

Symbols

/3GB 129–131
/PAE 130–131
##MS_PolicyTsqlExecution-Login## 164
% Disk Time 410
% Processor Time 406
%TMP% 365

Numerics

32-bit memory management 131
64-bit memory management 131

A

abnormal activity 331
acceptable data loss 229
Active Directory 151
active transaction 197
active/active 84
active/passive 84
Activity Monitor 171, 331–334
ad hoc queries 398
Address Windowing Extensions (AWE) 44, 129
addressable memory 44
administration cost 184
advanced cluster completion 87
advanced cluster preparation 87
advanced installation. *See* installing SQL Server 2008
AdventureWorks database 291
AES encryption algorithm 121
aggregate query cost 341
alerts 354

alias 101
allocation bitmap 171
allocation contention 171, 174
allocation errors (DBCC) 265
allocation unit 33, 35
 size 181
ALTER DATABASE 204
ALTER DATABASE SET PARTNER 246
ALTER RESOURCE GOVERNOR 386
Analysis Services 154, 376
antivirus software 92, 127
application design 12
application failure 68
application performance 12
application reconnection
 logic 245
application roles 110
APP_NAME() 117, 378
archive filegroup 176
asynchronous database mirroring. *See* database mirroring
asynchronous statistics
 update 322
ASYNC_IO_COMPLETION 410
ATA 16
at-rest encryption 119
attach database (upgrade technique) 72
audit 112
audit action groups 112, 147
auditing
 C2 111
 database audit
 specification 113
 implementing 111–119

 server audit specification 112
 SQL Server audit 111–115
 support per SQL edition 7
authentication mode 65
 Mixed Mode 98
 Windows authentication
 mode 97
auto create statistics 321
auto stats event 322
auto update statistics 321
autoclose 157, 191, 304–305
autogrow 363
autogrowth 154, 172
automatic failover
 (mirroring) 243
automatic failover support 230
automation 331, 350–358
autosense (networking) 50
AutoShrink 157, 191
availability target 226, 229
average disk queue length 372
average latency (SQLIO) 40
avg row lock waits in ms 413
Avg. Disk Reads & Writes / Sec 410
Avg. Disk Sec/Read 410
Avg. Disk Sec/Write 410
Avg./Current Disk Queue Length 410
AWE. *See* Address Windowing Extensions

B

background services 144
backup
 checksum 210

- backup (*continued*)
 - compression 221–223, 232
 - compression default 221
 - convenience 223
 - COPY_ONLY backup 203–204
 - dedicated disks 170
 - design 195, 199, 221
 - destination, disk vs. tape 207
 - devices 225, 359
 - differential backup 199–200, 351
 - disk 170
 - duration 184
 - filegroup backup 214
 - frequency 154, 201
 - full backup 196–198
 - hard-coded filename 225
 - maintenance plans 352
 - MDW database 367
 - mirroring 210
 - multiple files 199
 - portability 221
 - retention policy 209
 - rotation policy 209
 - scheduling 223
 - snapshot backups 209, 217
 - strategy 195, 219, 223
 - support per SQL edition 7
 - tail log backups 202
 - transaction log 198, 200–203
 - upgrade technique 72
 - verification 195, 231
 - verification servers 224
 - window 210
 - WITH COMPRESSION 221
 - WITH COPY_ONLY 237
 - WITH NORECOVERY 202
 - WITH NO_TRUNCATE 202
 - BACKUP DATABASE 197
 - BACKUP DATABASE MIRROR TO 210
 - BACKUP DATABASE WITH CHECKSUM 210
 - BACKUP DATABASE WITH COMPRESSION 221
 - BACKUP DATABASE WITH DIFFERENTIAL 199
 - backup domain controller (BDC) 61
 - BACKUP LOG 200
 - BACKUP LOG WITH NORECOVERY 203, 215
 - BACKUP LOG WITH NO_TRUNCATE 202
 - BACKUP WITH COPY_ONLY 204
 - backups, SATA disk 17
 - backwards compatibility 68
 - bandwidth requirements 17
 - base backup 200
 - baseline analysis 38, 53, 57, 348–350, 360
 - batch process 53
 - batch request/sec 372, 348, 405
 - battery-backed cache 37
 - BCDEdit 129
 - BCM. *See* Bulk Changed Map
 - BCP. *See* Bulk Copy Process
 - BDC. *See* backup domain controller
 - BEGIN TRANSACTION WITH MARK 211
 - benchmarking. *See* baseline analysis
 - best practices
 - backup and recovery 223
 - Data Collector and MDW 374
 - data management 190
 - database mirroring 256
 - DBCC validation 278
 - failover clustering 91
 - high availability 256
 - indexes 325
 - installing and upgrading SQL Server 75
 - log shipping 256
 - monitoring and automation 358
 - physical server design 56
 - policy-based management 166
 - Resource Governor 388
 - security 124
 - SQL Server configuration 145
 - storage system sizing 30
 - binary large object (BLOB)
 - storage in the database 178
 - storage in the filesystem 179
 - See also* FileStream
 - bit mask (NUMA node) 49
 - BitLocker 127
 - BLOB. *See* binary large object
 - block replication 24
 - blocked process report 345, 413
 - blocked process threshold 345
 - blocking 263, 412
 - BOL. *See* SQL Server Books Online
 - bookmark lookup 285
 - boost SQL Server priority 135
 - boot time 28
 - boot.ini 129
 - bottleneck 12
 - disk 32
 - RAM 47
 - SSD implications 29
 - breaking point. *See* baseline analysis
 - brute-force attack 97
 - b-trees 178, 284
 - budgetary constraints 3, 21
 - buffer cache 180, 184–185, 189, 197
 - Buffer Cache Hit Ratio 409
 - buffer overflow bug 101
 - buffer pool 269
 - bug 75
 - BUILTIN\Administrators 66, 104
 - Bulk Changed Map (BCM) 206
 - Bulk Copy Process (BCP) 206, 340
 - bulk insert 206
 - bulk load 242
 - bulk update 41
 - Bulk_Logged recovery model 206, 232, 239
 - bus bandwidth 17
-
- C**
- cache (storage) 37
 - bloat. *See* procedure cache
 - churn 403
 - efficiency 34
 - calculating required disk quantity 15
 - capacity-centric design 18
 - capacity planning 172–173, 191, 370, 371
 - CDC. *See* Change Data Capture
 - cell erasure (SSD) 29
 - cell-level encryption 119, 123
 - central management servers 159
 - central point of failure 228, 230
 - centralized computing 51
 - certificate 120
 - change control 148
 - Change Data Capture (CDC) 117–119
 - support per SQL edition 7
 - change log 128, 145, 257
 - character large object (CLOB) 177
 - check constraints 268
 - checklist (installation) 59
 - checkpoint 38, 41, 140, 197, 204
 - checksum 210, 269
 - classifier function (Resource Governor) 378–379
 - cleanup tasks (maintenance plans) 353
 - client redirection logic 227

