



Table of Contents

Introduction	xxxi
Chapter 1: Introducing SQL Server 2012	1
In Depth	2
Why Use SQL Server?	2
Features Introduced in SQL Server 2008 R2	3
Master Data Services	3
StreamInsight	3
Multi-Server Administration.....	3
PowerPivot for Excel and SharePoint	3
New Features in SQL Server 2012	3
Product Update.....	4
Multi-Subnet Failover Clustering.....	4
AlwaysOn Availability Groups	4
The THROW Statement	4
Sequence Objects	4
Support for a Contained Database	4
The Columnstore Index	4
Ad-Hoc Query Paging	5
SQL Server 2012 Express LocalDB.....	5
FileTables.....	5
PowerPivot Configuration Tool.....	5
SQL Server Data Tools	5
Reporting Services Excel and Word Rendering Extension.....	5
Power View	5
WITH RESULT SETS.....	6
SQL Server 2012 Editions.....	6
Enterprise Edition.....	6
Business Intelligence Edition	6
Standard Edition.....	7
Web Edition.....	7

Table of Contents

Developer Edition.....	7
Express Edition	7
SQL Server 2012 Instances	7
Default Instance	7
Named Instance	7
SQL Server 2012 System Databases.....	8
The master Database	8
The model Database	8
The msdb Database	9
The tempdb Database	9
The Resource Database	9
Immediate Solutions.....	10
Installing SQL Server 2012.....	10
Performing Attended Installation.....	11
Performing Unattended Installation	25
Upgrading to SQL Server 2012.....	26
Preparing for Upgrade.....	26
Performing the Upgrade.....	31
Summary	38
Chapter 2: Introducing SQL Server 2012 Tools	39
In Depth.....	40
Development Tools	40
SSMS.....	40
SSDT	44
Configuration Tools	49
SQL Server Configuration Manager.....	49
Reporting Services Configuration Manager.....	50
Performance Tools	53
SQL Server Profiler.....	53
Database Engine Tuning Advisor.....	55
Immediate Solutions.....	57
Registering a Server	57
Importing and Exporting Registered Servers	59
Exporting a Registered Server.....	59
Importing a Registered Server	61
Summary	64

Chapter 3: Building SQL Server Databases	65
<i>In Depth</i>.....	66
Basic Database Concepts.....	66
Database Management System	67
Relational Database Management System.....	67
Exploring Tables in Databases	68
ER Diagrams.....	69
Explaining Data Integrity	71
Entity Integrity	71
Domain Integrity	72
Referential Integrity	72
User-Defined Integrity	72
Exploring Keys.....	72
Primary Key	73
Foreign Key	73
Composite key	73
Candidate Key.....	73
Designing a Database.....	74
Gathering the Information.....	74
Categorizing Data into Tables.....	74
Determining Primary Keys.....	75
Identifying Relationship among Tables	76
Normalizing Tables	76
<i>Immediate Solutions</i>.....	87
Performing Database Operations	87
Detaching and Attaching an Existing Database.....	87
Creating a New Database	90
Deleting a Database	93
Performing Table Operations	95
Creating a New Table.....	95
Deleting a Table	98
Performing Data Operations	99
Inserting and Updating Data in a Table	99
Retrieving Data from a Table	101
Deleting Data from a Table	102
Importing and Exporting Data.....	103
Creating a Database Diagram.....	111
Summary	114

