

# Index

## A

- Account Provisioning screen, Database Engine**, 42
- accounts**
  - configuring Administrator, 43
  - specifying Reporting Services service, 718–719
  - system administrator. *See* sa (system administrator) account
- accounts, Database Mail**
  - associating with profile, 303–304
  - changing sequence within profile, 305
  - creating new, 296–297, 302–303
  - deleting, 309
  - managing, 301
  - overview of, 295
  - removing from msdb database, 309
  - removing from profile, 309
  - updating properties of, 305
- accumulate method, SQL CLR UDAs**, 628
- acknowledgements, Service Broker**, 735
- Active Directory**
  - SQLServerADHelper100 service, 13
  - Windows logins for, 205
- Active IP address, TCP/IP**, 263
- active/active clustering**, 557
- active/passive clustering**, 556–557
- ActiveX Script, job steps**, 328
- Activity Monitor**, 411–413
- actual execution plans, Query Optimizer**, 500
- ad hoc workloads, Database Engine**, 3
- Add Database Reference**, 613
- Add New Item dialog**, 616
- administrative tasks, automating**
  - best practices, 360–361
  - Central Management Servers, 292–294
  - Database Mail. *See* Database Mail
  - Event Notifications, 315–316
  - Maintenance Plans, 358–360
  - overview of, 285
  - Policy-Based Management. *See* Policy-Based Management
  - SQL Server Agent. *See* SQL Server Agent
- Administrator accounts, configuring**, 43
- administrators**
  - Central Management servers, 4
  - creating logins for, 205–206
  - policy-based management, 4
- Advanced Encryption Standard (AES)**, 580
- Advanced Properties, SQL Server Agent**, 317–319, 329
- AES (Advanced Encryption Standard)**, 580
- After triggers**, 194
- agents, replication**, 590–591
- aggregate functions**
  - ANSI Warnings Enabled and, 141–142
  - defined, 193
  - granting, denying, revoking actions for, 227–228
- aggregates, SQL CLR**, 627–629
- alerts, creating**
  - database mirroring, 583–584
  - operators for, 342–345
  - overview of, 345
  - performance condition, 351–352
  - SQL Server Agent, 318–319
  - SQL Server event-based, 345–351
  - WMI Event, 352–353
- aliases**
  - backup devices as, 367–368
  - creating for Agent connection properties, 320
  - creating with filtered indexes, 495–497
  - creating with SQL Native Client Configuration, 100, 264–265
  - synonyms as, 192
  - user-defined types as, 196, 624
- ALTER CERTIFICATE statement**, 251–252
- ALTER CREDENTIAL statement**, 212
- ALTER DATABASE statement**
  - database mirroring, 580–581, 584–585, 587
  - ENABLE\_BROKER, Service Broker, 741–742
  - initiating failover, 585–586
  - msdb database, 315–316
- ALTER FUNCTION statement, SQL CLR**, 619–621
- ALTER INDEX command**, 180–181
- ALTER LOGIN statement**, 209
- ALTER SCHEMA statement**, 155
- ALTER SYMMETRIC KEY**, 248–249
- ALTER TABLE command**
  - adding primary key constraint, 181
  - ANSI NULL Default setting, 140
- ALTER TRIGGER statement, SQL CLR**, 623
- ALTER USER command**, 395
- AMOs (Analysis Management Objects)**, 12
- Analysis Designers**, 90
- Analysis Management Objects (AMOs)**, 12
- Analysis Services Script, Solution Explorer**, 58–60
- Anonymous dialog security, Service Broker**, 739
- ANSI NULL Default, database option**, 140
- ANSI NULLS Enabled, database option**, 140–141
- ANSI Padding Enabled, database option**, 141
- ANSI Warnings Enabled, database option**, 141–142

## ANSI-style join syntax

**ANSI-style join syntax**, 530–531

**Any contract, Service Broker**, 737

**application roles, creating**, 222–224

**applications, security best practices**, 258–259

**architecture**

communication, 11–12

Data Collection, 456–458

programming object models, 12

Report Server, 708

services, 13–15

supported languages, 12

table, 155

**Arithmetic Abort Enabled, database option**, 142

**articles, replication**

defined, 589

Snapshot Agent and, 592

using New Publication Wizard, 599

**assemblies**

adding, 617–618

creating SQL CLR, 611–612

deploying with Visual Studio, 630–631

.NET and CLR, 609

overview of, 196

types supported for SQL CLR, 610–611

**asymmetric keys**

defined, 243

encrypting data, 253–254

overview of, 248–250

public key certificates vs., 251

**attribute hierarchies, SSAS**, 678

**Attribute Relationships tab**

creating Calendar Attribute Relationships,  
694–695

defining for Products Hierarchy, 687, 689

establishing Reseller Attribute Relationships,  
691–692

**audits**

defined, 430

Kerberos and, 225

overview of, 430

results of DDL trigger, 195

security best practices, 258

using C2 Audit Mode, 440

using Login Auditing, 438–439

using Profile, 441–442

using SQL Server Audit. *See* SQL Server Audit

using SQL Trace, 442–443

**authentication**

Database Mail, 297

Database Mail credentials, 295

database mirroring, 580, 583

digital signatures, 255–256

Kerberos, 225

login, 205–210

Reporting Services, 710

Service Broker, 738–739

**authentication modes**

changing, 202–203

Database Engine, 42–43

overview of, 22, 201–202

SQL Server Agent, 321

**authorization**

Kerberos, 225

Service Broker, 742

**Auto Close, database option**, 142

**Auto Create Statistics, database option**, 142

**Auto Shrink, database option**, 142–143

**Auto Update Statistics Asynchronously, database option**, 143

**Auto Update Statistics, database option**, 143

**Auto-Commit Transactions**, 124–125

**AutoCreatedLocal route, Service Broker**, 738

**Autogrowth**

database option, 137–138

setting transaction logs to, 126

**autonomy, replication type**, 592

**Available Bytes counter**, 405

**Average Wait Time counter**, 407

**Avg. Disk Queue Length counter**, 405

## B

**BACKUP CERTIFICATE statement**, 251–252

**BACKUP SERVICE MASTER KEY statement**, 245

**backup stripes**, 372

**backups**

data encryption keys, 259

database/service master keys, 245

devices for, 367–368

exercise in performing, 368–369

individual filegroup, 136

options for, 372–375

overview of, 367

restore preparation, 386

SQLServerAgent service performing, 13

SQLWriter service performing, 15

strategies, 375–379

transaction log, 126, 559–560

types of, 369–372

**backward compatibility**

database users and roles, 224

login management, 210

logins using T-SQL, 207

**backward compatibility views**, 112

**baselines, performance**, 402, 403

**Basic authentication**, 297

**BCM (Bulk Changed Map) pages**, 123

**BCP (Bulk Copy Program)**, 104–106, 594

**BEGIN DIALOG CONVERSATION statement**, 738

**BEGIN DISTRIBUTED TRANSACTION statement**, 593

**BEGIN TRANSACTION**, 125

**Beginning SQL Server 2005 Administration (Wiley, 2006)**, 7

**Beginning T-SQL with Microsoft SQL Server 2005 and 2008 (Turley and Wood)**

on cursors, 119

Instead Of triggers, 194

on LIKE command and Full-Text search, 14

on T-SQL, 12

**BI (Business Intelligence)**

Analysis Services and, 5

components, 640–642

## CLR (Common Language Runtime)

- implementing, 92
  - overview of, 639
  - Performance Management and, 640
  - Performance Point Server and, 643–644
  - ProClarity and, 643
  - SharePoint and, 642–643
  - SQL Server 2005 and, 2–3
  - summary, 644
  - understanding, 639–640
  - BIDS (Business Intelligence Development Studio)**
    - Analysis Services. *See* SSAS (SQL Server Analysis Services)
    - creating new SSAS project, 679–680
    - creating reports, 642, 714
    - IDE as, 658
    - Integration Services. *See* SSIS (SQL Server Integration Services)
    - managing SSAS, 679
    - overview of, 91–93
    - Reporting Services. *See* SSRS (SQL Server Reporting Services)
  - bigint data type**, 114
  - binary data**, 140, 485
  - binary data type**, 116
  - binary large object (BLOB) data**, 118–119, 169
  - binary sorting**, 41–42
  - bit data type**, 114
  - Blank template, Trace Properties dialog**, 420–421, 425
  - BLOB (binary large object) data**, 118–119, 169
  - blocking**, 497–499
  - Bookmark window**, 60–61
  - breadth-first indexes**, 168
  - Broker Enabled, database option**, 143
  - Browse command, OLAP cube**, 697–700
  - Browser Service, SQL**, 40
  - Buffer Cache Hit Ratio counter**, 406
  - Building the Data Warehouse (Inmon)**, 642
  - Bulk Changed Map (BCM) pages**, 123
  - Bulk Copy Program (BCP)**, 104–106, 594
  - Bulk Log backup, Transaction Log**, 371
  - bulkadmin server role**, 213
  - Bulk-Logged recovery model**
    - for optimization, 479–480
    - overview of, 366
    - setting database options, 139
  - business continuity**, 554
  - Business Intelligence. *See* BI (Business Intelligence)**
  - Business Intelligence Development Studio. *See* BIDS (Business Intelligence Development Studio)**
  - Bytes Total/Sec counter**, 407
- C**
- C2 Audit Mode**, 440
  - caching**
    - configuring Reporting Services, 729
    - execution plan, 500–501
  - Calendar Hierarchy**, 692–695
  - capacity planning, databases**, 130–131
  - Capture Job, Data Change Capture**, 449–450
  - CAs (Certification Authorities)**, 250
  - CASCADE keyword, server permissions**, 230–231
  - cascade settings, foreign key constraints**, 187–188
  - case-sensitivity, SQLCMD utility**, 102
  - catalog, defined**, 16
  - Catalog views**, 134–135, 191–192
  - categories, policy**, 289
  - categories, Registered Servers window**, 293
  - CDC (Change Data Capture)**
    - configuring, 445–447
    - job control, 449–450
    - limitations of, 450–451
    - overview of, 444–445
    - related dynamic management views, 450
    - tables, 451–452
    - using, 447–449
    - using Change Tracking vs., 444
  - Central Management Servers. *See* CMS (Central Management Servers)**
  - certificates**, 250–252
    - certificate chain, 250
    - creating, 252
    - Service Broker Full security using, 739
  - Certification Authorities (CAs)**, 250
  - Change Autogrowth dialog**, 137–138
  - Change Data Capture. *See* CDC (Change Data Capture)**
  - Change Tables**, 447–450
  - Change Tracking**
    - Change Data Capture vs., 444
    - functions and views, 453
    - merge replication using, 595
    - overview of, 452
    - working with, 453–455
  - CHANGE\_TRACKING flag**, 452
  - char data type**, 116, 484–485
  - character data**
    - ANSI Padding Enabled setting for, 140
    - collation settings, 40–41
  - check constraints**
    - enforcing data integrity, 188–189
    - for optimization, 485
  - CHECKPOINT event**, 126
  - checkpoints**
    - recording transactions, 126
    - Simple recovery model, 139, 366
  - CHECKSUM, RESTORE command**, 383
  - Checksum option, Page Verify**, 147–148
  - classes, .NET and CLR**, 609
  - classifier functions, Resource Governor**, 541, 543–545
  - Cleanup Job, Data Change Capture**, 449–450
  - client redirection, database mirroring**, 574
  - Close Cursor on Commit Enabled, database option**, 143–144
  - CLR (Common Language Runtime)**
    - assemblies, 196