- client-side trace 337
 - CLOB. *See* character large object
 - CLR. *See* Common Language Runtime
 - CLRIntegrationEnabled 152
 - cludadmin.msc 91–92
 - cluster management tool 91
 - cluster security policy 90
 - clustered index 281–284, 288–291
 - clustering. *See* failover clustering
 - cmdlets 164
 - codeplex.com 291
 - collation 60, 64, 247
 - column prefix 185
 - column statistics 322–323
 - command center 330
 - command prompt
 - installation 67
 - commodity servers 32
 - Common Language Runtime (CLR) 152
 - Compact edition 8
 - compatibility level 69
 - composite index 295–296
 - composite keys 283
 - compressed backups 221–223
 - compression (NTFS) 5, 35
 - rate 186, 222
 - See also* data compression, backup compression
 - compute constrained systems 30
 - computed columns 267
 - condition (policy-based management) 152
 - conditional index
 - maintenance 353
 - configuration changes history report 337
 - configurationfile.ini 66
 - connection properties (Management Studio) 160
 - connection string 62, 71, 379
 - connection strings
 - (passwords) 98
 - consistency errors (DBCC) 265
 - constraining resources 376
 - context switches/sec 136
 - CONTINUE_AFTER_ERROR 210
 - controller cards 36
 - controlling object
 - placement 175
 - copy database wizard 73
 - copy on write 217
 - COPY_ONLY backup 203–204
 - Core i7 43
 - corrupt backup 226
 - corrupted page 241
 - corruption 260
 - logical 268
 - physical 268
 - root cause analysis 278
 - cost savings 221
 - cost threshold for
 - parallelism 139
 - counter logs 348
 - covering indexes 286, 295–296
 - CPU
 - affinity 137, 376
 - affinity mask 49
 - boost SQL Server priority 135
 - cache 43
 - clock speed 43
 - compilation pressure. *See* procedure cache
 - cost threshold for
 - parallelism 139
 - fiber mode 136
 - hot-add 46
 - hyperthreading 42
 - Itanium 44
 - kernel mode 136
 - lightweight pooling 136
 - max worker threads 69, 135–136
 - multicore 42
 - Opteron 44
 - overhead (compression) 184
 - parallelism 137
 - support per SQL edition 45
 - thread pooling 135
 - threads 134
 - throttling with Resource Governor 384
 - user mode 136
 - x64 44
 - x86 44
 - Xeon 45
 - CREATE DATABASE AS SNAPSHOT 218
 - CREATE EVENT SESSION 395
 - CREATE RESOURCE POOL 385
 - CREATE STATISTICS 324
 - CREATE WORKLOAD GROUP 385
 - credentials 105
 - credit card details
 - (encryption) 120
 - cumulative updates 74, 223
 - custom reports 374
 - custom statistics 322
- ## D
-
- DAC. *See* dedicated administrator connection
 - daily tasks 419
 - damaged database 203
 - DAS. *See* direct-attached storage data
 - corruption 241
 - distribution. *See* replication
 - encryption 119–123
 - integrity 23
 - latency 230
 - loss 195, 202, 242
 - data access pattern 175
 - data cache 130, 140
 - data center 19
 - Data Collector
 - cache directory 365
 - component overview 361
 - custom collection sets 368
 - default collection sets 361
 - logging 368
 - new in 2008 5
 - scheduling uploads 365
 - setup and
 - configuration 362–365
 - support per SQL edition 7
 - data collector sets (Performance Monitor) 348
 - data compression 164, 183–189
 - support per SQL edition 6
 - Data Dude 256
 - data file configuration
 - AutoClose 191
 - autogrowth 172
 - AutoShrink 191
 - instant initialization 174
 - multiple files 171
 - proportional fill 174
 - sizing files 172
 - volume separation 169
 - data file I/O 332
 - data type conversion 303
 - data warehousing 117, 317
 - database administrator (DBA) 11
 - development DBA 10
 - production DBA 10, 330
 - responsibilities 10
 - work plan 419
 - database audit specification 112
 - database consistency check. *See* DBCC
 - database console commands. *See* DBCC
 - database design 29

- database encryption key (DEK) 121
- Database Engine Tuning Advisor 313–314, 341
- Database Exposure Survey 2007 101
- database integrity 260, 352
- Database Mail 7, 125, 152, 155, 355
- database migration 67, 172
- database mirroring overview 228
 - automatic corruption recovery 270
 - automatic failover 243
 - configure security 248
 - design considerations 246
 - encryption 249
 - endpoint 239, 249
 - failover 239
 - failure scenarios 246
 - FileStream limitations 182
 - forced service 239, 241, 245
 - high performance mode 239, 241
 - high safety mode 239–240, 242
 - initializing 247
 - log sequence number (LSN) 240
 - log stream compression 241
 - manual failover 245, 254
 - mirror database 238
 - mirror instance 238
 - mirroring multiple databases 255
 - monitor 250
 - monitoring stored procedures 251
 - network latency 243
 - performance counters 252
 - principal database 238
 - principal instance 238
 - recovery model 247
 - redo queue 238–241
 - restrictions 239
 - resuming 254
 - send queue 238–239
 - snapshots 259
 - SQL logins 247
 - status 250
 - support per SQL edition 6
 - suspending 253
 - TCP port 249
 - terminology 238
 - thresholds 252
 - timeout 244
 - witness 239
- database ownership chain 127
- database roles 108–110
- database snapshots 182, 217–221, 239
- DatabaseMailEnabled 152
- DATETIME data types 425
- David Litchfield 101
- DBA. *See* database administrator
- DBCC
 - auditing 113
 - commands categorized 261
 - database snapshot 263
 - false positives 263
 - I/O load 14
 - interpreting output 274
 - page restore 276
 - REPAIR_ALLOW_DATA_LOSS 273, 277
 - REPAIR_REBUILD 274
 - source (database snapshots) 221
 - transactional consistency 263
 - user defined snapshots 273
- DBCC CHECKALLOC 262, 267
- DBCC CHECKCATALOG 262, 267
- DBCC CHECKCONSTRAINTS 268
- DBCC CHECKKDB 262
 - ALL_ERRORMSGs 264
 - controlling user impact 270
 - DATA_PURITY 265
 - described 262
 - ESTIMATE_ONLY 264
 - EXTENDED_LOGICAL_CHECKS 264
 - last successful execution 272
 - MAXDOP 272
 - NOINDEX 264
 - NO_INFOMSGS 264
 - repair options 264
 - TABLOCK 264
 - WITH PHYSICAL_ONLY 265, 271
- DBCC
 - CHECKFILEGROUP 267, 272
- DBCC CHECKIDENT 268
- DBCC CHECKTABLE 262, 267, 272
- DBCC DBREINDEX 318
- DBCC DROPCLEANBUFFERS 188–189, 293
- DBCC FREEPROCCACHE 403
- DBCC
 - FREESYSTEMCACHE 403
- DBCC INDEXDEFRAG 317
- DBCC PAGE 272, 275
- DBCC SHOWCONTIG 315
- DBCC SHOW_STATISTICS 287, 324
- DBCC SQLPERF 392–394
- DBCC TRACEON 272, 345
- DBCC UPDATEUSAGE 70
- dbcreator 111
- db_datareader 111
- db_datawriter 111
- dbi_dbccLastKnownGood 272
- DCM. *See* Differential Changed Map
- DDL triggers 115–116, 153
- deadlock 343–344
 - graph 344
 - trace flags 345
 - victim 344
- debugging 334, 338, 340
- decentralized computing 51
- decision support system (DSS) 13
- dedicated administrator connection (DAC) 136, 143, 379
- dedicated disks 170
- default filegroup 176, 214
- default instance 62–63
- default schema 110
- default trace 154, 337
- DEK. *See* database encryption key
- density_vector 324
- design surface 350
- detach database 172
- detach database (upgrade technique) 72
- detecting corruption 268
- Developer edition 8
- development environments 205
- DHCP. *See* Dynamic Host Configuration Protocol
- differential backup 199–200
- Differential Changed Map (DCM) 203
- direct-attached storage (DAS) 22, 169
- directory locations 66
- dirty pages 140, 197
- dirty reads 142
- disabling indexes 316
- disaster recovery (DR) 23, 174
 - planning 206
 - SAN options 24, 27
 - simulation 223
 - time 229
 - virtualization 55
- disconnect users 234