Chapter 4: SQL Statements, Operators, and Functions	115
<i>In Depth</i>.....	116
Introducing Basic SQL Statements	116
The SELECT Statement	116
The INSERT Statement	117
The UPDATE Statement	118
The DELETE Statement.....	119
Exploring Operators in SQL Server 2012	119
Arithmetic Operators	120
Comparison Operators.....	120
Logical Operators	122
Assignment Operator	123
Compound Operators	123
Bitwise Operators	124
Unary Operators	125
String Concatenation Operator	125
Scope Resolution Operator.....	126
Set Operators.....	126
Exploring Functions in SQL Server 2012.....	126
Aggregate Functions	127
Scalar Functions	128
Rowset Functions.....	141
Ranking Functions.....	142
Adding Comments in a Code.....	143
<i>Immediate Solutions</i>.....	144
Working with Basic SQL Statements.....	144
Using the SELECT Statement	144
Using the INSERT Statement	146
Using the UPDATE Statement	147
Using the DELETE Statement	148
Working with Operators.....	148
Using Arithmetic Operators	149
Using Comparison Operators	150
Using Logical Operators	150
Using Assignment Operator	151
Using Compound Operators.....	151
Using Bitwise Operators	152
Using Unary Operators.....	153

Using String Concatenation Operator	153
Using Scope Resolution Operator	154
Using Set Operators	154
Working with Functions	157
Using Aggregate Functions	157
Using Scalar Functions	158
Using Rowset Functions	159
Using Ranking Functions	160
Summary	160
Chapter 5: Programming with T-SQL - I	161
<i>In Depth</i>	162
Data Types	162
Exact Numerics	162
Approximate Numerics	163
Date and Time	163
Character Strings	164
Unicode Character Strings	164
Binary Strings	165
Miscellaneous Data Types	165
Data Type Conversion	166
Control Flow Statements	167
The BEGIN...END Statement	167
The IF...ELSE Statement	167
The WHILE, BREAK, and CONTINUE Statements	168
The GOTO Statement	168
The RETURN Statement	168
The WAITFOR Statement	169
The Identity Column	169
The Sparse Column	170
The FILESTREAM Attribute	170
FileTables	171
The MERGE Statement	171
<i>Immediate Solutions</i>	172
Performing Data Type Conversion	172
Using the CAST() Function	172
Using the CONVERT() Function	172
Working with Control Flow Statements	173

Table of Contents

Using the BEGIN...END Statement	173
Using the IF...ELSE Statement.....	174
Using the WHILE, BREAK, and CONTINUE Statements.....	175
Using the GOTO Statement.....	176
Using the RETURN Statement.....	176
Using the WAITFOR Statement.....	177
Modifying Data using the MERGE Statement.....	178
Retrieving Topmost Records using the TOP Clause	180
Performing Database Operations.....	181
Creating a Database.....	181
Dropping a Database.....	182
Performing Table Operations.....	183
Creating a Table.....	183
Altering a Table	185
Truncating a Table.....	186
Dropping a Table.....	187
Summary	188
Chapter 6: Programming with T-SQL - II	189
<i>In Depth</i>.....	190
Understanding Constraints	190
The PRIMARY KEY Constraint	191
The FOREIGN KEY Constraint.....	191
The UNIQUE Constraint	191
The CHECK Constraint	191
Rules	191
The CREATE RULE Statement	192
The DROP RULE Statement	192
Joins in SQL Server 2012.....	192
Cross Join.....	193
Inner Join	193
Outer Join	193
Self-Join.....	194
Describing Views	194
The CREATE VIEW Statement	195
The ALTER VIEW Statement	195
The DROP VIEW Statement	196
Subqueries	196

Derived Tables.....	196
Common Table Expressions	197
Aliases.....	197
Immediate Solutions.....	198
Implementing Constraints.....	198
Using the PRIMARY KEY Constraint	198
Using the UNIQUE Constraint	199
Using the FOREIGN KEY Constraint.....	199
Using the CHECK Constraint	200
Working with Rules	201
Creating a Rule	201
Dropping a Rule	202
Joining Tables.....	202
Performing a Cross Join.....	203
Performing an Inner Join	203
Performing an Outer Join	204
Performing a Self-Join	206
Working with Views	207
Creating a View	208
Altering a View	208
Dropping a View	209
Using Subqueries	209
Using Derived Tables.....	210
Using Common Table Expressions	211
Creating Aliases	211
Summary	212
Chapter 7: Stored Procedures and User-Defined Functions.....	213
In Depth.....	214
Benefits of Stored Procedures.....	214
Types of Stored Procedures.....	215
System Stored Procedures	215
User-Defined Stored Procedures	216
Extended Stored Procedures	218
Nesting and Recursion.....	218
Parameters in Stored Procedure	218
The Input Parameter	218

