

Index

A

Access, 452–460

- accessing database, 452–453
- Connection Manager, 453–454
- importing data, 455–457
- parameter passing, 457–460
- queries, importing, 452
- security, 452–453
- Upsizing Wizard, 456

ACE engine, 450

ACH files. See payment processing example

AcquireConnection

- calling of, 670
- Destination adapter, building, 702–703
- functions of, 315, 670
- Source adapter, building, 680, 682

ActionAtEvent, 782

ActionAtTimeout, 109, 782

Active Directory, package roles, viewing, 832

ActiveX Script Task, 53–54

- functions of, 8, 294, 295
- migration to SSIS, 612
- Script Task as replacement, 294

AddErrorOutput, transform, building, 692

Add Precedence Constraint, 50

Add References, 671

Add Watch, 352–353

administering packages. See package administration

ADO

- Execute SQL Task connection, 86–87
- Foreach ADO Enumerator, 125–128
- record set, producing, 146

ADO.NET

- ADO.NET Destination, 15
- ADO.NET Source, 142
- Data Profiler Task connection, 64, 357

Data Reader, 15

data sources, 9

Execute SQL Task connection, 86–87

Foreach ADO.NET Schema Rowset
Enumerator, 122

functions of, 449

user interface, building, 733–734

Advanced

Fuzzy Grouping Transform, 165

Fuzzy Lookup Transform, 159

Term Lookup Transform, 192

Advanced Editor

Character Map Transform, 739–740

components, default interface, 717

Import Column Transform, configuring,
167–169

and OLE DB Command Transform, 172

and Row Count Transform, 183

and transformations, 533–534

verification methods, use of, 665

Advanced Windowing Extension (AWE), 515

AdventureWorks2008

Analysis Services Processing Task, use
of, 58–59

Export Column Transform, 156–157

images, importing into, 167–169

Import Column Transform, 167–169

joins, example of, 242–263

AfterEvent, 109, 782

AfterTimeout, 109, 782

Aggregate Transform

Aggregation Name, 148

configuring, 147

data cleansing, 552–553

and data viewers, 132

distinct values, setting, 148

as full blocking transform, 147, 533

functions of, 16, 147

Aggregate Transform (continued)

- multiple outputs, 148
- options, 147–148
- with Term Lookup Transform, 192

agile methodologies, MSF Agile, 590–593

Allow Append, 155

Analysis Management Objects (AMO),

SSAS processing, 401, 408

Analysis Services Connection Manager, 143

Analysis Services Execute DDL Task, 57–58

- configuring, 57–58
- functions of, 8, 57
- SSAS processing, 401, 404

Analysis Services Processing Task, 58–59

- database, use with, 58–59
- functions of, 8, 58–59
- SSAS processing, 400–408

annotations

- creating, 39–40
- functions of, 39

Append, 155

Application objects

- and external management. See managed code
- folder maintenance operations with, 750
- functions of, 744
- maintenance operations with, 745
- management operations with, 744
- package listing, 755–756
- package monitoring, 753–754
- package transfer, example of, 747–750

archiving files

- process of, 66–67, 290
- unique filename for files, 300–301

ASCII, transfer files in, 68

ASP.NET, SSIS functionality with, 797–802

assemblies

- AssemblyCulture, 678
- AssemblyInfo, 671, 673, 677, 721–722
- AssemblyVersion, 678, 722
- AssemblyFileVersion, 678
- component building, 671–672
- GAC, registering in, 302
- .NET assemblies, 303–305
- reusing, 302–305
- user interface, building, 721–722

asynchronous transforms

- fully blocking, 147
- functions of, 147
- partial blocking, 147
- PrimeOutput, 669
- ProcessInput, 669
- Sort Transform, 185–186
- transformation output, 534–535

Attach to Process, and debugging, 710–711

Audit Transform

- functions of, 16, 149
- options, 149

authentication, Import and Export Wizard, 22

Auto Extend Factor, 148

Autos

- BIDS, 36
- and debugging, 351–352

Available Input Columns, 164

Available Lookup Column, 158

Average, 147

B

backslash escape sequence, string

literals, 217

backup, snapshots, 442–444

BankBatchDetail table, 859, 893, 901–902, 912, 917–919, 932–933

BankBatch table, 858–859, 881–882, 916–919

bank files. See payment processing example

BaseSelect, 209, 234

batch processing

- payment processing example
 - ACH data flow validation, 910–911
 - adding batches, stored procedure for, 861–862
 - balancing batch, stored procedure for, 863
 - bank file data flow validation, 886–889
 - control flow batch creation, 873–877, 900–904
 - updating batch, stored procedure for, 862
- SQL statement, 88

BatchSize, 81

BCP format, Bulk Insert Task, 84–85

BIDS. See Business Intelligence Development Studio (BIDS)

BLOB counters, 564–565**blob-type data, Export Column Transform, 155–157****blocking transformations**

- and data flow optimization, 558–560
- as resource intensive, 533
- types of, 532–533

Boolean expressions

- for dynamic operations, 220
- functions of, 220
- with precedence constraints, 626–630

Boolean literals, expression building, 217–218**Boolean variable, 210****bottlenecks, 560–562**

- preventing, 560
- troubleshooting, 561–562

branching code

- defined, 602
- process of, 602

breakpoints, 645–648

- BIDS, 36
- Delete All Breakpoints, 132
- design-time debugging, 710–712
- functions of, 350, 645
- inventory check simulation example, 645–647
- runtime debugging, 713–714
- setting, 350, 645
- variables, viewing, 647

buffers, 527–528

- architecture of, 528
- BufferColumnIndex, 690
- buffer counters, 841
- Buffer Manager, 535, 669
- Buffer Memory counter, 564
- BufferWrapper, 333
- and data flow optimization, 556
- in execution tree, 542–543
- flat buffers, 564
- functions of, 527, 540
- ParseTheFileAndAddToBuffer, 687–688
- Performance Monitor (PerfMon), 564–565
- PipelineBuffer, 701
- private buffers, 564
- size of, 527

- synchronous transformation, 536–537
- transform, building, 691–692, 697, 700–701

Build Events, 675–676**Bulk Insert Task, 79–85**

- Bulk Insert Task Editor, 81
- configuring, 80
- connections, creating, 80, 82–83
- file delimiters, 80
- file specs, adding, 80–81
- functions of, 8, 79
- limitations of, 79
- operation of, 82–85
- options, 81–82

Business Intelligence Development Studio (BIDS), 28–31

- accessing, 28
- ActiveX Script Task in, 294
- development environment of, 5
- errors/warnings, 36
- functions of, 4–5
- navigation pane, 35
- new project, starting, 271–272
- off-line mode, 5
- output window, 36
- package, creating, 30–31
- project, creating, 29
- runtime debugging, 713, 716
- solutions, 30
- Task List, 36
- 32-bit emulation mode, 451
- Visual SourceSafe project example, 570–585
- and Visual Studio, 28–29
- Visual Studio Team System, 585–605

Byte Reversal, 150**Byte variable, 210****C****C#**

- for scripting, 296
- and writing expressions, 211–212

cache

- Cache Connection Manager (CCM), 266–268
- Cache Transform, 150
- dimension table data, 388
- extension (.caw), 266

cache (continued)

- full-cache mode, 253–255, 514–515
- Global Assembly Cache (GAC), 302
- information, reuse of, 515
- Lookup Component features, 238, 240, 242 and lookups, 150
- Lookup Transform, 514–515
- no-cache mode, 255–257, 514–515
- partial-cache mode, 257–259, 514–515
- persistent file storage, 515

Cache Connection Manager (CCM), 266–268

- advantages to use, 268
- cache, loading, 267–268
- configuring, 267
- functions of, 238
- Lookup Transform, 514

Cache Transform

- Cache Connection Manager, creating from, 266
- functions of, 150
- Lookup cache, loading, 266

Call Stack

- BIDS, 36
- debugging with, 648

Cancelled, task execution result, 50–51

Candidate Key Profile

- Candidate Key Profile Request, 63
- data profiler results, 361, 365

Candidate Key Profile Request, Candidate Key Profile, 63

capture instance tables

- and CDC process, 434–435
- functions of, 434
- querying, 436–438

Carriage Return, 80

cascaded operations, Lookup Component, 264–266

case-sensitivity, variables, 208

case study. See payment processing example

casting

- casting operators, list of, 207
- problems related to, 206–207

catch block

- functions of, 348
- transform, building, 701

CellContentClick, user interface, building, 730

CellValueChanged, user interface, building, 730

central SSIS server, creating, 820–821

Change Data Capture (CDC), 430–442

- advantages to use, 431–432, 439, 442
- alternative techniques, 431
- API of, 436–438
- Capture Instance tables, 434–435
- editions of SQL server for, 432
- enabling functionality of, 433–434
- functions of, 430–431
- shadow table, querying, 436–438
- SSIS, using output, 438–442

change tables. See capture instance tables

Change Types, Slowly Changing Dimension Transform, 373–374

Changing attributes, 373, 382

- Changing Attributes Updates Output, 375, 385

Chaos, 52

Character Map Transform, 150–151

- functions of, 16, 150
- payment processing example, 878
- user interface, building, 739–740

Char variable, 210

Check Constraints, 81

check-in, and shelving, 601–602

check payments, 844

- processing of. See payment processing example

Checkpoints, 492–502

- CheckpointFilename, 492
- CheckpointUsage, 492
- containers, effects of, 496–499
- control flow error example, 492–496
- FailPackageOnFailure, 492, 494–495
- FailParentOnFailure, 499–500
- file, example of, 501–502
- functions of, 492
- SaveCheckpoints, 492
- and staging data, 554
- variables, adding, 501

child packages

- functions of, 98
- parent variables, changing, 102
- parent variables, setting to use, 99–101

Chinese language, character maps, 150

classes, inheritance from other classes, 664

cleansing data. See data cleansing

Cleanup, functions of, 670

Close method, 670

CLSCompliant, 678

user interface, building, 721–722

clustering SSIS, 822–823

MSDTServer100, 822–823

steps in, 822–823

Code Page, 206

codeplex.com, 661

column(s)

Advanced Editor, cautions, 740

ColumnDelimiter, 83, 273

Column Length Distribution Profile, 63, 362

Column Mappings, 172–173

Column Null Ratio Profile, 63

Column Pattern Profile, 63

Column Statistics Profile, 63

data types, setting, 666–667

display, forms, 728–730

Extract Column, 155, 157

lineage number for, 219

names, qualifying, 219

properties, setting, 667

referencing in expressions, 218–219

selection, forms, 730–732

and Transform component, 663

usage types, setting, 668

user interface, 728–732, 739–740

Column Chart data viewer, 132

ColumnInfo

Destination adapter, building, 702, 708–709

transform, building, 690, 697, 700

Column Length Distribution Profile, data profiler results, 63, 362

Column Null Ratio Profile

Column Null Ratio Profile Request, 63

data profiler results, 362–363, 365

Column Pattern Profile

Column Pattern Profile Request, 63

data profiler results, 363–364

Column Statistics Profile

Column Statistics Profile Request, 63

data profiler results, 364

Columns

Fuzzy Grouping Transform, 164

Fuzzy Lookup Transform, 158

Column Value Distribution Profile, data profiler results, 363

Comma, 80

Command, BIDS, 36

Command Language Specification (CLS)