- disk
 - backups 207
 - configuration 32
 - controller 172
 - controller cards 22
 - drive anatomy 32
 - enclosures 22
 - failure 18, 36
 - fragmentation 33, 168, 173
 - head 32
 - mirroring 20
 - performance 185
 - quantity 25
 - queue 18, 36
 - response time 372
 - space requirements (installation) 63
 - transfer rate 372
 - usage report 361, 370
 - utilization 20, 25
 - disk management tool 35
 - disk reads per second 14
 - disk then tape backups 208
 - disk writes per second 14
 - diskpart.exe 34
 - diskpart.exe 34
 - display replay results 340
 - distributed partitioned views 7
 - distributed transactions 240
 - DML triggers 115
 - documentation 162, 206, 223
 - domain accounts 60
 - domain administrator 60
 - double caching 37
 - downtime 68, 74
 - DR. *See* disaster recovery
 - drive letters (mount points) 171
 - drivers 38, 268
 - DROP DATABASE 219
 - DROP STATISTICS 323
 - dropped events 337–338
 - dropping indexes 316
 - DSS. *See* decision support system
 - dual channel SCSI 16
 - Dynamic Host Configuration Protocol (DHCP) 82
 - Dynamic Management View (DMV) 304
 - dynamic ports 100
- E**
-
- ECC. *See* error-correcting code
 - editions of SQL Server
 - Compact 8
 - Developer 8
 - Enterprise 5
 - Express 8
 - Standard 7
 - Web 8
 - Workgroup 7
 - effective maximum percentage (Resource Governor) 382
 - EFS 127
 - EKM. *See* Extensible Key Management
 - encryption 5
 - See also* cell level encryption, TDE, data encryption, backup encryption, and SSL
 - endpoint 239, 249
 - enterprise DBA 148
 - Enterprise edition 5
 - environment destruction 231
 - error logs 357
 - error-correcting code (ECC) 46
 - ESX Server. *See* virtualization
 - ETL. *See* extract, transform, load
 - event alert 356
 - event sequencing 337, 340
 - EVENTDATA function 115
 - event tracing 337
 - exception-based management 150, 350
 - exclusive lock 344
 - ExecuteSql() 162
 - ExecuteWql() 162
 - execution plan 291, 321
 - expensive queries 333
 - exporting policies (policy-based management) 158
 - Express edition 8
 - extended events 395
 - Extensible Key Management (EKM) 127
 - extent 35, 206, 265–266
 - external waits 393
 - extract, transform, load (ETL) 117
- F**
-
- facet (policy-based management) 151
 - failback settings. *See* failover clustering
 - failover
 - database mirroring 243
 - log shipping 237
 - Failover Cluster Configuration Program (FCCP) 82
 - failover clustering
 - advantages and limitations 80
 - architecture 79
 - cluster network priority 92
 - failover rules 85
 - FCCP certification 82
 - high availability 227
 - iSCSI storage 24
 - multi-instance clusters 84
 - N + 1/M clusters 85
 - quorum models 82–83
 - resource groups 80
 - single instance clusters 84
 - validation test 81
 - failover partner (SNAC) 244
 - failure rate (tape) 207
 - failure tolerance (RAID) 21
 - false positive (DBCC) 263
 - fault tolerance 36, 169
 - faulty hardware 260
 - fiber mode 136
 - fibre channel 17, 22
 - file header 266
 - file I/O streaming access (filestream) 180
 - file system (blob storage) 179
 - filegroup backup 214
 - filegroups 175–177
 - dbcc checks 272
 - default filegroup 176
 - primary filegroup 176
 - secondary filegroup 176
 - FileStream
 - allocation unit size 181
 - DBCC checks 263
 - described 180–183
 - installing 66
 - limitations 182
 - fill factor 141, 319, 409
 - filtered indexes 297–299
 - compared to indexed views 303
 - filtered statistics 324
 - fine-grained auditing 111
 - fire drill 206
 - firewall 61
 - perimeter configuration 100
 - ports 100
 - Windows firewall 101
 - firmware 38, 268
 - five nines 229
 - fixed database roles 111
 - fixed server roles 111
 - flash storage. *See* solid-state disk
 - fn_trace_getinfo 338
 - follow the sun 298
 - forced
 - parameterization 401–403
 - forced service 239, 241
 - foreign keys 268, 307

foreign keys (DBCC) 277
 fragmentation 35, 168, 173
 fragmentation (indexes) 314
 free list 140
 FTP utility 127
 full backup 196–198
 full duplex 17
 full recovery model 205, 232,
 239
 full scan 324
 Full Scans/Sec 409
 full table index 298
 full text indexes 284

