

Index

SYMBOLS

!, 36, 50
 \$?, 114
 \$_, 114
 %=, 50
 *
 string operator, 52
 wildcard, 100
 *=, 50
 +
 concatenation, 47, 49, 52
 positive number, 50
 +=, 50
 -
 decrements, 50
 negative number, 50
 -=, 50
 /=, 50
 =, 50
 [,], 101
 ` (back tick)
 concatenation and, 209, 225
 escape \$ and, 148, 201, 203, 213
 . (current directory), 97
 ++ (increment), 50
 .. (parent directory), 97
 ? (wildcard), 101
 #, comments and, 21, 60

A

abstract classes, 162
access control lists (ACLs), 520
 AccessLevel **parameter**, 214, 215
ACLs (access control lists), 520
 Add-Computer, 512
 Add-Content, 106, 107, 512
 Add-History, 507
 Add-Member, 520
 add-num.ps1, 20, 21, 22
 Add-PSSnapin, 243–244, 260, 261, 507
 Add-PSSnapinSqlServerCmdletSnapin100, 244
 Add-PSSnapinSqlServerProviderSnapin100, 244
Address Windowing Extensions (AWE), 356, 402, 404
 Add-Type, 521

admin **database**, 328, 468
administrative event logs, 124
 AdventureWorksTest, 297–298
Agent service, 148, 173, 176, 177, 178, 199, 200, 203, 383, 384, 386, 391, 397
aliases. See client aliases
All Programs, 11
 ALTER_DATABASE, 235
 ALTER_LOGIN, 233
 ALTER_PROCEDURE, 236
Analysis Services, 199, 200, 378
analytic event logs, 124
 -and, 36, 50
ANSI SQL, 220. *See also* WQL
ANSI-standard join clauses, 323–324
Appendix A (cmdlets), 507–530. *See also* cmdlets
Application event log, 126–127
 filtering, 168, 430
 args, 78, 81
arguments, 78–80
 defining, 78–79
 as switch, 79
arrays, 48–49
asterisk (*)
 string operator, 52
 wildcard, 100
 AUDIT_LOGIN_FAILED, 234
authentication, SQL Server, 254, 255
Auto Create Statistics, 325
Auto Update Statistics, 325
Auto_Close, 325, 480
“Auto_Close and Auto_Shrink Off” policy, 480–485
 AutomatedPolicyEvaluationMode property, 269, 270
automatic variables, 113–115
Auto_Shrink, 325, 480
availability, disaster recovery and, 327–328
AWBuildVersion table, 243
AWE (Address Windowing Extensions), 356, 402, 404
 AWEAllocated **table**, 402, 407