CLSCompliant, 678

and component building, 678

command-line programs, Execute Process Task, 102–104

Command Transformation, 557–558

comments, annotations, 39–40

Common Table Expressions, and modularization, 428–430

compact edition, SQL Server, 19

comparison flags

Fuzzy Grouping Transform, 164

Pivot Transform, 178

compiler, using directives, 672

Completion, constraint value, 11

compliance, CLSCompliant, 678, 721–722

component(s), 661–716, 664–668

Buffer Manager, 669

building. *See* component building

complete package, building, 712

connection time, 670

creating and selling, 661

debugging, 710–712

design-time debugging, 710–712

design-time methods, 664–668

Destination adapter, 663–664

implementing, 664

installing, 710

necessity of, 661

runtime debugging, 713–716

runtime methods, 668–670

Source adapter, 662–663

SQL 2008 updates, 716

transform, 663

updating, 667

user interface, adding. *See* user interface

component building, 671–709

- assemblies, selecting, 671–672
- AssemblyCulture, 678
- AssemblyInfo, 671, 673, 677
- Build Events, 675–676
- CLSCompliant, 678
- ComponentType, 673
- Destination adapter, 702–709
- folder for, 674–675
- and Global Assembly Cache, 673–674, 676
- IconResources, 673
- inheritance in, 672
- new project, creating, 671
- ReinitializeMetaData, importance of, 665
- Source adapter, 678–690
- Transform component, 690–701

ComponentMetaData

- Destination adapter, building, 705–706
- Source adapter, building, 679
- transform, building, 691

Component Properties, 172

conditional expressions, 224–225

- functions of, 11–12
- options, 12

Conditional Split Transform, 151–153

- defined, 151
- error detection with, 514
- fact table, loading, 396–397
- functions of, 16
- logic, adding to data flow, 151–153
- missing data, remedy, 281–282
- subsets of data for scaling, 517–518

Confidence, 158

ConfigString, log providers, 768–769

Configure Error Output, 879

connection(s)

- concrete, examples of, 315
- to data sources, in Script Task, 315
- for packages, creating, 40
- retrieving, 315
- in SSIS, 315
- See also Connection Manager

Connection Manager

- Access, 453–454
- Bulk Insert Task, 80, 82–83
- Cache Connection Manager (CCM), 238

- data types, 139–140
- and Destination adapter, 663–664
- Destination adapter, building, 702–705
- destinations, 15
- DTEExec, 828
- Excel, 144
- Excel Source, 135–136
- Execute Package Task, 98
- File Connection Manager Editor, 83
- Flat File, 136, 139, 273, 482–485
- FTP Task, 67–68
- functions of, 9–10, 662
- Fuzzy Grouping Transform, 164
- HTTP, 69–70
- MultiFlatFile, 141
- New Flat File Connection, 867–868
- new project, creating connections, 272–274
- off-line mode, 10
- OLE DB Command Transform, 172
- Open Database Connectivity (ODBC), 486–489
- Script Component, 333
- Source adapter, building, 680–681
- Source adapter, functions of, 662
- and sources, 132
- user interface, building, 734–735
- WMIConnection, 106–107, 776, 782

Connections, Dts object, 308

connection time methods

- AcquireConnection, 670
- ReleaseConnections, 670

Constraint

- conditional expression, 12
- Evaluation Operation, 38

constraint values

- functions of, 11
- types of, 11

container(s), 12–13

- checkpoints, effects on, 496–499
- event handler inheritance, 643
- Foreach Loop Container, 122–129
- functions of, 7, 12
- For Loop Container, 119–122
- Sequence Containers, 117–118, 496–499

- single package/multiple transactions, 506–508
 - task grouping in, 39
 - Task Host Containers, 117
 - types of, 12–13
 - Control Flow, 36–40**
 - annotation, 39–40
 - Bulk Insert Task, adding to, 80
 - container tasks, 53
 - compared to Data Flow, 37, 131, 522–524
 - evaluating task, 38–39
 - expressions, use of, 231–232
 - functions of, 522
 - new project, creating, 276
 - payment processing example
 - ACH file, 895–904
 - bank file, 868–877
 - email transactions, 914–917
 - Invoice Matching, 920–923
 - precedence constraints, 38, 623–633
 - task, creating, 37
 - task grouping, 39
 - workflow handling with, 131, 525–526
 - copy**
 - CopyAllObjects, 115
 - CopyData, 115
 - Copy Directory, 64
 - Copy File, 64
 - copy-on-first write, 442
 - CopySids, 113
 - ObjectsToCopy, 115
 - Transfer Database Task, 110–111
 - Copy Column Transform, functions of, 16, 153**
 - corporate ledger data, payment processing example, 860**
 - corrupt packages, handling, 835–836**
 - Count, 147**
 - Count Distinct, 147, 148**
 - CPU utilization, WMI Event Watcher Task, 108–110**
 - Create Directory, 64**
 - CreateExternalMetaDataColumn, Source adapter, building, 687**
 - CreateFolderOnDtsServer, 750**
 - CreateFolderOnSqlServer, 750**
 - CreateNewOutputRows, 333**
 - CreateOutputAndMetaDataColumns, Source adapter, building, 685–686**
 - CreationDate, 42**
 - CreationName**
 - log providers, 768
 - Source adapter, building, 681
 - credential, proxy accounts, 838–839**
 - currency, conversion example, 467–475**
 - customer table**
 - CustomerLookup table, 858
 - Invoice Matching, 928–932
 - payment processing example, 853, 855–856
- ## D
- Data Access Mode, 133**
 - database(s)**
 - Access, 452–460
 - Analysis Services Processing Task with, 58–59
 - DatabasesList, 113
 - Excel, 450–451
 - Open Database Connectivity (ODBC), 486–489
 - Oracle, 460–461
 - for payment processing. See payment processing example
 - Script Task, retrieving data, 315–316
 - Transfer Database Task, 110–111
 - See *also* individual databases; relational database
 - dataBytes, 329**
 - data cleansing**
 - during data extraction, 418–420
 - from new project, 280–284
 - inside queries, 419
 - regenerate packages, 835–836
 - scope of, 551
 - transforms for, 551–553
 - dataCode, 329**
 - data conversion**
 - Data Conversion Transform, 153–154
 - guidelines for, 204
 - SQL conversion table, 205–206
 - Unicode-non-Unicode issues, 205–206

Data Conversion Transform, 153–154

- Excel Source, 135
- functions of, 16
- Output Alias, 153–154
- as synchronous transform, 147

Data Direct, 489

data extraction, 414–441

- Change Data Capture (CDC), 430–442
- combining datasets during, 420–421
- data issue, cleanup, 418–420
- queries, encapsulating, 423–424
- SELECT * FROM, problems of, 414–416
- set-based logic, 428–430
- sorting data, 421–423
- text data, accessing, 425–428
- transformation during, 417–420
- WHERE, advantages of, 416–417

DataFileType, 81

data flow

- components of, 131
- data cleansing, 551–553
- data correlation, 550–551
- data flow, 13–14
- Data Mining Model Training Destination, 143
- data processing, 526–527
- destination adapters, 537–538
- destinations, 142–146
- EngineThreads, 543
- expressions, use of, 233–236
- loading flat files, 482–483
- NULLs in, 222
- operation, example of, 193–197
- optimizing. *See* data flow optimization
- source adapters, 537
- sources, 132–142
- staging environments, 553–554
- transformations, 15–17, 529–537
- transforms, 42, 146–193

Data Flow

- compared to Control Flow, 37, 131, 522–524
- Data Flow Scope Level, 234
- Data Flow Task, 61, 274
- functions of, 523
- new project, creating data flow, 275–276, 280
- payment processing example
 - ACH file, 904–913

- bank file, 877–894
- email transactions, 917–918
- Invoice Matching, 923–932
- pipeline, location of, 662
- scaling out method, 516–518

data flow optimization, 555–565

- blocking transforms requirements, 558–560
- bottlenecks, avoiding, 560–562
- and buffers, 556
- data cleansing, 280–284, 418–420, 551–553
- design guidelines, 548–555
- disk IO, reducing, 549–550
- and execution trees, 556–557
- Performance Monitor (PerfMon), 562–565
- pipeline monitoring, 562–565
- RDBMS reliance, reducing, 549–550
- row-based transforms, limiting, 557–558
- and staging data, 554
- synchronicity, limiting, 548–550

Data Flow Scope Level, variables, 234

Data Flow Task

- accessing design surface, 13
- data processing streams, 61
- functions of, 8, 61
- new project, creating, 274
- payment processing example
 - ACH file, 901–903
 - bank file, 873–876
- source type component functions, 330

DataGridView, form constructor, 729–730

DataGridViewCellEventArgs, user interface, building, 730

data loading, 442–448

- MERGE, 444–448
- snapshots, 442–444

data mining

- Data Mining Model Training
 - functions of, 15
- Data Mining Model Training Destination, 143
- Data Mining Query Task, 59–60
- Data Mining Query Transform, 16, 154

Data Mining Query Task, 59–60

- functions of, 8, 59
- predictive queries, running, 60

Data Mining Query Transform

- functions of, 16, 154
- utility of, 154

data pipeline. See pipeline**Data Profiler Task, 62–64, 356–365**

- accessing, 62
- ADO.NET connection, 64, 357
- Candidate Key Profile, 365
- Column NULL Ratio, 365
- Data Profiler Task connection, 64, 357
- execution of, 357–359
- functions of, 8, 62, 356
- profiles, activating, 63–64
- profiles in, 361–364
- request types in, 63–64
- results, reviewing, 62, 359–364

data profiling, 356–366

- Candidate Key Profile, 361, 365
- columns. See column(s)
- Column Value Distribution Profile, 363
- Data Profiler Task, 62–64, 356–365
- defined, 356
- Functional Dependency Profile, 361
- Quick Profile, 63, 358
- SQL Profiler, 654

Data Pump Task, limitations of, 294**Data Reader Destination, functions of, 15, 144****data scrubbing, new project, 278–279****data sources, functions of, 9****data source views (DSV), 10–11**

- caching of, 11
- compared to connection managers, 11
- functions of, 10–11

Data Transformation Services (DTS), 2**data types, 202–207**

- casting operators, use of, 206–207
- data conversion guidelines, 204
- date/time values, new, 204
- importance and SSIS, 202
- and performance, 204
- SQL Server data types, 202–203
- SSIS support of, 202
- Unicode-non-Unicode conversion, 205–206
- for variables, 209–210

DataUtility, postal code format, validating, 305**data validation, Script Component, 337–346****data viewers**

- accessing, 132
- configuring, 132
- and debugging, 350–351
- functions of, 132
- removing, 132
- and Term Extraction Transform, 189
- types of, 132

data warehouse, 366–411

- dimension table loading, 366–388
- Execute Package Task, 408–411
- fact table loading, 388–400
- non-SQL Server data. See heterogeneous data
- SSAS processing, 400–408

DateTime variable, 210**date values**

- SQL Server, new, 204
- SSIS errors, 204, 225–226

DBNull variable, 210**DDL statements, Analysis Services Execute DDL Task, 57–58****debugging, 350–353**

- Autos window, 351–352
- breakpoints, 350, 645–648
- Call Stack window, 648
- components, 710–716
- data viewers, 132, 350–351
- DTEExec, 716
- Immediate window, 353
- Locals window, 351–352
- Row Count Component, 350–351
- watches, 352

DecisionIntVar, 311–312, 314**DecisionStrVar, 311–312, 314****DelayValidation, setting for tasks, 51****Delete All Breakpoints, 132****Delete Directory, 64****Delete Directory Contents, 64****Delete File, 65****DeleteInput, 666, 695****DeleteOutput, 666, 695****deployment utility, 814–818**

- deploying packages, steps in, 815–818
- deployment manifest, creating, 814–815
- Deployment Wizard, 815–818

