COUNTA function 163
COUNTAX function 162, 163
COUNTBLANK function 163
COUNTROWS function 163, 175, 182
CUBERANGE function 163
CreateAndSendCrashReports 386
CROSSJOIN function 168, 169
currency data type 95, 96
custom security 343
custom sorting 18, 55, 148
implementing 149
in tabular projects 306
CUSTOMDATA function 157, 349
dashboards
defined 141
implementing in Excel 142
implementing in Power View 314
data alerts 6
Data Analysis Expressions 10
and Report Builder 27
functions 161
new functions 37
operators 160
syntax 160
understanding 156
data collation 94
data denormalization 32
data drivers 64
data latency 335
data mining 5, 6
Data Mining add-in 8
data providers 64, 298
Data Quality Services 7
data refresh
configuring data sources 270
jobs 269
monitoring 271
security 268
understanding 266
Data Refresh web parts 274
data security 290, 343
data sources
managing 259
managing connection strings 365
shared 259
data types 95
converting 96
reason for changing 95
Data View
displaying data 338
understanding 92
data warehousing 26, 32, 336
database roles
adding members 351
creating 345
testing 349
understanding 344
database schema types 59
database synchronization 372
DatabaseCollection object 388
Databases
attaching and detaching 368
backing up 367
deploying 369
managing 365
restoring 368
synchronizing 372
testing 365
DataDir property 362
Date data type 95
Date table 18, 40, 44
implementing 148
understanding 147
Data Quality Services 7
DATEDATE function 167
dates
and calculated columns 171
sorting 55
DATESBETWEEN function 167, 192
DATESINPERIOD function 167
DATESMTH function 167
DATEQTD function 167
DateStream feed 147
DATESYTD function 167
DAX See Data Analysis Expressions
DAX editor 305
DAX queries
introducing 318
understanding syntax 318
Decimal Number data type 95
declarative relationships 23
default partition 328
Default processing option 308
DEFINE clause 318
delegating user identity 356
denied sets 347
dependent services 362
deploying changes 369
deploying projects
settings 307
testing 310
troubleshooting 309
deployment script 371
Deployment Wizard 369
command-line mode 370
running 370
DeploymentMode property 362
DeploymentOptions file 370
DeploymentTargets file 370
DESCENDANTS function 161
Designers group 280
Desktop Experience feature 215
detaching databases 368
detail-level reporting 45
development best practices 295
Diagram View 17, 37
making schema changes 115
understanding 114
dimension calculated members 24
dimension data security 347
dimension tables 60
dimensional modeling 295
dimensions 32
DirectQuery 10, 21, 290, 325, 365
and OLAP clients 339
enabling 338
events 341, 380
implementing 340
hybrid modes 339
limitations 337
testing 341
understanding 336
when to use 336
DirectQueryMode setting 339
DirectQuery-only partitions 339, 341
Discover events 380
DISCOVER_COMMANDS 385
DISCOVER_CONNECTIONS 385
DISCOVER_SESSIONS 385
Display folders 24, 98
distinct count 44, 181
distinct count calculations 24
DISTINCT function 163, 182, 322
DISTINCTCOUNT function 132, 163
DMVs 384
Do Not Process option 308
Document Approval workflow 264
double-hop authentication 356
DQS See Data Quality Services
Dr. Watson minidumps 386
draft workbooks 263
drillthrough actions 18, 24, 27, 99, 140
dynamic data security 348
and trusted accounts 355
implementing 350
dynamic management views 384
E
EARLIER function 163
EARLIEST function 163
EffectiveUserName 316, 349, 352, 355, 357
embedded connections 249
ENDOFMONTH function 166
ENDOFQUARTER function 166
ENDOFYEAR function 166
end-user features 147
error handling in Tabular 307
Error List window 307, 338
error logging 386
error messages 367
Errors and Warnings events 380
ETL See Extracting, Transforming, and Loading
EVALUATE clause 318
events 379
Excel 8
  connecting to PowerPivot 132
  installing for Tabular 297
  using for testing security 349
Excel Calculation Service 201
Excel Calculation Services 200
Excel files
  importing from 74, 86
Excel OLAP reports 222
  implementing 229
Excel reporting options 43
Excel Services 8, 199
Excel Starter Edition 35
Excel Viewer web page 226
Excel Web Access Service 200
Excel Web Access web part 200, 227
Excel Web Applications 35
Excel web reports 19, 222
  defining parameters 226
  introducing 221
  viewing 223
Excel Web Services 200
Existing Connections 103, 271, 304
EXISTS function 138
explicit measures
  implementing 179
  implementing in Tabular 304
  introducing 158
  syntax in Calculation Area 180
expressions 160
Extended Events 5
external security 347
Extracting, Transforming, and Loading 6, 12, 32
extranet security 356