B

back tick (`)
 concatenation and, 209, 225
 escape \$ and, 148, 201, 203, 213

Backup-DataBase.ps1

Backup-DataBase.ps1, 289, 290

backups, 308–313, 451

best practice, 327

database, 308–310

differential, 288, 308, 312

full, 288, 308

monitoring, 468–472

restore, 313–316

full backup, 313

transaction log backup and full backup, 313–316

SMO.Backup and, 309

SMO.BackupDeviceItem and, 309

SqlConnection class and, 309

tempdb and, 327

transaction log, 288, 308, 311

uspBackupDB, 288–289

Batch-Test.bat, 17, 18

best practices. *See also standards*

data protection, 327

database design, 324–327

Microsoft Best Practices: Maintenance, 270

PowerShell coding, 329–331

Set-StrictMode and, 511

standards and, 317

binary large objects (BLOBs), 214, 326

BLOBs (binary large objects), 214, 326

“**blocked process threshold**” option, 229, 440, 441, 442, 443, 449

BLOCKED_PROCESS_REPORT, 229, 439

blockings, 229–232, 439–444

bottlenecks, 401, 409

Browser service, 199, 200, 216, 479

Business Intelligence Development Studio, 378

C

calc, 17

calculate-arith2.ps1, 60–61, 72

calculate-arith3.ps1, 69–70

calculate-arith4.ps1, 73–74

calculate-arith.ps1, 59–60, 80–81

calculator (Windows), 17

Caption, 179, 186

CATCH block, 323

centralized inventory server, 328, 333, 409

-ceq, 35, 51

c:test.log, 66, 67

-cge, 51

-cgt, 51

CHODE1, 201, 208, 209, 210, 222, 334, 368, 435, 479

Change, 173, 178

ChangeDefaultPortNumber.ps1, 212–213

ChangeStartMode, 173, 177

ChangeStartupParameters.ps1, 216–217

Check constraint, 320

CheckOnChanges, 270

CheckOnSchedule, 270

Checkpoint-Computer, 512

CheckPowershellPreqs.bat (**listing 1–1**), 3–5

Check-Services **function**, 423–424

Check-Services.ps1, 424–425

Check-SqlServices **function**, 425–426

Check-SqlServices.ps1, 426–427

child scopes, 86, 87, 99, 117, 511

CIM (Common Information Model) repository, 161, 162, 220

CIM Studio, 162

CIMOM (Common Information Model Object Manager), 161, 162

class library, SMO, 290

classes, 159. *See also specific classes*

abstract, 162

ClientNetworkProtocol, 203

dynamic, 162

extension, 162, 198

hierarchy, 162

.NET, 6, 209, 221, 265, 283, 521, 526

Policy, 268, 273, 277, 278

server events, 220

ServerNetworkProtocolProperty, 211, 212, 213, 393, 394

SqlService, 198, 212, 216, 427

SqlServiceAdvancedProperty, 216, 217, 218

static, 162

StdRegProv, 190, 191, 192, 193

Win32_Environment, 186, 187, 189

Win32_LogicalDisk, 95, 162, 163, 453, 457

Win32_NTEventLogFile, 163, 164

Win32_NTLogEvent, 163, 165, 166, 167, 168, 169

Win32_Process, 163, 179–186

Win32_Service, 163, 170–179

-cle, 51

Clear-Content, 106, 107, 512

Clear-EventLog, 136, 137, 512

Clear-History, 508

Clear-Item, 512

Clear-ItemProperty, 512

Clear-Variable, 112, 120, 521

ClientNetworkProtocol **class**, 203

client aliases, 207–211

client network protocols, 203–207

client tools (SQL Server), 378

-cli, 51

-clt, 51

cluster installation example (SQL Server 2008), 395–399

ClusterTemplate.txt, 395–397

Install-Instance.ps1, 397–398

ClusterNodes table, 350–354

schema, 351

script for creating, 350–351

Upsert-ClusterNode.ps1, 353–354

uspUpsertClusterNodes.sql, 351–353

- Clusters table**, 346–350
 - CreateClusters.sql, 347
 - schema, 346
 - Upsert-Cluster.ps1, 348–350
 - uspUpsertClusters.sql, 347–348
- ClusterTemplate.txt, 395–397
- cmatch**, 51
- cmd.exe, 2, 16, 22, 96, 508
- cmdlets**, 16, 18–19, 507–530
 - Add-Content, 106, 107, 512
 - Add-History, 507
 - Add-PSSnapin, 243–244, 260, 261, 507
 - Add-PSSnapinSqlServerCmdletSnapin100, 244
 - Add-PSSnapinSqlServerProviderSnapin100, 244
 - change location with, 96–98
 - Clear-Content, 106, 107, 512
 - Clear-EventLog, 136, 137, 512
 - Clear-History, 508
 - Clear-Variable, 112, 120, 521
 - command shell and, 22–23
 - Convert-UrnToPath, 246, 258
 - Copy-Item, 99, 102, 103, 512
 - Core snap-in and, 507–511
 - Debug-Process, 152, 513
 - Decode-SqlName, 246, 256, 257, 258
 - documentation, 31
 - Encode-SqlName, 246, 256, 257, 258
 - Enter-PSSession, 508, 510
 - event logs and, 136–140
 - eventing, 221
 - Exit-PSSession, 508
 - filtering and, 34–38
 - Format-Custom, 39, 523
 - Format-List, 27, 39, 40, 41, 42, 523
 - Format-Table, 39, 40, 41, 42, 198, 523
 - formatting and, 39–42
 - Format-Wide, 39, 523, 527
 - Get-ChildItem, 99, 100, 101, 121, 247, 248, 249, 252, 256, 262
 - Get-Command, 19, 25, 245, 246, 508
 - Get-Content, 62, 63, 89, 106, 107
 - Get-Event, 221, 222, 435, 515, 516, 517, 519
 - Get-Eventlog, 129, 130, 132, 133, 134, 136, 139, 429, 430, 431, 513
 - Get-EventSubscriber, 221, 223, 224, 435
 - Get-Help, 31–38, 507
 - Get-History, 115
 - Get-Item, 249, 254, 261, 280, 513
 - Get-Location, 96, 97, 249, 513, 514
 - Get-Member. *See* Get-Member
 - Get-Process. *See* Get-Process
 - Get-PSBreakpoint, 19
 - Get-PSCallStack, 19
 - Get-PSDrive, 19, 93–94, 108, 163, 246, 514
 - Get-PSProvider, 19, 94–95
 - Get-PSSession, 19
 - Get-PSSessionConfiguration, 19
 - Get-PSSnapin, 19, 24, 509
 - Get-Service, 39, 144–146
 - Get-Variable, 112, 118–119
 - Get-WmiObject, 53, 95, 162, 163, 164, 514
 - Invoke-History, 115, 510
 - Invoke-PolicyEvaluation, 246, 278, 280, 281
 - Invoke-Sqlcmd, 246, 253–255
 - Limit-EventLog, 136, 140, 515
 - list, 507–530
 - manage files/directories with, 98–106
 - manage variables with, 111, 112
 - Management snap-in and, 512–519
 - Microsoft.PowerShell.core, 24–25
 - Microsoft.PowerShell.Diagnostics, 27
 - Microsoft.PowerShell.host, 25
 - Microsoft.PowerShell.Management, 25–26
 - Microsoft.PowerShell.Security, 26
 - Microsoft.PowerShell.Utility, 27
 - Microsoft.WsMan.Management, 28
 - Move-Item, 99, 105, 515
 - New-Item, 99, 101, 102, 116, 117, 118, 515
 - New-Variable, 112, 116, 117–118, 526
 - object oriented, 44
 - Out-Default, 39, 526
 - Out-File, 136, 526
 - Out-GridView, 527
 - Out-Host, 527
 - Out-Null, 527
 - Out-Printer, 527
 - Out-String, 527
 - Pop-Location, 96, 98, 515
 - processes and, 151–157, 513–514, 517–519, 522
 - Push-Location, 96, 98, 516
 - Read-Host, 58–59, 527
 - Register-WmiEvent, 221, 222, 435
 - Remove-Event, 221, 223, 224, 435, 516
 - Remove-EventLog, 137, 516
 - Remove-Item, 99, 104, 516
 - Remove-Variable, 112, 119–120, 527
 - Rename-Item, 99, 105, 106, 516
 - Security snap-in and, 519–520
 - Select-Object, 34, 37, 95, 100, 165, 166, 168, 172, 187, 198, 203, 204, 206, 263, 528
 - services and, 143–151
 - Set-Content, 65, 66, 89, 106, 107, 517
 - Set-ExecutionPolicy, 22, 26, 520
 - Set-Item, 121, 517
 - Set-Location, 21, 22, 96, 97, 517
 - Set-PSDebug, 71, 72, 73, 74, 75, 511
 - Set-Service, 150–151, 517
 - Set-StrictMode, 511
 - Set-Variable, 112, 119, 529
 - Show-EventLog, 136, 137, 138, 140, 513, 517
 - snap-ins. *See* snap-ins
 - sorting and, 38–39
 - Start-Process, 152, 517, 518

cmdlets (continued)

cmdlets (continued)

Start-Service, 148–149
Start-Transcript, 25, 90, 91
Stop-Process, 155–157, 522
Stop-Service, 146–148
Stop-Transcript, 25, 90, 91
syntax, 28–31
Unregister-Event, 221, 223, 224, 435
Utility snap-in and, 520–530
verb-noun format, 18, 28, 329
Wait-Process, 152, 519
Where-Object, 25, 30, 31, 34, 35, 100, 119, 132
Write-Debug, 73–74, 75
Write-EventLog, 136, 138, 139, 519
Write-Host, 28, 59, 60, 61, 62, 64, 65, 530
Write-Output, 64, 65, 473, 530

-cne, 35, 51
-cnotlike, 51
-cnotmatch, 51

coding standard (PowerShell), 329–331
Collect-HostPerfmon.ps1, 414–416
Collect-SQLPerfmonData.ps1, 406–407

columns
adding, 307–308
listing, 305–306
naming conventions, 319
removing, 306–307

-command, 22, 23

command chaining, 25, 30–31

command console, 12, 13
launching PowerShell with, 11

command shell, 22–23
CommandLine, 179, 180, 186

command-line interfaces, GUIs v., 1–2

commands
cmdlets. *See* cmdlets
native, 16–18
script, 20–22
shell function. *See* functions
types, 16

comments
and, 21, 60
best practice, 330
multiline, 21
stored procedures and, 321–322

Common Information Model Object Manager (CIMOM), 161, 162

Common Information Model (CIM) repository, 161, 162, 220

Community Technology Preview, 3. *See also* PowerShell

Compact edition, 378
Compare-Object, 521

comparison operators, 35, 51–52. *See also* specific **comparison operators**

Complete-Transaction, 512
-computername option, 151

-computerName parameter, 163, 164, 175, 201, 208

concatenation
+, 47, 49, 52, 59
back tick and, 209, 225
ConcatName, 78, 79, 85, 89, 90

conditional statements, 52–54

conditions, 260, 263–268
Create method, 265
Drop method, 266

Configuration Manager, 185, 197, 218, 378. *See also* **WMI Provider for Configuration Management**

-confirm switch parameter, 30, 137, 147, 148, 149, 156, 157

Connectivity Components (SQL Server), 378

console, writing to, 64–65

consumer (WMI), 162

-contains, 35
ConvertFrom-Csv, 521
ConvertFrom-SecureString, 519
ConvertFrom-StringData, 521
Convert-Path, 512
ConvertTo-Csv, 521
ConvertTo-Html, 522
ConvertTo-SecureString, 520
ConvertTo-Xml, 522
Convert-UrnToPath, 246, 258
Copy-Item, 99, 102, 103, 512
Copy-ItemProperty, 512

Core snap-in, 24–25
cmdlets related to, 507–511

CreatDiskUsagebyServer.sql, 455–456
Create **method**, 265
CreateClusters.sql, 347
CREATE_DATABASE, 236
CreateDatabaseSpace.sql, 461–462
CreateDatabases.ps1, 368–369
CreateDiskSpace.sql, 452
CreateHosts.sql, 337–338
CreateKey **method**, 193
CREATE_LOGIN, 233
CreatePolicy.ps1, 273–275
CREATE_PROCEDURE, 237
CreateServerAlias2008.ps1, 211
Create-Servers.ps1, 356
CreationDate, 179, 180
CSName, 179

current directory (.), 97

cursors, 322

C:MyPsTranscripts.txt file, 90, 91

D

Data Definition Language. *See* DDL

data protection standards/best practices, 327

data queries, 221

“Database Auto Options Disabled” policy, 481–485

- Database Engine**, 214, 226, 328, 437
- Database Engine Services**, 378, 436, 441, 446
- Database Engine Tuning Advisor**, 378
- databases. *See also tables; specific databases***
 - admin, 328, 468
 - AdventureWorksTest, 297–298
 - best practices, 325
 - DDL scripts and, 487–489
 - design standards/best practices, 324–327
 - file growth, monitoring, 461–468
 - file location, 328
 - monitoring, 235–236
 - MyDB2, 298–299
 - MyDBTest, 299–304
 - naming conventions, 318
 - objects, monitoring, 236–239
 - performance and, 326
 - scratch*, 328
 - size of, 325
 - SMOs and, 297–304
- Databases table**, 368–373
 - CreateDatabases.ps1, 368–369
 - schema, 373
 - Upsert-Database.ps1, 370–373
 - uspUpsertDatabases.sql, 369–370
- DatabaseSpace table**, 461–468
 - creation of, 461–462
 - schema, 461
 - utilization of, 467–468
- DataCollection**, 247
- DataSet class**, 284, 285
- date values, variables and**, 47
- date/datetime data types**, 323
- dbaLib.ps1**, 224
 - adding snap-ins (script) and, 260–261
- dbaLib.ps1, 465
- dba_MonitorBackups **stored procedure**, 479, 480
- DBO as object owner**, 321
- dbo schema**, 321
- DCOM security**, 160
- dcomcnfg**, 160
- DDL (Data Definition Language)**, 219, 246, 487
- DDL scripts**, 487–506. *See also scripts*
 - databases, 487–489
 - functions, 500–501
 - schemas, 489–491
 - SMO and, 487
 - stored procedures, 498–500
 - tables, 494–496
 - user views, 496–498
 - user-defined data types, 491–494
 - users, 503–506
 - XML schemas, 502–503
- DDL_LOGIN_EVENTS, 233
- DDL_PROCEDURE_EVENTS, 236
- DDL_SERVER_LEVEL_EVENTS, 235
- DEADLOCK_GRAPH **trace event class**, 226, 444
- deadlocks**, 226–229, 444–449
- Debug**, 30
- debug event logs**, 124
 - Debug **parameter**, 329
- debugging**, 71–75
 - \$DebugPreference, 75, 115
 - Debug-Process, 152, 513
- Declarative Management Framework (DMF)**, 265
- Decode-SqlName, 246, 256, 257, 258
- decrement (-)**, 50
- DEFAULT**, 247, 249
- Default constraint**, 320
- default formatter**, 39, 526
- default schema**, 321
- Delete method**, 189, 209
 - DeleteClientAlias.ps1, 209
 - DeleteValue **method**, 194
- DEMOPC**, 201, 208, 210, 220, 222, 334, 379
- deprecated features**, 324
 - desc **parameter**, 38
- Description, 171, 186
 - description <string>, 117
 - detailed **parameter**, 31, 32
- Developer edition**, 378, 379
- Diagnostics snap-in**, 27
- differential backup**, 288, 308, 312
- directories, managing, cmdlets for**, 98–106
 - Disable-ComputerRestore, 513
 - DisableListenOnAllIPs.ps1, 213–214
 - Disable-PSBreakpoint, 522
- disaster recovery, high availability and**, 327–328
- disk space usage, monitoring**, 451–460
- DiskSpace table**, 452–454
 - creation of, 452
 - schema, 452
 - utilization of, 467–468
- DiskUsageByServer, 454–460
 - creation of, 455–456
 - schema, 455
- DisplayName**, 171
- Distributed COM Users group**, 160
- DMF (Declarative Management Framework)**, 265
- DML statements**, 323
- DML triggers**, 319
- DMVs (dynamic management views)**, 404, 417
- dollar symbol (\$)**
 - `, 114
 - \$_, 114
 - escape, back tick and, 148, 201, 203, 213
 - variables and, 45
- domain guest cannot access server, 273, 475
- do-until **loop**, 56–57
- do-while **loop**, 56
- drives**, 93
 - list of, 94
 - variable, 88, 93, 111, 121
- Drop **method**, 266
- DROP_DATABASE, 236