Deployment Wizard, 605–606, 815–818

Derived Column Task, 157

Derived Column Transform, 14, 154–155

- configuring, 154–155
- data cleansing, 551–552
- expressions, in data flow, 234–235
- functions of, 16
- as synchronous transform, 147, 536–537

DescribeRedirectedErrorCode, 670

Description, setting for tasks, 52

design-time

- debugging, 710–712
- defined, 664
- functionality of, 664–668

design-time methods

- column data types, setting, 666–667
- column properties, setting, 667
- input/output verification methods, 666
- MapInputColumn, 666
- MapOutputColumn, 666
- path attachment methods, 668
- PerformUpgrade, 667
- ProvideComponetProperties, 665
- RegisterEvents, 667
- RegisterLogEntries, 667
- ReinitializeMetaData, 665
- SetComponentProperties, 667
- SetUsageType, 668
- Validate, 665

destination(s), 142–146

- connecting to data flow, 143
- Data Mining Model Training, 143
- DataReader, 144
- Destination Connection, 66, 80
- DestinationOverwrite, 111
- DestinationTable, 83
- Destination Type, 776
- destination type component, Script Component, 330
- Dimension Processing, 144
- Excel, 144
- Flat File, 145
- functions of, 15, 131, 142
- Mappings page, 142
- OLE DB, 145–146
- OverwriteDestination, 66, 776, 778
- Partition Processing, 144

- Raw File, 146
- Recordset, 146
- SQL Server, 146
- SQL Server Mobile, 146
- types of, 15
- WMI Data Reader Task, 776

Destination adapters

- building, code for, 702–709
- functions of, 537–538, 663–664

DialogResult, user interface, building, 724–725

Diff, 76–77

difference algorithms, XML Task, 76–77

Diffgram, 76

InfoPath, 790–791

DimensionAlternateKey, 367

DimensionKey, 367

Dimension Processing

- configuring, 144
- Dimension Processing Destination
 - functions of, 144
- functions of, 15
- Slowly Changing Dimension Transform, 184–185

dimension table loading, 366–388

- caching data, 388
- complex table, example of, 375–387
- simple table, example of, 367–375
- Slowly Changing Dimension Transform, use of, 371–374, 381–388

direct credits, payment processing example, 853

DirectInput, 231

directives, using directives, 672

directory

- File System Task functions, 64–66
- polling for file delivery, 109–110

DirectRow, transform, building, 692

Disable, tasks, 51–52, 850

disk IO, reducing, 549–550

Dispose method, 670

Distributed Transaction Coordinator (DTC)

Transactions, functions of, 503

Document Type Definition (DTD), 76

DoesEachOutputColumnHaveA

MetaDataColumnAndDoDatatypes Match, Source adapter, building, 684

Double variable, 210**DTExec**

- creating, 834
- runtime debugging, 716
- 64-bit version, 840
- 32-bit emulation mode, 451, 839–840

DTExecUI

- accessing, 826
- Connection Manager, 828
- creating DTExec with, 834
- execute packages with, 826–832
- Maximum Concurrent Executables, 828
- progress window, 832
- Set Values, 830

DTS 2000 migration, 611–620

- DTS xChange, 620
- migration success rates, 612
- Package Migration Wizard, 614–619

DtsDebugHost, 714**DTSFileConnectionUsageType, Source adapter, building, 681****Dts object**

- defined, 307
- Log method, 329
- properties of, 308
- Script Task, 307–308

DTS packages

- converting, ActiveX Script Task, 53–54
- editing in SQL Server 2008, 609
- Execute DTS 2000 Package Task, 610–611
- limitations of, 294
- migration of DTS 2000. See DTS 2000 migration
- opening in Management Studio, 610
- push paradigm, 199–200
- running under SSIS, 610–611

DtsPipelineComponent, 672–673**DTS runtime managed code library, 743–744****DTSUsageType.UT_IGNORED, 668****DTSUsageType.UT_READONLY, 668****DTSUsageType.UT_READWRITE, 668****dtswizard.exe, 21****DTS xChange, 620****.DTSX files, 7****DTUtil**

- corrupt packages, handling, 835–836

- functions of, 835–836
- re-encrypting packages, 835

dump, changed data, capturing, 431**Duplicate Sort Values, 185****dynamic connections, creating with expressions, 229–230****dynamic packages**

- capabilities of, 199–200
- creating, 289–291
- and expressions, 200

E**Edit Script, 56****email**

- payment processing, 913–919
- Send Mail Task, 105–106

Enabled, 52**Enable Identity Insert, 82****encryption, re-encrypting packages, 835****EngineThreads, 543****enterprise edition, SQL Server, 19****EntryMethod, 54****EntryPoint, 56, 306****EnumProp, user interface, building, 735****equal sign, double (==), 214****equivalence operator, expression building, 214****error(s), 36**

- and casting, 207
- date and time errors, 204, 225–226
- dirty data, handling, 280–284, 285–287
- Error List window, 36
- Error Output, 134
- error outputs, 511–514
- error rows, 648–653
- Lookup Component output, 260–261
- overflow errors, 131
- restarting packages. See Checkpoints
- Structured Exception Handling, 347–349
- task errors, 17

ErrorDetail, payment processing example, 860–861**error handling, 17–18**

- ACH data flow validation, 904–906
- bank file data flow validation, 877–881, 879–881

error handling (continued)

- logging, 653–658
- OnError, 17
- precedence constraints, 623–633
- process of, 17–18
- and staging data, 554
- for task errors, 17
- user interface, 737–739

error messages

- ErrorMessageLanguagesList, 112
- ErrorMessagesList, 112
- SomeStringVariable error message, 310
- Transfer Error Messages, 112

error outputs, 511–514

- advantages to use, 514
- data issues, correcting, 512–513
- Error Output, 134
- functions of, 511–512

Error Queue

- bad data, sending to, 287
- error queue table, 338

ErrorRowDisposition, transform, building, 699

error rows, 648–653

- configuring, 648
- error handlers, 648
- example of use, 650–653

escape sequences, string literals, 216–217

ETI, 489

EvaluateAsExpression, 209, 234

Evaluation Operation, options, 38–39

event(s)

- event information, logging, 327–328
- firing, methods for, 322–333
- raising in Script Component, 335–336
- raising in Script Task, 322–325
- respond to in Script Task, 325–327
- specifying events to log, 767–768

Event(s), Dts object, 308

event handling, 43–44, 633–645

- default at design phase, 323
- events, types of, 43, 634–635
- functions of, 7, 17, 43, 325
- handlers, setting up, 633–634
- inheritance, 643–645
- inventory check simulation example, 635–640

- logging event information, 327–328
- menu options, 634
- OnError, example of use, 641–642
- OnPreExecute, example of use, 642–643
- RegisterEvents, 667
- responding to event, 325–327
- warning events, generating, 323–325
- WMI Event Watcher Task, 784–785

Excel

- data integration with, 452
- Excel Connection Manager, 144
- Excel Destination, 15
- Excel Source, 135–136
- Execute SQL Task connection, 86–87

Excel Destination

- data retrieval with XML Source, 75
- Excel Destination Editor, 75
- functions of, 15, 144
- limitations of, 144

Excel Source, 135–136

- functions of, 14, 135
- general format, 135

exception handling, Structured

Exception Handling, 347–349

ExclusionGroup, transform, building, 692

execute

- DTEExecUI, 826–832
- new project, 277–278

Execute DTS 2000 Package Task, 610–611

- functions of, 8

ExecuteOutOfProcess, 98, 515

ExecutePackage, 761

Execute Package Task, 98–102, 408–411

- chaining packages with, 515
- configuring, 98
- connection, setting for, 98
- functions of, 8, 98
- for new project, 277–278
- parent/child packages, use of, 99–101
- steps in, 408–411
- two packages/one transaction, 508–509
- WMI Event Watcher Task, 784–785

Execute Process Task, 102–104

- configuring, 103

- functions of, 8, 31, 102
- runaway process, 104
- SSAS processing, 401
- Execute SQL Task, 85–97**
 - batch of SQL statements, 88
 - connections, creating, 86–88
 - connection type options, 86
 - functions of, 8, 85
 - migration to SSIS, 612
 - multi-row results, 91–93
 - parameterized SQL statement, 85–88
 - singleton results, capturing, 88–91
 - SQL statements, creating, 231–232
 - stored procedure, executing, 94–96
 - stored procedure, retrieving output parameters, 96–97
- Execution Instance GUID, 149**
- Execution Results, default event handler, 323**
- ExecutionStartTime, 149**
- execution time methods. See runtime methods**
- execution trees, 538–543**
 - buffers in, 542–543
 - components of, 540
 - and data flow optimization, 556–557
 - defined, 538
 - operation of, 540–543
 - PipelineExecutionPlan log, 546–548
 - PipelineExecutionTrees log, 545–546
 - process thread scheduler, 542–543
- ExecutionValue, 308**
- ExecValueVariable, setting for tasks, 52**
- Existing File, 83**
- ExistsOnDtsServer, 745**
- ExistsOnSqlServer, 745**
- Export Column Transform, 155–157**
 - AdventureWorks2008, use with, 156–157
 - configuring, 155
 - functions of, 16, 155
- expression(s), 211–236**
 - casting operators, use of, 206–207
 - columns, referencing, 218–219
 - conditional expressions, 11–12
 - in control flow tasks, 231–232
 - creating. *See* expression building
 - in data flow, 233–236
 - and dynamic packages, 200
 - functions of, 11–12, 39
 - in Lookup Component, 264
 - and scripting, 295
 - Script Task Editor, 307
 - and variables, 201
 - variables used as, 227–229
- Expression**
 - conditional expression, 12
 - Evaluation Operation, 38–39
- expression building**
 - Boolean expressions, 220
 - Boolean literals, 217–218
 - conditional expressions, 224–225
 - date/time values, adjustments, 225–227
 - dynamic connection, creating with, 229–230
 - equivalence operator, 214
 - Expression Builder, 213
 - language for, 211–212
 - line continuation, 215
 - NULLs, 221–222
 - numeric literals, 215–216
 - and precedence constraints, 232–233
 - string, 214–215
 - string functions, 223–224
 - string literals, 216–217
 - variables, referencing, 218
- Expression or Constraint, 12**
- Expression and Constraint, 12**
- Expression or Constraint, 12, 38**
- Expression and Constraint, 38**
- Extensible Stylesheet Language Transformations (XSLT), functions of, 76**
- external applications**
 - ASP.NET, 797–802
 - InfoPath, 788–797
 - SSIS functionality with, 787–788
 - Winform .NET, 802–808
- external management. See managed code**
- External Metadata, 665**
- ExternalMetadataColumn, Source adapter, building, 685, 687**
- ExternalMetadataColumnCollection, Source adapter, building, 687**
- ExternalMetadataColumnID, Source adapter, building, 684–685**

extract, transfer, and load (ETL)

- bad data, handling, 157
- Change Data Capture (CDC), 430–442
- data extraction, 414–441
- data loading, 442–448
- dimension table loading, 366–388
- Execute Package Task, 408–411
- fact table loading, 388–400
- Fuzzy Lookup Transform, 157–163
- SSAS processing, 400–408

Extract Column, 155, 157

F

fact table loading, 388–400

- process of, 388–400
- tasks in, 388

Fail Component, 649

FailPackageOnFailure, 492, 494–495

- setting for tasks, 52

FailParentOnFailure, 499–500

- setting for tasks, 52

FailTask, 113

Failure

- constraint value, 11
- task execution result, 50–51

Fast Load, OLE DB Destination, 146

FastParse, 140

file(s)

