- for passing data between cmdlets, 23–24

/p1, setup switches, 71

policies, Hub Transport

- accepted domains, 214
- e-mail addresses, 214
- overview of, 213–214

POP3 (Post Office Protocol version 3)

- CAS enabling, 167–170
- enabling/disabling client-access attributes, 120–121
- Exchange 2007 access methods, 165
- Set-CASMailbox cmdlet and, 110–111
- SSL and, 170

ports

- Edge Transport server, 245, 250
- Hub Transport server, 253, 255

positional parameters, 13–14

Post Office Protocol version 3. See POP3 (Post Office Protocol version 3)

PowerGadgets, 479–480

PowerShell, getting started

- aliases, 23
- cmdlets, 8–9
- command-line interface, 6–8
- data types, finding, 25–26
- Exchange Management Shell, preparing, 30
- filtering objects, 24–25
- Get-Command cmdlet for finding cmdlets, 17–19
- Get-Help cmdlet for finding cmdlets, 15–17
- help files, supplementary to cmdlet help, 21
- help information, effective use of, 19–20
- history of, 4
- list format for displaying properties, 27
- .NET Framework as power behind, 5–6
- noun names, 10
- optional and required parameters, 13
- output, controlling, 3–4

PowerShell, getting started

- parameter details for cmdlets, 20–21
- parameters, 10–12
- pipelines, 23–24
- positional and named parameters, 13–14
- property names, finding, 25–26
- references, 31

- running scripts, 29–30
 - shell limitations, 5
 - shells vs. GUIs, 4
 - shortcuts for parameter names, 14–15
 - summary, 31
 - syntax details for cmdlets and parameters, 20
 - tab expansion feature for entering cmdlets and parameters, 21–23
 - table format for displaying properties, 28–29
 - verb names, 9–10
 - verb-noun pair in cmdlet names, 9
 - powershell.exe, 6**
 - PRA (Purported Responsible Address), 270**
 - /PrepareAD, setup switches, 71**
 - /PrepareAllDomains, setup switches, 71**
 - /PrepareDomain, setup switches, 71**
 - /PrepareLegacyExchange Permissions, setup switches, 71**
 - /PrepareSchema, setup switches, 71**
 - Priority queueing, Hub Transport servers, 200**
 - Process Manager (MSExchangetransport.exe), 204**
 - processes, controlling in Windows OS, 54–55**
 - processors, Exchange 2007 hardware requirements, 67**
 - profiles, Exchange Management Shell, 52–54**
 - progress bar**
 - adding to script, 432
 - foreach loops and, 440–441
 - properties**
 - finding property names, 25–26
 - list format for displaying, 27
 - managing user mailbox properties, 121–122
 - table format for displaying, 28–29
 - viewing AD object properties, 165
 - providers, exposing PowerShell drives, 43–44**
 - proxies, 181–183**
 - /ps, setup switches, 71**
 - .ps1, PowerShell script file extension, 29**
 - .pst folders**
 - export mailbox content to, 111–112
 - import mailbox data from, 112–113
 - public folders, 139–160**
 - AD sites and, 300
 - administrative folder permissions, 146–148
 - client folder permissions, 145–146
 - creating, 150–152
 - database administration, 140
 - database creation, 140–141
 - database removal, 142–144
 - /EnableLegacyOutlook, 74
 - folder and content administration, 149–150
 - getting/setting public folder database information, 142–144
 - hierarchy of, 155–156
 - installing, 140
 - Mailbox server role and, 231–232
 - mail-enabling, 101, 158
 - overview of, 139
 - permissions, 144
 - removing, 152–153
 - replication, 153–155
 - reports, 158–160
 - scripts, 157–158
 - stopping replication, 156–157
 - summary, 160
 - top-level folders, 148–149
 - trees, 150
 - working with, 150
 - public folders, for new users, 454–464**
 - cmdlets for, 454
 - examining newuser-publicfolder.ps1, 457–462
 - newuser-publicfolder.ps1, script contents, 455–457
 - running newuser-publicfolder.ps1, 462–464
 - Purported Responsible Address (PRA), 270**
- ## Q
- QDB (Query Based Distribution Groups), 103.**
 - See also dynamic distribution groups
 - quorum model, in Windows Server 2003, 329**
 - Quota limit messages, Microsoft Exchange Recipient, 101**
 - quotas, mailbox store, 220**
- ## R
- /r, Setup.com, 72–73**
 - RAM, 66**
 - reading in files, 465–467**

receive connectors

- configuring, 203–206
- creating new, 202–203
- default connectors, 204
- linking with send connectors, 210–211
- relay restrictions and submit permissions, 206–207
- routing inbound messages from Internet, 246–247
- routing messages from Hub Transport servers, 248–249