F
fact tables 32, 60
factless fact table 352
filter expressions 346
FILTER function 163, 175, 319, 321
  filtering
  and partitions 329
  and Power View 243
  in Data View 94
  in Power View 318
filtering data 68
FILTERS function 165
FIRSTDATE function 166
FIRSTNONBLANK function 166
fixed-length files 73
flat files 73, 85
Flattened PivotTable layout 129
Flight Recorder 382
foreign key 61
FORMAT function 162
formatting columns 56, 96
Full Control permission level 281
Full processing option 308
fully-additive measures 192

G
Gartner Magic Quadrant 3
GENERATE function 168, 169
generic query designer 69
Geography data type 95
GetSnapshot.exe 267
g graphical query designer 68, 119, 328

H
HardMemoryLimit property 363
HASONEFILTER function 165
HASONEVALUE function 165
HideMemberIf property 155
hierarchies 17, 37, 171
  balanced 155
  defined 152
  implementing 153
  ragged 155
Hierarchy Managers group 280
HTTP access 356
HTTPS protocol 355
hybrid storage modes 339

I
IF 163, 192
IIF operator 118
images 37
IMDBs See in-memory databases
impersonating users 282, 355
implicit measures 158
  and tabular projects 304
  implementing 176
  in Power View 239
  introducing 131
  showing 178
implicit relationships 33
importing data with custom query 68
inactive relationships 113, 115
incremental processing 25, 330
  implementing in SSIS 378
infinite clickthrough 27
InfoPath Form Services 199
Infrastructure section 276
Infrastructure web part 274
in-memory databases 12
In-Memory setting 338
Integration Services project 376
interactive data analysis 33
Intranet security considerations 355
Invoke-ASCmdlet cmdlet 392
Invoke-ProcessDimension cmdlet 392
Invoke-ProcessPartition cmdlet 392
iPad support 221
ISBLANK function 321
ISCROSSFILTERED function 165
ISFILTERED function 165, 192
ISSUBTOTAL function 321

J
Join function 253
JSON 75

K
KEEPFILTERS function 324
Kerberos authentication 268, 350, 356
  configuring 356
  troubleshooting 356
key columns 61
key performance indicators 8, 17, 24, 37, 38, 118
  and PerformancePoint 199
implementing 185
importing 83
properties 70

L
LASTDATE function 166
LASTNONBLANK function 166, 192
LastNonEmpty function 193
Legend Fields zone 128
line chart visualization 317
linked tables 38, 79
  and data refresh 270
  creating 51
  limitations 80
  managing 80
load testing 384
LogViewer 218
lookup tables 60
LOOKUPVALUE function 163, 164, 190, 348, 351, 354

INDEX 399
low latency 290
LowMemoryLimit property 364

M
management dashboard 19
managing roles with PowerShell 392
many-to-many relationships 24, 191
map files 364
Master Data Services 7
matrix visualization 317
MAX function 162
MaxIdleSessionTimeout property 381
maximum file size in SharePoint 257
MAXX function 162
MDS  See Master Data Services
MDX  See Multidimensional Expressions
MDX queries tracing 38
MDX designer 70, 84, 250, 298, 365
Measure Grid 305
measures
  implicit vs. explicit 158
  introducing 158
  vs. calculated columns 159
member properties 24
MEMBER_KEY property 118
Members group 280
memory
  configuring 364
  estimating 363
memory planning
  for Analysis Services Tabular 291
metadata changes
  detecting 133
metadata improvements 37, 72, 131
Microsoft BI platform 4
Microsoft Query 44
Microsoft SQL Server 5
MIN function 162
minidump 386
MINX function 162
mixed storage mode 337
MOLAP  See Multidimensional OLAP
MsBuild 370
msmdsrv.ini file 361
Multidimensional
  benefits 32
    comparing with Tabular 22
    defined 2
  enhancements in SQL 2012 5
importing from 70
in Adventure Works 46
multidimensional cubes 32
multidimensional databases 70
Multidimensional Expressions 10
Multidimensional OLAP 10, 325
multiples 242, 316