G

GAM. *See* global allocation map
 get_waitstats 394
 GFS. *See* grandfather-father-son
 global allocation map
 (GAM) 266
 globally unique identifier
 (GUID) 117, 290, 340
 grandfather-father-son (GFS)
 tape rotation policy 209
 GRANT CONNECT 249
 granular auditing 111
 graphical execution plan 291,
 333
 group policy editor 130
 GROUP_MAX_REQUESTS 381
 growth patterns 173
 GUID. *See* globally unique identi-
 fier

H

hard error 244
 hardening (disk writes) 38
 hardware components 31
 hardware NUMA. *See* non-uni-
 form memory access
 hardware security module
 (HSM) 127
 hash join 323
 HBA. *See* host bus adapter
 heap 274, 281, 284
 heartbeat (mirroring) 244
 heat generation 28
 hidden snapshot (dbcc) 273
 high availability 226
 options compared 229
 high performance database
 mirroring. *See* database
 mirroring
 high-performance mode 239
 high-safety mode 239
 histogram 325

host bus adapter (HBA) 22
 HOST_NAME() 378
 hot spots 331
 hot standby 238
 hot-add CPU 46
 hot-add RAM 46
 hotfix 74, 223
 HP Integrity Superdome 45
 HP ProLiant DL585 36
 HSM. *See* hardware security mod-
 ule
 hubs (networking) 50
 Hyper-V. *See* virtualization
 hypervisors. *See* virtualization

I

I/O

capacity 36
 delay messages 154, 162
 driver 38
 failure 36
 firmware 38
 generation 38
 integrity (SQLIOSIM) 41
 IOPS 38
 latency 38
 load balancing
 (multipathing) 37
 profile 26
 thread (NUMA) 49
 throughput 38
 I/O per second (IOPS) 15
 IANA registration database 100
 IDE. *See* ATA
 identity columns 289, 323
 identity spoofing 98, 379
 image data type 178
 inaccessible database 203
 included columns 286, 296–297
 increaseuserva 129
 incremental servicing model 74
 index scan 175, 291
 Index Searches/Sec 409
 index seek 291
 indexed views 299–303
 compared to filtered
 indexes 303
 DBCC checks 263
 support per SQL edition 7
 indexes
 analysis 303–316
 bookmark lookup 285
 clustered index 281–283,
 288–291
 composite index 296
 conditional maintenance 353
 covering indexes 286,
 295–296

create with drop existing 319
 data compression 320
 design 287–303
 disabling 316
 dropping 316
 duplicate and overlapping
 indexes 307
 dynamic management
 views 303
 fill factor 141, 319
 filtered indexes 297–299
 fragmentation 314–316, 319
 full table index 298
 full text indexes 284
 heap 281
 hint 292
 identifying indexes to
 add 307–314
 identifying indexes to drop/
 disable 304–307
 included columns 286, 297
 key lookup 286
 leaf node 284
 maintenance 316–320
 maintenance plans 352
 nonclustered index 283–284,
 291
 online operations 318
 PAD_INDEX 320
 predicate 298
 range scan 290
 rebuild 242, 318
 reorganize 317, 351
 seek 284
 selectivity 287
 sort 290
 sort in tempdb 320
 SSD implications 29
 statistics 320–322
 structure 284–285
 support per SQL edition 7
 information storage
 explosion 183
 infrastructure solution 231
 in-place upgrade 70
 input verification (SQL
 injection) 124
 installation center 62
 installation checklist 59
 installing SQL Server 2008
 command prompt
 installation 67
 GUI installation 62–67
 installing a clustered
 instance 86–91
 pre-installation
 checklist 59–62
 instance ID 62

instant initialization 60, 173–174
 integrated installation. *See* installing SQL Server 2008
 Integration Services 376
 integrity 38
 intent-based management 150
 interleaved NUMA. *See* non-uniform memory access
 Internet Protocol Security (IPSec) 102
 internet SCSI (iSCSI) 23
 Invoke-PolicyEvaluation cmdlet 165
 IO_COMPLETION 410
 IOPS. *See* I/O per second
 IPAll 100
 IPSec. *See* Internet Protocol Security
 IPv6 81
 IsAlive 85
 iSCSI. *See* internet SCSI
 IS_MEMBER() 379
 isolation level 344
 IS_SRVROLEMEMBER() 379

J

job failover 230
 join logic 323

K

kernel mode 136
 key column 297
 key lookup 286, 291, 294

L

LAN. *See* local area network
 lane (PCI) 36
 large object (LOB) 177
 latency 38
 LazyWriter 41, 49, 140
 LAZYWRITER_SLEEP 393
 LCK_* waits 412
 .ldf file 169
 leaf node (index) 284
 least privilege 103–111, 149
 license terms 63
 licensing 56
 lightweight pooling 136
 linked servers 127
 load balancing (I/O) 37
 load generation 338
 load testing
 high availability 256
 LoadRunner 343

OStress 342
 Resource Governor considerations 384
 Visual Studio Team System 343
 LoadRunner 343
 LOB. *See* large object
 local administrator 60
 local administrator privilege 103
 local area network (LAN) 243
 local server groups 160
 lock pages in memory 60, 130–132
 locks (configuration setting) 142
 log chain 200, 203, 219
 validation 231
 log sequence number (LSN) 119, 198, 240
 log shipping
 backup verification 224
 disconnect users 234
 failover and role reversal 237
 monitoring instance 236
 no recovery mode 234
 overview 227
 pre-SQL Server 2000 230
 recovery model 205
 restore frequency 236
 script configuration 236
 standby mode 234
 status report 236
 transaction latency 231
 usage scenarios 231
 warm standby 236
 log stream compression 241
 logical corruption 268
 logical integrity 262
 logical reads 293, 333
 logical unit number (LUN) 22
 configuring for SQL Server 26
 replication 23
 snapping and cloning 209
 zoning 27
 logical write 16
 login failover 230
 login timeout 378
 logins/sec 372
 logon triggers 116–117, 378
 long-running transactions 205
 LooksAlive 85
 lossless compression 183
 lossy compression 183
 LSN. *See* log sequence number
 LUN. *See* logical unit number

M

magnetic erase 127
 maintenance plans 314, 350–353
 maintenance window 53, 74, 270
 Majority Node Set (MNS) 82
 man-in-the-middle attacks 98
 MAN. *See* metropolitan area network
 management data warehouse (MDW) 361
 advantages of centralizing 363
 autogrow operations 363
 backup considerations 367
 configure MDW wizard 362
 database roles 364
 mdw_admin 364
 mdw_reader 364
 mdw_writer 364
 retention period 368
 manual failover, (log shipping) 237
 manual failover (mirroring) 245
 master boot record (MBR) 33
 master database 239
 master key 120
 max worker threads 69, 135–136
 MAXDOP. *See* Maximum Degree of Parallelism
 Maximum Degree of Parallelism (MAXDOP) 154, 137–139, 187, 320, 381
 max_wait_time_ms 393
 MBR. *See* master boot record
 .mdf file 169
 MDW. *See* management data warehouse
 mdw_admin 364
 mdw_reader 364
 mdw_writer 364
 media cost 196
 media failure 208
 memory bus. *See* non-uniform memory access
 memory sniffing 122
 merge join 323
 metropolitan area network (MAN) 243
 Microsoft assessment and planning toolkit 51
 Microsoft Baseline Security Analyzer (MBSA) 153
 Microsoft iSCSI Software Initiator 24
 Microsoft Multipath I/O (MPIO) 36