## CLR (Common Language Runtime) *(continued)*

### CLR (Common Language Runtime) *(continued)*

- data types, 117–118
- databases and programming, 607–608
- deployment with Visual Studio, 629–632
- .NET and, 609–610
- programming support, 632–633
- security options, 633–636
- Transact-SQL and, 608
- CLR (Common Language Runtime), SQL CLR objects**
  - adding assembly, 617–618
  - aggregates, 627–629
  - compatible data types, 618–619
  - creating assembly, 611–617
  - enabling, 611
  - overview of, 610–611
  - stored procedures, 621–622
  - triggers, 622–623
  - user-defined functions, 619–621
  - user-defined types, 623–626
- cluster keys**
  - designing efficient tables, 480
  - GUIDs as, 492–493
  - optimization using, 491–492
- Cluster Security Policy configuration screen, 49**
- clustered indexes**
  - non-clustered indexes on, 166–167
  - non-clustered indexes vs., 165
  - overview of, 166
  - primary XML indexes as, 170–171
  - scanning execution plans with, 502
- clustered services, applying policies to, 47–48**
- cmdlets, PowerShell, 106–107**
- CMS (Central Management Servers)**
  - defined, 4
  - enforcing policies on multiple servers, 60
  - overview of, 292–294
- Code Editor**
  - overview of, 56–57
  - using bookmarks in, 60–61
- collation**
  - Collation Designer, 40–41
  - database options, 138
  - table, 155–156
- collection item, 456**
- collection mode, 456**
- collection sets**
  - creating custom, 462–465
  - defined, 456
  - system data, 461–462
- collector types, 456, 461**
- colors, customizing font, 82**
- Column Mappings, Import/Export Wizard, 650–653**
- columns**
  - avoiding encryption on frequently searched, 259
  - filtering for replication, 597
  - granting, denying, revoking actions for, 227–228
  - including in leaf nodes of indexes, 167
  - limiting number per table, 480
- command-line tools**
  - BCP utility, 104–106
  - PowerShell, 106–109
  - SQLCMD utility, 102–104
- Comma-Separated Value (CSV) extension, 711**
- COMMIT TRANSACTION, 125**
- Common Language Runtime. See CLR (Common Language Runtime)**
- communication architecture, 11–12**
- Compact Edition, SQL Server Compact 3.5 SP1, 8–9, 77**
- Compatibility Catalog views, 192**
- compatibility level, database options, 139–140**
- composite primary keys, 491**
- compressed backups, 373**
- compression**
  - index and table, 4
  - overview of, 164
  - row, 164–165
- Concatenate Null Yields Null, database option, 144**
- conditions, Policy Management, 287**
- Configuration Manager, 100**
- Configure Management Data Warehouse Wizard, 458–460**
- CONNECT permission, endpoints, 278**
- Connection folders, projects, 59**
- Connection Managers tab, Solution Explorer, 660**
- Connection properties, SQL Server Agent, 321**
- connections, data**
  - creating for new SSAS project, 680–681
  - creating Integration Services package, 671
  - creating Report Builder, 721–725
  - creating SQL CLR assembly, 613–614
- constraints**
  - check, 188–189
  - default, 189–190
  - deleting, 186
  - foreign key, 185–188
  - primary key, 181–183
  - unique, 183–184
  - using triggers vs., 488
- containers, Integration Services runtime engine, 648**
- CONTINUE\_AFTER\_ERROR, RESTORE command, 383**
- contracts, Service Broker, 735, 737, 743**
- control flow, Integration Services**
  - applying additional transforms, 674–675
  - Control Flow Items in, 659–660
  - creating new SSIS package, 661
  - tasks, 662–664
- CONTROL permission, database master keys, 244–245**
- conversation groups, Service Broker, 736**
- conversation priorities, Service Broker, 736**
- conversations, Service Broker**
  - defined, 734–736
  - finding appropriate route for, 738
  - between services, 737
- Copy Only backups, 372**
- COUNT (\*), 538–539**
- counters, performance**
  - correlating database activity with, 523–525
  - disk counters, 404–405
  - memory counters, 405–406

- monitoring file size with, 430
- monitoring Resource Governor, 545
- network counters, 406–407
- processor counters, 403–404
- SQL Server counters, 407–408
- covered indexes**, 167, 493–494
- CPU idle threshold, SQL Server Agent**, 317–319
- CPUs**
  - compressed backups and, 373
  - optimization and, 475
  - processor counters evaluating, 403
- CREATE APPLICATION ROLE**, 223–224
- CREATE ASSEMBLY statement**, 617–618, 630–631
- CREATE ASYMMETRIC KEY**, 248
- CREATE CERTIFICATE statement**, 251–252
- CREATE CONTRACT statement, Service Broker**, 743
- CREATE CREDENTIAL statement**, 212
- CREATE ENDPOINT command**, 273–277, 278
- CREATE FUNCTION statement, SQL CLR**, 619–621
- CREATE INDEX command**, 180
- CREATE LOGIN statement**, 207–208, 210
- CREATE ROLE statement**, 220–221
- CREATE ROUTE statement, Service Broker**, 738
- CREATE SERVICE statement, Service Broker**, 743–744
- CREATE SYMMETRIC KEY**, 247–248
- CREATE TABLE statement**, 140, 181
- CREATE TRIGGER statement**, 623
- CREATE TYPE statement**, 198–199
- CREATE USER statement**, 216, 218–219
- credentials**
  - creating proxies with, 354–356
  - Database Mail, 295
  - overview of, 210–212
- Cross-database Ownership Chaining Enabled, database option**, 144
- cross-joins**, 502
- CSV (Comma-Separated Value) extension**, 711
- Cube Browser window**, 701–702
- cubes, OLAP**
  - Analysis Services and, 641
  - creating, 684–686
  - creating Data Source view, 682–683
  - creating hierarchies. *See* hierarchies, OLAP
  - creating new SSAS project, 679–680
  - defined, 679
  - defining data source, 679–682
  - defining dimensions, 684
  - deploying project, 695–696
  - understanding, 677–678
- cursors**
  - alternatives to, 533–534
  - Close Cursor on Commit Enabled, 143
  - cursor data type, 119
  - Default Cursor, 145–146
- cycling log files, Log File Viewer**, 410

## D

- DAC (Dedicated Administrator Connection)**
  - endpoints, 266, 268
  - SQLCMD utility and, 102, 104
- Data Collection**, 455–468
  - architecture and processing, 456–458
  - configuring, 458–460
  - creating custom Data Collector set, 462–465
  - data collection sets, 461–462
  - Data Collector types, 461
  - error handling, 465–466
  - Management Data Warehouse, 466–468
  - overview of, 455–456
  - reporting, 466–467
  - terminology, 456
- data collection sets**, 461–465
- Data Collector**
  - creating new custom collector set, 462–465
  - error handling with, 465–466
  - overview of, 456–457
  - roles, 458
  - types, 461
- Data Copy phase, restore process**, 379
- Data Definition Language. *See* DDL (Data Definition Language)**
- Data Directories tab, Database Engine configuration**, 43
- Data File I/O section, Activity Monitor**, 413
- data files**
  - capacity planning for new database, 130–131
  - changing path for, 138
  - database storage in, 21
  - restore process for, 381
  - setting Encryption Enabled option, 146
  - storage architecture, 120–123
- data flow, Integration Services**
  - Data Flow Task, 665
  - Data Flow Task, creating, 671–673
  - defined, 648
  - exporting data, 656–658
  - importing data, 649–656
  - specifying data destination, 668–669
  - specifying data source, 666
  - using transformations, 667–668
- data integrity, enforcing**
  - check constraints, 188–189
  - default constraints, 189–190
  - foreign key constraints, 185–188
  - primary key constraints, 181–183
  - unique constraints, 183–184
- Data Manipulation Language (DML) triggers**, 194, 256
- data marts**, 641
- data mining**, 703–704
- Data Mining component, Analysis Services**, 5
- Data Mining eXtensions. *See* DMX (Data Mining eXtensions) language**
- data pages**
  - overview of, 121–122
  - table architecture, 156

## data processing extensions, Reporting Services

**data processing extensions, Reporting Services**, 710

**data processing, report processor**, 709

**data provider**, 456

**data regions, Report Builder 2.0**, 725–726

**data source**

creating for Report Builder, 721–725

creating Integration Services package, 671

defining in ETL process, 646

importing data, SSIS, 649–656

specifying data flow, 666

specifying OLAP, 678–682, 684

**Data Source View (DSV)**, 682–683

**Data Tier Web Services**, 6, 11–12

**Data Transformation Services (DTS)**, 5, 645

**data types**

Change Data Capture, 450

compatible .NET and SQL Server, 618–619

designing tables using narrow, 480

importing data, SSIS, 650–655

Large Object. *See* Large Object data types

new spatial, 5

optimizing for columns in tables, 484–485

user-defined, 196–198

**data types, physical storage**

CLR, 117–118

fixed-length, 114–116

in-row, 118

other types of, 119

overview of, 114

variable-length and Large Object, 116–117

**data warehouses, building**, 641

**database**, 16, 129–200

diagrams, 190–191

disaster prevention and recovery. *See* disaster prevention and recovery

distribution, 20

downloading samples used in this book, 49

enabling/disabling Change Data Capture, 445–447

overview of, 16

planning, 129–131

preparing for Service Broker, 740–741

programming, 607–608

programming objects, 193–200

schemas. *See* schemas

storage of, 20–22

synonyms, 192–193

system, 18–20, 129

user, 20, 129

views, 191–192

**database, creating**, 131–135

data compression, 164–165

database files, 135

enforcing data integrity, 181–190

file size, 137

filegroups, 135–137

generating scripts, 151–152

getting started, 132

indexes. *See* indexes

maintenance vs. performance, 136–137

overview of, 131–135

schemas, 152–155

setting options. *See* database options

table maintenance, 173–181

tables. *See* tables

**Database area, Reporting Services Configuration Manager**, 101

**Database Audit Specification, SQL Server Audit**, 433–434, 436

**Database Consistency Checker. *See* Database Console Command (DBCC)**

**Database Console Command (DBCC)**, 113, 178–179

**database diagrams**, 68–69, 190–191

**Database Encryption Key (DEK)**, 254

**Database Engine**

administrative best practices, 360

configuring, 42–43

features, 3–4

MSSQLServer service as, 13

queries supported by Code Editor, 56

Tuning Advisor, Query Optimizer, 517–523

**Database Engine Tuning Advisor. *See* DTA (Database Engine Tuning Advisor)**

**database files**

Auto Shrink option, 142–143

Copy Only backups, 372

creating database with, 135

storage architecture, 119–120

**Database Mail**, 294–315

configuring, 295–300

configuring SQL Server Agent Alert system properties, 318–320

deleting mail objects, 309

how it works, 294–295

managing messages, 314–315

managing profiles and accounts, 301–309

overview of, 7, 294

sending mail, 310–314

using Log File Viewer for, 410

**Database Mail Configuration Wizard**, 295–300

**database master key**, 243–245

**database mirroring**

Change Data Capture limitations, 451

client redirection, 574

configuring, 576–581

endpoints, 270–272

forcing service on mirror, 586

manual failover, 585–586

modes, 574–575

monitoring, 581–584

overview of, 572–574

pausing mirror session, 584

removing mirror, 586–587

resuming mirror session, 584–585

**Database Mirroring Monitor**, 581–584

**database objects**

database scope, 16

granting permissions on, 233–235

names, 16–17

schema scope, 16

server, 15–16

**database options**

ANSI NULL Default, 140  
 ANSI NULLs Enabled, 140–141  
 ANSI Padding Enabled, 141  
 ANSI Warnings Enabled, 141–142  
 Arithmetic Abort Enabled, 142  
 Auto Close, 142  
 Auto Create Statistics, 142  
 Auto Shrink, 142–143  
 Auto Update Statistics, 143  
 Auto Update Statistics Asynchronously, 143  
 Autogrowth, 137–138  
 Broker Enabled, 143  
 changing path, 138  
 Close Cursor on Commit Enabled, 143–144  
 collation, 138  
 compatibility level, 139–140  
 Concatenate Null Yields Null, 144  
 Cross-database Ownership Chaining Enabled, 144  
 Database Mail, 300  
 Database Read-Only, 144  
 Database State, 144–145  
 Date Correlation Optimization Enabled, 145  
 Default Cursor, 145–146  
 Encryption Enabled, 146  
 Honor Broker Priority, 146  
 Numeric Round-Abort, 146–147  
 Page Verify, 147–148  
 Parameterization, 148–149  
 Quoted Identifiers Enabled, 149–150  
 recovery models, 138–139  
 Recursive Triggers Enabled, 150  
 Restrict Access, 150  
 Service Broker Identifier, 150–151  
 Trustworthy, 151  
 VarDecimal Storage Format Enabled, 151

**database owner.** *See* **dbo user (database owner)**

**Database Read-Only option,** 144

**database scope**  
 overview of, 16  
 permissions, 235–238

**Database Snapshots**  
 creating, 396–398  
 creating of mirrored database, 573  
 disaster recovery and, 398–400  
 limitations of, 398  
 overview of, 396