DROP_LOGIN

DROP_LOGIN, 233
DROP_PROCEDURE, 237
dynamic classes, 162
dynamic management views (DMVs), 404, 417

E

editors. See also Notepad

Group Policy Object Editor, 160
Object Editor, 166
Registry Editor, 193
text, 21

ELSEIF statements, 53

Enable-ComputerRestore, 513
EnableFileStream.ps1, 215
Enable-PSBreakpoint, 522
Encode-SqlName, 246, 256, 257, 258
-encoding unicode, 63, 66

Enforce (value), 270

Enterprise edition, 378, 379

Enter-PSSession, 508, 510
Enumkey **method**, 191, 192

EnumProcess(), 292

environment drives, 93, 94

environment variables, 93, 121–122

WMI and, 186–189

-eq, 35, 51

errors

nonterminating, 67
terminating, 67

\$Error, 67, 68, 114

@@ERROR, 323

Error (log entry type), 128

error handling, 67–71

“**Error:**” **keyword**, 63, 65

error log (SQL Server), 225–226, 433–439

ErrorAction, 30, 69

\$ErrorActionPreference, 115

ErrorControl, 171

ERRORLOG, 225

ErrorVariable, 30, 69

event attributes, 124

Event Collector service, 124

event handling, 221–225

Event Log service, 124–125

event logs, 123–140. *See also logs*

administrative, 124
analytic, 124
Application, 126–127
Clear-EventLog, 136, 137, 512
cmdlets related to, 136–140
debug, 124
entry types, 128–134
Error, 128
Failure Audit, 129
Information, 128

Success Audit, 129

Warning, 128

Get-Eventlog, 129, 130, 132, 133, 134, 136,
139, 429, 430, 431, 513

Limit-EventLog, 136, 140, 515

monitoring, 429–433

operational, 124

Remove-EventLog, 137, 516

Security, 128

Show-EventLog, 136, 137, 138, 140, 513, 517

System, 128

types of, 124, 125–126

WMI and, 164–170

Write-EventLog, 136, 138, 139, 519

event queries, 221

Event Registration Tool, 162

Event Viewer, 125, 162

eventvwr, 125

EventVwr, 125, 137

exception handling, 330–331

exclamation point (!, logical operator), 36, 50

-exclude <string[]>, 119

EXIT keyword, 508

ExitCode **property**, 170

Exit-PSSession, 508

Export-Alias, 522

Export-Clixml, 522

Export-Console, 508

Export-Csv, 522

Export-PSSession, 523

Express edition, 378

expressions, 49. *See also operators*

extended procedures, 233

extension classes, 162, 198

F

-f, 52

facet, 260

failed login attempts, 233–235

Failure Audit (log entry type), 129

\$False, 114

file contents, managing, 106–107

file location, database, 328

file system drives, 93, 95–107

list of, 95

navigating, 96–98

files

managing, cmdlets for, 98–106

writing to, 65–66

FILESTREAM, 214–216

access level values, 215

enabling, 214, 215

filtering, 34–38

Application log, 168, 430

Firewall, Windows, 160, 368

“follow the sun” support model, 373

- for **loop**, 55
 - force **parameter**, 103, 252
 - \$ForEach, 114
 - foreach **statement**, 57–58
 - ForEach-Object, 508
 - foreign keys**, 320
 - format, log**, 329
 - Format-Custom, 39, 523
 - Format-List, 27, 39, 40, 41, 42, 523
 - Format-Table, 39, 40, 41, 42, 198, 523
 - formatter, default**, 39, 526
 - formatting**, 39–42
 - Format-Wide, 39, 523, 527
 - full **parameter**, 33
 - Full-Text Filter Daemon**, 199, 200
 - Full-Text Search feature**, 379
 - “_function_”, 501
 - function scope**, 87–88
 - functions**, 19–20, 77–81. *See also specific functions*
 - arguments, 78–80
 - DDL scripts and, 500–501
 - Help, 34
 - list-ini, 20
 - returning values, 80–81
 - reuse and, 19, 77, 88, 89, 223, 224
 - user-defined, naming conventions, 319
 - FunctionScope.ps1, 87–88
- G**
- ge, 35, 51
 - Get-Acl, 26, 520
 - Get-Alias, 523
 - GetAssemblies **method**, 209
 - Get-AuthenticodeSignature, 520
 - getBlockedProcessesDetails, 238
 - Get-ChildItem, 99, 100, 101, 121, 247, 248, 249, 252, 256, 262, 513
 - Get-Command, 19, 25, 245, 246, 508
 - Get-Command -CommandType cmdlet *service*, 143
 - Get-Command *process* -CommandType 'cmdlet', 153
 - Get-ComputerRestorePoint, 513
 - Get-Content, 62, 63, 89, 106, 107, 513
 - Get-Credential, 520
 - Get-Culture, 523
 - Get-Date, 524
 - Get-Event, 221, 222, 435, 515, 516, 517, 519
 - Get-EventLog, 513
 - Get-Eventlog, 129, 130, 132, 133, 134, 136, 139, 429, 430, 431, 513
 - Get-EventSubscriber, 221, 223, 224, 435
 - Get-ExecutionPolicy, 520
 - Get-Help, 31–38, 507, 508–509
 - Get-Help Get-Process, 29, 31, 32, 33
 - Get-History, 115, 509
 - Get-Host, 524
 - Get-Hotfix, 513
 - Get-Item, 249, 254, 261, 280, 513
 - Get-ItemProperty, 513
 - Get-Job, 509
 - Get-Location, 96, 97, 249, 513–514
 - Get-Member, 45, 46
 - defined, 524
 - \$Error and, 67
 - event class and, 167, 168
 - Get-Process and, 154
 - Get-Service and, 144, 145
 - Method and, 204
 - methods/properties and, 99, 100, 130, 249, 250, 254
 - SMO and, 291
 - Get-PfxCertificate, 520
 - Get-Process, 18, 153–155, 514
 - command chaining and, 30–31
 - Get-Member and, 154
 - output of, 153, 182
 - Win32_Process and, 182–183
 - Get-PS, 19
 - Get-PSBreakpoint, 19, 524
 - Get-PSCallStack, 19, 524
 - Get-PSDrive, 19, 93–94, 108, 163, 246, 514
 - Get-PSProvider, 19, 94–95, 514
 - Get-PSSession, 19, 509
 - Get-PSSessionConfiguration, 19
 - Get-PSSnapIn, 509
 - Get-PSSnapin, 19, 24, 509
 - Get-Random, 524
 - GetSecurityDescriptor, 173
 - Get-Service, 144–146, 514
 - Get-Member and, 144, 145
 - sorting and, 39
 - Get-SQLVersion.ps1, 286–287
 - GetStringValue, 193
 - Get-Tables.ps1, 287–288
 - Get-TraceSource, 524
 - Get-Transaction, 514
 - Get-UICulture, 524
 - Get-Unique, 524
 - Get-Variable, 112, 118–119, 525
 - Get-WMIEvent **functions**, 224–225, 434–435
 - Get-WMIEvent.ps1, 223–224
 - Get-WmiObject, 53, 95, 162, 163, 164, 514
 - Get-WmiObject -class __Namespace -namespace root | Select-Object Name, 162
 - Get-WmiObject -class Win32_Environment | Get-Member, 187
 - Get-WmiObject -class Win32_Environment | Select-Object Name, VariableValue, 187
 - Get-WmiObject -class Win32_NTEventlogFile | Format-Table -wrap, 164