Microsoft product support services (PSS) 340
 Microsoft Source Code Analyzer for SQL Injection 124
 Microsoft Virtual Server. *See* virtualization
 migrating databases 67
 mirror commit overhead 253
 mirror database 238
 mirror instance 238
 mirroring backups 210
 mirroring session 240
 missing index 314
 missingindexes XML element 307
 MissingIndexGroup XML element 309
 mission-critical database 231
 mixed extent 266
 Mixed Mode authentication 65, 98
 MNS. *See* Majority Node Set
 model database 169, 173, 204, 239
 monitoring instance 236
 monitoring regime 350
 monitoring tools 330
 monthly tasks 420
 mount points 171
 MPIO. *See* Microsoft Multipath I/O
 msdb database 166, 239, 367
 MSDTC 91
 multi-server queries 160
 multi-file backups 199
 multipathing 36
 multiple column statistics 321
 multiple data files 171
 multiple standby destinations 230
 MySQL 148

N

named instances 62–63, 100
 namespace 110
 NAS. *See* network-attached storage
 Native Command Queuing (NCQ) 16
 natural key 289
 NCQ. *See* Native Command Queuing
 .ndf file 169
 nested loop join 323
 net send 355
 NetBIOS 61

.NET framework 62
 network
 autosense 50
 bandwidth 50, 241
 configuring 50
 data transmission 122
 hubs 50
 latency 243
 NIC teaming 24, 50, 92
 quality 247
 saturation 255
 switches 50
 traffic 50
 network-constrained systems 30
 network protocols
 AppleTalk 99
 Banyan Vines 99
 Multiprotocol 99
 Named Pipes 99
 NWLink IPX/SPX 99
 shared memory 99
 TCP/IP 99
 VIA 99

network-attached storage (NAS) 23
 NewSequentialID() 290
 NIC teaming 50
 no majority. *See* failover clustering
 NO_CHECKSUM 210
 node and disk majority. *See* failover clustering
 node and file share majority. *See* failover clustering
 noexpand 303
 nonclustered index 262, 283–284, 290–291
 non-uniform memory access (NUMA) 47–50, 146, 357
 notify operator task (maintenance plans) 352
 NTFS compression 35, 183
 NUMA. *See* non-uniform memory access
 nvarchar(max) data type 178

O

object placement 175
 offline 305
 offsetting partitions 33
 offsite recovery point 231
 offsite rotation (backup tape) 207
 off-the-shelf components 32
 OLAP. *See* online analytical processing

OLTP. *See* online transaction processing
 on demand (policy-based management) 153
 on schedule (policy-based management) 153
 on-call rotation 148
 online analytical processing (OLAP) 13, 138
 online backups 197
 ONLINE index operations 318
 online piecemeal restore 72, 212–217

online transaction processing (OLTP) 13, 138, 145
 operating costs 52
 operations staff 148
 operator 355
 Opteron 45
 Optimization hints 402
 OPTIMIZE FOR 402
 Optimize for Ad Hoc Workloads 403–404
 Oracle 148
 ORIGINAL_LOGON 117
 OStress 342, 349
 out-of-the-box settings 148
 owner-qualified object reference 415

P

P2V. *See* physical to virtual
 pad_index 320
 PAE. *See* Physical Address Extensions
 page 140, 266
 checksums 269
 compression 185
 dictionary 185
 file 145
 page free space (PFS) 266
 Page Life Expectancy 408
 page restore 276
 Page Splits/Sec 409
 PAGEIOLATCH 409
 pager alert 355
 PAGE_VERIFY 210
 parallel ATA. *See* ATA
 parallel queries 137
 parallelism 44, 381
 parameter sniffing 309, 400
 parity 20
 partitioning 164
 partition offset. *See* track-aligning partitions
 partitioned tables 177

- partitioning 6
 - password complexity 60, 97
 - policies 97
 - password expiration 60
 - policies 97
 - Paul Randal 198
 - PCI Express (PCI-E) 36
 - PCI-E. *See* PCI Express
 - PDC. *See* primary domain controller
 - peak latency (SQLIO) 40
 - peak usage period 349
 - peer-to-peer transactional replication 259
 - pending reboots 61
 - PerfAnalysis database 341
 - perform volume maintenance tasks 60, 174
 - performance baseline 27
 - performance-centric design 18
 - performance condition alert 356
 - Performance Monitor 14, 27, 346–350, 387
 - counters 421
 - performance requirements 32
 - performance trends 348
 - performance tuning 12
 - permissions management 110
 - PFS. *See* Page Free Space
 - Physical Address Extensions (PAE) 129
 - physical corruption 268
 - physical integrity 262
 - physical reads 293, 37, 333
 - physical security 120, 127
 - physical to virtual (P2V) 54
 - physical write 16
 - piecemeal restore 175
 - plan cache 44
 - plan count 333
 - Plan Guides 402
 - plan reuse. *See* procedure cache
 - platter 32
 - point-in-time recovery 205, 207, 209, 217
 - policy (policy-based management) 153
 - policy compliance 153
 - policy failure alerts 156
 - PolicyAdministratorRole 164
 - policy-based management 51
 - ##MS_PolicyTsqlExecution-Login## 164
 - alerts 356
 - central management servers 161
 - conditions 152
 - creating new policies 157
 - evaluating policies 155
 - evaluation modes 153
 - exporting policies 158
 - facet 151
 - importing policies 153
 - new in 2008 4
 - policies 153
 - policy state 154
 - PolicyAdministratorRole 164
 - Powershell 164
 - predefined policies 154
 - target 151
 - poor maintenance practice 226
 - port 1433 100
 - port scanners 101
 - possible owner. *See* failover clustering
 - power consumption 28
 - power failure 37, 244
 - Powershell 147, 164–166
 - precedence constraint (maintenance plans) 352
 - predefined policies (policy-based management) 153
 - preferred owner. *See* failover clustering
 - preinstallation checklist 59
 - prepared plans 401
 - preserved on import (policy-based management) 154
 - preventing corruption 268
 - primary data file 169
 - primary domain controller (PDC) 61
 - primary filegroup 175–176
 - primary key 282, 288
 - principal 107
 - principal database 238
 - principal instance 238
 - principals (proxy) 106
 - private network 92
 - proactive maintenance 150, 173, 191, 227
 - procedure cache
 - AWE setting 130
 - bloating 398–405
 - processadmin 111
 - processes 332
 - Processor Queue Length 406
 - product key 63
 - production DBA 330
 - proportional fill 174
 - proxies 106
 - public certification authority certificates 102
 - public network 92
 - pure NUMA. *See* non-uniform memory access
- ## Q
-
- query governor cost limit 143, 388
 - query importance 380
 - query optimizer 307, 321
 - query statistics (report) 361, 371
 - query wait 142
 - queue depth (HBA configuration) 27
 - queue depth (SQLIO) 39
 - queue wait 393
 - quorum, failover clustering 82
- ## R
-
- RAID. *See* redundant array of inexpensive disks
 - RAM
 - 32-bit memory management 131
 - 64-bit memory management 131
 - controlling usage with Resource Governor 383
 - ECC RAM 46
 - hot-add 46
 - lock pages in memory 60, 130–132
 - maximum memory setting 132–134
 - minimum memory setting 132–134
 - page file 145
 - query wait 142
 - support per SQL edition 46
 - random I/O 13, 170, 286, 291
 - random read performance (SSD) 29
 - random write performance (SSD) 29
 - range scan 290
 - rate of database change (differential backups) 199
 - reactive administration 3
 - reactive work environment 227
 - read ahead 41, 294
 - read cache 37
 - read/write percentage 27
 - reading a database mirror (database snapshots) 220
 - readtrace 341–342
 - rebuilding indexes 318
 - recompilation 400
 - reconfigure server (policy-based management) 161
 - recovering state 200
 - recovery interval 140