**Database State, database option,** 144–145

**database users**  
 CREATE USER statement, 216–217  
 creating new user, 218–219  
 overview of, 214–216

**DatabaseMail.exe,** 295

**Data-driven subscriptions, Reporting Services,** 730

**Dataset Properties dialog, Reporting Services,** 722–725

**Date Correlation Optimization Enabled, database option,** 145

**date data type,** 116

**datetime data type,** 115

**Date/Time option, optimization,** 485

**datetime2 data type,** 115–116

**datetimeoffset data type,** 116

**DBCC (Database Consistency Checker).** *See* **DBCC (Database Console Command)**

**DBCC (Database Console Command),** 113, 178–179

**DBCC FREEPROCCACHE,** 501

**dbcreator server role,** 213

**dbo user (database owner)**

created by default, 216

defined, 153

schema creation, 153–154

schema maintenance, 155

**dc\_admin role, Data Collector,** 458

**dc\_operator role, Data Collector,** 458

**dc\_proxy role, Data Collector,** 458

**DCM (Differential Changed Map) pages,** 123

**DDL (Data Definition Language)**

Change Data Capture limitations, 450

creating scripts, 152

executing Event Notifications, 315–316

not using on table variables, 540

**DDL (Data Definition Language) triggers**

creating, 470–472

EVENTDATA function, 469–470

events used with, 469

overview of, 194–195

traditional triggers vs., 469

**deadlocks**

analyzing with Profiler, 420–425

minimizing blocking, 497–498

sample of events resulting in, 408

using Deadlocks/Sec counter, 407

**Debug Location toolbar,** 70

**Debug toolbar,** 70

**debugging, SQL CLR,** 614–615

**decimal data type,** 114–115

**declarative referential integrity (DRI),** 480, 485–488

**decomposition phase, spatial indexes,** 169

**Decomposition Trees, ProClarity,** 643

**Dedicated Administrator Connection.** *See* **DAC (Dedicated Administrator Connection)**

**default constraints**

enforcing data integrity, 189–190

for optimization, 485

**Default Cursor, database option,** 145–146

**default group,** 542

**default instances, configuring,** 37–38, 47

**default pools,** 542

**Default TCP endpoint, TSQL,** 267–268

**Default VIA endpoint, TSQL,** 268

**defense in depth, with permissions,** 229

**de-fragmentation, index,** 508–509

**degree of selectivity, index optimization,** 493

**DEK (Database Encryption Key),** 254

**DELETE statement,** 124, 444–445

**deleting**

constraints, 186

mail messages from server, 314–315

## deleting (continued)

### deleting (continued)

- mail objects, 309
- undoing with Database Snapshots, 399
- delimiting objects**, 149–150
- delivery extensions, Reporting Services**, 712
- de-normalization**
  - designing efficient tables, 480
  - overview of, 483–484
  - using indexed views, 494
- DENY permission state**, 225–228, 231
- Deploy option, BIDS**, 695–696
- Designers configuration, Management Studio IDE**, 89–90
- destination, Integration Services**
  - data flow, 668–669
  - defining for new package, 671–673
  - exporting data, 656–657
  - importing data, 651–655
- Developer Edition, SQL Server 2008**, 8
- diagrams, database**, 68–69, 190–191
- dialog conversations, Service Broker**, 735–736
- dialog security, Service Broker**, 738–739
- Differential backups**, 370, 376, 378, 389
- Differential Changed Map (DCM) pages**, 123
- Differential File/Filegroup backups**, 370–371
- digital signatures**, 255–257
- dimensions, OLAP**
  - creating cube, 686
  - defined, 678
  - defining for new SSAS project, 684
- disaster prevention and recovery**, 363
  - backup, overview, 367–369
  - backup options, 372–375
  - backup strategies, 375–379
  - backup types, 369–372
  - Bulk-Logged recovery model, 366
  - as business continuity, 554
  - chapter preparation, 363–365
  - database snapshots, 396–400
  - Full recovery model, 365–366
  - overview of, 363
  - restoring databases. *See* restoring databases
  - Simple recovery model, 366
- disk counters**, 404–405
- disk I/O performance, storage optimization**, 476–477
- disk space, capacity planning and**, 130
- % Disk Time counter**, 405
- Disk Usage collection set, Data Collector**, 461
- Disk Usage report, SSMS**, 427–428
- Disk Usage Summary report, Data Collector**, 466
- diskadmin server role**, 213
- distinct aggregation**, 537–538
- DISTINCT keyword**
  - avoiding for T-SQL optimization, 526
  - distinct aggregation and, 537–538
- Distributed Management Objects (DMOs)**, 12
- distributed transactions**, 592–593
- Distribution Agent**, 591, 602
- distribution database**, 20, 590

### distributor

- choosing for new publication, 598–599
- defined, 590
- replication types, 591–595
- DML (Data Manipulation Language) triggers**, 194, 256
- DMOs (Distributed Management Objects)**, 12
- DMVs (Dynamic Management Views)**
  - creating performance baseline, 403
  - creating plan guides, 514
  - defined, 192
  - monitoring Change Data Capture, 450
  - monitoring performance, 408–409
  - storage architecture, 113
- DMX (Data Mining eXtensions) language**
  - Code Editor supporting, 56
  - overview of, 703–704
  - SQL Server support for, 12
  - SSAS Editors toolbar for, 77
- dockable tool windows**, 53–54
- domain groups, for clustered services**, 47–48
- double quotation marks (“ ”), Quoted Identifiers**, 149–150
- DRI (declarative referential integrity)**, 480, 485–488
- DROP CERTIFICATE statement**, 251–252
- DROP SYMMETRIC KEY**, 248
- DROP\_EXISTING option**, 180
- drops, undoing with Database Snapshots**, 399–400
- DSV (Data Source View)**, 682–683
- DTA (Database Engine Tuning Advisor)**, 97–100
  - analyzing existing indexes, 517–518
  - analyzing SQL script, 518–523
  - analyzing trace data with Profiler, 523
  - correlating performance data, 523–525
  - General tab, 98–99
  - overview of, 97
  - Tuning Options tab, 99–100
  - using with Profiler, 523–525
- DTS (Data Transformation Services)**, 5, 645
- Dynamic Management Views. *See* DMVs (Dynamic Management Views)**

## E

- editions, SQL Server 2008**
  - operating system requirements, 32–33
  - overview of, 7–8
  - supporting Change Data Capture, 450
- effective policies, Policy Management**, 289–290
- EFS (Encrypting File System)**, 250
- EKM (Extensible Key Management)**, 246
- e-mail. *See also* Database Mail**
  - digital signatures, 255–256
  - as example of SOA, 733–734
  - Reporting Services, 101, 712
- EMERGENCY database state**, 145
- ENABLE\_BROKER option, Service Broker**, 315, 360, 741
- Enabled IP address setting, TCP/IP**, 263
- Enabled property**, 262–263
- Encrypting File System (EFS)**, 250

## Filegroup backups

**encryption**

- algorithms, 243
- asymmetric keys, 248–250
- best practices, 258–259
- certificates, 250–252
- of data, 253–254
- digital signatures, 255–257
- Extensible Key Management, 246
- overview of, 243–245
- Service Broker security and, 738–739, 741
- symmetric keys, 247–248
- Transparent Data Encryption, 254–255

**ENCRYPTION BY PASSWORD option, asymmetric keys,** 249

**Encryption Enabled, database option,** 146

**Encryption Keys, Reporting Services,** 101–102

**endpoints**

- creating, 279–284
- database mirroring, 270–272, 578–580
- granting server permissions for, 232
- overview of, 265–266
- securing, 278
- Service Broker, 278
- SOAP, 272–277
- TSQL default, 266–268
- TSQL TCP, 269–270

**Enterprise Data Platform,** 3

**Enterprise Edition, SQL Server 2008,** 8, 10–11

**Environment configuration, Management Studio IDE,** 82

**Environment settings, Source Control,** 90

**EOIO (exactly-once-in-order), Service Broker dialogs,** 735

**error handling**

- with Data Collector, 465–466
- managing transactions, 125
- in SQL Server Agent General Properties, 317–318

**Error List,** 62

**error reports, configuring,** 44

**estimated execution plans, Query Optimizer,** 500

**ETL (Extract-Transform-Load)**

- BIDS BI project templates for, 92
- Data Transformation Services, 645
- process of, 646
- SSIS. *See* SSIS (SQL Server Integration Services)

**Evaluation modes, policies,** 288

**event forwarding, SQL Server Agent,** 317–319

**event handling, Integration Services,** 648, 669–670

**Event Notifications,** 315–316

**event-based alerts, SQL Server,** 345–351

**EVENTDATA function, DDL triggers,** 195, 469–472

**events, monitoring Resource Governor,** 545

**Events Extraction Settings tab, Trace Properties dialog,** 96–97

**Events Extraction tab, Trace Properties dialog,** 420, 422, 426

**Events Selection tab, Trace Properties dialog,** 95–96, 420–421, 425–426

**exactly-once-in-order (EOIO), Service Broker dialogs,** 735

**Excel Web Services, MOSS 2007,** 642–643

**Execution Account, Reporting Services Configuration Manager,** 101

**execution plans**

- analyzing, 502–504
- creating plan guides, 512–517
- defined, 500
- plan caching, 500–501
- viewing, 501

**Explicit transactions,** 125

**Export Wizard, SSIS,** 656–658

**Express Edition, SQL Server 2008,** 8–9, 142

**Extended Events engine,** 4, 316, 430

**extended stored procedures,** 621

**Extensible Key Management (EKM),** 246

**Extensible Markup Language for Analysis. *See* XMLA (Extensible Markup Language for Analysis)**

**extensions, Reporting Services,** 710–712

**extents, data files and,** 120–121

**EXTERNAL NAME statement,** 623

**External\_Access permission,** 635–636

**F**

**facets, Policy Management,** 287

**failover, initiating,** 585–586

**failover clustering**

- active/active clustering, 557
- active/passive clustering, 556–557
- components, 556
- configuring virtual server name, 46–49
- considering, 558
- for high availability, 554–555
- installing SQL Server to, 45–46
- Windows Clustering, 555–556

**Failover Partner attribute, database mirroring,** 574

**fail-safe operator, designating,** 345

**Feature Selection, Installation Wizard,** 37

**Fields page, Dataset Properties dialog,** 724

**File backups**

- Differential, 370–371
- overview of, 370
- performing, 377–378
- restore process, 381, 389–390

**file copy, log shipping for,** 561–562

**file extensions, Text Editors,** 82

**file share delivery, Reporting Services,** 712

**file size**

- Autogrowth option, 137–138
- creating databases, 137
- monitoring, 427–430

**file system backups, SQLWriter service,** 15

**FILE=option, RESTORE command,** 384

**Filegroup backups**

- Differential, 370–371, 378
- overview of, 370
- performing, 377–378
- restore process, 381, 389

## filegroups

### filegroups

- database storage in, 21
- grouping data files as, 119
- optimizing maintenance vs. performance, 136–137
- organizing database files as, 135–136
- partial database backups on, 371
- partitioning tables with, 158–159
- restore process for, 381

### files, solution folder, 59

### Files-Only installation, Reporting Services, 719–720

### FILESTREAM data

- configuring Database Engine, 43
- overview of, 4
- storage architecture, 118–119

### fill-factor, fragmentation, 179–181

### filter scan, of execution plans, 503

### filtered indexes, 167–168, 494–497

### filtering, for replication, 596–597, 600

### Finalizer method, SQL CLR, 610

### first normal form, 481

### five nines rule of availability, 554

### fixed database roles, 219–220

### fixed server roles, 212–214

### fixed-length data types, 114–116

### float data type, 115

### floating tool windows, 53–54

### folders, project, 59

### fonts, Text Editor, 82

### FOR SERVICE\_BROKER command, 278

### FORCESEEK table hint, 510

### foreign key, as cluster key, 492

### foreign key constraints

- for optimization, 485
- options, 186–188
- overview of, 185–186

### fragmentation

- checking indexes for, 174–178
- mitigating with fill-factor, 179–180
- removing, 180–181

### freezing plans, 514–515

### freq\_interval values, 340–341

### freq\_type values, 340–341

### FROM DATABASE\_SNAPSHOT, RESTORE command, 382

### FROM DISK, RESTORE command, 382

### FROM options, restoring databases, 381

### FROM TAPE, RESTORE command, 382

### Full backups

- with Differential and Transaction Log backup, 377
- with Differential backup, 376
- with Differential restore, 387
- and Differential with Transaction Log restore, 389
- overview of, 369–370
- restore process, 381, 387
- strategy, 375–376
- with Transaction Log backup, 376
- with Transaction Log restore, 387–388

### Full dialog security, Service Broker, 739

### Full recovery model

- log shipping prerequisite, 558

for optimization, 479–480

overview of, 365–366

setting database options, 139

### full-text indexing, 14, 134

### fully qualify object names, T-SQL, 526

### functions

- Change Tracking, 453
- dynamic management, 113
- overview of, 193–194
- SQL CLR, 619–621
- using digital signatures, 256

## G

### GAM (Global Allocation Map) pages, 122

### genealogy, tracing certificate, 250

### General Properties, SQL Server Agent, 317–318

### General property sheet, 209, 214–215

### General tab, DTA, 98–99

### General tab, Trace Properties dialog, 94–95, 420–421

### Geographies Hierarchy, 689–691

### geography data type

- defined, 5
- overview of, 117
- using SQL CLR UDTs to implement, 623

### geometry data type

- defined, 5
- overview of, 117
- spatial indexes using, 169
- SQL CLR UDTs implementing, 623

### Global Allocation Map (GAM) pages, 122

### Globally Unique Identifiers. See GUIDs (Globally Unique Identifiers)

### GRANT command, 226–228

### GRANT permission state, 225–226

### GRANT\_W\_GRANT permission state, 225–226, 230

### graphical plans, Query Optimizer views, 501

### GROUP\_MAX\_REQUESTS parameter, workload groups, 542

### grouping sets, 536–537

### guest account, 217

### GUIDs (Globally Unique Identifiers)

- as cluster keys, 492–493
- in multi-server jobs, 326
- optimizing table columns, 485

## H

### hardware

- installation requirements, 26–27
- optimization, 474–478
- Reporting Services requirements, 717–718