Get-WmiObject -class (continued)

Get-WmiObject -class Win32_Process, 179
Get-WmiObject -class Win32_Service, 170
Get-WmiObject -computerName PowerServer3
 -class Win32_Process, 183
Get-WmiObject -computerName PowerServer3
 -class Win32_Service, 170
Get-WmiObject -list, 163
global DBA group, 373
global scope, 85, 87
gpedit.msc, 160
graphical user interfaces. See GUIs
Group Policy Object Editor, 160
Group-Object, 525
-gt, 35, 51
Guest Permissions policy, 277
GUIs (graphical user interfaces), command-line interfaces v., 1-2

H

HandleCount, 181
handling errors. See error handling
Help function, 34
-help parameter, 79, 329
high availability, disaster recovery and, 327-328
hives, 190, 191
HKEY_CLASSES_ROOT, 191
HKEY_CURRENT_CONFIG, 191
HKEY_CURRENT_USER, 191
HKEY_DYN_DATA, 191
HKEY_LOCAL_MACHINE, 191
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WBEM Scripting, 163
HKEY_USERS, 191
\$Home, 114
Host snap-in, 25
HostPerfmonDLL.sql file, 414
hosts (SQL Server)
 information, SMOs and, 296
 performance data collection, 408-417
 pinging, 420-423
 SQL Server-related services and, 423-427
 uptime of, 427-429
Hosts table, 335-346
 CreateHosts.sql, 337-338
 schema, 335-337
 Upsert-Host.ps1, 341-344, 380
 uspUpsertHosts.sql, 338-341

I

-ieq, 51
IF statement, 53-54
-ige, 52
-igt, 52
-ile, 52
-ilike, 52
-ilt, 52
-imatch, 52

538

Import-Alias, 525
Import-Clixml, 525
Import-Csv, 525
Import-LocalizedData, 525
Import-PSSession, 525
-include <string[]>, 119
increment (++), 50
indexes, naming convention for, 319
-ine, 52
infinite loop, 222, 434
Information (log entry type), 128
infrastructure, WMI, 162
-inotlike, 52
-inotmatch, 52
inputs
 parameters as, 59, 60, 61
 Read-Host cmdlet, 58-59, 527
 text files as, 62-64
installation (SQL Server 2008), 377-399
 cluster installation example, 395-399
 standalone installation example, 389-395
 template for, 381-389
Install-AutoOptionsOff.ps1, 483-484
InstallDate, 186
Install-Instance.ps1, 383-389, 397-398
Install-MonitorBlocking.ps1, 441-443
Install-MonitorDeadlock.ps1, 446-447
Install-MonitorErrorLogsTask.ps1,
 437-438
Install-MonitorWindowsEventLogs.ps1,
 432-433
Install-StoredProcNamingConvention
 Policy.ps1, 476-478
Integrated Scripting Environment (ISE), 3, 11
Integration Services, 199, 200, 328, 378, 384,
 386, 427
inventory database (SQL Server), 333-376
 centralized inventory server, 328, 333, 409
inventory database (SQL_Inventory), tables
 ClusterNodes table, 350-354
 Clusters table, 346-350
 Databases table, 368-373
 Hosts table, 335-346
 Servers table, 355-368
 supplementary, 373-376
Invoke-Command, 509
Invoke-Expression, 526
Invoke-History, 115, 510
Invoke-Item, 514
Invoke-PolicyEvaluation, 246, 278, 280, 281
Invoke-Sqlcmd, 246, 253-255
ISE (Integrated Scripting Environment), 3, 11

J

join clauses, 323-324
Join-Path, 515

K**KernelModeTime**, 181**keywords**

"Error:", 63, 65
 EXIT, 508
 LIKE, 322
 reserved, 320
 "throw," 69

L

\$LastExitCode, 114

-le, 35, 51**-like**, 35, 51, 52**LIKE keyword**, 322

Limit-EventLog, 136, 140, 515

listing 1-1 CheckPowershellPreqs
.bat, 3-5**list-ini function**, 20

LoadWithPartialName, 210, 290

local scope, 86, 87**location**, 96

change, with cmdlets, 96-98

LogFileUsage, 402, 407

logical operators, 50

!, 36, 50

-and, 36, 50

-not, 36, 50

-or, 36, 50

login changes, monitoring, 233**logs. See also event logs**

backup, 288, 308, 311

best practices, 324

entry types, 128-134

Error, 128

Failure Audit, 129

Information, 128

Success Audit, 129

Warning, 128

format of, 329

naming convention, 329

size of, 325

loop constructs, 54-58

do-until loop, 56-57

do-while loop, 56

foreach statement, 57-58

for loop, 55

while loop, 55-56

loop, infinite, 222, 434**-lt**, 35, 51**lusrmgr.msc**, 160**M****-Mail parameter**, 329**managed resource**, 161**Management snap-in**, 25-26

cmdlets related to, 512-519

ManageSQLServerService.ps1, 201**managing**

client network protocols, 203-207

file contents, 106-107

files/directories, 98-106

server network protocols, 211-214

SQL Server client aliases, 207-211

SQL Server services, 198-203

variables, 111, 112

-match, 51, 52

\$MaximumHistoryCount, 115

MaximumWorkingSetSize, 181

Measure-Command, 526

Measure-Object, 526

MemoryPerHost **setting**, 165, 166**methods. See also specific methods**

Get-Member and, 99, 100, 130, 249, 250, 254

Microsoft Best Practices: Maintenance, 270**Microsoft Clustering Service. See MSCS****Microsoft Management Console (MMC)**, 125, 197**Microsoft.PowerShell.core**, 24-25**Microsoft.PowerShell.Diagnostics**, 27**Microsoft.PowerShell.host**, 25**Microsoft.PowerShell.Management**, 25-26**Microsoft.PowerShell.Security**, 26**Microsoft.PowerShell.Utility**, 27

Microsoft.SqlServer.Management.Dmf, 265, 475

Microsoft.SqlServer.Management.Smo

.relocatefile, 313, 314

Microsoft.SqlServer.Management.Smo

.Scripter **class**, 303, 487, 488

Microsoft.SqlServer.Management.Smo

.Server **class**, 251, 290, 298, 303, 487, 488,

490, 492, 497, 499, 502, 504

Microsoft.SqlServer.Management.Smo

.StoredProcedure, 488, 499

Microsoft.SqlServer.Smo.dll assembly, 209, 290**Microsoft.SqlServer.SqlWmiManagement.dll assembly**, 209, 210**Microsoft.WsMan.Management**, 28**MinimumWorkingSetSize**, 181**MMC (Microsoft Management Console)**, 125, 197**models**