Table of Contents

The Table-Valued Parameter.....	219
The Output Parameter	219
Statement-Level Recompilation.....	219
Types of User-Defined Functions.....	220
Scalar Function.....	221
Table-Valued Function.....	222
Immediate Solutions.....	223
Creating a Stored Procedure.....	223
Altering a Stored Procedure	224
Executing a Stored Procedure.....	225
Dropping a Stored Procedure.....	226
Passing Data to a Stored Procedure	227
Using Input Parameters	227
Using Table-Valued Parameters	228
Returning Data from a Stored Procedure	230
Working with User-Defined Functions.....	232
Creating and Executing a Scalar Function.....	232
Creating and Executing a Table-Valued Function.....	234
Summary	236
Chapter 8: Triggers in SQL Server 2012.....	237
In Depth.....	238
Comparing Triggers and Constraints	238
Limitations of Triggers.....	238
Types of Triggers.....	239
DML Triggers.....	239
DDL Triggers	240
Logon Triggers.....	241
The CREATE TRIGGER Statement	241
The ALTER TRIGGER Statement.....	243
The DROP TRIGGER Statement.....	245
Nested Triggers.....	245
Immediate Solutions.....	246
Creating Triggers	246
Creating DML Triggers.....	246
Creating DDL Triggers	252
Creating Logon Triggers.....	253

Altering Triggers.....	254
Removing Triggers.....	256
Summary	256
Chapter 9: Cursors in SQL Server 2012	257
<i>In Depth</i>.....	258
Cursor Models.....	258
API Server Cursors	259
Client Cursors	259
Transact-SQL Cursors	259
Cursor Types	260
Static Cursors	260
Dynamic Cursors	261
Forward-Only Cursors.....	261
Keyset-Driven Cursors.....	261
Anatomy of a Cursor.....	262
The DECLARE CURSOR Statement.....	262
The OPEN Statement	264
The FETCH Statement.....	265
The CLOSE Statement.....	266
The DEALLOCATE Statement.....	266
System-Defined Cursor Functions	266
The CURSOR_STATUS() Function.....	267
The @@CURSOR_ROWS Function.....	268
The @@FETCH_STATUS Function.....	268
Cursor Related Database Options	270
The CURSOR_CLOSE_ON_COMMIT Option	270
The CURSOR_DEFAULT Option.....	270
Cursor Concurrency Options	270
Positional Updates and Deletes.....	271
The CURSOR THRESHOLD Option.....	272
Cursor Transaction Isolation Levels.....	272
Read Committed.....	272
Read Uncommitted	273
Repeatable Read or Serializable.....	273
Snapshot	273
<i>Immediate Solutions</i>.....	274
Creating a Simple Cursor.....	274

Table of Contents

Performing Positioned Updates	275
Performing Positioned Deletes.....	278
Creating a Cursor to Select a Random Record.....	281
Summary	284
Chapter 10: Managing Transactions and Locking	285
<i>In Depth</i>.....	286
The ACID Properties.....	286
Atomicity	286
Consistency	286
Isolation	287
Durability.....	287
Types of Transactions	287
Autocommit Transactions	287
Explicit Transactions	287
Implicit Transactions.....	289
Batch-Scoped Transactions.....	289
Concurrency Problems.....	289
Concurrency Control Mechanisms.....	290
Optimistic Concurrency Control	290
Pessimistic Concurrency Control	290
Transaction Isolation Levels	290
Locking in SQL Server 2012.....	292
Lock Granularity.....	292
Types of Locks	293
Deadlocking	295
<i>Immediate Solutions</i>.....	296
Starting, Committing, and Rolling Back a Transaction.....	296
Creating a Savepoint within a Transaction.....	298
Handling Deadlocks	300
Summary	302
Chapter 11: Error Handling in SQL Server 2012	303
<i>In Depth</i>.....	304
Exploring Error Handling Techniques.....	304
The @@ERROR Function	306
The RAISERROR Statement	306
The TRY...CATCH Statement.....	307