Recipient Configuration node, EMC, 37, 93–94

Recipient filtering, Edge Transport server, 271

Recipient scope, in Exchange Management Shell, 84–86

Recipient Update Service (RUS), 71

recipients

- bulk mailbox creation, 131–132
- bulk modification of mailbox attributes, 136
- bulk operations, generally, 130
- bulk reconnection of mailboxes, 136–137
- bulk-enabling existing users, 135–136
- defined, 84
- dynamic distribution groups, 103–105, 129–130
- Enable-Mailbox cmdlet, 108–109
- Export-Mailbox cmdlet, 111–112
- Get-DistributionGroup cmdlet, 91–92
- Get-DynamicDistributionGroup cmdlet, 92–93
- Get-Group cmdlet, 90–91
- Get-Mailbox cmdlet, 88–89
- Get-MailContact cmdlet, 89–90
- Get-Recipient cmdlet, 87–88
- group objects, 101
- group objects, creating/modifying, 128–129
- Import-Mailbox cmdlet, 112–113
- mail users and mail contacts, creating, 126–127
- mail users and mail contacts, modifying, 127–128
- mailbox-enabled, 96
- New-Mailbox cmdlet, 106–107
- nonuniversal groups, 103
- overview of, 83–84
- Recipient scope in Exchange Management Shell, 84–86
- Remove-Mailbox cmdlet, 109–110

- resource mailboxes, creating, 122–123
- resource mailboxes, modifying, 123–126
- Set-CASMailbox cmdlet, 110–111
- Set-Mailbox cmdlet, 107–108
- summary, 137
- templates for mailboxes, 133–134
- universal distribution groups, 102
- universal security groups, 102–103
- user and group objects, 86–87
- user mailboxes, creating, 113–119
- user mailboxes, modifying, 119–122
- user objects, 96–101
- user objects, creating/modifying, 105–106

RecipientTypeDetails property, 83

Recovery Storage Groups. See RSG (Recovery Storage Groups)

redirection, client access and, 181–183

regedit.exe, 57

Registry, in Windows OS, 57–60

remote domains

- Edge Transport server, 250
- Hub Transport server, 255

Remove, verb names, 9

Remove-DistributionGroup cmdlet, 129

Remove-DistributionGroupMember cmdlet, 129

Remove-EdgeSubscription cmdlet, 243

Remove-ExchangeCertificate cmdlet, 172

Remove-Item cmdlet, 58

Remove-ItemProperty cmdlet, 59

Remove-Mailbox cmdlet

- disabling, disconnecting, removing mailboxes, 119–120
- modifying resource mailboxes, 123
- removing AD and Exchange mailbox accounts, 223
- removing user account associated with mailbox, 109–110

Remove-MailboxDatabase cmdlet, 222

Remove-MailContact cmdlet, 127

Remove-PublicFolder cmdlet, 152

Remove-PublicFolderAdministrative Permission cmdlet, 148

Remove-PublicFolderDatabase cmdlet, 144

Remove-ReceiveConnector cmdlet, 206

RemoveReplicaFromPFRecursive.ps1, 157

Remove-SendConnector cmdlet, 210
Remove-StorageGroup cmdlet, 219
Remove-UM cmdlets, 292–293
/RemoveUmLanguagePack, Setup.com, 76
ReplaceReplicaOnPFRecursive.ps1, 157
replication, continuous. See continuous replication
replication, public folders
 data, 153–155
 hierarchy, 155–156
 overview of, 139
 stopping, 156–157
replication topology, KCC and, 300
reporting tasks
 mailbox size, 475–480
 online defragmentation and backups, 471–475
 overview of, 471
reports, public folders, 158–160
required parameters, 13
resource mailboxes
 converting shared mailbox to, 99
 creating, 122–123
 equipment mailboxes, 98–99
 modifying, 123–126
resource management, cluster resources, 383–385
response banner, for Hub transport server, 207
restore-Mailbox cmdlet, 228–231
Restore-StorageGroupCopy cmdlet, 354, 356–357
-ResultSize parameter, Get-Mailbox cmdlet, 12
Resume-PublicFolderReplication cmdlet, 156–157
Resume-Queue cmdlet, 194
Retry-Queue cmdlet, 194
-Role parameter, Get-Help cmdlet, 16–17, 38–39
roles. See server roles
/roles, Setup.com, 72–73
room mailboxes, 122
root folders, 148
route selection process, in Exchange 2007, 301–302
routing, Exchange Server 2007, 297–326
 AD site links, 314–316
 AD site-based routing, 300–301