### Hardware Security Models (HSM), 246

### HASH join hint, 511

### HASHED option, creating logins, 208

### HAVING clause, limiting result sets, 529–530

### heaps

- clustered indexes vs., 166

## internal pools

- defined, 156
  - non-clustered indexes on, 166
  - Help**
    - configuration settings, 82
    - toolbar, 70–71
  - HelpDesk.MessageLog**, 739–740
  - HelpDesk.ProcessMessage**, 739–740
  - hierarchical indexes**, 168–173
  - hierarchies, OLAP**
    - Calendar Hierarchy, 692–695
    - defined, 678
    - Products Hierarchy, 687–689
    - Reseller and Geographies Hierarchies, 689–692
  - hierarchyid data type**, 117–118, 168–169
  - high availability**
    - database mirroring. *See* database mirroring
    - failover clustering, 554–558
    - introduction to, 553–554
    - log shipping. *See* log shipping
  - high-performance mode, database mirroring**, 574
  - high-safety with automatic failover mode**, 575
  - high-safety without automatic failover mode**, 574–575
  - hints, Query Optimizer**, 510–512
  - History properties, SQL Server Agent**, 320–321, 323
  - HOLDLOCK/SERIALIZABLE table hint**, 511
  - Honor Broker Priority, database option**, 146
  - horizontal partitioning**, 480–481
  - Hot Add CPU, Database Engine**, 3
  - HSM (Hardware Security Models)**, 246
  - HTML document, sending mail as**, 313–314
  - HTML rendering extension, Reporting Services**, 711
  - hyperthreading, disabling for optimization**, 475
- I**
- IAM (Index Allocation Map) pages**, 122
  - iCSCI storage arrays, network design for**, 477
  - IDE (Integration Development Environment)**, 658
  - IIS (Internet Information Services)**, 6
  - image data type**, 117
  - Image rendering extension, Reporting Services**, 711
  - IMPERSONATE permission**, 220–221
  - impersonation**, 633
  - Implicit transactions**, 124–125
  - Import Wizard, SSIS**, 649–656
  - IMPORTANCE parameter, workload groups**, 542
  - importing**
    - CLR assemblies, 196–197
    - Import/Export Wizard, Integration Services, 649–658
  - included columns, non-clustered indexes**, 167
  - Index Allocation Map (IAM) pages**, 122
  - INDEX (name) table hint**, 511
  - index pages**, 122
  - indexed views, for optimization**, 494
  - indexes**
    - clustered, 166
    - compressing, 4, 164–165
    - DTA analysis. *See* DTA (Database Engine Tuning Advisor)
    - filtered, 167–168
    - generating statistics for columns without, 142–143
    - hierarchical, 168–169
    - included columns on non-clustered, 167
    - maintenance. *See* fragmentation
    - managing in Query Optimizer, 505–510
    - non-clustered, 166–167
    - overview of, 165
    - replicating partitioned, 598
    - spatial, 169
    - XML, 169–170
  - indexes, optimizing**
    - cluster key choice, 491–492
    - degree of selectivity, 493
    - overview of, 488–489
    - primary key choice, 489–491
    - using covering index, 493–494
    - using filtered indexes, 494–497
    - using GUIDs as cluster keys, 492–493
    - using indexed views, 494
    - using narrow indexes, 493
    - using unique constraints, 494
  - Indexes/Keys dialog**, 184
  - Information Schema views**, 191
  - INFORMATION\_SCHEMA**, 217
  - Init method, SQL CLR UDAs**, 628
  - Initiator Only contract, Service Broker**, 737
  - initiators, Service Broker dialogs**, 735, 742
  - Inmon method**, 641
  - INNER joins**, 485
  - in-row data, storage architecture**, 118
  - INSERT statement**
    - Auto-Commit Transactions and, 124
    - Change Data Capture and, 444–445
  - installation, SQL Server 2008**
    - considerations, 27
    - hardware, 26–27
    - memory, 27–28
    - overview of, 25–26
    - Reporting Services, 717–720
    - setup support, 34–37
    - software, 32–33
    - with SQL Server Installation Center. *See* SQL Server Installation Center
    - storage, 28–32
    - virtualization, 32
  - Installation Center. *See* SQL Server Installation Center**
  - Instance Configuration screen, Installation Wizard**, 37–38
  - instances, SQL Server 2008**, 16
  - Instead Of triggers**, 194
  - int data type**, 114
  - integer data types**, 485
  - Integration Development Environment (IDE)**, 658
  - Integration Services. *See* SSIS (SQL Server Integration Services)**
  - Integration Services Connection Project Wizard**, 658
  - IntelliSense**, 4, 56
  - internal groups**, 542
  - internal pools**, 542

## Internet Information Services (IIS)

---

**Internet Information Services (IIS)**, 6  
**IP addresses**, 262–264  
**IPC (Interprocess Communication), Named Pipes**, 262  
**iSCSI, clustering solution**, 556  
**isolating database, restore process**, 385

### J

**job control, Change Data Capture**, 449–450  
**Job History properties, SQL Server Agent**, 320–323  
**Job Properties dialog box**, 336–337  
**Job system properties, SQL Server Agent**, 319–320  
**jobs, SQL Server Agent**  
 creating, 323–327  
 History properties, 320–321, 323  
 managing categories, 327  
 multi-server, 356–358  
 operators, 342–345  
 schedules, 335–338  
 SQL Server Agent roles and, 321–323  
 steps, 328–333  
**join filters**, 598  
**join hints**, 511  
**join syntax, ANSI-style**, 530–531  
**joins, merge**, 534–536

### K

**Kana sensitivity**, 41  
**Keep Alive property, TCP/IP Protocol tab**, 262–263  
**Kerberos security protocol**, 225  
**key lookup, execution plans**, 502  
**Key Performance Indicator (KPI), OLAP**, 679  
**key value**, 243  
**keyboard shortcuts, configuration**, 82  
**KILL command**, 418  
**Kimball method**, 641–642  
**KPI (Key Performance Indicator), OLAP**, 679

### L

**languages, SQL Server 2008**, 12  
**Large Object data types**  
 in-row data, 118  
 performance advantage of filegroups, 136–137  
 storage architecture, 116–117  
 text/image pages, 122  
**latency, choosing replication type**, 592  
**layout, Report Builder**, 725–729  
**.ldf extension**, 20, 119  
**leaf level, indexes**, 165  
**levels, OLAP**, 678  
**license, Installation Wizard**, 35  
**lifetime of dialog, Service Broker**, 735–736  
**Listen All property, TCP/IP Protocol tab**, 262–263  
**local disk storage**, 30, 32  
**Local Machine endpoint, TSQL**, 268  
**Local Server Groups category, Registered Servers**, 293

**locks, SQL Server**  
 minimizing blocking, 497–498  
 overview of, 497  
 sp\_lock, 415–417  
 table variables not participating in, 540  
 working with, 419–420

**Log File Viewer**  
 monitoring using, 410–411  
 overview of, 90–91  
 viewing audit results, 437–438

**log files**  
 changing path for, 138  
 overview of, 21–22  
 restricting size of, 138  
 setting Encryption Enabled, 146  
 SQLWriter backups of, 15

**Log Reader Agent**, 591, 600

**Log Sequence Numbers. See LSNs (Log Sequence Numbers)**

**log shipping**  
 configuring failover, 571–572  
 configuring with Management Studio, 558–563  
 configuring with Transact-SQL, 563–571  
 defined, 558  
 preparing for, 558

**Log Shipping monitor**, 562–563

**Login Auditing**, 438–439

**logins**  
 adding to fixed server roles, 213  
 creating in Management Studio, 206–207  
 creating in T-SQL, 207–208  
 managing, 209  
 for new SSAS project, 681–682  
 overview of, 205–206  
 security practices, 258  
 server permissions for, 233  
 setting Restrict Access options, 150  
 stored procedures for, 210  
 using CREATE LOGIN, 210

**LOOP join hint**, 511

**LSNs (Log Sequence Numbers)**  
 Change Data Capture using, 445  
 tracking changes and, 444  
 transaction log restores, 381  
 transaction logs and, 126

### M

**maintenance**  
 implementing filegroups for, 136–137  
 schema, 154–155

**Maintenance Plan**  
 best practices, 361  
 overview of, 358–360  
 Tasks, SSIS Toolbox, 659–660

**Maintenance Plan Designer**  
 configuring, 90  
 Toolbox window and, 61  
 working with, 358–360

- majority node cluster, Windows Clustering**, 555
- Management Data Warehouse**
  - configuring data collection, 458–460
  - defined, 456
  - overview of, 466–468
- Management Reporter, Performance Point**, 643
- Management Studio**. *See* **SSMS (SQL Server Management Studio)**
- Map Partitions page, Create a Partition wizard**, 162, 164
- mapping, SQL Server login**, 206
- master database**
  - defined, 18–19
  - recovering, 393–394
  - storage location of, 21
- master key, Service Broker**, 740–741
- master servers, for multi-server jobs**, 356–358
- .mdf extension**, 20, 119–121
- MDX (Multidimensional eXpression) language**
  - additional reading for, 702–703
  - Code Editor support for, 56
  - overview of, 703–704
  - SQL Server 2008 support for, 12
  - SSAS Editors toolbar for, 77
- measure groups, OLAP**, 679, 684–686
- measures, OLAP**, 679, 684–686
- member, OLAP**, 678
- memory**
  - installation requirements, 27–28
  - optimization of, 475–476
- memory counters**, 405–406
- Merge Agent**, 591
- MERGE join hint**, 511
- merge joins**, 534–536
- Merge method, SQL CLR UDAs**, 628
- merge replication**, 594–595, 597–598
- messages, Database Mail**, 314–315
- messages, Service Broker**
  - contracts, 737
  - conversations, 735–736
  - creating, 742–743
  - delivering along routes, 737–738
  - using queues, 737
- methods, .NET and CLR**, 610
- Microsoft**
  - developing SQL Server, 2
  - Office PerformancePoint 2007, 643
  - partnership with Sybase, 1–2
  - Reporting Services rendering extensions, 711
- Microsoft Cryptographic API (MSCAPI)**, 245
- The Microsoft Data Warehouse Toolkit: With SQL Server 2005 and the Microsoft Business Intelligence Toolset (Mundy and Thornwaite)**, 642
- Microsoft Distributed Transaction Coordinator (MSDTC)**, 15, 45, 592
- Microsoft Message Queing (MSMQ)**, 6
- Microsoft Office SharePoint Server (MOSS) 2007**, 642–643
- minimal logging**, 139, 366
- mirror database**, 572–574
- mirror server**
  - client redirection, 574
  - configuring database mirroring, 577–579
  - database mirroring and, 573
  - database mirroring modes, 574–575
  - forcing service on, 586
  - monitoring database mirroring, 581–584
- mirrored backups**, 372–373
- mirroring**. *See* **database mirroring**
- miscellaneous folder**, 59
- Missing Index views, Query Optimizer**, 505–508
- mixed extents, data files**, 120
- Mixed Mode authentication**
  - configuring Database Engine, 43
  - defined, 22
  - overview of, 201–202
- Mobile Edition, SQL Server 2005**, 8–9
- model database**, 18–19, 21
- models, SQL Server Replication**, 595–596
- money data type**, 115
- monitoring**
  - of database mirroring, 581–584
  - of database modifications, 468–472
  - of file sizes, 427–430
  - overview of, 401
  - of Resource Governor, 545–551
  - tracking changes with Change Data Capture, 444–452
  - tracking changes with Change Tracking, 452–455
  - using Activity Monitor, 411–413
  - using auditing. *See* **audits**
  - using Data Collection. *See* **Data Collection**
  - using Log File Viewer, 410–411
  - using Profiler, 420–427
  - using Replication Monitor, 602–604
  - using System Stored Procedures, 413–420
- monitoring, performance**
  - creating baseline, 403
  - disk counters, 404–405
  - Dynamic Management Views for, 408–409
  - memory counters, 405–406
  - network counters, 406–407
  - overview of, 401–402
  - processor counters, 403–404
  - SQL Server counters, 407–408
  - strategy, 402
- Monitoring Server, Performance Point**, 643
- MOSS (Microsoft Office SharePoint Server) 2007**, 642–643
- MOVE . . . TO option, RESTORE command**, 384–385
- MSCAPI (Microsoft Cryptographic API)**, 245
- msdb database**
  - administrative best practices, 360
  - configuring for Event Notifications/Service Broker, 315–316
  - Database Mail configuration information in, 295

## msdb database (continued)

### msdb database (continued)

overview of, 19  
storage location of, 21

### MSDTC (Microsoft Distributed Transaction Coordinator), 15, 45, 592

### MSMQ (Microsoft Message Queing), 6

### MSSQLFDLauncher (SQL Full-Text Filter Daemon Launcher), 14

### MSSQLServer (SQL Server) service, 13

MSX\_DOP parameter, workload groups, 542

MSXOperator account, multi-server jobs, 357

### Multidimensional eXpression. *See* MDX

(Multidimensional eXpression) language

multiple instances, installing, 6–7, 719–720

multiple publishers/multiple subscribers model, replication, 596

multiple publishers/single subscriber model, replication, 596

### multi-server jobs

creating, 356–358  
using GUIDs for, 326

## N

### name resolution

named instances, 14  
schemas and, 153

### named instances

configuring for installation, 38  
name resolution, 14

Named Pipes protocol, 262, 266–270

### namespaces

in database projects, 616  
database schema and, 16  
.NET and CLR, 609

### naming conventions

configuring virtual server, 46–49  
designing efficient tables, 481  
managing database users, 214  
new database, 132  
objects, 16–17  
schema objects, 152

### narrow indexes, 493

### NAS (network attached storage), 30–31

Native mode, Reporting Services installation, 719–720

### natural keys, 489–491

### navigation, bookmark, 61

### nchar data type, 116

.ndf extension, 119, 121

### .NET

and CLR, 609–610  
data types compatible with, 618–619  
security, 634–636  
SQL Server CLR objects. *See* SQL CLR objects  
support for threading, 633

NET SEND RECIPIENT, SQL Server Agent, 317–318

NET START command, SQL Server Agent, 317

NET STOP command, SQL Server Agent, 317

network attached storage (NAS), 30–31

### network communication

Named Pipes protocol, 262  
Shared Memory protocol, 262  
SQL Native Client Configuration, 264–265  
SQL Server endpoints. *See* endpoints  
TCP/IP protocol, 262–264  
Virtual Interface Adapter protocol, 264

Network Configuration node, Configuration Manager, 100

network counters, 406–407

network hardware, 477–478

Network Load Balancing (NLB), 555

Network Name, virtual server, 47

### network protocols

Named Pipes, 262  
overview of, 261–262  
security best practices, 258  
Shared Memory, 262  
TCP/IP, 262–264  
Virtual Interface Adapter, 264