- archiving, 66–67
- File System Task functions, 64–66
- File Connection Manager, 670**
- File Connection Manager Editor, 83

File Path Column, 157

File System Deployment, 815–816

File System Task, 64–67

- archiving files, 66–67
- file operations, list of, 64–65
- functions of, 8, 64
- looping, 65
- payment processing example
- ACH file, 901–903
- bank file, 874–876

File System Task Editor, 65

file transfer protocol (FTP), FTP Task, 67–69

FileUsageType

Destination adapter, building, 703

Source adapter, building, 681

Finally block, 349

FindColumnByLineageID, 697

FireCustomEvent, 323

FireError, 322

Destination adapter, building, 705–706

Source adapter, building, 683

transform, building, 693, 695

FireInformation, 322, 329

payment processing example, 873

FireProgress, 323

FireQueryCancel, 323

Fire Triggers, 82

FireWarning, 323, 327

Fixed attributes, 373, 382, 386

fixed-width files, 136

flags, data cleanup, 340, 345

flat buffers, 564

flat file(s), 481–486

data flow issues, 140

extracting data from, 483–486

FastParse, 140

Flat File Connection Manager, 139, 273

Flat File Destination, 15, 145

Flat File Format, 482

Flat File Source, 136–141, 877

loading, 481–483

MultiFlatFile, 141

New Flat File Connection, 867–868

problems related to, 481

Raw File Source, 142

types of files, 136

Flat File Destination

functions of, 15, 145

loading flat files, 482–483

Web Service Task, use with, 474–475

Flat File Source, 136–141

Connection Manager, 136, 482–485

FastParse, 140

files, types of, 136

functions of, 14, 136

migration to SSIS, 612

MultiFlatFile, 141

new project, creating, 273–274

Text qualifier, 136–139

folder(s), package folder maintenance, 750–752

FolderExistsOnDtsServer, 750

FolderExistsOnSqlServer, 750

Force Truncate, 155, 157

Foreach ADO Enumerator, 125–128

functions of, 122, 125

operation of, 125–128

Foreach ADO.NET Schema Rowset Enumerator, 122

Foreach File Enumerator, 123–125

functions of, 122

new project, looping, 288–289

operation of, 123–125

starting, 123

Foreach From Variable Enumerator, 122

Foreach Item Enumerator, 122

Foreach Loop Container, 122–129

Foreach ADO Enumerator, 125–128

Foreach File Enumerator, 123–125

functions of, 13, 122

new project, looping, 288–289

options, 122

payment processing example

ACH file, 896

bank file, 869–870

Foreach Nodelist Enumerator, 122

Foreach SMO Enumerator, 122

Foreach Task, 53

For Loop Container, 119–122

functions of, 13, 119–120

looping, example of, 120–122

For Loop task, 53

form

building for user interface, 718, 727–732

column display, 728–730

column selection, 730–732

constructor, 728

FTP Task, 67–69

connection, setting for, 67–68

FTP Connection Editor, 68–69

functions of, 8, 67

passive mode, 67

retrieving file with, 68–69

full-cache mode

configuring, 253–255

Lookup Component, 238, 240, 241, 252–255

Lookup Transform, 514–515

Full Width, 150

fully blocking transforms, 147

Functional Dependency Profile

data profiler results, 361

Functional Dependency Profile Request, 63

Fuzzy Grouping Transform, 163–167

configuring, 164–165

data cleansing, 551

example of use, 165–166

functions of, 16, 163–164

Fuzzy Lookup Transform, 157–163

configuring, 158–160

data cleansing, 551

example of use, 161–163

functions of, 16, 157–158

input stream requirements, 158

Invoice Matching, 925–929

output to, 158

fx, constraint marker, 51

G

GateKeeperSequence, 232

GetErrorMessage, user interface, building, 737–738

GetErrorOutput, transform, building, 699

GetPackagesRoles, 752

GetRunningPackage, 753–754

GetString, transform, building, 700

GetVirtual Input, user interface, building, 729

Global Assembly Cache (GAC), 302

and component building, 673–674, 676

user interface, 720–721

granularity, and Change Data Capture (CDC), 432

Grid data viewer, 132

GridView, 758

group(s), 118–119

creating, 119

functions of, 118, 538

compared to Sequence Containers, 118–119

Group By, 147

grouping

- Fuzzy Grouping Transform, 163–167
- renaming group, 39
- task grouping, 39

H

Half Width, 150

HappyPathEnum, 311, 313

HasSideEffects, Destination adapter, building, 703

Hello World, scripting example, 298–300

heterogeneous data

- Access, 452–460
- data integration providers, 489–490
- Excel, 450–451
- IBM DB2, 489
- Open Database Connectivity (ODBC), 486–489
- Oracle, 460–461
- Web Service Task, 463–476
- XML, 476–481

Hiragana, 150

Histogram data viewer, 132

Historical attributes, 373, 383, 386

horizontal partitioning, 518–520

HTTP Connection Manager, 69–70

I

IBM DB2, OLE DB provider, 489

IconResources, 673

ID, setting for tasks, 52

identity insert, Import and Export Wizard, 25

IDtsClipboardService, 723

IDtsComponentMetaData100, 723–724

IDtsComponentUI

- IDtsComponentUI.Delete, 723
- IDtsComponentUI.Edit, 724–725
- IDtsComponentUI.Help, 723
- IDtsComponentUI.Initialize, 723–724
- IDtsComponentUI.New, 723
- troubleshooting, 726–727
- user interface, building, 718, 722–725

IDtsConnectionService, 723

IDTSInputColumn, transform, building, 694–695

IDTSTaskHost100 interface, 50

IErrorCollectionService, 723

- user interface, building, 737–739

IfObjectExists, 113

IF...THEN, conditional expression building, 224–225

Ignore Failure, 649

Immediate, BIDS, 36

Immediate window, and debugging, 353

Import and Export Wizard, 21–27

- accessing, 4, 21–22
- data protection, 25
- default location for package, 27
- destination, specifying, 23
- functions of, 3–4, 21
- moving data, 24–25
- saving package, 25–26
- source connection, 22, 28

Import Column Transform, 167–169

- Advanced Editor, configuring with, 167–169
- AdventureWorks2008, importing images, 167–169
- functions of, 16, 167
- input stream requirements, 167

importing data

- from Access, 455–457
- code-complete package, 606–608
- connectivity providers, 489–490
- dimension table loading, 366–388
- from Excel, 452
- fact table loading, 388–400
- from flat files, 481–486
- Import Column Transform, 167–169
- Open Database Connectivity (ODBC), 486–489
- from Oracle, 461–463

index, on dimension table, 387

Inferred Dimension Members, 373–374

inferred members, 386

InfoPath

- disconnected data, joining, 792–796
- operation types, 790–791
- SSIS functionality with, 788–797
- XML Task configuration, 789–791

Informix, 489

inheritance

- and classes, 664
- component building, 672
- event handlers, 643–645

Initialize, user interface, building, 722–724**inline schema, XSD, accessing, 476****INNER JOIN**

- Lookup Transform, 170
- Merge Transform, 170

input(s)

- Input0_ProcessInputRow, 333
- Input and Output Properties, 172
- OnInputPathAttached, 668
- ProcessInput, 669
- verification methods, 666

Input and Pass-Through Field Names and Values, 158**InputColumn, 668****InputColumnCollection**

- component building, 668
- Destination adapter, building, 702
- transform, building, 690, 693, 697

InsertInput, 666**InsertOutput, 666, 695****installing project**

- deployment utility, creating, 814–818
- Package Installation Wizard, 45

Int16 variable, 210**Int32 variable, 210****Int64 variable, 210****Integration Server, DTS packages, 747–748****Integration Services**

- component types used, 662
- importing code-complete package, 606–608
- Integration Services Connections
 - BIDS, 29

Integration Services Project

- BIDS, 29, 30
- functions of, 4

IntelliSense, functions of, 295**InteractiveMode, 42****invoices**

- Invoice Matching, 919–933
- table, for payment processing, 853, 856–857
- See *also* payment processing example

IsDestinationPathVariable, 66**IsErrorOutput, transform, building, 692****IServiceProvider, user interface, building, 723, 725****IsLocalPathVariable, 68–69****IsolationLevel, setting for tasks, 52****IsRemotePathVariable, 68****IsSort, 422****iteration**

- defined, 590
- MSF Agile, 590–593

iterative SDLCs, 569–570**J****Japanese language, character maps, 150****JET engine, 450****jobs, Transfer Jobs Task, 114****join(s)**

- during data extraction, 420–421
- example of use, 242–263
- inner/outer join streams, 239
- Lookup Component, 238, 252–266
- Merge Join Component, 239, 247–252
- and relational database, 237
- relational source, use of, 245–247
- SSIS compared to relational, 239–240

K**Katakana, 150****Keep Identity, 145****Keep Nulls, 81****keyboard, user interface navigation, 740****Key scale, 148****L****labeling**

- defined, 604
- Visual Studio Team System, 604–605

libraries, DTS runtime managed code library, 743–744**LineageID, 177–178**

- for columns, 219, 535
- transform, building, 690, 693, 694

line continuation, expression building, 215

Line Feed, 80

Linguistic Casing, 150

literals

- Boolean literals, 217–218
- numeric literals, 215–216
- string literals, 216–217

LoadFromDtsServer, 745

LoadFromSqlServer, 745

LoadFromSqlServer2, 745

LoadGridView, 764

LoadPackage, 745

LoadTreeView, 764

Locals

- BIDS, 36
- LocalPath, 68–69

Locals Window, and debugging, 351–352

lockbox service, payment processing

example, 852–853

Log, Dts object, 308

log entry

- writing in Script Component, 336–337
- writing in Script Task, 329–330

Log File Viewer, 837

logging, 653–658

- functions of, 18, 653
- Log Events, 544–545
- log events, defining, 654–655
- Logging Mode, setting, 52
- Logging option, 544
- PipelineExecutionPlan log, 546–548
- PipelineExecutionTrees log, 545–546
- process of, 655–658
- RegisterLogEntries, 667
- See *also* log providers

logic and data flow, Conditional Split Transform, 151–153

logins

- LoginsList, 113
- LoginsToTransfer, 113
- Transfer Logins Task, 112–113

log providers, 765–770

- default providers, 654
- defining, 765–767
- functions of, 765
- object, configuration information, 768–770
- programming to, 768–775

- specifying events to log, 767–768

Lookup

- and cache files, 150
- new features, 3

Lookup Component, 252–266

- Cache Connection Manager (CCM), 238, 266–268
- Cache Transform, 266
- cascaded operations, 264–266
- example of use, 252–263
- expressions, use of, 264
- full-cache mode, 238, 240, 241, 252–255
- functions of, 238
- largest/smallest tables, actions with, 248
- miss-cache feature, 242
- multiple outputs, 259–263
- new features, 242
- no-cache mode, 240, 255–257
- output options, 260–263
- partial-cache mode, 240, 257–259
- SSIS compared to relational, 239–240
- synchronous behavior, 238
- three or more joins, 238
- troubleshooting, 242
- unsuccessful joins, 238

Lookup Transform

- cache modes, 514–515
- dimension table, loading, 369–371, 376–380
- fact table, loading, 389, 391
- functions of, 16, 170
- Lookup Editor, accessing, 389
- missing data, remedy, 282–287
- SSIS improvements, 514–515

looping

- File System Task, 65
- Foreach Loop Container, 122–129
- For Loop Container, 119–122
- For Loop tasks, 53
- for new project, 288–289
- payment processing example
 - ACH file, 895–897
 - bank file, 868–870
 - shredding recordsets, 92