recovery model
 bulk_logged 206, 232, 239
 full 149, 205, 232, 239
 MDW database 367
 simple 204
 recovery point 196
 redo queue 239–241
 reduced maintenance
 requirements 205
 reducing backup impact 221
 Redundant Array of Inexpensive
 Disks (RAID) 19
 hardware RAID 22
 RAID 0 19
 RAID 1 20
 RAID 10 21
 RAID 5 20
 RAID controller 33
 software RAID 22
 stripe size 33
 refresh rate 331
 registered servers 159
 registry 62
 regulatory requirements 183
 Reliability and Performance
 Monitor 347
 remote memory. *See* non-uni-
 form memory access
 reorganize indexes 317
 REPAIR_ALLOW_DATA_LOSS
 277
 replay events, in order 339
 replay events, multiple
 threads 340
 replay markup language
 (RML) 343
 replay server 339
 replay threads 339
 replaying a trace 338
 replication 227, 340
 replication (upgrade
 technique) 73
 Report Builder 381
 Reporter (RML utility) 342
 reporting database 271
 reporting database (database
 snapshots) 220
 Reporting Services 154, 376
 reporting solution 230–231
 reports
 custom reports 374
 disk usage summary 370
 query statistics history 371
 server activity history 372
 REQUEST_MAX_CPU_TIME_
 SEC 381
 REQUEST_MAX_MEMORY_
 GRANT_PERCENT 380

REQUEST_MEMORY_GRANT_
 TIMEOUT_SEC 381
 resource arbitration 80
 resource crunch 85
 resource flexibility 54
 Resource Governor 376
 Activity Monitor 332
 benefits and limitations 376
 classifier function 377–379
 CPU considerations 383
 effective maximum and
 minimums 382
 establishing resource
 boundaries 388
 load testing 384
 memory considerations 383
 monitoring 387
 new in 2008 4
 resource pools 377, 382–384
 workload groups 377,
 380–382
 resource pools (Resource
 Governor) 382–384
 resource segregation 376
 resource starvation 383
 resource throttling 383
 resource waits 393
 RESOURCE_SEMAPHORE_
 QUERY_COMPILE 405
 response time 38
 restoration time 195
 restore
 complexity 202
 differential backup
 restore 200
 FROM
 DATABASE_SNAPSHOT
 219
 full backup restore 198
 online piecemeal restore 72,
 212–217
 page restore 276
 STOPBEFOREMARK 211
 support per SQL edition 6
 synchronized restores 211
 transaction log restore 202
 WITH NORECOVERY 200
 WITH RECOVERY 202
 WITH STOPAT 202
 RESTORE DATABASE 198
 RESTORE DATABASE FROM
 DATABASE
 SNAPSHOT 219
 RESTORE DATABASE WITH
 NORECOVERY 200
 RESTORE DATABASE WITH
 PARTIAL 215

RESTORE LOG WITH
 NORECOVERY 203, 237
 RESTORE LOG WITH
 RECOVERY 203, 237
 RESTORE LOG WITH
 STOPAT 203
 RESTORE LOG WITH
 STOPBEFOREMARK 211
 restoring compressed
 backups 221
 retrospective performance
 troubleshooting 348
 ribbon cable 16
 RID. *See* row id
 role reversal, log shipping 237
 role-based security 107–111
 roll back 198, 200
 roll forward 198, 200
 rollback (DBCC) 277
 ROLLBACK (DDL Trigger) 116
 rollback point 217, 232
 rolling back database changes
 (database snapshots) 220
 root cause analysis 278
 row compression 185
 row id (RID) 284
 lookup 291
 row locator 284
 ROWGUIDCOL 181
 RPC:Completed 335
 run as 107
 run to cursor 340
 runaway query 376
 runnable queue 392

S

SA account 65, 97
 sampling frequency 349
 sampling frequency
 (statistics) 323
 SAN. *See* storage area network
 SAS. *See* Serial Attached SCSI
 SATA. *See* Serial ATA
 scalability 44
 schedulers 392
 schema 110
 schema binding 301
 schema comparison tools 256
 SCOM. *See* Systems Center Oper-
 ations Manager
 script configuration 236
 scripting a trace definition 337
 SCSI. *See* Small Computer Sys-
 tems Interface
 secondary data file 169
 secondary filegroups 176, 217
 sector 32