N
named calculations 27, 157
named instances 360
named sets 70, 136
native pivot reports 44, 125
netstat utility 362
NEXTDAY function 167
NEXTMONTH function 167
NEXTQUARTER function 167
NEXTYEAR 167
None permission 345
Notification events 380
NTLM protocol 356
NUMA 5

O
Object Role Modeling 26
object security 348
OData  See Open Data Protocol
ODBC 65
ODBC data sources 44
Office 365 35, 199
Office connection files 104
Office Web Components 297
OLAP browser 5
OLAP clients 221
OLAP pivot reports 125
OLAP PivotTable Extensions 38
OLE DB 65
online analytical processing 32, 60
Online Analytical Processing  See Online Analytical Processing
Open Data Protocol 25, 75
operational reports 248
operators 160
Oracle 27
ORDER BY clause 318
organizational BI 20
challenges 33
classic solution 32
defined 2
understanding 289
vs. personal BI 290
Owners group 280
passwords 66
PATH function 189
PATHCONTAINS function 348, 351
PATHITEM function 190
percent of total 183
performance considerations 24
performance counters 382
PerformancePoint Services 8, 199, 213
permission levels 279
permissions 278, 345
personal BI 16
  benefits 34
  challenges 34
  defined 2
  demand 12
  understanding 34
  vs. organizational BI 290
perspectives 17, 24, 37
and hierarchies 154
implementing 150
testing 152
pie charts 142
pivot reports
  comparing 125
  moving 127
OLAP features 136
refreshing 133
understanding 125
PivotCache 125
PivotChart 39, 53, 125
implementing 141
improving appearance 141
PivotChart layout 128
PivotTable 8, 39, 53, 125
improving 138
types of 125
PivotTable Field List 129, 229, 308
PivotTable report layout 126
port number 362
Power View 18
  column data types 44
image support 236
Kerberos 357
architecture 231
introduced 6
introducing 221
keeping unique rows 236
understanding 231
PowerPivot Configuration Tool 209
PowerPivot Field List 38,54,128,222
vs. PivotTable Field List 129
PowerPivot for Excel
32-bit vs. 64-bit 35, 42
installing 36
introduced 16
maximum file size 42
memory consumption 43
new features 17, 37
storing data 42
system requirements 35
understanding 35
upgrading 36
PowerPivot for SharePoint
configuring 209
connecting to workbooks 71
installing 203
introduced 18
managing settings 256
prerequisites 203
security 281
troubleshooting 211
understanding 200
upgrading 212
verifying setup 213
PowerPivot Gallery 19, 224, 258, 316
introducing 213
PowerPivot Management Dashboard
understanding 272
usage collection 272
PowerPivot models 41
implementation steps 43
importing 302
publishing 214
securing in SharePoint 281
upgrading 216
PowerPivot reports
defined 125
limitations 44
vs. native reports 44
PowerPivot ribbon 38
PowerPivot System Service 201, 266
PowerPivot Web Service 201
PowerPivot window 38
PowerPivot workbooks 313
PowerPoint 247
PowerShell 5, 291, 391
PowerShell for AMO 390
PREVIOUSSDAY function 167
PREVIOUSMONTH function 167
PREVIOUSQUARTER function 167
PREVIOUSYEAR function 167
PREVMEMBER function 161
primary keys 61, 109
Process Add 378
Process All 332
Process Clear 330, 333
Process Data 330, 376, 390
Process Default 330, 333, 371, 374
Process Defrag 330
Process Full 330, 371
Process Partitions 332
Process permission 345
Process Recale 330, 376, 379, 390
Process Table 332
Process Update 331
processing
automating with SSIS 376
managing 374
monitoring 383
scheduling with SQL Agent 375
scripting 374
understanding 330
with PowerShell 392
processing options 330, 371
processing script 374
processing windows 326
professional features 290
professional toolset 290
Progress events 380
project configurations 309
project properties 308
proxy account in SQL Agent 375
pump component 356
push-mode processing 376
Q
QlikView 12
Query Begin event 341
Query events 380
Query Mode setting 338
Query Processing events 380
Query String Filter web part 227
Quick Access Toolbar 41
R
radar charts 145
RANK.EQ function 167
RANKX function 167, 176
rapid development 26
RDBMS 6
Read and Process permission 345
Read permission 281, 345
real time data access 336
referential integrity 68, 69
Refresh permission 375
refreshing data 57, 105, 247
RELATED function 163, 174
RELATEDTABLE function 316, 174, 354
Relational OLAP 10, 325
relationships 40
active and inactive 112
auto-creating 110
auto-detecting 109
changing directions 111
changing to inactive 115
creating in Data View 111, 116
creating in Diagram View 116, 121
introduced 51, 62
limitations 109
managing 111
managing in Diagram View 115
many-to-many 62
marking as inactive 122
one-to-many 62
role-playing 112
rules 108
understanding 108
relative dates 40
Remove-RoleMember 392
Report Builder 6, 26, 33, 221, 223
design environment 252
understanding 248
report data sources 315, 356
and Kerberos 356
vs. BI connections 260
Report Designer 254
Report Filter zone 126
report headers 253
Report Manager 76
reporting properties 18, 37, 236
Reporting Services
and Microsoft BI platform 6
importing from 75, 87
installing 232
execution account 357
Reports web part 274
ReportViewer control 355
Restore-ASDatabase cmdlet 391
restoring backups 368
restoring from PowerPivot 368
Restricted Readers group 280
Robocopy 369
ROLAP See Relational OLAP
Role Manager 347
role membership 346, 365
role-playing relationships 115, 188
roles 365
creating 345
understanding 343
Roles setting 346, 350
Top 10 filter 55
TOPN function 167, 324
TotalMemoryLimit property 363
TOTALYTD function 184
trace 379
transactional deployment 371
transactional reports 32
translations 24
TRUE/FALSE data type 95
transfer account 355
trusted file locations 257
two-tier deployment 200