Debugging Tools in SQL Server 2012.....	309
The PRINT Statement.....	310
Trace Flags.....	311
SQL Server Management Studio Integrated Debugger	311
Immediate Solutions.....	313
Using the @@ERROR Function.....	313
Using the RAISERROR Statement.....	314
Using the TRY...CATCH Statement	316
Using the THROW Statement.....	318
Creating User-Defined Error Messages	319
Recording an Error Information to the Event Log.....	320
Debugging a T-SQL Code.....	322
Summary	326
Chapter 12: Monitoring, Auditing, and Maintaining SQL Server	327
In Depth.....	328
Overview of SQL Server Monitoring	328
Determining SQL Server Monitoring Goals	329
Selecting a Proper Monitoring Tool	329
Determining the Components for Monitoring.....	329
Selecting Metrics for Monitored Components	330
Starting the Monitoring Tool.....	330
Analyzing the Gathered Data	330
SQL Server Monitoring Tools.....	330
Performance Monitor	330
Activity Monitor	331
SQL Server Profiler.....	332
SQL Server Audit.....	335
Database Maintenance Plans	336
Immediate Solutions.....	337
Monitoring SQL Server Performance.....	337
Using Performance Monitor	337
Using Activity Monitor.....	341
Using SQL Server Profiler	342
Using SQL Server Audit	345
Using Maintenance Plan Wizard.....	350
Summary	358

Chapter 13: Data Replication	359
<i>In Depth</i>.....	360
Need for Replication	360
Benefits of Replication	361
Replication Components.....	361
Publisher	361
Distributor	361
Subscribers.....	362
Article.....	362
Publication.....	362
Subscription.....	362
Overview of the Replication Process.....	362
Types of Replication.....	363
Snapshot Replication.....	364
Transactional Replication	364
Merge Replication.....	364
Replication Agents	365
Snapshot Agent.....	365
Distribution Agent.....	365
Log Reader Agent.....	365
Queue Reader Agent	366
Merge Agent.....	366
Replication Topologies.....	366
Central Publisher	366
Central Subscriber	368
Central Publisher with Remote Distributor	368
Multiple Publishers and Multiple Subscribers.....	369
<i>Immediate Solutions</i>.....	370
Configuring Replication	370
Creating a Distribution	370
Creating a Publication.....	376
Creating a Subscription.....	384
Verifying Replication.....	393
Monitoring Replication.....	396
Summary	398

Chapter 14: Log Shipping and Database Mirroring	399
<i>In Depth</i>.....	400
Exploring Log Shipping.....	400
Benefits and Limitations	400
The Log Shipping Architecture.....	401
Exploring Database Mirroring.....	403
Benefits and Limitations	403
The Database Mirroring Architecture	403
Operating Modes of a Database Mirroring Session.....	405
Factors Determining the Operating Mode	405
Role Switching	406
Automatic Page Repair Feature.....	407
<i>Immediate Solutions</i>.....	408
Configuring Log Shipping.....	408
Monitoring Log Shipping	416
Configuring Database Mirroring.....	417
Monitoring Database Mirroring.....	424
Summary	426
Chapter 15: Implementing Failover Clustering	427
<i>In Depth</i>.....	428
Introducing Failover Cluster	428
Introducing Multi-Subnet Failover Cluster	428
Exploring Benefits and Limitations of Failover Clustering.....	429
Explaining Architecture of a SQL Server Failover Cluster.....	430
Working of the Failover Clustering.....	431
<i>Immediate Solutions</i>.....	432
Creating a SQL Server Failover Cluster	432
Creating Single-Node SQL Server Failover Clusters	433
Adding Nodes to a Single-Node SQL Server Failover Cluster	446
Removing a Node from a SQL Server Failover Cluster	447
Summary	452
Chapter 16: Performing Bulk Copy Operations	453
<i>In Depth</i>.....	454
The bcp Syntax	454
The bcp out Command	456
The bcp in Command.....	457