- securable 107
- secure environment 95
- Secure Sockets Layer (SSL) 102
- security breach 226
- security identifier (SID) 247, 257
- security notifications 127
- security token 97
- seek (index) 284
- seek latency 17, 28
- selectivity 287, 321
- self-managing features 148
- self-signed certificates 98, 102
- send queue 239
- separation of powers 104
- sequential I/O 13, 170, 286, 291
- Serial ATA (SATA) 16, 170
- Serial Attached SCSI (SAS) 17, 170
- serializable isolation level 344
- server activity (report) 361, 372
- server audit specification 112
- server components 31
- server consolidation 51–56, 62
- server load 349
- Server Message Block (SMB) 61
- server replacement policy 56
- server-side trace 337
- server sizing 29
- server sprawl 51
- Server Virtualization Validation Program (SVVP) 55
- service accounts 249, 59, 64, 104
- service broker 263
- service level agreement (SLA) 12, 38, 195, 202, 221, 223, 229, 256
- service packs 223
 - application outage 74
 - installation considerations 74
 - named instance 62
- services (stopping unnecessary) 144
- SET PARTNER FAILOVER 254
- SET PARTNER FORCE_SERVICE_ALLOW_DATA_LOSS 255
- SET PARTNER RESUME 254
- SET PARTNER SUSPEND 253
- SET STATISTICS IO 309
- SET STATISTICS XML 309
- set warnings thresholds (mirroring) 253
- setup support files 63
- setup support rules 63
- SGAM. *See* shared global allocation map
- shared global allocation map (SGAM) 266
- shared lock 344
- shared nothing 79
- shared percentage (Resource Governor) 382
- shared scalable databases 259
- shared storage 80, 228
- shell plans 401
- shock resistance 28
- show execution plan XML 308
- SID. *See* security identifier
- side-by-side upgrade techniques 71
 - attach/detach 72
 - backup and restore 72
 - transaction log backup/restore 72
 - transactional replication 73
- signal waits 394, 406
- signal_wait_time_ms 393
- simple parameterization 401
- simple recovery model 204
- single-column statistics 324
- single-user mode 104
- sizing database files 168
- SLA. *See* service level agreement
- sliding window (disk backups) 208
- sliding windows (partitioning) 177
- Small Computer Systems Interface (SCSI) 16, 170
- SMB. *See* Server Message Block
- SMO. *See* SQL Server Management Objects
- SNAC. *See* SQL Server Native Client
- snapshot backups (SAN) 24
- snapshot. *See* database snapshots
- soft error 244
- soft NUMA. *See* non-uniform memory access
- solid-state disks (SSD) 17, 28–30
 - array 29
- sort space 44
- SOS_SCHEDULER_YIELD 406
- source control 256
- sparse file 217
- sp_createstats 324
- sp_dbcmptlevel 69
- sp_dbmmonitoraddmonitoring 252
- sp_dbmmonitorchangealert 253
- sp_dbmmonitorchangemonitoring 252
- sp_dbmmonitordropalert 253
- sp_dbmmonitordropmonitoring 252
- sp_dbmmonitorhelpalert 253
- sp_dbmmonitorhelpmonitoring 252
- sp_dbmmonitorresults 252
- sp_dbmmonitorupdate 251
- specialization 148
- sp_estimate_data_compression_savings 186–187
- spindle-based storage 28
- split brain 82
- split I/O 35
- split mirror backup (SAN) 27
- sp_setapprole 110
- sp_spaceused 70
- sp_syscollector_create_collection_item 369
- sp_syscollector_create_collection_set 368
- sp_trace_create 338
- sp_trace_setstatus 338
- sp_updatestats 324
- SQL Agent job steps 107
- SQL compilations/sec 372, 405
- SQL injection 123–124
- SQL Mail 125
- SQL Operating System (SQLOS) 391
- SQL recompilations/sec 372, 405
- SQL Server Agent 356–357
 - automating jobs 356
 - event alerts 355
 - job permissions 105
 - Powershell job type 166
- SQL Server Books Online (BOL) 9
- SQL Server Browser 100
- SQL Server Configuration Manager
 - FileStream configuration 180
 - network configuration 99
 - service accounts 105
- SQL Server features
 - new in SQL Server 2008 4
 - support per SQL edition 5
- SQL Server log 270, 357
- SQL Server Management Objects (SMO) 147
- SQL Server management pack 354
- SQL Server Management Studio 423
- SQL Server Native Client (SNAC) 244
- SQL Server network name 87
- SQL Server Profiler 314, 332, 334–347
- SQL slammer worm 101

- SQL Trace 337
 - SQL trace file 313
 - SQL:BatchCompleted 335
 - SQLIO 38, 61
 - SQLIOSIM 41, 61, 268, 278
 - SQLOS. *See* SQL Operating System
 - sqlos.wait_info 395
 - SQLskills.com 198
 - SSD. *See* solid state disk
 - SSIS package subsystem 106
 - SSL. *See* Secure Sockets Layer
 - staggered uploads (MDW) 367
 - standard configuration 150
 - Standard edition 7
 - standard server build 56
 - standby mode 234
 - startup option 104, 345
 - StarWind iSCSI software 24
 - stat_header 324
 - static ports 100
 - statistics 320–325, 287
 - asynchronous statistics
 - update 322
 - auto create statistics 321
 - auto update statistics 321
 - column statistics 322–323
 - create statistics 324
 - DBCC
 - SHOW_STATISTICS 324
 - density vector 324
 - drop statistics 323
 - filtered indexes 299
 - fullscan 324
 - histogram 325
 - sp_createstats 324
 - sp_updatestats 324
 - stat header 324
 - update statistics 321, 324
 - updating post upgrade 69
 - STATISTICS IO 293
 - STATISTICS XML 308
 - status bar (Management Studio) 160
 - STOPAT 202
 - storage
 - bottlenecks 12
 - cost 199
 - design 30
 - formats 16
 - infrastructure 22
 - management 23
 - requirements 27
 - storage allocation 23
 - storage area network (SAN) 22
 - administrator 25
 - configuring for SQL Server 25
 - monitoring tools 27
 - performance testing 27
 - storage cache 27, 37
 - storage controller 36
 - storage virtualization 27
 - stored procedures 399
 - streaming events 337
 - streaming performance
 - (FileStream) 180
 - stress testing 349
 - stripe size 33
 - striping 20, 26, 36
 - subplan. *See* maintenance plans
 - support lifecycle 74–75
 - surface area configuration 98, 152, 154
 - surrogate key 289
 - SUSER_NAME() 379
 - SUSER_SNAME() 379
 - suspect_pages table 210
 - SVVP. *See* Server Virtualization Validation Program
 - switch speed (networking) 50
 - symmetric key 120
 - Symmetric MultiProcessor (SMP) 48
 - synchronized backups 211
 - synchronized restores 211
 - synchronous database mirroring. *See* database mirroring
 - synonyms 220
 - sys.database_mirroring 252
 - sys.database_mirroring_endpoints 252
 - sys.database_mirroring_witnesses 252
 - sys.dm_database_encryption_keys 121
 - sys.dm_db_index_operational_stats 188
 - sys.dm_db_index_physical_stats 315–316
 - sys.dm_db_index_usage_stats 188, 304–305
 - sys.dm_db_missing_index DMVs 309–313
 - sys.dm_exec_cached_plans 398, 404
 - sys.dm_exec_query_plan 404
 - sys.dm_exec_query_stats 333, 361
 - sys.dm_exec_sql_text 398
 - sys.dm_io_virtual_file_stats 332, 411
 - sys.dm_os_memory_clerks 48
 - sys.dm_os_performance_counters 347
 - sys.dm_os_schedulers 407
 - sys.dm_os_waiting_tasks 395
 - sys.dm_os_wait_stats 332, 393
 - sys.dm_resource_governor_configuration 387
 - sys.dm_resource_governor_resource_pools 388
 - sys.dm_resource_governor_workload_groups 388
 - sys.fn_cdc_map_time_to_lsn 119
 - sys.fn_xe_file_target_read_file 396
 - sys.indexes 305
 - sys.objects 305
 - sys.schemas 305
 - sys.sm_db_index_operational_stats 412
 - sys.sp_cdc_enable_table 126
 - sysadmin lock-out 104
 - system cache 180
 - system database backup 223
 - system databases 239
 - system failures 154
 - system objects 176
 - system tables 169
 - system_health extended event 397
 - Systems Center Operations Manager (SCOM) 125, 148, 354
- ## T
-
- table lock (DBCC) 263
 - table name policy 155
 - table scan 40, 175, 286
 - tail log backups 202
 - tape archive 208
 - tape backups 207
 - tape drivers 211
 - tape rotation policy 209
 - tape software 211
 - target (policy-based management) 151
 - TCO. *See* total cost of ownership
 - TDE. *See* Transparent Data Encryption
 - tempdb 122
 - allocation contention 171, 266
 - consolidation
 - considerations 53
 - dedicated disks 170
 - multiple data files 171
 - presizing files 173
 - RAID level 19
 - single vs. multi-instance 53
 - sizing for DBCC 278
 - sort_in_tempdb option 320
 - space required for DBCC 264