backoff routines, 305–307
 cmdlets, 298
 coexistence routing, 322–325
 coexistence with Exchange 2003, 317–318
 common errors, 308–309
 comparing Exchange versions, 299
 dedicated AD sites for Exchange, 314
 delayed fanout, 307–308
 determining AD site membership, 313–314
 hub sites, 304–305
 hub sites, working with, 316–317
 link state and, 318–319
 link state islands, 319–322
 Log Viewer, 309–310
 message tracking, 310–313
 next hop selection process, 302–304
 overview of, 297
 route selection process, 301–302
 summary, 325

routing group connectors, Hub Transport, 212
Routing Log Viewer, Exchange 2007, 309–310
RPC over HTTP. See Outlook Anywhere
RSG (Recovery Storage Groups)
 cmdlets, 225–226
 creating, 226
 creating RSG database, 227
 mounting, 228
 restoring, 227–228
runspace, 488
RUS (Recipient Update Service), 71

S

/s, Setup.com, 73
SANs (Storage Area Networks), 330
SANs (Subject Alternate Names), 171
SCCs (Single Copy Clusters), 363–388
 CCR compared with, 330
 cluster designs and, 327
 cluster installation for MSCS, 375–380
 in Exchange clustering, 328
 formatting shared disk for MSCS, 372–375
 hardware requirements for MSCS, 364
 installing Exchange on, 380–383
 installing MSCS and, 365–371
 mailbox roles and, 80
 overview of, 363

SCCs (Single Copy Clusters) (continued)

- resource management, 383–385
- script for installing/configuring, 385–388
- software requirements for MSCS, 364–365
- summary, 388

Schema Master, Exchange 2007 domains, 70, 71

SCL (spam confidence level), 237, 266, 269

SCP (service connection point), 177–178

SCR (Standby Continuous Replication)

- failback, 360–361
- failover, 357–359, 496
- installing, 345
- options for applying, 333
- overview of, 332–333
- reasons for using, 332
- seeding process, 347–349

screen resolution, Exchange 2007 hardware requirements, 67

ScriptBlock, 490–492

scripts

- administrative. See administrative scripts
- client folder permissions, 145–146
- lack of integration between shell and scripting languages, 5
- public folders, 157–158
- running, 29–30
- Sysocmgr.exe, 337

SDK (software development kit), Windows PowerShell SDK, 485–486

search service, 408–409

Secure Sockets Layer (SSL)

- CAS configuration and, 170
- IIS not requiring, 184

security groups

- Microsoft Exchange Security Groups, 104–105
- universal security groups, 102–103

seeding

- cmdlets for, 346
- defined, 328
- process of, 347–349
- when required, 346

Select-Object cmdlet, 479, 483

send connectors

- configuring, 208–210
- configuring for Edge servers, 253
- creating new, 203

- linking with receive connectors, 210–211
- permissions and authentication settings, 210
- routing messages from Internet to Hub Transport servers, 247–248
- routing outbound messages to Internet, 245–246
- SMTP Send Connector, 194

sender filtering, Edge Transport server, 270

Sender Policy Framework (SPF), 398

Sender Reputation, Edge Transport server, 271

SenderID

- Edge Transport server, 270
- overview of, 398
- Test-SenderID cmdlet, 397–398

Server Configuration node, EMC, 37

server health, troubleshooting Exchange 2007, 390–392

server limits, Hub Transport, 201

server roles

- Client Access. See CAS (Client Access Server)
- Edge Transport. See Edge Transport server
- Exchange Public folder Administrators role, 149
- Exchange roles during server installation, 72
- Hub Transport. See Hub Transport server
- Mailbox. See Mailbox servers
- sequence for installing, 77
- Unified Messaging. See UM (Unified Messaging) server

service connection point (SCP), 177–178

services

- cmdlets for managing, 56
- controlling in Windows OS, 55–56

Set verb

- for gathering system and application data, 411
- verb names, 9

Set-ADSite cmdlet, 212–213, 317

Set-Alias cmdlet, 49–50

Set-CASMailbox cmdlet

- enabling/disabling client-access attributes, 120–121
- LinkAccess and, 188
- setting client access-related attributes, 110–111
- user settings for client access, 164–165