Lotus Notes, 489

Lowercase, 150

M

MachineName, 42, 149

magic numbers, converting to NULLs, 417

Main, 299

managed code, 741–775

- Configuration object, 773–775
- data stores/capabilities, 771
- DTS runtime managed code library, 743–744
- log providers, 765–770
- package, set-up, 742–743
- package configuration, creating, 772–775
- package folder maintenance, 750–752
- package listing, 755–756
- package maintenance, example of, 745–747
- package maintenance operations, 745
- package management, example of, 756–765
- package monitoring, 753–754
- package role maintenance, 752–753
- package transfer, example of, 747–750

Management Studio, 825–826

- accessing, 45, 825
- connecting to stores, 825
- DTEExecUI, 826–832
- functions of, 45, 825–826
- MSDTServer100, 819–820, 822–823
- reports, producing, 826
- storing packages, 824–825

MapInputColumn, functions of, 666

MapOutputColumn

- functions of, 666
- Source adapter, building, 687

master packages, Execute Process Task, 408–411

master stored procedures, Transfer Master Stored Procedures Task, 113–114

Maximum, 147

Maximum Concurrent Executables, 828

Maximum Insert Commit Size, 145

MDAC drivers, 840

metadata issues, Union All Transform, 192–193

memory

- asynchronous and synchronous transforms, 147
- buffers, 527–528
- increasing, 515
- Lookup Component full-cache mode, 256

- partial versus full blocking transforms, 147
- rows processing caution, 131
- and scaling out, 515
- SSIS speed, 131, 204
- for 32-bit Windows systems, 515

MERGE

- data loading, 444–448
- running, 445–447
- with SSIS, 447–448

Merge, XML Task, 76

Merge Join Component, 247–252

- example of use, 250–252
- functions of, 239
- versus Lookup Component, 247–248
- sorting errors, 250

Merge Join Transform

- configuring, 171
- disconnected data, joining InfoPath, 792–796
- fact table, loading, 392, 396, 400
- functions of, 16, 170–171
- sorting requirements, 531–532

Merge Transform

- functions of, 170
- limitations of, 170
- sorting requirements, 531
- compared to Union All Transform, 170

merging

- defined, 603
- Merge Join Component, 247–252
- Merge Join Transform, 170–171
- Merge Transform, 170
- Visual Studio Team System, 603–604
- See also join(s)

MessageBox, Hello World, 300

Message Queue Task, 104–105

- advantages to use, 104
- functions of, 8, 104
- type of message, choosing, 105
- and updates, 59

MessageText, 329

metadata

- External Metadata, 665
- ReinitializeMetaData, 665, 693–694
- SetExternalMetadataColumn
 - DataTypeProperties, 666

methods. See **design-time methods; runtime methods**

Microsoft Data Access Components (MDAC), 460, 486

Microsoft Message Queue (MSMQ), 8

Message Queue Task, 104–105

Microsoft.SqlServer.Dts.Pipeline.Pipeline Component, 664

migrating packages

Deployment Wizard, 605–606

DTS 2000 packages, 609–620

importing packages, 606–608

Minimum, 147

Miscellaneous folder, Solution Explorer, 33

mobile devices, SQL Server Mobile Destination, 86–87, 146

modularization

and Common Table Expressions, 428–430

queries, encapsulating, and data

extraction, 423–424

mouse, user interface navigation, 740

move

Move Directory, 65

Move File, 65

Transfer Database Task, 110–111

MS Access. See **Access**

msdb deployment, 824–825

MSDTServer100

clustering, 822–823

configuring, 819–820

MSF Agile, 590–593

functions of, 590

Reporting Services, 592–593

templates, 592

Work Items, 591

Multicast Transform

and data flow optimization, 561–562

functions of, 16, 171

staging data, 555

MultiFlatFile, 141

N

name

payment processing example, 849–850

setting for tasks, 52

strong, importance of, 721, 726

Native Transaction

functions of, 503

single package, in SQL Server,
509–511

navigation, BIDS, 35

.NET assemblies

on Global Assembly Cache (GAC), 302

reuse of, 303–305

.NET language

expressions, writing in, 211–212

selecting for use, 55

New Flat File Connection, 867–868

New Line, 80

New Query, 855

no-cache mode

configuring, 256

Lookup Component, 240, 255–257

Lookup Transform, 514–515

non-blocking transformations

synchronous outputs, 537

types of, 529–531

Not Supported, 52, 503, 509

noun/noun phrase tokens, Term Lookup Transform, 190–192

NULLs

in data flow, 222

expression building, 221–222

magic numbers, converting to, 417

and variables, 221–222

NumberOfEvents, 109, 782

numerals, Fuzzy Grouping Transform, 164

numeric literals

decimal point, meaning of, 216

expression building, 215–216

suffixes with, 216

O

object(s)

Dts object, 307–308

looping through, 122

moving/copying, 110

ObjectsToCopy, 115

Transfer SQL Server Objects Task, 115

and variables, 201

- Object Browser, 45**
 - accessing, 743
- Object Explorer, 45**
- Object variable, 210**
- ODBC. See Open Database Connectivity (ODBC)**
- OEM, Bulk Insert Task, 81**
- OLAP Tasks, migration to SSIS, 612**
- OLE DB**
 - compared to ODBC, 486
 - OLE DB Command Transform, 172–175
 - OleDb.Connection, 315
 - OLE DB Destination, 145–146, 284–285
 - OLE DB Source, 132–134
- OLE DB Command Transform, 172–175**
 - and Advanced Editor, 172
 - and data flow optimization, 557–558
 - example of use, 173–175
 - fact table, loading, 398–400
 - functions of, 16, 172
 - options, 172
 - reusability of data, 175
- OLE DB Destination**
 - Access, importing data from, 456
 - batch size, 145
 - column width, 145
 - fact table, loading, 392, 397
 - fast versus normal load, 145
 - functions of, 15, 145–146
 - rows per batch, 145
 - sending data to, 284–285
- OLE DB Source, 132–134**
 - configuring, 132–133
 - Data Access Mode, 133
 - dimension table, loading, 367–369, 375–378
 - fact table, loading, 388–389, 394–395
 - functions of, 14, 132
 - migration to SSIS, 612
 - options, 133–134
 - table/column operations, 133–134
- OnError**
 - example of use, 641–642
 - functions of, 17, 43, 634
 - specifying events to log, 767
- OnExecStatusChanged, functions of, 43, 634**
- On Failure, functions of, 37**
- OnInformation, functions of, 43, 634**
- OnInputAttached, Destination adapter, building, 707**
- OnInputPathAttached, 668**
- OnOutputPathAttached, 668**
- OnPostExecute, functions of, 43, 634**
- OnPostValidate, functions of, 43, 634**
- OnPreExecute**
 - example of use, 642–643
 - functions of, 43, 634
- OnPreValidate, functions of, 43, 634**
- OnProgress, functions of, 43, 634**
- OnQueryCancel, functions of, 43, 634**
- OnTaskFailed, functions of, 43, 635**
- OnVariableValueChanged, functions of, 43, 635**
- OnWarning, functions of, 43, 635**
- Open Database Connectivity (ODBC), 486–489**
 - connection to source, 486–489
 - Execute SQL Task connection, 86–87
 - functions of, 486
 - loading data from, 488–489
 - OdbcConnection, 315
 - compared to OLE DB providers, 486
 - view loaded data, 489
- OPENQUERY, 425–428**
- OPENROWSET, 425–428, 447**
- Options, 189**
- Oracle, 460–461**
 - client setup, 460–461
 - client software, accessing, 460
 - connectivity provider, 489
 - importing data, 461–463
 - OracleConnection, 315
 - 64-bit support, 461
- OUTER JOIN, Merge Transform, 170**
- output(s)**
 - OnOutputPathAttached, 668
 - output parameters, retrieving from stored procedure, 96–97
 - Output window, BIDS, 36
 - PrimeOutput, 669
 - verification methods, 666
- Output Alias, 150, 153**
- OutputColumnCollection, Source adapter, building, 686, 690**

OutputType, 776

Overwrite, 113

OverwriteDestination, 66, 776, 778

OverwriteFileAtDest, 69

P

package(s)

administering. See package administration

archiving files, 66–67

connections, creating, 40

creating in BIDS, 30–31

designing. See Package Designer

dividing, 117–118

dynamic packages, 199

Execute Package Task, 98–102

executing, 44

execution time, start to finish, 524–525

execution tracking, 6

functions of, 7

management/maintenance.

See managed code

navigation, 35

Package Explorer, 44

PackageID, 42, 149

Package Installation Wizard, 45

of Package Installation Wizard, 45

Package Migration Wizard, 614–619

PackageName, 42

parent packages, 98

runtime engine, 7

saving, 25–26, 277, 850

system variables, 41–42

transactions with. See transaction(s)

and variables, 201

XML structure, 7

package administration, 809–841

central SSIS server, creating, 820–821

clustering SSIS, 822–823

Configuration Filter, 812

configuration type, 812

deployment utility, creating, 814–818

DTEExec, 834

DTEExecUI, execute packages with, 826–832

DTUtil, 835

Management Studio, 825–826

msdb deployment, 824–825

Package Configuration, 809–810

Package Store, 818–820

performance counters, 840–841

proxy accounts, 838–839

scheduling packages, 836–837

security, 832–834

64-bit issues, 839–840

Package Configuration

Configuration Filter, 812

Configurations Organizer, 812

configuration type, 812

methods to use, 813

and package migration, 813

Package Designer, 36–44

Connection Managers, 40

Control Flow, 36–40

Data Flow, 42–43

event handlers, 43–44

executing package, 44

functions of, 36

Package Explorer, 44

variables, 41–42

Package Explorer, functions of, 44

PackageGroupCollection, 761–764

PackageInfo, 755–756, 761, 764

Package Installation Wizard, functions of, 45

Package Migration Wizard, DTS 2000 migration, 614–619

PackageName, 149

Package objects

and external management. See managed code
maintenance operations with, 744

package roles

connecting, 834

GetPackagesRoles, 752

maintenance of, 752–753

read and write role, 832

SetPackagesRoles, 752

viewing, 832–834

Package Store, 818–820

functions of, 818

importing packages, msdb database, 825

running packages, 819–820

Packages Validation, 817

padding operation, strings, comparing, 224

parameters

- Access, parameter passing, 457–460
- parameterized SQL statement, executing, 85–88
- Parameters, 189

parent packages

- driver package for payment processing, 934–935
- functions of, 98
- variables, changing in child packages, 102
- variables, use by child packages, 99–101

parsing

- ACH data flow validation, 904–906
- bank file data flow validation, 877–881
- ParseTheFileAndAddToBuffer, 687–688

partial blocking transforms, 147**partial-cache mode**

- configuring, 258–259
- Lookup Component, 240, 257–259
- Lookup Transform, 514–515

partitioning

- Execute Process Task, 515
- horizontal, 518–520
- Partition Processing, 15, 144
- Partition Processing Destination, 144, 515–516
- raw file adapters, 516, 518
- staging data, 515–516

Partition Processing

- configuring, 144
- functions of, 15

Partition Processing Destination, functions of, 144**Passive Mode, FTP Task, 67****pass-through**