Table of Contents

Authentication Switches	457
Switches for Error Handling	458
Switches for Partitioning Data	458
Input and Output File Format Switches	459
Optimization Switches	459
Special Insert Switches	460
Switches for bcp Hints	460
Miscellaneous Switches	461
The bcp queryout Command.....	461
bcp Errors	462
Format Files.....	463
The BULK INSERT Statement	465
The BULK INSERT Default File Format	468
The BULK INSERT Permissions	468
BULK INSERT and Integration Services.....	468
Optimizing bcp Performance	469
Immediate Solutions.....	470
Using the bcp out Command.....	470
Using the bcp in Command.....	471
Using the bcp queryout Command.....	473
Using Format Files	473
Executing the BULK INSERT Statement.....	475
Summary	476
Chapter 17: SQL Server Service Broker.....	477
In Depth.....	478
Enhancements in Service Broker	478
Architecture of Service Broker.....	478
Messages	479
Services	479
Contracts.....	479
Queues	479
Dialog Conversations.....	480
Conversation Groups	480
The Service Broker Endpoint	481
Remote Service Bindings	481
Routes.....	481
Uses of Service Broker.....	481

Asynchronous Triggers.....	481
Reliable Query Processing.....	482
Reliable Data Collection.....	482
Large-Scale Batch Processing.....	482
Distributed Server-Side Processing.....	482
Data Consolidation.....	482
The CREATE EVENT NOTIFICATION Statement.....	483
Immediate Solutions.....	484
Integrating DDL and DML Operations with Service Broker.....	484
Creating a Message Queue.....	484
Creating a Service Broker Service.....	484
Creating an Event Notification.....	485
Managing a Service Broker.....	486
Activating Service Broker in a Database.....	486
Starting and Stopping a Queue.....	486
Creating Certificates for Securing the Service Broker Transport.....	487
Summary.....	488
Chapter 18: Policy-Based Management.....	489
In Depth.....	490
Basic Terminology of PBM.....	490
Managed Target.....	490
Facet.....	490
Condition.....	491
Policy.....	492
Policy Category.....	492
Effective Policy.....	492
Modes of Policy Evaluation.....	492
Immediate Solutions.....	494
Working with Conditions.....	494
Creating a Condition.....	494
Viewing or Modifying a Condition.....	495
Working with Policies.....	497
Creating a Policy.....	497
Viewing or Modifying a Policy.....	498
Evaluating a Policy.....	500
Specifying a Schedule to Run a Policy.....	504
Importing a Policy.....	505

Table of Contents

Exporting a Policy	507
Summary	508
Chapter 19: Automating SQL Server 2012	509
<i>In Depth</i>.....	510
SQL Server Agent.....	510
Jobs	510
Schedules	511
Alerts	511
Operators	511
Database Mail.....	511
Database Maintenance Plans	512
<i>Immediate Solutions</i>.....	513
Configuring the SQL Server Agent Service	513
Working with Jobs in SQL Server Agent	518
Creating a Job.....	518
Defining Job Steps	520
Creating a Job Schedule	523
Executing a Job.....	524
Creating an Operator	525
Creating Alerts	527
Setting Up Database Mail	530
Creating a Database Maintenance Plan.....	537
Modifying and Executing a Database Maintenance Plan.....	545
Summary	546
Chapter 20: Performance Optimization with Query Execution Plans	547
<i>In Depth</i>.....	548
Explaining the Lifecycle of a Query	548
Query Compilation.....	549
Query Optimization	549
Query Execution	549
Describing Execution Plan Formats	550
Execution Plan Caching	550
<i>Immediate Solutions</i>.....	552
Viewing Estimated Query Execution Plans.....	552
Using the Graphical Format	552
Using the Text Format.....	554