Set-ClientAccessServer cmdlet, 178

- Set-Contact cmdlet, 128**
- Set-ImapSettings cmdlet, 168–170**
- Set-ItemProperty cmdlet, 59**
- Set-Location cmdlet**
 - accessing Registry as drive, 57
 - changing from current location to new drive, 44
- Set-Mailbox cmdlet**
 - bulk modification of mailbox attributes, 136
 - converting shared mailbox to resource mailbox, 99
 - modifying resource mailbox, 123
 - parameters for input values, 11
 - setting existing mailboxes, 107–108
- Set-MailboxDatabase cmdlet, 220–221, 470**
- Set-MailboxServer cmdlet, 310, 354–355**
- Set-OabVirtual Directory cmdlet, 184**
- Set-OfflineAddressBook cmdlet, 184–186**
- Set-OWAVirtualDirectory cmdlet, 187–189**
- Set-PopSettings cmdlet, 168**
- Set-PublicFolder cmdlet, 153–154**
- Set-PublicFolderDatabase cmdlet, 143–144**
- Set-ReceiveConnector cmdlet, 206–207**
- Set-ResourceConfig cmdlet, 123, 125**
- Set-RoutingGroupConnector cmdlet, 210**
- Set-SendConnector cmdlet, 210**
- Set-TransportAgent cmdlet, 264**
- Set-TransportServer cmdlet**
 - configuring Hub Transport server, 197
 - configuring message tracking, 310
 - modifying transport server limits, 201
 - routing and, 306–307
- Set-UMAutoAttendant cmdlet, 290**
- Set-UMDialPlan cmdlet, 278–281**
- Set-UMIPGateway cmdlet, 281–282**
- Set-UMMailboxPIN cmdlet, 286–287**
- Set-UMMailboxPolicy cmdlet, 282–284**
- setup switches**
 - for clustered installs, 76
 - for domain preparation, 70–71
 - for server installation, 72–76
- Setup.com, 72–76**
- Set-User cmdlet**
 - changing mail contact attributes, 128
 - Identity parameter and, 13
 - parameters for input values, 11
- shared mailboxes, 123**
- shells**
 - vs. GUIs, 4
 - limitations of, 5
- shortcuts, for parameter names, 14–15**
- simplebulk-newmailbox.ps1, 426–428, 430–431**
- Single Copy Clusters. See SCCs (Single Copy Clusters)**
- single server deployment, Exchange 2007, 78**
- site link costs, AD sites, 314–316**
- sites, AD. See AD sites**
- SmartHost Delivery, 303**
- SMTP connectors, 208. See also send connectors**
- SMTP Receive, Hub Transport server, 192**
- SMTP relay, 303–304**
- SMTP Send/Remote Delivery, Hub Transport server, 194–197**
- SMTPClient object, 469**
- software requirements**
 - Exchange 2007, 68–69
 - MSCS (Microsoft Cluster Server), 364–365
 - /SourceDir, Setup.com, 73
- spam confidence level (SCL), 237, 266, 269**
- spam prevention**
 - Anti-Spam agent, 266–267
 - overview of, 395
 - Test-IPAllowListProvider cmdlet, 395–396
 - Test-IPBlockListProvider cmdlet, 396–397
 - Test-SenderID cmdlet, 397–398
- SPF (Sender Policy Framework), 398**
- SQL Server, 328**
- SSL (Secure Sockets Layer)**
 - CAS configuration and, 170
 - IIS not requiring, 184
- standard deployment, Exchange 2007, 78–80**
- standards, script for applying default settings, 469–471**
- Standby Continuous Replication. See SCR (Standby Continuous Replication)**
- Start-ClusteredMailboxServer cmdlet, 384**
- Start-EdgeSubscription cmdlet, 241, 243**