- Pass-Through, 164
- queries to SQL Server, 422

Patch, 77**paths**

- attachment methods, 668
- defined, 42
- destination path, specifying, 66
- Execute Process Task, 103
- Export Column Transform, 155–156
- FTP transfers, 68
- XPATH, 76

payment processing example, 843–935

- ACH file, 894–913
 - ACH file processing, 911–912
 - capturing total batch items, 910–911
 - control flow batch creation, 900–904
 - control flow loop, 895–897
 - control flow processing, 895–904
 - data flow detail processing ETL, 911–913
 - data flow validation, 904–911
 - file snapshot, saving, 912–913
 - file system tasks, 894–895
 - package setup, 894–895
 - parsing/error handling, 904–906
 - validation process, 906–909
 - XML file size, retrieval, 897–900
- architecture of solution, 846–849
- bank file, 864–894
 - bank file check processing, 890–892
 - bank file snapshot, saving, 892–894
 - capturing total batch items, 886–889
 - control flow batch creation, 873–877
 - control flow file loop, 868–870
 - control flow retrieval, file properties, 870–873
 - data flow detail processing ETL, 889–894
 - data flow validation, 877–894, 881–886
 - error folder, use of, 879–881
 - invoice detail lines processing, 890–892
 - parsing/error handling, 877–881
 - variable setup tasks, 864–868
- case study database model, 853–854
- corporate ledger data, 860
- database setup, 854–863
- email transactions, 913–919
 - control flow processing, 914–917
 - data flow processing, 917–919
 - file system tasks, 914
 - setup requirements, 913–914
- ErrorDetail, 860–861
- file storage location, setup, 851
- Invoice Matching, 919–933
 - high-confidence data flow, 923–928
 - hit-rate, analysis of, 932–933
 - medium-confidence data flow, 928–931
 - package setup, 920–921
 - process logic, adding, 921–923
- large project tips, 850

payment processing example (continued)

- naming conventions, 849–850
- parent driver package
 - creating, 934–935
- payment methods
 - bank ACH payments, 851–852
 - direct credits, 853
 - lockbox service, 852–853
 - PayPal payments, 853
- payment processing goals, 844–845
- solution summary, 845
- stored procedures
 - adding batches, 861–862
 - balancing batch, 863
 - updating batch, 862
- tables
 - BankBatchDetail table, 859, 893, 912, 917–919, 932–933
 - BankBatch table, 858–859, 881–882, 901–902, 916–919
 - CustomerLookup table, 858
 - customer table, 853, 855–856
 - invoice table, 853, 856–857

PayPal payments, payment processing example, 853

Peoplesoft, 489

Percentage Sampling Transform, functions of, 16, 175

performance counters, 840–841

- buffer counters, 841
- Rows Read/Rows Written, 840

Performance Monitor (PerfMon), 562–565

- buffers of, 564–565
- counters available in, 563–564

PerformUpgrade, 667

persistent file storage, functions of, 515

Persistent Systems, 489

pipeline

- Data Pipeline, 515
- execution events, 543–548
- extending. See component building;
 - component(s); pipeline component methods
- functions of, 662
- location of, 662
- performance monitoring, 562–565

- PipelineExecutionPlan log, 546–548
- PipelineExecutionTrees log, 545–546
- SSIS improvements, 515
- transformations, 15–17

PipelineBuffer, transform, building, 701

pipeline component methods

- component building, 672
- design-time methods, 664–668
- PipelineComponent, overriding, 664
- runtime methods, 668–670

pivoting

- defined, 16
- Pivot Column, 175
- PivotKeyValue, 178
- Pivot Transform, 175–179
- PivotUsage, 177

Pivot Transform, 175–179

- data cleansing, 551
- example of use, 176–179
- functions of, 16
- input columns for, 175–176
- pivot rules, setting, 176

Play, 44

polling, WMI Event Watcher Task, 108–110

PopulateConnectionsCombo, user interface, building, 733–734

PostExecute, functions of, 333, 670

precedence constraints, 11–12, 623–633

- Boolean expressions with, 626–630
- conditional expressions, 11–12
- constraint values, 11
- in control flow, 38
 - creating new, 50
 - example of, 624–625
 - expressions, use of, 232–233
 - functions of, 7, 624
 - fx marker, 51
 - multiple, use of, 630–633
 - Precedence Constraint Editor, 38, 218, 625
 - setting for tasks, 50

PreCompileScriptIntoBinaryCode, 55

predictive queries

- Data Mining Query Task, 59–60
- Data Mining Query Transform, 154
- running, 60

PreExecute

Destination adapter, building, 707–709
 functions of, 333, 669
 Source adapter, building, 687
 transform, building, 695–696, 700

PrepareForExecute, 669, 670**PrimeOutput**

functions of, 669
 Source adapter, building, 687
 transform, building, 695, 701

private buffers, 564**processes, Execute Process Task, 102–104****ProcessInput**

component building, 669
 Destination adapter, building, 702, 707–708
 transform, building, 695, 697–699, 701

process logic, Invoice Matching, 921–923**profiles. See data profiling****ProgID, log providers, 770****programmatically example. See payment processing example****project(s), creating, 271–291**

archiving files, 290
 BIDS, starting new project, 271–272
 Conditional Split Transform, 281–282
 connections, creating, 272–274
 Control Flow, 276
 Data Flow, 275–276, 280
 data scrubbing, 278–279
 dirty data, handling, 280–284, 285–287
 dynamic package, creating, 289–291
 Error Queue, sending bad data to, 287
 executing package, 277–278
 looping, 288–289
 OLE DB destination, sending data, 284–285
 saving package, 277
 tasks, 274

Project Explorer, scripting, 298, 299**Project Portal, contents of, 594****Properties, 34–35**

editing for package, 34
 functions of, 34

Property Expressions Editor, 289**ProtectionLevel, 816****prototype data changes, snapshots, 442–444****ProvideComponetProperties**

design-time debugging, 711–712
 Destination adapter, building, 702–703
 functions of, 667
 procedures for, 665
 Source adapter, building, 678–679, 683
 transform, building, 691–692, 697, 699
 user interface, building, 732–733

proxy accounts, 838–839

credential, creating, 838–839
 functions of, 838

Q**queries**

changed data, capturing, 431
 cleaning data in, 419
 Data Mining Query Task, 59–60
 Data Mining Query Transform, 154
 encapsulating, during data extraction, 423–424
 FireQueryCancel, 323
 OnQueryCancel, 43
 pass-through, 422
 WHERE, advantages of, 416–417
 WQL queries, 107–110, 776–777

Quick Profile, 63, 358**Quick Watch window, 352****R****ragged-right files, 136****RaiseChangeEvent, 635****random sample, transforms, 146****raw file(s)**

adapters, functions of, 516, 518
 Conditional Split to produce, 518–519
 RAW, Bulk Insert Task, 81
 Raw File, functions of, 449
 Raw File Destination, 15, 146
 Raw File Source, 14, 142
 and staging data, 516

ReadCommitted, 52**reader role, 832****read only**

DTSUsageType.UT_READONLY, 668
 ReadOnlyVariables, 56, 307, 309, 312, 334

ReadUncommitted, 52

read write

- DTSUsageType.UT_READWRITE, 668
- ReadWriteVariables, 56, 307, 309, 312, 334
- transform, building, 693

ReattachSourceDatabase, 111

Recordset Destination, functions of, 15, 146

Redirect Row, 649–651

- DescribeRedirectedErrorCode, 670

Reference Field Name and Value, 158

Reference Table, 158, 160, 192

regenerate packages, 835–836

RegisterEvents, 667

RegisterLogEntries, 667

ReinitializeMetaData

- column properties, setting, 667
- Destination adapter, building, 707
- functions of, 665
- Source adapter, building, 683, 685
- transform, building, 693–694
- user interface, building, 729

relational database

- Bulk Insert Task, 79–85
- Execute SQL Task, 85–99
- join operation, 237
- joins, use in, 245–247
- reducing reliance on, 549–550
- types of, 33

relational engine, SQL Server

- data extraction, 414–441
- data loading, 442–448

ReleaseConnections, functions of, 670

reloading, changed data, capturing, 431

RemotePath, 68

RemoveFolderFromDtsServer, 750

RemoveFolderFromSqlServer, 750

RemoveFromDtsServer, 745

RemoveFromSqlServer, 745

Remove Rows, 185

Rename File, 65

RenameFolderonDtsServer, 750

RenameFolderonSqlServer, 750

RepeatableRead, 52

Reporting Services, MSF Agile, 592–593

Required, 52, 503, 505

restarting packages. See Checkpoints

reusability of data

- of .NET assemblies, 303–305
- persistent file storage, 515

ReverseString

- component building, 668
- user interface, building, 725, 729

ReverseStringTransform

- design-time debugging, 711–713
- form constructor, 729

roles. See package roles

row(s)

- error rows, 648–653
- missing, error outputs, 511–514
- processing and memory, 131
- row-based transformations, 530–531
- Row Count Transform, 182–184
- RowDelimiter, 83, 273
- Rows Per Batch, 145

row-based transformations, 530–531

- and data flow optimization, 557–558

Row Columns, 175

Row Count Transform, 182–184

- and Advanced Editor, 183
- and debugging, 350–351
- example of use, 183–184
- functions of, 16, 182–183

Row Sampling Transform, functions of, 17, 175

Rows Read counter, 840

Rows Written counter, 840

RunningPackage, 753–754, 764

runtime

- defined, 664, 668
- functionality of, 668–670

RuntimeConnectionCollection, user interface, building, 735

runtime engine, functions, 7

runtime methods

- Cleanup, 670
- DescribeRedirectedErrorCode, 670
- PostExecute, 670
- PreExecute, 669
- PrepareForExecute, 669
- PrimeOutput, 669
- ProcessInput, 669
- user interface, building, 732–735

S**sampling**

- Percentage Sampling Transform, 175
- Row Sampling Transform, 175

SAP, 489**Sarbanes-Oxley compliance, 830****SaveToDtsServer, 745****SaveToSqlServer, 745****SaveToSqlServerAs, 745****SaveToXML, 745****saving**

- and Import and Export Wizard, 25–26
- packages, 25–26, 277, 850
- during run, 850
- SaveCheckpoints, 492
- XML file, saving data to, 317–319

SByte variable, 210**scalability**

- Lookup Transform, 514–515
- scaling out, 515–520

scaling out, 515–520

- Data Flow division and restart, 516–518
- across machines, 518–520
- and memory, 515
- staging data, 515–516

Scatter Plot data viewer, 132**scheduling packages, 836–837**

- and central server, 821
- SQL Server Agent, 836–837
- steps in, 836–837

schema validation, XML Task, 76**Score Type, 189****Script Component, 330–347**

- configuring, 331–334
- connections, specifying, 333
- data sources, connecting to, 335
- data validation, 337–346
- destination type component, 330
- events, raising, 335–336
- functions of, 295
- log entry, writing, 336–337
- Script Component Task, 880, 907–910
- Script Component Transform, 17, 184
- compared to Script Task, 299, 330, 333–334
- source type component, 330

- transformation type component, 330
- variables, accessing, 334–335

Script Component Transform, functions of, 17, 184**scripting**

- ActiveX Script Task, 53–54, 295
- assemblies, reusing, 302–305
- basic components of, 293
- C# language, 296
- code and classes, adding, 300–302
- debugging, 350–353
- defined, 293
- expressions for, 295
- message boxes, 300
- .NET assemblies, reuse of, 303–305
- Script Component, 295, 330–347
- Script Component Transform, 17, 184
- Script Task, 55–57, 295, 306–330
- Structured Exception Handling, 347–349