test data 256
 test environments 205
 Test Load Agent (Visual Studio Team System) 343
 testing strategy (database snapshots) 220
 text data type 178
 third-party backup compression tools 208, 221
 thread pooling 135
 threads 134
 timestamp 117
 toggle breakpoint 340
 total cost of ownership (TCO) 24
 TPC. *See* Transaction Processing Performance Council
 TPC-C 45
 trace
 definition 337
 file 313
 filter 335
 flag 3604 275
 flags 345
 process 332
 properties 335
 replay 338
 template 335
 track 32
 track-aligning partitions 33
 track_waitstats 394
 transaction
 performance 238
 profile 38
 rate 37
 response time 26, 242
 safety 238
 throughput 16, 241
 transaction (DBCC) 277
 transaction duration 37
 transaction latency 231, 242
 transaction log
 backup frequency 201
 backups 198, 200
 bottleneck 37
 Bulk_Logged backup 206
 checkpoint 140
 dedicated disks 16
 described 197
 growth 198
 log chain 200
 log sequence number (LSN) 198
 LUN configuration 26
 marking WITH MARK 211
 purpose and usage 200
 recovery interval 140
 restore 202

roll back 140
 roll forward 140
 tail log backups 202
 volume separation 170
 transaction log backup 200–203
 transaction log marks 211
 transaction performance targets 229
 Transaction Processing Performance Council (TPC) 18
 transactional consistency (BLOBs) 182
 transactional replication 340
 transactionally consistent 179, 197, 273
 transactions/sec 372
 Transparent Data Encryption (TDE) 102, 120–123, 182, 223
 support per SQL edition 7
 triple DES 120
 trustworthy computing initiative 124
 TSQL_Replay template 339
 tuning advisor. *See* Database Engine Tuning Advisor

U

Ultra320 SCSI 17
 UMS. *See* User Mode Scheduler
 unattended installation 67
 unexpected outage 226
 uniform extent 266
 unique constraint 285
 UNIQUEIDENTIFIER 181
 uniqueifier 285
 unpredictable performance 376
 unrestored log 253
 unsent log 253
 UPDATE STATISTICS 321, 324
 Upgrade Advisor 68
 upgrade solution 232
 upgrade technical reference guide 68
 upgrading to SQL Server 2008
 in-place upgrade 70
 side-by-side upgrade 71–73
 Upgrade Advisor 68–70
 upgrade technical reference guide 68
 UPS 37
 usable life (SSD) 29
 USE PLAN 402
 usecount 400
 user connections 143
 user connections (report) 372
 user mode 136

User Mode Scheduler (UMS) 391
 user objects 169
 user/schema separation 110
 user_lookups. *See* sys.dm_db_index_usage_stats
 user_scans. *See* sys.dm_db_index_usage_stats
 user_seeks. *See* sys.dm_db_index_usage_stats
 user_updates. *See* sys.dm_db_index_usage_stats

V

varbinary(max) data type 178
 varchar(max) data type 178
 VDI. *See* Virtual Device Interface
 vendor support 74
 very large database (VLDB) 212
 Virtual Device Interface (VDI) 23
 virtual LAN (VLAN) 92
 virtual machines (VM) 53
 virtual server 79
 virtualization 51–56, 70
 virtualized RAID 15, 19
 virtualized storage 169
 virus scanners 41
 Visual Studio Team System Database Edition 256
 VLAN. *See* virtual LAN
 VLDB. *See* very large database
 VM. *See* virtual machines
 VMWare. *See* virtualization
 volume separation 169
 volume test environment 314
 V-RAID. *See* virtualized RAID

W

wait category 332
 wait list 392
 waiting_tasks_count 393
 waits 372
 observing with Activity Monitor 332
 observing with sys.dm_os_wait_stats 393
 waits and queues tuning methodology 392
 wait_time_ms 393
 wait_type 393

WAN. *See* wide area network
warm standby 236, 238
_WA_Sys 322
Web edition 8
weekly tasks 420
wide area network (WAN) 243
Windows administrator 104
Windows authentication 65, 97,
160
Windows authentication
mode 97
Windows event log 162, 270, 357
Windows installer 62
Windows Management Instru-
mentation (WMI) 61, 162
Windows Server 2008 61
clustering improvements 81
WITH RECOMPILE 400

WMI Query Language
(WQL) 162
WMI. *See* Windows Management
Instrumentation
worker threads 255
Workgroup edition 7
working relationship 26
workload analysis 334
workload classification 14
workload groups (Resource
Governor) 380–382
worst practices 417
WQL. *See* WMI Query Language
write balancing (SSD) 29
write burst 37
write cache 37, 172
write ordering 28
write overhead (RAID) 21

write performance 37
WRITELOG 410

X

Xeon 45
XML indexes 264
XML policy files 158
xp_cmdshell 105, 125, 152
XPcmdShellEnabled 152

Z

ZBR. *See* zoned-bit recording
zero data loss 238, 242
zero padding files 174
zoned-bit recording (ZBR) 32
zoning 27