- Start-Transcript cmdlet, 54**
- Status, of services, 56**
- Stop-Clustered MailboxServer cmdlet, 349–350**
- Stop-ClusteredMailboxServer cmdlet, 383–384**
- Stop-Process cmdlet, 55**
- Storage Area Networks (SANs), 330**
- storage groups**
 - cmdlets, 217–218
 - creating, 218
 - creating for SCR, 345
 - enabling for LCR, 335
 - enabling for SCR, 346
 - moving, 218–219
 - recovering with LCR, 331
 - removing, 219
- strings (words), parameter input values, 10**
- Subject Alternate Names (SANs), 171**
- subkeys, Registry, 58**
- Submission Queue, Hub Transport server, 193–194**
- subscription, edge subscription, 237, 239**
- Suspend-PublicFolderReplication cmdlet, 156–157**
- Suspend-Queue cmdlet, 194**
- synchronization. See EdgeSync**
- syntax details, for cmdlets and its parameters, 20**
- Syntax parameter, Get-Command cmdlet, 19**
- Sysocmgr.exe, 337**
- system data, gathering with Get and Set cmdlets, 411**
- system health, troubleshooting Exchange 2007, 393–395**
- system policies, PowerShell alternative to, 469–471**

T

- /t, Setup.com, 73**
- tab expansion feature, for entering cmdlets and parameters, 21–23**
- table format. See Format-Table**
- /TargetDir, Setup.com, 73**
- Task Manager, 54**

- tasks, Exchange Management Shell administrative cmdlets, 8**
- Test-ActiveSyncConnectivity cmdlet, 400–402**
- Test-EdgeSubscription cmdlet, 240, 244**
- Test-EdgeSynchronization cmdlet, 409–410**
- Test-ExchangeSearch cmdlet, 408–409**
- Test-IPAllowListProvider cmdlet, 395–396**
- Test-IPBlockListProvider cmdlet, 396–397**
- Test-Mailflow cmdlet, 406–407**
- Test-MapiConnectivity cmdlet, 405–406**
- Test-OutlookWebServices cmdlet, 399–400**
- Test-OwaConnectivity cmdlet, 180, 402–403**
- Test-ReplicationHealth cmdlet, 351–352**
- Test-SenderID cmdlet, 397–398**
- Test-ServiceHealth cmdlet, 390**
- Test-SystemHealth cmdlet, 393–395**
- Test-UMConnectivity cmdlet, 410–411**
- Test-WebServicesConnectivity cmdlet, 404**
- time and date, cmdlets for managing, 483**
- TLS (Transport Layer Security), 239**
- Toolbox node, EMC, 38**
- top-level folders, public folders, 148–149**
- transport agents**
 - Enable-TransportAgent cmdlet, 264–265
 - Get-TransportAgent cmdlet, 264
 - overview of, 263
 - Set-TransportAgent cmdlet, 264
- transport architecture**
 - Hub Transport server, 192
 - routing and, 299
- Transport Layer Security (TLS), 239**
- transport pipeline**
 - Categorizer, 194
 - Local (MAPI) Delivery, 194
 - SMTP Receive, 192–194
 - SMTP Send/Remote Delivery, 194–197
 - Submission Queue, 193–194
- Tree view, EMC, 37**

troubleshooting Exchange 2007, 389–422

- anti-spam functions, 395–398
- CAS functions, 399–403
- Edge synchronization, 409–410
- event logging levels, 420–422
- Get and Set cmdlet for gathering system and application data, 411
- Get-EventLog cmdlet, 412–414
- Get-Message cmdlet, 414–417
- mailbox server roles, 405–406
- mailflow, 406–407
- overview of, 389–390
- search service, 408–409
- server health, 390–392
- summary, 422
- system health, 393–395
- Test-MapiConnectivity cmdlet, 405–406
- tracking messages, 417–420
- UM (Unified Messaging), 410–411
- web service connectivity, 404

U

/u, Setup.com, 73

UCE (Unsolicited Commercial E-mail), 235

UM (Unified Messaging) server, 273–293

- AD sites and, 301
- /AddUmLanguagePack, 75
- architecture and components, 274
- AutoAttendants (AA), 288–290
- configuring UM dial plan, 278–281
- configuring UM IP gateway, 281–282
- configuring UM mailbox policy, 282–284
- creating UM dial plan, 275
- creating UM IP gateway, 275–276
- creating UM mailbox policy, 276
- disk space requirements and, 67
- enabling users, 276–277
- Exchange 2007 deployment and, 80
- Exchange 2007 software requirements, 69
- Get-UM cmdlets for information retrieval, 284–286
- order of deploying Exchange roles, 77
- overview of, 273–274
- /RemoveUmLanguagePack, 76
- removing/disabling UM features, 291–293

- reviewing configuration, 277–278
- summary, 293
- Test-UMConnectivity, 410–411
- user management, 286–288