ScriptLanguage, 55, 306**ScriptMain, 56, 298–299**

- unique filename for files, 300–301

Script Task, 55–57, 306–330

- as ActiveX Script Task replacement, 294
- breakpoints, 350
- C#, choosing, 296
- configuring, 55, 306–307
- database data, retrieving, 315–316
- data sources, connecting to, 315
- Dts object, 307–308
- event information, logging, 327–328
- events, raising, 322–325
- events, responding to, 325–327
- functions of, 8, 55, 295
- Hello World example, 298–300
- log entry, writing, 329–330
- multiple languages, use of, 296, 298
- .NET assemblies, reuse of, 303–305
- package flow, control of, 311–314
- Project Explorer, 298, 299
- compared to Script Component, 299, 330, 333–334
- scripting IDE, 297–298
- Script Task Editor, 55
- SSAS processing, 401, 408
- upgrades to, 55

Script Task (continued)

- variables, accessing, 308–310
- XML, serializing data to, 319–322
- XML file, saving data to, 317–319

Script Transform

- data cleansing, 551
- New method, use of, 723

scrubbing data, for new project, 278–279

security

- Access, 452–453
- Import and Export Wizard, 25
- package roles, 832–834
- package roles, viewing, 832–834
- re-encrypting packages, 835
- Transfer Logins Task, 112–113

SELECT * FROM, problems of, 414–416

SELECT clause, sorting, 422

SelectSQL, 234–235

SelectSQL_ExpDateParm, 234

SelectSQL_UserDateParm, 234–235

SelectSQL variable, 209

semi-blocking transformations, types of, 531–532

Semicolon, 80

Send Mail Task, 105–106

- functions of, 8
- SMTP Connection Manager, 105–106

Sequence Containers

- checkpoints, use with, 496–499
- embedding, 118
- example of, 118
- functions of, 13, 117–118
- payment processing example
 - ACH file, 896
 - bank file, 869
 - email transactions, 914, 916
- and precedence constraints, 624–625
- task names in, 118

Sequence Task, 53

serialization

- data to XML, 319–322
- Serializable, 52

server mangement objects (SMO)

- ForEach SMO Enumerator, 122
- Transfer Database Task, 110–111
- Transfer Error Messages, 112

- Transfer Jobs Task, 114
- Transfer Logins Task, 112–113
- Transfer Master Stored Procedures Task, 113–114
- Transfer SQL Server Objects Task, 115

ServerStorage, 816

Set Attributes, 65

set-based logic, data extraction, 428–430

SetComponentProperties, 667

- user interface, building, 735–736

SetDataTypeProperties, Source adapter, building, 686–687

SetEndOfRowset, transform, building, 699

SetExternalMetadataColumn

- DataTypeProperties, 666

SetExternalMetadataColumnProperty, 667

SetInputColumnProperty, 667

SetInputProperty, 666

SetInputVirtualInputColumns, form constructor, 728

SetOutputColumnDataTypeProperties, 666

SetOutputColumnProperty, 667

SetOutputProperty, 666

SetPackagesRoles, 752

SetString, transform, building, 700

SetUsageType, 668

- Destination adapter, building, 707
- transform, building, 694–695
- user interface, building, 731

Set Values, DExecUI, 830

shadow tables. See capture instance tables

SharePoint Portal Services, Project Portal, 594

shelving

- defined, 600
- Visual Studio Team System, 600–601

Show Advanced Editor, 140

shredding

- defined, 92
- recordsets, 92

Similarity

- Fuzzy Grouping Transform, 165
- Fuzzy Lookup Transform, 158

Single variable, 210

64-bit support

- DExec, 840
- Oracle, 461

- package administration issues, 839–840
- SSIS, 450–451, 840
- Skip, 113**
- Slowly Changing Dimension Transform, 184–185**
 - Change Types options, 373–374
 - dimension table, loading, 371–374, 381–388
 - functions of, 17, 184, 367
 - limitations of, 387
 - optimizing, 387–388
- SMTP Connection Manager, 105–106**
- snapshots**
 - ACH file, saving, 912–913
 - bank file snapshot, saving, 892–894
 - creating, 443–444
 - data loading, 442–444
 - rollback functionality, testing, 444
 - Snapshot, 52
- software development. See source code**
- Software Development Life Cycles (SDLCs), 567–570**
 - history of, 568
 - iterative SDLCs, 569–570
 - waterfall SDLCs, 569
- solution(s)**
 - BIDS, 30
 - functions of, 30, 32
 - names, viewing, 30
- Solution Explorer, 32–33**
 - executing packages, 44
 - functions of, 32
 - project, creating in solution, 32–33
- sorting**
 - during data extraction, 421–423
 - Duplicate Sort Values, 185
 - IsSort, 422
 - Merge Join Component, 250
 - Merge Join Transform, 531–532
 - SELECT clause, 422
 - Sort Component, 250
 - SortKeyPosition, 178, 186, 422
 - Sort Transform, 185–186
 - transforms, 146
- Sort Transform, 185–186**
 - fact table, loading, 392–394
 - as full blocking transform, 147, 533
 - functions of, 17, 185
 - options, 185–186
- source(s), 132–142**
 - ADO.NET Source, 142
 - coding, 15
 - and Connection Manager, 132
 - Excel Source, 135–136
 - Flat File Source, 136–141
 - functions of, 14, 131
 - OLE DB Source, 132–134
 - Raw File Source, 142
 - Script Component, as source type component, 330
 - types of, 14–15
 - XML Source, 142
- Source adapters**
 - building, code for, 678–690
 - functions of, 537–538, 662–663
 - ProcessInput, 669
- source back pressure, and staging data, 554**
- source code**
 - Deployment Wizard, 605–606
 - importing, 606–608
 - Integration Services, 606–608
 - Project Portal, 594
 - Software Development Life Cycles (SDLCs), 567–570
 - source control, 570
 - Team System, 585–605
 - Visual SourceSafe, 570–585
- SourceColumn, 178**
- source control**
 - defined, 570
 - Visual Studio Team System, 597–600
- SourceDirect, 57**
- Source Safe, 29**
- SourceSafe, 825**
- SourceType, 57**
- spooling, buffers, 841**
- SQL**
 - Execute SQL Task, 85–97, 231
 - SqlConnection, 315
 - SQL Native Client, 22
 - SQL Profiler, 654
 - SQLSourceType, 87–88, 231
 - SQLStatement, 94–95
 - SQL statements, creating, 231–232

SQL 2008, components, recompiling, 716

SQLMOBILE

- Execute SQL Task connection, 86–87
- SQL Server Mobile Destination, 86–87

SQL Profiler, log provider for, 766, 770

SQL Server

- Change Data Capture (CDC), 430–442
- Compact Edition Destination, 15
- data extraction, 414–441
- data loading, 442–448
- data types, 202–203
- data types and SSIS, 139–140
- editions of, 19
- log provider for, 654, 766, 770
- mobile, 86–87, 146
- SQL conversion table, 205–206
- SQL Server Destination, 15, 146
- Transfer SQL Server Objects Task, 113, 115
- TSQL extension features
 - new features, 3

SQL Server Agent

- and Change Data Capture (CDC), 433
- scheduling packages, 836–837

SQL Server Deployment, 815–816

SQL Server Integration Services. See SSIS

SSAS processing, 400–408

- basic components of, 401
- steps in, 401–407

SSIS

- architecture of, 5–7
- breakpoints, 645–648
- Business Intelligence Development Studio (BIDS), 4–5, 28–31
- case study. See payment processing example
- components of. See component building;
component(s)
- Connection Manager, 9–10
- containers, 12–13
- data conversion guidelines, 204
- data flow elements, 13–14
- data processing, scope of, 355–356
- data profiling, 356–366
- data sources, 9
- data source views, 10–11
- data types, 202–207
- data warehouse, 366–411

- destinations, 15
- development of, 2
- dynamic capabilities, 199
- end-to-end package, creating. See
project(s), creating
- error handling, 17–18
- event handling, 633–645
- expressions, 200, 211–236
- with external applications. See external
applications
- external management. See managed code
Import and Export Wizard, 3–4, 21–27
- large project tips, 850
- logging, 18, 653–658
- Management Studio, 45
- new features, 3
- Package Designer, 36–44
- Package Installation Wizard, 45
- packages, 7
- precedence constraints, 11–12, 623–633
- Properties, 34–35
- pull paradigm, 199–200
- runtime engine, 7
- scalability improvements, 514–515
- scripting, 293–354
- 64-bit support, 450–451
- Solution Explorer, 32–33
- sources, 14–15
- speed of, 131, 204
- and SQL editions, 19
- SSIS Service, 6
- tasks, 8–9
- 32-bit emulation mode, 451
- Toolbox, 33–34
- transformations, 15–17
- variables, 13, 201, 208–210
- See *also* specific topics

SSIS engine

- buffers, 527–528
- Control Flow, 522–526
- Data Flow, 522–524, 526–527
- data processing, 526–527
- execution time, start to finish, 524–525
- execution trees, 538–543
- information processing efficiency, 521–522
- pipeline execution events, 543–548

runtime engine, functions of, 7
 source/destination adapters, 537–538
 transformations, 529–537
 workflow, handling, 525–526

SSIS Service

functions of, 6
 stopping, effects of, 6

staging data

and error handling, 554
 Multicast Transform, 555
 scaling out by, 515–516
 situations related to, 554

standard edition, SQL Server, 19**StandardErrorVariable, 103****StandardInputVariable, 103****StandardOutputVariable, 103****StartTime, 42****Stop, 44****StoredData, 82****stored procedures**

Execute SQL Task, 94–96
 moving/copying, 110
 output parameters, retrieving, 96–97
 payment processing example, 861–863
 Transfer Master Stored Procedures Task,
 113–114

streaming transformations, types of, 529–530**string(s)**

comparing, 224
 concatenation, expression building, 214–215
 double quotes (" ") and building, 214
 and expressions, 223–224

string literals

escape sequences, 216–217
 expression building, 216–217

String variable, 210**Structured Exception Handling, 347–349**

Catch block, 348
 Finally block, 349
 Try block, 348

subject matter experts (SMEs), 845**Success**

constraint value, 11
 task execution result, 50–51

suffixes, with numeric literals, 216**Sum, 147****Supported, 52, 503, 505****Sybase, 489****synchronicity, limiting, 548–550****synchronous transforms**

functions of, 147
 ProcessInput, 669
 SynchronousInputID, 537, 692
 transformation output, 536–537

system management. See Windows Management Instrumentation (WMI)**system variables**

accessing, 41
 types of, 42

T**Tab, 80****Table Lock, 82, 145****Tabular Data Stream (TDS), 88–89****task(s)**

ActiveX Script Task, 53–54
 adding to flow, 47
 Analysis Services Execute DDL Task, 57–58
 Analysis Services Processing Task, 58–59
 AND/OR with, 38
 Bulk Insert Task, 79–85
 configuring, 47
 Data Flow Task, 61
 Data Mining Query Task, 59–60
 Data Profiler Task, 62–64
 disabling, 51, 850
 Execute Package Task, 98–102
 Execute Process Task, 102–104
 Execute SQL Task, 85–97
 execution results, 50–51
 File System Task, 64–67
 FTP Task, 67–69
 functions of, 7, 8, 47
 grouping, 39
 groups, 118–119
 looping tasks, 53
 Message Queue Task, 104–105
 new project, creating tasks, 274
 precedence, setting, 50
 preprocessing, 333
 properties, 51–52

task(s) (continued)