New Data Source Wizard, 679–682

New Database Reference, 613

New Database screen, 132–133

New Dimension Wizard, 684

New Filegroup dialog, 135

New Job Schedule screen, 335–336

New login dialog box, 206

New Publication Wizard, 597–600

New Subscription Wizard, 601–602

NLB (Network Load Balancing), 555

NO\_CHECKSUM, RESTORE command, 383

node table, primary XML indexes, 170

nodes, clustering, 554

NOEXPAND hint, 494

NOEXPAND table hint, 510

NOLOCK/READUNCOMMITTED table hint, 511

### non-clustered indexes

clustered indexes vs., 165  
filtered indexes as, 167–168  
included columns on, 167  
overview of, 166–167  
performance advantage of filegroups, 136–137

None option, Page Verify, 147

non-overlapping partitions, 597

non-XML format file, BCP files, 104–105

NORECOVERY, RESTORE command, 382–383

### normalization

de-normalization vs., 483–484  
designing efficient tables, 480–483  
minimizing blocking with, 498

### Notification Services, 7

ntext data type, 117

NTFS file system, FILESTREAM storage for, 4

Null block, data pages, 121–122

### NULL values

ANSI NULL Default setting, 140  
ANSI NULLS Enabled setting, 140–141  
Concatenate Null Yields Null option, 144  
limiting result sets, 531–532

## parameterized row filters, merge replication

**numeric data type**, 114–115  
**Numeric Round-Abort, database option**, 146–147  
**nvarchar data type**, 116–117  
**nvarchar (MAX) data type**, 117–118

**O****Object Explorer**

configuring log shipping, 558–559  
controlling permission states, 226  
creating logins in Management Studio, 206–207  
creating new credential, 211–212  
Details window, 62–64  
overview of, 54–56

**object model, Integration Services**, 647

**OEM (original equipment manufacturer) file, SQL Server Agent**, 317–318

**OFFLINE database state**, 145

**OGC (Open Geospatial Consortium) Simple Features for SQL version 1.1.0**, 117–118

**OLAP (Online Analytical Processing) engine**

Analysis Services using, 5, 641  
hardware optimization, 474  
terminology, 678–679  
understanding, 677–678

**OLAs (Operating Level Agreements)**, 553

**OLTP (Online Transaction Processing)**

Database Engine and, 3  
hardware optimization, 474  
normalizing, 640  
OLAP engine vs., 5

**On Change: Log Only Evaluation mode, policies**, 288

**On Change: Prevent Evaluation mode, policies**, 288

**ON DELETE CASCADE, foreign key constraints**, 187

**ON DELETE SET DEFAULT, foreign key constraints**, 188

**ON DELETE SET NULL, foreign key constraints**, 187

**On Demand Evaluation mode, policies**, 288

**On Schedule Evaluation mode, policies**, 288

**ON UPDATE CASCADE, foreign key constraints**, 187

**ON UPDATE SET DEFAULT, foreign key constraints**, 188

**ON UPDATE SET NULL, foreign key constraints**, 187–188

**Online Analytical Processing. See OLAP (Online Analytical Processing) engine**

**ONLINE database state**, 145

**ONLINE option, rebuilding index**, 180–181

**online resources**

altering database compatibility level, 140  
Microsoft BI roadmap, 644  
sample databases for this book, 49  
software requirements, 32  
user databases, 20

**Online Transaction Processing. See OLTP (Online Transaction Processing)**

**Open Geospatial Consortium (OGC) Simple Features for SQL version 1.1.0**, 117–118

**OPEN MASTER KEY statement**, 243

**Operating Level Agreements (OLAs)**, 553

**operators, creating**, 342–345

**optimization**, 473

constraints vs. triggers, 488  
dangers of time-outs, 498–499  
database recovery model, 479–480  
deciding what to index, 488–494  
declarative referential integrity, 485–488  
designing efficient tables, 480–485  
filtered indexes, 494–497  
hardware, 474–478  
indexed views, 494–497  
minimizing blocking, 497–498  
overview of, 473  
query. *See* Query Optimizer  
T-SQL. *See* T-SQL (Transact-Structured Query Language) optimization  
using Resource Governor. *See* Resource Governor

**OPTION clause, query hints**, 512

**Options page, Dataset Properties dialog**, 724

**Options window. See database options**

**Oracle killer (SQL Server 2005)**, 2–3

**Oracle replication**, 595

**ORDER BY clause, T-SQL**, 527

**original equipment manufacturer (OEM) file, SQL Server Agent**, 317–318

**orphaned users, checking user databases**, 394–395

**overlapping partitions**, 597

**Overview section, Activity Monitor**, 412

**ownership. See also dbo user (database owner)**

creating new database, 132–133  
cross-database ownership chain option, 144  
schema, 153–154  
specifying for CREATE ROLE, 220–221

**P**

**Package Explorer, Integration Services**, 670

**packages, SSIS**

control flow, 661  
control flow tasks, 662–664  
creating, 658–659, 670–675  
data flow, 665–669  
event handling, 669–670  
executing, 656  
Integration Services runtime engine, 648  
Package Explorer and, 670  
precedence constraints, 664–665  
task grouping, 665

**Page Free Space (PFS) pages**, 122

**Page Life Expectancy counter**, 406

**page restore option**, 381

**Page Splits/Sec counter**, 407–408

**Page Verify, database option**, 147–148

**pages, data files**, 121–123

**Pages/Sec counter**, 405

**Parameterization, database option**, 148–149

**parameterized row filters, merge replication**, 597

## Parameters and Filters page, Dataset Properties dialog

**Parameters and Filters page, Dataset Properties dialog**, 724

**Partial database backup**, 371, 378

**PARTIAL option, RESTORE command**, 385

**Partial restore**, 390–392

**Partition Switching**, 5

**partitioning tables**

data compression and, 164–165

overview of, 156–164

replicating indexes and, 598

using horizontal partitions, 480–481

**passwords**

for complex SQL logins, 205

creating logins with T-SQL, 208

security best practices, 258

**PATH indexes, secondary XML**, 171–172

**Pause button, mirror sessions**, 584–585

**PDF rendering extension, Reporting Services**, 711

**PDS (Physical Design Structures)**, 99–100

**peer-to-peer transactional replication**, 593–594

**performance**

creating partitioned tables, 160–161

filegroups for, 136–137

increasing RAM for, 26

monitoring. *See* monitoring, performance

**Performance (Heat) Maps, ProClarity**, 643

**performance condition alerts**, 351–352

**Performance Counters Collector type**, 461

**Performance Management**, 640

**Performance Point Server (PPS)**, 643–644

**Permission sets, SQL CLR**, 634–636

**permissions**

assembly, 196–197

database scope, 235–238

endpoint, 278

managing with Management Studio, 240–243

overview of, 225–229

schema scope, 238–239

server, 229–235

SSAS, 700–702

**PFS (Page Free Space) pages**, 122

**Physical Design Structures (PDS)**, 99–100

**physical security**, 258

**physical storage data types. *See* data types, physical storage**

**Pipe Name property, Named Pipes**, 262

**piping, PowerShell cmdlets**, 107

**PKI (Public Key Infrastructure)**, 250, 739

**plain-text documents, configuring**, 82

**plan cache, Query Optimizer**, 500–501, 514

**plan guides, Query Optimizer**, 512–517

creating, 515–517

creating from plan cache, 514

defined, 512–513

freezing plans, 514–515

parameters for creating, 513–514

**planning, database**, 129–131

**Planning Server, Performance Point**, 643

**Plug-In Selection, Source Control**, 90

**Plug-in Settings, Source Control**, 90

**Point-in-time restore**, 392–393

**policies. *See also* Policy-Based Management**

Central Management Server, 293–294

clustered service, 47–48

enforcing on multiple servers, 60

**Policy-Based Management**

conditions, 287

defined, 4

effective policies, 289–290

facets, 287

naming policies, 290–292

overview of, 286

policies, 288

policy categories, 289

targets, 286–287

**POP3 (Post Office Protocol) server, obtaining**, 284

**Post Office Protocol (POP3) server, obtaining**, 284

**PowerShell**, 4, 106–109

**PPS (Performance Point Server)**, 643–644

**precedence constraints, Integration Services**,

664–665, 674–675

**preparation phase, distributed transactions**, 592

**primary clusters**, 556

**primary data files**, 21

**Primary filegroups**, 21, 136

**primary key**

as cluster key, 492

constraints, 181–183, 485

designing efficient tables, 480

for optimization, 489–491

**primary node, clusters**, 556

**primary server**

configuring failover, 571–572

log shipping in Management Studio, 559

log shipping in T-SQL, 564–565

preparing log shipping, 558

**primary XML indexes**, 170–171

**principal database, database mirroring**, 572–573

**principal server, database mirroring**

configuring, 577–578

configuring in T-SQL, 579

modes, 574–575

monitoring, 581–584

overview of, 573

**principals**

CREATE APPLICATION ROLE statement, 223–224

CREATE ROLE statement, 221–222

credentials, 210–212

database users, 214–219

defined, 204

finding in database, 224–225

fixed database roles, 219–221

logins, 205–210

overview of, 204–205

security best practices, 258

server roles, 212–214

**principle of least privilege**, 229, 258

**priority, Honor Broker Priority**, 146

**private keys**, 248–250

**private profiles, Database Mail**, 298–299

## RAID (Redundant Array of Inexpensive Disks)

**procedure cache, clearing**, 501  
**processadmin server role**, 213  
**Processes section, Activity Monitor**, 412  
**processor counters**, 403–404  
**Processor Queue Length counter**, 404  
**processors, installation requirements**, 27  
**ProClarity**, 643  
**Products Hierarchy**, 687–689  
**Professional Microsoft SQL Server 2008 Administration (Wiley, 2008)**, 136  
**Professional Microsoft SQL Server 2008 Analysis Services 2008 with MDX (Wiley, 2009)**, 702–703  
**profile, Database Mail**  
 associating with account, 303–304  
 changing default, 308  
 changing name or description, 304–305  
 changing sequence of accounts, 305  
 configuring, 298–299  
 controlling access to, 306–308  
 creating new, 301–302  
 deleting, 309  
 managing, 301  
 removing account from, 309  
 removing association between principal and, 308  
 removing from msdb database, 309  
**Profiler**  
 analyzing deadlocks, 420–425  
 analyzing queries, 425–427  
 auditing security events, 441–442  
 auditing using, 441–442  
 monitoring, 420  
 SQL Server Trace, 93–94  
 Trace Properties dialog, 94–97  
 using DTA with, 523  
**programming objects**, 193–200  
 assemblies, 196  
 defaults, 199  
 functions, 193–194  
 programming object models, 12  
 rules, 200  
 stored procedures, 193  
 triggers, 194–195  
 user-defined data types, 196–198  
 user-defined table types, 198–199  
 user-defined types, 199  
**project folders, Solution Explorer**, 59  
**properties, plan guide**, 516–517  
**Properties tab, Solution Explorer**, 660  
**Properties window**, 60  
**PROPERTY indexes, secondary XML**, 173  
**Protocol tab, TCP/IP**, 262–263  
**protocols. See network protocols**  
**proxies**, 353–356, 360  
**Public Key Infrastructure (PKI)**, 250, 739  
**public keys**, 248–252  
**public profiles, Database Mail**, 298  
**public server role**, 212–213  
**publications, and replication**, 591–597, 600  
**publishers, and replication**

configuring New Subscription Wizard, 601  
 defined, 590  
 replication models, 595–596  
 replication types, 591–595  
 SQL Server replication types, 591  
 using filtering, 596–597  
**publishing reports, Reporting Services**, 729  
**pull replication**, 590  
**Pure Log backup, Transaction Log**, 371  
**push replication**, 590

## Q

**queries**  
 analyzing with Profiler, 425–427  
 Central Management Server support for, 293–294  
 Code Editor support for, 56  
 Parameterization settings, 148–149  
 within sp\_send\_dbmail, 312–313  
 troubleshooting with Error List, 62  
**Queries folders, projects**, 59  
**Query Activity Collector type**, 461  
**Query Designer toolbar**, 71–73, 80  
**Query Editor. See Code Editor**  
**Query Execution section, SSMS**, 83–85  
**query hints**, 512  
**Query Optimizer**, 499–500  
 correlating performance data, 523–525  
 Database Engine Tuning Advisor, 517–523  
 execution plans, 500–504  
 hints, 510–512  
 managing indexes, 505–510  
 overview of, 499–500  
 plan guides, 512–517  
 updating statistics, 504  
 using DTA with Profiler, 523  
**Query page, Dataset Properties dialog**, 723  
**Query Results section, SSMS**, 85–87  
**Query Statistics collection set**, 462  
**Query Statistics History report, Data Collector**, 466  
**Queue Reader Agent**, 591  
**queues, Service Broker**  
 creating, 743  
 granting, denying, revoking actions for, 227–228  
 overview of, 737  
 used by services, 737  
**quorum, Windows Clustering**, 555  
**quorum device, Windows Clustering**, 555  
**Quoted Identifiers Enabled, database option**, 149–150

## R

**RAID (Redundant Array of Inexpensive Disks)**  
 improving performance using, 137  
 installation requirements, 28–32  
 storage optimization, 476  
 types of, 28–30