Common Information Model Object Manager, 161, 162

Common Information Model repository, 161, 162, 220

WMI model, 161-164

Monitor-Backups.ps1, 470-471

Monitor-Blocking.ps1, 440-441

MonitorBlockings.ps1, 230

MonitorDatabases.ps1, 236

Monitor-Deadlock.ps1, 445-446

MonitorDeadlocks.ps1, 226, 227

MonitorErrorLog.ps1, 225-226

MonitorFailedLoginAttempts.ps1

MonitorFailedLoginAttempts.ps1, 234

monitoring (SQL Server), 419–450, 451–473

backups, 468–472

blockings, 229–232, 439–444

database file growth, 461–468

database objects, 236–239

databases, 235–236

deadlocks, 226–229, 444–449

disk space usage, 451–460

event logs, 429–433

failed login attempts, 233–235

hosts

pinging, 420–423

SQL Server-related services and, 423–427

uptime of, 427–429

login changes, 233–235

SQL Server error log, 225–226, 433–439

MonitorLogins.ps1, 233

Monitor-SQLServerErrorLog.ps1, 436

MonitorStoredProcs.ps1, 237, 238

Monitor_WindowsEventLogs, 438

Monitor-WindowsEventLogs.ps1, 430–432

more, 33

Move-Item, 99, 105, 515

Move-ItemProperty, 515

MoveNext (), 114

MSCS (Microsoft Clustering Service), 346, 348,

350, 380

msdb.dbo.backupset **table**, 468, 469, 480

MS-DOS, 2, 3, 33

MSSQLSERVER, 171, 172, 176

multiline comments, 21

multi-table.ps1, 61–62

Murphy's law, 327

MyDB2, 298–299

MyDBTest, 299–304

compatibility level, 302–303

differential backup, 312

execute stored procedure/query, 301

scripting of, 303

set_RecoveryModel method and, 300, 302

transaction log backup, 311

MyDBTest2, 313, 314

MyError, 69

myfunction, 86

mymodule.ps1, 84–85, 89

\$mynumvar, 45

Myscope.ps1, 86

\$mystrvar, 45

\$myvar, 45, 86, 120

N

-name **parameter**, 119, 154

Name **property**, 170, 186

named parameters, 28–29

Named Pipes **protocol**, 192, 193, 204, 205,
206, 211

naming conventions

Check constraint, 320

columns, 319

databases, 318

Default constraint, 320

foreign keys, 320

general rules, 320

indexes, 319

log files, 329

primary keys, 320

roles, 320

script, 329

SQL Server standards, 318–320

stored procedures, 318–319, 475

tables, 318

triggers, 319

user-defined data types, 319–320

user-defined functions, 319

variables, 320, 330

views, 318

native commands, 16–18

-ne, 35, 51

.NET classes, 6, 209, 221, 265, 283, 521, 526

.NET Framework

download, 6

install, 6

SQL Server 2008 install and, 242

.NET-based object library, 487, 506. **See also** SMOs

network protocols

client, 203–207

server, 211–214

New-Alias, 526

newest **parameter**, 132

New-EventLog, 137, 138

New-Item, 99, 101, 102, 116, 117, 118, 515

New-Object, 526

New-PSDrive, 515

New-PSSession, 510

New-Service, 515

New-TimeSpan, 526

New-Variable, 112, 116, 117–118, 526

New-Item v., 117–118

syntax, 117

New-WebServiceProxy, 515

“no server access” condition, 265, 267, 273, 275,
475

NODE1, 334

NODE2, 334

nonterminating errors, 67

non-uniform memory access (NUMA) nodes, 213

-not, 36, 50

-notcontains, 35

Notepad

add-num.ps1 and, 20, 21, 22

calculate-arith.ps1 and, 59–60

C:MyPsTranscripts.txt file and, 90, 91

Notepad (continued)

native command, 16
 read-errorlog.ps1 and, 63–64
 sqlevents.txt file and, 136, 137
 terminate, 185

Notify-WMIEvent **function**, 435, 439, 440

-notlike, 35, 51

-notmatch, 51

noun format, verb-, 18, 28, 329

NsService, 200

NTFS file system, 214

NUMA (non-uniform memory access) nodes, 213

numeric assignment operators, 50

%=, 50

*=, 50

+ =, 50

- =, 50

/=, 50

=, 50

variables and, 45, 47

O

Object Browser, 162

Object Editor, 166

object owner, DBO as, 321

object-oriented cmdlets, 44

object-oriented design principles, 162

operational event logs, 124

operators, 45, 50–52

comparison, 51–52

logical, 50

numeric assignment, 50

string, 52

unary, 50

-option <ScopedItemOptions>, 117

-or, 36, 50

OSName, 180

OtherOperationCount, 182

OtherTransferCount, 182

Out-Default, 39, 526

Out-File, 136, 526

Out-GridView, 527

Out-Host, 527

Out-Null, 527

Out-Printer, 527

output, 64–67

writing to console, 64–65

writing to file, 65–67

OutputBuffer, 30

OutputVariable, 30

Out-String, 527

P

PageFaults, 181

PageFileUsage, 181

parameters, 59, 60, 61. *See also specific parameters*

AccessLevel, 214, 215

-computerName, 163, 164, 175, 201, 208

Debug, 30

-Debug, 329

default, scripts and, 329

-desc, 38

-detailed, 31, 32

ErrorAction, 30

ErrorVariable, 30

-force, 103, 252

-full, 32, 33

-help, 79, 329

information on, 30

-Mail, 329

-name, 119, 154

named, 28–29

newest, 132

OutputBuffer, 30

OutputVariable, 30

-Path, 102, 121

positional, 29–30

-recurse, 103, 104

script, 81–84

switches v., 79. *See also* switch parameters

-Type, 101

Verbose, 30

WhatIf, 30

wildcards and, 29

parent directory (..), 97

ParentProcessId, 180

-passThru <SwitchParameter>, 117

-Path **parameter**, 102, 121

PATH variable, 12

PathName, 171

PBM. See Policy-Based Management

PeakPageFileUsage, 181

PeakVirtualSize, 181

PeakWorkingSetSize, 181

PerfDisk_PhysicalDisk, 409, 414

PerfMon_DB, 409, 414, 415, 416

performance

bottlenecks, 401, 409

database design and, 326

guidelines, 326–327

performance counters, 27, 153, 182, 297

performance data collection

host-related, 408–417

SQL Server-related, 401–408

Perform-PostSetupTasks.ps1, 392–395

PerfRawData_PerFOS_Memory, 409, 414

PerfRawData_PerFOS_Processor, 409, 415

PerfRawData_PerfProc_Process, 409, 415

PerfRawData_Tcpip_NetworkInterface, 409, 415

permissions

ACLs and, 520

Guest Permissions policy, 277

permissions (continued)

permissions (continued)

- special, 325
 - WMI and, 159–161
- \$PID, 114
- Ping-Host function, 421–422
- Ping-Hosts.ps1, 422
- pinging SQL Server hosts, 420–423
- pipe (|), 25
- pipelines, 30, 65. *See also* command chaining
- plus (+)
 - concatenation, 47, 49, 52
 - unary operator, 50
- policies, 268–281, 475–486. *See also* **SQLSERVER:SQLPolicy folder**
 - “Auto_Close and Auto_Shrink Off,” 480–485
 - “Database Auto Options Disabled,” 481–485
 - manual evaluation, 278–279
 - “Stored Procedure Naming Convention,” 475–480
- Policy class, 268, 273, 277, 278
- Policy-Based Management (PBM)**, 259–262, 475, 485
 - conditions and, 260, 263–268
 - online information, 260
 - policies and. *See* policies
 - terms in, 259
- Pop-Location, 96, 98, 515
- positional parameters**, 29–30
- positive (+)**, 50
- pound symbol (#)**, 21, 60
- POWERPC**, 334
- POWERSERVER3**, 334
- PowerShell**
 - 1.0
 - SQL Server 2008 install and, 242
 - uninstalling, 7
 - 2.0 CTP3, 3, 7, 10
 - coding, standards/best practices, 329–331
 - installing, 7–10
 - prerequisites, 2–7
 - standard for, 329
 - ISE, 3, 11
 - launching, 10–13
 - All Programs, 11
 - command console, 11
 - on SQL Server, 242–244
 - SSMS and, 243
 - StartRun, 11–13
 - Management snap-in, 25–26
 - cmdlets related to, 512–519
 - prompt and, 329
 - purpose of, 1, 2
 - RTM, 3, 10, 151
 - SDK, 18
 - SQL Server and, 241–258. *See also* SQL Server SQLConnection class and, 283–290, 309
 - version, choosing, 329
 - window, title and, 329
- powershell**, 11

preference variables, 115–116

primary keys, 320

Priority, 180

PrivatePageCount, 181

processes, 151–157

change priority of, 155

cmdlets related to, 151–157, 513–514, 517–519, 522

Debug-Process, 152, 513

Get-Process, 18, 153–155

command chaining and, 30–31

Get-Member and, 154

Start-Process, 152, 517, 518

Stop-Process, 155–157, 522

Wait-Process, 152, 519

WMI and, 179–186

ProcessId, 171, 180

production standards (SQL Server), 327–328

\$Profile, 115

\$profile, 89, 115

Profiler (SQL Server), 378

profiles, 20, 88–90

%UserProfile%\Documents\WindowsPowerShell\
Microsoft.PowerShell_profile.ps1, 89, 115, 224

%UserProfile%\Documents\WindowsPowerShell\
profile.ps1, 88

%UserProfile%\My
Documents\WindowsPowerShellMicrosoft
.PowerShell_profile.ps1, 89, 115, 224

%UserProfile%\My Documents\WindowsPowerShell\
profile.ps1, 88

%windir%\system32\WindowsPowerShell\v2.0\
Microsoft.PowerShell_profile.ps1, 88

%windir%\system32\WindowsPowerShell\v2.0\
profile.ps1, 88

programming languages, basic requirements for, 44

prompt, PowerShell, 329

properties. *See also specific properties*

Get-Member and, 99, 100, 130, 249, 250, 254

providers (WMI), 161, 162. *See also* **WMI Provider for**

**Configuration Management; WMI Provider for
Server Events**

.ps1 files, 20, 44. *See also* **scripts**

\$PSHome, 115

Push-Location, 96, 98, 516

\$pwd, 115

Q

queries

data, 221

event, 221

schema, 221

SELECT* and, 322

Query Optimizer, 325

“quota violation,” 165

QuotaNonPagedPoolUsage, 182

QuotaPagedPoolUsage, 182
QuotaPeakNonPagedPoolUsage, 182
QuotaPeakPagedPoolUsage, 182