- Script Task, 55–57
 - Send Mail Task, 105–106
 - setup requirements, 47
 - Task Editor, 48–49
 - task errors, 17
 - Task Host Container
 - functions of, 12, 117
 - TaskID, 149
 - TaskName, 149
 - TaskResult, 308
 - Transfer Database Task, 110–111
 - Transfer Error Messages, 112
 - Transfer Jobs Task, 114
 - Transfer Logins Task, 112–113
 - Transfer Master Stored Procedures Task, 113–114
 - Transfer SQL Server Objects Task, 113, 115
 - types of, 8–9
 - Web Service Task, 69–75
 - WMI Data Reader Task, 106–108
 - WMI Event Watcher Task, 108–110
 - XML Task, 75–79
- Task List, BIDS, 36**
- Team System. See Visual Studio Team System templates, MSF Agile, 592**
- Teradata, 489**
- Term Extraction Transform, 186–190**
- example of use, 187–189
 - functions of, 17, 186–187
 - options, 189
 - TFIDF score, 187
- Term Lookup Transform, 190–192**
- Aggregate Transform, use of, 192
 - functions of, 17, 190
 - input stream requirements, 158
 - operation of, 191–192
- Term Type, 189**
- text data**
- accessing, SQL Server, 425–428
 - log provider for, 654, 766, 770
- Text Qualifier**
- actions of, 136
 - Flat File Source, 136–139
 - New Flat File Connection, 273

32-bit emulation mode, 451

- Business Intelligence Development Studio (BIDS), 451
- DTEExec, 451, 839–840
- SSIS, 451
- Windows system memory, 515

Timeout

- Execute Process Task, 104
- WMI Event Watcher Task, 782

time values

- removal error, 204
- SQL Server, new, 204
- SSIS errors, 225–226

Toolbox, 33–34

- customizing, 34
- functions of, 30–31, 33
- organization of, 34
- resetting, 34

transaction(s), 502–511

- Distributed Transaction Coordinator (DTC)
 - Transactions, 503
- Native Transaction, 503, 509–511
- single package/multiple transactions, 506–508
- single package/single transaction, 503–506
- TransactionMode values, 52
- TransactionOption, 52, 503, 505
- two packages/one transaction, 508–509

Transaction, Dts object, 308

TransactionOption

- setting for tasks, 52, 505–506
- values, 503

TransferAllStored Procedures, 113

Transfer Database Task, 110–111, 115

- copy or move option, 111
- functions of, 110

Transfer Error Messages, 112

Transfer Jobs Task, 114

Transfer Logins Task, 112–113

Transfer Master Stored Procedures Task, 113–114

Transfer SQL Server Objects Task, 113, 115

- functions of, 115
- operation of, 115

transform(s), 146–193

- Aggregate, 147–148
- asynchronous, 147

- Audit, 149
 - Cache, 150
 - Character Map, 150–151
 - Conditional Split, 151–153
 - Copy Column, 153
 - custom, component for, 330
 - Data Conversion, 153–154
 - during data extraction, 417–420
 - and data flow, 42
 - Data Mining Query, 154
 - Derived Column, 154–155
 - in Enterprise Edition SQL Server, 19
 - Export Column, 155–157
 - feeding with recordsets, 93
 - functions of, 15, 131, 146, 663
 - Fuzzy Grouping, 163–167
 - Fuzzy Lookup, 157–163
 - Import Column, 167–169
 - Lookup, 170
 - Merge, 170
 - Merge Join, 170–171
 - Multicast, 171
 - OLE DB Command, 172–175
 - Percentage and Row Sampling, 175
 - Pivot, 175–179
 - Row Count, 182–184
 - Script Component, 184
 - setting, 146–147
 - Slowly Changing Dimension, 184–185
 - Sort, 185–186
 - synchronous, 147
 - Term Extraction, 186–190
 - Term Lookup, 190–192
 - types of, 16–17
 - Union All, 192–193
 - Unpivot, 179–182
 - transformation(s), 15–17, 529–537**
 - Advanced Editor, 533–534
 - asynchronous output, 534–535
 - blocking, 532–533
 - for data cleansing, 551–553
 - for data correlation, 550–551
 - functions of, 15–16, 522, 663
 - non-blocking, 529–531
 - row-based, 530–531
 - semi-blocking, 531–532
 - streaming, 529–530
 - synchronous output, 536–537
 - types of. *See* transforms
 - Transform component**
 - building, code for, 690–701
 - functions of, 663
 - Transform Data Task, 61**
 - migration to SSIS, 612
 - TreeView, 758**
 - triggers, changed data, capturing, 431**
 - truncation, OLE DB Source, 134**
 - Try block, 348**
 - TSQL**
 - expressions, writing in, 211–212
 - extension, new features, 3
 - tutorial. *See* project(s), creating**
- ## U
- UInt32 variable, 210**
 - UInt64 variable, 210**
 - UTypeName, user interface, building, 718, 725–727**
 - Unchanged Output, 387**
 - Unicode**
 - casting, problems of, 207
 - conversion issues, 205–206
 - Union All Component, joins, use in, 246–247**
 - Union All Transform, 192–193**
 - configuring, 192–193
 - during data extraction, 421
 - functions of, 17, 192
 - compared to Merge Transform, 170
 - as partial blocking transform, 147
 - as semi-blocking transform, 530, 537
 - Union AllTransformationNow, 284**
 - Unpivot Transform, 179–182**
 - configuring, 180–181
 - data cleansing, 551
 - functions of, 17, 180
 - unpivoting data, 181–182
 - unshelving, Visual Studio Team System, 602**
 - Unspecified, 52**
 - Uppercase, 150**
 - Use File, 80**
 - UseParentSetting, 52**

UserExp, 232

user interface, 717–740

- Advanced Editor, default interface, 717
- AssemblyInfo, 721–722
- building, steps in, 718
- column display, 728–730
- column properties, 739–740
- column selection, 730–732
- component-level properties, 735–736
- Connection Manager, 734–735
- error handling, 737–739
- form, building, 718, 727–732
- form constructor, 728
- Global Assembly Cache (GAC), 720–721
- IDsComponentUI, 718, 722–725
- Initialize, 722
- mouse versus keyboard navigation, 740
- project, creating, 719–722
- references, adding, 722
- runtime connections, 732–735
- UTypeName, 718, 725–727

UserName, 42, 149

user variables, 41

Use Windows Authentication, 107

using directives, functions of, 672

USZIP, accessing, 69

V

Validate

- Destination adapter, building, 704–706
- functions of, 76, 665
- Source adapter, building, 682–683, 685
- transform, building, 692–693

value(s), variables, actions on, 208

Value Columns, 175

Value Inclusion Profile Request, 63

variable(s), 208–210

- case-sensitivity, 208
- changing, only method, 208
- checkpoints, adding to, 501
- creating, 208–209
- Data Flow Scope Level, 234
- data types for, 209–210
- dummy variables, use of, 218
- and expressions, 201

- functions of, 13, 201, 208
- naming, 208, 310
- and NULLs, 221–222
- payment processing example
 - ACH file, 894–895
 - bank file package, 864–868
 - email transactions, 914–915
 - Invoice Matching, 920–921
- properties, setting, 209
- ReadOnlyVariables, 56
- ReadWriteVariables, 56
- referencing, expression builder, 218
- scope, setting, 41
- in Script Component, 334–335
- in Script Task, 308–314
- setting, 13, 56
- SomeStringValue error message, 310
- system variables, 41–42
- use as expressions, 227–229
- user variables, 41
- values, changing, 353, 647
- VariableDispenser, 308–309
- viewing with watch, 647
- window, accessing, 41

Variables, Dts object, 308

VBScript, 54

verification methods, functions of, 664–665

version

- AssemblyVersion, 678
- AssemblyFileVersion, 678
- VersionBuild, 42
- VersionID, 149

Vertical Bar, 80

Virtual Input, 668, 695

Visual SourceSafe, 570–585

- configuring, 570
- customization options, 571–572
- example of use, 572–585
- predefined roles, 572
- remote access, 572
- updates, 570

Visual Studio

- and BIDs, 28–29
- Visual SourceSafe, 570–585
- Visual Studio Team System, 585–605

Visual Studio Team System, 585–605

- branching code, 602
- examples of use, 586–589
- integration with SSIS project, 597–605
- labeling, 604–605
- merging, 603–604
- MSF Agile, 590–593
- Process Guidance, 589
- project management website feature, 588
- requirements for use, 585–586
- shelving, 600–601
- source control, 597–600
- unshelving, 602

Visual Studio Tools for Applications (VSTA)

- accessing, Script Task, 55–57
- Script Components, 295

VSTA. See Visual Studio Tools for Applications (VSTA)**W****watch**

- adding, 352–353
- BIDS, 36
- and debugging, 352
- Quick Watch window, 352
- variables, viewing, 647

waterfall SDLCs, 569**web project, package management operations in, 756–765****Web Service Task, 69–75, 463–476**

- data retrieval, 73–75, 464–465
- functions of, 8, 69, 463
- operation of, 69–75
- values for calculations, conversions, 467–475
- XML result sets, retrieving, 69–75

WHERE, advantages of, 416–417**Windows Event log, 654**

- log provider for, 767, 770

Windows Management Instrumentation (WMI), 8

- WMI Data Reader Task, 106–108, 775–781
- WMI Event Watcher Task, 108–110, 782–785
- WQL language, 775

Winform .NET, SSIS functionality with, 802–808**wire payments, 844**

- processing of. See payment processing example

WmiConnection, 776**WMI Connection Manager, 776, 782****WMI Data Reader Task, 106–108, 775–781**

- connection, setting for, 106–107, 776
- data type conversion, 779–780
- example of use, 777–781
- functions of, 8, 106
- parameters, 776, 778
- tasks, configuring, 779
- WQL queries, 107–108, 778–781

WMI Event Watcher Task, 9, 108–110, 782–785

- event handler, configuring, 784–785
- example of use, 783–785
- functions of, 108, 782
- parameters, 782–783
- polling, 108–110
- WqlQuerySource, 109–110

word frequency, Term Extraction Transform, 186–190**workflow**

- and Control Flow, 131, 525–526
- Execute Package Task, 98–102
- Execute Process Task, 102–104
- Message Queue Task, 104–105
- Send Mail Task, 105–106

workgroup edition, SQL Server, 19**Work Items, MSF Agile, 591****WQL language, 775****WQL queries, 107–110**

- functions of, 107–108
- output, example of, 107–108
- WMI Data Reader Task generation of, 776–777
- WqlQuerySource, 109–110, 776, 782
- WqlQuerySourceType, 107, 776, 782

Write BOM, 155**writer role, 832****WSDL file, 69–70****X****XML**

- data integration with, 476–481
- Diffgram, 76, 790–791
- InfoPath, 788–797

XML (continued)

XML (continued)

- in-line XSD, accessing, 476
- log provider for, 654, 767, 770
- packages, structure of, 7
- result sets, retrieving, 69–75
- Script Task, saving data to file, 317–319
- serializing data to, 319–322
- Web Service Task, 69–75, 463–476
- XML Schema Definition (XSD), 76, 476–481
- XML Source, 14, 73–75, 142, 476–481
- XML Task, 9, 75–79
- XPATH, 76, 469–470
- XSLT transformations, 76, 791

XMLA scripts, SSAS processing, 401, 404–407

XML Schema Definition (XSD)

- functions of, 76, 476
- in-line XSD, accessing, 476
- XSD files, generating, 142, 476–481

XML Source

- data retrieval, 73–75
- functions of, 14, 73, 142
- output path, choosing, 478–481
- XSD files, generating, 476–481

XML Task, 75–79

- functions of, 9, 75
- options of, 76–77
- XML file, validating, 77–79
- XSD files, generating, 142

XPATH, 76, 469–470

XSLT, 76

Z

ZipCodeExtract, 275

ZipLoad, 273