Using the XML Format	555
Viewing Actual Query Execution Plans.....	556
Using the Graphical Format	557
Using the Text Format.....	559
Using the XML Format	560
Viewing Procedure Cache Details.....	561
Summary	562
Chapter 21: Indexing and Partitioning.....	563
<i>In Depth</i>.....	564
Indexing.....	564
Clustered Indexes	565
Non-Clustered Indexes	565
Unique Indexes	565
Columnstore Indexes	565
Indexes with Included Columns.....	565
Full-Text Indexes	566
Spatial Indexes	566
Filtered Indexes.....	566
XML Indexes	566
Partitioning.....	566
Partition Function.....	566
Partition Scheme	568
<i>Immediate Solutions</i>.....	569
Creating Indexes	569
Creating a Clustered Index.....	569
Creating a Non-Clustered Index.....	572
Creating a Columnstore Index.....	574
Optimizing Index Performance.....	577
Enabling and Disabling Indexes.....	580
Removing Indexes.....	581
Partitioning a Table.....	582
Creating a Partition Function.....	583
Creating a Partition Scheme	583
Creating a Partitioned Table	587
Querying a Partitioned Table.....	587
Summary	588

Chapter 22: Working with Full-Text Search	589
<i>In Depth</i>.....	590
Full-Text Search Architecture.....	590
Full-Text Querying.....	593
The CONTAINS Predicate	593
The FREETEXT Predicate	594
The CONTAINSTABLE Function.....	594
The FREETEXTTABLE Function	595
Property Searching.....	595
<i>Immediate Solutions</i>.....	596
Creating a Full-Text Catalog.....	596
Using SSMS	596
Using T-SQL Code.....	598
Creating a Full-Text Index.....	599
Using SSMS	599
Using T-SQL Code.....	604
Executing Full-Text Queries	604
Using the CONTAINS Predicate	605
Using the FREETEXT Predicate	605
Using the CONTAINSTABLE Function	606
Using the FREETEXTTABLE Function	607
Summary	608
Chapter 23: Data Compression.....	609
<i>In Depth</i>.....	610
Benefits and Limitations of Data Compression.....	610
Types of Data Compression.....	611
Row Compression	611
Page Compression.....	611
Unicode Compression.....	612
Compression Savings.....	612
<i>Immediate Solutions</i>.....	613
Determining Compression Savings.....	613
Implementing Data Compression	614
Using SSMS	614
Using T-SQL Code.....	618
Summary	618

Chapter 24: Resource Governor.....	619
<i>In Depth</i>.....	620
Benefits and Limitations of Resource Governor.....	620
Components of Resource Governor.....	621
Resource Pools.....	621
Workload Groups.....	622
Classification.....	623
<i>Immediate Solutions</i>.....	624
Using Resource Governor.....	624
Creating Resource Pools.....	624
Creating Workload Groups.....	625
Creating a Classifier Function.....	625
Configuring Resource Governor.....	626
Monitoring Resource Governor.....	627
Using Performance Counters.....	627
Using Trace Events.....	628
Using Dynamic Management Views.....	631
Using Catalog Views.....	632
Summary.....	632
Chapter 25: Security in SQL Server 2012.....	633
<i>In Depth</i>.....	634
Enhancements in Security.....	634
The SQL Server Security Model.....	635
Authentication Types in SQL Server.....	635
SQL Server Authentication.....	635
Windows Authentication.....	635
Authentication Modes.....	636
Windows Authentication Mode.....	636
Mixed Mode.....	636
Principals and Securables.....	637
Principals.....	637
Securables.....	641
Permissions.....	643
Types of Permissions.....	643
Problems with Permissions.....	644
CAS.....	646
Application Roles.....	646