R

RAID configuration, 328
read-errorlog2.ps1, 65–66
read-errorlog.ps1, 63–64
read-file.ps1, 62
Read-Host, 58–59, 527
ReadOperationCount, 182
ReadTransferCount, 182
Receive-Job, 510
recovery, high availability and, 327–328
 -recurse **parameter**, 103, 104
RegionHolidays table, 374, 376
Regions table, 374, 375
RegionSupportShifts table, 374, 375
Register-WmiEvent, 221, 222, 435
registry drives, 93, 108–111
Registry Editor, 193
registry, WMI and, 190–195
release to manufacturing (RTM), 3, 10, 151
Remove-Computer, 516
Remove-Event, 221, 223, 224, 435, 516
Remove-EventLog, 137, 516
Remove-Item, 99, 104, 516
Remove-ItemProperty, 516
Remove-Job, 510
Remove-PSBreakpoint, 527
Remove-PSDrive, 516
Remove-PSSession, 510
Remove-PSSnapIn, 510
Remove-Variable, 112, 119–120, 527
Rename-Computer, 516
Rename-Item, 99, 105, 106, 516
Rename-ItemProperty, 516
-replace, 52
 -replace, 47, 52
Replication feature, 379
Reporting Services, 199, 200, 378, 427
reserved keyword, 320
Reset-ComputerMachinePassword, 516
Resolve-Path, 516
Restart-Computer, 516
Restart-Service, 517
restore, 313–316
 full backup, 313
 transaction log backup and full backup, 313–316
Restore-Computer, 517
Resume-Service, 517
returning values, 80–81
reuse
 functions and, 19, 77, 88, 89, 223, 224. **See also**
 functions
 scripts and, 42, 77, 440. **See also** **scripts**

roles, 320
 best practices, 325
 security and, 325
rootCIMV2 namespace, 162, 163, 165, 170, 190
rovar, 117, 118, 119, 120
RTM (release to manufacturing), 3, 10, 151

S

schema(s)
 ClusterNodes table, 351
 Clusters table, 346
 data protection and, 327
 Databases table, 373
 DatabaseSpace table, 461
 dbo, 321
 DDL scripts and, 489–491
 default, 321
 DiskSpace table, 452
 DiskUsageByServer, 455
 Hosts table, 335–337
 queries, 221
 RegionHolidays table, 374, 376
 Regions table, 374, 375
 RegionSupportShifts table, 374, 375
 ServerBUContacts table, 374, 375
 Servers table, 355–356
 tables and, 318
 views and, 318
 XML, DDL and, 502–503
 -scope <string>, 117
scopes
 child, 86, 87, 99, 117, 511
 function, 87–88
 global, 85, 87
 local, 86, 87
 script, 86, 87
 variable, 85–87
scratch database, 328
“script cannot be loaded because execution of script is disabled”, 21
script commands, 20–22
script parameters, 81–84
script scope, 86, 87
 ScriptAlter **method**, 267
 ScriptCreate **method**, 267
 Script-Db.ps1, 488–489
 ScriptDrop **method**, 267
 Scripter **class**, 303, 487, 488
 Script-Function.ps1, 500–501
Scripting Library, WMI, 161, 162
scripts, 43, 44, 59
 add-num.ps1, 20, 21, 22
 Backup-DataBase.ps1, 289, 290
 basic requirements for, 44
 calculate-arith2.ps1, 60–61, 72
 calculate-arith3.ps1, 69–70

scripts (continued)

scripts (continued)

calculate-arith4.ps1, 73–74
calculate-arith.ps1, 59–60, 80–81
ChangeDefaultPortNumber.ps1, 212–213
ChangeStartupParameters.ps1, 216–217
Check-Services.ps1, 424–425
Check-SqlServices.ps1, 426–427
ClusterNodes table creation and, 350–351
Collect-HostPerfmon.ps1, 414–416
Collect-SQLPerfmonData.ps1, 406–407
command shell and, 22–23
CreateDatabases.ps1, 368–369
CreatePolicy.ps1, 273–275
CreateServerAlias2008.ps1, 211
Create-Servers.ps1, 356
DDL, 487–506
 databases, 487–489
 functions, 500–501
 schemas, 489–491
 stored procedures, 498–500
 tables, 494–496
 user views, 496–498
 user-defined data types, 491–494
 users, 503–506
 XML schemas, 502–503
default parameters, 329
DeleteClientAlias.ps1, 209
DisableListenOnAllIPs.ps1, 213–214
EnableFileStream.ps1, 215
FunctionScope.ps1, 87–88
Get-SQLVersion.ps1, 286–287
Get-Tables.ps1, 287–288
Get-WMIEvent.ps1, 223–224
Install-AutoOptionsOff.ps1, 483–484
Install-Instance.ps1, 383–389, 397–398
Install-MonitorBlocking.ps1, 441–443
Install-MonitorDeadlock.ps1, 446–447
Install-MonitorErrorLogsTask.ps1, 437–438
Install-MonitorWindowsEventLogs.ps1, 432–433
Install-StoredProcNamingConvention Policy.ps1, 476–478
Monitor-Backups.ps1, 470–471
Monitor-Blocking.ps1, 440–441
MonitorBlockings.ps1, 230
Monitor-Deadlock.ps1, 445–446
MonitorDeadlocks.ps1, 226, 227
MonitorErrorLog.ps1, 225–226
MonitorFailedLoginAttempts.ps1, 234
MonitorLogins.ps1, 233
Monitor-SQLServerErrorLog.ps1, 436
Monitor-WindowsEventLogs.ps1, 430–432
multi-table.ps1, 61–62
mymodule.ps1, 84–85, 89
Myscope.ps1, 86
naming convention, 329
Perform-PostSetupTasks.ps1, 392–395
Ping-Hosts.ps1, 422
read-errorlog2.ps1, 65–66
read-errorlog.ps1, 63–64
read-file.ps1, 62
reuse and, 42, 77, 440
Script-Db.ps1, 488–489
Script-Function.ps1, 500–501
Script-Schema.ps1, 490–491
Script-SP.ps1, 498–499
Script-TableData.ps1, 494–496
Script-UDDtype.ps1, 491–492
Script-UDtype.ps1, 492–493
Script-User.ps1, 503–504
Script-View.ps1, 497
Script-XMLSchema.ps1, 502
Test-Args1.ps1, 81
Test-Args2.ps1, 82
Test-Args3.ps1, 83–84
test-trap.ps1, 70–71
Update-DiskSpace.ps1, 456–459
Update-SQLServerHosts.ps1, 428
Upsert-ClusterNode.ps1, 353–354
Upsert-Cluster.ps1, 348–350
Upsert-Database.ps1, 370–373
Upsert-Host.ps1, 341–344, 380
Upsert-Server.ps1, 361–368
Script-Schema.ps1, 490–491
Script-SP.ps1, 498–499
Script-Table.ps1, 494–496
Script-UDDtype.ps1, 491–492
Script-UDtype.ps1, 492–493
Script-User.ps1, 503–504
Script-View.ps1, 497
Script-XMLSchema.ps1, 502
SDK (Software Development Kit), 18
security
 best practices, 325
 DCOM, 160
 roles and, 325
Security event log, 128
Security snap-in, 26
 cmdlets related to, 519–520
segregation, 328
SELECT*, 322
Select-Object, 34, 37, 95, 100, 165, 166, 168, 172, 187, 198, 203, 204, 206, 263, 528
Select-String, 528
Send-Email **function**, 420–421
Send-MailMessage, 528
Serialize **method**, 270, 271, 272
server components (SQL Server), 378
Server Events. See WMI Provider for Server Events
server events classes, 220
Server Management Objects. See SMOs
server network protocols, 211–214
ServerBUContacts table, 374, 375
ServerNetworkProtocolProperty **class**, 211, 212, 213, 393, 394