UM dial plan, 275, 278–281

UM IP gateway, 275–276, 281–282

UM mailbox policy, 276, 282–284

Undefined, routing delivery types, 303

Unified Communication certificates, 171

universal distribution groups, 102

universal security groups, 102–103

UNIX shells, 4

Unreachable, routing delivery types, 303

Unsolicited Commercial E-mail (UCE), 235

Update-PublicFolderHierarchy cmdlet, 155

Update-Safelist cmdlet, 241

/UpdatesDir, Setup.com, 73

Update-StorageGroupCopy cmdlet, 346, 348

UPN (User Principal Name)

- creating mailboxes and, 466
- creating new user mailbox and, 117
- Enable-Mailbox cmdlet and, 108
- UM accounts and, 277

URLs, CAS proxy and redirection, 181–183

user accounts, adding to distribution groups, 443

user accounts, group assignments, 443–449

- bulk-newmailbox.v2.ps1, script contents, 444–445
- examining bulk-newmailbox.v2.ps1, 446–448
- overview of, 443–449
- running bulk-newmailbox.v2.ps1, 448–449

user accounts, load balancing across mailbox servers, 449–454

- examining bulk-newmailbox.v3.ps1, script contents, 450–453
- overview of, 449–450
- running bulk-newmailbox.v3.ps1, script contents, 454

user accounts, mailbox-enabled, 425–443

- CSV file for, 430
- examining bulk-newmailbox.v1.ps1 script, 435–441
- improvements in bulk-newmailbox.v1.ps1 script, 432–434

user accounts, mailbox-enabled (continued)

- overview of, 425–426
- parameters for `New-Mailbox`, 428–429
- running improved script, 441–443
- running simple script, 430–431
- simple script for, 426–428

user objects, 96–101

- bulk-enabling existing users, 135–136
- `Connect-Mailbox` or `Disable-Mailbox`, 97
- creating mail user and mail contact, 126–127
- creating user mailbox, 113–119
 - creating/modifying, 105–106
- `Enable-Mailbox` cmdlet, 108–109
- equipment mailboxes, 98–99
- legacy mailboxes, 98
- `LinkedMailbox`, 97
- mail-enabled, 99–101
- modifying user mailbox, 119–122
- `New-Mailbox` cmdlet, 106–107
 - as recipients, 86–87
- `Remove-Mailbox` cmdlet, 109–110
- room mailboxes, 98
- setting existing mailboxes, 107–108
- shared mailboxes, 99
- `UserMailbox`, 96–97

User Principal Name. See UPN (User Principal Name)

user settings, CAS (Client Access Server), 164–165

UserMailbox, 96–97

users, UM

- enabling, 276–277
- managing, 286–288

V

validation, 51

variables

- automatic, 49
- in creating scripts, 427
- Exchange Management Shell, 49
- lifetime of user-defined variables, 49
- PowerShell, 48–49

VB.NET, 485–486

verb names, 9–10

Verb parameter, Get-Command cmdlet, 17–18

verb-noun pair, in cmdlet names, 9

version numbers, 318–319

Virtual Memory (VM(M)), 54

Visual Studio 2005, 486–487

W

web interface, for PowerShell scripts, 495

web services

- `Test-OutlookWebServices` cmdlet, 399–400
- `Test-WebServicesConnectivity` cmdlet, 404

web-based distribution

- CAS providing, 184
- Outlook 2007, 184

Where-Object cmdlet

- filtering event logs, 62
- filtering objects, 24–25
- filtering results obtained with
 - `Get-EventLog` cmdlet, 472–473
- finding property names and data types when using, 25–26

wildcard certificates, 171

wildcards, 47

Windows 2003 R2 SP2, 337

Windows Application log, 308–309

Windows OSs

- event logs, 60–63
- Exchange 2007 software requirements, 68
- processes, 54–55
- Registry, 57–60
- services, 55–56

Windows PowerShell, getting started.

See **PowerShell, getting started**

Windows PowerShell SDK, 485–486

Windows Scheduler (AT), 469

Windows Script Host

- lack of integration between shell and scripting languages, 5
- shell history and, 4

Windows Server 2003, 329

Windows Server 2003 Server Clustering (WSSC), 328
WinRoute, 309
Working Set (WS(K)), 54
Wrap parameter, Format-List, 47
Write-Host cmdlet, 473
WSSC (Windows Server 2003 Server Clustering), 328

X

X-MS-Exchange-Organization-SenderIdResult: PASSJunk E-Mail filter, 268–270