Table of Contents

SQL Server Passwords	647
Encryption	648
User-Supplied Password Encryption	649
Symmetric Key Encryption	650
Asymmetric Key Encryption	650
Encryption Using a Certificate	651
TDE	651
EKM	652
Backing Up Keys	653
Immediate Solutions	654
Performing User-Specific Operations	654
Creating a User at Server Level	654
Creating a User at Database Level	659
Modifying the Existing User Properties	667
Deleting a User at Server Level	668
Deleting a User at Database Level	669
Implementing Permissions	673
Granting Permissions	673
Denying Permission	678
Revoking Permission	680
Creating a Cross-Database Ownership Chaining	680
Using CAS	682
Changing or Resetting Passwords	688
Encrypting Data	689
Using Symmetric Key Encryption	690
Using Asymmetric Key Encryption	691
Using TDE	692
Summary	694
Chapter 26: Backing Up and Restoring Databases	695
In Depth	696
Types of Backups	696
Full Backup	696
Differential Backup	696
File or Filegroup Backup	697
Copy-Only Backup	697
Transaction Log Backup	697
Types of Recovery Models	697

Simple Recovery Model	697
Full Recovery Model	698
Bulk-Logged Recovery Model	698
Immediate Solutions.....	699
Selecting the Recovery Model for a Database.....	699
Backing Up Databases.....	700
Taking a Full Backup.....	700
Taking a Differential Backup	704
Taking a File or Filegroup Backup	705
Taking a Copy-Only Backup.....	708
Taking a Transaction Log Backup	710
Restoring Databases.....	712
Restoring Files and Filegroups.....	715
Summary	718
Chapter 27: SQL Server Reporting Services.....	719
In Depth.....	720
Basic SSRS Concepts	720
Report Definition	720
Report Types	720
Report Models.....	721
Data Regions and Maps	721
The SSRS Architecture	722
Report Server.....	723
Report Manager	727
Report Builder.....	727
Report Designer	728
Model Designer.....	729
Reporting Services Configuration Manager.....	729
Immediate Solutions.....	730
Configuring SSRS.....	730
Creating SSRS Reports	735
Creating Reports by using SSDT	735
Creating Reports by using Report Builder	743
Publishing SSRS Reports.....	756
Summary	760

Chapter 28: SQL Server Analysis Services.....	761
<i>In Depth</i>.....	762
Basic SSAS Terminologies.....	762
New Features of SSAS.....	763
SSAS Architecture.....	763
BISM.....	763
ASSL.....	764
Analysis Services Tools.....	764
Analysis Services Deployment Wizard.....	764
The Rename Instance Tool.....	765
Objects of SSAS.....	765
Cubes.....	766
Cells.....	766
Measures and Fact Tables.....	766
Dimensions and Attributes.....	766
Hierarchies.....	766
Data Source Views.....	767
Securing SSAS.....	767
Deciding the Security Architecture.....	767
Setting up a Logon Account.....	768
Setting up an Access for SSAS.....	768
Cube Designer.....	769
The Cube Structure Tab.....	770
The Dimension Usage Tab.....	770
The Calculations Tab.....	771
The KPIs Tab.....	772
The Actions Tab.....	772
The Partitions Tab.....	773
The Aggregations Tab.....	774
The Perspectives Tab.....	775
The Translations Tab.....	775
The Browser Tab.....	776
<i>Immediate Solutions</i>.....	778
Managing Data Sources in SSAS.....	778
Creating a New Data Source.....	778
Modifying an Existing Data Source.....	784
Deleting a Data Source.....	786