- Servers table**, 355–368
 - Create-Servers.ps1, 356
 - schema, 355–356
 - Upsert-Server.ps1, 361–368
 - uspUpsertServers stored procedure, 357–361
- Service Broker**, 220, 259
- services (SQL Server)**, 198–203
 - start modes, 203
 - states, 200
 - types, 199, 200
- services (Windows)**, 141–151
 - cmdlets related to, 143–151
 - WMI and, 170–179
- SET NOCOUNT ON, 323, 404, 415, 463
- Set-Acl, 520
- Set-Alias, 528
- Set-AuthenticodeSignature, 520
- Set-Content, 65, 66, 89, 106, 107, 517
- Set-Date, 528
- Set-ExecutionPolicy, 22, 26, 520
- Set-Item, 121, 517
- Set-ItemProperty, 517
- Set-Location, 21, 22, 96, 97, 517
- SetPriority, 183–185
- Set-PSBreakpoint, 528–529
- Set-PSDebug, 71, 72, 73, 74, 75, 511
- set_RecoveryModel **method**, 300, 302
- SetSecurityDescriptor, 173
- Set-Service, 150–151, 517
- SetStartMode, 202, 203
- Set-StrictMode, 511
- SetStringValue **method**, 194
- Set-TraceSource, 529
- Set-Variable, 112, 119, 529
- SetX.exe**, 122
- shell functions**. *See* **functions**
- Show-EventLog, 136, 137, 138, 140, 513, 517
- SilentlyContinue, 75, 115, 116
- size, database/log file**, 325
- SMO.Backup **class**, 309
- SMO.BackupDeviceitem **class**, 309
- SMOs (Server Management Objects)**, 209, 290–316
 - backup with, 308–313
 - class library, 290
 - databases and, 297–304
 - DDL scripts and, 487. *See also* DDL scripts
 - restore with, 313–316
 - SQL Server and, 290–297
 - change login mode, 296
 - database-related information, 295
 - host information, 296
 - performance counters, 297
 - properties/methods, 291
 - server-related information, 293–294
 - SPID information, 292
 - version information, 291–292
 - tables and, 304–308
 - “TestDatabase” and, 251–252
- snap-ins**, 23–28, 241
 - adding, dbaLib.ps1 and, 260–261
 - Core, 24–25
 - cmdlets related to, 507–511
 - Diagnostics, 27
 - Host, 25
 - Management, 25–26
 - cmdlets related to, 512–519
 - Security, 26
 - cmdlets related to, 519–520
 - SQL Server, 241, 242
 - Utility, 27
 - cmdlets related to, 520–530
 - WsMan.Management, 28
- Software Development Kit (SDK)**, 18
- sorting**, 38–39
- Sort-Object, 30, 31, 38–39, 529
- Source **option**, 138
- sourcing**, 84–85
- sp_configure, 229, 260, 294
- Split-Path, 517
- sp_trace_setevent, 233
- sp_trace_setstatus, 233
- SQL (child item)**, 247
- SQL Server**
 - 2008. *See also* installation
 - editions, 378
 - installation, 377–399
 - advanced properties, changing, 216–218
 - Agent service, 148, 173, 176, 177, 178, 199, 200, 203, 383, 384, 386, 391, 397
 - Analysis Services, 199, 200, 378
 - authentication, 254, 255
 - Browser service, 199, 200, 216, 479
 - Business Intelligence Development Studio, 378
 - client aliases, 207–211
 - client tools, 379
 - Configuration Manager, 185, 197, 218, 378. *See also* WMI Provider for Configuration Management
 - Connectivity Components, 378
 - Database Engine Tuning Advisor, 378
 - date/datetime data types, 323
 - development standards, 318–320
 - error log, monitoring, 225–226, 433–439
 - hosts
 - information, SMOs and, 296
 - performance data collection, 408–417
 - installation, 377–399
 - cluster installation example, 395–399
 - standalone installation example, 389–395
 - template for, 381–389
 - Integration Services, 199, 200, 328, 378, 384, 386, 427
 - inventory database. *See* inventory database
 - launching PowerShell on, 242–245
 - monitoring, 419–450, 451–473
 - blockings, 229–232, 439–444
 - database objects, 236–239

SQL Server (continued)

SQL Server (continued)

- databases, 235–236
- deadlocks, 226–229, 444–449
- error log, 225–226, 433–439
- event logs, 429–433
- failed login attempts, 233–235
- login changes, 233–235
- performance data collection, 401–408
- PowerShell and, 241–258
- PowerShell provider, 242
 - restrictions of, 250
- production standards, 327–328
- Profiler, 378
- Reporting Services, 199, 200, 378, 427
- segregation and, 328
- server components, 378
- SMOs and, 290–297
 - change login mode, 296
 - database-related information, 295
 - host information, 296
 - performance counters, 297
 - properties/methods, 291
 - server-related information, 293–294
 - SPID information, 292
 - version information, 291–292
- snap-ins, 241, 242
- standards, 318
- traces, 233

SQL Server Management Studio (SSMS)

- launching PowerShell through, 243
- query window, 216, 226, 230, 231, 233, 236, 237, 443, 444, 447, 448

SQL Server-related services, hosts and, 423–427

SQL2008CLUSTER, 334, 350, 354, 380, 395, 397, 398

- SQLCommand **class**, 284
- SQLConnection **class**, 283–290, 309
- SQLDataAdapter **class**, 284
- sqlevents.txt file, 136, 137
- sqlevents.xml file, 135

SQL_Inventory. See inventory database

SQLPerfmonDDL.sql file, 406

- sqlps utility, 241–245

SQLRegistration, 247, 248

SQLRestore(), 313, 314

SQLSERVER: drive, 241, 245, 246, 256, 258, 259, 260, 261, 283

- child items, 247

SQLSERVERAGENT, 173, 174, 175, 176, 177, 203

- SqlServerAlias **class**, 208, 209, 211
- SqlServerCmdletSnapin100, 245, 246
- SqlServerProviderSnapin100, 245, 246

SQLSERVER:SQLPolicy folder, 247, 259–262

- SqlServerService **class**, 198, 212, 216, 427
- SqlServerServiceAdvancedProperty **class**, 216, 217, 218

SQLservr.exe, 172, 179, 180, 182, 184

SSMS. See SQL Server Management Studio

standalone installation example (SQL Server 2008), 389–395

- Perform-PostSetupTasks.ps1, 392–395
- template file for, 389–391
- StandaloneTemplate.txt, 389–391

Standard edition, 378, 379

standards, 317–331

- best practices and, 317
- data protection, 327
- database design, 324–327
- PowerShell coding, 329–331
- SQL Server, 318
 - development, 318–320
 - production, 327–328
 - stored procedure, 321–324

Start Run, PowerShell and, 11–13

Started, 171

- Start-Job, 511

- StartMode **property**, 171

StartName, 172

- Start-Process, 152, 517, 518

- Start-Service, 173, 174

- Start-Service, 148–149, 518

- Start-Sleep, 529

- Start-Transaction, 518

- Start-Transcript, 25, 90, 91

static classes, 162

- Status **property**, 171

- StdRegProv, 190, 191, 192, 193

- Step, 71, 511

- Stop-Computer, 518

- Stop-Job, 511

- Stop-Process, 155–157, 518, 522

- StopService, 173

- Stop-Service, 146–148, 518

- Stop-Transcript, 25, 90, 91

- “**stored procedure**”, 499

- “**Stored Procedure Naming Convention**” policy, 475–480

stored procedures

- comments and, 321–322

- cursors and, 322

- dba_MonitorBackups, 479, 480

- DDL scripts and, 498–500

- naming conventions for, 318–319, 475

- SELECT* and, 322

- small, 321

- standards, 321–324

- temporary tables and, 322

- “usp” and, 318, 475

- uspMonitorBackups, 468–469

- uspUpsertClusterNodes, 351, 353

- uspUpsertClusters, 347

- uspUpsertDatabases, 369

- uspUpsertDatabaseSpace, 462

- uspUpsertDiskspace, 453

- uspUpsertHosts, 338

string operators, 52

Success Audit (log entry type), 129
supplementary tables (inventory database), 373–376
 Suspend-Service, 518
svchost.exe, 125
switch parameters, 83
 -confirm, 30, 137, 147, 148, 149, 156, 157
 -unique, 165, 166, 168
 -WhatIF, 116, 146, 157
switch statement, 53
switches
 arguments as, 79
 parameters v., 79
syntax
 cmdlet, 28–31
 New-Variable, 117
 sys.dm_exec_query_stats, 404
 sys.dm_exec_sql_text, 404
 sys.dm_os_memory_clerks, 404
 sys.dm_os_performance_counters, 404
 sys.dm_os_schedulers, 404
System event log, 128
SystemName, 172
SystemVariable, 186

T

“**table_**”, 496

tables

AWBuildVersion, 243
 AWEAllocated, 402, 407
 ClusterNodes table, 350–354
 Clusters table, 346–350
 columns
 adding, 307–308
 listing, 305–306
 removing, 306–307
 creating, 305
 Databases table, 368–373
 DatabaseSpace, 461–468
 DDL scripts and, 494–496
 DiskSpace, 425–454, 467–468
 dropping, 308
 Hosts table, 335–346
 LogFileUsage, 402, 407
 msdb.dbo.backupset, 468, 469, 480
 naming convention for, 318
 RegionHolidays, 374, 376
 Regions, 374, 375
 RegionSupportShifts, 374, 375
 schema and, 318
 ServerBUContacts, 374, 375
 Servers table, 355–368
 SMOs and, 304–308
 supplementary (inventory database), 373–376
 TaskCount, 402, 407
 temporary, 322
 Test, 227, 231, 232, 330, 444, 448, 449