## RAM

- RAM**, 26–28
- RDBMS (Relational Database Management Platform)**, 3
- RDL (Report Definition Language)**, 712
- Read Only**
  - Database option, 144
  - marking all data within filegroups as, 136
  - resource database as, 18
- READ\_WRITE\_FILEGROUPS**, **restore process**, 381
- real data type**, 115
- REBUILD option**, **ALTER INDEX**, 180–181
- Recent Expensive Queries, Activity Monitor**, 413
- recording transactions**, 125–126
- records, retrieving from table**, 538–539
- RECOVERING database state**, 145
- RECOVERY, RESTORE command**, 382–383
- recovery models, database**
  - choosing for optimization, 479–480
  - overview of, 365–366
  - settings, 138–139
- RECOVERY PENDING database state**, 145
- Recursive Triggers Enabled, database option**, 150
- Redo phase, restore process**, 379
- Redundant Array of Inexpensive Disks. See RAID (Redundant Array of Inexpensive Disks)**
- Registered Servers window**, 60, 293
- Registration Information screen, Installation Wizard**, 35
- Relational Database Management Platform (RDBMS)**, 3
- Remote Procedure Call (RPC)**, 262
- remote service binding, Service Broker**, 739
- Remove Mirror button**, 586
- REMOVE PRIVATE KEY**, 249
- rendering, report processor**, 709
- rendering extensions, Reporting Services**, 711
- REPLACE option, RESTORE command**, 385
- replication**
  - agents, 590–591
  - distributed transactions, 592–593
  - merge replication, 594–595
  - Oracle, 595
  - overview of, 589–590
  - replication models, 595–596
  - snapshot, 594
  - transactional, 593–594
  - types of, 591–595
  - using filtering, 596–597
  - using for partitioned tables and indexes, 597
  - using New Publication Wizard, 597–600
  - using New Subscription Wizard, 601–602
  - using Replication Monitor, 602–604
- Replication job steps**, 328
- Replication Management Objects (RMOs)**, 12
- Replication Monitor**, 602–604
- Replication Services**, 6
- Report Builder**
  - connecting to data, 721–725
  - creating reports, 721
  - defined, 642
  - laying out report data, 725–729
  - overview of, 715
  - publishing reports, 720
- Report Center, MOSS 2007**, 642
- Report Definition Language (RDL)**, 712
- report definition process, report processor**, 709
- report delivery, Reporting Services**, 729–731
- Report Designer**, 720–721
- Report Manager, Reporting Services**, 101, 715–716, 729
- report processing extensions, Reporting Services**, 712
- report processor, Reporting Services**, 709
- Report Server, Reporting Services**, 101, 708, 729
- Report Wizard**, 721
- Reporting Services. See SSRS (SQL Server Reporting Services)**
- Reporting Services Configuration Manager**, 100–102, 712–713
- Reporting Services Server**, 15
- reports. See also Report Builder; SSRS (SQL Server Reporting Services)**
  - configuring for error and usage, 44
  - Data Collector, 466–467
  - enabling in Object Explorer Details window, 62–63
  - minimizing blocking, 498
- REQUEST\_MAX\_CPU\_TIME\_SEC parameter**, 542
- REQUEST\_MAX\_MEMORY\_GRANT\_PERCENT parameter**, 542
- REQUEST\_MEMORY\_GRANT\_TIMEOUT\_SEC parameter**, 542
- Reseller Attribute Relationships**, 691–692
- Reseller Hierarchy**, 689–692
- resource database**
  - overview of, 19
  - storage location of, 21
  - working with, 112
- Resource Governor**
  - configuring, 541–545
  - defined, 4
  - monitoring, 545–546
  - overview of, 540–541
  - using, 546–551
- resource groups, clusters**, 47–48
- resource managers, distributed transactions**, 592
- resource pools, Resource Governor**, 541–542
- ResourcePool Stats performance counter**, 545
- Resources Wait section, Activity Monitor**, 412
- RESTORE command**, 380, 382
- RESTORE DATABASE database\_name statement**, 380
- RESTORE LOG database\_name statement**, 381
- RESTORE MASTER KEY statement**, 245
- RESTORING database state**, 145
- restoring databases**, 379–395
  - Change Data Capture limitations, 451
  - configuring log shipping, 562
  - from Database snapshots, 400
  - delaying recovery, 380
  - FROM options, 381
  - phases of, 379
  - preparation tasks, 385–386

## Select a Partitioning Column page, partitions

- RESTORE command, 380
  - RESTORE DATABASE database\_name, 380
  - restore process, 379
  - system databases, 393–395
  - user databases, 387–393
  - Restrict Access, database option**, 150
  - Restricted File Growth button**, 138
  - RESTRICTED\_USER mode**, 385
  - result sets, limiting**, 527–530
  - Resume button, mirror sessions**, 584–585
  - Review Data Type Mappings, Import/Export Wizard**, 655
  - REVOKE command, permissions**, 226–228
  - revoked permissions**, 226–228
  - RID lookup, execution plans**, 502–503
  - RMOs (Replication Management Objects)**, 12
  - roles**
    - application, 222–223
    - Data Collector, 458
    - fixed database, 219–220
    - fixed server, 212–214
    - Management Data Warehouse, 458–459
    - managing permissions in SSAS, 698–702
    - more information on, 224
    - SQL Server Agent, 321–323
    - user-defined database, 220–222
  - rollback transactions**
    - closing explicit transactions, 125
    - closing implicit transactions, 124–125
    - closing open cursor, 85
    - table variables not affected by, 540
  - routes, Service Broker**, 737–738
  - ROWGUID column, FILESTREAM**, 119
  - rows**
    - data compression for, 164–165
    - data pages containing data from, 121–122
    - determining changes to, 452–455
  - rowversion data type**, 116
  - RPC (Remote Procedure Call)**, 262
  - rule of nines**, 554
  - runtime engine, Integration Services**, 648
- S**
- sa (system administrator) account**
    - overview of, 132–134
    - security best practices, 258
    - specifying password for, 206
  - SAFE Permission Set**, 635
  - SAM (Security Accounts Manager)**, 205
  - SANs (storage area networks)**, 30–32
  - scalar functions**
    - defined, 193
    - granting, denying, revoking actions for, 227–228
    - SQL CLR, 619–620
  - Scale-out Deployment, Reporting Services Configuration Manager**, 102
  - scheduled jobs, SQL Server Agent**
    - creating, 335–338
    - creating with sp\_add\_schedule, 338–341
    - creating with sp\_attach\_schedule, 341
    - defined, 13
    - server configuration, 39
    - system properties, 319–321
  - scheduling and delivery processor, Reporting Services**, 709, 730
  - schema scope**, 16, 238–239
  - schemas**
    - creating, 153–154
    - creating Service Broker objects, 741–742
    - maintenance of, 154–155
    - managing database users, 214–216
    - name resolution and, 153
    - overview of, 152–153
    - system view for, 191
  - Script button**, 151–152
  - scripts**
    - creating with Object Explorer, 54–56
    - generating, 151–152
    - Solution Explorer and, 58–60
    - SQLCMD accepting parameters of, 103
    - using bookmarks, 60–61
  - SCSI (Small Computer Systems Interface), and SANs**, 30
  - search space, queries**, 499
  - second normal form**, 482
  - second phase, distributed transactions**, 593
  - Secondary Global Allocation Map (SGAM) page**, 122
  - secondary nodes, clustering**, 556
  - secondary servers**
    - configuring failover, 571–572
    - log shipping in SSMS, 560–562
    - log shipping in T-SQL, 565–566
  - secondary XML indexes**, 171–173
  - Securables page**, 214
  - security**
    - application roles for, 222–224
    - applying clustered service policies, 47–48
    - authentication modes, 22, 201–203
    - best practices, 257–259
    - CLR options, 633–636
    - with CREATE ROLE statement, 221–222
    - Database Mail profiles for, 298
    - for New Subscription Wizard, 601–602
    - Reporting Services, 710, 718–719
    - Service Broker, 738–739
    - for Service Broker endpoints, 278
    - SSAS, 700–702
    - using encryption. *See* encryption
    - using permissions. *See* permissions
  - Security Accounts Manager (SAM)**, 205
  - Security Catalog Views**, 214, 224
  - Security Context window, SSAS**, 701–702
  - securityadmin server role**, 213
  - segregation, data**, 136
  - Select a Partition Function page, partitions**, 162–163
  - Select a Partition Scheme page, partitions**, 162–163
  - Select a Partitioning Column page, partitions**, 161–162

## self-signed certificates

- self-signed certificates**, 250–251
- sending mail, with Database Mail**, 310–314
- Server Activity collection set**, 461–462
- Server Activity History report, Data Collector**, 466–467
- Server Audit Specification, SQL Server Audit**, 431–432, 436
- Server Network Interface (SNI)**, 11
- Server restriction property, policies**, 288
- server roles**, 212–214
- serveradmin server role**, 213, 216
- server-level only action groups, Server Audit Specification**, 431–432
- servers**
  - active/passive clustering, 556–557
  - configuring database mirroring, 577–578
  - configuring Log Shipping monitor, 562–563
  - creating multi-server jobs, 356–358
  - database mirroring roles, 573
  - overview of, 15–16
  - permissions, 229–235
  - preparing for log shipping, 558
  - using in clustering solution, 556
- Service Account, Reporting Services Configuration Manager**, 101, 718–719
- Service Broker**, 6, 730
  - configuring msdb database for, 315–316
  - contracts, 737
  - conversations, 734–736
  - database setting, 143
  - dialog security model, 738–739
  - endpoints, 277
  - granting, denying, revoking actions for, 227–228
  - Identifier, 150–151
  - managing with SSMS, 753
  - overview of, 6
  - queues, 737
  - routes, 737–738
  - services, 737
  - transport security model, 739
  - using SOA model, 733–734
- Service Broker, sample application**
  - creating objects for TicketInputService, 744–746
  - creating objects for TicketNotifyService, 746–749
  - creating Service Broker objects, 741–744
  - creating/preparing database, 740–741
  - overview of, 739–740
  - testing, 749–753
- Service Level Agreements (SLAs)**, 553
- service master key**, 243, 245
- Service Oriented Architecture (SOA), and Service Broker**, 6, 278, 733–734
- services**
  - applying policies to clustered, 47–48
  - configuring for installation, 38–39
  - configuring SQL Server Agent, 317
  - security best practices, 258–259
  - Service Broker. *See* Service Broker
  - types of, 13–15
- Services node, Configuration Manager**, 100
- SET NOCOUNT ON command**, 526
- SET ROWCOUNT**, 528–529
- SET TRUSTWORTHY ON option**, 315, 360
- setup support rules, SQL Server**, 34–37
- setupadmin server role**, 213
- SETVAR command**, 103–104
- severity level(s), event-based alerts**, 346
- SGAM (Secondary Global Allocation Map) pages**, 122
- Shared Memory protocol**, 262, 266–270
- SharePoint**
  - BI side of, 642–643
  - Document Library delivery extension, Reporting Services, 712
  - Integrated mode, Reporting Services, 719–720
- Shiloh code name**, 2
- Show Plan files, reading**, 427
- ShowPlan, XML**, 507–508
- SHOWPLAN options, Query Optimizer**, 501
- Simple Mail Transfer Protocol (SMTP) server**
  - Database Mail using. *See* Database Mail
  - obtaining, 284
- Simple Object Access Protocol (SOAP)**, 272–277
- Simple recovery model**
  - Full backup strategy for, 376
  - for optimization, 479–480
  - overview of, 366
  - setting database options, 139
- single publisher/multiple subscriber model, replication**, 595–596
- SINGLE\_USER mode**, 385
- SLAs (Service Level Agreements)**, 553
- Small Computer Systems Interface (SCSI), and SANs**, 30
- smalldatetime data type**, 115
- smallint data type**, 114
- smallmoney data type**, 115
- SMOs (SQL Management Objects)**, 12
- SMTP (Simple Mail Transfer Protocol) server**
  - Database Mail using. *See* Database Mail
  - obtaining, 284
- snapshots**
  - Database Snapshots. *See* Database Snapshots
  - replication, 591, 594
  - using Reporting Services, 729–730
  - using Snapshot Agent, 591, 600
- SNI (Server Network Interface)**, 11
- SOA (Service Oriented Architecture), and Service Broker**, 6, 278, 733–734
- SOAP (Simple Object Access Protocol)**, 272–277
- software requirements**
  - Reporting Services installation, 717–718
  - SQL Server 2008 installation, 32–33
- solid-state drives**, 476, 477
- Solution Explorer**
  - adding solution to source control, 74
  - overview of, 58–60
  - Properties window, 60
- solution file, Solution Explorer**, 59–60
- sort scan, execution plans**, 503