Administering SSAS.....	787
Connecting to an Instance of SSAS.....	787
Creating an SSAS Database.....	788
Creating a Data Source View.....	789
Creating a Cube.....	792
Adding Attributes to Dimensions.....	797
Deploying an Analysis Services Project.....	798
Browsing a Cube.....	799
Summary.....	800
Chapter 29: SQL Server Integration Services	801
<i>In Depth</i>.....	802
New Features of SSIS.....	802
The SSIS Architecture.....	802
SSIS Designer.....	803
SSIS Wizards.....	804
Command Prompt Utilities.....	805
Integration Services Service.....	805
Object Model.....	806
Run-Time Engine and Run-Time Executables.....	806
Data Flow Engine and Data Flow Components.....	806
Components of an SSIS Package.....	806
Control Flow Elements.....	807
Data Flow Elements.....	808
Connection Managers.....	809
Variables.....	809
Event Handlers.....	809
Log Providers.....	810
SSIS Support in SSMS and SSDT.....	811
<i>Immediate Solutions</i>.....	812
Creating a Custom Integration Services Package.....	812
Using SSIS Designer.....	812
Using SQL Server Import and Export Wizard.....	823
Deploying a Custom Integration Services Package.....	829
Creating Package Configurations.....	831
Creating a SSIS Package Deployment Utility.....	836
Using Package Installation Wizard.....	837
Using SSIS Packages in Integration Services.....	841

Table of Contents

Importing Integration Services Package	841
Exporting an Integration Services Package	844
Summary	846
Chapter 30: SQL Server 2012 and XML	847
<i>In Depth</i>	848
Benefits of Storing XML Data in SQL Server	848
The XPath Language	848
The OPENXML Statement.....	849
The FOR XML Clause	850
The xml Data Type.....	850
The XQuery Language.....	851
XML DML.....	852
The insert Keyword	852
The delete Keyword	853
The replace value of Keyword	853
<i>Immediate Solutions</i>	854
Using the OPENXML Statement	854
Using the FOR XML Clause.....	856
The RAW Mode	856
The AUTO Mode	857
The Explicit Mode.....	858
The PATH Mode.....	859
Working with the xml Data Type.....	860
Using the exist() Method	861
Using the value() Method.....	861
Using the query() Method	862
Using the nodes() Method	864
Using the modify() Method.....	865
Summary	870
Chapter 31: SQL Server 2012 and Common Language Runtime	871
<i>In Depth</i>	872
Benefits of CLR Integration	872
Program Execution inside CLR	873
CLR Features	874
Type Safety Verification.....	874
Application Domains	874

CAS.....	874
HPAs	874
The Microsoft.SqlServer.Server Namespace.....	875
Immediate Solutions.....	877
Enabling CLR Integration.....	877
Creating a CLR Stored Procedure.....	877
Deploying a CLR Stored Procedure to a Test Server.....	885
Moving a CLR Stored Procedure to Production Server.....	889
Summary.....	894
Chapter 32: SQL Server 2012 and Language-Integrated Query.....	895
In Depth.....	896
Standard Query Operators.....	896
Projection Operators.....	897
Filtering Operators.....	897
Sorting Operators.....	898
Grouping Operators.....	898
Join Operators.....	898
Aggregation Operators.....	899
Element Operators.....	899
Concatenation Operators.....	900
Partitioning Operators.....	901
Set Operators.....	901
Equality Operators.....	902
Quantifier Operators.....	902
Generation Operators.....	902
Data Type Conversion Operators.....	903
Object Relational Mapping and LINQ to SQL.....	903
The DataContext Class.....	904
Immediate Solutions.....	906
Working with Standard Query Operators.....	906
Using the Select Operator.....	906
Using the Where Operator.....	912
Using the OrderBy Operator.....	913
Using the GroupBy Operator.....	914
Using the Join Operator.....	916

Table of Contents

Modifying Databases using the DataContext Class	917
Inserting New Records	918
Updating Existing Records.....	919
Deleting Records.....	921
Summary	922
Appendix A: Migrating from MS Access to SQL Server	923
Appendix B: Spatial Data Types	933
Appendix C: Exploring System Functions	941
Appendix D: Data Quality Services	949
Appendix E: Management Data Warehouse in SQL Server 2012	955
Appendix F: Master Data Services	965
Appendix G: PowerPivot for Excel	979
Appendix H: Change Data Capture.....	995
Appendix I: Assemblies in SQL Server 2012.....	1003
Glossary	1107
Index	1021
What's on the CD-ROM	1032