U
ULS Log Viewer 218
UDM See Unified Dimensional Model
Unified Dimensional Model 3
Unified Logging Services 217
uniform partitions 326
unknown member 113
Update method 388
Usage Data Collection section 274
usage logs 272
USERELATIONSHIP 163, 188
USERNAME 157, 348, 349, 350

V
VALUES function 163
Values zone 127
VAR.P function 163
VAR.S function 163
VARX.P function 163
VARX.S function 163
versions
managing in SharePoint 263
VertiPaq 21, 363
and PowerPivot for Excel 42
hosting 14
introduced 10, 13
implementation 43
drawbacks 335
refresing data 106
storage 325
compression rate 25
VertiPaq SE events 381
VertiPaqMemoryLimit property 363
VertiPaqPagingPolicy property 363
View Only permission level 281
Viewers SharePoint group 280
Visitors SharePoint group 280
Visual Basic for Applications 45
Visual Studio 2010 21
visual totals 348
visualizations 239
VLOOKUP 34, 44, 46
volatile partitions 326

W
web parts
connecting 228
working with 227
WebDAV 215
what-if analysis 24
Whole Number data type 95
Windows accounts 350
Windows authentication 66, 343
Windows Basic authentication 356
Windows Clipboard 39, 303
importing from 81, 89
Windows Communication Foundation 75
Windows Event log 386
Windows integrated security 260, 294
Windows Management Instrumentation 379
Windows Performance Monitor 382
Windows PowerShell 391
Windows Server 2008 R2 364
Windows SharePoint Services 198
Workbook Activity web parts 274, 277
workspace databases
data backups 293
retention policies 293
synchronization 293
understanding 292
writeback 24

X
XML for Analysis 201, 372
XML/A
see XML for Analysis
XMLA scripts 371, 378, 392

Y
YTD calculations 184