## SQL Server Configuration Manager

- sorting, T-SQL optimization**, 527
- Source Control configuration, Management Studio IDE**, 90
- Source Control toolbar**, 73–75
- sp\_add\_alert**, 349–351
- sp\_add\_job**, 325–327
- sp\_add\_jobserver**, 326–327
- sp\_add\_jobstep**, 330–333
- sp\_add\_notification**, 349
- sp\_add\_operator**, 343–345
- sp\_add\_schedule**, 338–340
- sp\_addlogin**, 207
- sp\_addmessage**, 347
- sp\_attach\_schedule**, 341
- sp\_change\_users\_login**, 395
- sp\_configure**, 300, 610–611
- sp\_cycle\_agent\_errorlog**, 410
- sp\_cycle\_errorlog**, 410
- sp\_grantlogin**, 207
- sp\_helpdb**, 133–134
- sp\_lock**, 415
- sp\_purge\_jobhistory**, 322
- sp\_send\_dbmail**, 310–314
- sp\_spaceused**, 428–429
- sp\_update\_job**, 344
- sp\_who**, 414–415
- sp\_who2**, 415
- sparse columns**, 451
- spatial data types**, 5
- spatial indexes**, 169
- Sphinx code name**, 2
- spindles**, 29
- SQL CLR objects**
  - adding assembly, 617–618
  - aggregates, 627–629
  - compatible data types, 618–619
  - creating assembly, 611–617
  - deployment with Visual Studio, 629–632
  - enabling, 611
  - overview of, 610–611
  - Permission sets, 634–636
  - securing, 634
  - stored procedures, 621–622
  - triggers, 622–623
  - user-defined functions, 619–621
  - user-defined types, 623–626
- SQL Editor toolbar**, 75–76
- SQL Full-Text Filter Daemon Launcher (MSSQLFDLauncher)**, 14
- SQL logins**, 205
- SQL Mail**
  - configuring Alert System properties, 318–320
  - Database Mail vs., 360
  - as legacy feature, 295
- SQL Native Client Configuration**, 100, 264–265
- SQL Server 2000**, 2
- SQL Server 2005**, 2, 5
- SQL Server 2008, introduction**
  - architecture, 11–15
  - Database Engine, 3
  - database objects, 15–17
  - database storage, 20–22
  - database types, 18–20
  - defined, 3
  - editions, 7–11
  - history of, 1–3
  - release of, 3
  - security, 22
- SQL Server 4.2**, 1–2
- SQL Server 6.0**, 2
- SQL Server 6.5**, 2
- SQL Server 7.0**, 2
- SQL Server Agent**
  - administrative best practices, 360
  - alerts. *See* alerts, creating
  - multi-server jobs, 356–358
  - operators, 342–345
  - proxies, 353–356
  - Reporting Services dependence on, 709
  - schedules, 335–341
  - scheduling jobs, 39
  - security, 321–323
  - using Log File Viewer, 410
  - using msdb database, 18
- SQL Server Agent, configuring**
  - Advanced Properties, 317–319
  - Alert System Properties, 318–320
  - connection properties, 320
  - General Properties, 317–318
  - History properties, 320–321, 323
  - Job System Properties, 319–320
  - New Publication Wizard, 600
  - New Subscription Wizard, 602
  - overview of, 316–317
- SQL Server Agent, creating jobs**, 323–335
  - adding job steps, 328–333
  - creating job categories, 327
  - overview of, 323–324
  - token replacement, 333–334
  - using tokens in job steps, 334–335
  - using T-SQL, 325–327
- SQL Server Audit**
  - Audit Destination, 434
  - Audit Package, 431
  - auditing security events, 435–438
  - Database Audit Specification, 433–434
  - enabling targeting of security log, 434–435
  - overview of, 430
  - Server Audit Specification, 431–432
- SQL Server Authentication Mode**, 22, 321
- SQL Server Compact Edition**
  - Editor toolbar, 77
  - overview of, 8–9
  - queries supported by Code Editor, 56
  - Script, Solution Explorer, 58–60
- SQL Server Configuration Manager**
  - configuring server protocols, 261
  - configuring SQL Server Agent, 317

## SQL Server Configuration Manager (*continued*)

### SQL Server Configuration Manager (*continued*)

- overview of, 100
- SQL Native Client Configuration, 264–265
- SQL Server counters**, 407–408
- SQL Server endpoints**. *See endpoints*
- SQL Server event-based alerts**, 345–351
- SQL Server Extended Events**. *See Extended Events engine*
- SQL Server Installation Center**, 34–37
  - Analysis Services configuration, 43
  - collation settings, 40–42
  - configuring virtual server name, 46–49
  - Database Engine configuration, 42–43
  - error and usage reporting, 44
  - feature selection, 37–38
  - final steps, 45
  - instance configuration, 37–38
  - Reporting Services configuration, 43
  - sample databases, 49
  - server configuration, 38–40
  - validating Install Rules, 44
  - to Windows cluster, 45–46
- SQL Server Log**, 438–439
- SQL Server Management Studio**. *See SSMS (SQL Server Management Studio)*
- SQL Server (MSSQLServer) service**, 13
- SQL Server Object Explorer configuration section**, 87–88
- SQL Server Profiler**. *See Profiler*
- SQL Server Replication**. *See replication*
- SQL Server Reporting Services**. *See SSRS (SQL Server Reporting Services)*
- SQL Server Resolution Protocol (SSRP)**, 14
- SQL Server Script**, 58–60
- SQL Server Trace**
  - capturing events using, 442–443
  - Collector type, 461
  - Event Notifications and, 315–316
  - monitoring Resource Governor events, 545
  - overview of, 93–94
  - viewing results of with Profiler, 420
- SQL Solution Options file**, 59
- sql\_variant data type**, 117
- SQLAgentOperatorRole**, 322–323
- SQLAgentReaderRole**, 322
- SQLAgentUserRole**, 321–322
- SQLCMD utility**
  - overview of, 102–104
  - recovering master database, 393–394
  - using PowerShell to invoke, 108–109
- sqlps utility**, 107
- SQLServerADHelper100 (SQL Server Active Directory Helper) service**, 13
- SQLServerAgent (SQL Server agent) service**, 13
- SQLServerOLAPBrowser (SQL Server Browser) service**, 14
- SQLServerOLAPService (SQL Server Analysis Services)**, 14
- SQLWriter (SQL Server VSS Writer) service**, 15

- square brackets [ ], Quoted Identifiers**, 149–150

### SSAS (SQL Server Analysis Services)

- BI and, 641
- collation, 40
- configuring, 43
- defined, 5
- Editors toolbar, 77
- job steps, 328
- OLAP and, 677–679
- overview of, 677
- Project template, 92
- queries supported by Code Editor, 56
- Query Execution, 85
- Query Results, 87
- run by SQLServerOLAPService, 14
- security, 698–702
- using data mining, 704–705
- using MDX language, 703–704

### SSAS (SQL Server Analysis Services), working with

- browsing cube, 697–698
- creating cube, 684–686
- creating Data Source view, 682–683
- creating hierarchies, 686–695
- creating project, 679
- defining data source, 679–682
- defining dimensions, 684
- deploying project, 695–696

### SSIS (SQL Server Integration Services), 5, 645–646

- Business Intelligence of, 641
- exporting data, 656–658
- importing data, 649–656
- Integration Services, 646–647
- Integration Services data flow, 648
- Integration Services object model, 647
- Integration Services runtime engine, 648
- job steps, 328
- MSDTSSTServer100 service creating/managing, 15
- overview of, 5, 645–646

### SSIS (SQL Server Integration Services), transforming data, 658–659

- control flow, 661
- control flow tasks, 662–664
- creating simple package, 670–675
- data flow, 665–669
- event handling, 669–670
- overview of, 658–659
- Package Explorer, 670
- precedence constraints, 664–665
- Solution Explorer, 660–661
- task grouping, 665
- Toolbox, 659–660

### SSMS (SQL Server Management Studio)

- changing authentication mode from, 202
- configuring database mirroring, 576–578
- configuring log shipping, 558–563
- configuring SQL Server Agent, 317
- creating database with. *See database, creating*
- creating logins in, 206–207
- creating new job in, 323–324
- creating partition using, 161–164

## subscribers

- Log File Viewer, 90–91
- managing database mirroring, 584–587
- managing permissions with, 240–243
- managing Reporting Services, 713–714
- managing Service Broker with, 753
- managing SSAS, 679, 696–702
- overview of, 52–53
- toolbars. *See* toolbars
- SSMS (SQL Server Management Studio) configuring,** 82–90
  - Designers section, 89–90
  - Environment section, 82
  - overview of, 82
  - Query Execution section, 83–85
  - Query Results section, 85–87
  - Source Control section, 90
  - SQL Server Object Explorer section, 87–88
  - Text Editor section, 82–83
- SSMS (SQL Server Management Studio), tool windows,** 53–64
  - Bookmark window, 60–61
  - Code Editor, 56–57
  - Error List, 62
  - Object Explorer, 54–56
  - Object Explorer Details window, 62–64
  - Properties window, 60
  - Registered Servers window, 60
  - Solution Explorer, 58–60
  - Template Explorer, 64
  - Toolbox window, 61
  - Web Browser window, 64
- .ssmss1n extension,** 58
- SSRP (SQL Server Resolution Protocol),** 14
- SSRS (SQL Server Reporting Services)**
  - Business Intelligence of, 642
  - configuring, 43
  - creating reports with Report Builder, 721–729
  - defined, 6
  - designing reports with Report Designer, 720–721
  - installation and configuration, 717–720
  - overview of, 707
  - publishing reports, 729
  - report delivery, 729–731
  - ReportingServicesServer service running, 15
- SSRS (SQL Server Reporting Services), components and tools**
  - Business Intelligence Development Studio, 714
  - extensions, 710–712
  - Report Builder 2.0, 715
  - Report Manager, 715–716
  - report processor, 709
  - Report Server, 708
  - Reporting Services Configuration Manager, 712–713
  - scheduling and delivery processor, 709
  - SQL Server Management Studio, 713–714
- Standard Edition, SQL Server 2008,** 8, 10
- Standard subscriptions, Reporting Services,** 730–731
- Standard toolbar,** 77–78
- Standard transactional publication replication,** 593
- STANDBY, RESTORE command,** 383
- started state, TSQL endpoints,** 266
- start-up options, configuration,** 82
- states, database options,** 144–145
- states, permission,** 225–226
- static row filters, replication,** 597
- statistics**
  - Auto Create Statistics, 142
  - Auto Update Statistics, 143
  - Auto Update Statistics Asynchronously, 143
  - Date Correlation Optimization Enabled, 145
  - not calculated on table variables, 540
  - retrieving from tables, 181
- statistics, Query Optimizer**
  - identifying missing indexes, 506–507
  - overview of, 499–500
  - updating, 504
- STATISTICS options, Query Optimizer views,** 501
- status bar, configuration settings,** 82
- STOP\_ON\_ERROR, RESTORE command,** 383
- stopped state, TSQL endpoints,** 266
- storage**
  - architecture requirements, 30–32
  - in clustering solution, 556
  - FILESTREAM for, 4
  - optimization, 476–477
  - overview of, 20–22
  - RAID requirements, 28–30
- storage architecture**
  - data files, 120–123
  - database files, 119–120
  - Dynamic Management Views and functions, 113
  - FILESTREAM data, 118–119
  - overview of, 111
  - physical storage data types. *See* data types, physical storage
    - resource database, 112
    - sys schema, 112
    - transaction log, 123–127
- storage area networks (SANs),** 30–32
- stored procedures**
  - configuring log shipping, 564–565
  - creating SQL CLR, 621–622
  - database users and roles, 224
  - managing logins, 210
  - minimizing blocking, 498
  - overview of, 193
  - processing message queues in Service Broker, 737
  - retrieving database information, 133–134
  - signing with digital signatures, 256
- stripping backups,** 372
- subscribers**
  - defined, 590
  - replication models, 595–596
  - replication partitioned tables/indexes, 597
  - replication types, 591–595
  - SQL Server replication types, 591
  - using filtering, 596–597

## subscriptions

### subscriptions

- configuring New Subscription Wizard, 601–602
- Reporting Services, 730
- tracking with Replication Monitor, 600
- surrogate keys**, 489–491
- SUSPECT database state**, 145
- Sybase DataServer**, 1–2
- symmetric keys**
  - creating, 247–248
  - defined, 243
  - encrypting data, 253–254
- synonyms**, 192–193, 227–228
- sys schema**, 112, 217
- sysadmin role**, 205–206
- sysadmin server role**, 213
- sys.dm\_db\_index\_physical\_stats view**, 174–178, 409
- sys.dm\_db\_index\_usage\_stats view**, 409
- sys.dm\_os\_performance\_counters view**, 408–409
- sysmail\_add\_account\_sp**, 302–303
- sysmail\_add\_principalprofile\_sp**, 306–308
- sysmail\_add\_profile\_sp**, 301
- sysmail\_add\_profileaccount\_sp**, 303–304
- sysmail\_configure\_sp**, 300
- sysmail\_delete\_account\_sp**, 309
- sysmail\_delete\_mailitems\_sp**, 314–315
- sysmail\_delete\_principalprofile\_sp**, 308
- sysmail\_delete\_profile\_sp**, 309
- sysmail\_delete\_profileaccount\_sp**, 309
- sysmail\_help\_account\_sp**, 303
- sysmail\_help\_profile\_sp**, 301–302
- sysmail\_mailitems table**, 314
- sysmail\_update\_account\_sp**, 305
- sysmail\_update\_principalprofile\_sp**, 308
- sysmail\_update\_profile\_sp**, 304–305
- sysmail\_update\_profileaccount\_sp**, 305
- sys.sm\_db\_index\_physical\_stats view**, 510
- sys.sp\_cdc\_enable\_db**, 445–446
- sys.sp\_cdc\_enable\_table**, 445–446
- sys.sysfiles**, 429
- system administrator account**. *See* **sa (system administrator) account**
- System Area Network**, 264
- System Consistency Checker**, 32
- system data types**, 196–198
- system databases**
  - defined, 18
  - master database, 18
  - model database, 18
  - msdb database, 19
  - overview of, 129
  - recovering, 393–395
  - resource database, 19
  - storage of, 20–22
  - tempdb database, 19
- system functions**, 194
- System Stored Procedures**
  - exercise using, 418–420
  - KILL command, 418
  - locking and, 416–417