Test2, 227, 448, 449
 TopMemConsumption, 402, 407
 TopQueries, 402, 407
 user-defined, 324
target sets, 259, 260
targets, 259
Task Scheduler 2.0, 124
 TaskCount, 402, 407
taskmgr, 151
 TaskMgr, 151
TCP/IP ports, 368, 441, 476, 481
 #1433, 193, 206, 212
 #3660, 212, 213
 #7001, 206, 207, 208, 210, 395, 399
 TCP/IP **protocol**, 192, 204, 205, 206, 210, 212,
 367, 368, 385
 Tee-Object, 529
 tempdb
 backup and, 327
 split, 325
 temporary tables and, 322
template (SQL Server installation), 381–389
 Install-Instance.ps1, 383–389
temporary tables, 322
 Terminate, 183, 185–186
terminating errors, 67
 Test **table**, 227, 231, 232, 330, 444, 448, 449
 Test2 **table**, 227, 448, 449
 Test-Args1.ps1, 81
 Test-Args2.ps1, 82
 Test-Args3.ps1, 83–84
 Test-Connection, 519
 “TestDatabase”, 251–252
 Test-Path, 519
 test-trap.ps1, 70–71
text editors, 21. *See also* Notepad
text files, 62–64
 TextData **property**, 227, 228–229, 231
ThreadCount, 181
“throw” keyword, 69
 TopMemConsumption, 402, 407
 TopQueries, 402, 407
 ToUpper **method**, 46
 Trace, 71, 72, 73, 511
 Trace-Command, 529
traces, 233
transaction log backup, 288, 308, 311
transcripts, 90–91
 Transfer object, 505
 TRAP, 70–71
triggers, 319
 \$True, 115
 TRY **block**, 323
T-SQL command (example), 286–287
 -Type **parameter**, 101

U

“_udtype_”, 494
unary operators, 50
 Undo-Transaction, 519
Uniform Resource Name (URN), 256–258
 -unique **switch parameter**, 165, 166, 168
 Unregister-Event, 221, 223, 224, 435
 Update-DiskSpace.ps1, 456–459
 Update-FormatData, 529
 Update-List, 529
 Update-SQLServerHosts.ps1, 428
 Update-TypeData, 529–530
 Upsert-ClusterNode.ps1, 353–354
 Upsert-Cluster.ps1, 348–350
 Upsert-Database.ps1, 370–373
 Upsert-Host.ps1, 341–344, 380
 Upsert-Server.ps1, 361–368
URN (Uniform Resource Name), 256–258
 “_user_”, 504
user profiles. *See profiles*
user views, DDL scripts and, 496–498
user-created variables, 116–120
user-defined data types, 319–320
 DDL scripts and, 491–494
user-defined functions, 319
user-defined tables, 324
UserModeTime, 181
UserName, 186
 %UserProfile%\Documents\WindowsPowerShell\
 Microsoft.PowerShell_profile.ps1, 89, 115, 224
 %UserProfile%\Documents\WindowsPowerShell\
 profile.ps1, 88
 %UserProfile%\My Documents\WindowsPowerShell\
 Microsoft.PowerShell_profile.ps1, 89, 115, 224
 %UserProfile%\My
 Documents\WindowsPowerShell\profile.ps1, 88
users, DDL scripts and, 503–506
 Use-Transaction, 519
 “usp,” 318, 475. *See also stored procedures*
 uspBackupDB, 288–289
 uspMonitorBackups **stored procedure**, 468–469
 uspUpsertClusterNodes **stored procedure**, 351,
 353
 uspUpsertClusterNodes.sql, 351–353
 uspUpsertClusters **stored procedure**, 347
 uspUpsertClusters.sql, 347–348
 uspUpsertDatabases **stored procedure**, 369
 uspUpsertDatabaseSpace **stored procedure**, 462
 uspUpsertDatabaseSpace.sql, 462–463
 uspUpsertDatabases.sql, 369–370
 uspUpsertDiskSpace **stored procedure**, 453
 uspUpsertDiskSpace.sql, 453–454
 uspUpsertHosts **stored procedure**, 338
 uspUpsertHosts.sql, 338–341
 uspUpsertServers **stored procedure**, 357–361
Utility snap-in, 27
 cmdlets related to, 520–530

V

-valueOnly <SwitchParameter>, 119
values, returning, 80–81
varbinary (max), 214, 326
variable drives, 88, 93, 111, 121
variable scope, 85–87
variables, 44–47. *See also specific variables*
 automatic, 113–115
 date values and, 47
 dollar symbol and, 45
 environment, 93, 121–122
 WMI and, 186–189
 equals operator and, 45, 47
 managing, with cmdlets, 111, 112
 naming convention for, 320, 330
 preference, 115–116
 user-created, 116–120
VariableValue, 186
VBScripts, 2, 18, 162
VCS (Veritas Cluster Server), 348
verb-noun format, 18, 28, 329
Verbose, 30
Veritas Cluster Server (VCS), 348
versions
 PowerShell, 329
 SQL Server, SMOs and, 291–292
 “_view_”, 498
views
 DMVs, 404, 417
 naming convention for, 318
 schema and, 318
VirtualSize, 182

W

Wait-Job, 511
 Wait-Process, 152, 519
Warning (log entry type), 128
 \$WarningPreference, 116
wbemtest.exe, 165
Web edition, 378
wevutil, 124
WhatIf, 30
 -WhatIf **switch parameter**, 116, 146
 \$WhatIfPreference, 116
 Where-Object, 25, 30, 31, 34, 35, 100, 119,
 132, 511
 while **loop**, 55–56
wildcards
 *, 100
 ?, 101
 [,], 101
 parameter values and, 29
 Win32_Environment, 186, 187, 189
 Win32_LogicalDisk, 95, 162, 163, 453, 457
 Win32_NTEventlogFile, 163, 164
 Win32_NTLogEvent, 163, 165, 166, 167, 168, 169

XML schemas, DDL scripts and

- Win32_PerfRawData_PerfDisk_PhysicalDisk, 414
 - Win32_PerfRawData_PerfOS_Memory, 414
 - Win32_PerfRawData_PerfOS_Processor, 414
 - Win32_PerfRawData_PerfProc_Process, 414
 - Win32_PerfRawData_Tcpip_NetworkInterface, 414
 - Win32_Process, 163, 179–186
 - CPU-related properties, 181
 - Get-Process and, 182–183
 - I/O related properties, 182
 - memory-related properties, 181–182
 - SetPriority and, 183–185
 - static properties, 179–180
 - Terminate and, 183, 185–186
 - Win32_Service, 163, 170–179
 - methods, 173
 - properties, 170–172
 - %windir%\system32\WindowsPowerShell\v2.0\Microsoft.PowerShell_profile.ps1, 88
 - %windir%\system32\WindowsPowerShell\v2.0\profile.ps1, 88
 - Windows calculator**, 17
 - Windows event logs**. *See* **event logs**
 - Windows Firewall**, 160, 368
 - Windows Management Instrumentation**. *See* **WMI**
 - Windows PowerShell**. *See* **PowerShell**
 - Windows processes**. *See* **processes**
 - Windows Remote Management (WinRM)**, 6–7
 - Windows services**. *See* **services**
 - WindowsVersion, 180
 - WinRM (Windows Remote Management)**, 6–7
 - WMI (Windows Management Instrumentation)**, 95, 159–195
 - CIM Studio, 162
 - classes. *See* **classes**
 - consumer, 162
 - DCOM security and, 160
 - environment variables and, 186–189
 - event logs and, 164–170
 - Event Registration Tool, 162
 - Event Viewer, 125, 162
 - importance of, 159
 - infrastructure, 162
 - managed resource, 161
 - model, 161–164
 - Object Browser, 162
 - permission issues and, 159–161
 - processes and, 179–186
 - providers, 161, 162
 - registry and, 190–195
 - Scripting Library, 161, 162
 - services and, 170–179
 - Windows Firewall settings and, 160
 - WMI Provider for Configuration Management**, 197–218
 - client network protocols and, 203–207
 - FILESTREAM settings and, 214–216
 - server network protocols and, 211–214
 - SQL Server advanced properties and, 216–218
 - SQL Server client aliases and, 207–211
 - SQL Server services and, 198–203
 - WMI Provider for Server Events**, 197, 219–240
 - blockings and, 229–232
 - database monitoring and, 235–236
 - database object monitoring and, 236–239
 - deadlocks and, 226–229
 - event handling and, 221–225
 - failed login attempts and, 233–235
 - login changes and, 233
 - online information, 239
 - overview, 219–220
 - SQL Server error log and, 225–226
 - WQL and, 220–221
 - WMI Query Language**. *See* **WQL**
 - WMI Windows Installer Provider**, 5
 - Workgroup edition**, 378
 - WorkingSetSize**, 181
 - WQL (WMI Query Language)**, 220–221
 - Write-Debug, 73–74, 75, 530
 - Write-Error, 530
 - Write-EventLog, 519
 - Write-Host, 28, 59, 60, 61, 62, 64, 65, 473, 530
 - WriteOperationCount**, 182
 - Write-Output, 64, 65, 473, 530
 - Write-Progress, 530
 - WriteTransferCount**, 182
 - Write-Verbose, 530
 - Write-Warning, 530
 - writing**
 - to console, 64–65
 - to file, 65–67
 - Ws-Management**, 6–7
 - WsMan.Management snap-in**, 28
- X**
- “_xml_”, 503
 - XML schemas, DDL scripts and**, 502–503