- monitoring with, 413–420
- overview of, 193
- sp\_lock, 415
- sp\_who and sp\_who2, 413–414
- system tables, and backward compatibility**, 112
- system views**, 191–192, 545

## T

- Tabbed Documents, tool windows as**, 53–54
- Table and Database Designers**, 89–90
- table data type**, 119
- Table Designer toolbar**, 78
- table hints**, 510–511
- table variables**, 539–540
- tables**, 156–164
  - analyzing execution plans, 502
  - architecture, 155
  - capacity planning for, 130–131
  - Change Data Capture, 451–452
  - collation, 155–156
  - compressing, 4, 164–165
  - created by Change Data Capture, 451–452
  - creating for primary XML indexes, 170–171
  - Date Correlation Optimization Enabled option, 145
  - defined, 155
  - designing efficient, 480–485
  - DRI relationships between, 485–488
  - enabling/disabling Change Data Capture, 445–447
  - enforcing data integrity. *See* **constraints**
  - granting, denying, revoking actions for, 227–228
  - partitioning, 156–164
  - replicating partitioned, 598
  - user-defined types, 198–199
  - using constraints vs. triggers, 485
  - using DTA to analyze SQL script, 518–523
- tables, maintaining**
  - index fragmentation, 174–179
  - mitigating fragmentation with fill-factor, 179–180
  - removing fragmentation, 180–181
- table-valued functions**, 193, 620–621
- Table-Valued Functions (TVFs)**, 447–449
- Tabular Data Stream (TDS)**
  - defined, 11
  - endpoints, 266–270
- Tail Log backup**, 371, 386
- Target Only contract, Service Broker**, 737
- target servers**
  - authentication in Central Management Server, 293
  - for multi-server jobs, 356–358
- target type, data collection**, 456
- targets**
  - data collection, 456
  - Policy Management, 286–287
  - Service Broker, 735–736, 742
- task grouping, Integration Services**, 665
- Task Host Container**, 662
- tasks, Integration Services**
  - control flow, 662–664

- Data Flow Tasks, 665–669
  - grouping, 665–666
  - precedence constraints, 664–665
  - runtime engine, 648
- TCP Dynamic Ports IP address, TCP/IP**, 264
- TCP endpoints, TSQL**, 269–270
- TCP Ports IP address, TCP/IP**, 264
- TCP/IP protocol**
  - network communication, 262–264
  - SQL Native Client support for, 262–264
  - SQL Server communication, 11
  - TSQL endpoints for, 266–270
- TDE (Transparent Data Encryption)**, 254–255, 259
- TDS (Tabular Data Stream)**
  - defined, 11
  - endpoints, 266–270
- tempdb database**
  - collation settings, 41
  - optimization, 476
  - overview of, 19
  - temporary tables, 539–540
- template database**, 18
- Template Explorer**, 64
- templates, BIDS Project**, 92, 679–680
- temporary tables**, 539–540
- Terminate method, SQL CLR UDAs**, 628
- tessellation phase, spatial indexes**, 169
- testing**
  - Service Broker application, 749–753
  - SSAS security, 701–702
- Text data type**, 117, 485
- Text Editor**, 79–83. *See also* Code Editor
- text in row option**, 118
- text plans, Query Optimizer**, 501
- text/image pages**, 122
- third normal form**, 480, 482–483
- threading**, 633
- TicketInputService**, 739–740, 744–746
- TicketNotifyService**, 739–740, 746–749
- time data type**, 116
- time-outs, hidden dangers of**, 498–499
- timestamp data type**, 116
- tinyint data type**, 114
- tokens**, 319, 333–335
- tool windows. See SSMS (SQL Server Management Studio), tool windows**
- toolbars**
  - customizing, 67–68
  - Database Diagram, 68–69
  - Debug, 70
  - Debug Location, 70
  - Help, 70–71
  - overview of, 65–66
  - Query Designer, 71–73
  - Source Control, 73–75
  - SQL Editor, 75–76
  - SQL Server Analysis Services Editors, 77
  - SQL Server Compact Edition Editor, 77
  - Standard, 77–78
  - Table Designer, 78
  - Text Editor, 79–80
  - View Designer, 80
  - XML Editor, 80–81
- Toolbars menu**, 65–68
- Toolbox, Integration Services**, 659–660
- Toolbox window**, 61
- tools**
  - BCP utility, 104–106
  - BIDS, 91–93
  - Database Engine Tuning Advisor, 97–100
  - PowerShell, 106–109
  - Profiler, 93–97
  - Reporting Services Configuration Manager, 100–102
  - SQL Server Configuration Manager, 100
  - SQLCMD utility, 102–104
- TOP N**, 528–529
- Torn\_Page\_Detection, Page Verify**, 147–148
- Trace Properties dialog, Profiler**, 94–97
- tracking changes**
  - overview of, 444
  - using Change Data Capture. *See* CDC (Change Data Capture)
  - using Change Tracking, 452–455
- transaction date, choosing cluster key**, 492
- Transaction Log backup**
  - Full and Differential backup with, 377
  - Full backup with, 376–377
  - overview of, 371
  - restore process, 387–388
- transaction logs**
  - Bulk-Logged recovery model and, 366
  - capacity planning for, 131
  - Change Data Capture and, 444
  - configuring log shipping. *See* log shipping
  - Copy Only backups on, 372
  - database storage in, 20–22
  - defined, 21
  - in Full recovery model, 365
  - overview of, 123
  - physical characteristics of, 126–127
  - recording transactions, 125–126
  - recovery model options, 138–139
  - restore process for, 381
  - in Simple recovery model, 366
  - transaction types, 123–125
- transaction managers=**, 592
- Transactional Publications with Updatable Subscriptions in a Hierarchical Topology**, 593
- transactional replication**, 591, 593–594
- Transact-SQL job steps**, 328–329
- Transact-Structured Query Language. See T-SQL (Transact-Structured Query Language)**
- transformations**, 667–668, 674–675
- Transparent Data Encryption (TDE)**, 254–255, 259
- transport security, Service Broker**, 739
- triggers**
  - constraints vs., 488
  - DDL. *See* DDL (Data Definition Language) triggers
  - DML, 194

## triggers (continued)

### triggers (continued)

- overview of, 194–195
- Recursive Triggers Enabled option, 150
- SQL CLR, 622–623
- TroubleTicket.MessageLog**, 745–746, 752
- TroubleTicket.ProcessMessages**, 746, 750, 752
- TRUNCATE TABLE** command, 365
- TRUSTWORTHY** option, **Service Broker**, 151, 741–742
- T-SQL (Transact-Structured Query Language)**
  - configuring, 82
  - creating new job, 325–326
  - database mirroring, 578–581, 584–587
  - getting best database performance, 608
  - log shipping, 563–571
  - logins, 207–208
  - permission states, 226
  - SQL Server 2008 support for, 12
  - SQLCMD utility and, 103
  - stored procedures written in, 193
- T-SQL (Transact-Structured Query Language)**
  - optimization**, 526–527
  - ANSI-style join syntax, 530–531
  - cursor alternatives, 533–534
  - dealing with NULL values, 531–532
  - distinct aggregation, 537–538
  - grouping sets, 536–537
  - limiting result sets, 527–530
  - merge joins, 534–536
  - overview of, 526–527
  - Query Collector type, 461
  - retrieving records from table, 538–539
  - temp tables vs. table variables, 539–540
- TSQL endpoints**, 266–280
- Tuning Options** tab, **DTA**, 99–100, 519, 521
- TVPs (Table-Valued Functions)**, 447–449
- 2PC (two-phased commit)**, 15, 592

## U

- UDA (user-defined aggregates), SQL CLR**s, 627–629
- UPDATE** statement, **CDC**, 444–445
- UDTs (user-defined types)**, 199, 623–626
- UNC (Universal Naming Convention)**, 30, 594
- Undo phase, restore process**, 379
- Unicode strings, table columns**, 485
- uniform extents, data files**, 120
- Uniform Resource Locator (URL), SOAP endpoints**, 272–273
- UNION ALL** keyword, **optimization**, 527
- unique constraints**
  - enforcing data integrity, 183–184
  - for index optimization, 494
  - for optimization, 485
- unique indexes**, 183–184
- uniqueidentifier** data type, 116
- uniqueifier**, 166
- Universal Naming Convention (UNC)**, 30, 594
- UNSAFE Permission Set**, 635–636
- UPDATE** statement, 124

- UPDATE STATISTICS** command, 504
- updates, undoing with Database Snapshots**, 398–399
- UPDATEUSAGE** command, 539
- UPDLOCK** table hint, 511
- URL (Uniform Resource Locator), SOAP endpoints**, 272–273
- usage reports**, 44
- User Connections** counter, 407
- user databases**
  - checking for orphaned users, 394–395
  - overview of, 20, 129
  - restoring, 387–393
  - storage of, 20–22
- user-created stored procedures**, 193
- user-defined aggregates (UDA), SQL CLR**s, 627–629
- user-defined data types**, 196–199
- user-defined database roles**, 220–221
- user-defined filegroups**, 136
- user-defined functions**, 193, 619–621
- user-defined hierarchies, SSAS**, 678
- user-defined table types**, 198–199
- user-defined types (UDTs)**, 199, 623–626
- users. See database users**

## V

- validation tests**, 34–37
- VALUE indexes, secondary**, 172–173
- varbinary (MAX) data type**, 117–119
- varbinary data type**, 116, 485
- varchar (MAX) data type**, 117–118
- varchar data type**, 116–117, 484–485
- VarDecimal Storage Format Enabled, database option**, 151
- variable block, data pages**, 122
- variable-length data types**, 116–117
- VIA (Virtual Interface Adapter) protocol**, 11, 264, 266–270
- View Designer** toolbar, 80
- view server state permission, Activity Monitor**, 411
- views**
  - Change Tracking, 453
  - dynamic management, 113
  - granting, denying, revoking actions for, 227–228
  - indexed, 494
  - monitoring Resource Governor, 545
  - overview of, 191
  - Query Optimizer execution plans, 501
  - resource database, 112
  - sys schema, 112
  - system, 191–192
- Virtual Interface Adapter (VIA) protocol**, 11, 264, 266–270
- virtual servers**, 556–557
- virtualization**
  - improving hardware utilization, 478
  - installation requirements, 32
- Visual Studio**
  - deploying SQL CLR objects with, 629–632
  - SQL Server Management Studio interface, 52–53

## zero normal form

**Visual Studio for Applications (VSTA)**, 5  
**Volume Shadow Copy Service (VSS)**, 15  
**VSS (Volume Shadow Copy Service)**, 15  
**VSTA (Visual Studio for Applications)**, 5

**W**

**Web Browser window**, 64  
**Web Edition, SQL Server 2008**, 8, 9–10  
**Web Service URL, Reporting Services Configuration Manager**, 101  
**Web Services, data-tier vs. XML**, 272  
**WHERE clause**, 529–530  
**while loops, alternatives to**, 533–534  
**width sensitivity, collation settings**, 40–41  
**Windows Application Log**, 438–439  
**Windows Authentication Mode**  
 Database Engine, 42–43  
 Database Mail, 297  
 database mirroring, 580  
 defined, 22  
 Mixed Mode, 22, 201–202  
 overview of, 201–202  
 Reporting Services, 710  
 SQL Server Agent connection properties, 321  
 SSAS relying on, 700  
 using when possible, 259  
**Windows Clustering**  
 active/active clustering, 557  
 active/passive clustering, 556–557  
 configuring virtual server name, 46–49  
 considering, 558  
 installing SQL Server to, 45–46  
 overview of, 555–556  
**Windows collation**, 40  
**Windows Executable (CmdExec) job steps**, 328  
**Windows logins**, 205, 293  
**Windows NT**, 1–2  
**WITH CHECK, foreign key constraints**, 186  
**WITH clause**  
 database backup command, 373–374  
 RESTORE command, 382–385  
 table hints using, 510–511

**WITH NOCHECK, foreign key constraints**, 186  
**witness server, database mirroring**, 573, 576–577, 579  
**WMI Event alerts**, 352–353  
**WMI Query Language (WQL)**, 352  
**Workgroup Edition, SQL Server 2008**, 8, 10  
**Working Set (sqlserver) counter**, 405–406  
**workload groups, Resource Governor**, 541–543  
**WorkloadGroup Stats performance counter**, 545  
**workloads, 3. See also Resource Governor**  
**WQL (WMI Query Language)**, 352  
**Write caching**, 477

**X**

**XACT\_ABORT command**, 499  
**XML (Extensible Markup Language)**  
 CDC limitations, 451  
 configuration settings, 82  
 creating BCP files in, 105–106  
 SQL Server 2008 support for, 12  
**XML data type**, 117, 485  
**XML Editor toolbar**, 80–81  
**XML indexes**, 169–173  
**XML plans**, 501  
**XML rendering extension, Reporting Services**, 711  
**XMLA (Extensible Markup Language for Analysis)**  
 SQL Server Analysis Services Editors toolbar for, 77  
 SQL Server support for, 12  
 supported by Code Editor, 56  
**xp\_instance-rewrite extended stored procedure**, 202–203

**Y**

**Yukon code name**, 2

**Z**

**zero normal form**, 481